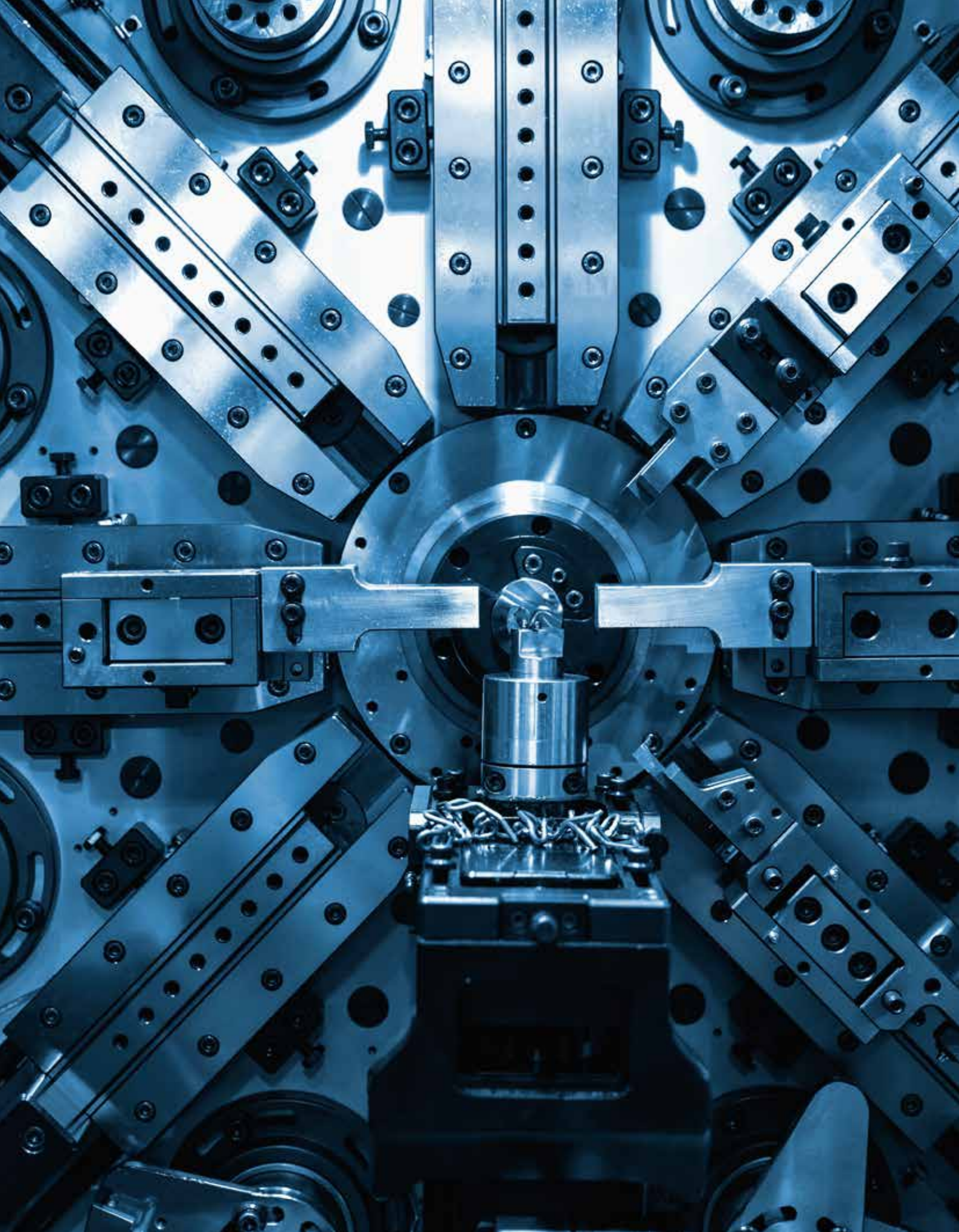
EMBARGOED UNTIL 00.01, MONDAY 29 JANUARY 2018

Cities Outlook

2018

centreforcities



1. Urban Britain is faced by stark political divides

More than half of voters in cities in the Greater South East chose to remain in the EU, but in the rest of the UK, the reverse was true

2. These divides are mirrored in the economy

Cities outside the Greater South East tend to be less productive, have a lower average wage and a lower employment rate than cities within it

£42k GVA per worker
Doncaster

£424 average weekly wage
Huddersfield

64% employment rate
Dundee

£82k GVA per worker
Slough

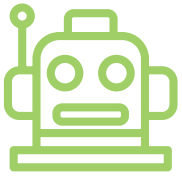
£655 average weekly wage
Reading

87% employment rate
Crawley

Source: Electoral Commission; ONS 2017, Annual Population Survey, residents analysis, July 2015 - June 2016 and July 2016 - June 2017; DETINI 2017, District Council Area Statistics for Belfast, Jan
Annual Survey of Hours and Earnings (ASHE), average gross weekly workplace-based earnings, 2017 data. Own calculations for PUA-level weighted by number of jobs, CPI inflation adjusted (2015=
Employment Survey, 2016 data; Nesta 2017, The future of skills: employment in 2030, London: Nesta; ONS 2017, Business Register of Employment Survey; Census 2011.

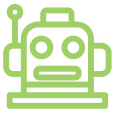
3. Automation & globalisation may compound these divides

Cities outside the Greater South East are more at risk of losing jobs to automation and globalisation than those within it



29% of jobs at risk by 2030 in Mansfield

13% of jobs at risk by 2030 in Oxford



4. How do we bridge the divide?

To reunite urban Britain, policy needs to give both cities and people the tools to succeed

Empower cities

City leaders need the powers and a direct democratic mandate to tackle the specific challenges in their place

Empower people

Both young people about to enter work, and older people at risk of losing their jobs need the relevant skills to succeed in a changing world

uary 2015 - December 2015 and January 2016 - December 2016 data; ONS 2017, Annual Survey of Hours and Earnings (ASHE), average gross weekly workplace-based earnings, 2017 data; DETINI 2017, 100). Earnings data is for employees only, whereas the rest of the tables use employment data; ONS 2017, Regional Value Added (Balance Approach), 2016 data. ONS 2017, Business Register and

"As the pace of technological change rapidly accelerates, Cities Outlook 2018 couldn't be more relevant. The future of work in UK Cities is a subject that will dominate local and national level policy making and is of huge importance in Wakefield and the Key Cities. This report is essential reading for city leaders on what the impact of these changes could mean, as well as for understanding the opportunities and challenges that cities will face going ahead.

"This year the Centre for Cities has done an outstanding job in highlighting how at the policy level cities can continue to attract job growth so to ensure that they remain at the heart of a strong national economy."
Cllr Peter Box, Leader, Wakefield Council

"Ways of working in our cities have been changing dramatically. For example: co-working spaces are no longer the reserve of Shoreditch startups but have sprung up in every city from London to Belfast; flexible working is becoming the rule rather than the exception; and young industries like the tech sector are growing at twice the rate of the wider economy.

"We need to prepare for this change. Reskilling and upskilling must become the norm, and it's essential that we equip young people to face the future of work. As this report highlights, the opportunity is a big one; the UK's digital economy is worth $100bn. Resources like the Digital Business Academy already provide free digital skills training solutions. Now we just need the ambition. We've built Tech City. Now let's build Tech Nation."
Gerard Grech, Chief Executive Officer, Tech City UK

"Cities Outlook 2018 gives insight into the future of the UK workforce, to understand the potential opportunities and risk from the rise of robotics, artificial intelligence and the other methods of job automation. Bristol and other cities across the UK can use the advances in technology and globalisation to help raise their productivity, improve job quality, diversify employment and drive inclusive economic growth.

"This year's Outlook will be a vital tool for those policy makers who recognise that the key to facing the national economic challenges ahead is to build upon the strength and potential of our cities."
Marvin Rees, Mayor of Bristol

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Acknowledgements

All views expressed are those of Centre for Cities.

01

Cities Outlook 2018

The State of Urban Britain


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The state of urban Britain in 2018

Urban Britain is a divided entity, both in terms of politics and economics. *Cities Outlook 2018* shows the extent of these divides, and the implications they have for the future.

Mansfield has broadcast some very clear messages via the ballot box in the last two years. It polled the highest percentage of votes to leave the European Union of any UK city in the EU referendum. And it returned its first non-Labour MP since 1923 in the form of Conservative Ben Bradley in last year's general election.

There is clearly dissatisfaction among the residents, and the city's economic performance suggests why this might be the case. In 2017, resident wages were 19 per cent below the national average, while employment rates were lower than the national average too. In much of the recent discussion around 'left behind' places, Mansfield is a leading example.

The picture looks very different in Reading where its residents voted to remain in the EU. Resident wages were 18 per cent above the national average, and it saw a swing towards Labour in the last election. And in 2016/17, welfare payments were £1,100 lower for every resident living in Reading compared to Mansfield.

This is a story seen across urban Britain, which is divided both politically and economically. In terms of politics, this can be seen both in the outcomes of the EU referendum and the most recent general election (as shown in Figure 1). In the referendum small and medium sized cities on the coast (such as Southend and Chatham) or in the midlands or the north of England (such as Mansfield and Doncaster) tended to poll a greater share of votes for leave.

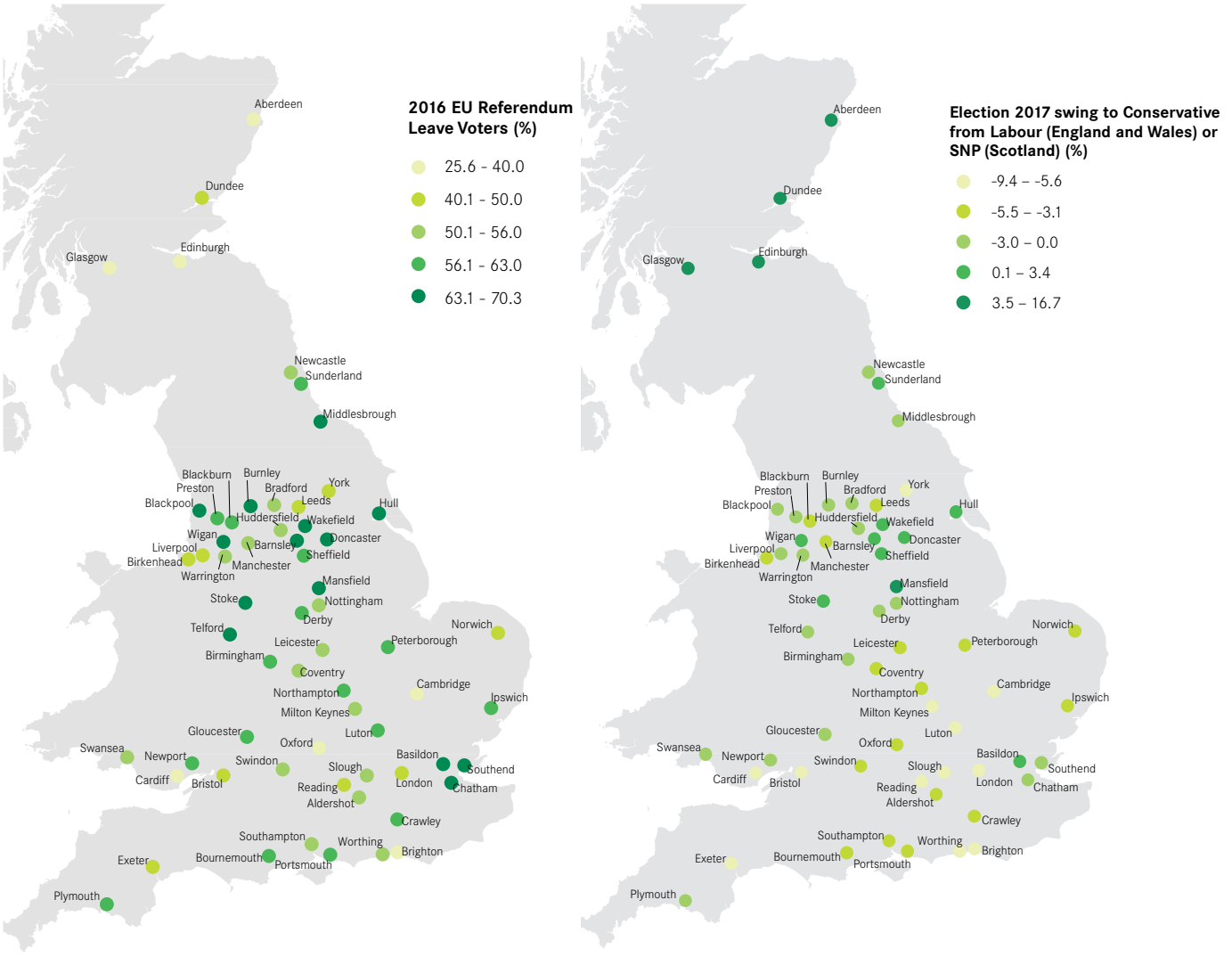
A similar geography is seen when looking at the swing towards or away from the Conservative party at the election. The majority of Britain's cities returned Labour MPs once again. But the swing towards the Conservatives was surprising – cities such as Stoke and Hull, long considered Labour heartlands, saw shifts towards the

Tories. And while many northern cities did see a swing towards Labour, this was smaller than the swing the party enjoyed at the national level.

The economic divides across urban Britain map closely to the political ones (see Figure 2). In terms of wages, welfare spend per capita and employment rates, the patterns tell a story of winners and losers, with southern cities in general being the relative winners. This has come at a cost though (for renters at least, if not homeowners), with housing being much less affordable in southern cities than elsewhere.

Figure 1:

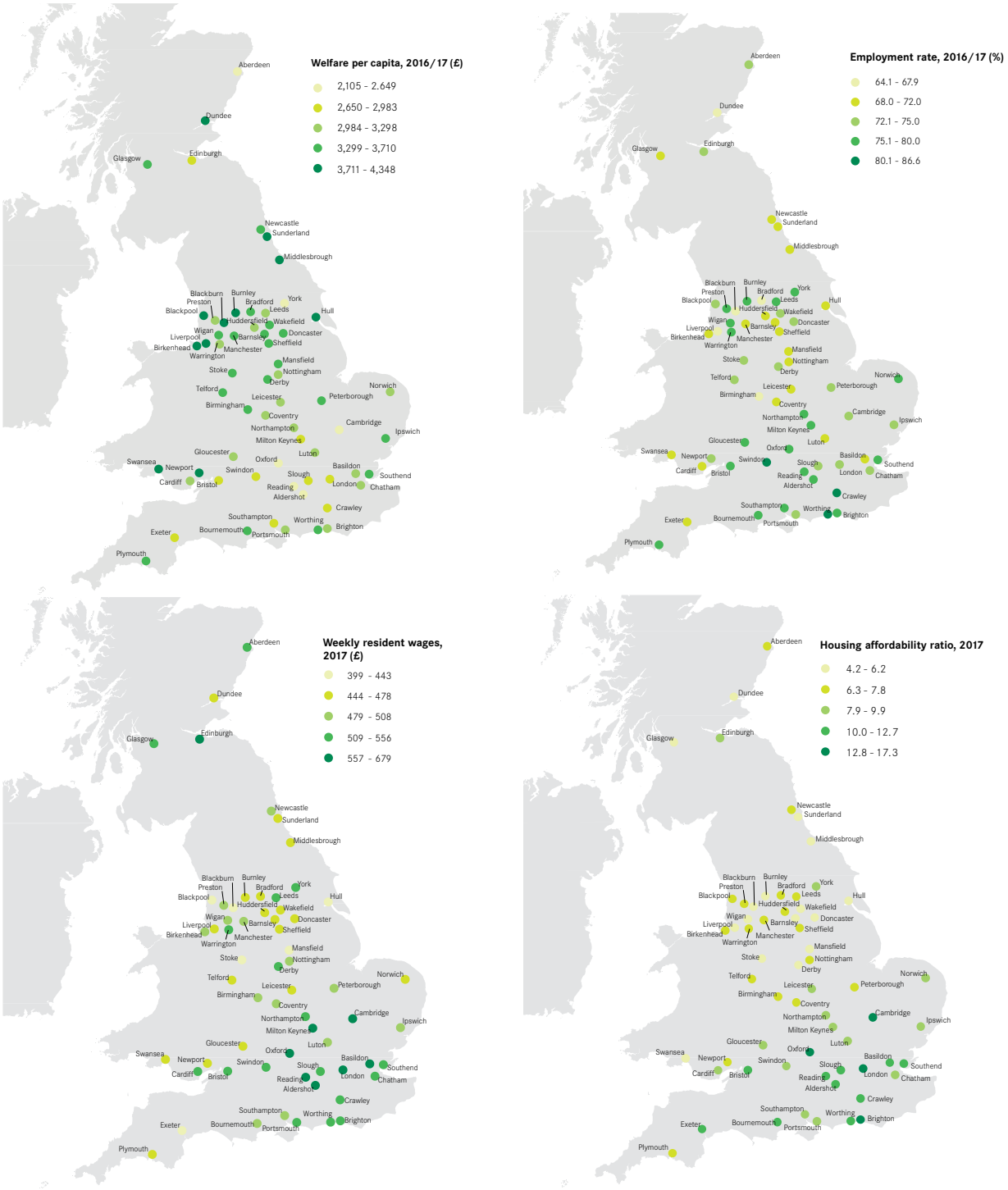
The political divides across urban Britain



Source: The Electoral Commission 2017

Figure 2:

The economic divides across urban Britain



Source: ONS 2017, Annual Survey of Hours and Earnings (ASHE); NOMIS 2017, Annual Population Survey; Land Registry 2017, Market Trend Data, Price Paid, 2017 data. Simple average used. Scottish neighbourhood statistics 2016, Mean House prices; DWP 2017; HMRC 2017; DCLG 2017; Welsh Government 2017; Scottish Government 2017; NOMIS 2017, Population estimates; ONS 2017, Birth summary tables; National Registers of Scotland 2017, Births by sex, year and council area.

Why economic divides exist across the country

One of the main reasons for these differences in economic outcomes is the differing productivity – the average output of each worker - across the country. While the UK's productivity woes have been subject to a great deal of comment and analysis in recent years, there has been much less consideration of how this plays out across the country and the implications for the national picture.

Centre for Cities analysis[1] has shown that the country's productivity problems are the result of the underperformance of many cities outside the Greater South East of England. While cities such as London and Reading are among the most productive in Europe, cities such as Leicester and Sheffield perform well below the European average.[2] This means that a big part of improving the productivity of the UK as a whole will need to address the poor productivity in these cities.

How well politicians do this will depend in part on how well they use the tools made available to them in the most recent Budget and the Industrial Strategy. Both unveiled a number of helpful place-based initiatives, including new devolution and growth deals and funds designed to tackle the challenges that different cities face, such as the Transforming Cities Fund for local transport. The six metro mayors were also given extra tools and funding to support their economies.

But neither the Budget nor the Industrial Strategy set out with enough clarity the overarching role of place in explaining the UK's productivity challenges. The productivity divergence seen across the country is the result of the different advantages that cities offer to businesses. Those cities that struggle economically tend to offer many lower-skilled workers and cheap land to businesses, but they don't offer access to a large number of higher-skilled workers or a network of higher-skilled businesses. The result is that while many have been successful at attracting investment from call centres and distribution warehouses, for example, they have struggled over a long period of time to attract investment from more productive, innovation-focused firms.

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1 Swinney P & Breach A (2017) *The role of place in the UK's productivity problem*, London: Centre for Cities

2 Bessis H (2016) *Competing with the Continent: How UK cities compare with their European counterparts*, London: Centre for Cities

Without this clear overarching strategy, there is a lack of coherence to the many initiatives announced. This makes tackling the underperformance of a number of cities, and the impact this has on national productivity, a much more difficult task.

That said, the commitment within the national strategy to create local industrial strategies offers a chance to address this. The ability of the local industrial strategies to set out a coordinated set of actions to deal with the challenges and opportunities their areas face will make or break the success of the national strategy overall.

A successful local industrial strategy will be one that is able to change a city's offer to businesses across a range of sectors, with the result being an increase in higher paid, more productive jobs in that city.

Devolution and local leadership

Over the last 12 months there has been increased variation in the way England is governed. Last May six metro mayors took office for the first time, with some powers over skills, planning and transport in particular. Along with the Mayor of London, they now have a mandate which covers one third of England's population. And while their powers are limited, they are already expanding.

A number of announcements in the last Budget and Industrial Strategy showed a clear preferencing of metro mayors, for example the direct allocations of money to the mayors from the Transforming Cities Fund (while other cities will have to compete for money) and the invitation to Greater Manchester to be the first place to agree a local industrial strategy.

This once again shows that the original devolution deals that the Government struck with particular areas are likely to be the first of many, and have opened the door to further rounds of devolution and access to national funding. This means that those big cities that have not been able to agree an initial deal, such as Leeds and Nottingham, are increasingly being left behind.

A key achievement for national and local policymakers in 2018 would be to secure devolution deals for the remaining big cities that do not have one in place. Cities have long been restricted by the centralised nature of the UK,

and this has limited their ability to tailor policy to respond to the ongoing changes seen in the national and global economies. The variation seen across the country (as shown in the maps above) reduces the effectiveness of blanket national policies which invariably fail to address the different challenges that places face. But those places with a metro mayor now have the ability to tailor policy to do just this.

Urban Britain in 2018 is one characterised by its divides, and as we show in the next chapter, these divides are likely to widen without sufficient policy intervention. Variation in outcomes across cities requires variation in policy. This requires the recognition of the crucial role that place plays in this, be that through national policies such as the Industrial Strategy delivered locally, or more local control through greater devolution.

Box 1: Defining cities

The analysis undertaken in Cities Outlook compares Primary Urban Areas (PUAs) – a measure of the built-up areas of a city, rather than individual local authority districts or combined authorities. A PUA is the city-level definition first used in the Department for Communities and Local Government's State of the Cities report. The definition was created by Newcastle University and updated in 2016 to reflect changes from the 2011 Census.

The PUA provides a consistent measure to compare concentrations of economic activity across the UK. This makes PUAs distinct from city region or combined authority geographies. You can find the full definitions table and a methodological note on the recent PUA update at this page: **www.centreforcities.org/puas.**

02

The future of work in cities

Which cities stand to lose or gain?

The future of work in UK cities

Artificial intelligence, automation and other technological changes are among the biggest economic issues of our age. They featured in the opening remarks of the Chancellor's recent Budget speech and are identified as one of the 'Grand Challenges' in the Government's new Industrial Strategy.

"The world is on the brink of a technological revolution. One that will change the way we work and live and transform our living standards for generations to come. And we face a choice: either we embrace the future, seize the opportunities which lie within our grasp and build on Britain's great global success story, or reject change and turn inwards to the failed and irrelevant dogmas of the past."
Philip Hammond, Budget speech 2017

In contrast to the Chancellor's bullish tone, much of the focus of the debate around automation and technological change to date has been on the potential job losses these trends are likely to cause. Yet much less work has been done on the impact of current technological and non-technological trends on different places across the country and their potential to create jobs for the future.

By 2030, technological advancements - combined with globalisation and changes to the make-up of the country's population - will have brought significant changes into the labour market, with big implications for policy-makers. However, a point that is often missed is that this change is not new, but an ongoing process. Indeed change has been a good thing, bringing with it innovations and improvements in standards of living.

But as this chapter will show, the problem with the policy response to change in recent decades is that it has not effectively supported all cities to adapt to this ongoing evolution. This means that some people and places have benefited more from this evolution than others.

To inform discussions at the national and local level, this chapter looks at the likely impact of automation and other trends on cities across Great Britain, identifying where job losses are most likely and which places are best placed to see growth in new areas.

Box 2: Methodology

This work builds on the research undertaken by researchers at the National Endowment for Science, Technology and the Arts (Nesta) and Oxford Martin.

In *The future of skills: employment in 2030* report, Nesta used an innovative mixed-methods approach, combining expert human judgement with machine learning to estimate how technological and non-technological trends will affect the demand for different bundles of skills, and so employment in the future.

The probabilities estimated by Nesta of the likely increase in demand for minor occupation groups (SOC 3 digits) were then combined with labour market information for each city, to make estimates about jobs likely to increase and decrease in different parts of the country.

The composition of the labour market in each city was built using data from the 2011 Census and the Business Register of Employment Survey (BRES). Data from the Census provides a detailed breakdown of minor occupation groups that is not available in BRES. In order to have the most recent data possible, estimates on the 2016 workforce in each minor occupation group were created by combining data in the Census with the most updated information on broad occupation groups available in BRES.

Cities and the risk of job losses

The job market will look very different in 2030. As Nesta identifies in *The future of skills: employment in 2030*, a number of factors, such as technological changes, globalisation and demographic changes will affect employment, reducing demand for some occupations and increasing it for others. Generally, those jobs that are made up of routine tasks are at a greater risk of decline, whereas those occupations requiring interpersonal and cognitive skills are well placed to grow.

Nesta's study looks at the likely impact for the UK as a whole and finds that there are likely to be more jobs nationally in 2030 than today. But this is likely to play out differently across the country. In what follows, Nesta's estimates are applied to Britain's cities to see how these impacts are likely to be felt in different places. Box 2 outlines the methodology used.

Overall, one in five jobs in cities across Great Britain is in an occupation that is very likely to shrink. This amounts to approximately 3.6 million jobs, or 20.2 per cent of the current workforce in cities.

However, the risk is not evenly spread across the country, and cities outside the south of England are more exposed to job losses. In places like Mansfield, Sunderland, Wakefield and Stoke almost 30 per cent of the current workforce is in an occupation very likely to shrink by 2030. This contrasts with cities such as Cambridge and Oxford where less than 15 per cent of jobs are at risk (see Figure 3).

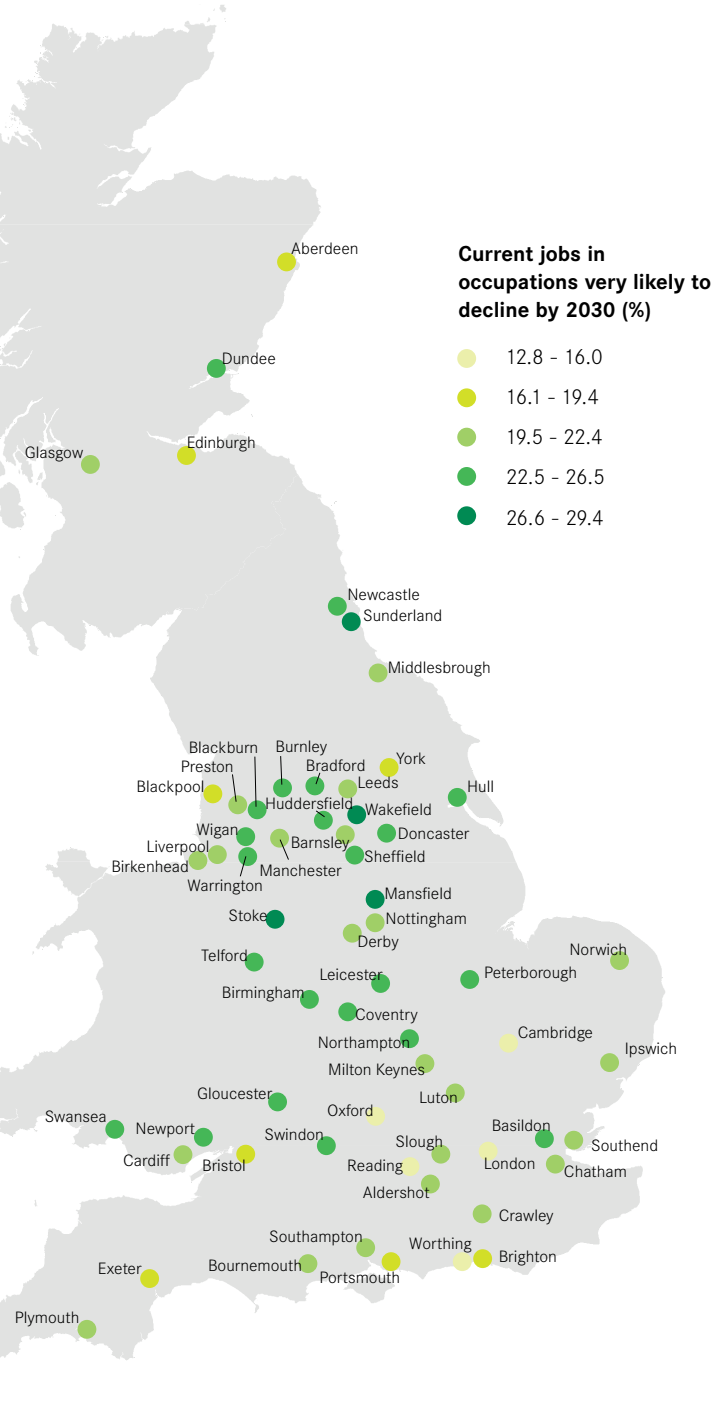
Box 3: Displacement in big cities

While big cities are relatively less exposed to occupations likely to shrink, they are likely to see a great deal of disruption. For example, London and Worthing have a similar share of jobs likely to see a decrease in demand (16.1 per cent in London, 16.0 per cent in Worthing), but this translates to around 908,000 jobs in London – 25 per cent of all jobs at risk in cities across Great Britain – and only 8,400 jobs in Worthing, which is just 0.2 per cent of all jobs at risk in cities.

Figure 3:

Share of jobs in occupations likely to shrink

City	Share (%)	City	Share (%)
Mansfield	29.4	Bournemouth	21.9
Sunderland	29.2	Birkenhead	21.8
Wakefield	29.2	Barnsley	21.5
Stoke	28.4	Milton Keynes	21.5
Doncaster	26.5	Preston	21.4
Blackburn	26.3	Liverpool	21.3
Northampton	25.8	Leeds	21.3
Dundee	25.3	Derby	21.3
Huddersfield	25.3	Plymouth	21.0
Telford	24.9	Nottingham	21.0
Leicester	24.9	Norwich	20.7
Coventry	24.8	Slough	20.7
Wigan	24.7	Crawley	20.6
Peterborough	24.6	Ipswich	20.5
Bradford	24.2	Glasgow	20.5
Swindon	23.9	Cardiff	20.4
Hull	23.9	Aldershot	20.3
Basildon	23.9	Luton	20.1
Burnley	23.8	Exeter	19.4
Warrington	23.7	Aberdeen	19.3
Sheffield	23.5	Bristol	19.1
Newport	23.4	Portsmouth	19.1
Newcastle	23.3	York	18.7
Birmingham	23.2	Blackpool	18.6
Gloucester	23.2	Brighton	18.5
Swansea	23.2	Edinburgh	17.5
Southend	22.4	London	16.1
Middlesbrough	22.4	Worthing	16.0
Manchester	22.4	Reading	15.4
Chatham	21.9	Cambridge	12.9
Southampton	21.9	Oxford	12.8



Source: Bakhshi et al. 2017, *Future of Skills: Employment in 2030,* London: Nesta and Pearson; ONS 2017, Business Register of Employment Survey; Census 2011.

Box 4: What types of jobs are at risk?

The majority of jobs at risk are in a handful of occupations. Nesta identified 36 minor occupation groups likely to shrink in the future, but 53 per cent of all jobs at risk in cities are just in five occupations (see Figure 4).

Figure 4:

Occupations representing the majority of all jobs at risk of displacement

	Minor occupation group	Share of all jobs at risk in cities (%)
1.	Sales assistants and retail cashiers	19.5
2.	Other administrative occupations	11.0
3.	Customer service occupations	9.0
4.	Administrative occupations: finance	7.0
5.	Elementary storage occupations	6.6

Source: Bakhshi et al. 2017, *Future of Skills: Employment in 2030*, London: Nesta and Pearson; ONS 2017, Business Register of Employment Survey; Census 2011.

Sales assistants and retail cashiers is the occupation group most at risk – as a whole, one in five urban jobs in this occupation is deemed at risk of displacement. And it is the most at risk occupation in all but three cities, with only Exeter (where 21.2 per cent of jobs at risk are in customer services occupations) and Milton Keynes and Wakefield (where the biggest share of jobs at risk is in elementary storage occupations -16.9 per cent and 17.9 per cent respectively - reflecting their large distribution sectors) proving the exceptions.

Other at-risk occupations are also notable in a handful of other cities. In Oxford and Swindon, assemblers and routine operatives make up a significant share of all jobs at risk (respectively 10.4 per cent and 9.8 per cent). In Aberdeen, plant and machine operatives account for 7.4 per cent of all jobs likely to see a decrease in demand and in Huddersfield, process operatives represent 10.7 per cent of all jobs at risk.

Overall though, in most cities, jobs at risk are concentrated in a small number of occupations. 70.2 per cent of all jobs at risk in Worthing are in just five occupations, and even in Aberdeen – the city where the top five occupations make up the lowest share of jobs at risk– they still represent 44.1 per cent of all jobs at risk.

Today's weakest performing cities are also those most exposed to the risk of job losses in the future. Mansfield, Stoke, Doncaster and Blackburn not only feature among the top 10 cities where jobs are most at risk, but they are also among the bottom 10 cities in terms of productivity (GVA per worker). In contrast, Oxford, London and Reading, the three cities with the lowest share of jobs likely to shrink, are among the most productive cities of Great Britain (see Figure 5).

Cities with a higher risk of job losses also tend to have a higher welfare spend per capita (see Figure 5), a lower share of jobs in knowledge intensive business services (KIBS) and a lower share of high-skilled workers.

Figure 5:

The relationship between jobs at risk of decline, productivity per worker (left) and welfare spend per capita (right)

Source: Bakhshi et al. 2017, *Future of Skills: Employment in 2030,* London: Nesta and Pearson; ONS 2017, Business Register of Employment Survey; Census 2011; ONS, Regional Gross Value Added (Income Approach) NUTS3 Tables; NOMIS, Mid-year population estimates, Centre for Cities calculations; DWP; HMRC; DCLG; Welsh Government; Scottish Government; NOMIS, Population estimates, ONS, Birth summary tables; National Registers of Scotland, Births by sex, year and council area.

Cities and past trends in the labour market

While the potential job losses set out will pose a challenge, history shows that cities were exposed to a similar risk of job losses a hundred years ago resulting from both automation and globalisation. Despite this, most have been able to bounce back and grow.

Automation has a long history of reshaping the way people work. The impact of automation and the political reaction to it stretch back to the nineteenth century with the Luddite protests against the introduction of machines into the textile industry.

Cities are no more at risk of automation today than they were a hundred years ago. Data from 1911 suggests that, in aggregate, a number of occupations that employed many people a century ago have almost disappeared as a result of machines. For example, laundry workers have mostly been replaced by washing machines and demand for domestic servants has fallen with the rise of electrical domestic appliances. Automation and innovation have also changed the way people shop, and the creation of large supermarkets means that street sellers in city centres or milk floats gliding down residential streets at dawn are a rare sight today.

By picking out a selection of these occupations (see Box 5), it emerges that the current challenges faced by cities are not so different from those faced a century ago. As an illustration, these occupations alone (listed in Figure 6) used to employ around 12.4 per cent of the total English and Welsh workforce in 1911. Given that this is just a subset of affected occupations, the total share of jobs affected by automation is likely to have been even higher.

Interestingly, as Figure 7 shows, it was southern cities that were most exposed to automation of these sectors. In Bournemouth, Oxford and Brighton the share of the workforce affected by those changes was above 20 per cent. In contrast, that share was less than 5 per cent in Burnley, Blackburn and Preston.

Globalisation also had a big impact on the labour market, and on mining and manufacturing in particular. Unlike the pattern for automation, it was cities further north that were more exposed to this (see Figure 7). In 1911, 60 per cent of jobs in Barnsley were in mining and manufacturing, while in Coventry it was 61 per cent. A century later it was 13 and 11 per cent respectively.

Box 5: The rise and fall of occupations in the last century

In 1911, approximately 10 per cent of the workforce in cities in England and Wales was employed as a domestic servant or laundry worker. However, the advent of electrical appliances such as washing machines and vacuum cleaners helped make these occupations less and less relevant throughout the century.

Within just 50 years, the share of workers employed in these jobs decreased dramatically. The number of laundry workers decreased by 34 per cent between 1911 and 1951, and the number of domestic servants fell by 67 per cent. Nowadays, these occupations only play a very marginal role in terms of employment.

The shift away from these two occupations affected a larger share of workers in Bournemouth, Oxford, Southend and Cambridge than elsewhere. In these places, more than 15 per cent of the 1911 workforce was involved in these occupations. In contrast, the decline of laundry workers and domestic servants had a minimal impact on Burnley, Blackburn and Preston, as less than 3 per cent of the whole workforce in these cities was employed in those occupations.

Figure 6:

Jobs that have mostly been replaced by automation

Occupations	Number of workers, 1911	Share of all jobs, 1911 (%)
Other Domestic Indoor Servants	1,314,020	8.1
Messengers, Porters, Watchmen (not Railway or Goverment)	231,750	1.4
Laundry Workers; Washers, Ironers, Manglers, etc.	179,520	1.1
Costermongers, Hawkers, Street Sellers	69,350	0.4
Domestic - Coachmen, Grooms	67,230	0.4
Milk sellers, Dairymen	56,970	0.3
Horse keepers, Grooms, Stablemen (not Domestic)	45,520	0.3
Bargemen, Lighter men, Watermen	28,200	0.2
Telegraph, Telephone - Service (not Government)	17,090	0.1
News - Boys, Vendors (Street or undefined)	16,440	0.1

Source: Census 1911 (England and Wales only).

Box 6: Defining occupations in 1911

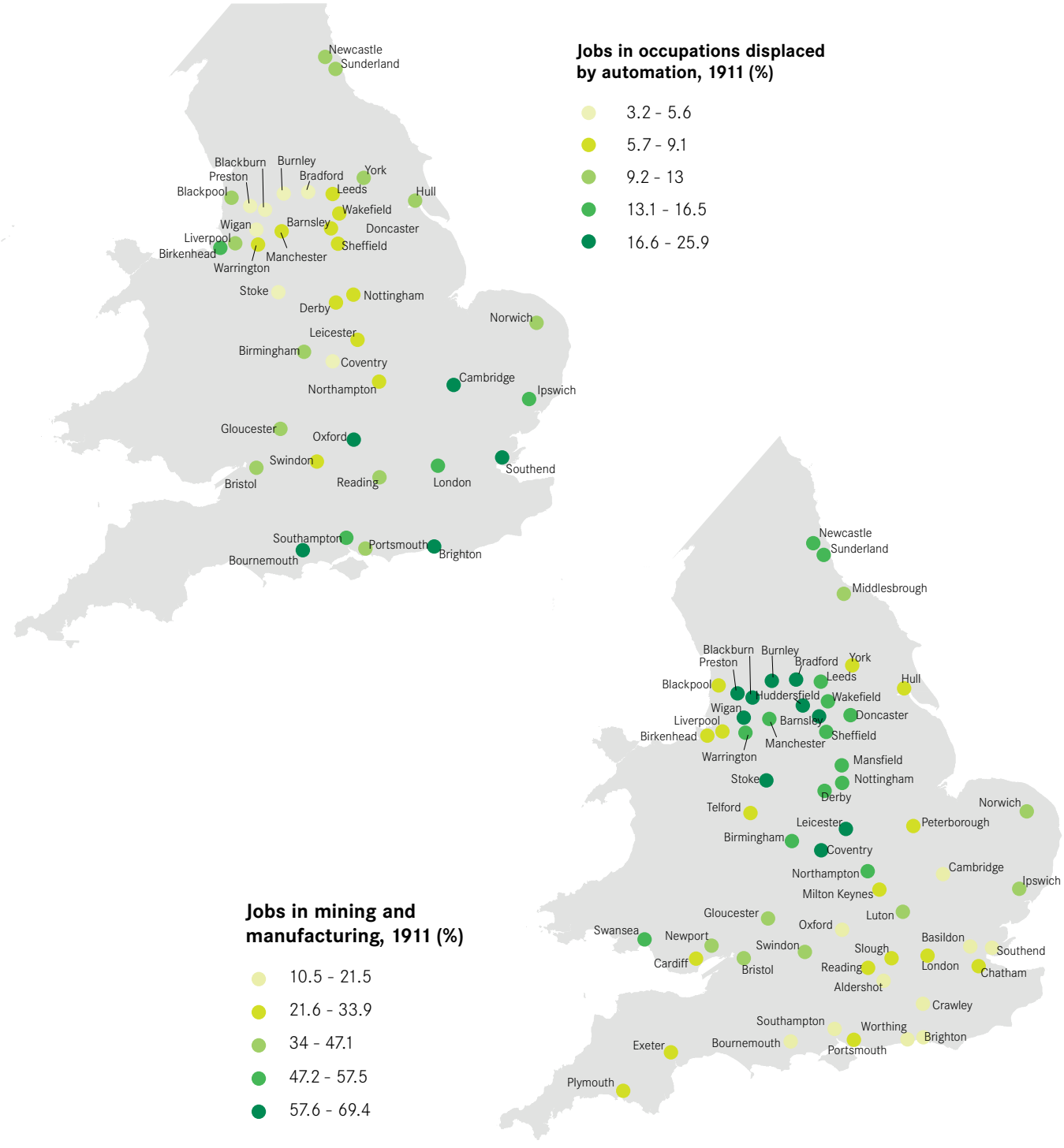
The 1911 Census has detailed data on occupations for administrative areas with populations over 5,000. To understand how history has affected the performance of modern cities, this data was matched to current Primary Urban Area boundaries. In most instances, data is available for the core urban authority only, while some cities have no data available. In total, it was possible to look at 40 cities across England.

But crucially, despite the pressures of automation and globalisation, most cities have seen jobs growth over the last century (see Figure 8). 52 cities have more jobs now than they used to in 1911; and 27 cities more than doubled their workforce. Meanwhile seven cities have seen a decline in jobs over time.[3] There is a clear geography to this, with southern cities growing more than cities in the north.

3 The new towns of Crawley, Basildon and Milton Keynes have been excluded from the analysis as they had a very small number of jobs to start with in 1911.

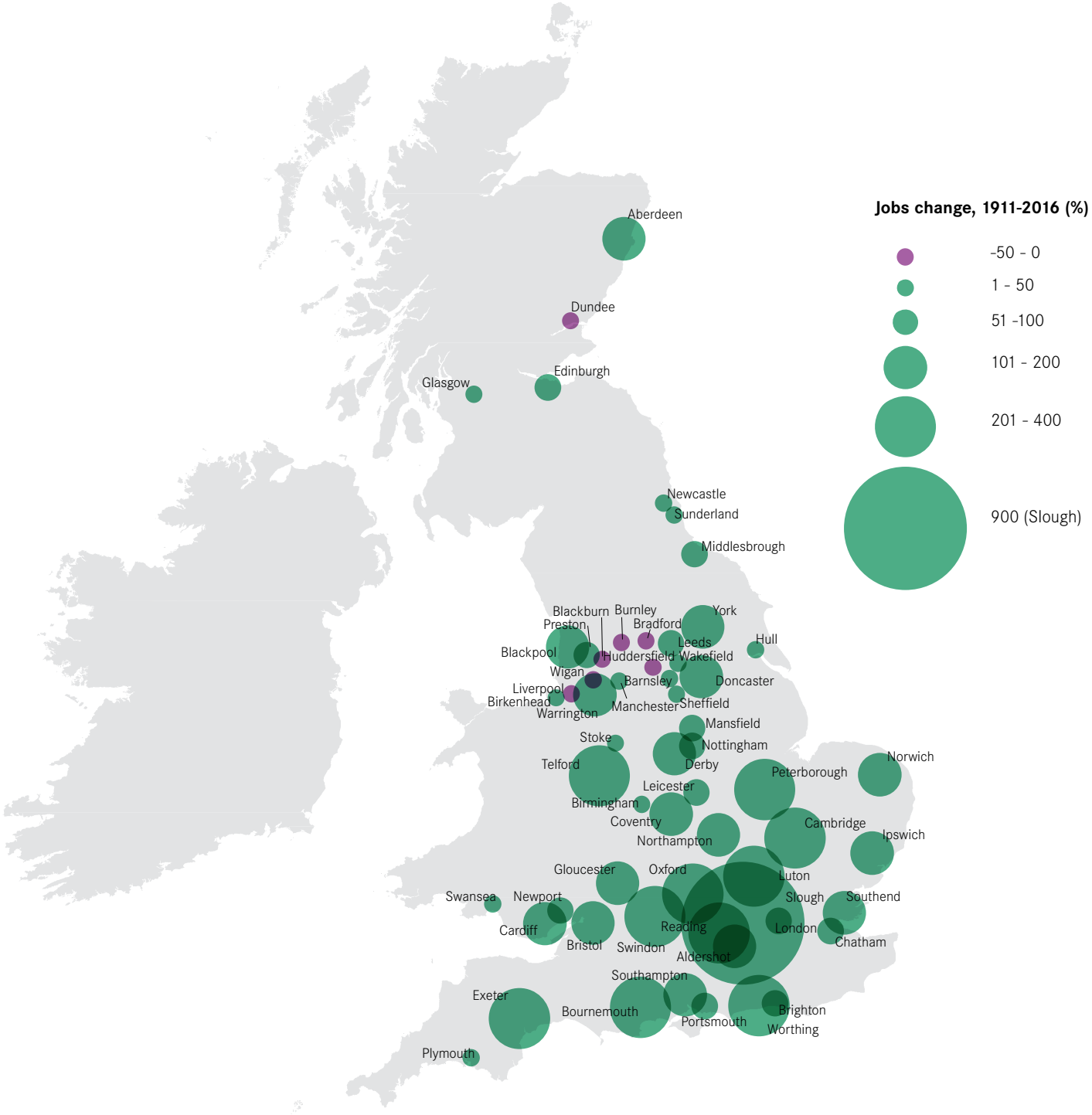
Figure 7:

Share of all jobs at risk because of automation and globalisation 1911



Source: Census 1911 (England and Wales only); University of Portsmouth, *A Vision of Britain Through Time*

Figure 8:
Growth in jobs, 1911-2016



Source: University of Portsmouth, *A Vision of Britain Through Time*; NOMIS, Business Register of Employment Survey. Note: Basildon, Crawley and Milton Keynes have been excluded from this map because they are new towns.

Cities and jobs likely to see an increase in demand to 2030

As has happened over the last century, the labour market will continue to evolve - new occupations will arise and some occupations that already exist will become increasingly important.

It is hard to anticipate what the jobs of the future will look like and where in the country they will be created. However, what can be observed is where the jobs likely to experience an increase in demand are currently located, showing how successful cities have been at attracting these jobs to date, with implications for their ability to continue to do so in the future.

All cities are likely to see job creation to 2030

Looking at the locations of jobs that Nesta predicts will grow in the future shows that these occupations are currently more evenly spread across the country than those at risk of decline. With the exceptions of Oxford, Cambridge and Brighton, where the share of jobs likely to grow is slightly higher, these occupations currently account for between 5 and 10 per cent of all jobs. And there is no particular geography to these figures. This suggests that all are well placed to see job creation occur in their economies in the future.

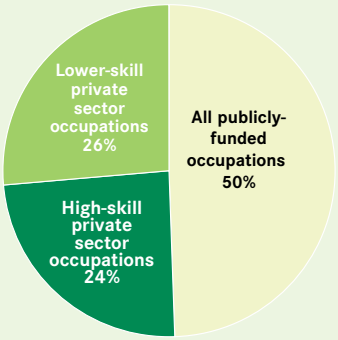
Box 7: The current composition of jobs likely to grow in the future

Half of the jobs very likely to experience an increase in demand according to Nesta's estimations are currently in publicly-funded occupations, whereas the remaining fifty per cent is almost evenly divided into high-skilled and lower-skilled private sector occupations (see Figure 9).

Growing demand for publicly-funded activities in the future is driven by demographic shifts and expectations around increased demand for lifelong learning, with an impact on higher-skilled public sector occupations. Demand will not just grow for high-skilled jobs though - some non-routine lower-skilled jobs in the private sector are also expected to grow as a result of increased demand for services in areas such as sports and fitness.

Figure 9:

Occupational breakdown for existing jobs likely to grow to 2030



Source: Bakhshi et al. 2017, *Future of Skills: Employment in 2030,* London: Nesta and Pearson; ONS 2017, Business Register of Employment Survey; Census 2011. Breakdown of occupations likely to grow in the private sector. High skilled occupations: 122, Managers and proprietors in hospitality and leisure services; 211 Natural and social science professionals; 212, Engineering professionals; 247, Media professionals; 341, Artistic, Literary and Media occupations. Lower skilled occupations: 344, Sports and Fitness Occupations; 524, Electrical and electronic trades; 543, Food preparation and hospitality trades; 927, Other elementary services occupations.

But while these jobs are fairly evenly spread as a whole, the composition of these jobs across cities looks very different (see Figure 10). There are three points to note. Firstly, publicly-funded activities[4] (e.g. in health and welfare) currently account for a large share of jobs projected to grow (see Box 7). Ongoing demographic changes suggest that publicly-funded jobs will continue to play an important role in future job creation.

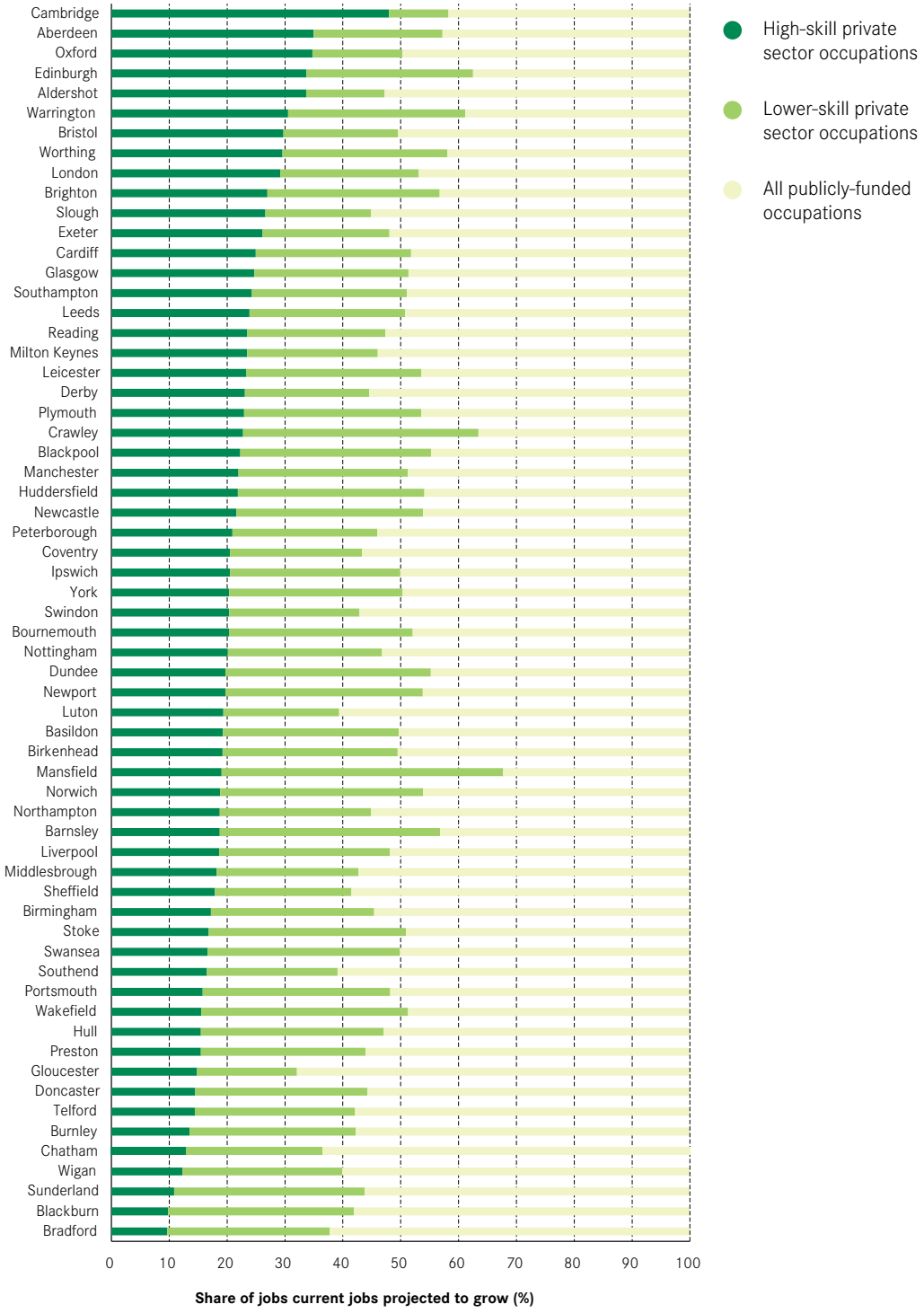
Secondly, variation is greater between higher and lower-skilled jobs in the private sector. In Cambridge, close to half of all jobs expected to see an increase in demand are currently in high-skilled occupations, such as natural science professionals, while in Aldershot this figure is one in three. This stands in stark contrast with a number of cities further north. In Blackburn, Sunderland and Bradford, around one in 10 of these jobs is currently in higher-skilled private sector occupations, with lower-skilled jobs in the private sector, such as in food preparation and hospitality, having a much larger share (see Figure 10).

Thirdly, those cities that currently have a larger share of high-skilled private sector jobs that are likely to grow are also likely to be more insulated from job declines (see Figure 11).

4 Defined as Public administration, Education and Health.

Figure 10:

Breakdown of the type of jobs likely to grow in each city to 2030



Source: Bakhshi et al. 2017, *Future of Skills: Employment in 2030,* London: Nesta and Pearson; ONS 2017, Business Register of Employment Survey; Census 2011.

Figure 11:

Jobs likely to decline and the composition of jobs likely to increase

Source: Bakhshi et al. 2017, *Future of Skills: Employment in 2030,* London: Nesta and Pearson; ONS 2017, Business Register of Employment Survey; Census 2011.

While once again it is difficult to predict how exactly these three categories of jobs will grow in the future, the past does give us some indication as to what may happen.

Since 1951, the public sector has played an ever larger role in the national economy, driven by changing demographics, healthcare provision and rising demand for education. Between 1951 and 2011, the share of jobs in publicly-funded activities rose from 13 per cent to 29 per cent.

But there has been a great deal of variation around this figure across cities. Those places where the increase in publicly-funded jobs has been the highest are among the weakest performers today. In 29 out of 62 cities across Britain – mostly concentrated in the north and midlands – the share of jobs accounted for by publicly-funded sectors has increased by more than 20 percentage points in the last 60 years. In Blackburn it increased by 27 percentage points, and in Dundee it increased by 30. Increasingly the public sector has compensated for the sluggish performance of the private sector in these

places. And where private sector jobs have been created they have tended to be lower skilled, and thereby lower paid.

In contrast, cities in the Greater South East in particular have mostly experienced a smaller shift towards publicly-funded jobs,[5] and a greater share of their private sector jobs growth has been in high-skilled, knowledge-intensive occupations, some of which have been created as a result of innovations in technology. For example, IT professionals and technicians, occupations that did not exist 60 years ago, are mostly concentrated in and around cities in the Greater South East. Similar patterns are seen for jobs in fund management, advertising and market research.

Over the last 100 years, the evolution of the economy has meant that the ability to access and use knowledge has become increasingly important for businesses, people and cities. Those cities that have best been able to provide access to knowledge are the ones that have best been able to deal with change over the last century.[6]

These patterns have occurred because of the relative advantages that different cities offer. The location decisions made by businesses are based on the trade-off between the availability of skilled workers, access to knowledge and cost of land.

As noted in the first chapter, high-skilled businesses look for locations that offer them access to knowledge – both through the availability of highly-skilled workers and, for services businesses in particular,[7] a network of high-skilled businesses. Cities such as Reading and London offer both of these advantages, and this is reflected in the types of jobs they have attracted in spite of the higher cost of commercial space in these cities.[8]

Businesses undertaking lower-skilled, more-routinised activities (such as in call centres or warehousing) look for different attributes, namely access to a lower-skilled workforce and cheaper land. Cities such as Barnsley and Swansea offer

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5 In Aldershot and Portsmouth the share of publicly-funded jobs declined in the last 60 years. This is likely due to the fall in jobs in the military.

6 Swinney P & Thomas E (2014) *Century of Cities: Urban economic change since 1911*, London: Centre for Cities

7 Graham D (2007) *Agglomeration Economies and Transport Investment*, Journal of Transport Economics and Policy 41

8 Swinney P (2017) *Why don't we see growth up and down the country?* London: Centre for Cities

these types of benefits, making them more appealing to lower-skilled businesses than higher-skilled ones. The result is that the business investment they have attracted in recent years has tended to create lower-skilled work. And the analysis above shows that these cities are more at risk of job losses due to changes in the labour market.

Without any change to the benefits that places offer to businesses, then it is likely that job creation in the future will match that seen in recent decades. This will mean that while most places will likely see jobs growth, some will replace routinised jobs lost due to changes in the labour market with more lower-skilled jobs. These tend to be less productive and less innovative, putting them at continued risk over the longer term.

Policy has not focused on helping people and places to adapt

As well the public sector playing an ever larger role in job creation in weaker economies, it has also compensated those people who have seen their jobs disappear as a result of automation and globalisation. As Figure 12 shows, there is a positive relationship between the change in share of jobs accounted for by publicly-funded activities and the share of working-age people on long-term incapacity benefit.

These policy choices have helped cushion the impact of substantial changes in city economies, and the creation of publicly-funded jobs has no doubt been a good thing in terms of increasing employment opportunities available in weaker labour markets.

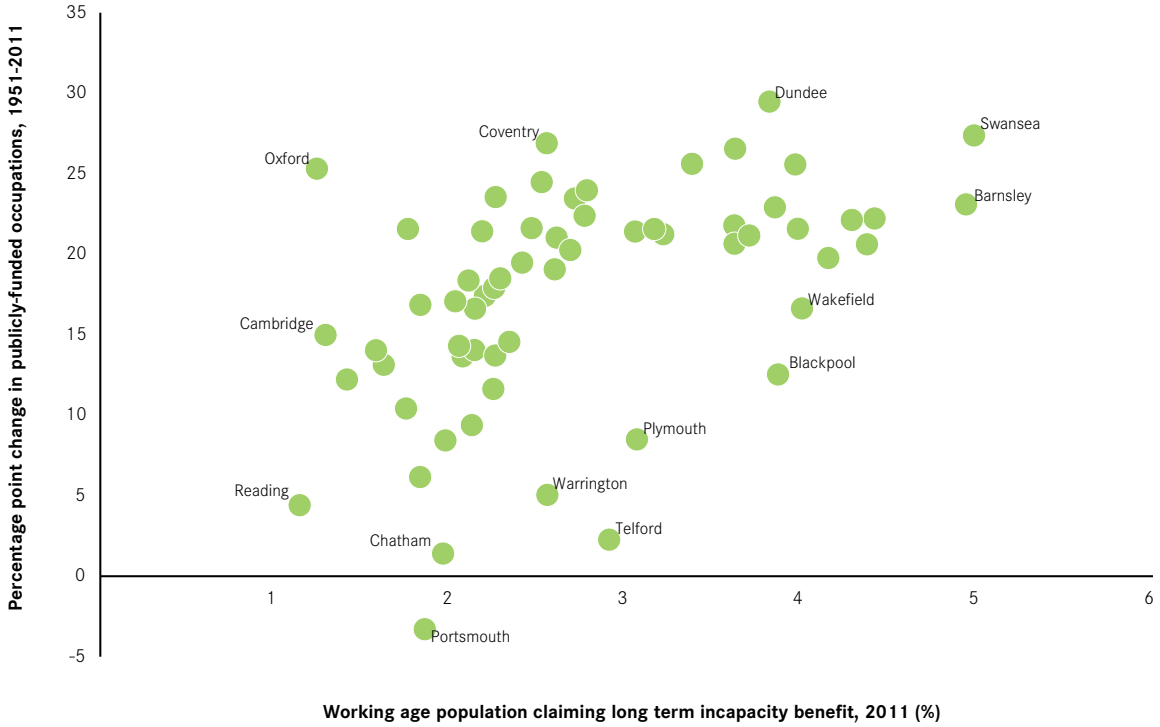
But what they have not done is help people and places adapt to changes in demand for workers. This has had an impact on the relevance of skills available in these cities, especially among workers that have been affected by previous waves of change, with a knock-on impact on how attractive a city is to investment from higher-skilled business activities. Looking at the qualifications levels of those aged between 50-64 in 2016 shows that a much higher share of this age group tend to have no formal qualifications at all in cities in the North. Liverpool leads this list, with 26 per cent of 50-64 year olds having no formal qualifications, followed by Stoke and Birmingham (both 22 per cent). In contrast this figure is just 6 per cent in Swindon, and 7 per cent in Bristol (see Figure 13).

The outcome of this difference in skills across cities is that while jobs have increased across the country, in weaker economies this has meant an increasing reliance on public sector and lower-skilled jobs in the private sector (e.g. administration or food preparation). This has led to a divergence in standards of living across the country, entrenching economic divides, as summarised in Figure 14.

The increasing economic divides explain at least in part the recent political divides that have opened up across the country. One of the most common explanations put forward for the EU Referendum result was that it was a protest by people in 'left behind' places who felt that they had been ignored by politicians. Figure 15 shows a negative relationship between the referendum result and the share of jobs projected to grow which are high-skilled. The implication is that if patterns of job creation in the future reflect those of the past then the political divide illustrated by the referendum result will likely grow wider.

Figure 12:

The relationship between incapacity benefits and publicly-funded jobs

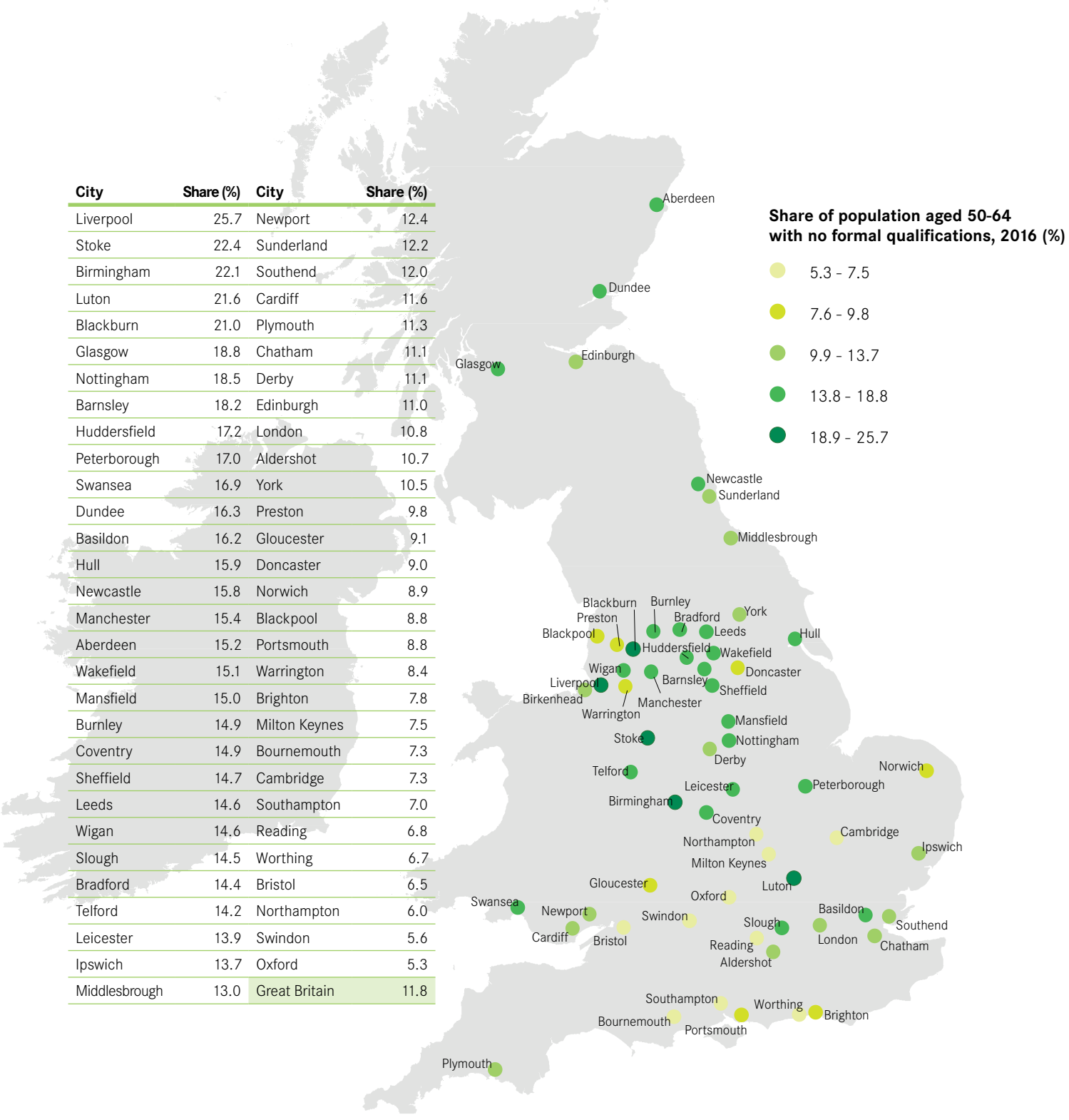


Source: NOMIS, Work and Pensions Longitudinal Study; NOMIS, Population Estimates/Projections; University of Portsmouth, *A Vision of Britain Through Time*

Figure 13:

Share of 50-64 year olds with no formal qualifications

City	Share (%)	City	Share (%)
Liverpool	25.7	Newport	12.4
Stoke	22.4	Sunderland	12.2
Birmingham	22.1	Southend	12.0
Luton	21.6	Cardiff	11.6
Blackburn	21.0	Plymouth	11.3
Glasgow	18.8	Chatham	11.1
Nottingham	18.5	Derby	11.1
Barnsley	18.2	Edinburgh	11.0
Huddersfield	17.2	London	10.8
Peterborough	17.0	Aldershot	10.7
Swansea	16.9	York	10.5
Dundee	16.3	Preston	9.8
Basildon	16.2	Gloucester	9.1
Hull	15.9	Doncaster	9.0
Newcastle	15.8	Norwich	8.9
Manchester	15.4	Blackpool	8.8
Aberdeen	15.2	Portsmouth	8.8
Wakefield	15.1	Warrington	8.4
Mansfield	15.0	Brighton	7.8
Burnley	14.9	Milton Keynes	7.5
Coventry	14.9	Bournemouth	7.3
Sheffield	14.7	Cambridge	7.3
Leeds	14.6	Southampton	7.0
Wigan	14.6	Reading	6.8
Slough	14.5	Worthing	6.7
Bradford	14.4	Bristol	6.5
Telford	14.2	Northampton	6.0
Leicester	13.9	Swindon	5.6
Ipswich	13.7	Oxford	5.3
Middlesbrough	13.0	Great Britain	11.8



Source: NOMIS, Annual Population Survey. Note: Data not available for Crawley and Exeter.

Figure 14:

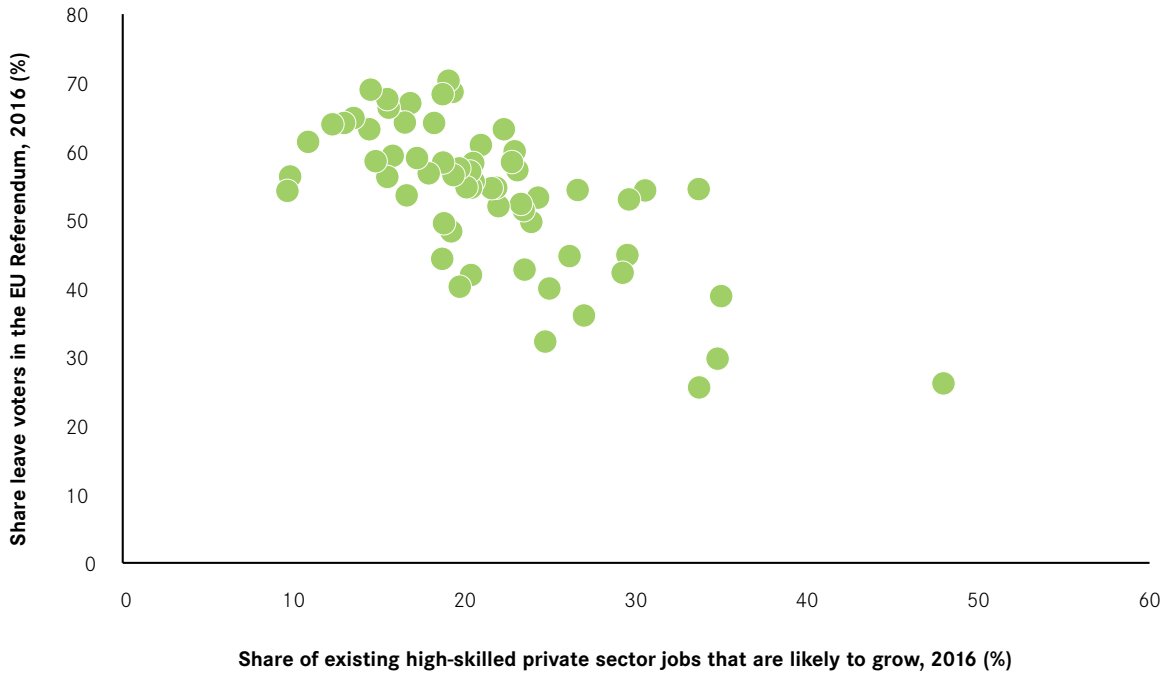
Differences in economic outcomes between cities in the South and cities elsewhere in Britain

Economic outcome	Cities in the South	Cities elsewhere in Britain
Growth in jobs, 1911-2016 (%)	99	33
Percentage point change in the share of jobs in publicly-funded activities, 1951-2011	12.4	21.4
DWP working-age benefit claimant rate, Nov 2016 (%)	10	15
Weekly workplace wages, 2017 (£)	656	505

Source: University of Portsmouth, *A Vision of Britain Through Time*; NOMIS, DWP Benefit Claimants – Working Age Client Group; DWP; ONS, Annual Survey of Hours and Earnings

Figure 15:

The EU Referendum result and share of jobs likely to grow that are in higher-skilled private sector activities



Source: Bakhshi et al. 2017, *Future of Skills: Employment in 2030,* London: Nesta and Pearson; ONS 2017, Business Register of Employment Survey; Census 2011; Electoral Commission

Policy implications

The policy response to the changing nature of work in recent decades has not prepared those people and places most affected by these changes to adapt to them. Policy has not sufficiently understood why businesses locate where they do and so has not focused on giving people the skills required to fill the non-routine occupations that have become increasingly common in an ever-evolving world of work. And policy has not helped places to create the environments that are attractive to higher-skilled firms.

So as cities across the country prepare to deal with the latest wave of change brought about by automation, globalisation and changing demographics, there must be a shift in the policy response on both fronts to this change.

For struggling cities in particular, policy needs to create the conditions that support the development of knowledge, and the use and exchange of it. A key element of this will be to provide their residents with the skills they need to be sucessful in a labour market that is likely to be ever more dominated by non-routine work.

This should take three main approaches:

Prepare:

Give younger generations entering the labour market the right set of skills and knowledge to succeed in the jobs of the future.

The basis for the estimation for which occupations will become more or less important is founded on the expectation that interpersonal skills, cognitive skills (such as originality and fluency of ideas) and judgment and decision making will become ever more important. This will require teaching both in schools and at further education colleges to adjust to help their students develop such skills.

A major related concern is that schools in a number of areas are failing to provide quality education based on today's curriculum, even before further improvements to what is taught are considered. Weaker economies such as Hull and Middlesbrough have very few schools deemed as high performing

according to the Education Policy Institute,[9] meaning pupils in these places face the dual challenge of not being given the core skills required to get a high-skilled job as they enter a labour market where higher-skilled opportunities are limited.

Adjust:

The current workforce should be given adequate resources to adjust to changes in the labour market.

People currently in the labour market need to be able to adapt as the demand for skills changes. This will require continuous training and upskilling.

The unveiling of the National Retraining Scheme in the most recent Industrial Strategy suggests a move in this direction. At this stage the policy applies only to digital and construction jobs, but as such a scheme is rolled out there should be a shift towards developing the idea of lifelong learning. One way to do this would be to allocate each worker a number of hours a year to devote to training, to encourage workers to further their skillset in light of an ever changing labour market. This would require greater funding of the further education sector.

Compensate:

Individuals least able to adapt need to be given adequate compensation for their job loss but should also be given retraining.

As part of any wave of change, not everyone will be better off, at least in the short-term. This means that there will still be a requirement to provide a safety net for people if their job disappears.

But this should be done in conjunction with improved access to and requirement for training, to give individuals the ability to continue to work, as well as helping to shift the skills base of a city to improve its chances of attracting in higher-skilled business investment. Cities and the national government must ensure people who are worse off as a result of future job losses receive adequate support. But unlike the past, this support cannot only come in the form of welfare payments.

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9 Andrews J &Perera N (2017) *Access to high performing schools in England,* London: Education Policy Institute

03

City monitor

The latest data

City monitor: the latest data

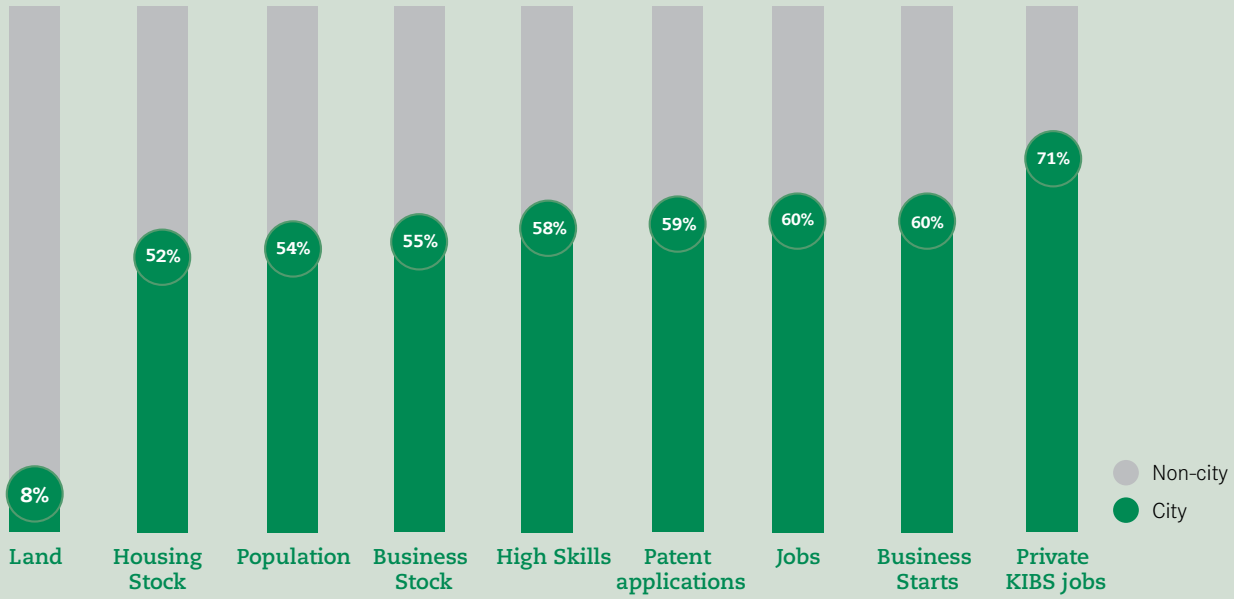
There is considerable variation in the economic performance of cities across the UK. The purpose of this chapter is to show the scale and nature of this variation by highlighting the performance of the 63 largest cities on 18 indicators covering:

- Population
- Business dynamics
- Productivity
- Innovation
- Employment
- Skills
- Wages
- Inequality
- Housing
- Environment
- Digital connectivity

For most indicators the 10 strongest and 10 weakest performing cities are presented. Tables of the full list of cities can be found on:
www.centreforcities.org/data-tool

Figure 16:

Cities as a share of the national average,



Sources: Land: ONS Census 2011; Housing: Department of Communities and Local Government (DCLG), 2017, Dwelling stock estimates by local authority district 2016. Scottish Neighbourhood Statistics 2017, Dwelling stock estimates 2016 data. Northern Ireland Neighbourhood information service 2017, Land and Property Services, 2016 data; Population: ONS 2017, Population estimates, 2016 data. Business: ONS 2017, Business Demography, 2016 data. Patents: PATSTAT 2017, January-November 2016 data; Intellectual Property Office 2017, Patents granted registered by postcode, January-October 2016 data. ONS 2017, Population estimates, 2016 data ; Skills: ONS 2017, Annual Population Survey, residents analysis, 2016 data; DETINI 2017, District Council Area Statistics for Belfast, 2016 data; Jobs: ONS 2017, Business register and Employment Survey, 2016 data.

Population

Growing populations can give an indication of the economic opportunities that are available in cities. Cities that provide more job and career opportunities are likely to attract and retain more people than cities that do not.

- In 2016, 53.9 per cent of the UK population (around 35.4 million) lived in cities.
- The four biggest cities (London, Birmingham, Manchester and Glasgow) accounted for almost a quarter of the total UK population (24.3 per cent) and 45.2 per cent of the total population living in cities.
- London alone was home to 15.3 per cent of the UK population and accounted for 28.3 per cent of the population living in cities.
- 29 out of 63 cities experienced a higher population growth than the national average between 2015 and 2016.
- Eight out of the 10 slowest-growing cities were located in northern England and in Scotland. Aberdeen is the only city that recorded a decline in population between 2015 and 2016, shrinking by 0.3 per cent.
- The age breakdown of population growth shows that there have been large increases in those aged over 50. London saw the largest increase of its 50 plus population of any city.

Table 1:
Population growth

Rank	City	Growth rate, 2015-2016 (%)	Population, 2015	Population, 2016	Change, 2015-2016
10 fastest-growing cities by population					
1	Coventry	2.2	345,400	352,900	7,500
2	Exeter	2.0	127,300	129,800	2,500
3	Edinburgh	1.7	498,800	507,200	8,400
4	Peterborough	1.6	194,000	197,100	3,100
5	Southampton	1.4	378,500	383,900	5,400
6	Leicester	1.4	494,900	501,800	6,900
7	Northampton	1.3	222,500	225,500	3,000
8	London	1.2	9,896,000	10,018,200	122,200
9	Cardiff	1.2	357,200	361,500	4,300
10	Nottingham	1.2	661,600	669,400	7,800
10 slowest-growing cities by population					
54	Wigan	0.3	322,000	323,100	1,100
55	Burnley	0.3	177,500	178,100	600
56	Swindon	0.3	217,200	217,900	700
57	Sunderland	0.3	277,200	278,000	800
58	Ipswich	0.2	135,600	135,900	300
59	Blackpool	0.1	216,900	217,200	300
60	Blackburn	0.1	146,800	147,000	200
61	Birkenhead	0.1	320,900	321,200	300
62	Dundee	0.1	148,200	148,300	100
63	Aberdeen	-0.3	230,400	229,800	-600
	United Kingdom	0.8	65,110,000	65,648,100	538,100

Source: ONS 2017, Population estimates, 2015 and 2016 data

Business dynamics

City economies are predominantly driven by their businesses. The overall number of businesses in a city, as well as the number of new business start-ups and closures, are all good indicators of the strength of a city's economy.

Business starts and closures

- Three out of five businesses (60 per cent) that started up in 2016 were located in cities. This has increased in recent years: in 2010, 58 per cent of business starts were in cities.
- London had the highest number of start-ups per 10,000 population (112.3), followed by Slough (82.9) and Milton Keynes (80.7). At the other end of the spectrum Dundee (33.7), Swansea (32.6) and Sunderland (32.2) were the lowest-ranked cities.
- Meanwhile, 61 per cent of UK business closures occurred in cities in 2016.
- Between 2015 and 2016, the number of business closures increased by 15.9 per cent nationally, with Aberdeen, Belfast and Doncaster experiencing the highest increases in closures (33.1, 42.9 and 59.7 per cent respectively). Moreover, Telford and Plymouth were the only two cities where the number of closures fell.
- London, Aberdeen and Northampton were the three cities with the highest number of closures (90.7, 68.3 and 64.3 per 10,000 population).
- Birmingham, Manchester and Peterborough had the highest churn rate (7.1, 6.8 and 6.6 respectively) – these cities saw the greatest difference between new businesses setting up and current businesses closing.

Table 2:

Business starts and closures per 10,000 population

Rank	City	Business start-ups per 10,000 population, 2016	Business closures per 10,000 population, 2016	Churn rate*
10 cities with the highest start-up rate				
1	London	112.3	90.7	3.8
2	Slough	82.9	56.7	6.5
3	Milton Keynes	80.7	62.0	4.0
4	Manchester	78.1	53.2	6.8
5	Northampton	74.3	64.3	2.5
6	Reading	73.5	60.5	2.7
7	Southampton	70.3	52.0	5.5
8	Brighton	69.3	59.3	2.2
9	Basildon	68.2	49.1	4.8
10	Peterborough	65.4	43.1	6.6
10 cities with the lowest start-up rate				
53	Burnley	40.1	33.4	2.3
54	Telford	38.7	29.2	3.5
55	Stoke	37.9	29.7	3.3
56	Hull	37.1	29.0	3.5
57	Belfast	34.8	36.7	-0.7
58	Plymouth	34.6	31.2	1.6
59	Mansfield	34.5	25.4	3.8
60	Dundee	33.7	32.7	0.5
61	Swansea	32.6	31.1	0.7
62	Sunderland	32.2	25.5	3.3
	United Kingdom	63.1	49.9	4.2

Source: ONS 2017, Business Demography, 2016 data. ONS 2017, Population estimates, 2016 data. Note: Luton has been removed from the latest data due to irregularities compared with previous years' data.

*Difference between business start-ups and business closures as a percentage of total business stock.

Business stock

- Cities were home to 54 per cent of all UK businesses in 2016. Between 2015 and 2016 the stock of businesses increased by 5 per cent in the UK, and by 6 per cent in cities as a whole. Looking at the past 10 years, the business stock increased by almost a quarter nationally, and by more than a third in cities.
- Leeds was the city with the fastest year on year growth in business stock (11.3 per cent) between 2015 and 2016, followed by Manchester (10 per cent).
- London alone accounted for 23 per cent of the total UK business stock and 42 per cent of total cities business stock, far larger than Manchester and Birmingham (each accounting for less than 4 per cent of the total UK business stock).
- London also ranked first for business stock per capita, with 566 businesses per 10,000 population, followed by Reading (474), Milton Keynes (463) and Brighton (453).
- Dundee (221), Plymouth (217) and Sunderland (204) on the other hand had the lowest levels of business stock per 10,000 population.

Table 3:

Business stock per 10,000 population

Rank	City	Business stock per 10,000 population, 2016	Business stock per 10,000 population, 2015	Change, 2015-16 (%)
10 cities with the highest number of businesses				
1	London	566	543	4.1
2	Reading	474	457	3.6
3	Milton Keynes	463	442	4.8
4	Brighton	453	440	2.9
5	Aldershot	436	430	1.5
6	Northampton	402	398	0.8
7	Basildon	401	379	5.8
8	Slough	400	374	6.9
9	Southend	389	378	2.9
10	Bournemouth	383	376	1.7
10 cities with the lowest number of businesses				
53	Barnsley	250	238	4.8
54	Stoke	248	240	3.3
55	Middlesbrough	247	241	2.6
56	Newport	245	235	4.0
57	Mansfield	236	227	3.9
58	Swansea	231	227	1.8
59	Hull	229	221	3.4
60	Dundee	221	217	2.1
61	Plymouth	217	213	1.8
62	Sunderland	204	197	3.7
	United Kingdom	382	367	4.0

Source: ONS 2017, Business Demography, 2016 and 2015 data. ONS 2017, Population estimates, 2016 data. Note: Luton has been removed from the latest data due to irregularities compared with previous years' data

Productivity and innovation

Productivity and innovation are drivers of long-run economic growth. Finding new and better ways of making goods and delivering services improves the performance of businesses which in turn increases the capacity of city economies.

Productivity

- Only 10 cities out of 62 had levels of productivity above the British average in 2016.
- Slough, London and Reading were the three cities with the highest levels of productivity, with GVA per worker at least 25 per cent above Great Britain's average of £56,600.
- As Figure 17 shows, there is a very clear geography to productivity, with cities in the Greater South East tending to perform better on this measure than cities elsewhere. This is reflective of the make-up of jobs across cities, with jobs in cities in the Greater South East tending to be in higher-skilled occupations than elsewhere.

Innovation

- In total, about 11,400 patent applications from the UK were published in 2016. Of this, 59 per cent of all patent applications published were registered in cities.
- Cambridge had the highest number of patent applications published per resident in 2016. This was more than three times the number in Coventry, the city with the second highest number (108.9 applications published per 100,000 residents).
- London had the highest absolute number of patent applications published in 2016, with 1,948 publications. Relative to its resident-base the capital ranked 19th nationwide, with 19 applications published per 100,000 residents.
- Seven of the top 10 cities with the highest number of published patent applications are located in the south of England, with the exceptions being Coventry, Derby and Aberdeen.

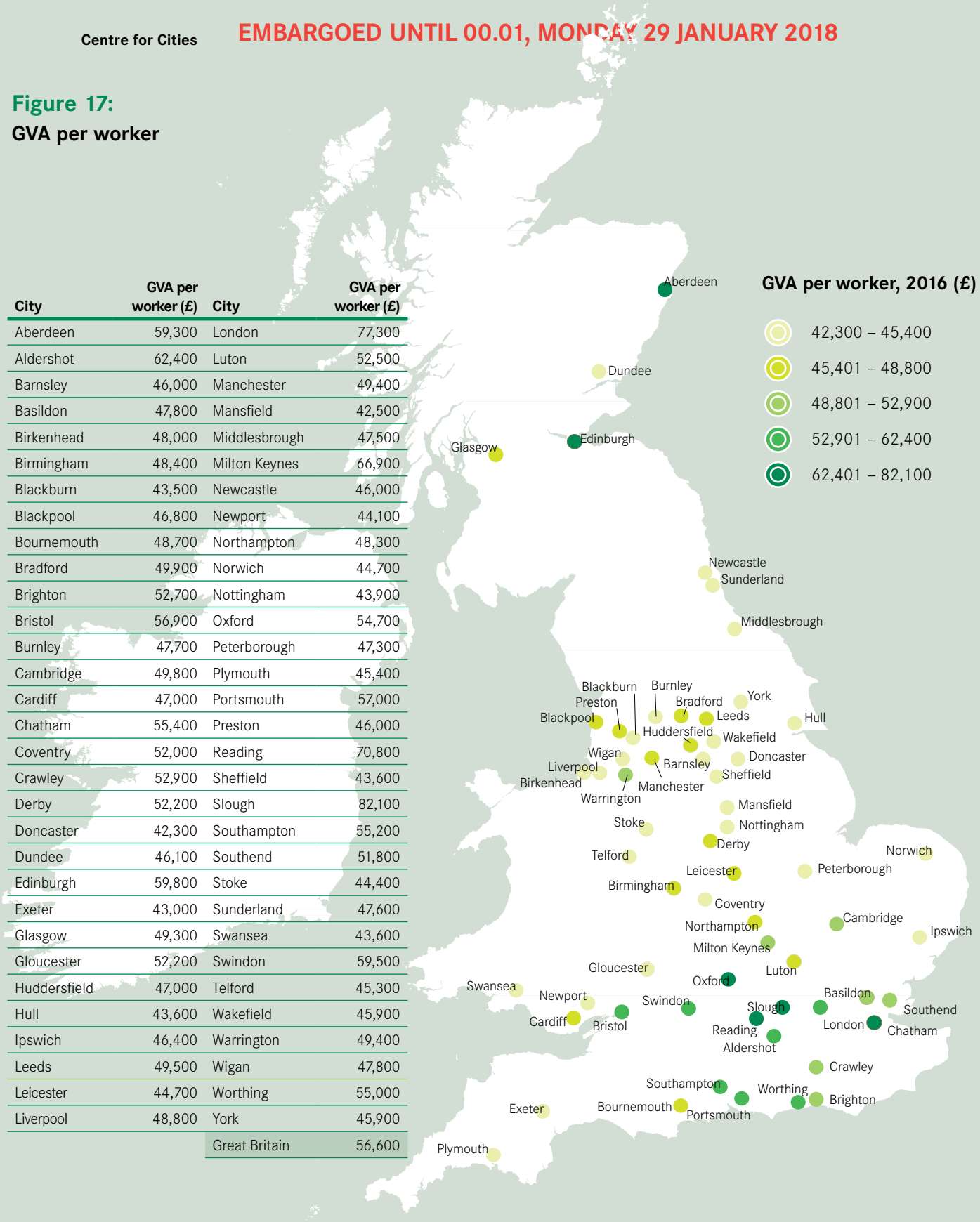
Table 4:
GVA per worker

Rank	City	GVA per worker, 2016 (£)
10 cities with the highest GVA per worker		
1	Slough	82,100
2	London	77,300
3	Reading	70,800
4	Milton Keynes	66,900
5	Aldershot	62,400
6	Edinburgh	59,800
7	Swindon	59,500
8	Aberdeen	59,300
9	Portsmouth	57,000
10	Bristol	56,900
10 cities with the lowest GVA per worker		
53	Stoke	44,400
54	Newport	44,100
55	Nottingham	43,900
56	Swansea	43,600
57	Hull	43,600
58	Sheffield	43,600
59	Blackburn	43,500
60	Exeter	43,000
61	Mansfield	42,500
62	Doncaster	42,300
	Great Britain	56,600

Source: ONS 2017, Regional Value Added (Balanced Approach), 2016 data. ONS 2017, Business Register and Employment Survey, 2016 data. Note: Data for Northern Ireland is not available, so Great Britain figure is shown.

Figure 17:
GVA per worker

City	GVA per worker (£)	City	GVA per worker (£)
Aberdeen	59,300	London	77,300
Aldershot	62,400	Luton	52,500
Barnsley	46,000	Manchester	49,400
Basildon	47,800	Mansfield	42,500
Birkenhead	48,000	Middlesbrough	47,500
Birmingham	48,400	Milton Keynes	66,900
Blackburn	43,500	Newcastle	46,000
Blackpool	46,800	Newport	44,100
Bournemouth	48,700	Northampton	48,300
Bradford	49,900	Norwich	44,700
Brighton	52,700	Nottingham	43,900
Bristol	56,900	Oxford	54,700
Burnley	47,700	Peterborough	47,300
Cambridge	49,800	Plymouth	45,400
Cardiff	47,000	Portsmouth	57,000
Chatham	55,400	Preston	46,000
Coventry	52,000	Reading	70,800
Crawley	52,900	Sheffield	43,600
Derby	52,200	Slough	82,100
Doncaster	42,300	Southampton	55,200
Dundee	46,100	Southend	51,800
Edinburgh	59,800	Stoke	44,400
Exeter	43,000	Sunderland	47,600
Glasgow	49,300	Swansea	43,600
Gloucester	52,200	Swindon	59,500
Huddersfield	47,000	Telford	45,300
Hull	43,600	Wakefield	45,900
Ipswich	46,400	Warrington	49,400
Leeds	49,500	Wigan	47,800
Leicester	44,700	Worthing	55,000
Liverpool	48,800	York	45,900
		Great Britain	56,600



Source: ONS 2017, Regional Value Added (Balanced Approach), 2016 data. ONS 2017, Business Register and Employment Survey, 2016 data. Note: Data for Northern Ireland is not available, so data for Great Britain is shown.

Box 8: Measuring Innovation

Patent data is widely used to measure innovation. The data is based on the number of patent applications, at their date of publication (in 2016). Applications are usually published about 18 months after the application is submitted to the patent authority, but this does not mean the patent is granted.

There are some limitations with this data:

- Patents only demonstrate more technical innovations and exclude process innovations, trademarks and creative innovation, much of which takes place within service sector businesses
- The address of the patentee does not confirm that the innovative activity occurred at this address
- That said, the data still offers some insight into where innovation occurs across the UK, and as shown in the tables, there is a great deal of variation across the country.

Since 2017, we have included patent applications made to the European Patent Office (EPO) as well as the UK Intellectual Property Office (IPO). While firms that only seek protection in the UK will generally apply to the IPO, those who want a wider international protection are likely to apply through the EPO instead. The analysis finds that EPO published patent applications represent more than half of the total number of published patent applications from the UK in Jan-October 2016.

Table 5:

Patent applications published per 100,000 residents

Rank	City	UK patent applications published per 100,000 residents, 2016
10 cities with highest number of published patent applications		
1	Cambridge	315.7
2	Coventry	108.9
3	Derby	98.6
4	Oxford	78.0
5	Aberdeen	60.1
6	Slough	48.0
7	Aldershot	47.9
8	Bristol	38.2
9	Crawley	36.7
10	Gloucester	32.7
10 cities with lowest number of published patent applications		
54	Birmingham	8.0
55	Luton	7.6
56	Glasgow	7.5
57	Bradford	5.8
58	Sunderland	5.8
59	Wakefield	5.7
60	Barnsley	5.4
61	Hull	5.0
62	Southend	5.0
63	Wigan	3.5
	United Kingdom	17.3

Source: PATSTAT 2017, January-November 2016 data; Intellectual Property Office 2017, Patents granted registered by postcode, January-October 2016 data. ONS 2017, Population estimates, 2016 data.

Employment

High employment rates, employment growth and low unemployment point to well-functioning labour markets, with the demand for workers amongst employers being high. Low employment rates and high unemployment are suggestive of a combination of poor skills and weaker employer demand.

Employment rate

- 42 out of 63 cities across the UK saw their employment rate improve in 2017, and 15 did so by two or more percentage points.
- Overall, UK employment increased by 0.5 percentage points between 2016 and 2017, from 73.7 per cent to 74.2 per cent. The city average remains slightly lower than the national average, at 72.7 per cent.
- 36 cities had employment rates below the national average. To bring these cities up to the current UK average a further 487,400 residents in these places would need to find employment.
- Dundee, the UK city with the lowest employment rate in 2017 (64.1 per cent), would need almost 9,800 of its residents to find employment to reach the UK average. Birmingham (the city with the highest deficit in absolute terms) would need 117,700 of its residents to find jobs to match the UK average.
- Southern cities tend to perform better than cities elsewhere. York is the only city outside of the south of England to feature in the top 10. Moreover, no southern city is listed in the bottom 10.
- Big cities tend to fare worse than the average, with only four (Bristol, Leeds, Portsmouth and London) of the twelve biggest cities having employment rates above the national average. Meanwhile Birmingham, Liverpool and Nottingham are all in the bottom 10.

Table 6:
Employment rate

Rank	City	Employment rate, Jul 2016-Jun 2017 (%)	Employment rate, Jul 2015-Jun 2016 (%)	Percentage point change
10 cities with highest employment rate				
1	Crawley	86.6	84.8	1.8
2	Worthing	83.1	80.4	2.7
3	Swindon	80.6	79.0	1.6
4	Gloucester	80.0	80.7	-0.7
5	Oxford	79.7	74.6	5.1
6	Aldershot	78.3	83.8	-5.6
7	Reading	78.1	77.4	0.7
8	Bristol	78.0	77.3	0.7
9	Norwich	77.7	79.3	-1.7
10	York	77.3	76.7	0.7
10 cities with lowest employment rate				
54	Sunderland	69.3	67.0	2.3
55	Swansea	69.2	68.7	0.5
56	Middlesbrough	69.0	68.8	0.2
57	Nottingham	68.7	71.9	-3.3
58	Cardiff	68.6	69.1	-0.5
59	Bradford	67.8	65.2	2.6
60	Liverpool	66.8	63.9	2.9
61	Birmingham	66.7	64.2	2.5
62	Blackburn	64.5	65.3	-0.8
63	Dundee	64.1	63.8	0.3
	United Kingdom	74.2	73.7	0.5

Source: ONS 2017, Annual Population Survey, residents analysis, July 2015 - June 2016 and July 2016 - June 2017; DETINI 2017, District Council Area Statistics for Belfast, January 2015 - December 2015 and January 2016 - December 2016 data.

Jobseeker's Allowance claimant count

Jobseeker's Allowance (JSA) is currently being rolled into Universal Credit which has led to inconsistencies in the definition of a claimant looking for work across the country. While this has a big impact when looking at change in claimant rates, a static picture still provides a good indication of the relative strength of different labour markets and so is presented here.

- Almost two thirds (64 per cent) of those claiming Jobseekers' Allowance lived in cities in November 2017.
- With the exception of York and Edinburgh, all top 10 cities with the lowest claimant count rate were located in the Greater South East of the UK.
- On the other hand, eight of the bottom 10 cities with highest claimant count rate were located in the north of England.

Private sector jobs growth

- 44 of 62 cities increased their number of private sector jobs between 2015 and 2016, and 28 did so by more than the British average (2 per cent).
- 13 cities saw reductions in their number of private sector positions, and in four cities the number of jobs dropped by more than 2 per cent. (Middlesbrough -5.1 per cent, Aberdeen -4.9 per cent, Newcastle -2.8 per cent and Plymouth -2.1 per cent). Middlesbrough experienced a significant shift in its ranking moving from eighth (3.9 per cent) in 2015 to last (-5.1 percent) in 2016.
- Overall, cities led the private sector jobs growth in 2016 with 269,000 net jobs created, 62 per cent of the total 436,000 net jobs gain in Great Britain.

Public and private sector jobs

- In 2016 the private to public sector employment ratio in Great Britain was equal to 2.8.
- In general, the job market in cities tends to be more dominated by publicly-funded activities than the national average. Out of 62 cities, only 16 had private to public employment ratios above the British average. Crawley had the smallest public sector of any city, where there were eight private sector jobs for every publicly-funded one. It was followed by Slough and Swindon.
- In the bottom 10 cities, Oxford had almost the same number of private and public sector employees, mainly the result of its universities. This highlights that higher levels of publicly-funded jobs do not necessarily mean a less successful economy.

Table 7:

Jobseeker's Allowance claimant count

Rank	City	JSA claimant count rate, Nov 2017 (%)
10 cities with the lowest claimant count		
1	Aldershot	0.7
2	Cambridge	0.8
3	Oxford	0.9
4	York	0.9
5	Exeter	0.9
6	Reading	1.1
7	Bournemouth	1.2
8	Norwich	1.2
9	Crawley	1.2
10	Edinburgh	1.3
10 cities with the highest claimant count		
54	Blackburn	2.9
55	Dundee	3.1
56	Burnley	3.1
57	Sunderland	3.1
58	Blackpool	3.3
59	Newcastle	3.3
60	Liverpool	3.4
61	Hull	3.5
62	Middlesbrough	3.6
63	Birmingham	3.7
	United Kingdom	1.9

Source: ONS 2017, Claimant count, November 2016 and November 2017; Population estimates, 2016 data. Note: Data differ to NOMIS claimant count rates as latest available population estimates are used to calculate the figures above. Due to the staggered roll out of Universal Credit, there is variation in definition of claimants across different cities. Despite this, the claimant count rate serves as a good indicator for the strength of demand for workers across cities.

Table 8:

Private sector jobs growth

Rank	City	Change, 2015-2016 (%)	Private sector jobs, 2015	Private sector jobs, 2016	Net job gains or losses
10 cities with the highest net private sector jobs growth					
1	Luton	15.7	67,000	77,500	10,500
2	Crawley	11.3	75,000	83,500	8,500
3	Chatham	8.3	60,500	65,500	5,000
4	Milton Keynes	8.2	134,500	145,500	11,000
5	Slough	6.2	65,000	69,000	4,000
6	Blackburn	5.9	42,500	45,000	2,500
7	Dundee	5.6	44,500	47,000	2,500
8	Newport	5.5	73,000	77,000	4,000
9	Reading	5.3	141,000	148,500	7,500
10	Exeter	5.1	58,500	61,500	3,000
10 cities with the lowest net private sector jobs growth					
53	Birmingham	-1.0	790,000	782,000	-8,000
54	Aldershot	-1.2	82,500	81,500	-1,000
55	Stoke	-1.3	116,000	114,500	-1,500
56	Huddersfield	-1.3	115,500	114,000	-1,500
57	Blackpool	-1.4	71,000	70,000	-1,000
58	Doncaster	-1.8	83,000	81,500	-1,500
59	Plymouth	-2.1	72,000	70,500	-1,500
60	Newcastle	-2.8	282,500	274,500	-8,000
61	Aberdeen	-4.9	141,500	134,500	-7,000
62	Middlesbrough	-5.1	128,500	122,000	-6,500
	Great Britain	2.0	21,656,500	22,092,500	436,000

Source: ONS 2017, Business Register and Employment Survey, 2015 and 2016 data. Note: Northern Ireland data not available so Great Britain figure is shown.

Table 9:

Ratio of private sector to publicly-funded jobs

Rank	City	Private to public ratio	Private sector jobs, 2016	Publicly-funded* jobs, 2016
10 cities with the highest proportion of private sector jobs				
1	Crawley	8.0	83,500	10,500
2	Slough	4.8	69,000	14,500
3	Swindon	4.1	95,000	23,000
4	Aldershot	4.0	81,500	20,500
5	London	3.8	4,580,500	1,199,000
6	Peterborough	3.7	90,500	24,500
7	Milton Keynes	3.7	145,500	39,500
8	Warrington	3.5	104,000	29,500
9	Reading	3.5	148,500	42,500
10	Luton	3.4	77,500	23,000
10 cities with the lowest proportion of private sector jobs				
53	Gloucester	2.0	43,000	22,000
54	Liverpool	1.9	206,500	107,000
55	Worthing	1.8	30,500	16,500
56	Exeter	1.8	61,500	33,500
57	Swansea	1.8	103,000	56,500
58	Plymouth	1.8	70,500	39,500
59	Birkenhead	1.7	64,500	38,000
60	Dundee	1.5	47,000	30,500
61	Cambridge	1.5	61,500	41,500
62	Oxford	1.1	63,500	60,000
	Great Britain	2.8	22,092,500	7,792,500

Source: ONS 2017, Business Register and Employment Survey, 2016 data. Note: Northern Ireland data is not available so Great Britain figure is shown.

* Publicly-funded jobs are defined as those jobs that fall into the sectors of public administration and defence, education, and health. This means that this definition captures private sector jobs in these sectors but also captures jobs such as GPs and those in universities that the standard ONS definition does not.

Skills

Skills levels are a key component of the success of a city economy. Those cities that have a high proportion of graduates tend to have stronger economies than those that have a large number of people with no formal qualifications.

High level qualifications

- While cities were home to 55.8 per cent of the UK working-age population in 2016, they were home to 57.9 per cent of those with a degree or equivalent qualification.
- But the UK's highly-skilled population is concentrated in a few cities. The top 10 cities combined accounted for around 30 per cent of the total UK highly skilled population (compared to 22.6 per cent of the working age population), whereas the bottom 10 only accounted for 3.2 per cent of the population with high level qualifications (but 5 per cent of the working age population).
- Northern cities fare poorly on this measure. Six of the top 10 cities are located in the South, while only two southern cities (Southend and Gloucester) are in the bottom 10.
- Scottish cities perform relatively well when compared with the rest of the UK, with Edinburgh, Aberdeen and Glasgow ranking in the top 10 and Dundee in 14th position.

No formal qualifications

- Cities were also over represented for people with no qualifications, being home to almost 59 per cent of the population with no formal qualifications.
- Most of the best performing UK cities were small or medium sized, while four of the UK's twelve biggest cities – Glasgow, Liverpool, Birmingham and Bradford – were in the bottom 10.
- Moreover, southern cities tend to perform better than cities elsewhere. Edinburgh is the only city outside the south of England to feature in top 10.
- Some cities have very polarised skills profiles: Glasgow had the 7th highest share of working age population with high level qualifications (46.6 per cent), but also a very high share of population with no formal qualifications (13 per cent). Similarly, Belfast was 26th in UK for highly skilled population (35.1 per cent), but had the fifth highest share of population with no formal qualifications (13.7 per cent).

Table 10:

Residents with high-level qualifications

Rank	City	Working age population with NVQ4 & above, 2016 (%)
10 cities with the highest percentage of high qualifications		
1	Cambridge	66.8
2	Oxford	60.9
3	Edinburgh	59.2
4	Aberdeen	52.6
5	London	50.7
6	Reading	49.9
7	Glasgow	46.6
8	Brighton	46.5
9	Cardiff	45.6
10	Bristol	44.5
10 cities with the lowest percentage of high qualifications		
54	Barnsley	26.8
55	Leicester	26.2
56	Stoke	26.1
57	Sunderland	26.0
58	Wakefield	24.9
59	Doncaster	24.7
60	Bradford	24.5
61	Gloucester	24.2
62	Southend	23.1
63	Mansfield	18.0
	United Kingdom	38.0

Source: ONS 2017, Annual Population Survey, residents analysis, 2016 data; DETINI 2017, District Council Area Statistics for Belfast, 2016 data.

Table 11:

Residents with no formal qualifications

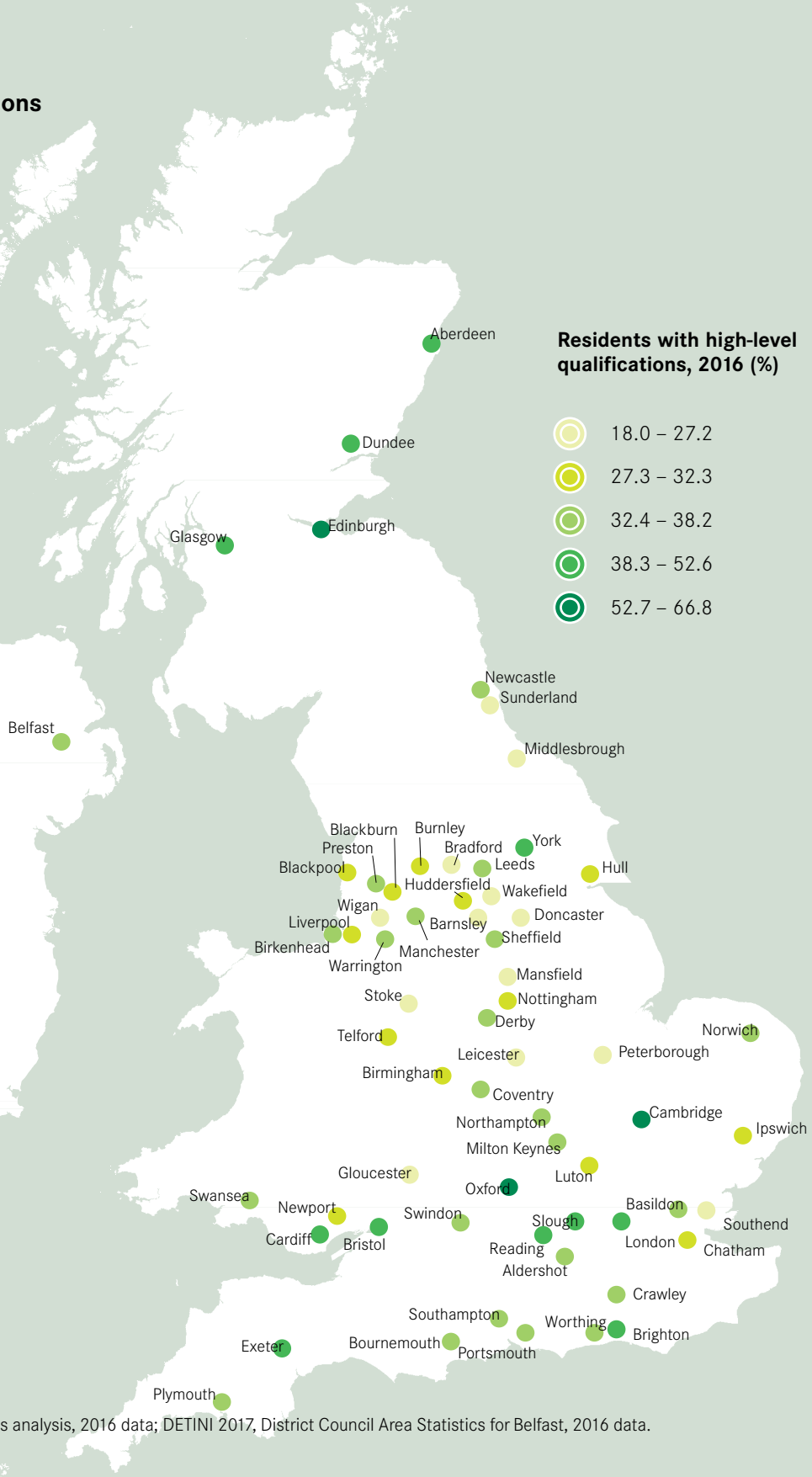
Rank	City	Working age population with no formal qualifications, 2016 (%)
10 cities with the lowest percentage of no formal qualifications		
1	Crawley	2.0
2	Exeter	2.1
3	Brighton	3.8
4	Swindon	3.9
5	Oxford	4.2
6	Cambridge	4.4
7	Worthing	4.5
8	Southampton	4.9
9	Reading	5.4
10	Edinburgh	5.5
10 cities with the highest percentage of no formal qualifications		
54	Dundee	12.2
55	Blackburn	12.6
56	Glasgow	13.0
57	Peterborough	13.6
58	Stoke	13.7
59	Belfast	13.7
60	Bradford	13.8
61	Luton	14.3
62	Liverpool	15.5
63	Birmingham	16.3
	United Kingdom	8.3

Source: ONS 2017, Annual Population Survey, residents analysis, 2016 data; DETINI 2017, District Council Area Statistics for Belfast, 2016 data.

Figure 18:

Residents with high-level qualifications

City	Share (%)	City	Share (%)
Aberdeen	52.6	London	50.7
Aldershot	38.2	Luton	31.8
Barnsley	26.8	Manchester	35.6
Basildon	33.5	Mansfield	18.0
Belfast	35.1	Middlesbrough	31.7
Birkenhead	36.4	Milton Keynes	35.6
Birmingham	28.4	Newcastle	33.8
Blackburn	28.0	Newport	31.5
Blackpool	32.0	Northampton	35.2
Bournemouth	36.6	Norwich	34.4
Bradford	24.5	Nottingham	32.3
Brighton	46.5	Oxford	60.9
Bristol	44.5	Peterborough	27.2
Burnley	27.9	Plymouth	33.0
Cambridge	66.8	Portsmouth	34.1
Cardiff	45.6	Preston	36.9
Chatham	30.3	Reading	49.9
Coventry	33.7	Sheffield	34.2
Crawley	38.0	Slough	41.1
Derby	33.3	Southampton	35.8
Doncaster	24.7	Southend	23.1
Dundee	40.9	Stoke	26.1
Edinburgh	59.2	Sunderland	26.0
Exeter	43.3	Swansea	33.7
Glasgow	46.6	Swindon	33.8
Gloucester	24.2	Telford	30.3
Huddersfield	29.3	Wakefield	24.9
Hull	29.5	Warrington	37.7
Ipswich	30.7	Wigan	27.1
Leeds	33.6	Worthing	37.4
Leicester	26.2	York	42.7
Liverpool	32.3	United Kingdom	38.0



Source: ONS 2017, Annual Population Survey, residents analysis, 2016 data; DETINI 2017, District Council Area Statistics for Belfast, 2016 data.

Wages

Wages reflect the types of jobs available in cities. Those cities that have higher workplace wages typically have a greater number of high-skilled jobs in them than those that have lower wages.

- In 2017, the average weekly workplace wage in cities was £577, compared to the UK average of £539.
- However in only 15 cities did workers earn more than the UK average. The average London weekly wage was £727; 76 per cent higher than in neighbouring Southend (£413).
- Overall the UK saw no change to its real weekly earnings between 2016 and 2017 (£539).
- However, 35 cities saw their weekly salaries decrease in real terms between 2016 and 2017. Exeter recorded the largest fall (-£35 per week), followed by Bradford (-£34 per week) and Reading (-£31 per week).
- On the other hand, Luton experienced the largest increase in wages, with a real increase of £29 per week between 2016 and 2017, followed by York (£19), Middlesbrough (£13), Dundee (£14) and Brighton (£12).

Table 12:

Average workplace wages

Rank	City	Wages, 2017 (av £ per week, 2017 prices)	Wages, 2016 (av £ per week, 2017 prices)	Real wage growth, 2016-2017 (£ per week)
10 cities with the highest weekly workplace earnings				
1	London	727	715	12
2	Reading	655	686	-31
3	Crawley	633	651	-19
4	Milton Keynes	619	645	-26
5	Cambridge	609	621	-12
6	Slough	606	604	2
7	Oxford	600	593	8
8	Edinburgh	598	593	5
9	Aberdeen	597	619	-22
10	Derby	595	588	6
10 cities with the lowest weekly workplace earnings				
54	Stoke	455	453	2
55	Bradford	455	489	-34
56	Worthing	455	445	10
57	Barnsley	453	460	-7
58	Norwich	450	448	2
59	Doncaster	447	451	-4
60	Wigan	436	432	4
61	Birkenhead	428	437	-9
62	Huddersfield	424	433	-9
63	Southend	413	414	-1
	United Kingdom	539	539	0

Source: ONS 2017, Annual Survey of Hours and Earnings (ASHE), average gross weekly workplace-based earnings, 2017 data; DETINI 2017, ASHE, average gross weekly workplace-based earnings, 2017 data. Own calculations for PUA-level weighted by number of jobs, CPI inflation adjusted (2015=100). Earnings data is for employees only. Note: ASHE statistics are based on a sample survey, so the statistical significance of the results should be treated with caution.

Inequality

As the UK economy has recovered from the last recession, there has been an increasing focus not just on achieving growth but 'inclusive' growth. And this has become ever more prescient in light of the EU Referendum vote.

Experimental data on incomes of residents (which includes wages, pensions, benefits and other income) released by the ONS using administrative data sources allows us to create a Gini coefficient for each city to measure what inequality looks like across our cities. The Gini coefficient gives a value between zero and one, with zero representing perfect equality and one representing a very unequal society. The estimates for cities show that:

- The most equal cities tended to be in the north of England or Wales. Burnley and Hull were the most equal of all English and Welsh cities.
- The top 10 least equal cities were dominated by those in the Greater South East, with Cardiff and York being the only two exceptions. Cambridge was the least equal, followed by Oxford and London.
- Those cities that were most equal also tended to have weaker economies, for example having lower average incomes, fewer knowledge-based services jobs and less productive economies (see Figure 19). This means that although these cities were more equal, they were poorer overall.
- Just 10 cities were more unequal than the English and Welsh average. This is likely to reflect the greater preference of higher income people to live in the hinterland around cities rather than in cities themselves.

Table 13:
Gini coefficient

Rank	City	Gini Coefficient, 2015/16
10 least equal cities		
1	Cambridge	0.460
2	Oxford	0.452
3	London	0.433
4	Reading	0.433
5	Brighton	0.426
6	Southend	0.421
7	Aldershot	0.418
8	Basildon	0.418
9	York	0.416
10	Cardiff	0.413
10 most equal cities		
49	Swansea	0.371
50	Sunderland	0.371
51	Wigan	0.371
52	Barnsley	0.369
53	Newport	0.369
54	Wakefield	0.368
55	Mansfield	0.368
56	Stoke	0.366
57	Hull	0.365
58	Burnley	0.365
	England and Wales	0.410

Source: ONS 2017, Research Outputs: Income from PAYE and benefits for tax year ending 2016, 2015/16 data; ONS 2017, Research outputs estimating the size of the population in England and Wales: 2017 release, 2016 data

0 = perfect equality | 1= perfect inequality

Figure 19:

The relationship between productivity and inequality

Source: ONS 2017, Regional Value Added (Balanced Approach), 2016 data. ONS 2017, Business Register and Employment Survey, 2016 data. Note: Data for Northern Ireland is not available, so data for Great Britain is shown; ONS 2017, Research Outputs: Income from PAYE and benefits for tax year ending 2016, 2015/16 data; ONS 2017, Research outputs estimating the size of the population in England and Wales: 2017 release, 2016 data. 0 = perfect equality | 1= perfect inequality

Housing

Housing stocks and prices together provide useful insights into cities' housing markets, highlighting both supply and demand and their impact on house affordability.

Housing stock growth

- Cities account for 52 per cent of the UK's housing stock.
- The UK's dwelling stock increased by 0.8 per cent between 2015 and 2016, consistent with previous years (0.7 per cent between 2014 and 2015).
- In 30 cities housing stock growth exceeded the UK average, with Telford and Cambridge experiencing the highest growth (1.7 per cent), followed by Swindon and Slough (1.5 per cent).
- Around 34,200 new houses were built in London between 2015 and 2016. This represented a housing stock growth of 0.9 per cent, ranking London 23rd nationally.

House prices

- In 36 out of 62 cities, house prices grew by more than the Great Britain average of 3.8 per cent.
- Not all cities saw increases though – five cities saw their average house price fall. Aberdeen saw the largest fall (-1.9 per cent), followed by the northern cities of Burnley, Middlesbrough, Preston and Huddersfield.
- Southend experienced the highest house price growth, with average prices increasing by 11.4 per cent, followed by Slough (10.8 per cent) and Northampton (10.2 per cent).
- House prices in London (£592,500) were twice the British average (£278,200). Oxford and Cambridge were second and third with £523,200 and £505,200, considerably above next placed Brighton (£394,600).
- At the other end of the spectrum, Burnley had the lowest average house price with £102,300, and it decreased by 1.7 per cent compared to last year. The prices in London were 5.8 times than in Burnley, and houses in the city were less than half the British average.

Table 14:
Housing stock growth

Rank	City	Change, 2015-2016 (%)	Housing stock, 2015	Housing stock, 2016	Change, 2015-2016
10 cities with the highest housing stock growth					
1	Telford	1.7	71,960	73,210	1,250
2	Cambridge	1.7	51,120	52,000	880
3	Swindon	1.5	93,900	95,340	1,440
4	Slough	1.5	53,080	53,870	790
5	Wakefield	1.3	149,690	151,610	1,920
6	Crawley	1.2	44,130	44,680	550
7	Exeter	1.2	52,830	53,480	650
8	Peterborough	1.1	80,480	81,400	920
9	Edinburgh	1.1	241,430	244,130	2,700
10	Milton Keynes	1.1	107,550	108,740	1,190
10 cities with the lowest housing stock growth					
54	Wigan	0.4	143,220	143,860	640
55	Derby	0.4	108,020	108,500	480
56	Bradford	0.4	210,730	211,640	910
57	Swansea	0.4	175,410	176,160	750
58	Cardiff	0.4	149,960	150,590	630
59	Burnley	0.4	79,710	80,040	330
60	Stoke	0.3	169,100	169,680	580
61	Birkenhead	0.3	146,810	147,300	490
62	Southend	0.3	152,850	153,350	500
63	Blackburn	0.1	60,290	60,380	90
	United Kingdom	0.8	28,277,670	28,497,860	220,190

Source: Department of Communities and Local Government (DCLG), 2017, Dwelling stock estimates by local authority district 2015 and 2016. Scottish Neighbourhood Statistics 2017, Dwelling stock estimates 2015 and 2016 data. Northern Ireland Neighbourhood information service 2017, Land and Property Services, 2015 and 2016 data.

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Table 15:
House price growth

Rank	City	Annual growth, 2016-2017 (%)	Average price, 2016 (£)	Average price, 2017 (£)	Difference in average prices, 2016-2017 (£)
10 cities with the highest rises in house prices					
1	Southend	11.4	285,000	317,600	32,500
2	Slough	10.8	296,000	328,100	32,100
3	Northampton	10.2	196,800	216,800	20,000
4	Luton	9.2	227,300	248,200	20,900
5	Chatham	8.8	231,800	252,300	20,500
6	Cambridge	8.8	464,300	505,200	40,900
7	Swindon	8.2	206,500	223,400	16,900
8	Oxford	7.7	485,600	523,200	37,600
9	Brighton	7.4	367,600	394,600	27,000
10	Portsmouth	7.2	236,900	253,900	17,000
10 cities with the lowest rises in house prices					
53	Newcastle	0.7	161,000	162,100	1,100
54	Swansea	0.6	145,100	146,000	900
55	Barnsley	0.6	125,500	126,200	700
56	Newport	0.1	157,600	157,900	200
57	Dundee	0.1	132,500	132,700	200
58	Huddersfield	-0.4	163,100	162,400	-625
59	Preston	-0.7	164,400	163,200	-1,200
60	Middlesbrough	-0.8	139,100	138,100	-1,100
61	Burnley	-1.7	104,000	102,300	-1,700
62	Aberdeen	-1.9	203,700	199,900	-3,800
	Great Britain	3.8	268,000	278,200	10,200

Source: Land Registry 2017, Market Trend Data, Price Paid, 2016 and 2017 data. Scottish neighbourhood statistics 2017, Mean house prices, 2016 and 2017 data. Note: 2017 prices in Scotland are an average of the first three quarters of the year. 2017 house prices in England and Wales are an average of the period January to November. Difference in average prices may not add up due to rounding of figures.

Housing affordability

- In 2017, on average house prices in Britain were 10 times the annual salary of residents.
- Oxford was the least affordable city, with house prices being 17.3 times higher than annual earnings. In total, only 16 out of 62 cities were less affordable than the British average.
- On the other hand Burnley was the most affordable city, with an affordability ratio of 4.2.
- All the top 10 least affordable cities were located in the south of England. Meanwhile with the exception of Dundee the 10 most affordable cities were in the north of England.

Table 16:
Housing affordability ratio

Rank	City	Affordability ratio	Average house price, 2017 (£)	Annual wages, 2017 (£)
10 cities with the highest affordability ratio				
1	Oxford	17.3	523,200	30,200
2	London	16.8	592,500	35,300
3	Cambridge	15.3	505,200	33,000
4	Brighton	14.3	394,600	27,600
5	Bournemouth	12.7	331,700	26,100
6	Slough	11.9	328,100	27,600
7	Reading	11.8	389,400	33,100
8	Exeter	11.7	266,300	22,800
9	Aldershot	11.4	386,100	33,800
10	Southend	11.2	317,600	28,400
10 cities with the lowest affordability ratio				
53	Middlesbrough	5.8	138,100	24,000
54	Stoke	5.7	131,800	23,000
55	Blackburn	5.5	123,900	22,400
56	Liverpool	5.5	137,100	24,900
57	Wigan	5.4	136,000	25,000
58	Dundee	5.4	132,700	24,500
59	Sunderland	5.4	126,800	23,600
60	Hull	5.4	111,200	20,800
61	Barnsley	5.2	126,200	24,400
62	Burnley	4.2	102,300	24,300
	Great Britain	9.9	278,200	28,100

Source: Land Registry 2017, Market Trend Data, Price Paid, 2017 data. Simple average used. Scottish neighbourhood statistics 2016, Mean House prices, 2016 and 2017 data. ONS 2017, Annual Survey of Hours and Earnings (ASHE), average gross weekly resident earnings, 2017 data.

Environment

Accounting for over 80 per cent of total greenhouse gas emissions, CO_2 emissions are one way to gauge how 'green' a city is and the size of its carbon footprint.

- In 2015, cities accounted for 54 per cent of the UK population but only 45.5 per cent of the UK's total CO_2 emissions, reflecting the lower carbon emissions per capita in cities than elsewhere.
- Average UK emissions per capita in 2015 totalled 5.9 tonnes (down from 6.2 tonnes in 2014), but the city average was as low as 5 tonnes.
- Swansea and Middlesbrough are significant outliers. They were two of only eight cities to emit more CO_2 per capita than the national average. This was driven by large industrial installations which accounted for more than three quarters of total emissions in each city.
- All cities except Crawley, Slough, Stoke and Wakefield reduced their emissions per capita in the year between 2014 and 2015.
- In seven cities (Belfast, Cambridge, Oxford, Telford, Sunderland, Exeter and Middlesbrough) emissions per capita reduced by more than 10 per cent.
- Big cities are significant emitters, but they are very efficient when emissions are considered on a per capita basis. London for example accounted for 10.4 per cent of total UK emissions in 2015, but was twelfth out of 63 cities for per capita emissions with only 4.1 tonnes emitted for every resident (down from 4.4 tonnes in the previous year).

Table 17:

Total CO_2 emissions per capita

Rank	City	Total CO_2 emissions per capita, 2015 (t)	Total CO_2 emissions per capita, 2014 (t)
10 cities with the lowest emissions per capita			
1	Luton	3.4	3.7
2	Ipswich	3.4	3.7
3	Chatham	3.5	3.6
4	Southend	3.6	3.7
5	Brighton	3.6	3.8
6	Worthing	3.6	3.9
7	Exeter	3.8	4.3
8	Gloucester	3.8	4.1
9	Plymouth	3.8	4.0
10	Southampton	4.0	4.2
10 cities with the lowest emissions per capita			
54	Milton Keynes	5.6	5.9
55	Aberdeen	5.8	6.1
56	Stoke	5.9	5.9
57	Preston	6.1	6.3
58	Wakefield	6.5	6.5
59	Warrington	6.5	6.7
60	Doncaster	6.8	7.0
61	Newport	6.9	7.4
62	Middlesbrough	23.0	26.5
63	Swansea	24.6	26.8
	United Kingdom	5.9	6.2

Source: Department of Energy and Climate Change (DECC) 2017, CO_2 emissions per capita, 2015 data. ONS 2017, Population estimates 2014 and 2015 data.

Digital connectivity

Broadband connectivity is a key component of the infrastructure offer that a city can make to businesses, entrepreneurs and residents. The development of optical fibre has considerably increased broadband speed across the country, now enabling access to 'ultrafast' (>100Mbps) speeds.

- In 2017, more than half of UK premises (53.1 per cent) had access to ultrafast broadband.
- In 56 out of 63 cities the proportion of properties with access to ultrafast speeds exceeded the UK average.
- Six of the top 10 cities were located in the south of England, whereas only two cities in the bottom 10 were in the south of England (Southend and Milton Keynes).
- While there is variation in the coverage of ultrafast broadband, with the exception of Hull all cities had at least 90 per cent of their properties covered by 'superfast' broadband (> 30 Mbps).

Table 18:

Premises achieving ultra-fast broadband speeds (> 100 Mbps)

Rank	City	Properties achieving ultrafast broadband, 2017 (%)
10 cities with the highest ultrafast broadband penetration rate		
1	Worthing	94.5
2	Luton	93.2
3	Cambridge	93.0
4	Dundee	92.9
5	Portsmouth	92.4
6	Middlesbrough	91.4
7	Plymouth	91.3
8	Brighton	91.3
9	Wigan	90.9
10	Derby	90.3
10 cities with the lowest ultrafast broadband penetration rate		
54	Blackpool	55.2
55	Sunderland	54.3
56	Newport	54.1
57	Sheffield	45.3
58	Barnsley	44.0
59	Southend	42.4
60	Wakefield	37.4
61	Doncaster	37.2
62	Milton Keynes	13.9
63	Aberdeen	0.4
	United Kingdom	53.1

Source: Thinkbroadband.com, percentage of premises covered with ultrafast broadband (>100 Mbps) as at end of 2017. https://labs.thinkbroadband.com/local/postcode-search. Ultrafast coverage figures do not include business grade leased line services and other on-demand connectivity solutions.

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About Centre for Cities

Centre for Cities is a research and policy institute, dedicated to improving the economic success of UK cities.

We are a charity that works with cities, business and Whitehall to develop and implement policy that supports the performance of urban economies. We do this through impartial research and knowledge exchange.

For more information, please visit www.centreforcities.org/about

Partnerships

Centre for Cities is always keen to work in partnership with like-minded organisations who share our commitment to helping cities to thrive, and supporting policy makers to achieve that aim.

As a registered charity (no. 1119841) we rely on external support to deliver our programme of quality research and events.

To find out more please visit: www.centreforcities.org/about/partnerships

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