



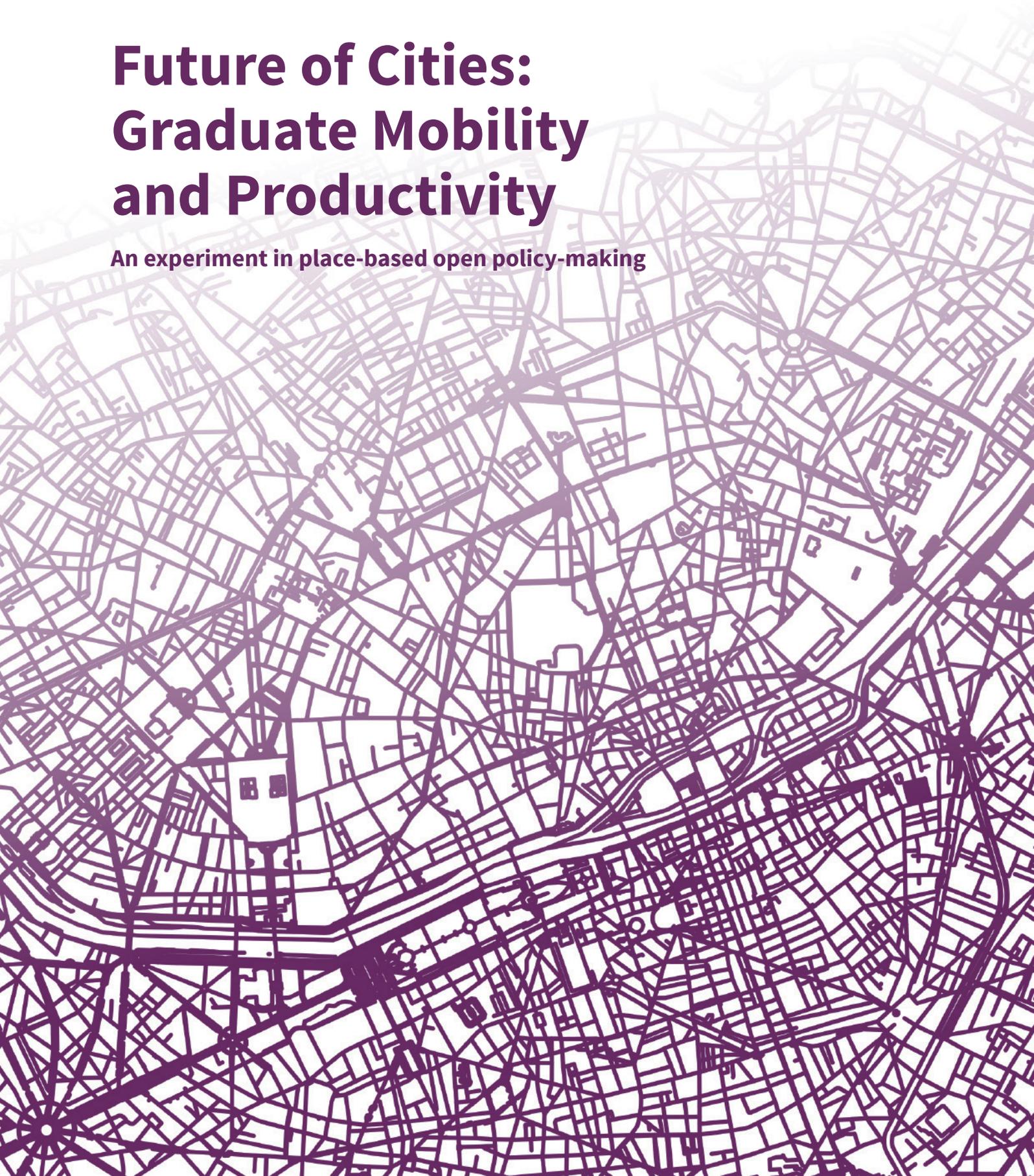
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Foresight

Future of Cities: Graduate Mobility and Productivity

An experiment in place-based open policy-making



Foresight Future of Cities Project

The Foresight Future of Cities Project is run from within the Government Office for Science (GO-Science) and was launched in June 2013 by Sir Mark Walport. This major project has developed an evidence base on the future of UK cities to inform decision-makers. It has used evidence and futures analysis, taking a view towards 2065, considering how people will live, work and interact in our cities 50 years from now. The project has focused on taking a holistic, long-term view of the future of UK cities, working across spatial scales from the national system of cities to city and sub-city systems.

Foresight is not alone in this space. Through the lifetime of the project we have seen an increasing number of organisations taking an interest in the future of cities. Along with this, there has been a growing amount of research and analysis on the future of cities, both in the UK and around the world. We have sought to work with these organisations and drawn upon much of this work.

We have collected evidence in a variety of ways, from the commissioning of working papers and essays, to running futures workshops, and visiting, supporting and working with more than 20 cities of various types and sizes across the breadth of the country. There is a considerable evidence base available on the project's website including the peer reviewed working papers, essays and workshop reports.

The project undertook an experiment in open policy making, adopting a place-based approach to a key challenge emerging from the Future of Cities project's evidence base: graduate mobility and productivity. The project encouraged collaboration between national government and key local actors including local government, universities and employers to meet national policy objectives, and this report sets out the process and provides a synthesis of the evidence. It sits alongside two other deliverables in the Future of Cities project's final outputs:

- *Foresight for Cities* – provides a value proposition to encourage mid-sized and smaller cities in the UK to engage in foresight exercises and offers practical lessons for implementing and managing a city foresight process. This is aimed primarily at local government officials and partners.
- *The Science of Cities and Future Research Priorities* – examines what science can offer to understanding the future of cities, and in what direction research could most usefully be focused in future.

This report can be used as a basis for understanding the value of place-based open policy-making approach to working through challenges affecting cities.

Foreword

The relationship between local and central government has evolved and become more dynamic over recent years. It is clear that a high degree of collaboration and integration is required in most of the important issues affecting the UK's internal development. Central and local government will need to forge new and agile ways of working together to help tackle both local and national challenges. Devolution does not remove this imperative, it perhaps intensifies it.

Inspired by the Cabinet Office's work to open up national policy making, Foresight conducted its own place-based open policy making experiment as part of the Foresight *Future of Cities* project. We took as our starting point the repeated concern that too many of the UK's graduates appear to gravitate to London, at the expense of other UK regions. We reviewed the evidence, noted the important policy developments already in train, and then considered what practical innovations might be mounted to tackle the issues involved.

The following pages are a record of that experiment, bringing together six cities, with their universities and central government departments, in an action group focused on working out how more UK city regions could be attractive to graduate talent.

There was substantial engagement from all sides and everyone participating recognised the nature of this complex problem and the innovation required to address it. I hope that this enthusiasm continues and the ideas developed here are taken forward locally.

Could this be a model of how government at different levels comes together to solve national challenges? That will be for our policy makers to decide. I do know that we need to keep experimenting and working together to ensure there's a net gain to the public good, and that we learn how to make place-based open policy making a key approach in the UK.

Greg Clark
Lead expert, *Future of Cities* project

Executive Summary

UK labour productivity persistently lags behind other major economies, a trend exacerbated by the recent financial crisis, despite the UK's achievements in education.

Education is one factor that has a strong effect on productivity and the UK has 4 of the top 10 universities in the world, with many more in the top 250 (Clark and Moonen 2013). Over 750,000 Higher Education qualifications were awarded in 2013/14 (HESA 2015), yet the UK still has lower productivity than other countries, most of which have fewer leading institutions.

Through regional seminars and workshops across cities in the UK, the Foresight Future of Cities project identified that the movement of graduates is a concern for cities outside London, a result supported by evidence on graduate migration flows. Can these city-level perceptions provide an insight into the apparent mismatch between the success of UK higher education and the productivity of the country?

Place-based open policy making

Foresight worked with local and national actors to identify evidence on graduate mobility and generate practical solutions to improve local economies and national productivity. This project drew on best practice pioneered by the Cabinet Office on open policy making (see box 1) to ensure that local and national experts combined their efforts to develop innovative and practical ideas.

Foresight formed an action group to allow national government to collaborate directly with six participating cities and universities. The cities are Birmingham, Bristol, Cardiff, Leeds, Liverpool and Manchester.

Ideas and propositions for action

Improving productivity through graduate mobility requires strategies that draw on the expertise of businesses, universities, cities and national government in a 'quadruple helix' of intertwined perspectives.

Rather than approaching graduate mobility as a zero-sum game, whereby certain cities and regions develop by displacing human capital from others – the action group concluded that productivity *across* the UK could be raised by city-level measures focused on improving the city-graduate experience.

These measures have been designed to fit squarely within the context of national and local governments' existing frameworks and actions such as the powerhouses approach, science and innovation audits, further education area reviews and enhanced regional transport investment. The outcome is five practical initiatives to be undertaken and developed at the city regional level, in response to different dimensions of the graduate mobility question:

- **Synchronising learning, employers and work.** The Skills Engine being developed in Birmingham brings together a network of key players from the local area in order to improve the matching of demand for and supply of talent in the local economy.
- **Building long term engagement between SMEs and graduates.** FASTTRACK is an initiative being tested by Leeds University to attract and assist graduate integration into small and medium-sized businesses in the region through placements and specially designed induction and training programmes.
- **Developing the ecosystem for knowledge-rich enterprise.** The Graduate Business Lounge builds on Bristol's existing engagement in student enterprise to integrate existing graduate enterprise service providers and platforms to foster greater student entrepreneurship.
- **Establishing knowledge-economy strategies in cities.** New Economy Hubs in Birmingham, Liverpool and Manchester will take a multi-sector approach to understanding key economic growth areas at the city regional level.
- **Gathering better data to support graduate careers:** The GRAData Project, working with Leeds City Council and Leeds Institute for Data Analytics, aims to improve university and council use of national graduate data. The hope is that this will improve local careers support for students, and illuminate graduate mobility to enable the development of regional talent strategies.

On top of these practical actions, the project provides a case study for place-based open policy making. It could be a model for addressing other city policy issues that have emerged from the Foresight *Future of Cities* evidence base.

Box 1: The graduate mobility project: an experiment in open policy making

To consider the issue of local productivity and graduate mobility in cities and their wider local labour markets in the UK, Foresight brought the Cabinet Office, the Government Office for Science, the Cities and Local Growth Unit and HM Treasury into an action group with six UK cities and their regional university partners. The project adopted an open policy making approach, inspired by work by the Cabinet Office's Policy Lab.

Evidence-based idea generation is central to open policy making (Civil Service Report 2013). Trialling, testing and iteration are also important to develop options that are practical and implementable. By applying principles of design, Policy Lab adopts a range of approaches to policy making, including working with departments to develop new hybrid ways of working, and challenging existing methods through exploratory and collective enquiries. A key advantage of the approach is that it “enables people inside and outside of government to collaborate effectively by enabling more equal participation, generating a shared language and approach and acknowledging difference constructively” (Kimbell 2015).

The *Future of Cities* action group has explored graduate mobility by reviewing the evidence base and holding expert workshops to develop five emerging ideas and propositions for action. These propositions will be tested at the local level as examples of place-based open policy making.

All six cities are concerned to attract and retain highly skilled labour, and in particular to facilitate graduate employment and enterprise as a means to increase local productivity. The work has helped cities identify ways to achieve this, working in partnership with their universities and with support from central government departments. The project complements ongoing Devolution Deal discussions by helping to understand the interplay between local, regional and national policies in boosting productivity.

Graduate flows analysis

(Source: Duncan Smith, CASA UCL)

Data from the Higher Education Statistics Agency (HESA) on the destination of leavers from higher education shows the workplace destinations of graduates from all higher education providers in England, Scotland and Wales (See Annex A).

The following maps show proportional flows analysis of graduates from the 2013/2014 cohort to London and the six participating cities of the action group. These indicate that the highest proportion of graduates move to London for employment which supports the general perceptions of cities surveyed as part of the Foresight *Future of Cities* project.



Legend

Graduate flows to city¹ for employment as % of graduates from HE provider.

- 0.5 - 1
- 1.1 - 2
- 2.1 - 5
- 5.1 - 10
- 10.1 - 20
- 20.1 - 35
- 35.1 - 50
- 50.1 - 91.8



¹ HESA data is only available at region/county level within which the indicated city is located for: Birmingham (West Midlands), Leeds (West Yorkshire), and Liverpool (Merseyside).

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Graduate mobility and productivity: the need for intervention

The policy challenge

The UK's slow productivity growth in the wake of the financial crisis has worsened a long-standing productivity gap relative to most other advanced economies (Figure 1). This is thought to have many causes (including macro-economic policies, international population movement, industrial structure and specialisation, investment and infrastructure), but a skilled workforce is one important factor in productivity and growth. Specifically, this report identifies the contribution of graduates to city productivity as a priority area for action.

The government's policy framework for raising national productivity is embedded in two pillars (Figure 2). The first pillar is based on encouraging long-term investment in economic capital, including economic infrastructure, skills and human capital and knowledge. The second sets out principles to promote a dynamic economy with flexible, open and competitive markets as well as a rebalanced economy with a strong Northern Powerhouse (HM Treasury 2015a; HM Treasury 2015b). This project sits at the nexus between these pillars, linking to skills, ideas, flexibility and resurgence.

Figure 1. The productivity gap: difference in GDP per hour worked of G7 countries compared with UK average (Source: HMT 2015a)

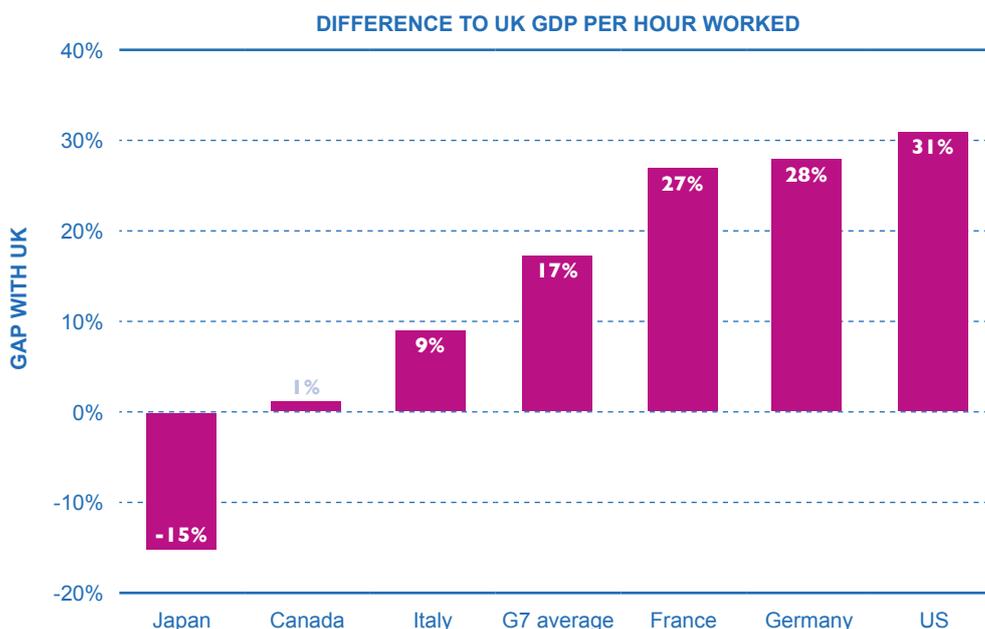
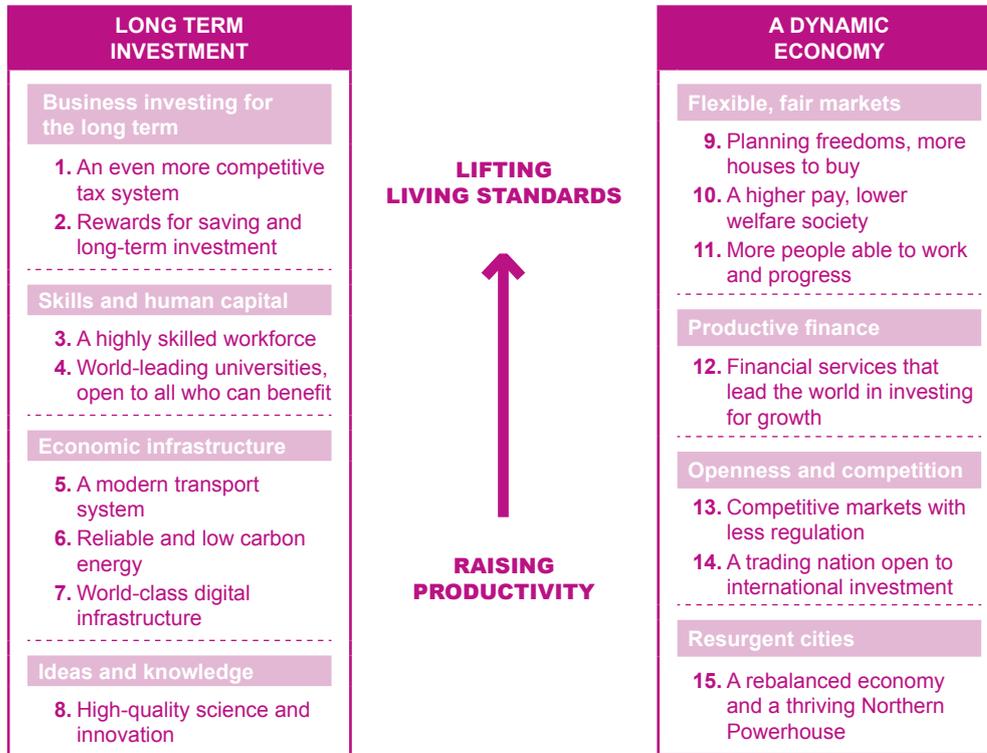


Figure 2. HM Treasury framework for raising productivity – fifteen point plan (Source: HMT 2015a)



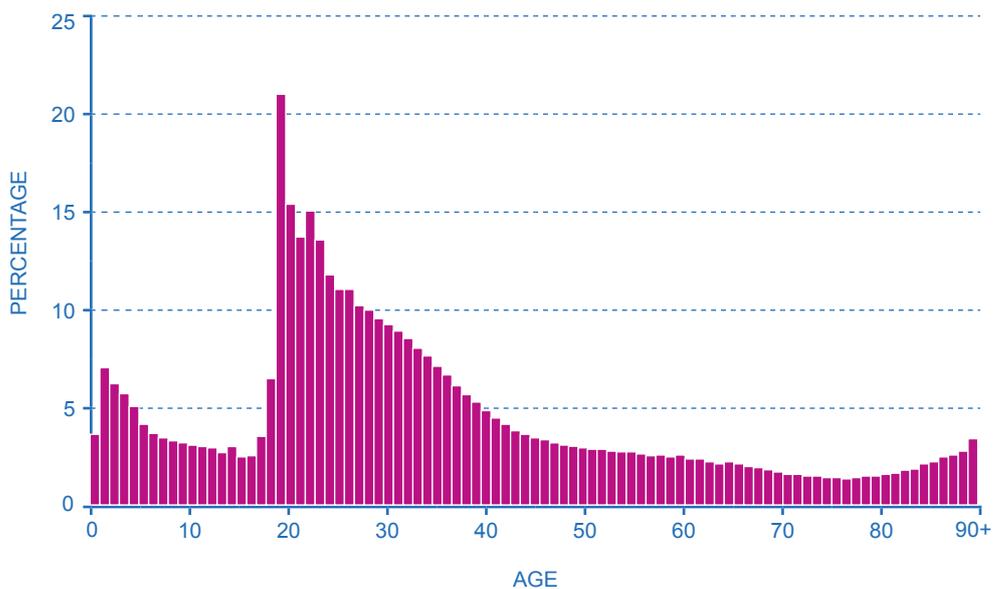
Graduate mobility in context

Theories of economic growth have emphasised the role of human capital and examined the distinct ways in which it may affect economic growth (Holland et al 2013). Educational expansion along with other factors of skill acquisition and training are key long term contributors to output growth (Schütt 2003). The potential value of human capital to city economies is determined by the ability of a city, its employers and institutions to produce, attract, and retain highly qualified labour. A two-way relationship can be identified, in which the presence of high-skilled and enterprising people tend to increase city productivity, and growing cities tend to attract more mobile talent (Martin, Gardiner and Tyler 2014). Understanding of the importance of human capital to local and regional economic performance is increasing, in line with national and academic interest in the ability of cities and regions to produce, attract, and retain highly qualified graduate labour (Pill et al 2011).

Internal migration in the UK is dominated by young, highly educated, start-of-career, or early career professionals (Champion 1999). People move more in the early years of their careers than later on. After a peak age of internal migration at

19, when students move to university, a second peak is evident at age 22 (Figure 3). In many cases this second peak reflects graduates moving for employment or further study, returning to their home address or moving in with a partner (Office for National Statistics (ONS) 2015).

Figure 3. Moves into local authorities in England and Wales including moves from Northern Ireland and Scotland by age, year ending June 2014, as a proportion of the mid-2014 population of England and Wales (Source ONS 2015).



As well as internal migration, UK city productivity is also linked to attracting international skills and talent (Gordon, Travers and Whitehead 2007). The move from product-based to knowledge-based economies has intensified international competition for talent (Beechler and Woodward 2009). The graduate labour market is increasingly international, with the top graduates having greater choice and expectations for where they work in what some have described as a ‘global war for talent’ (McKinsey 2008). The availability of key skills is high on the agenda for firms at both national and international level. So a policy framework for graduate mobility needs to include international talent as well as UK talent.

The importance of place attractiveness

Cities are not only places of work, but also places to live. While generating, attracting and retaining talent is strongly linked to employment opportunities, it also extends to wider considerations such as affordability, connections to multiple employment hubs, and cultural issues. This requires a holistic view of city region ecosystems including liveability, social infrastructure and cost frameworks (Coyle and Rosewell 2014).

Place attractiveness is an important dimension in how labour markets attract and retain talent and is based on the 'whole offer' of a city or city region (Pill et al 2011). The attractiveness of places also varies significantly over the life course of a person. For example, leisure is prioritised by those early in their careers; education is often more important in middle age; and health services tend to have a greater pull in older age. This highlights the mix of motivations that drive the movement of people between places.

There is some evidence that London has played the role of an accelerator region at certain times for workers in some sectors of the economy, with occupational progression observed as part of a so-called escalator effect (Gordon 2015). There is evidence of graduates from UK regions who seek to work in sectors such as finance and professional services moving to London for the first period of their career. This allows them to hone their skills in the large firms and competitive labour markets that come with London's scale, size, and global reach and develop at an accelerated rate. A graduate who has advanced in their career may then choose to settle in other UK regions, or the wider south-east, once their career has escalated to a particular level and they turn to other priorities such as starting a family or home-making (Gordon, Champion and Coombes 2015).

The increasing mobility of graduates means that first destinations are no longer assumed to be the locations of jobs and labour markets for life (Hoare and Corver 2010). The shift of graduates from first career destination carries important implications for regions that lose graduates initially, but may be capable of attracting them back later in life (Pill et al 2011).

Bond et al (2008) suggest that graduate migration behaviour is principally influenced by three general factors: the connections people have to various geographical places; the opportunities that are perceived to exist in such places; and expectations for future lives. With the stated aim of the UK government to boost local economies, cities and city regions are seeking to attract graduates. Local and regional strategies to improve attractiveness and create positive context for graduate mobility can play a role in achieving these ambitions.

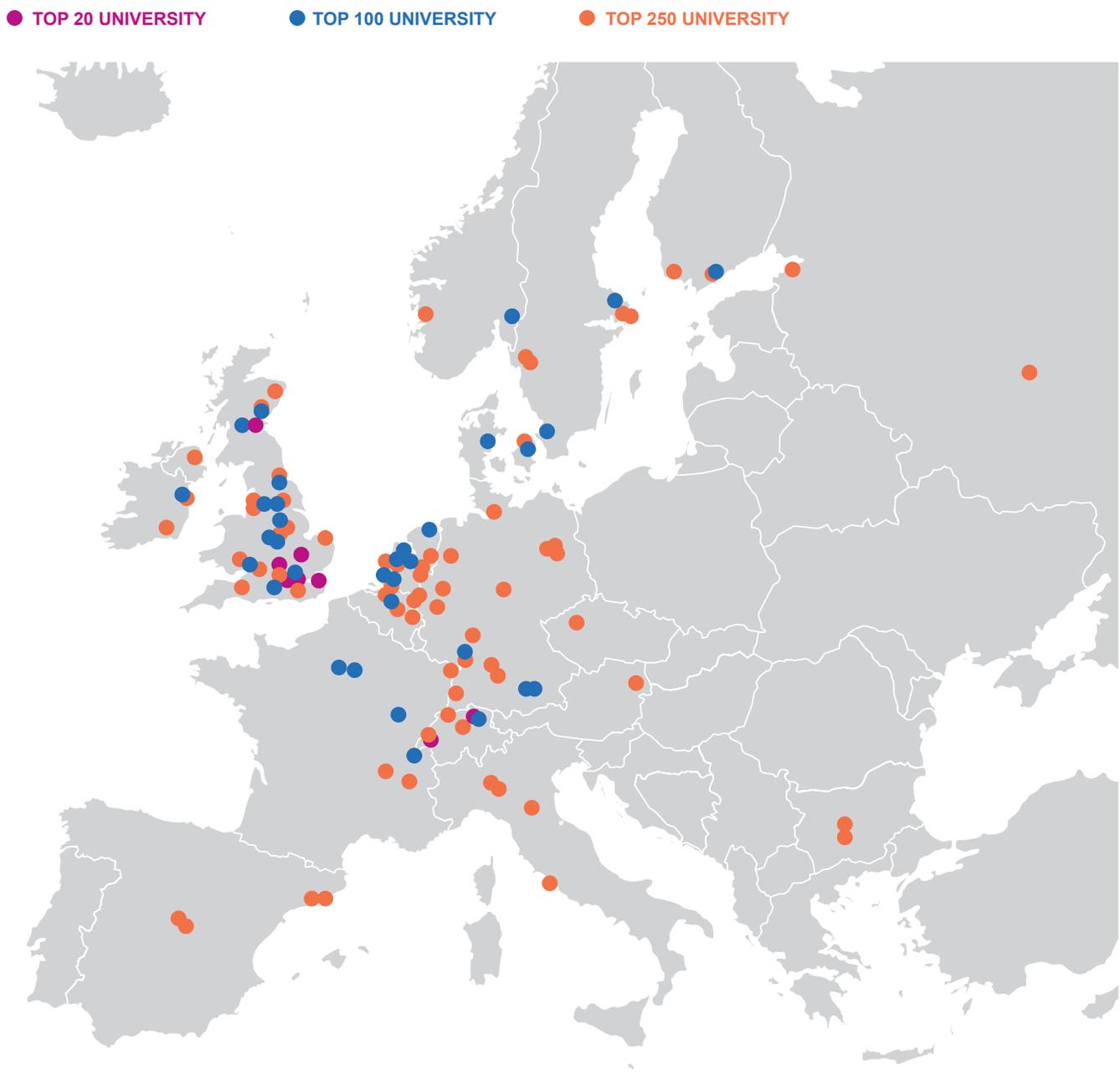
Universities as anchoring institutions

Higher education has an impact on economic growth and competitiveness (Holland et al 2013). In 2013/2014 the UK awarded 777,800 HE qualifications, 421,850 (54%) at first degree level. The UK also has 4 of the top 10 universities in the world (Times Higher 2015), with many more in the top 250 (Figure 4), yet it has lower productivity than many countries with fewer leading institutions (Figure 1).

The UK's education excellence is not translating into productivity gains at present. Universities should be central to addressing this problem and finding broader strategies for growth and competitiveness across the UK (Schiffers 2014).

A growing body of evidence highlights that certain ‘anchor’ institutions have particularly helped to shape the character of those cities. Their development drives the physical, economic and cultural fabric of cities through their intellectual and social capital, their reputations, prestige and brands, their buildings, their role as major employers or their contribution as purchasers of goods and services. They include universities, museums, sports teams, hospitals and large private-sector organisations. The UK has a system of 160 universities and colleges with degree awarding powers (British Council 2014). So as anchor institutions, universities are not just producers of research and skills; they also contribute substantially to the attractiveness and adaptability of cities.

Figure 4. European universities in the global top 250, 2013
(Source: Clark and Moonen 2013)



University-civic links have been explored extensively. These include the impacts of the university as a local institutional presence and as a major economic entity, generating employment, spending and activity.

Furthermore, the university is a central node for interactions with other learning providers, employers and industry, civic and community interests and, increasingly, private sector delivery partners. These develop the idea of the university at the heart of a learning and knowledge/innovation ecosystem (Watson 2007, Goddard 2009). While the primary mission for universities does not necessarily involve urban regeneration or local economic development, their scale, local rootedness and community links do play an important role in local development and economic growth (Williams et al 2008).

Beyond the concept of the individual anchor institution, place-based challenges such as that presented by graduate mobility can be considered within a larger geographical footprint through the joining up of universities and other local actors. Local collaboration is likely to optimise the role of universities and other anchor institutions to contribute individually and collectively to growth and productivity (Boxall and Stevenson 2016).

Skills supply and demand

Some reports suggest that the skills and talents of graduates are not being used as effectively as they could be because of a lack of demand (CIPD 2015, Seddon 2015). This project has also seen that there is a perceived shortage of supply of highly skilled workers at both the local and national levels. A tension exists between these two narratives. It may never be possible to ever ascertain which of these narratives is true, and it is likely to vary over time and between cities.

The economic benefit of a university degree depends on the quality and breadth of skills imparted (Holland et al 2013), as well as a consideration of differentiated supply and demand across city regions which determines whether graduates move to the areas where their skills are most needed. Graduates have a wide range of abilities, ambitions, skills, relationships and knowledge. There is also a question of the subject backgrounds of graduates and how far these satisfy employer demand.

There is an increasing need for policy to stimulate demand and help employers think about how skills can be deployed productively in the workplace (Keep 2015). A lack of investment by British firms to create new jobs for high skilled workers can be seen as one factor that leads to more graduates taking on jobs which are considered lower skill. This leads to skills 'mismatch' (McGowan et al 2015).

The existing policy framework

To affect a shift towards a higher productivity and higher skilled economy, there may be a need for policy interventions at national and regional levels. There are already some national and sub-national level policy initiatives that aim to increase productivity and strengthen and rebalance the economy. It is important that new work on graduate mobility is positioned within these existing policies, does not duplicate them, and delivers synergies with existing initiatives. This section outlines some of the most important policies being developed in this area.

The powerhouses

Two regional macro strategies, the 'Northern Powerhouse' and the 'Midlands Engine', are designed to address several regional growth issues. Demand for graduates and high-skilled workers will be affected by the development of these emerging strategies. Increasing connectivity, science, and cultural investment in hubs outside the greater south-east is intended to deepen the UK's labour market. This investment aims to develop competitive specialisation and diversification to help the regional powerhouses become capable of leadership in distinct technologies and industries.

Science and innovation audits

Evidence suggests that coordinating regional specialisation is important for innovation driven growth (OECD 2013; European University Association 2014). Science and innovation audits have been developed by the government to facilitate such regional coordination. The audits aim to encourage collaboration between city-level players in order to support excellence and specialisation, while developing better understanding of how research-driven activities can foster economic growth.

Further education area reviews

Government also takes a central role in the alignment between statutory education, work-based learning (apprenticeships), further education (FE) and higher education (HE). In the realm of HE, the publication of a recent green paper highlighted a shift in the national framework and new infrastructure proposals for the sector (Hale 2015). Area reviews of the current structure of FE see efforts to facilitate the transition towards more resilient and efficient providers, with more effective collaboration between institution types. This creates opportunities for greater specialisation and progression in professional and technical disciplines.

Transport investment

The UK Government has committed to long term investment in transport, including the full funding of the Road Investment Strategy, the beginning of the construction of HS2 and funding to support large local transport projects (HM Treasury 2015b).

Good connections within regions will be essential to maximise the productivity of the emerging powerhouses. The regions also need to be well connected with each other, with London and with international markets. Transport is necessary for economic interactions, to let cities specialise and develop sector-specific advantages, to connect workers and to make places more attractive for investment (Venables, Laird and Overman 2014). Transport investment is a relevant dimension for understanding graduate mobility because it is an important factor shaping the location decisions of businesses, along with the availability of suitably skilled labour.

In summary, it is important to recognise the existing government interventions that will help to stimulate the demand for high-skilled employees, and support the shift towards appropriate levels of specialisation across the UK. Devolution, regional growth and productivity are all priorities for the Government. The mobility of graduates sits at the nexus between these efforts to raise national productivity, to re-balance the economy, and to support devolved governance and leadership.

Graduate mobility and productivity: an evidence review

Introduction and hypotheses

UK productivity has lagged behind other major economies for decades (HM Treasury 2015b). The role of graduates and high-skilled workers, together with ways they might constitute part of a wider solution, is indicated by a positive relationship between level of workforce education and GDP growth (Holland et al 2013). In the 1980s, the expansion of higher education was a factor which helped UK productivity catch up somewhat (Aghion et al 2013) and between 1994 and 2005 a third of the UK's economic growth was considered to be driven by the expansion of HE (Holland et al 2013). However, national comparisons are not straightforward due to the range of indicators that are used and the limited number of studies that examine the impact of graduates on growth (Holland et al 2013).

Given this current state of understanding, our review of the evidence seeks to test the following hypotheses:

- i. There is a significant relationship between the skills base of a city and its productivity
- ii. Increasing the proportion of people with higher skills employed in sectors with growing productivity and firms based in lower-productivity city regions will help to increase national productivity
- iii. Attracting or retaining graduates and high-skilled workers in cities could improve productivity in lower-performing cities, and thereby national productivity.

An important prerequisite to our analysis is an understanding of the distribution of skills between UK city regions. As part of our analysis we will also consider whether enabling more regions to attract talented graduates will help to rebalance the economy and raise national productivity.

Education and the economy – evidence on human capital and productivity

Education is an important determinant of economic and social well-being, as well as a key tool for raising the human capital of the workforce (Brewer and McEwan 2010; Sahlgren 2014).

Researchers use a range of proxies in measuring the outcome of education and skills (Hawkes and Ugar 2012), meaning empirical evidence is mixed. Nonetheless, the empirical literature typically finds a positive relationship between education and GDP (Holland et al 2013), with economic growth considered to be strongly affected by the skills of workers (Brewer and McEwan 2010). Human capital is considered a fundamental element for improving a country's economic well-being and productivity (Sahlgren 2014). Empirical evidence has shown that improving human capital increases productivity, suggesting that education is productivity-enhancing (Sianesi and Van Reenen 2003).

Holland et al (2013) found evidence that:

- graduate skills accumulation contributed roughly 20% to GDP growth in the UK from 1982-2005
- each 1% increase in the share of the workforce with a university degree raised the level of long-run productivity by 0.2-0.5%
- the UK share of the workforce with a university education increased by 57% between 1994 and 2005 with estimates suggesting that this will have raised UK long-run productivity by 11-28% - this means that one third of the 34% increase in labour productivity between 1994 and 2005 can be attributed to the accumulation of graduate skills in the labour force.

Further evidence shows that vocational skills made positive contributions to growth in average labour productivity (ALP) in six of seven countries including the UK (Mason et al 2012), demonstrating that vocational programmes such as apprenticeships may also have productivity benefits.

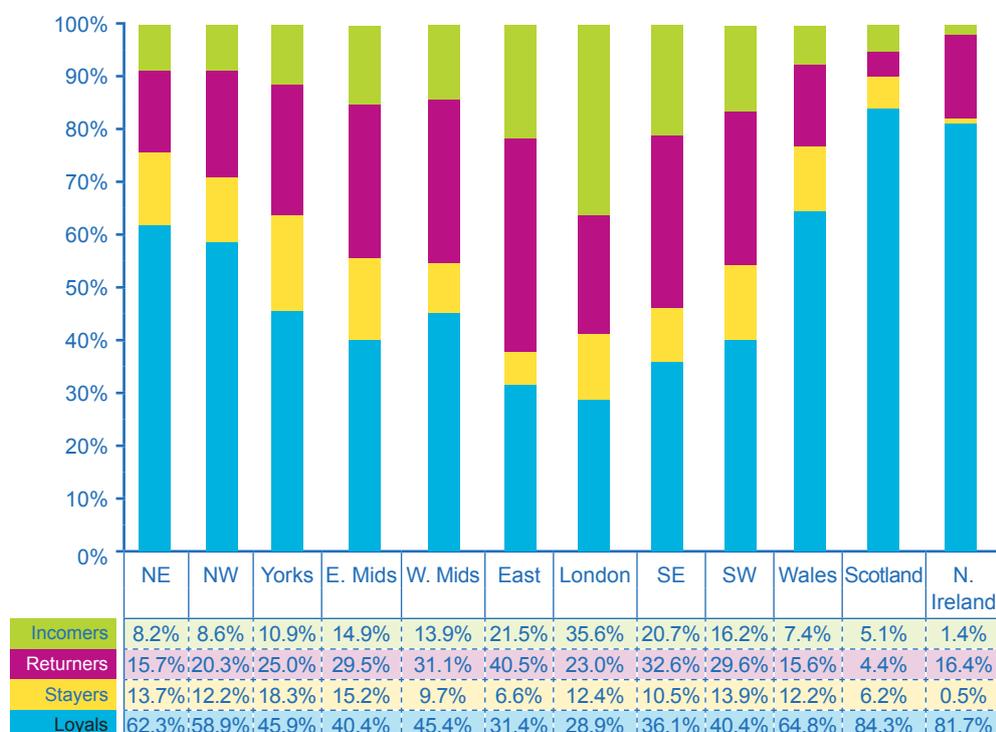
Universities also play an intrinsic role in the UK economy, supporting economic growth and contributing to regional growth by increasing skills, supporting innovation and attracting investment and talent (Universities UK 2015). In the UK, 60% or more of growth is generated by those with tertiary education (OECD 2012).

Given this evidence of the powerful effects of skills accumulation, graduate mobility emerges as an area for further study, with the aim of understanding the productivity and rebalancing potential of this high skilled group.

Table 1. Definition of categories of graduate mobility

INCOMERS	neither lived nor studied in the area previously
RETURNERS	left the area to study and returned for work
STAYERS	studied and stayed to work
LOYALS	lived, studied and stayed to work within the region

Figure 5a. Breakdown of graduates from 2012/13 employed in each region after 6 months by migration category (Source: HESA in Ball, February 2015)



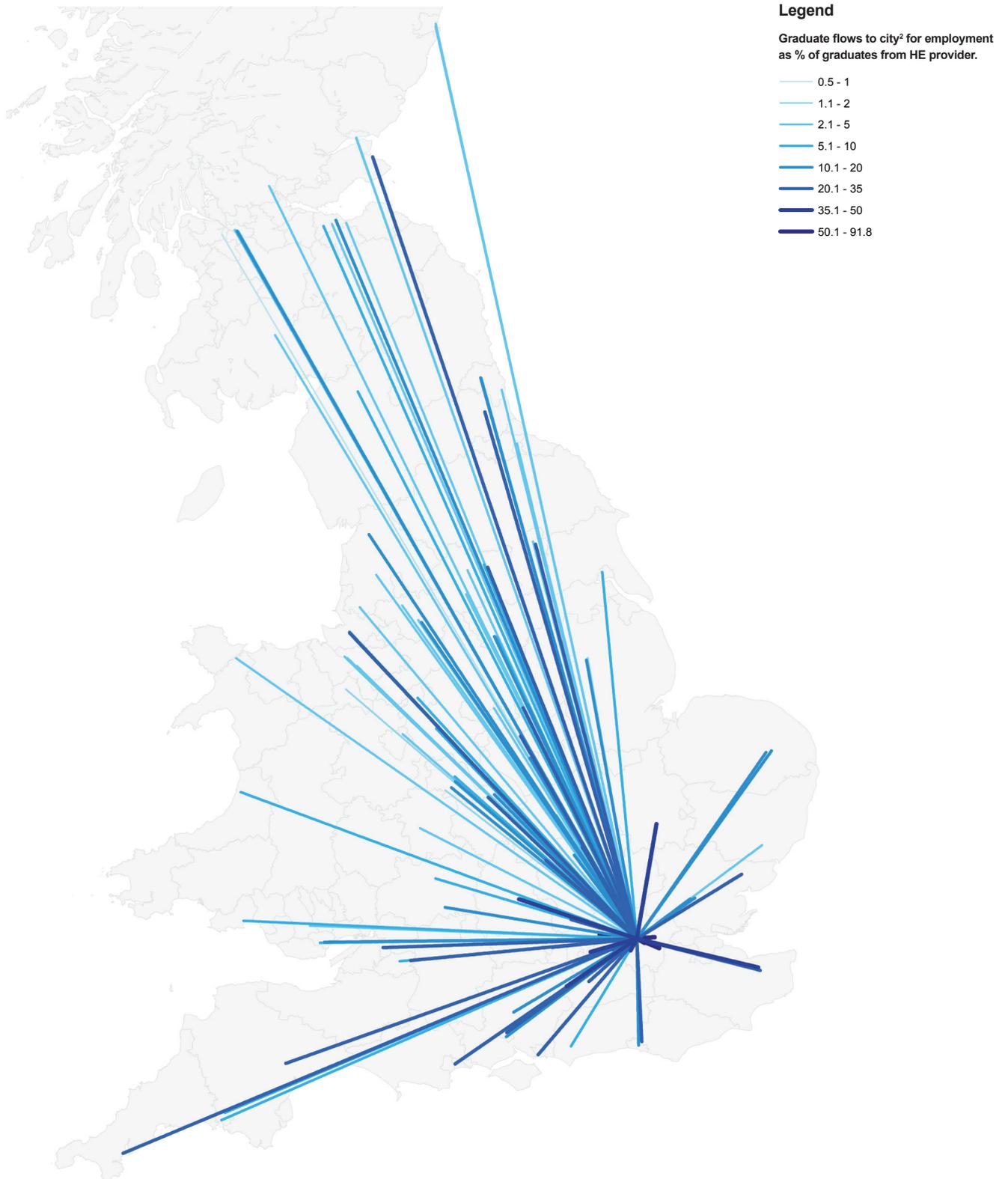
Patterns of graduate mobility in the UK

In an analysis by the Higher Education Statistics Agency (HESA) from the Destination of Leavers from Higher Education (DLHE) survey data for 2012/2013, Ball (2015) defines four graduate groups: regional loyals, regional stayers, regional returners and regional incomers (Table 1 and Figure 5a) to differentiate between destination decisions made by graduates following completion of study. This emphasises that graduate mobility encompasses processes of both attraction and retention.

Among all regions, London has the highest number of graduates migrating to it (Figures 5a and 5b). The data from six months after graduation for the 2012/2013 cohort highlights the dominance of London as a graduate employer with 35.6% incomers, who neither lived nor studied in the area previously, 84.6% of whom had professional and managerial jobs (Ball 2015). At the same time the North East and North West offer examples of areas that have a high number of loyals who have lived, studied and stayed to work within the region. These were in sectors such as retail, health and education, with nursing the most popular profession in these regions. Due to the intimate connection between study and work in healthcare, it is more likely that graduates of health professions stay within the regions where they study.

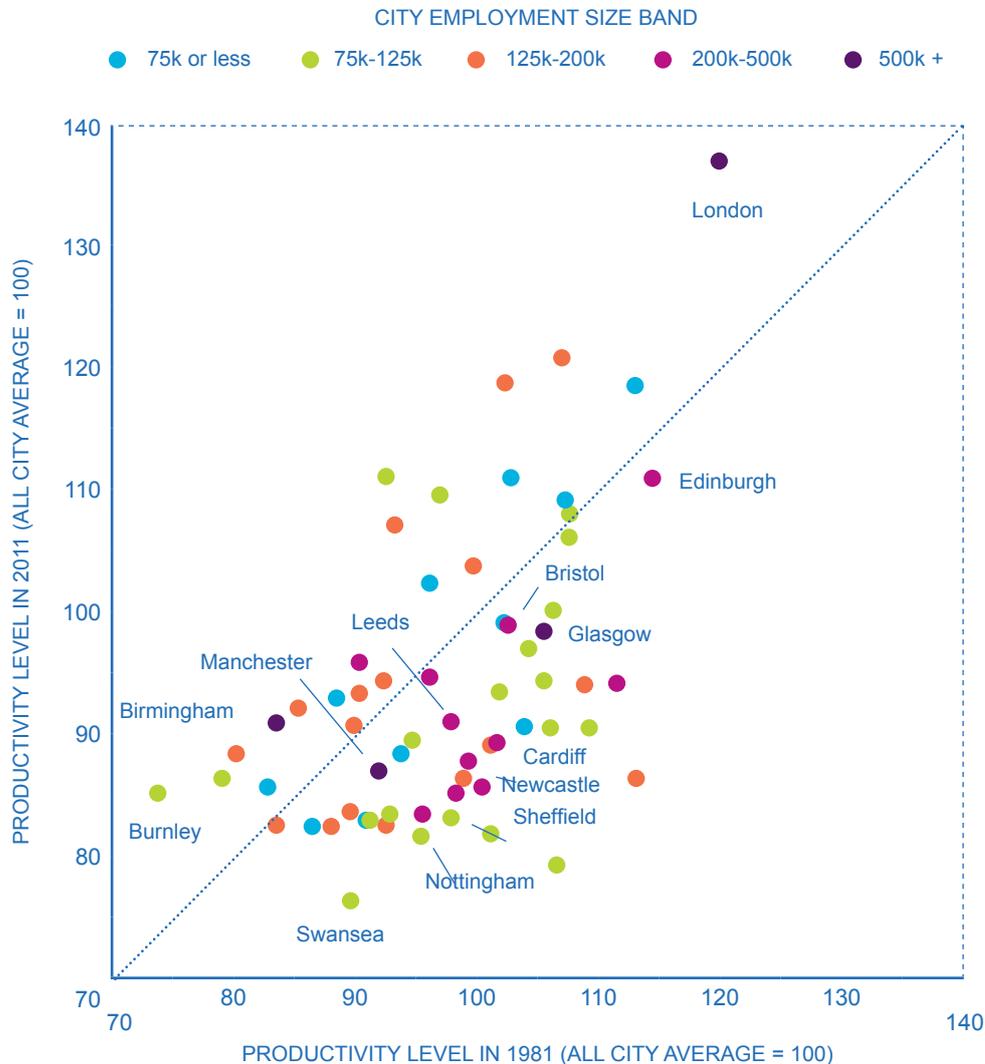
London has comparatively high productivity and growth (Figure 6), and the highest number of graduates migrating to it both in relative and absolute terms. Although this correlation does not prove causation, it does support the empirical evidence outlined above which shows that skills affect productivity.

Figure 5b. Map of graduate flows from Higher Education providers in England, Scotland and Wales to London from 2014/14, 6 month HESA DLHE survey (Duncan Smith, CASA UCL).



² HESA data is only available at region/county level within which the indicated city is located for: Birmingham (West Midlands), Leeds (West Yorkshire), and Liverpool (Merseyside).

Figure 6. Productivity (Gross Value Added(GVA) per person employed) across British cities, 1981 and 2011 (Source Martin, Gardiner and Tyler 2014)



Graduate employment rates in cities and city regions

The Centre for Cities uses three categories to indicate the economic performance of 56 English cities (Centre for Cities 2014): 'buoyant' (e.g. Milton Keynes, Reading), 'struggling' (e.g. Blackburn, Stoke and Burnley) and 'stable' (e.g. Portsmouth and Coventry) (Webber and Swinney 2010). These are defined according to indicators that include population growth, private sector job creation, GVA growth, average wages, average house prices and benefit claimant rates.

Although regions have different levels of graduate mobility (Figure 5), the chance of a graduate being employed does not vary much according to the strength of a city's economic performance. Figure 7 shows employment rate by qualification across these categories of cities, plus London. Analysis indicates that graduates have a similar employment rate in all categories of cities, at around 85-87%³.

Figure 7. Employment rate by qualification across city groups, average 2004 to 2010 (Source: Swinney and Clayton 2011).



Analysis of higher education data on graduate destinations

The Higher Education Statistics Agency (HESA) has two main surveys of graduates carried out six months and three and a half years after graduation. The six-month survey records the largest sample, 299,300 leavers from the 2013/14 cohort. Data is collected by county⁴, with London represented by the Greater London Authority boundary.

Figure 8 maps graduates by employment destination in each county. Here we can see the dominance of larger cities, particularly London, which attracted nearly 70,000 graduates from the 2013/14 cohort, but also Greater Manchester at 15,000, West Midlands at 11,000 and West Yorkshire at 10,000.

When assessing these workplace geographies, it is not just the number of graduates that is important, but also their proportion of the workforce (see Table 2). London scores highly at 1.5% despite the total size of the workforce. Smaller cities also have quite a high percentage (e.g. Bristol 1.5%). Cities in northern England tend to be lower on this measure, which is partly connected to regional metropolitan county definitions which are likely to dilute graduate concentrations (Smith 2015). Greater Manchester has the highest graduate workforce percentage among northern cities at 1.2%.

³ This does not confirm that graduates are occupying graduate positions due to the proportions of people employed in highly skilled work being more variable.

⁴ There are certain limitations to the data – major cities in northern England are represented by metropolitan counties (West Yorkshire, Greater Manchester, Merseyside, South Yorkshire) whereas other cities, including Cardiff, Bristol, Southampton, Leicester, Nottingham and Reading are more tightly defined. Cambridge and Oxford are represented as Cambridgeshire and Oxfordshire.

The increased income for individuals with higher skills can be considered a simple indicator of the impact of education on the economy (OECD 2012). Table 2 shows London, Bristol and Cardiff to have the highest proportions of graduates in the workforce and the highest mean hourly wages. This differentiation in wages is linked to the cost of living, which is much higher in London and Bristol than in other cities.

Table 2: City/County indicators of graduates and graduate income

CITY/ COUNTY NAME	TOTAL JOBS 2011	TOTAL 2013 WORKPLACE GRADUATES	TOTAL WORKPLACE GRADUATES AS % WORKFORCE	INTERNAL WORKPLACE GRADUATES AS % OF ALL GRADUATES	MEAN HOURLY PAY 2013 (£)
Greater London	4,500,481	68,099	1.5	48.8	21.41
Greater Manchester	1,243,218	14,464	1.2	51.1	14.82
West Midlands	1,197,976	11,408	1.0	52.8	14.95
West Yorkshire	1,036,058	10,418	1.0	57.2	14.38
South Yorkshire	579,575	5,784	1.0	56.9	13.85
Merseyside	572,957	6,138	1.0	44.7	14.70
Tyne and Wear	522,161	5,820	1.1	70	14.41
Bristol	236,098	3,434	1.5	13.2 ¹	16.14
Cardiff	199,702	2,815	1.4	43.9	15.32

¹There's an issue with universities around Bristol not being inside the City of Bristol boundary. If these are included the internal graduate figure is closer to 30%.

Graduate mobility from the employer perspective

Employers form one strand of the 'quadruple helix' of perspectives required to address regional productivity, alongside universities and city and national governments.

The opportunities for initial employment and career progression are primary determinants of mobility among early-career graduates, and are important considerations for employers trying to attract the best talent. Employer perspectives are widely reported but can differ greatly according to the nature of the business as well as regional geographical factors. Acknowledging the existing literature on employers' needs, this project also undertook primary research in the form of qualitative interviews with eleven local and national employers. Insights are presented here to demonstrate the wide ranging needs and concerns of both large employers and SMEs.

Employer insights in the literature

- Recent reports from the Association of Graduate Recruiters (AGR) indicate that, on average, larger graduate recruiters target their campaigns towards students of 15-20 universities, with the smaller recruiters and those operating in the public and professional services sectors tending to engage with many more. The AGR data also tell us that over 50% of vacancies offered by these larger recruiters are located in London and the south-east of England.
- Almost a third of graduate hires will previously have worked for their employer as an intern (High Fliers, 2016), which emphasises the importance of integrating work experience into higher education curricula, and its value among employers as a selection and conversion tool.
- By contrast, graduate recruitment to SMEs often occurs in an incidental way and/or through informal networks and recruitment methods. This makes it inherently unpredictable and can lead to the under-utilisation of graduate skills (Graduate Recruitment to SMEs, BIS, 2012). SMEs experience difficulties in recruiting skilled staff, but it is clear that the sector or nature of business activity and the type of owner-manager can heavily influence views about the value of graduate hires.
- The more highly ranked universities find that most engineering graduates will relocate for their first jobs. This is consistent with reports from employers, which typically attract graduates from across and beyond the UK to engineering and technology roles. Indeed, Alistair Cox, Chief Executive of recruitment firm Hays, recently talked about a virtual 'war for talent' in the engineering and technology sector (Hays Global Skills Index 2015).
- There is evidence of a growing demand for higher-level skills from two thirds of respondents to the 2015 CBI/Pearson Education and Skills Survey. The same respondents reported falling demand for lower-level skills, which is a

possible signal of future developments in this space regarding the increasing automation of routine work.

- The UKCES (2014) reports that there are very high levels of business satisfaction with graduates' preparedness for the workplace, while the CBI/ Pearson survey reflects concerns about graduates' commercial awareness, but rates technical skills very highly.

Researching large employers

This project undertook primary research in the form of qualitative interviews with eleven local and national employers within the West Midlands combined authority region including: Enterprise Rent-a-Car, Fujitsu, HSBC, Jaguar Land Rover, Birmingham City Council, Arup, Barclays Wealth, Bosch, University Hospital Birmingham Foundation Trust (NHS), the Challenge Org and Gensler.

The qualitative research offers some insights for our five areas for action and how these might be positioned to meet demands of large employers, but also provide the context for alternative approaches that might be required to meet the differing needs of small and medium sized employers (see FASTTRACK in section 4).

The interviews provided insight into a number of dimensions of graduate mobility such as recruitment patterns of large employers, the skills desired by employers, retention and attraction experiences, incentive options for businesses as well as some suggested actions for cities. The main findings of this research include:

- Employers reported that those graduates who were most likely to stay in the local area had previously pursued a placement or internship in the city as part of their course, and that these graduates tended to perform better in their roles. Some employers attempt to identify the 'best of the best' through these placements and those students who have successfully received such a benefit tend to remain loyal to their employers and stay in the locality.
- Employers suggested they did not actively discriminate based on the ranking or type status of university; moreover they were keen to get the right type of applicant based on skills and course specialism.
- Established employers offering local graduate jobs based on specific skills needs, such as engineering or computer science, found it relatively easy to attract graduates from the entire country and from international markets. This was in part due to awareness of their brand but also the reputation across the careers service of companies' graduate programmes. In these organisations graduates not only remained in the company beyond the initial period of the graduate programme but remained in the local area too.
- Employers said that universities are providing highly skilled people in terms of technical knowledge. However, a number of graduates are still lacking in the interpersonal, team working and communication skills necessary to be able to thrive in the workforce.

- The majority of employers offered competitive salaries of up to £25,000 in the first year. Very few offered 'golden hellos' but some were tempted to introduce 'golden handcuffs', whereby graduates would need to pay for formal post graduate training if they left during the graduate programme.
- Employers argued that cities need to make themselves more attractive propositions for young people to want to live, work and stay. This includes offering a better quality of life, not only in housing affordability but also health, wellbeing and wider environmental aspects. These factors may not feature immediately with the majority of graduates, but they become more important as people move through the life course, such as raising a family and buying a home. Cities need to be alert to these moments and ensure they have the right tools to market themselves to potential alumni at different life stages.
- Both universities and potential employers need to identify talent at an earlier stage than the final year. Local employers should ensure that they work with the university careers service to develop extra-curricular programmes to present themselves as a potential employer to undergraduates.

The diversity of employment opportunities in the UK means that different approaches are required to attract graduates into different kinds of business. Although some factors are common between large and small employers, it remains important to differentiate between them, and promote the need for graduates to have skills that are transferable to the workplace. Understanding employers' needs is one way to ensure graduates are exposed to the wide-ranging opportunities that exist at an early stage, in order to fully understand the career options available to them across the UK.

Data Limitations

Better data is central to unlocking regional productivity and policy issues around graduate retention and mobility. This project has identified some important limitations in the data on graduate mobility. Addressing these will enable national and local decision-makers to use data as a long term tool to attract and retain top talent.

The project found that:

- A wide range of indicators are used to capture measures of education, making the comparison between studies difficult.
- Few studies identify different levels of education, so direct impact of graduates on growth is not always considered.
- Not all graduate data includes Scotland and Northern Ireland.

- Graduate data only provides a snapshot of destination at 6 months after graduation and a smaller sample 3.5 years after graduation. There is a lack of life course data beyond anecdotal evidence.
- Graduate data is derived from employment destination and not migration destinations. So it does not account for residential patterns, remote working practices etc.
- Graduate data excludes migration of non-EU domiciled international graduates, which affects the impact of graduates on international competitiveness.
- Graduate data does not provide information on migration of leavers who are not in employment 6 months after graduation.
- Graduate data does not allow for differentiation of migration motivated by factors other than employment (partnership, child-bearing, financial hardship/ debt, social networks, location and cultural preferences).

Addressing these gaps is likely to require a coordinated approach to data collection, better matching of data and definition of categories. The action group's proposal to establish a graduate data facility (GRADData lab) could be a way to address some of these gaps (see Section 4.6).

Conclusion: the graduate life course - attraction and retention of high skilled workers

Our review of the evidence suggests that there is a relationship between the effective skills base of a city and its productivity. There are several different ways in which graduates might contribute to productivity. These include skills and knowledge, innovation and enterprise. City regions need to take steps to become more productive by addressing these issues. Enhanced understanding of the graduate life course is one means by which to achieve this. Attracting or retaining graduates and high-skilled workers could improve productivity in lower-performing cities.

Examining the local labour market: examples and evidence from six cities

This project has sought to take open policy making principles and apply them to a city and local context. The principles of open policy making are to engage a range of people in collective exploration of a policy issue in a way which allows problems and solutions to co-evolve (Kimbell 2015). Cities and city regions have different geographies, which affect how they might respond to the productivity and high-skilled labour question. At the same time, universities have a range of roles within the local landscape as producers of graduates, as well as acting as brokers for student engagement within the city region.

This section provides six “views from the ground” written by the action group participants from Birmingham, Bristol, Cardiff, Leeds, Liverpool and Manchester. The Foresight Future of Cities project has extensively engaged with a number of other UK cities⁵ and the cities who participated in the graduate mobility action group comprised a range of places and represented different ‘powerhouse’ regions, with differential levels of productivity and with a propensity to experiment with their local labour market policy levers.

Section 4 will explain how Foresight facilitated the action group to provide solutions to graduate mobility issues. Before that was possible, it was important to understand how cities perceive the issue of graduate mobility and what they are already doing to address it.

⁵ As detailed on the Foresight, Future of Cities Website <https://www.gov.uk/government/collections/future-of-cities>

The view from Birmingham⁶

Attracting mobile world class talent has a role to play in solving the productivity puzzle in the Midlands. There are 25 universities in the 'Midlands Engine' (Midlands Engine for Growth Prospectus 2015). The evidence on graduate mobility suggests that London attracts much of the highest-skilled labour grown in or attracted to the Midlands for study. By looking at the most recent Higher Education Funding Council of England (HEFCE) Data Maps, London is the only significant pull for employment from outside Birmingham (HEFCE 2015). Taking one of the strongest growth areas in the Greater Birmingham and Solihull area, London attracts one in every four that are retained, an increasing trend since 2008.

The area is experiencing a net gain in employed graduates, and this is also an increasing trend since 2008. Other parts of the region are losing graduates to Birmingham and Solihull. Birmingham and Solihull attract a similar ratio from Coventry and Warwickshire to that which London attracts from them, even though Coventry and Warwickshire also have a net gain of graduates attracted to and employed in the area.

More work is required to improve the quality of data, and to look at the nature of the talent being attracted to London. Anecdotal evidence suggests that graduates are going to London, particularly in the STEM subjects.

To reduce this loss of skills, the city region needs to be attractive to all talent, regardless of life course stage.

Agglomeration in the Birmingham 'mega city' has potential to act as a complementary and rebalancing force, one that is increasingly working with the market, due to the city's responsiveness and positioning in the changing economic geography of the UK. Joined-up strategic planning and intervention is required at national and local levels to exploit in full the proximity, diseconomy, agglomeration and spill over effects with London, and at the same time preserve and enhance the liveability, connectivity and resilience of the place as part of its future competitiveness. Robust leadership emerging through devolution is seeking to develop a whole-system approach to supporting talent in the region. Universities, employers and local government are working collaboratively to join-up both sides of the labour market, temporally and across cohorts, enabling all those with talent to find fulfilment in the region.

London is the centre of national financial, economic and administrative power. The West Midlands Combined Authority Productivity Commission is currently looking to understand its productivity gap and what can be done about it. Graduate mobility is included in this analysis. City REDI – the new regional economic institute – is developing a new centre of excellence for understanding all aspects of the new economy in the region.

⁶ Text provided by Professor Julian Beer, Pro Vice-Chancellor of Research, Enterprise and Business Engagement, Birmingham City University; and Richard Kenny, Head of Strategic Development, Birmingham City Council

Birmingham and its position in the changing economic geography

Birmingham is predicted to be a global hot-spot for competitiveness by 2025 (The Economist 2013). This is already being realised in emerging economic data⁷. This upturn in economic performance is reinforcing Birmingham's position at the core of a future 'mega city' at the centre of the UK. The 'Midlands Engine', has a population of over 11.5 million people, providing £222bn GVA – 17.5% of the UK total. In the last year private sector employment in the Midlands grew more than three times fast than the South East (Javid 2015). It provides a third of all the UK's manufacturing. The eleven local enterprise partnerships (LEPS) contained in the area are already jointly promoting manufacturing and the automotive sector – including the supply chains of Rolls Royce, Toyota and JLR (Tift 2015; The Midlands Engine Growth Prospectus 2015).

Birmingham will be reached by the first phase of the High Speed 2 rail programme, and eventually will sit at the junction of the new Y-shaped high speed network. This will enhance its position as the most connected powerhouse outside London. The Birmingham-London corridor will become an area of major investment for the UK. The HS2 growth strategy will enhance this connectivity and investment to create a step change in the economic performance of the Midlands, driving growth and improving outcomes for its people, businesses and places (see Greater Solihull and Birmingham LEP 2015a). With the location of the HS2 Ltd national construction headquarters in Birmingham, alongside the co-hosting of the National College for High Speed Rail, the supply chain is already concentrating in the Midlands. The wider growth strategy is estimated to be worth 104,000 jobs. Within this, 36,000 jobs are highly skilled knowledge-economy jobs (NVQ level 4+) (Greater Solihull and Birmingham LEP 2015b).

Understanding and growing the knowledge economy to attract talent

The emerging renaissance is remarkable given the recent past. A range of commentators have highlighted Birmingham's relatively poor performance in attracting and developing the knowledge economy in the 1980s, 1990s, and 2000s. In fact, Birmingham and the wider West Midlands region saw the slowest growth in private sector jobs anywhere in the country over this period, with a growing dependence on the public sector (West Midlands Regional Observatory 2010). Since the recession, Birmingham has been 'bouncing back', aided by densification and the big city plan (Clark and Moonen 2015). Between 2009 and 2013, employment in knowledge-intensive industries increased by nearly 7,000, amounting to growth of 7%, compared with 6% for Great Britain as a whole (ONS 2015). The HSBC decision to move its UK retail banking head office here illustrates the city's new attractiveness.

⁷ Economic output in the city (as measured by GVA) increased in real terms by £695m between 2012 and 2013 (latest data). This was an annual growth rate of 4.2%, well above the national rate of 1.6% and the best performing core city. Birmingham also outperformed London, which grew by 2.2%. The latest official data shows that workplace based employment in the city stood at just under half a million in 2014, a five year high. Private sector jobs grew strongly in 2014, up by 21,000 (+5.7%). Birmingham was the top performing core city for private sector jobs growth, accounting for nearly a fifth (19.7%) of all private sector jobs created within the 10 core cities. The Greater Birmingham area had the highest number of foreign direct investment (FDI) projects and associated jobs of any LEP area in 2014/15 with 6,172 jobs created or safeguarded in the area as a result. Exports (goods only) in the West Midlands totalled £287.7bn in 2014, more than any other UK region outside the south-east, and accounted for 10% of all UK exports (Birmingham City Council, Economic Bulletin).

City REDI – a new intellectual economic powerhouse

For some time now certain cities have created their own economic intelligence support, such as the Manchester Independent Economic Review and New Economy Manchester which delivers policy, strategy and research for Greater Manchester's economic growth and prosperity. Other areas also have intelligence support bodies, which enable them to maintain a single coherent narrative and reduces reliance on diminishing in-house economic development resources and short term and often fragmented consultancy work.

Following these examples, a £5 million research institute, City REDI, has been established at the University of Birmingham. It will provide a global centre of excellence on city regions. As part of this it will analyse a wide range of factors influencing regional growth, and it is already part of a consortium delivering a dynamic economic impact model (DEIM) for the West Midlands Combined Authority. The model will address the effect of raising skills on productivity. The net impact on jobs of business support and skills interventions will be passed to the rest of the DEIM to consider, and then outputs from DEIM will be used by City REDI to assess the broader impacts of skills. The aim is to model the impact of raising skills levels in the economy to demonstrate the wider and longer term impact of skills interventions. Six universities are supporting the City REDI 'hub and spoke' model.

The city narrative is being refreshed and re-co-produced by its communities, voluntary and private sectors, and other public sector partners. This includes a Birmingham foresighting programme of workshops, drawing on the Foresight Future of Cities Project and work by the Liveable Cities Urban Policy Commission⁸.

Demand – big sector strengths and specialisation

Birmingham can also demonstrate strong and attractive sector specialisms – a crucial pull factor for attracting and retaining talent.⁹ Integrating talent-marketing strategies within sector strategies is central to success. Attractive employment opportunities for highly skilled talent are provided by the scale, scope and development of the sector specialisms in the city of advanced engineering, business, professional and financial services, food and drink, information technology, electronics and communications, and life sciences. Scaling these up, joining with higher education strengths and marketing them together provides a powerful means to attract undergraduates, graduates and other expert and high-end talent through mutually reinforcing synergies. Combining this with place-based city living promotion can make the UK's core cities highly attractive to talent.

⁸ See University of Birmingham Report on Future Urban Living Policy Commission <http://www.birmingham.ac.uk/Documents/research/policycommission/future-urban-living/future-urban-living-policy-commission-report.pdf>

⁹ See Marketing Birmingham Greater Birmingham sector based prospectuses at www.marketingbirmingham.com

The view from Bristol¹¹

Bristol is a global city, with a powerful tradition of enterprise, exploration and non-conformism. It is the UK's second city for creative and digital technologies, with more than 16,000 jobs delivering £660m in GVA each year, and is the only city outside London making a net return to the national economy. It is home to world class companies such as Airbus and Toshiba, Aardman and BBC Natural History, as well as a proliferation of SMEs and early-stage enterprises.

Bristol is a social enterprise city, a cycling city, and one of only two UK cities in Bloomberg's '100 Resilient Cities'. In 2015 it became the UK's first European Green Capital. It is also a leading smart city, with an approach that aims to ensure a central role for citizens.

The University of Bristol and the University of the West of England play a major role in the life and economy of the city. Together they host more than 47,000 students each year. More than one in five of the University of Bristol's students come from outside the UK. The universities also play a key role in economic governance. The City Council, the University of Bristol, and other anchor institutions collaborate across policy areas including business and high tech innovation; smart city innovation/internet of things; social innovation for sustainability; creative industries and talent development; and health.

Business incubation

The Bristol SETsquared Centre is part of the SETsquared partnership between the universities of Bristol, Bath, Exeter, Southampton and Surrey. SETsquared was named best university business incubator in the world in November 2015 by UBI global.

The Bristol SETsquared Centre provides coaching, mentoring, workshops, business review panels, access to professional services, access to its global network, investor readiness training, investor showcase events, access to the 'Bristol is Open' experimental network, and use of meeting and office space. It supports 64 members who between them employ more than 840 people globally. Since 2007, companies supported by Bristol SETsquared have raised more than £188 million in investment and recorded an aggregate turnover of more than £155 million. It has contributed to the success of Engine Shed, which opened in December 2013, and is credited with adding £8 million to the economy of Bristol and the west of England in its first year.

¹¹ Contribution from Professor Alex Marsh, University of Bristol and Howard Swift, Head of Service: Economic Development Bristol City Council

Successful companies supported by Bristol SETsquared in the last year include BluWireless, Reach Robotics, Ultrahaptics, YellowDog, Neighbourly, Folium Optics, and Boxarr. All have raised investment or won awards in their own right.

The Engine Shed incubator reached full capacity in little more than a year. In November 2015 capacity was increased by 30% through the Boxworks extension, based on repurposed shipping containers. This is a temporary measure while plans for permanent expansion are finalised for delivering 'Engine Shed 2' as part of the Enterprise Zone.

Case study start up: Ultrahaptics

In 2013 student Tom Carter was awarded £15k through the University of Bristol's New Enterprise Competition for his business Ultrahaptics. In 2014 Ultrahaptics joined the SETsquared Bristol incubator and was awarded £600,000 in seed investment led by IP Group plc. In June 2015 they received a €1.49M grant from the European Commission under Horizon 2020 and in November 2015 attracted a further £10.1M in private investment. The company is recognised as the leading developer of ultrasonic free-space haptics technology.

West of England University Enterprise Zone

Construction work is now underway on the site of one of the first few University Enterprise Zones (UEZ) in the country, aimed at encouraging greater university-business interaction to increase innovation and growth. The UEZ has been part-funded by the Department for Business, Innovation and Skills and the West of England LEP, supported by partners and stakeholders including the University of Bristol.

Enterprise and innovation education

Both Bristol universities are strongly committed to delivering enterprise education. The University of the West of England is one of the first few UK institutions to adopt the Team Academy approach, developed in Finland, with the launch of its BA (Hons) Business (Team Entrepreneurship) in 2013. The UWE Business Fellow scheme, developed in collaboration with Business West, brings local senior business leaders to the university to input directly into enterprise education.

The University of Bristol's Enterprise Education team offers extra-curricular support including an on campus student business incubator (Basecamp); workshops and events involving guest speakers, including university alumni and local entrepreneurs; and the New Enterprise Competition, an annual business plan competition. Workshops and events are well supported by private sector organisations that deliver pro bono workshops and lectures, and offer tailored advice and support to successful individuals/teams.

The University of Bristol is broadening its innovation offering in 2016. Through its Centre for Innovation it will be recruiting students to four-year integrated masters programmes that combine innovation with 11 academic disciplines. A key aim is for students to come together to move beyond specialism to interdisciplinary problem-focused collaboration. They will be supported in translating their ideas into plans for delivering innovative, commercially viable products and services. The university is planning to build on this initiative to mainstream its offer of innovation and entrepreneurship education to undergraduates across all faculties.

Case study start up: Southmedia

Southmedia is a web design and development business with a strong social vision as “Bristol’s ethically minded digital agency”. The company was established after its founder Ben Treadaway graduated with a degree in computer science from the University of Bristol.

Southmedia is based in The Greenway Centre in Southmead, a converted school developed by the local authority into a business centre in a relatively less wealthy residential suburb. Ben has said one of the reasons he stayed in Bristol after graduation was the liveability, as well as an infrastructure which makes it a great place to run a business. This infrastructure includes connections to other social enterprises and start-ups, to the rest of the UK and to the wider tech community.

The view from Cardiff¹³

Over the past 20 years Cardiff has responded to deindustrialisation by investing in cultural and leisure infrastructure, enhancing the city's amenities and quality of life, attracting major events and raising the city's international profile.

At the same time the city has pursued a strategy of restructuring the city economy away from heavy industry and manufacturing towards the service sector, and achieved good levels of jobs growth compared with other members of the Core Cities group¹⁴.

Cardiff Today

Between 2002 and 2013, Cardiff's population grew by 13% – a rate of growth higher than London or any of the English Core Cities. This growth trend is set to continue with a projected growth of 26% over the next 20 years making Cardiff the fastest growing UK city. In many ways this growth reflects the quality of life on offer – Cardiff now routinely features in the UK's most liveable cities (Cardiff Liveable City report 2015).

The population is highly skilled compared with other major British cities, whether measured by number of graduates per head of population, or by the percentage of the population with no qualifications. However, this is not translating in to higher wages and higher productivity. Similarly, the city's universities are not securing high levels of R&D or other innovation-related indicators – despite Cardiff University being ranked 5th in the UK in the quality of its research. While higher education is a great local asset, more can be achieved.

Wales, and by extension Cardiff, successfully attracts a net inflow of students to study. Since 2000, student numbers in the city rose by 60%, with the number of postgraduate students trebling. However, once students have gained their degrees from universities in Cardiff and Wales, they tend not to stay. This is due to a combination of factors that provides an insight into what makes a place attractive to graduates.

Employment available in Cardiff and its surrounding labour market is also often of a lower quality as measured by pay or anticipated career pathways, than that on offer in other parts of the UK. This is particularly the case for STEM subjects. The weakness is most acute in the private sector, with the public sector employing around half of the post-1992 graduates who were both born in and now live in Wales.

¹³ Contribution from Dr Adrian Healy, Cardiff University and Gareth Newell, Head of the Cabinet Office, Cardiff City Council.

¹⁴ <http://www.corecities.com/>

Responding

The City of Cardiff Council has set a city vision for Cardiff to become Europe's most liveable capital city. This ambition builds on Cardiff's strengths, seeking to maintain quality of life while strengthening the 'quality of opportunity'. It puts the attraction and retention of talented people at the heart of the city's economic strategy. Specific initiatives include:

- **Cardiff Start.** This network of entrepreneurs is run by and for the city's tech start up community. Cardiff Start received start-up funding from the City of Cardiff Council and Cardiff University.
- **Creative Cardiff.** This network connects people working in any creative organisation, business or job in the Cardiff region. Hosted by Cardiff University the Creative Cardiff network seeks to support the city's cultural and creative economy, conducting research, running events, signposting and connecting. Cardiff University also operates a Cardiff University Innovation Network, which draws firms and the academic community together.
- **Redevelopment of Central Square.** Wrapped around a new integrated transport hub (bus and rail) which will be delivered by 2017, the redeveloped Central Square will be the new home for BBC Wales, moving Cardiff's biggest creative employer from the suburbs to the heart of the city.

The view from Leeds¹⁶

Leeds: the city and region

Leeds sits at the heart of the largest city region outside London. With an economic output of £60bn, the city region has a larger economy than 9 of the EU countries (Leeds City Region Enterprise Partnership 2014). Leeds boasts the largest UK financial centre outside London, as well as strong and growing specialisations in health and bioscience, advanced manufacturing, and food and drink.

Around 750,000 of the city region's 3 million people reside in the urban areas of Leeds, but the city is growing rapidly and Leeds City Council estimates that its population will reach 1 million by 2030.

The local economy is particularly strong in knowledge-intensive business services. KPMG's new Innovation and Solutions centre capitalises on the regional infrastructure, while Hitachi Capital and Sky are also expanding their existing bases in the region. The NHS head office is in Leeds and 80% of UK mortgages are administered in the region.

Leeds: a student city

The Leeds city region is home to 115,000 HE students and eight universities. Leeds itself is a student city, with more than 60,000 students distributed across its four higher education institutions. More than half of Leeds' students come from outside the region, demonstrating that the city and its universities are highly attractive to young and highly skilled people. The challenge now is to retain them and develop their potential within the regional economy.

Job opportunities

In 2015, the top ten graduate employers nationwide, according to the Guardian, were Google, GSK, Cancer Research UK, MI6, Rolls Royce, JLR, Amazon, Microsoft, BP and Unilever. Of these only Unilever has a presence in the Leeds city region, and while Leeds is an important regional centre for finance and law firms, there are very few large companies headquartered in the locality.

The largest employers in the city are Leeds City Council, the NHS and the University of Leeds. By contrast, the regional economy is dominated by smaller employers. There are 100,000 of these businesses within the region, each employing an average of 8 people. Regional growth is largely dependent on their development, but these smaller firms are less attractive to recent graduates. The reasons include that they are less visible and prestigious; they are not always able to offer competitive salary packages; and training and career development

¹⁶ Contribution from Robert Partridge, Director of Student Opportunities, University of Leeds, and Simon Brereton, Head of Innovation and Sector Development, Leeds City Council.

opportunities may be more limited. And because they have limited capacity to train and develop their staff, they may also demand technical skills and experience that the typical university graduate does not possess.

An innovation and skills ecosystem

A new £42 million investment in central Leeds will soon provide improved access to world-class research and innovation at the University of Leeds. The Leeds universities already have a strong track record in commercialisation – the University of Leeds alone has established over 100 companies with a market value of more than £450m over the last 20 years. The new centre will play an important role in the regional higher-education ecosystem and drive the growth of technology-led start-up companies. It will complement the Enterprise and Innovation Hub at Leeds Beckett University, which provides access to expert training and mentoring, technical facilities and expertise. Likewise, the universities are working with the local authorities and industry to increase the opportunity for work-based learning within the region and ease the transition from education to employment.

The view from Liverpool¹⁸

Liverpool City Region has been through a long and difficult process of change and restructuring but arguably has emerged in better shape economically, socially, physically and politically than for a very long time. During the last decade Liverpool City Region has become a good news story. It made some improvements on the key drivers of performance – skills, diversity, connectivity, innovation and place quality and had some real success in the boom years. The baseline is higher and the trend is positive (Parkinson et al 2016)

Liverpool faces challenges to become more competitive, to attract people to the area, to improve liveability and to improve national perceptions of the city.

Liverpool lost half of its population and economy between 1945 and 1995. The last 20 years has seen a return to economic and population growth, albeit at a pace slower than many comparable cities. Many legacy issues remain from the years of decline and the city has one of the highest levels of multiple deprivation in England (IMD2015). Given this context, the city prioritises not only higher level jobs and sectors, but also overall employment of residents.

The city's economy lacks scale. The private sector is too small, business density is only 68% of the GB average and there is a resultant lack of graduate opportunities and career progression opportunities. Liverpool's work-based productivity (GVA per hour worked) is at 97.5% of the UK average. With a large proportion of economically inactive residents and the relatively small business base, Liverpool lags behind national performance on population-wide measures such as GVA per head.

The city's knowledge-based anchor institutions have played a crucial role in the city's survival and revival. They have a major economic impact in their own right and are among the city's largest employers and GVA producers. The student population of 60,000 is around 13% of the city's total. There is a strategic recognition that knowledge sectors and innovation are critical to the city's future economic growth and restructuring.

City priorities around the 'talent agenda' include:

- Improving data, intelligence and the capacity to develop and implement a holistic strategy and coordinated activity to attract talent
- Increasing the number of graduate-level jobs, particularly in health and advanced manufacturing, which align with research strengths
- Increasing the proportion of people with NVQ4 and reducing the gap with the national average, in particular attracting young graduates (22-35)

¹⁸ Contribution from Martin Thompson, Policy Officer, Liverpool City Council and Dr Sarah Jackson, University of Liverpool

- Increasing home-grown graduate start-ups and attracting graduate-level entrepreneurs, to reduce the city's huge business density gap
- Improving career progression and tackling underemployment in the city
- Raising liveability and city image. The 'place agenda' requires continual improvement for the city to remain competitive
- Updating understanding of local skills demand and gaps

Increasing productivity for global business and SMEs

The Materials Innovation Factory is a £68M public/private investment which brings together one of the UK's largest research-active companies, Unilever, with one of the UK's strongest chemistry departments at University of Liverpool (1st for research output quality). The facility is the largest R&D investment Unilever has made with any university and is the UK's largest collaboration between industry and higher education in the field of chemistry.

The new building is designed to promote the exchange of ideas and knowledge by co-locating up to 300 industry & academic researchers. It builds on the track record of Liverpool's Centre for Materials Discovery, which dramatically accelerated the rate of Unilever innovation in chemistry, led to an increase in regional turnover in excess of £7M and supported more than 60 of the city's technology driven SMEs.

The Materials Innovation Factory will include lab robotics that will deliver game changing improvements in scientific productivity, reducing new product development times, and driving economic growth and international research competitiveness. This collaboration on accelerated materials discovery shows how world-leading knowledge creation is directly increasing productivity for a global company as well as many SMEs.

Supporting industry, increasing productivity and developing graduate work experience

The Virtual Engineering Centre (VEC) is focused on how the digital revolution can be maximised by industry. Through digital engineering collaborative projects, industry benefits from the VEC's expertise to help them to improve their product's physical design, manufacturing, assembly and testing processes, enabling these companies to improve productivity and gain a competitive edge. The VEC works with University of Liverpool students across disciplines at post-graduate level, including Industrial Design, Psychology, Architecture and Engineering. This includes student-projects such as ARION (LandSpeed Bike) and the Formula Student international competition team, aiming to equip students with industry-ready skills.

Bentley, for example, used VEC facilities and expertise when designing their new SUV and benefitted from a reduction in product development time of 6 months. This project created 457 new jobs within the partner organisations and supply chain, including many newly developed roles resulting from the new technologies deployed.

Eco innovation, increasing SME productivity and developing graduate work experience

Centre for Global Eco-Innovation (CGE) is a £9.8M ERDF-funded partnership between the University of Liverpool, Lancaster University and Inventya Ltd. Since 2012, the CGE has engaged with over 300 regional SMEs assisting with the development of products, processes and services designed to reduce environmental impact and enable resource efficiency. Over 150 of these collaborations have been delivered through a range of undergraduate and postgraduate projects, where the SMEs had specific research needs to support their innovation, but did not have the capacity, knowledge, facilities or resource to pursue them. The programme increases the region's SME capacity to undertake ambitious R&D projects, offering benefits for industry and invaluable work experience for postgraduate and undergraduate students, who are exposed to the commercial realities of R&D.

Case Study 1. Marlan Maritime Technologies is a Liverpool based SME specializing in maritime radar systems. The company realised the potential for commercialising algorithms and via CGE funding developed a new technique for utilizing radar to monitor intertidal zones. The new technology developed by the PhD researcher has opened up new markets for the company.

Case Study 2. Elixir Group is an environmental business providing specialist plastic, PVC-U and general waste management. Through CGE, the company undertook a dissertation project with a 2nd year undergraduate geography student to design a WEEE recycling line. The line was subsequently implemented, processing 1,000 tonnes of PFD waste per annum from 26,000 units. It is responsible for increasing turnover by 10% and employing an additional 8 staff – plus the student, who was also employed by Elixir on completion of his degree.

The view from Manchester

Skills and education in the devolution agenda

Skills and education policy has consistently played a central part in Greater Manchester's vision for devolution. The vision has been one of prosperity, economic growth and a labour market able to use and reward high-level skills and the talents of its people. So a highly skilled population that includes the right supply of graduates is central to Greater Manchester's economic ambitions.

Increasing the attainment of high skills within Greater Manchester's resident population, and also the supply of high skilled labour from outside, will both be in a mix of strategies aimed at further strengthening the economic performance of the city region.

Skills and talent in the Manchester context

New graduates form an important part of the flow of new skills into the Greater Manchester labour market; they are not the only aspect of a highly skilled workforce, which also includes migrants, apprentices, adults studying part time and people with non-degree, high level qualifications such as HND and professional qualifications.

It is also important to put high level skills, however they are achieved, into the context of other factors driving economic performance and productivity (see Leitch Review 2006). These include investment, competition, enterprise, innovation and – especially important within and between Northern cities – transport and ICT.

The Greater Manchester Combined Authority (GMCA) allocates each authority with a strategic lead on policy areas that are collectively prioritised. Priorities are determined partly through the Greater Manchester Strategy and through an evidence base originally assembled in the Manchester Independent Economic Review (MIER) in 2008-2009. This set out the economic case for the city region and the opportunity to rebalance the economy and drive productivity.

One of the MIER key priorities was related to skills and talent. "The first and more intractable challenge, linked to education and skills, is to ensure that MCR residents are equipped, with the qualifications, confidence and learning capacities they need in order to take advantage of the higher skilled employment opportunities on offer." (MIER, 2009)

Manchester's Economic Strategy

A Local Enterprise Partnership was established in 2010, covering the ten Greater Manchester local authorities and largely drawn from New Economy's employer led board. Using the MIER, it also prioritised skills as part of its economic strategy.

This theme has intensified as central government upped its ambitions for both devolution and improving productivity. A new economic strategy for the north was unveiled in George Osborne's speech in Manchester in June 2014, officially launching the idea of the Northern Powerhouse. At its heart were ideas of human capital, science, connectivity and economic growth (George Osborne 23rd June 2014, Speech at MOSI).

In Greater Manchester, growth in the demand for and supply of specific higher level skills for specific sectors is prioritised as well as being market driven. So rather than aiming only for increases in graduate populations or improved retention of new graduating cohorts, priority goes to certain areas of applied research and specific education investment. This prioritisation is built around Greater Manchester's leading economic sectors and locations (as measured by existing job volume and GVA performance as well as by forecasted growth in both). This largely focuses on the business/professional, health and life sciences, creative and digital and advanced manufacturing and engineering sectors.

The strategy also considers expanding science, research and higher education as a sector in itself – as they are productive, high paying and likely to be a significant employers, as well as bringing investment via increasing numbers of students whether they stay in the city region or not.

It is likely that there will be growth in city economies, especially if measures such as regional rebalancing and the Northern Powerhouse are effective in the long term. To maximise this, the fastest growing and most productive firms, sectors and clusters will need a ready supply of high skilled workers. Some may be initial graduates, some may be relocating graduates already with some experience, and some may have achieved higher level skills through other non-degree routes.

Ideas and propositions

Taking action for national government, cities and universities

After exploring the evidence and existing activity in city regions, this section describes five practical initiatives to address graduate mobility that were identified by the *Foresight* action group. The group concluded that productivity across the UK could be raised by a series of city-level measures focused on improving the city-graduate experience. The measures have been designed to fit squarely within the context of national and local government's existing frameworks and actions such as the Powerhouses approach, science innovation audits, FE area reviews and enhanced regional transport investment. They place the quadruple helix of businesses, universities, cities, and national government at the forefront of successful action.

The five areas for complementary innovation are:

1. Synchronising learning, employers and work – The Skills Engine
 2. Building long term engagement between SMEs and graduates - FASTTRACK
 3. Developing the ecosystem for knowledge-rich enterprise – The Graduate Business Lounge
 4. Establishing knowledge-economy strategies in cities – New Economy Hubs
 5. Gathering better data to support graduate careers – The GRAData Project
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Synchronising learning, employers and work: The Skills Engine model in Birmingham

The Challenge

In the fast moving world of enterprise and innovation, the demand for workers with the right skills is increasingly disjointed from the model of supply. For example 21% of workers in the high-growth digital sector are self-taught in the skills they need to do their jobs (Tech Nation 2015). Employers routinely highlight a contrast between the good technical knowledge of new graduates and their lack of softer skills such as leadership, interpersonal, critical analysis and problem solving skills needed to make them attractive and productive employees.

It can take several years to approve and implement a new university course, by which time the content may already be redundant. There are also issues with the

journey through the skills system, with critical transition moments where learners routinely fall away. Graduates experience a *catch-22* situation; struggling to find work without the requisite skills and experience, but unable to acquire the skills and experience without work. This points to a mismatch between the technical and knowledge-based skills acquired in universities and colleges, and the softer skills often required in the workplace. This problem is even more critical given that new analysis argues that up to 35% of jobs are at high risk of automation over the coming two decades (Osborne and Fray, 2015).

The inspiration

As anchor institutions rooted in the landscape of local skills provision, universities have a crucial role to play in delivering talented individuals with the right skills to supply regional and national demands. In Birmingham a wide range of partners have come together to explore how the devolution agenda is enabling new possibilities for skills provision at city region level. The Skills Engine is a new cross-cutting structure that brings together key local players to improve the match between demand for and supply of skilled talent in the regional economy (Boxall and Stevenson 2016).

Introducing the Skills Engine

Instigated by Birmingham City University, this initiative offers a radical and exciting new response to the talent shortage that is holding back productivity and opportunity across the Birmingham city region. Through a broad-ranging partnership of learning providers, employers and civic authorities, it will provide new services and pathways for purposeful learning, embedded in local responses to economic and social challenges.

The Skills Engine is built on three big ideas:

- A collaborative cross-regional partnership engaging universities, colleges and major learning services providers (including Pearson, SAP and Cisco), along with major employers and SMEs, Local Authorities, Local Enterprise Partnerships and, ultimately, the new Combined Authority for the West Midlands. Using the metaphor of an engine, the model is made up of several different parts under a single coherent design. This includes the emerging concept of a further education sector-led Institute of Technology, all with a view to smoothing the transitions between school, FE and HE, and equipping learners for the workplace.
- Novel approaches to formative and lifelong education, providing learning-in-practice programmes based upon global best practices in problem-based learning, competency-based education and STEAM curricula (combining design and creativity with science and technology).
- Learner-centred opportunities provided through a learning academy (curating world-class learning resources), an innovation hub (identifying and resolving

shared challenges), a talent escalator (providing personalised learning progression) and a talent connector (matching people to placements and jobs).

By engaging all the key players in this multi-functional ecosystem, the Skills Engine aims to overcome the structural mismatches and blockages that have dogged previous approaches to attracting, developing and mobilising highly skilled people in the city region.

Birmingham plans to develop the Skills Engine model through 2016. Although the ambition is for this endeavour to provide direct benefits to the city and its inhabitants, it can also provide valuable lessons and best practice for other city partnerships. In sum, the Skills Engine can be a 'challenger model' to prototype new models of purposeful learning within a unique architecture combining innovation with talent development.

Building long term engagement between SMEs and graduates - the FASTTRACK prototype in Leeds

The challenge

Qualitative evidence suggests that graduates are reluctant to work in small and medium sized businesses (SMEs) because they perceive them to be less glamorous than larger employers, and SMEs do not appear to offer sufficient training or scope for career progression (Pollard et al 2015). This is a material problem, even though anecdotal evidence also suggests that graduates can receive good support. This policy idea builds on models that have been designed to solve similar problems in other systems.

The inspiration

Spring Singapore is an initiative in that country to enable SMEs to hire, induct and train new graduates, in partnership with the trade associations that represent Singapore's important industrial sectors. In the UK, Teach First has reformed the recruitment and training of new teaching professionals. The equally successful fast-track training scheme for new IT professionals offered by US-based FDM follows the same principles.

Introducing FASTTRACK

In a similar way, FASTTRACK aims to attract more highly skilled young people into the region's small and medium sized businesses. The approach is two-fold:

- A substantial placement scheme will enable students and recent graduates to gain experience with regional employers. This will build awareness of opportunity among students and awareness of student capability among smaller employers.

- An intensive induction and training programme for graduates entering SMEs will be aligned to the needs of the region's growth sectors. This will be complemented by ongoing professional development over the first two years of employment. For graduates, it will offer accredited training, with the option to complete a relevant postgraduate qualification.

While the primary focus of the scheme will be SMEs, the scheme will also be open to larger and public sector employers, making it possible to deliver training and development in supply-chain groupings and enhance learning and networking opportunities.

The intended outcome of the FASTTRACK prototype is to eliminate risk in the hiring and induction of graduates, accelerate productivity gains and establish a new network of young professionals within the city regions. Depending on the success of the prototype, this may be a model that other UK cities replicate or learn from.

Developing the ecosystem for knowledge rich enterprise – the Graduate Business Lounge pilot in Bristol

The challenge

Graduates make a significant contribution to innovation and entrepreneurship, not just in creating employment for themselves, but also in creating employment within broader society. The needs of new and small enterprises include: early stage support, incubation, workspace, funding, economic growth and resource efficiency. The challenge is to respond to these needs, and to integrate and further develop existing graduate enterprise service providers and platforms to foster student entrepreneurship and new ways of working.

Over the past decade the University of Bristol has seen a step change in the extent to which its undergraduates and graduates engage with the business community in the city. The university is an anchor institution and already a major contributor to the local economy. However, the university is now focused on how it can be a more effective catalyst for developing the local economy in the future.

The city council also encourages entrepreneurship, creativity and innovation, especially using alternative, creative models of social enterprise. While Bristol's entrepreneurship and business support landscape is complex and highly regarded nationally and internationally, the components of this landscape are not necessarily unique. Bristol already addresses many of the needs of new and small enterprises, but there is scope for further development.

The inspiration

The University of Bristol and Bristol City Council offer business support to graduates through the SETsquared/EngineShed business incubator that has been acclaimed as best-in-class globally. It is recognised that the general support ecosystem for innovation and entrepreneurship could be more effectively targeted at university students as they approach graduation. The University is seeking to enable students across academic disciplines to engage with innovation, creativity and sustainable futures: the aspiration is to foster entrepreneurship – with a distinctive Bristol flavour – among tomorrow's global citizens.

Introducing the Graduate Business Lounge

Bristol will adopt a holistic approach to the landscape of entrepreneurship and business support by integrating the various support components and ensuring they are mutually supportive and complement the weaving of entrepreneurship into the curriculum. The aim is to ensure that students with creative ideas and potentially novel solutions and products are able to navigate a landscape of appropriate business support: from the initial kernel of an idea to floating off as successful, independent entrepreneurs.

The Graduate Business Lounge will be both physical and virtual. It will:

- Provide integrated information flows between support providers
- Engage businesses through active and coordinated animation
- Guide and transition users between support providers
- Track user progress and deliver meaningful and productive relationships

Bristol's Graduate Business Lounge will concentrate on integrating existing initiatives and excellent support services in ways that make them more intelligible. The lessons learnt from this change programme will be shared across the broader region through the creation of systems and methods that are can be extended and transferred to other institutions.

Establishing knowledge-economy strategies in cities: New Economy Hubs in Birmingham, Liverpool and Manchester

The challenge

Many UK cities and city regions have been paying more attention to strategies for knowledge- and innovation-led growth. Such knowledge economy strategies are collaborative, as they must involve knowledge-rich

institutions together with enterprises and investors. City governments will need to play different roles from those related to physical development, including fostering coalitions and connections where businesses and innovators are in the lead.

There is a risk that without such business and institutional leadership on knowledge-economy strategies, cities may adopt a 'me too' approach where they all seek to be hubs of creative industries, or nano technology, or digital/software, biotechnology, or whichever new technology is in vogue. Sound knowledge-economy strategies should be based on robust assessments of local opportunities, reflecting long held assets and expertise, married to the opportunities created by new technologies and other developments. If executed well, such strategies can marshal resources and communication behind comparative advantages and create a positive climate for higher productivity.

The inspiration

As a product of robust assessment and evidence building, knowledge-economy strategies can be co-created by universities, business, local and central government.

Local knowledge-economy strategies might have three distinctive strands that work together:

- Fostering the eco-systems and business climate for invention and enterprise
- Understanding and promoting specific expertise and capabilities within a region to be shared between public and private sectors and between groups of employers
- Understanding and enhancing the non-job attributes that make a place attractive to talent, including culture, housing, services, amenities, identity and reputation

Such strategies can also provide an imperative to improve intelligence and evidence about local economic assets, and also to encourage city leaders to support the knowledge economy and graduate employment as goals and recognise the benefits and multipliers for the wider local economy.

Introducing New Economy Hubs

New-economy strategies are already being developed in both Manchester and Liverpool. Both cities intend to focus and strengthen their strategies towards higher productivity, based on market intelligence, evidence reviews, and research carried out by organisations including Liverpool Vision and Grow Manchester. We are terming these organisations New Economy Hubs. Another example is City REDI in Birmingham, a new centre of excellence at the University of Birmingham for understanding all aspects of the new economy in the region.

These New Economy Hubs will actively:

- Recognise the knowledge-creation role of higher education institutions. A key element of all HEIs is knowledge creation through research and discovery. To optimise demand for graduate skills we should reinforce existing areas of excellence and knowledge generators. This acknowledges the need for applied research and direct engagement with industry in a city ecosystem.
- Understand and organise local knowledge assets. City economic strategies will increasingly move towards understanding and support for knowledge, technological, and scientific nodes and assets. For many UK cities this requires a shift from physical redevelopment and consumption-based models of economic repositioning towards knowledge and innovation systems, while retaining investment in infrastructure and the quality of place that support productivity growth.
- Improve liveability and connectivity in cities and city regions. Cities and city regional alliances have special roles to play in improving local identity and character, enhanced liveability (housing, schools, health, and leisure) and connectivity (transport, digital, institutional). Connecting students and graduates better into local communities and place can increase their appreciation of the local fabric and their loyalty.

The knowledge-economy strategies being developed will deliver tangible benefits for graduate employment in Birmingham, Liverpool and Manchester. Beyond this, they may be useful models that other cities and universities can develop for their own local employment and skills environments.

Gathering better data to support graduate careers – the GRAData project pilot in Leeds

The challenge

Better data can help cities and universities to support graduates and employers in the local labour market. The imperative grows as devolution returns more powers to cities and regions and their decisions have a greater impact on the local economy.

But today, data is not available in a coherent format that allows cities to make informed policy decisions. Different data is owned by different central government departments, with useful information owned by other organisations such as the Student Loans Company (nationally) and university alumni offices locally.

Facilitating access to this data, anonymised and depersonalised, will provide a long term resource for cities and universities in supporting their graduates and local employers.

The inspiration

The Department for Business Innovation and Skills is working to use available data on destinations of leavers from its learner records and matching it with individual lifetime tax records to track employment and earnings for all education sectors. The database will contain information such as: university course attended, as well as career cycle details such as location, wages and occupation.

There may be an opportunity for Departments and third parties to propose further work to enhance their studies of graduate mobility and its impact on productivity at the national and local level, subject to an appropriate business case.

The GRAData lab

By providing information on where graduates work, the relationship between graduate salaries and place of work and whether graduates move out of London to have families, cities will be able to make evidence-based allocations of skills and innovation funding, and better support local businesses to attract talent.

A skills, innovation and talent strategy for a city such as Leeds would better reflect the needs and life-stage choices of the people it seeks to attract, whereas currently the emphasis is on the requirements of employers for higher level skills. As the datasets develop, there may be scope for BIS to work with Leeds City Council and Leeds Institute for Data Analytics to develop a framework or set of principles where cities could become robust third-party users, allowing them to add their local intelligence. Leeds city will pilot this approach.

Conclusion: graduate mobility, productivity and rebalancing – a new innovation agenda

The five initiatives developed through this project are the product of an interaction between cities, universities, employers and national government – the quadruple helix – as part of Foresight’s place-based open policy making experiment. This experiment used evidence on graduate mobility as a starting point to develop initiatives to deliver local and national priorities of productivity and regional rebalancing.

The intention is that this place-based open policy making experiment can be a pathfinder model for local and national governments working together. The key steps are:

- Developing a rigorous evidence base on graduate mobility
- Seeking first-hand experience from cities, employers and universities on the local experience of graduate mobility
- Forming an action group comprising cities, universities and government
- Primary research carried out with local employers

Together this work helped provide a collective understanding of the issue for the action group and a strong basis for developing policy ideas. The project then took a place-based approach to developing new ideas and initiatives, with an emphasis on prototyping, trialling and implementation.

Now, participating cities are taking forward demonstrator projects on five innovative solutions to graduate mobility and retention. These interventions are likely to be highly transferable to other cities, in the UK and internationally.

Beyond the five ideas themselves, this project has tried to develop a broader model for successful local-national relationships and productive future experiments on city issues. Cities can be excellent laboratories for innovating and developing new ideas, and this project has shown how to realise their potential.

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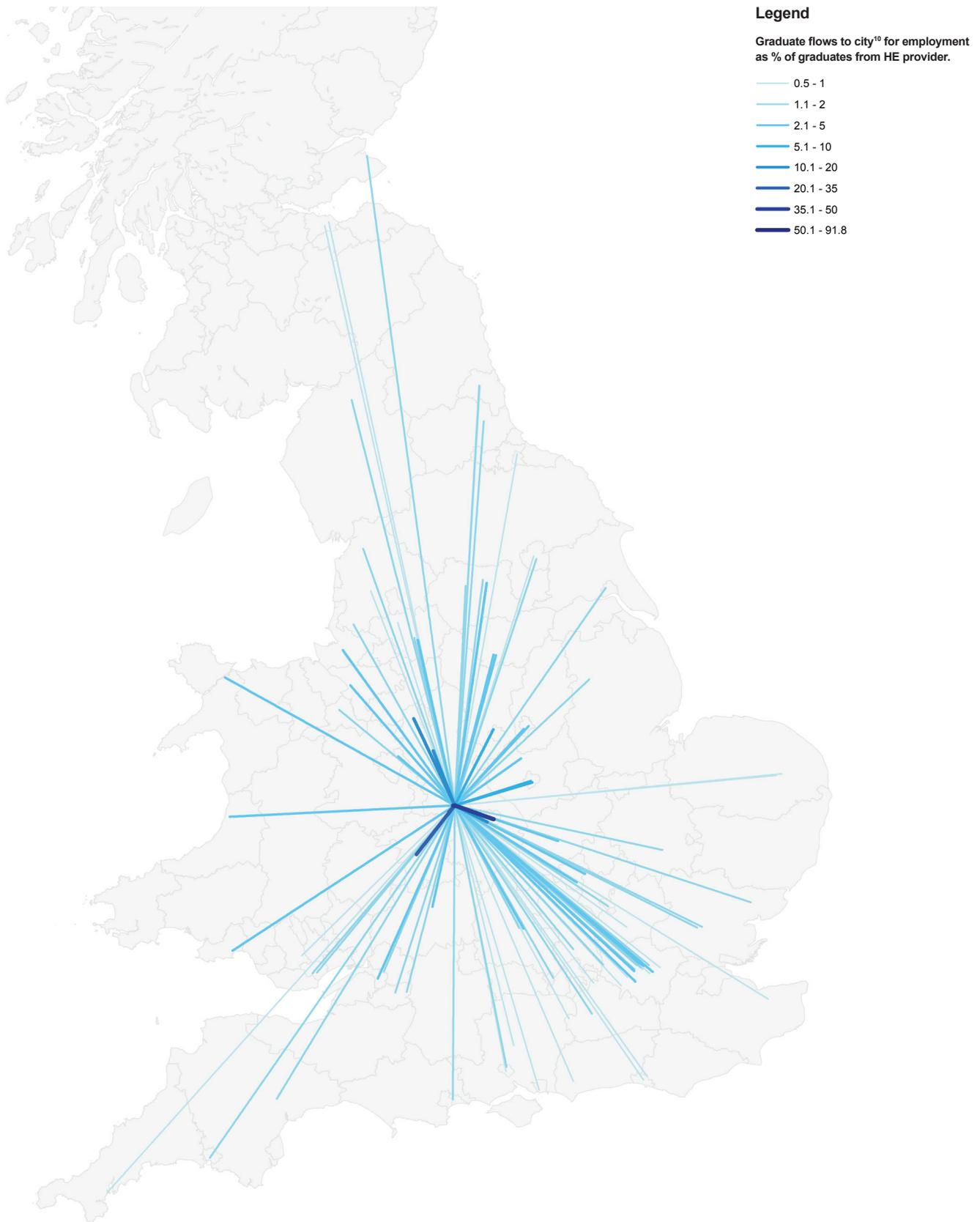
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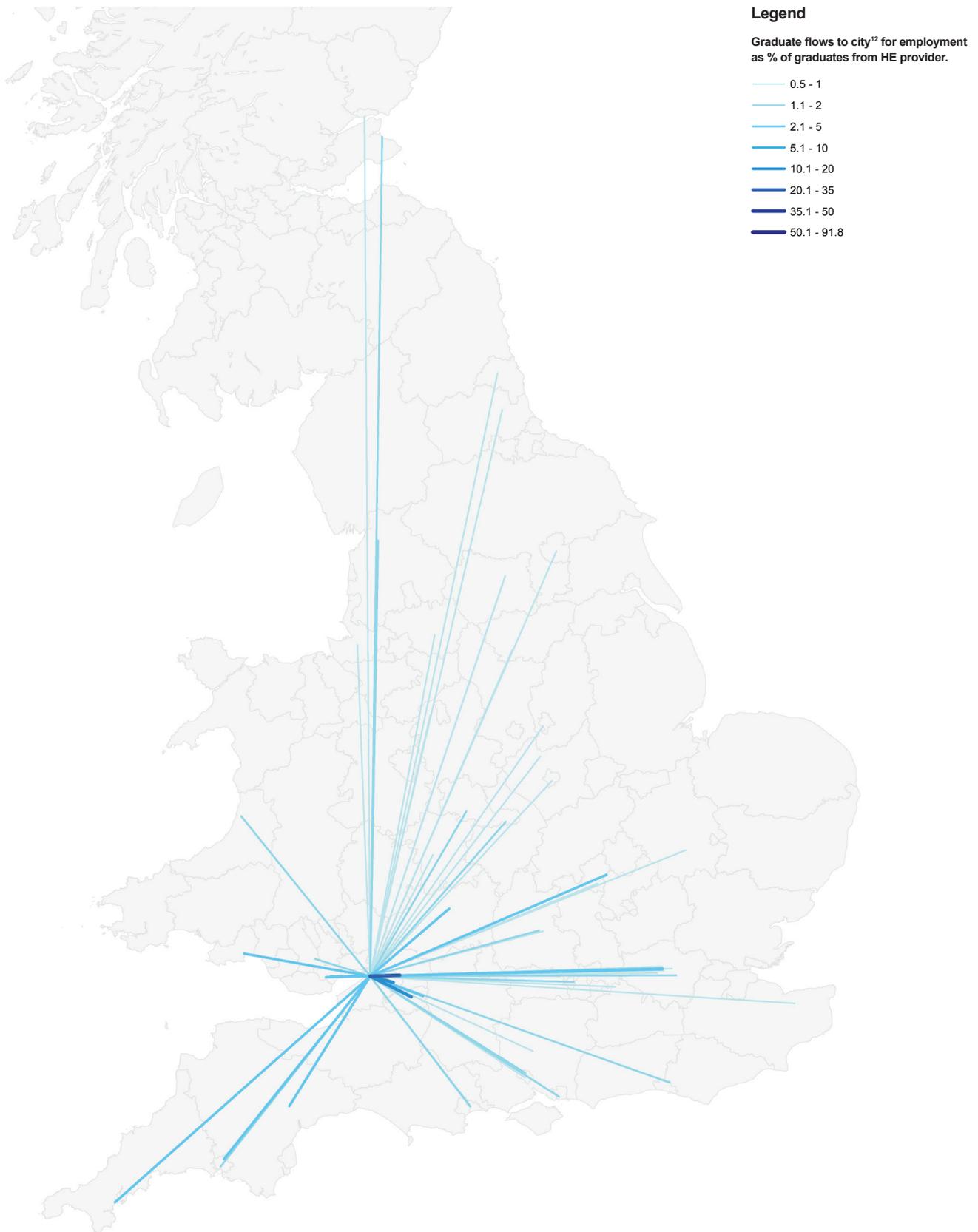
Annexes

Fig 9a: Birmingham (Source: Duncan Smith, CASA UCL)

¹⁰ HESA data is only available at region/county level within which the indicated city is located for: Birmingham (West Midlands), Leeds (West Yorkshire), and Liverpool (Merseyside).

Proportional Flows of Graduates to Work in **West Midlands (Birmingham)** (1% minimum cut off)

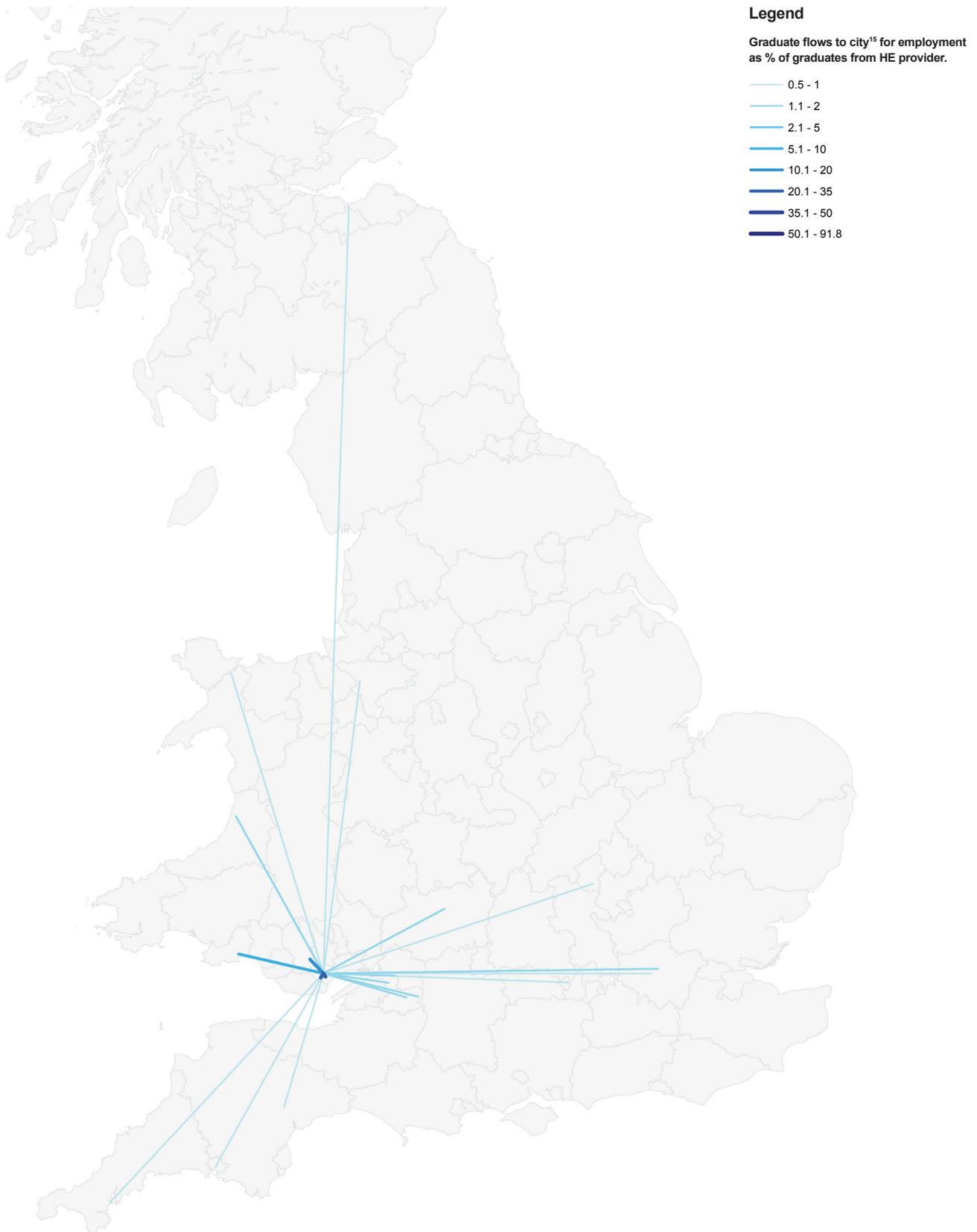
Proportional Flow Class	Higher Education Provider and Proportional Flow to West Midlands			
Greater than 40%	Newman University	78.9	Birmingham City University	57.7
10% - 40%	Coventry University	37.8	The University Of Warwick	17
	Aston University	35.4	Staffordshire University	11.5
	The University Of Birmingham	34.9	The University Of Keele	11
	University Of Worcester	22.8		
5% - 10%	De Montfort University	6.2	The University Of Leicester	5.3
	University Of Derby	5.7	Royal Northern College Of Music	5
2% - 5%	Loughborough University	4.9	The Manchester Metropolitan University	2.6
	Harper Adams University	4.8	St George'S Hospital Medical School	2.5
	The Nottingham Trent University	4.7	Bangor University	2.4
	Aberystwyth University	4.7	Guildhall School Of Music And Drama	2.4
	The Institute Of Cancer Research	4.3	The Royal Veterinary College	2.2
	University Of Nottingham	4	University Of Chester	2.2
	The University Of Sheffield	3.8	The University Of Leeds	2.2
	The Open University	3.8	Trinity Laban Conservatoire Of Music And Dance	2.2
	University Of Gloucestershire	3.8	Leeds College Of Art	2.2
	Heythrop College	3.6	The University Of Manchester	2.1
	Oxford Brookes University	3.2	The University Of Bristol	2
	The University Of Liverpool	3	Sheffield Hallam University	2
	The University Of Northampton	2.9	Swansea University	2
	Cranfield University	2.6	The University Of Reading	2
1%-2%	University Of Durham	1.9	The University Of Southampton	1.4
	The University Of Buckingham	1.9	Buckinghamshire New University	1.4
	The University Of York	1.9	The University Of Lincoln	1.4
	The University Of Oxford	1.9	Bath Spa University	1.4
	The University Of Exeter	1.9	University Of Bedfordshire	1.4
	Central School Of Speech And Drama	1.9	The University Of Bradford	1.3
	The University Of Bath	1.8	University Of The West Of England, Bristol	1.3
	Leeds Beckett University	1.8	The University Of Hull	1.3
	The University Of Lancaster	1.8	Writtle College	1.2
	Imperial College Of Science, Technology And Medicine	1.8	King'S College London	1.2
	Royal College Of Music	1.8	University College London	1.2
	Conservatoire For Dance And Drama	1.7	The University Of Salford	1.2
	Liverpool John Moores University	1.7	Courtauld Institute Of Art	1.2
	The Liverpool Institute For Performing Arts	1.7	The University Of West London	1.2
	Cardiff University	1.7	Bournemouth University	1.1
	London School Of Hyg. And Trop. Med.	1.6	Glyndŵr University	1.1
	Brunel University London	1.6	Royal Academy Of Music	1.1
	Queen Mary University Of London	1.5	University Of Cumbria	1.1
	University Of Plymouth	1.5	The University Of Surrey	1.1
	Edge Hill University	1.5	University Of Newcastle-Upon-Tyne	1.1
	The University Of Cambridge	1.4	Anglia Ruskin University	1
	The University Of St Andrews	1.4	Cardiff Metropolitan University	1
			The University Of Essex	1

Fig 9b: Bristol (Source: Duncan Smith, CASA UCL)

¹² HESA data is only available at region/county level within which the indicated city is located for: Birmingham (West Midlands), Leeds (West Yorkshire), and Liverpool (Merseyside).

Proportional Flows of Graduates to Work in **Bristol** (1% minimum cut off)

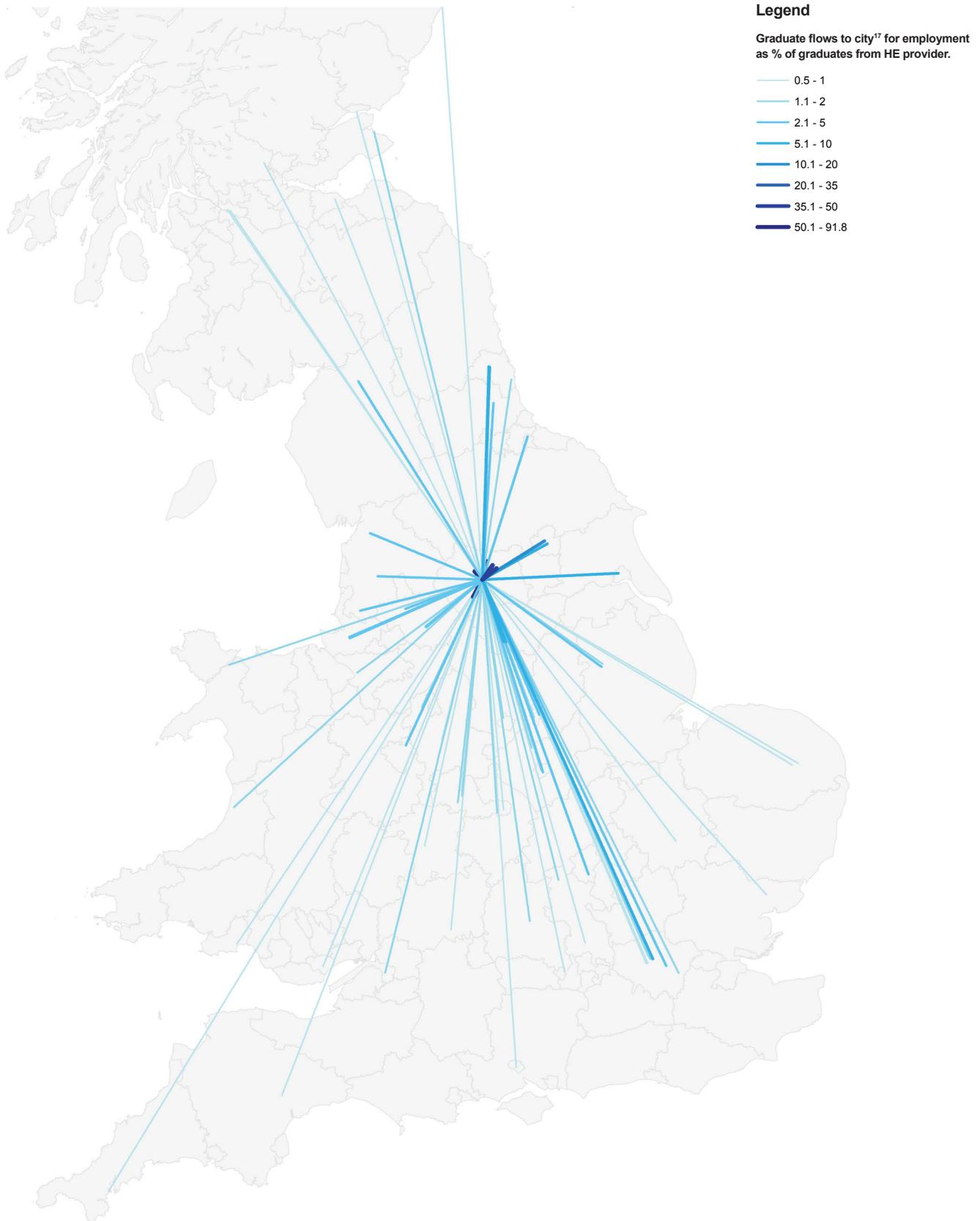
Proportional Flow Class	Higher Education Provider and Proportional Flow to Bristol			
Greater than 40%				
10% - 40%	Uni. of the West Of England, Bristol The University Of Bristol	21.1 18.5	Bath Spa University	12.1
5% - 10%				
2% - 5%	The University Of Bath Conservatoire For Dance And Drama University Of Gloucestershire Cardiff University Falmouth University London School Of Hyg. & Trop. Med.	4.9 4.8 4.6 3.8 3.8 2.7	The University Of Exeter Swansea University Cardiff Metropolitan University Cranfield University University Of St Mark And St John	2.6 2.5 2.3 2.3 2.1
1%-2%	Bournemouth University The Arts University Bournemouth The University Of Lancaster The University Of Sussex University Of South Wales Aberystwyth University The University Of Portsmouth The University Of Southampton The University Of Oxford	1.6 1.5 1.5 1.5 1.5 1.4 1.4 1.4 1.3	The University Of Birmingham The University Of Reading The University Of St Andrews The University Of Warwick Royal Academy Of Music Trinity Laban Conservatoire Of Music And Dance University Of Plymouth Southampton Solent University The University Of Sheffield	1.2 1.2 1.2 1.2 1.1 1.1 1.1 1 1

Fig 9c: Cardiff (Source: Duncan Smith, CASA UCL)

¹⁵ HESA data is only available at region/county level within which the indicated city is located for: Birmingham (West Midlands), Leeds (West Yorkshire), and Liverpool (Merseyside).

Proportional Flows of Graduates to Work in **Cardiff** (1% minimum cut off)

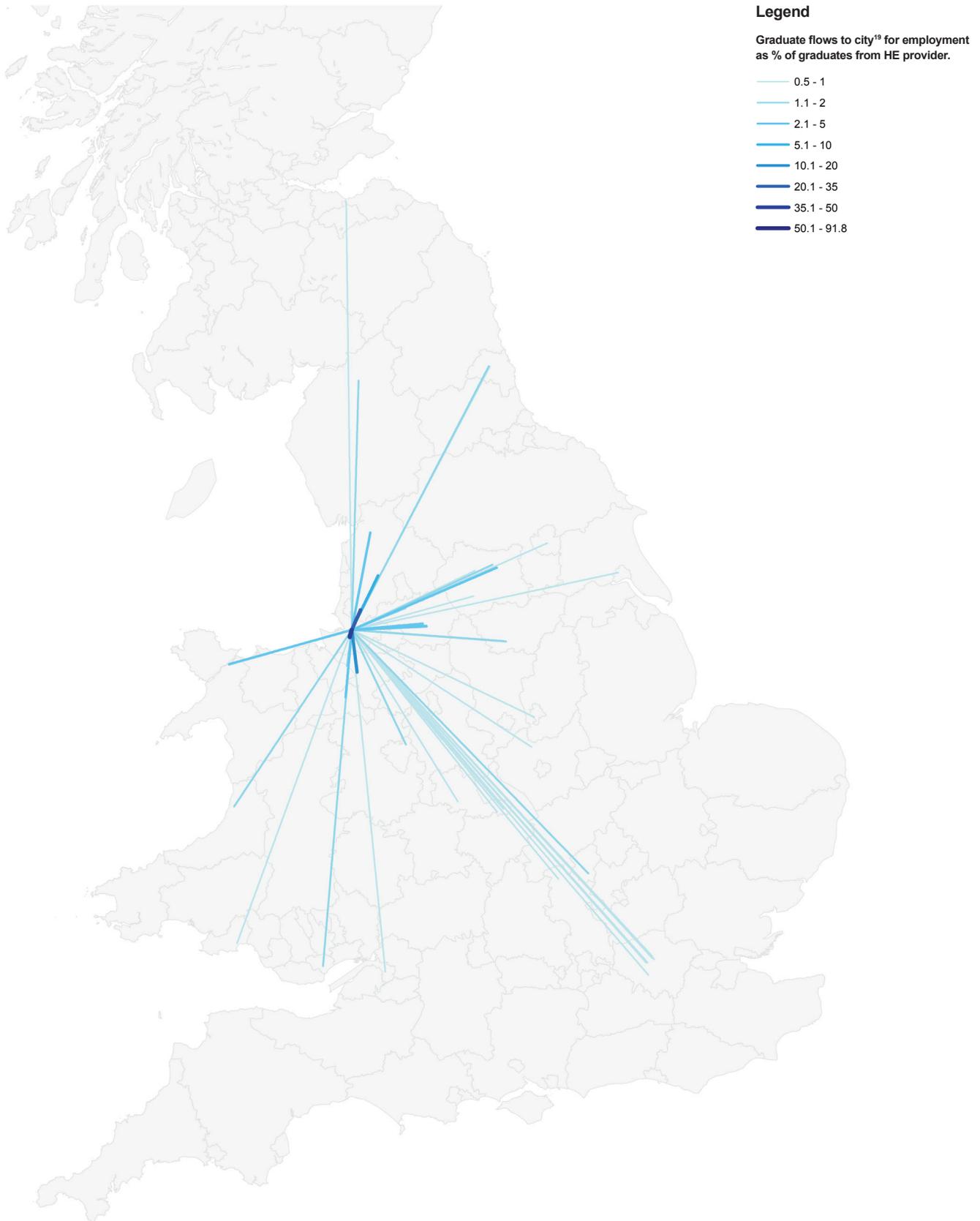
Proportional Flow Class	Higher Education Provider and Proportional Flow to Cardiff			
Greater than 40%				
10% - 40%	Cardiff Metropolitan University Cardiff University	29.5 20.9	University Of South Wales	19
5% - 10%	Swansea University	7.4		
2% - 5%				
1%-2%	Aberystwyth University Conservatoire For Dance And Drama Bath Spa University The University Of Bath	1.7 1.3 1.2 1.2	Uni. of the West Of England, Bristol The University Of Bristol Falmouth University University Of Gloucestershire	1.2 1.1 1 1

Fig 9d: Leeds (Source: Duncan Smith, CASA UCL)

¹⁷ HESA data is only available at region/county level within which the indicated city is located for: Birmingham (West Midlands), Leeds (West Yorkshire), and Liverpool (Merseyside).

Proportional Flows of Graduates to Work in **West Yorkshire (Leeds)** (1% minimum cut off)

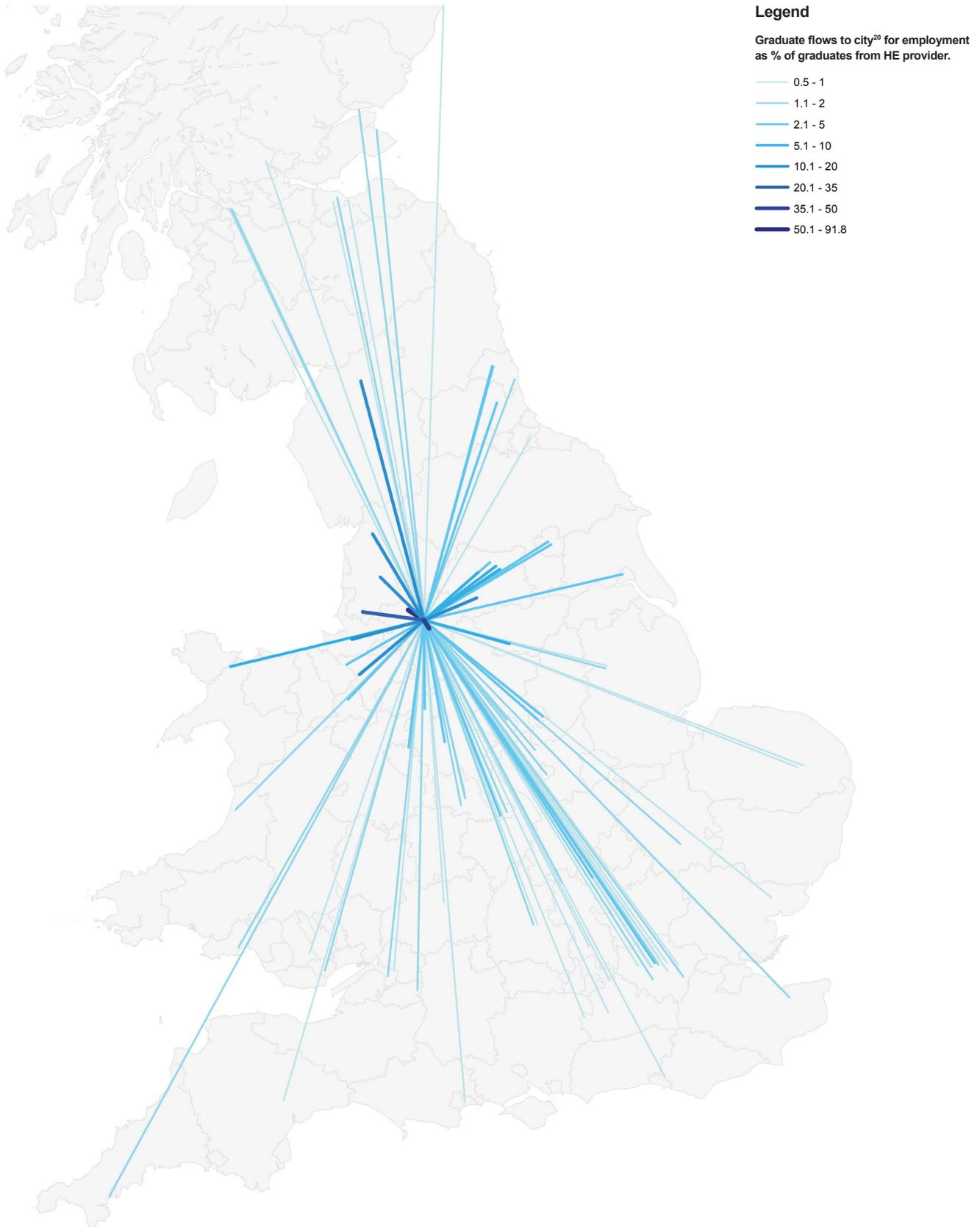
Proportional Flow Class	Higher Education Provider and Proportional Flow to West Yorkshire			
Greater than 40%	The University Of Bradford	61.5	Leeds Beckett University	42.9
	Leeds Trinity University	59.2	Leeds College Of Art	42.9
	The University Of Huddersfield	53.9		
10% - 40%	The University Of Leeds	33.6	York St John University	18.2
5% - 10%	The University Of York	8.6	The University Of Sheffield	5.3
	Sheffield Hallam University	6.9	University Of Newcastle-Upon-Tyne	5.3
	The University Of Hull	6.2	University Of Northumbria At Newcastle	5.2
	Conservatoire For Dance And Drama	6.1		
2% - 5%	Liverpool Inst. For Performing Arts	4.2	University Of Cumbria	3.2
	Royal Northern College Of Music	4.1	The University Of Liverpool	3.1
	Manchester Metropolitan University	4.1	The Open University	2.8
	The University Of Lancaster	4.1	The University Of Central Lancashire	2.5
	The University Of Lincoln	3.9	Edge Hill University	2.3
	Teesside University	3.5	Harper Adams University	2.3
	The University Of Bolton	3.3	The University Of Leicester	2.3
	The University Of Manchester	3.3	Trinity Laban Conservatoire Of Music And Dance	2.2
	University Of Durham	3.3	The Nottingham Trent University	2.1
	1%-2%	The University Of Salford	1.9	Aberystwyth University
The University Of Sunderland		1.9	De Montfort University	1.3
University Of Nottingham		1.9	The University Of Bristol	1.3
Bishop Grosseteste University		1.8	The University Of St Andrews	1.2
Liverpool John Moores University		1.8	University Of Derby	1.2
University Of Chester		1.8	London School Of Hygiene And Tropical Medicine	1.1
Loughborough University		1.7	Royal Academy Of Music	1.1
Rose Bruford College		1.7	The University Of Keele	1.1
The University Of Buckingham		1.7	The University Of Oxford	1.1
The University Of Warwick		1.7	Imperial College	1
Bangor University		1.6	The University Of Cambridge	1
Aston University		1.5	The University Of Exeter	1
The University Of Birmingham		1.5		

Fig 9e: Liverpool (Source: Duncan Smith, CASA UCL)

¹⁹ HESA data is only available at region/county level within which the indicated city is located for: Birmingham (West Midlands), Leeds (West Yorkshire), and Liverpool (Merseyside).

Proportional Flows of Graduates to Work in **Merseyside (Liverpool)** (1% minimum cut off)

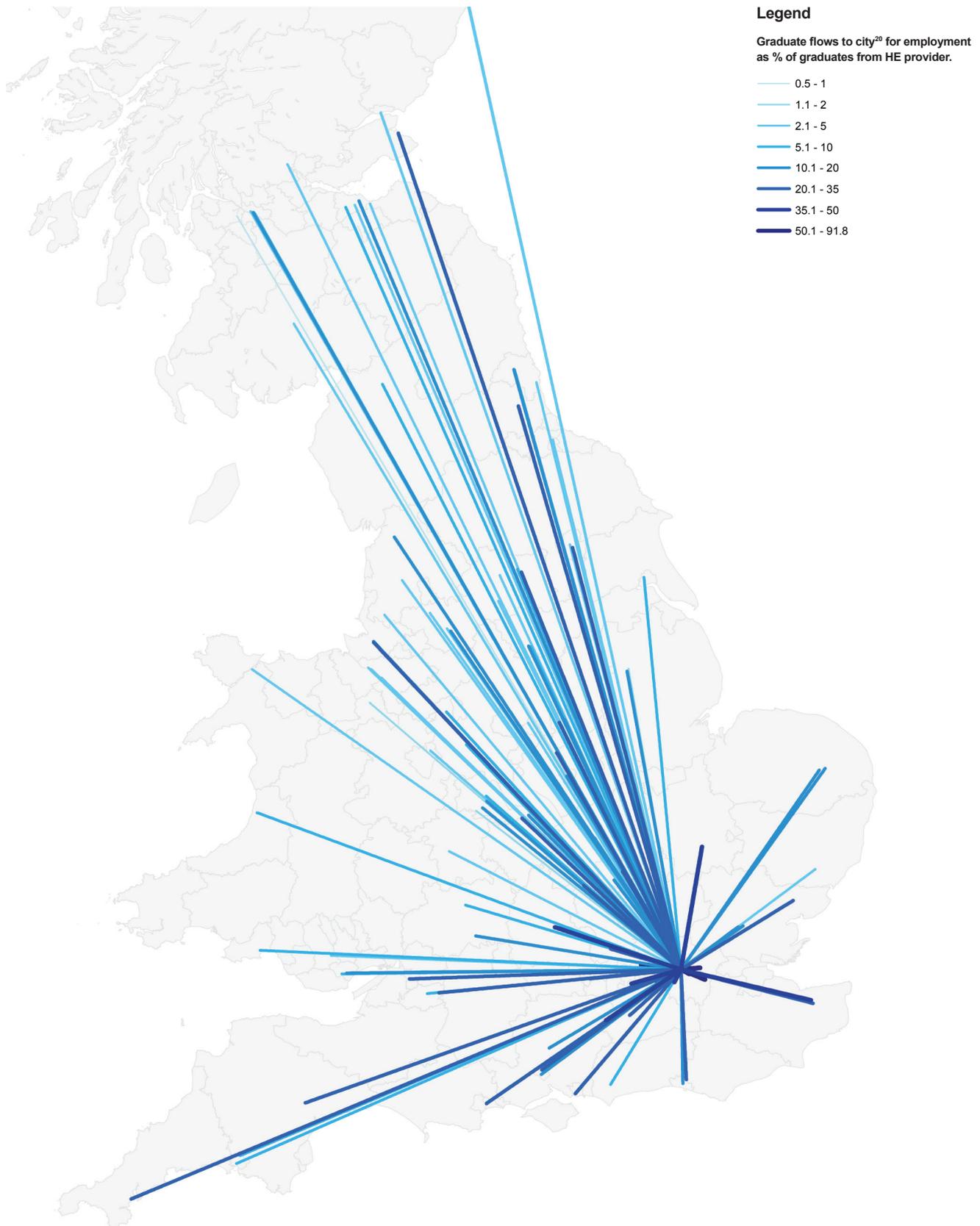
Proportional Flow Class	Higher Education Provider and Proportional Flow to Merseyside			
Greater than 40%	Liverpool John Moores University	45.5		
10% - 40%	Liverpool Inst. For Performing Arts Edge Hill University	33.1 32.7	The University Of Liverpool University Of Chester	31.3 14.1
5% - 10%	The University Of Central Lancashire	6.3		
2% - 5%	The University Of Salford Bangor University The University Of Lancaster Manchester Met. University	3.5 3.2 3.2 3	Leeds College Of Art The University Of Manchester Glyndwr University	2.6 2.6 2.5
1%-2%	The University Of Bolton The University Of Sheffield Leeds Beckett University Harper Adams University University Of Newcastle-Upon-Tyne Cardiff University Sheffield Hallam University	1.9 1.6 1.5 1.4 1.3 1.2 1.2	The University Of Leeds University Of Cumbria Aberystwyth University The Open University Staffordshire University Stranmillis University College The University Of Keele	1.2 1.2 1.1 1.1 1 1 1

Fig 9f: Manchester (Source: Duncan Smith, CASA UCL)

²⁰ HESA data is only available at region/county level within which the indicated city is located for: Birmingham (West Midlands), Leeds (West Yorkshire), and Liverpool (Merseyside).

Proportional Flows of Graduates to Work in **Manchester** (1% minimum cut off)

Proportional Flow Class	Higher Education Provider and Proportional Flow to Manchester			
Greater than 40%	University Of Bolton	72.3	Royal Northern College Of Music	41.3
	University Of Salford	64.1	The University Of Manchester	40.4
	Manchester Metrop. University	47.8		
10% - 40%	Edge Hill University	22.7	Liverpool John Moores Uni.	10.8
	University Of Central Lancashire	17.8	The University Of Lancaster	10.7
	The University Of Huddersfield	12	University Of Chester	10.6
	University Of Cumbria	10.9		
5% - 10%	The University Of Liverpool	9.4	Bangor University	5.6
	Leeds Beckett University	7.3	The University Of Bradford	5.5
	Sheffield Hallam University	6.1	Leeds College Of Art	5.2
	The University Of Leeds	5.7	Liverpool Inst. For Performing Arts 5.1	
	The University Of Sheffield	5.7		
2% - 5%	Staffordshire University	3.9	The Open University	2.7
	Royal Academy Of Music	3.4	University Of Durham	2.6
	The University Of Keele	3.4	The University Of Warwick	2.4
	The University Of Hull	3.3	Glyndŵr University	2.3
	The University Of York	3.1	St Mary's University College	2.3
	York St John University	3.1	Harper Adams University	2.1
	Leeds Trinity University	2.8	The Nottingham Trent University	2
	Uni. Of Newcastle-Upon-Tyne	2.8	University Of Derby	2
	University Of Nottingham	2.8	Uni.Of Northumbria At New.	2
1%-2%	Aberystwyth University	1.9	The University Of Edinburgh	1.3
	Loughborough University	1.9	Courtauld Institute Of Art	1.2
	The University Of Oxford	1.9	Coventry University	1.2
	The University Of St Andrews	1.9	Falmouth University	1.2
	Glasgow School Of Art	1.8	The University Of Bristol	1.2
	The University Of Leicester	1.8	The University Of Buckingham	1.2
	Rose Bruford College	1.7	The University Of Cambridge	1.2
	The University Of Birmingham	1.7	The University Of Lincoln	1.2
	London School Of Hyg. And Trop. Med.	1.6	Cardiff University	1.1
	St George's Hospital Med. Sch.	1.5	The University Of Bath	1.1
	Aston University	1.4	The University Of Kent	1.1
	Birmingham City University	1.3	De Montfort University	1
	Swansea University	1.3	Teesside University	1
	The University Of Dundee	1.3	The University Of Sunderland	1
			University For The Creative Arts	1

Fig 9g: London (Source: Duncan Smith, CASA UCL)

²⁰ HESA data is only available at region/county level within which the indicated city is located for: Birmingham (West Midlands), Leeds (West Yorkshire), and Liverpool (Merseyside).

Proportional Flows of Graduates to Work in London (5% minimum cut off)

Proportional Flow Class	Higher Education Provider and Proportional Flow to London			
Greater than 80%	Royal College Of Art	91.8	Goldsmiths College	82.8
	London Business School	90.8	The University Of Westminster	82.1
	London School Of Economics	85.9	Ravensbourne	81.3
	Courtauld Institute Of Art	85.5	University Of The Arts, London	80.4
	Birkbeck College	84	Middlesex University	80.2
	SOAS	83.6		
70% - 80%	London Metropolitan University	79.8	Guildhall School Of Music And Drama	75.8
	London South Bank University	79.6	Rose Bruford College	73.5
	The University Of East London	79.6	University College London	70.8
	The City University	79.3		
60% - 70%	Central School Of Speech And Drama	69.9	Queen Mary University Of London	65.3
	Royal College Of Music	69.6	Trinity Laban Conserv. Of Music And Dance	65.2
	The Institute Of Cancer Research	69.6	The University Of Greenwich	65
	Roehampton University	69.5	Brunel University London	64.1
	King's College London	69.1	The University Of West London	63.2
	London School Of Hygiene & TM	68.4	St Mary'S University, Twickenham	61.1
	Kingston University	66.7	Imperial College	61
	UoL (Institutes And Activities)	65.4	Conservatoire For Dance And Drama	60.4
50% - 60%	Heythrop College	57.3	Royal Academy Of Music	57.3
40% - 50%	Royal Holloway And Bedford New College	49.4	University For The Creative Arts	43.4
	St George's Hospital Medical School	46.8	The University Of Cambridge	40.2
	The University Of Oxford	44.3		
30% - 40%	The University Of Kent	38.7	The University Of Surrey	32.5
	Buckinghamshire New University	34.6	The University Of Bath	31.9
	The University Of Sussex	33.8	University Of Durham	31.8
	University Of Hertfordshire	33.5	Cranfield University	30.4
	The University Of St Andrews	33	The University Of Warwick	30.4
20% - 30%	The University Of Bristol	29	University Of Nottingham	24.8
	The Arts University Bournemouth	28.8	Falmouth University	24.2
	Loughborough University	28.4	Canterbury Christ Church University	22
	The University Of Essex	27.2	The Liverpool Institute For Performing Arts	22
	The University Of Buckingham	27	The University Of Portsmouth	21.6
	The University Of Reading	27	The University Of Southampton	20.8
	The University Of Exeter	26.4	The University Of York	20.6
	The University Of Leeds	24.8	Bournemouth University	20
10% - 20%	The University Of Brighton	19.7	Royal Agricultural University	15.4
	Leeds College Of Art	19.5	The University Of East Anglia	15.1
	Norwich University Of The Arts	19.2	University Of Newcastle-Upon-Tyne	15.1
	Southampton Solent University	19.1	The Open University	14.7
	University Of Bedfordshire	19	Coventry University	14.1
	Aston University	18.9	De Montfort University	14
	Oxford Brookes University	18.7	The University Of Edinburgh	13.4
	The Nottingham Trent University	18.7	Glasgow School Of Art	13.3
	The University Of Leicester	18.7	The Royal Veterinary College	13
	The University Of Manchester	18.7	The University Of Lancaster	12.6
	Writtle College	18	Cardiff University	12.2
	Anglia Ruskin University	17.7	The University Of Liverpool	11.6
	The University Of Birmingham	17.4	The University Of Lincoln	10.4
	The University Of Sheffield	16.9	The University Of Winchester	10.1
5% - 10%	University Of The West Of England, Bristol	9.9	University Of Cumbria	7.7
	The University Of Chichester	9.8	The University Of Keele	7.6
	Royal Conservatoire Of Scotland	9.7	University Of Gloucestershire	7.6
	Swansea University	9.2	University Of Plymouth	7.6
	Royal Northern College Of Music	9.1	Manchester Metropolitan University	7.2
	The University Of Northampton	9.1	University Of Northumbria At Newcastle	6.5
	Aberystwyth University	8.5	Heriot-Watt University	6.4
	Bath Spa University	8.5	Cardiff Metropolitan University	5.9
	Leeds Beckett University	8.1	Staffordshire University	5.8
	The University Of Hull	8	University Of St Mark And St John	5.4
	Birmingham City University	7.8	Sheffield Hallam University	5.1

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