2: The spatial characteristics of London

2.1 Key points

- A number of different geographies can be used to examine London depending on what issue is of interest such as London's administrative geography, its Functional Urban area, its connected built up area etc.

- Agglomeration has led to a large clustering of economic activity in London, particularly in the area of the Central Activities Zone and the northern part of the Isle of Dogs.

- It is calculated that the output of the Central Activities Zone, northern part of the Isle of Dogs and a 1km fringe around them stood at just over £188 billion in 2014, accounting for nearly 52 per cent of London's output and just under 12 per cent of UK output from an area of land covering just 0.03 per cent of the UK[1].

- Significant concentrations of employment can also be seen in Central London which have grown over time, but with other areas such as Heathrow and Croydon also being important areas of employment in London. Important hubs of employment are seen across London and not just within Inner London.

- London represents a significant share of employment in the Greater South East accounting for just over 42 per cent of employee jobs in 2015.

- Distinct clusters of sectors by employment are seen within London with Financial and insurance activities, and Professional, scientific and technical activities being of importance in Inner London; while employment in the Transportation and communication sector is generally more significant in Outer London.

- London is a dynamic business area containing the greatest number of active enterprises of any UK nation or region and nearly one fifth of all UK enterprises. However, in terms of firms migrating into and out of London the capital has seen more firms move out than move in from the Greater South East and the rest of the UK in recent years. Although, the firms lost are more than made up for by new firm start-ups.

2.2 Introduction

Urbanisation and the trade of goods and services often go hand in hand. Cities benefit from agglomeration economies, external benefits that arise when economic activity takes place in a concentrated space. The spatial nature of London's economy is the product of hundreds of years of trade and agglomeration at work. Central London is, and will likely remain, the most significant employment centre in the Greater South East region, with over two million jobs in the Central Activities Zone, Northern Isle of Dogs and their fringes alone. London's specialised, globally competitive activities tend to locate here, and in fact some locate almost exclusively in central London because they benefit so greatly from agglomeration economies. Meanwhile, those in London's outer boroughs provide a support function to other businesses in the region as part of a complex network of businesses, while also fulfilling the needs of London's many residents. This chapter considers aspects of the spatial nature of London's economy, including its relationship with surrounding regions.

2.3 London: its evolution and relationship to its neighbours

This section examines the evolution of London's population, to give a background to its changing geography. It then looks at different definitions of London itself such as the boundaries of Greater London, travel to work areas etc. and shows that more than the official administrative boundaries of Greater London may be necessary when thinking about the geography of the capital.

London has long had a large and often growing population as shown by Table 2.1 and this has meant that setting a geographic definition of London has always been more difficult than it may first appear. Thus in bygone times would London be defined as just the City of London or should it also have included neighbouring populations in Southwark and Westminster? Where the exact boundary of London lies remains a question to this day. In order to best understand the capital, different definitions of where London starts and ends are appropriate, so that they best reflect the issue that is being considered.

Table 2.1: World's largest cities, 1500-1900 (inhabitants, millions)

	1500		1600		1800		1900		2015	
1	Beijing	0.7	Beijing	0.7	Beijing	1.1	London	6.5	Shanghai	24.3
2	Istanbul	0.7	Istanbul	0.6	London	1.1	New York	4.2	Karachi	23.5
3	Vijayanagar (India)	0.5	Agra	0.5	Guangzhou	0.8	Paris	3.3	Beijing	21.5
4	Cairo	0.4	Osaka	0.4	Tokyo	0.7	Berlin	2.7	Delhi	16.8
5	Tabriz (Iran)	0.3	Kyoto	0.3	Istanbul	0.6	Chicago	1.7	Lagos	16.1
	London	0.06	London	0.2					London	8.6

Source: Tertius Chandler, (1987), Four Thousands Years of Urban Growth via London 2036: an agenda for jobs and growth[2] (1500–1900); Wikipedia and London Datastore (2015)

A number of definitions of London's boundaries exist with a few of these summarised below. It should be noted that each definition of London has their advantages and disadvantages, with some providing ease of international comparison and others providing insights into London's true economic spread. Thus which boundaries are used in any analysis will be partly dependent on the type of question asked, however in this analysis, given the GLA's statutory responsibilities, the definition of London mostly used in this report will be that of the administrative boundaries of Greater London.
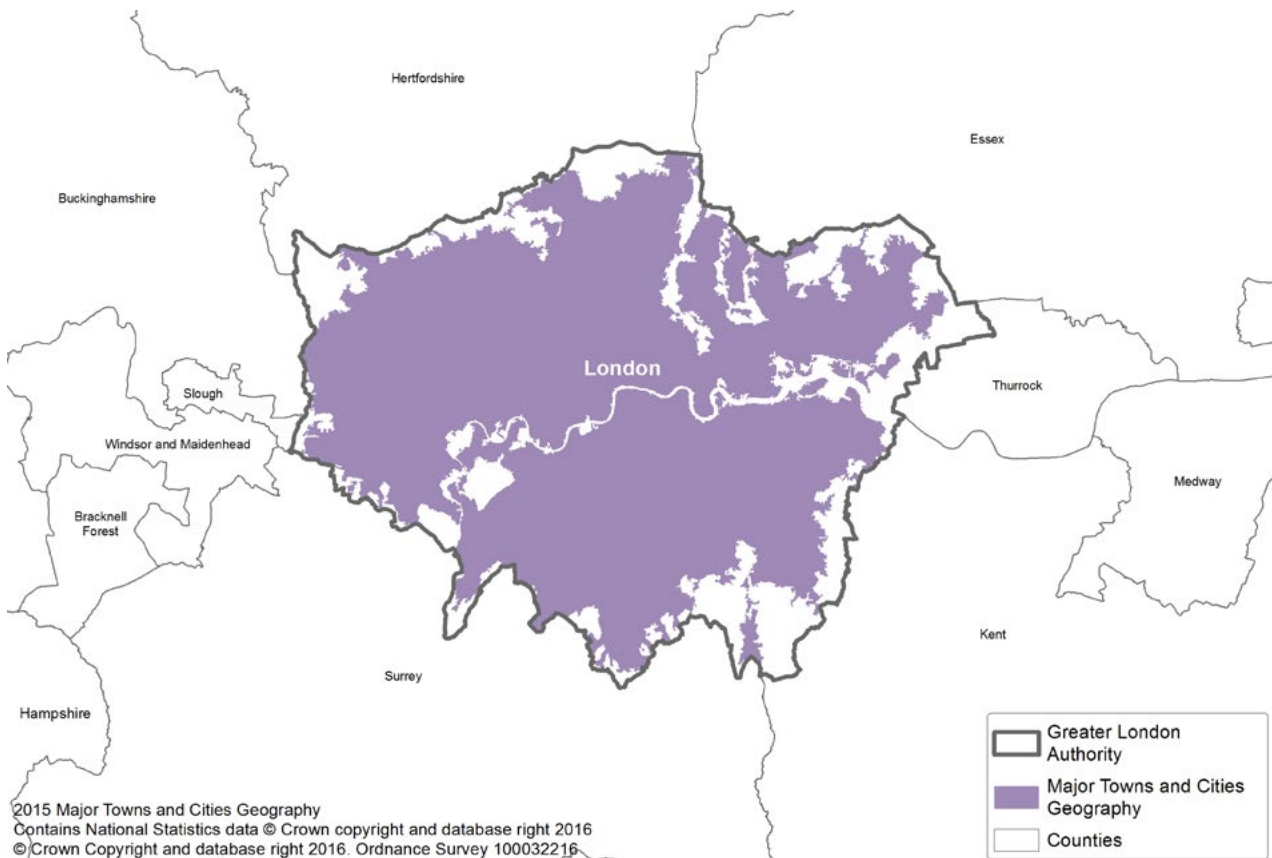
For administrative purposes London is defined as the Greater London area which covers 33 constituent local authorities (LAs) (32 boroughs surrounding the nucleus of the City of London) and is shown in Map 2.1. However, looking at London's administrative boundaries may lead to an impression that all of this area is developed when in fact a significant portion of land within London is green space. Thus a different definition of London can be given by just looking at London's 'core' built-up geography as defined by the Office for National Statistics' (ONS) Major Towns and Cities methodology[3] which is shown in Map 2.2.

Map 2.1: Greater London and its constituent local authorities

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London Boroughs

Source: GLA Intelligence Unit

Map 2.2: London's 'core' geography

2015 Major Towns and Cities Geography
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Greater London Authority

Major Towns and Cities Geography
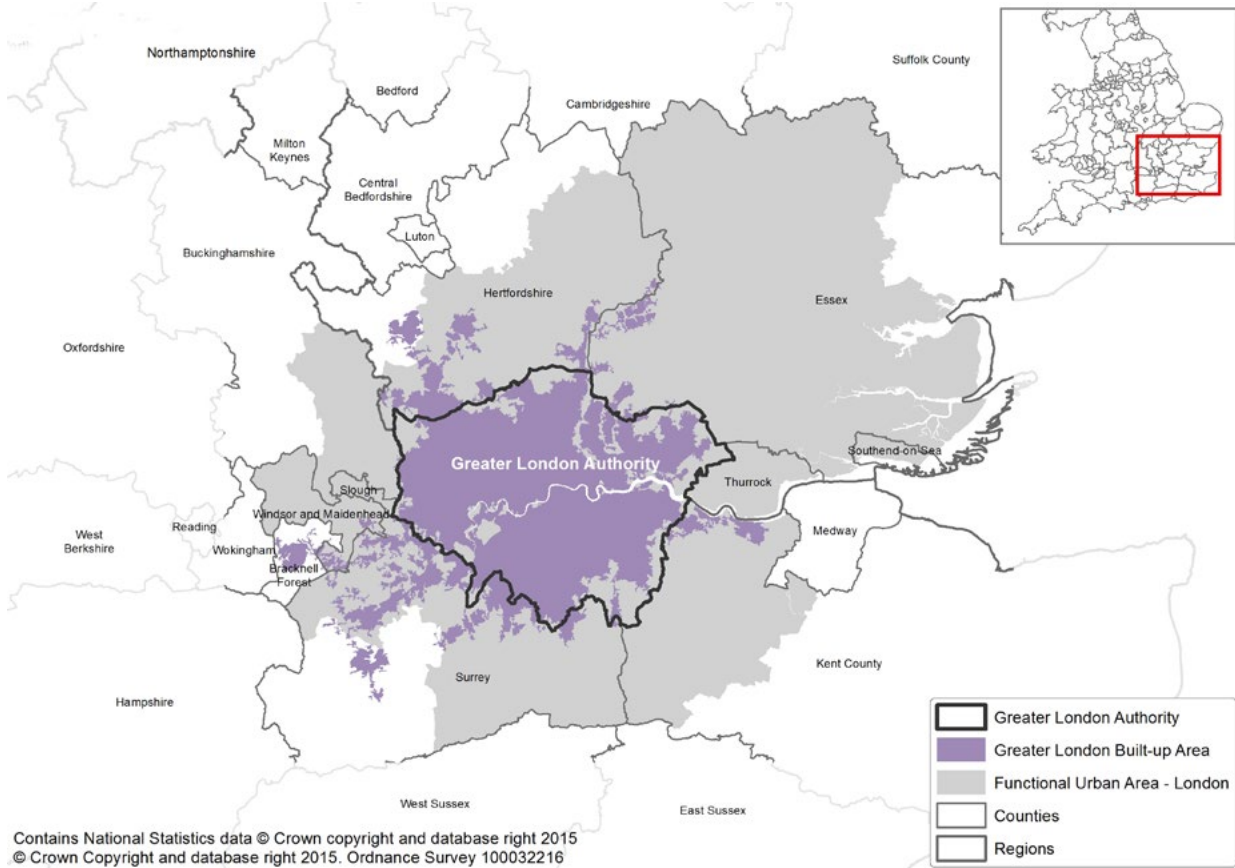
Counties

Source: GLA Intelligence Unit

Another way of looking at London is via its reach which goes beyond its official administrative boundary. This is illustrated by other definitions. For instance its built form illustrates how its social impact goes wider than its official boundaries. This is shown in Map 2.3 which shows London's connected built-up or metropolitan areas which extend beyond the defined boundaries of the Greater London area, demonstrating that development has extended beyond these administrative boundaries.

London draws people to work within it from far and wide and so another way of defining London would be by those dependent on it for work whether or not they live within its administrative boundaries. This can be shown by its travel to work area (TTWAs). This is, as noted by the ONS in its current definition of TTWAs, defined generally by "at least 75 per cent of an area's resident workforce work in the area and at least 75 per cent of the people who work in the area also live in the area. The area must also have a working population of at least 3,500. However, for areas with a working population in excess of 25,000, self-containment rates as low as 66.7 per cent are accepted. TTWA boundaries are non-overlapping, are contiguous and cover the whole of the UK. TTWAs do cross national boundaries, although no account is taken of commuting between Northern Ireland and the Republic of Ireland"[4]. Maps 2.4 a to c show the UK's, parts of the Greater South East's and London's TTWAs. As can be seen London's TTWA extends eastward beyond its administrative boundaries toward Tilbury and Gravesend and northwards towards Harlow. Interestingly, a significant part of West London including Heathrow is not a part of the London TTWA, but has its own TTWA called Heathrow and Slough. Whilst not in the London TTWA, arguably Heathrow and Slough TTWA should be considered as part of London given much of it lies within the city's boundaries.

Further, it should be noted that the above discussed TTWAs are for the entire working population; however sub groups of the working population may have significantly different TTWAs[5]. Thus the ONS in recent research has highlighted that in the case of workers that commute by train there exists a TTWA that "covers close to the entire East and South East of England"[6]. They further observe that the size and number of TTWAs in the UK varies depending on whether part-time or full-time workers are being examined and note that "London is captured in one TTWA for full-time employees, however is split across 4 TTWAs for part-time employees"[7]. Varying size and numbers of TTWAs also hold for workers in different age groups with London generally forming "one large TTWA for the 16 to 24, 25 to 34 and 35 to 49 age groups; however, for the older age groups London is divided into smaller TTWAs"[8].
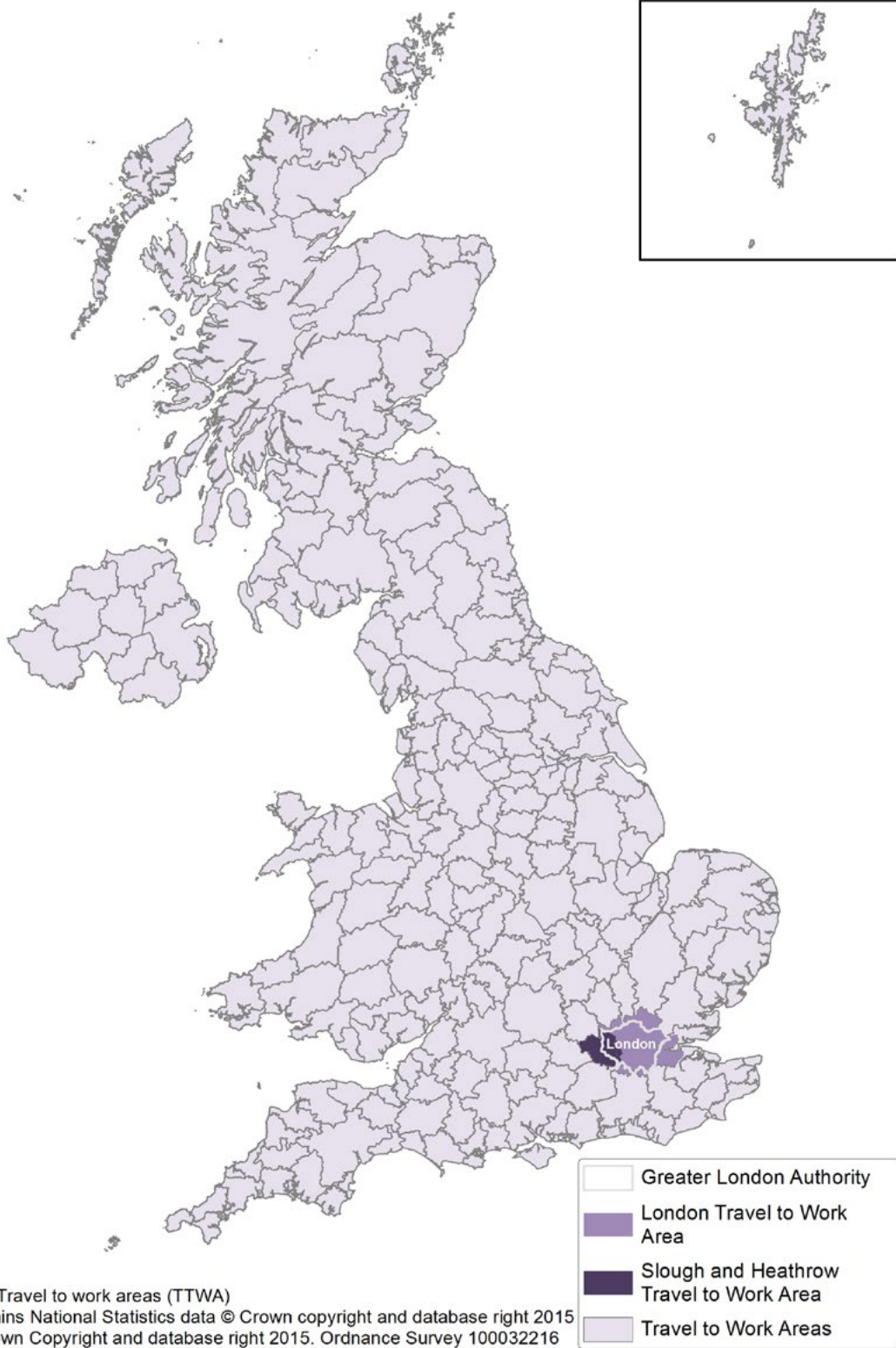
Map 2.3 shows another attempt at encapsulating the economic reach of the capital with it showing London's Functional Urban Area[9], which is a definition that allows international comparisons between cities, by covering the wider area over which London's economic impact is thought to extend. Its use in comparisons across European urban areas is that it provides a consistent international standardised definition of a city and then goes on to define its commuting zone in a way that allows for like for like comparisons that do not depend on arbitrary national definitions of either a city or their surrounding economic geography. Finally, it should also be noted that Maps 3.3 to 3.6 in the next chapter of this Evidence Base show the commuter flows into London from areas outside of Greater London and thus highlight how large areas of the Greater South East are influenced by London.

Map 2.3: Greater London's connected built-up area and functional urban area
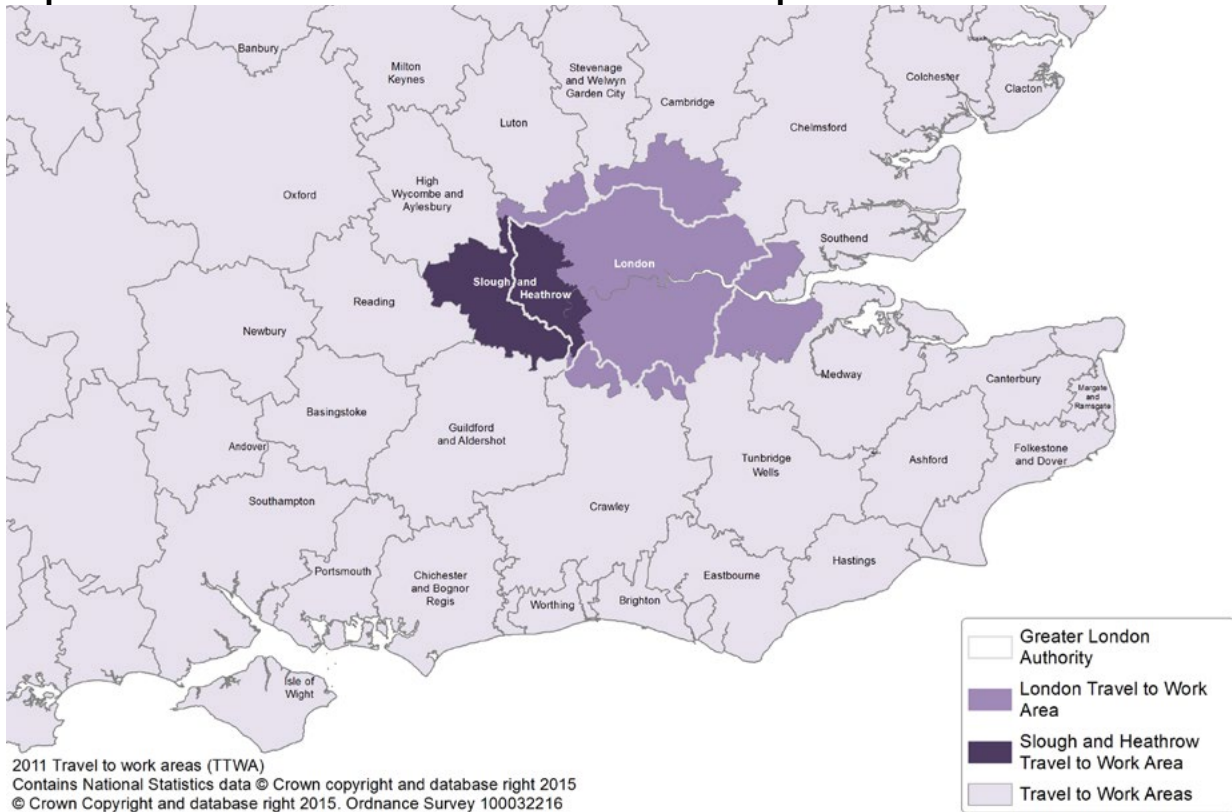

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Source: GLA Intelligence Unit

Map 2.4a: United Kingdom 2011 Travel to Work areas

Greater London Authority

London Travel to Work Area

Slough and Heathrow Travel to Work Area

Travel to Work Areas

2011 Travel to work areas (TTWA)
Contains National Statistics data © Crown copyright and database right 2015
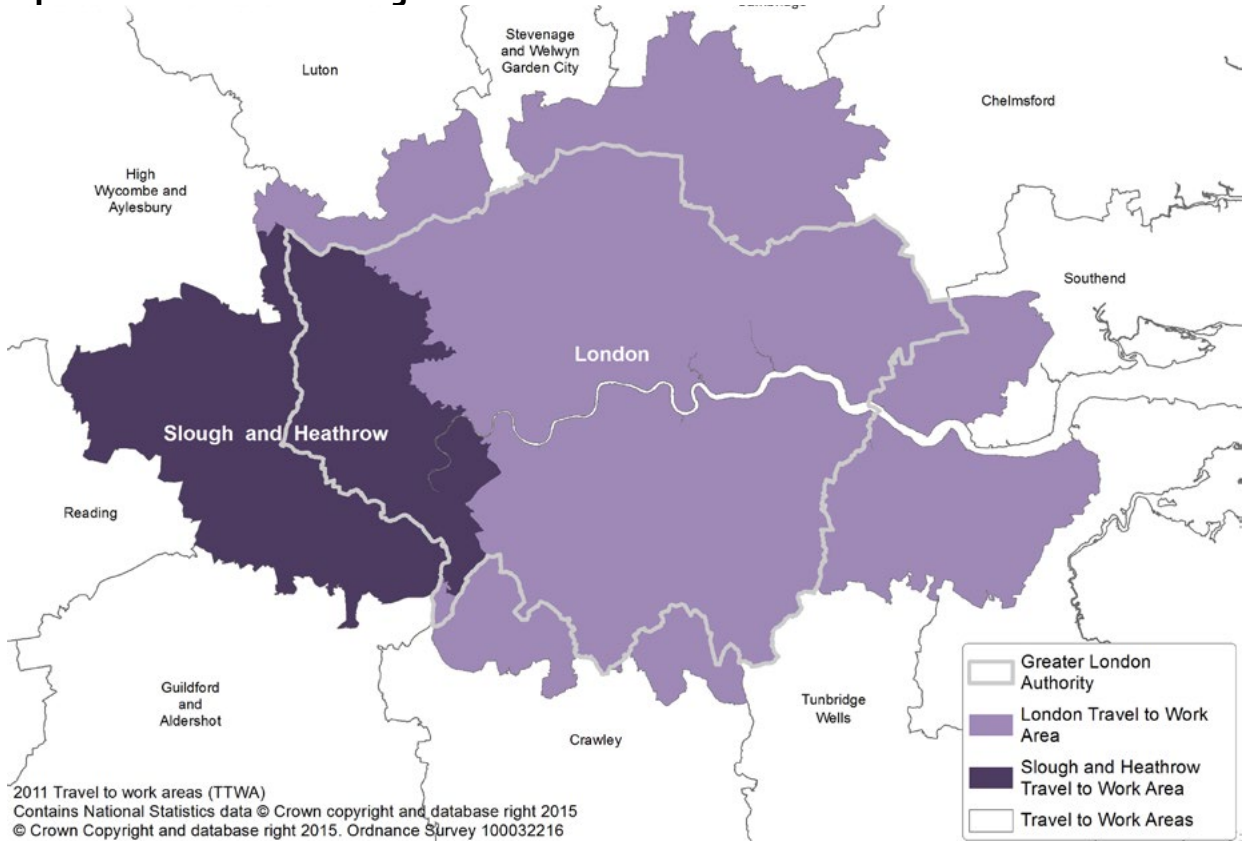© Crown Copyright and database right 2015. Ordnance Survey 100032216

Source: ONS & GLA Intelligence Unit

Map 2.4b: Travel to Work Areas in 2011 with a focus on part of the Greater South East
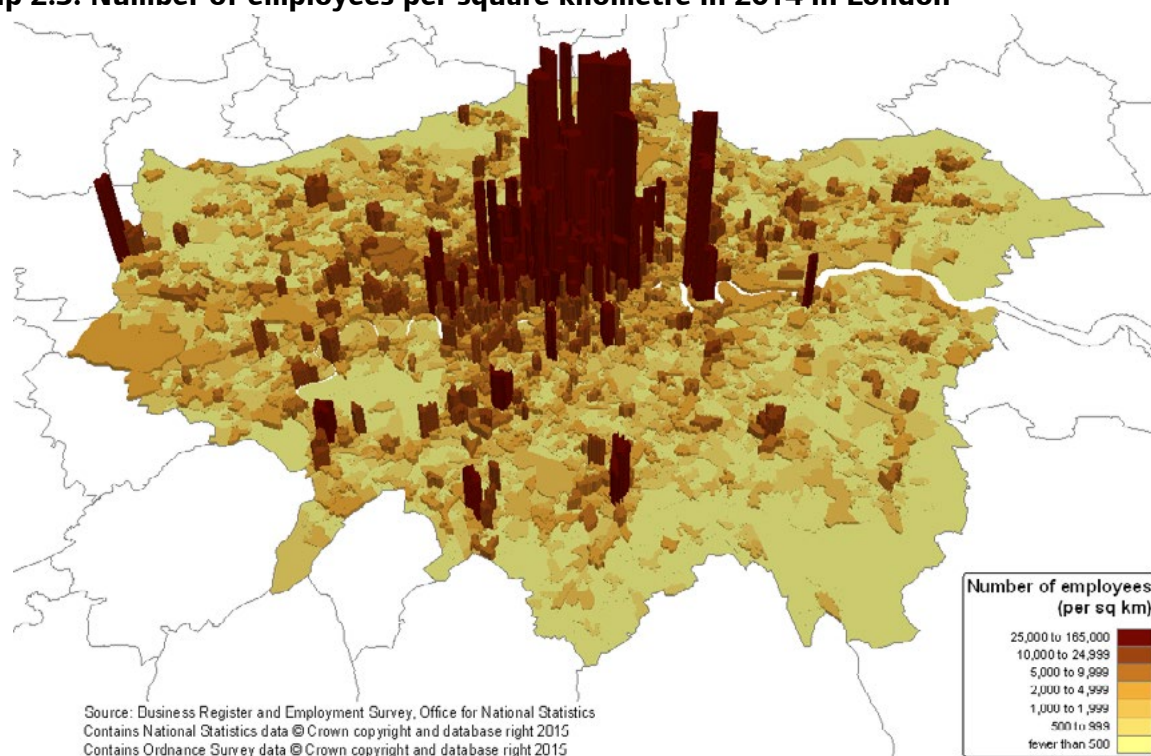

2011 Travel to work areas (TTWA)
Contains National Statistics data © Crown copyright and database right 2015
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Source: ONS & GLA Intelligence Unit

Map 2.4c: London's and Slough and Heathrow's 2011 Travel to Work Areas

2011 Travel to work areas (TTWA)
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Source: ONS & GLA Intelligence Unit

Having observed that London's reach or spatial impact can be defined in many ways it should be noted that particular (and many) functions of London's economy have tended to locate in certain areas of London – particularly central London leading to very high employment densities as shown by Map 2.5.

Map 2.5: Number of employees per square kilometre in 2014 in London

Source: Business Register and Employment Survey, Office for National Statistics
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Contains Ordnance Survey data © Crown copyright and database right 2015

Number of employees
(per sq km)

25,000 to 165,000
10,000 to 24,999
5,000 to 9,999
2,000 to 4,999
1,000 to 1,999
500 to 999
fewer than 500

Source: Business Register and Employment Survey (BRES)

Central London offers a range of factors that are not found in combination in many other places. As shown by a number of surveys[10] on a range of factors, businesses see London as the best place in Europe to locate – with the top one of these being availability of qualified staff (see Chapter 5 for more details on this). A large number of firms therefore locate themselves within central London with 40 per cent of the world's largest 250 companies basing their European headquarters in London. London's nearest European rival is Paris with 8 per cent[11]. This concentration of businesses at the centre of London brings benefits to the economy over and above those that accrue to the individual firms themselves: agglomeration benefits[12]. These agglomeration benefits are the positive externalities which arise when specialised economic activity takes place in a spatial concentration – such as in central London. The four key elements of agglomeration are: labour, specialised inputs, knowledge, and the market.

Such agglomeration benefits support the development of economic activity by providing firms with access to a deep and highly-skilled labour force, a range of complementary input and output markets and the benefits of spill over effects such as the rapid transfer of innovation and knowledge. These agglomeration benefits are also greater in certain industries such as Finance, Insurance and Business services[13], as outlined in Chapter 1 of this Evidence Base.

The economies of agglomeration have a degree of circular causality – existing spatial concentration results in forces that encourage further spatial concentration. The productivity benefits of high employment density, within industries, across geography and over time, are found in cities across the world. The development of London's radial public transport network has enabled the growth of central London by reducing the cost of accessibility to a significant proportion of the region's population; the implementation of the various transport projects such as Crossrail and High Speed 2 (HS2) will advance this accessibility further.

It should also be noted that these agglomeration economies in the centre of the city have wide impacts outside of central London through 'chains of substitution'. As a result a good understanding of the factors driving economic activity in central London can aid in the understanding of the economic drivers of other areas of the capital and beyond. Finally, although beneficial to the city's economy, agglomeration economies can also lead to costs within London in terms of increased congestion and competition for space, between businesses seeking to maximise the benefits of agglomeration, and increased demand for housing from people working in these areas. These costs are examined in more detail later in this chapter and also in Chapters 4 (where the impact on land use is considered), 6 (where the risks to London's economy is considered), 7 (where the impact on London's environment is considered) and 10 (where the social impacts are considered) of this Evidence Base.

2.4 The Central Activities Zone, Northern Isle of Dogs and their fringes

It can be seen that a geography of particular importance to not only London or the UK as a whole but arguably Europe in general is London's Central Activities Zone (CAZ). As noted the CAZ contains a unique cluster of activities including central government offices, headquarters and embassies, and a large concentration of business activity, with many businesses clustering by industry sector. This clustering also occurs in the northern part of the Isle of Dogs[14] (NIOD) and may further bleed into a fringe surrounding the CAZ and the NIOD. This section sets out to examine the economy of this dynamic area in detail[15].

2.4.1 The output of the CAZ

Given the economic activity that is easily observable and concentrated in the CAZ, the NIOD and their fringes it is likely that these areas are responsible for a large proportion of London's output. However, official measures of output for the CAZ, its fringe, the NIOD and its fringe are not available from the ONS. Data is however now available at borough level[16]. GLA Economics has thus used this data to produce estimates of output in the CAZ; the results of this analysis are given in Table 2.2, although it should be emphasised that these numbers are estimates based on GLA Economics' calculations and are not official ONS statistics.

Table 2.2: Calculations of GVA (I) generated within the CAZ, NIOD, and their approximately 1km fringes in 2014 (£ million rounded to the nearest £10 million)

Area	GVA (£ million)	Areas GVA as a % of London's total GVA	Areas GVA as a % of the UK's total GVA
CAZ	145,600	40.0%	9.0%
CAZ 1km Fringe	23,210	6.4%	1.4%
NIOD	17,380	4.8%	1.1%
NIOD 1km Fringe	2,120	0.6%	0.1%
CAZ & NIOD	162,980	44.7%	10.1%
CAZ, NIOD & a 1km Fringe	188,310	51.7%	11.6%

Source: ONS, BRES and GLA Economics' calculations

Given that in 2014 London's GVA stood at £364,310 million, these estimates would suggest that the CAZ accounted for nearly 40 per cent of London's GVA. While they further suggest that the CAZ and NIOD accounted for nearly 45 per cent of London's GVA and the CAZ, NIOD and the 1 km fringe around these areas accounted for nearly 52 per cent of London's GVA. UK GVA stood at £1,618,346 million in 2014 implying that the CAZ, NIOD and their fringes accounted for just under 12 per cent of UK GVA from a land area accounting for just 0.03 per cent of the UK's land mass.

2.4.2 Employment in the CAZ and NIOD

The CAZ along with the NIOD and the immediate areas that border them are also home to a large number of jobs, as shown in Table 2.3 which show the evolution of employee jobs in the CAZ, NIOD and their approximately 1 km fringes over the years 2009 to 2014. There was a large increase in employees within this area over the six years under consideration, with the numbers of employees increasing at a faster rate in the CAZ, NIOD and their fringes compared to the increases seen in London as a whole. It should be noted that employee growth in the NIOD was particularly strong with it increasing from around 98,000 in 2009 to around 131,000 in 2014 an increase of over 34 per cent. In terms of the total number of employees in London, the CAZ accounts for around 36 per cent, with this increasing to 38 per cent when the NIOD is included, and around 45 per cent when their respective fringes are taken into account. Given the calculation that the CAZ, NIOD and their fringes account for 52 per cent of London's output this employee figure would imply that employees in this area are generally more productive than the London average.

Table 2.3: Employees in the CAZ, NIOD, and an approximately 1km fringe around them and London in 2009 to 2014 (million) and their growth over those years (% change)

	2009	2010	2011	2012	2013	2014	Areas Share of London total in 2014	Change from 2009 to 2014
CAZ	1.42	1.46	1.51	1.55	1.61	1.68	35.5%	18.3%
CAZ 1km Fringe	0.27	0.28	0.29	0.30	0.30	0.31	6.6%	13.9%
NIOD	0.10	0.10	0.12	0.12	0.13	0.13	2.7%	34.4%
NIOD 1km Fringe	0.02	0.03	0.03	0.03	0.03	0.03	0.6%	20.5%
CAZ & NIOD	1.52	1.55	1.63	1.67	1.74	1.81	38.3%	19.3%
CAZ, NIOD & their 1km Fringes	1.82	1.86	1.95	2.00	2.07	2.15	45.5%	18.5%
London	4.14	4.21	4.30	4.45	4.56	4.73	100.0%	14.2%

Source: BRES

The nature of employees in the CAZ, NIOD and their fringes is, as could be expected, heavily concentrated in a few sectors as shown by Table 2.4, with Professional, scientific and technical being particularly important. The five sectors considered in Table 2.4 accounted for around 65 per cent of all employees in the CAZ in 2014, 66 per cent of employees in the CAZ & NIOD, and 63 per cent of employee jobs in these two areas and their fringe. In the NIOD alone these five sectors accounted for 82 per cent of all employees. This compares to London as a whole where these five sectors accounted for around 46 per cent of all employees in 2014. Further, as can be seen from Table 2.4 of employees in these sectors a large minority to large majority of all of London's employees in these specialised areas of work is located in the very centre of the city. Given the importance of these sectors to international trade this thus highlights the importance of this geography to the economy of not only London but also to the economy of the UK as a whole.

Table 2.4: Employees by sector in 2014 in the CAZ, NIOD, and an approximately 1 km fringe around them (top five sectors only)

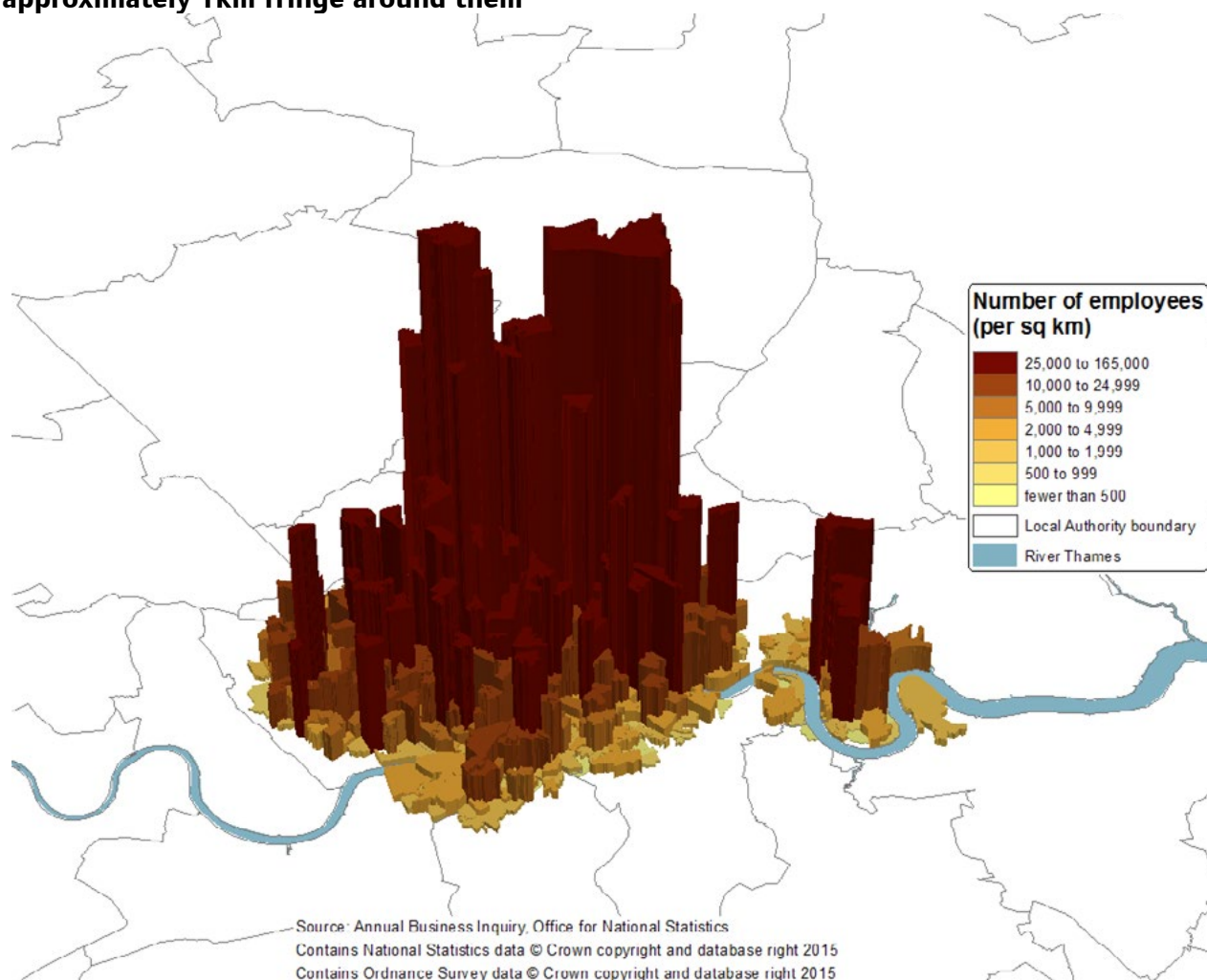|	CAZ	CAZ as % of sector total for London	CAZ 1km Fringe	CAZ Fringe as % of sector total for London	NIOD	NIOD as % of sector total for London	NIOD 1km Fringe	NIOD Fringe as % of sector total for London	CAZ & NIOD	CAZ & NIOD as % of sector total for London	CAZ, NIOD & their Fringes	CAZ, NIOD & their Fringes as % of sector total for London
Professional, scientific and technical activities	358,000	58.3%	36,000	5.9%	18,000	2.9%	2,000	0.3%	376,000	61.2%	414,000	67.4%
Financial & insurance activities	237,000	67.3%	11,000	3.1%	57,000	16.2%	1,000	0.3%	294,000	83.5%	307,000	87.2%
Information & communication	186,000	49.9%	27,000	7.2%	13,000	3.5%	3,000	0.8%	199,000	53.4%	229,000	61.4%
Business administration and support services	178,000	36.3%	25,000	5.1%	15,000	3.1%	9,000	1.8%	193,000	39.3%	227,000	46.2%
Accommodation & food services activities	135,000	37.7%	39,000	10.9%	5,000	1.4%	2,000	0.6%	140,000	39.1%	182,000	50.8%

Source: BRES & GLA Economics calculations

The large number of employees in the CAZ, NIOD and their bounding areas is further underlined by Maps 2.6 and 2.7[17]. These maps show employees per square kilometre, with the higher the bar illustrating a larger number of employees, and emphasises the concentration of employees in most areas of the CAZ and NIOD and some areas of their fringes and shows how this concentration has increased between 2003 and 2014. In particular they especially highlight the high concentration of employees in the centre of the CAZ and the NIOD and show how this has become more marked over time.

Although a clear concentration of employees can be observed in this geography, this does not imply that there is a uniform dispersal of employment in the dominant sectors of the economy across the CAZ, NIOD and their fringes. In fact, a geographic concentration of employment by industrial sector in certain areas of the CAZ etc. could well be expected from knowledge of industries clustering together whether it is, for example, insurance firms around Lloyds or tech firms around 'Silicon Roundabout'[18].
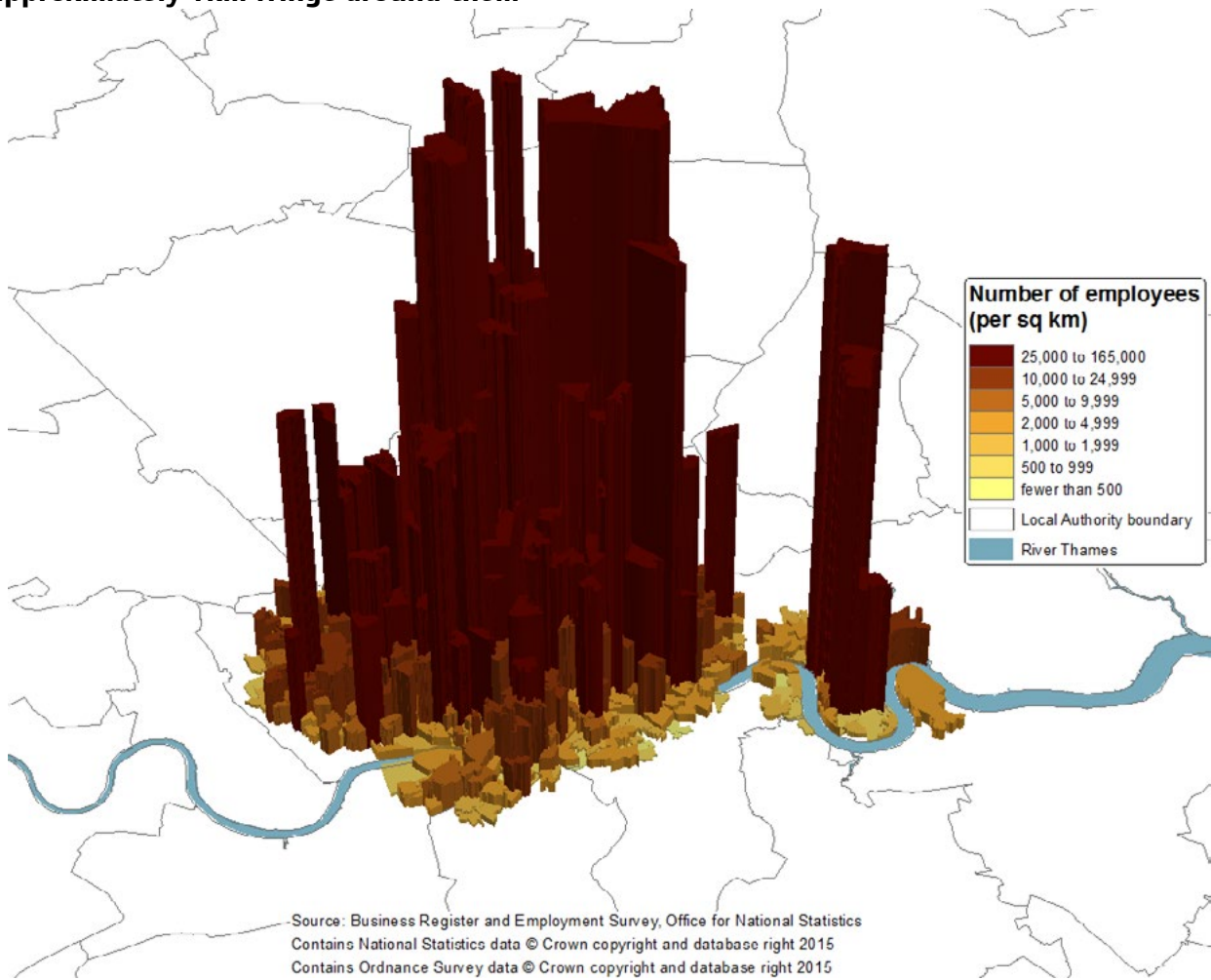
Map 2.8, using statistical analysis[19] of census employment data (and is thus for the year 2011), shows the effect of these economies of agglomeration[20] to form employment clusters for a number of industries. It should of course be noted that these results can vary depending on the data and statistical analysis used as highlighted in Map 2.9, although this still shows similar clustering to that shown in Map 2.8. While as shown by Map 2.10 hub analysis can also highlight areas of particular importance to sectors of the economy which may be missed by other forms of analysis. Thus in determining areas of importance to different sectors of the economy a variety of analysis can be best used to shed light on this issue.

Map 2.6: Number of employees per square kilometre in 2003 in the CAZ, NIOD and an approximately 1km fringe around them
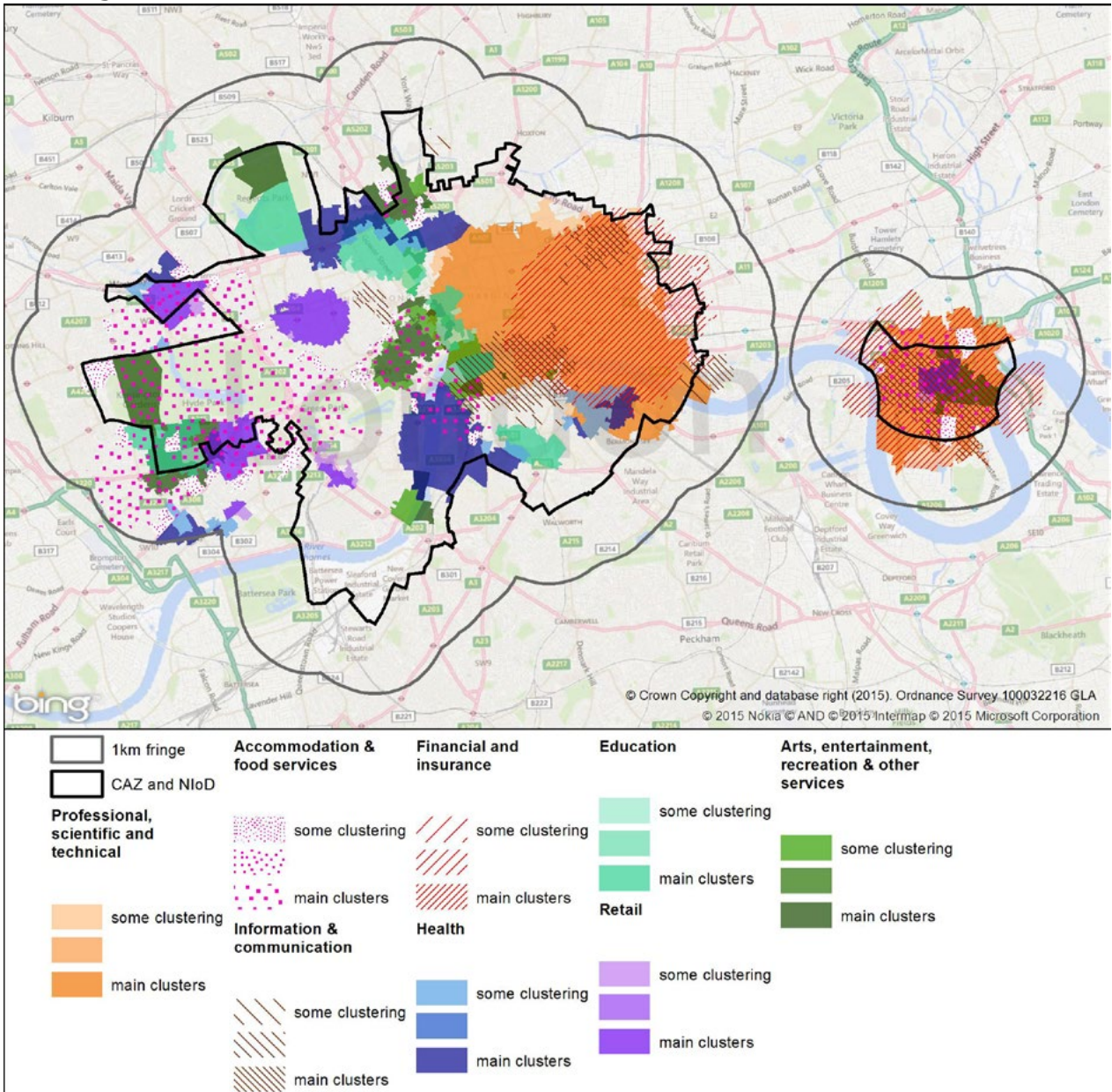

Source: Annual Business Inquiry, Office for National Statistics
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Source: Annual Business Inquiry (ABI)[21]

Map 2.7: Number of employees per square kilometre in 2014 in the CAZ, NIOD and an approximately 1km fringe around them


Number of employees
(per sq km)

25,000 to 165,000
10,000 to 24,999
5,000 to 9,999
2,000 to 4,999
1,000 to 1,999
500 to 999
fewer than 500

Local Authority boundary

River Thames

Source: Business Register and Employment Survey, Office for National Statistics
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Source: BRES

Map 2.8: Clustering[22] by industry employment type in the CAZ, NIOD and an approximately 1km fringe around them in 2011
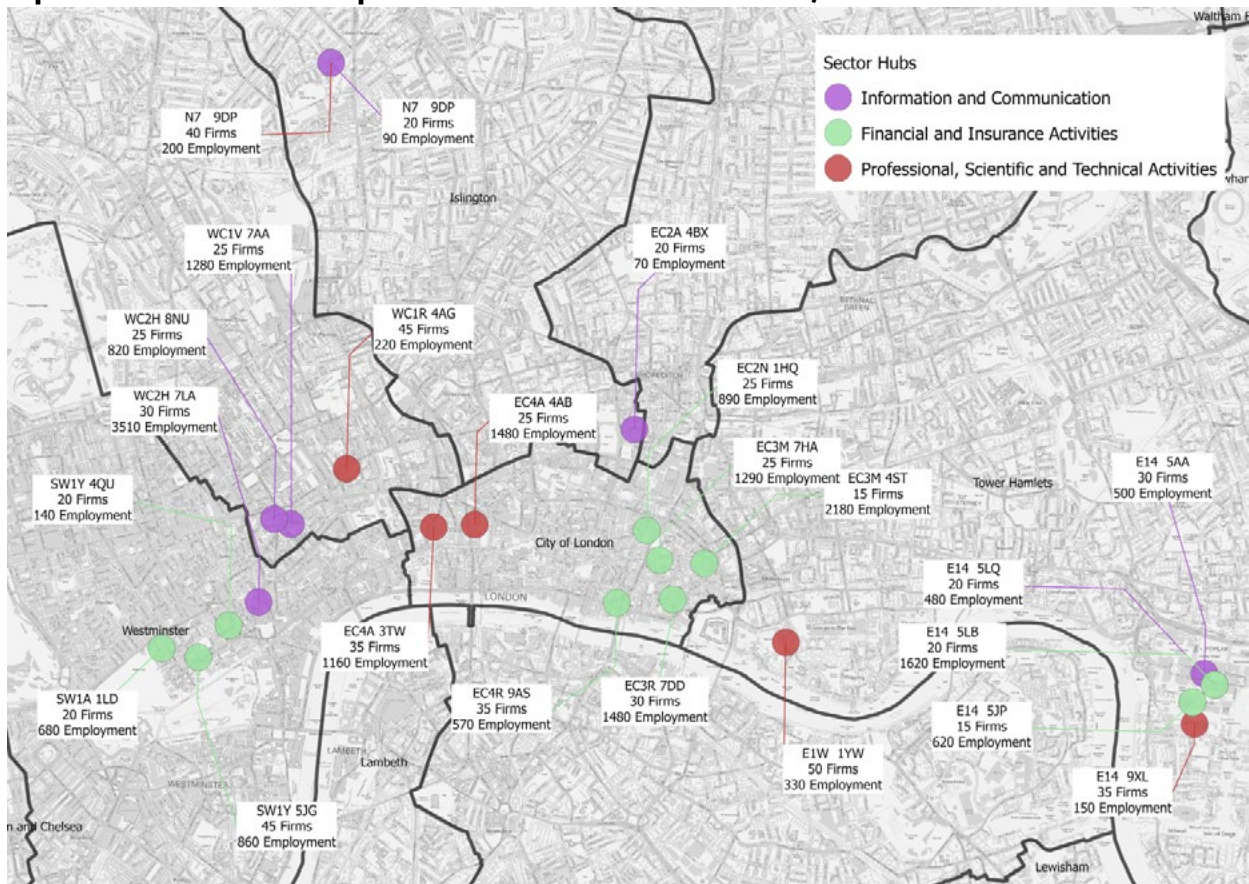

Source: Census[23] and GLA Intelligence Unit analysis

Map 2.9: Heat-map of co-locating firms in selected sectors in the CAZ, 2013[24]
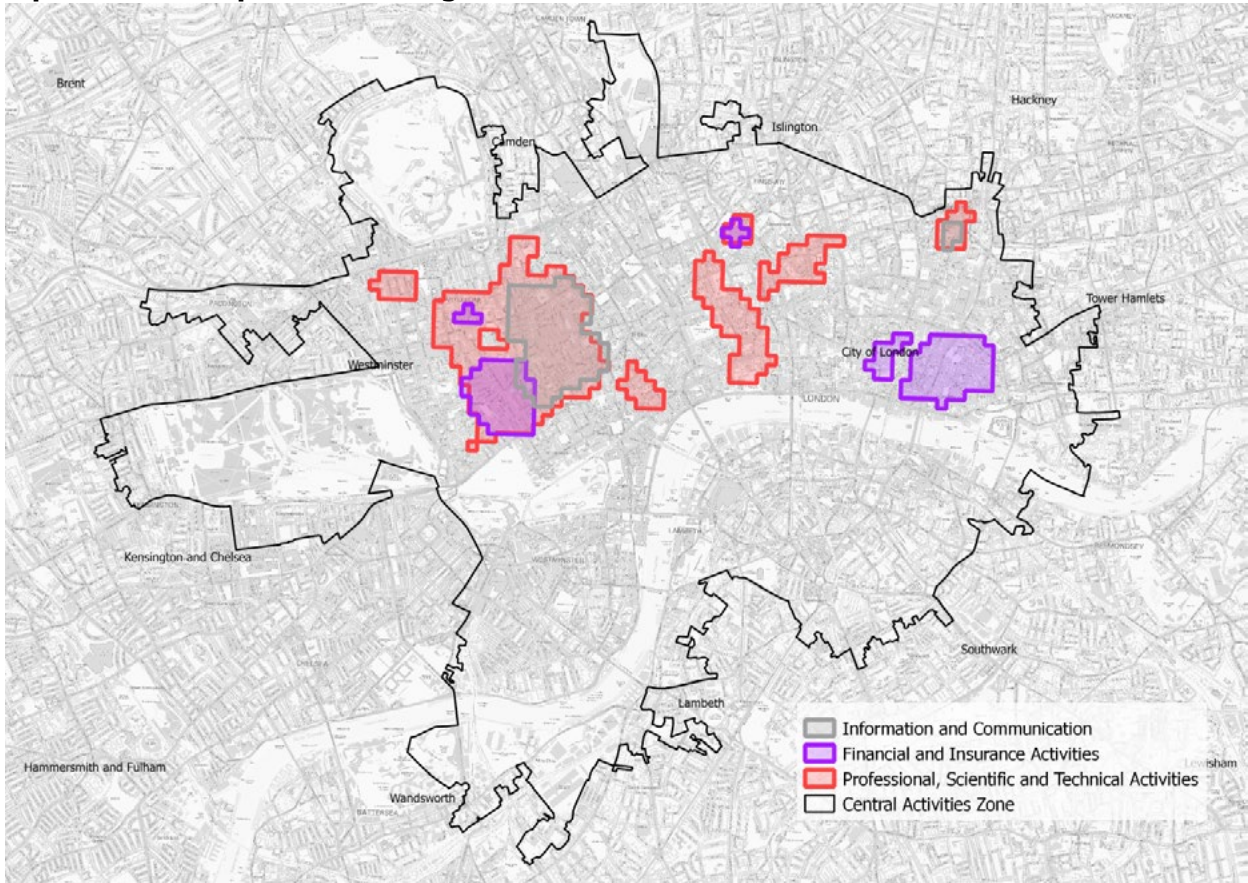
Source: TBR Observatory 2015. QGIS Development Team, 2015. QGIS Geographic Information System. Contains National Statistics data and Ordnance Survey data © Crown copyright and database right 2015 (TBR ref: W11/M1).

Map 2.10: Selected sector postcode hubs in central London, 2013

Sector Hubs
- Information and Communication
- Financial and Insurance Activities
- Professional, Scientific and Technical Activities

Source: TBR Observatory 2015. QGIS Development Team, 2015. QGIS Geographic Information System. Contains National Statistics data and Ordnance Survey data © Crown copyright and database right 2015 (TBR ref: W12/M1).

Finally, although the CAZ is an important area of employment concentration in London there exist a number of town centres across the capital of varying size that also act as centres of employment. Analysis and data on these centres can be found in the London Plan technical and research reports publications, although at the time of writing this Evidence Base an update to the Town Centre Health Check Analysis is currently being undertaken. Further, it should be noted that there also exists a number of specific geographies in London which are of particular interest beyond the CAZ and town centres, given the potential future development potential of these areas. Further analysis of these areas is included in Appendix 2.1 of this chapter.
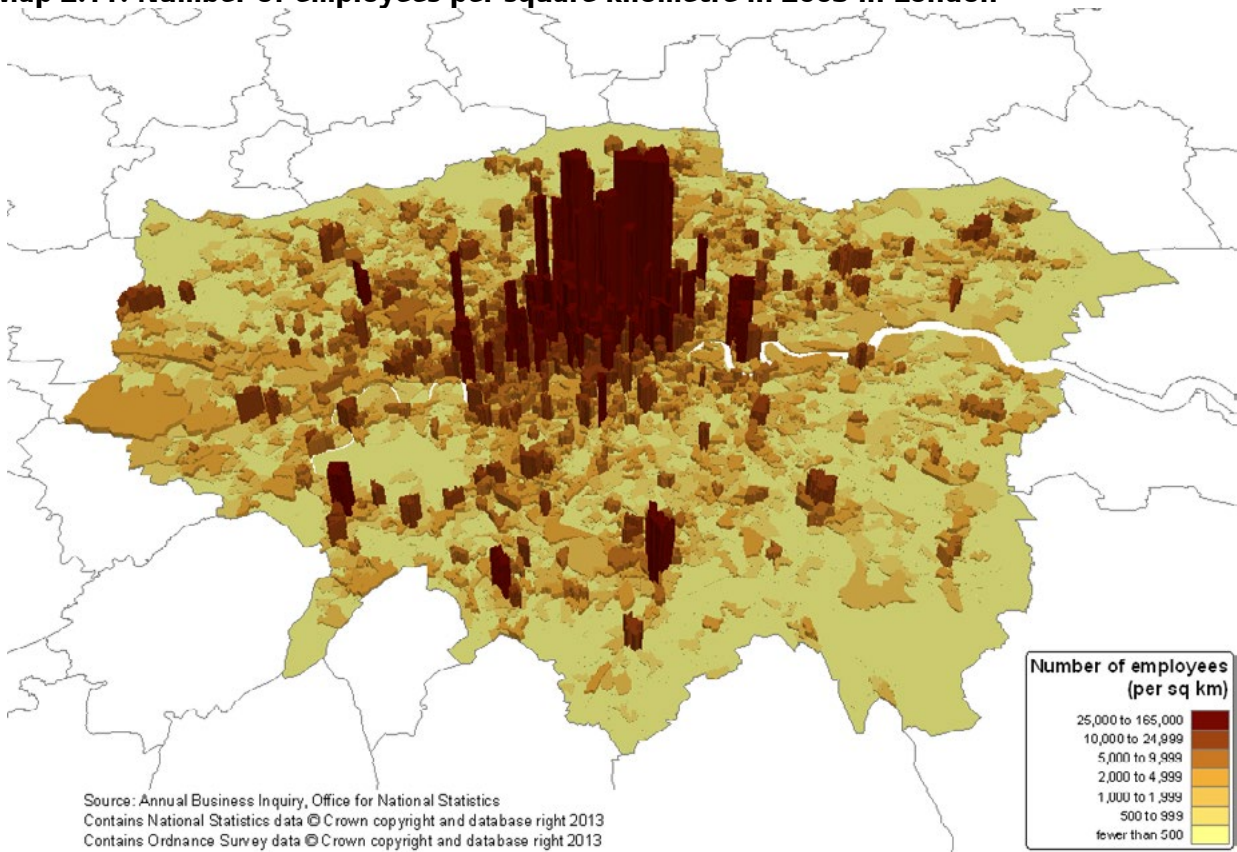
2.5 The wider London economy

Although the CAZ, NIOD and their fringes account for a noteworthy concentration of employment, particularly in London's specialised services, London has a large level of employment outside of these service areas, many of which meet the needs of London's large population via the retail, health, education etc. sectors. The nature of this different sectoral make up of London's sub regional labour markets is examined in more detail in GLA Economics [Working Papers 75 to 79](#). This section now examines the wider London economy, beyond that already examined in Chapter 1 of this Evidence Base.

2.5.1 Employee levels and concentration, density and changes over time

Maps 2.11 and 2.12 shows how employee concentration in London has evolved since 2003. The maps show that while employees are highly concentrated in the CAZ and NIOD other areas such as Hillingdon (most likely associated with Heathrow), some industrial areas and various town centres also see significant employee concentration. Indeed in absolute terms the majority of London's employee jobs reside outside the CAZ, NIOD and their fringes. The maps also highlight the strong growth in employee jobs seen in a number of areas of London in recent years. Appendix 2.2 of this chapter provides Maps B1 to B5 which look at employee jobs in London at the lower NUTS2 geography levels to allow for an examination of the employee jobs situation in London at a more disaggregated geographic level. Maps B6 & B7 also in Appendix 2.2 of this chapter examine the recent history of employee concentration in London using a different geographical measure, in this case workplace zones. Still, as shown by Map 2.13, since 2009 not all areas of London or even inner London have seen a rise in employee numbers. However, Map 2.13 also shows that employee growth since 2009 has generally been much stronger in inner London than outer London.
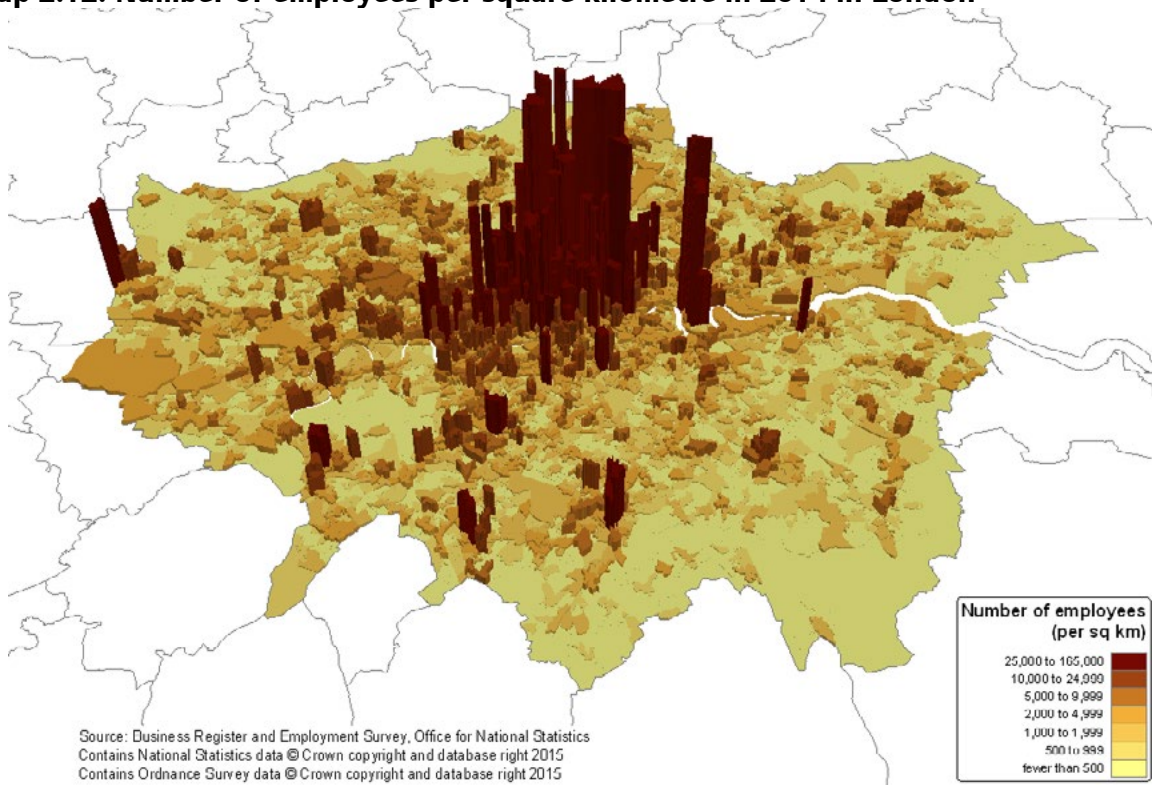
The dominance of London as a centre for employee jobs can be observed from Map 2.14 which shows employee jobs concentration per square kilometre in the Greater South East (GSE) in 2015. The map shows that whilst the concentration of jobs is at its greatest at the centre of the city, when compared to the GSE as a whole there is a significant level of employment across London as a whole, with London accounting for just over 42 per cent of all employee jobs in the Greater South East in 2015. Finally, it should be noted that further details on London's workforce are provided in Chapter 9 of this Evidence Base.

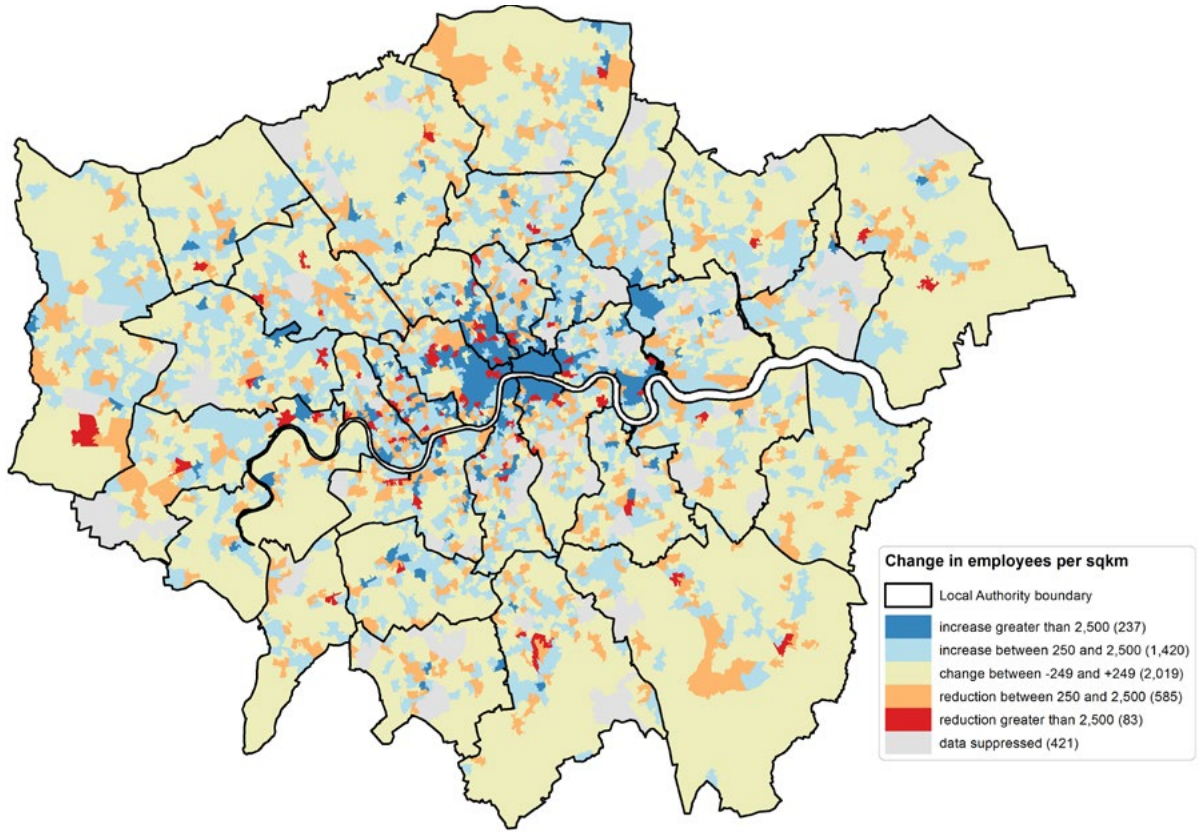## Map 2.11: Number of employees per square kilometre in 2003 in London

Source: Annual Business Inquiry, Office for National Statistics
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Contains Ordnance Survey data © Crown copyright and database right 2013

Number of employees (per sq km)

- 25,000 to 165,000
- 10,000 to 24,999
- 5,000 to 9,999
- 2,000 to 4,999
- 1,000 to 1,999
- 500 to 999
- fewer than 500

Source: Annual Business Inquiry (ABI)

Map 2.12: Number of employees per square kilometre in 2014 in London

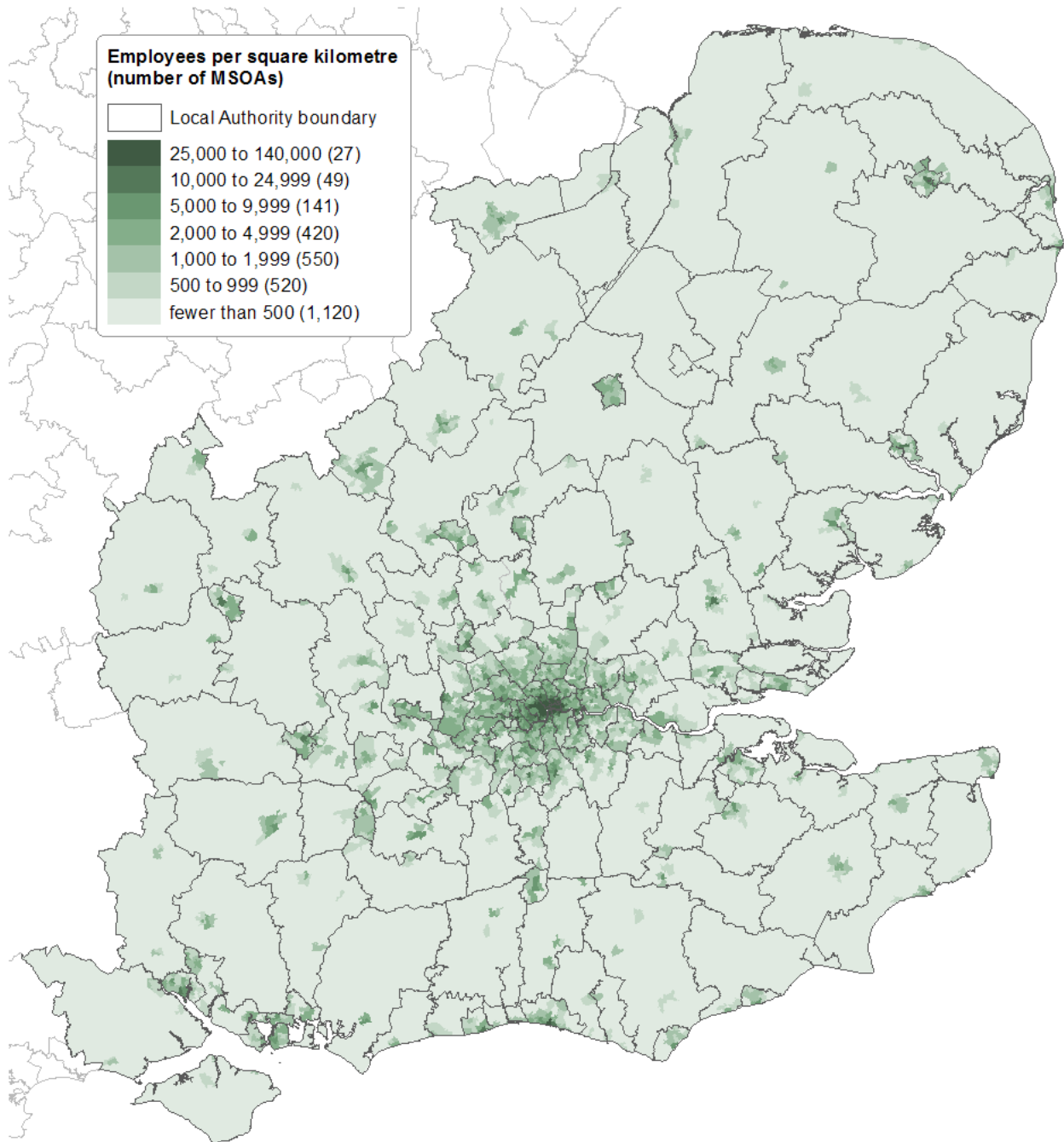Source: Business Register and Employment Survey, Office for National Statistics
Contains National Statistics data © Crown copyright and database right 2015
Contains Ordnance Survey data © Crown copyright and database right 2015

Number of employees (per sq km)

- 25,000 to 165,000
- 10,000 to 24,999
- 5,000 to 9,999
- 2,000 to 4,999
- 1,000 to 1,999
- 500 to 999
- fewer than 500

Source: BRES

Map 2.13: Change in the number of employees per square kilometre in London LSOA's between 2009 and 2014

Change in employees per sqkm

☐ Local Authority boundary

■ increase greater than 2,500 (237)
■ increase between 250 and 2,500 (1,420)
■ change between -249 and +249 (2,019)
■ reduction between 250 and 2,500 (585)
■ reduction greater than 2,500 (83)
■ data suppressed (421)

Note: LSOA denotes Lower-layer Super Output Areas, a geography used for the analysis of small area statistics
Source: Inter-Departmental Business Register, Office for National Statistics
Contains National Statistics data © Crown copyright and database right 2016
Contains Ordnance Survey data © Crown copyright and database right 2016. Ordnance Survey 100032216

Source: Inter-Departmental Business Register (IDBR)

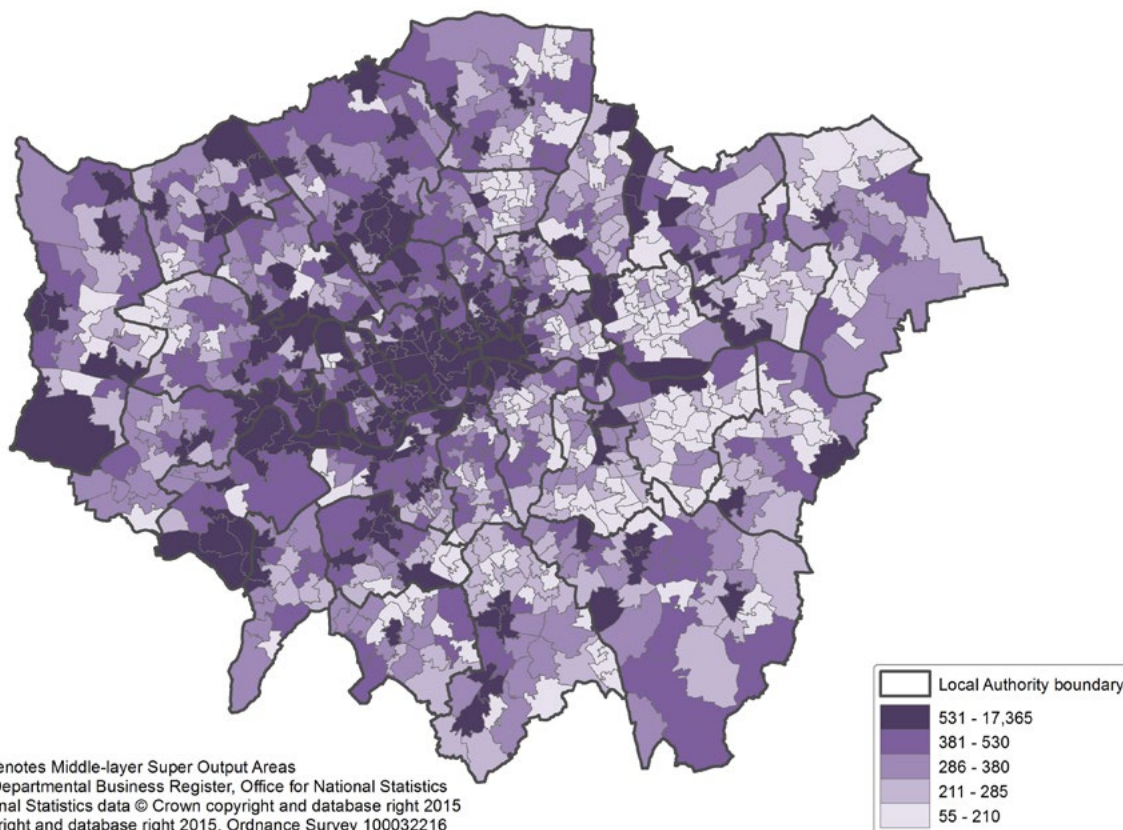**Map 2.14: Number of employees per square kilometre in 2015 in the Greater South East**

**Employees per square kilometre
(number of MSOAs)**

Local Authority boundary

25,000 to 140,000 (27)
10,000 to 24,999 (49)
5,000 to 9,999 (141)
2,000 to 4,999 (420)
1,000 to 1,999 (550)
500 to 999 (520)
fewer than 500 (1,120)

Note: MSOA denotes Middle-layer Super Output Areas, a geography used for the analysis of small area statistics
Source: Inter-Departmental Business Register, Office for National Statistics
Contains National Statistics data © Crown copyright and database right 2015
Contains Ordnance Survey data © Crown copyright and database right 2015. Ordnance Survey 100032216
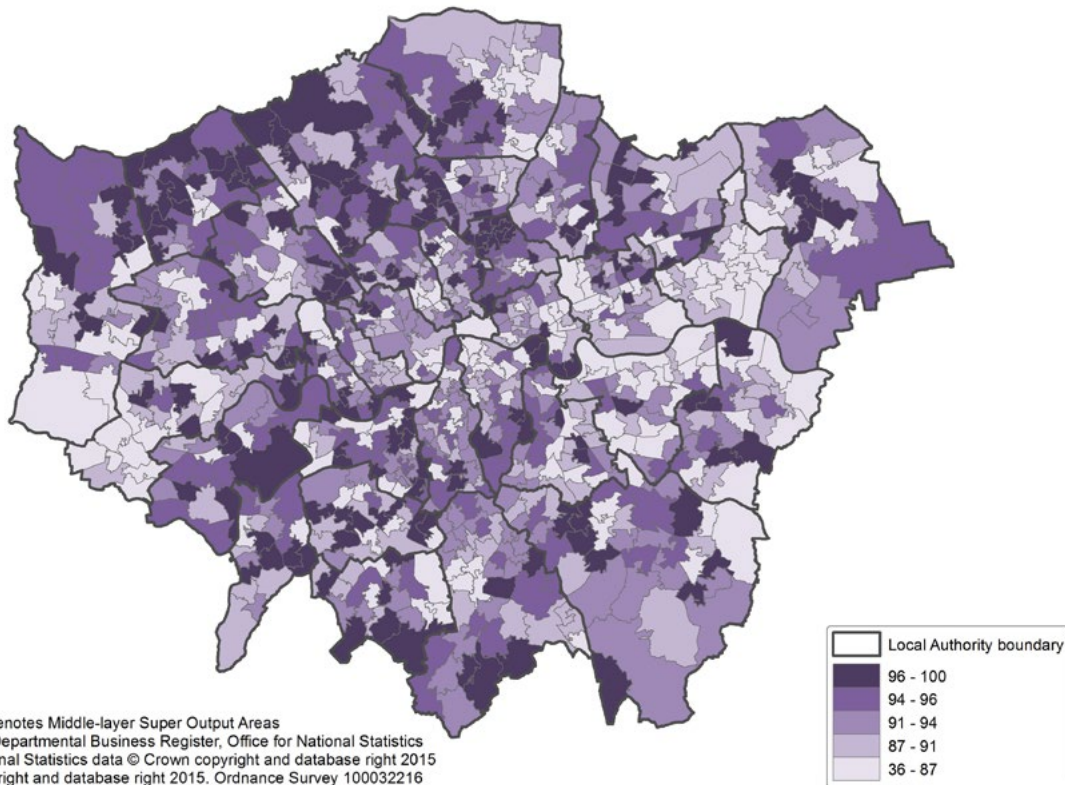
Source: IDBR

2.5.2 Firms in London

Just as London is the location for a lot of employment, so London is home to a large number of workplaces. This is especially the case in the CAZ, but as can be seen from Map 2.15 other areas of London, especially in the west of London, as well as various town centres and several Strategic Industrial Locations (SIL) such as Park Royal, the Thames Gateway SILs in Newham (Royals), Charlton and Barking and Dagenham (River Road) also have significant concentration of workplaces. Conversely, it can be see that some areas of east London have relatively few workplaces concentrated within them. The nature of the firms also varies across London with smaller workplaces (those employing less than 250) generally being more important in the south and north west of London with very few firms of this size trading in the city (see Map 2.16), while large workplaces (those employing 250 or more people) being more visible in a belt that runs from West London through central London to small areas of South London and North London (see Map 2.17). It should however be noted (as shown by Table 2.5) that large employment businesses are quite rare as a total number of all businesses across all of London with most businesses being Small and Medium sized Enterprises (SME's). However, as also shown in Table 2.5 although SME's make up over 99 per cent of all London businesses they accounted for just over 51 per cent of all of London's employment and just under 50 per cent of the turnover of London's firms in 2015.

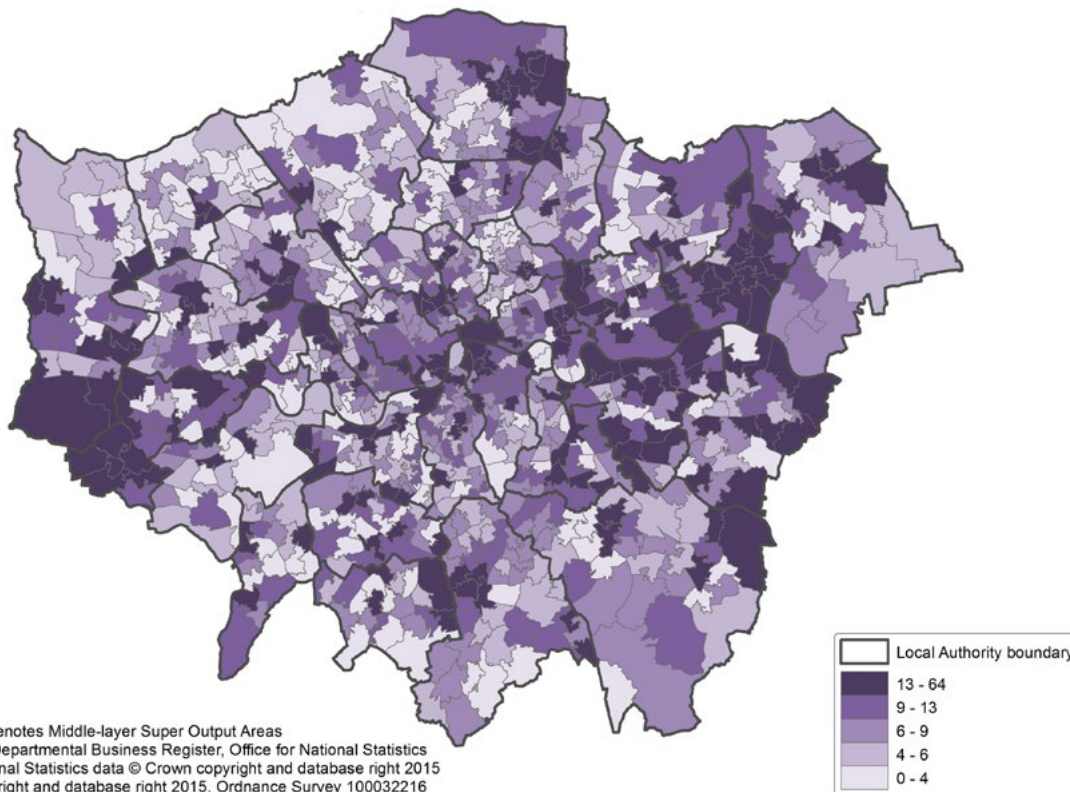**Map 2.15: Workplaces in London in 2014 by MSOA**[25]

Note: MSOA denotes Middle-layer Super Output Areas
Source: Inter-Departmental Business Register, Office for National Statistics
Contains National Statistics data © Crown copyright and database right 2015
© Crown Copyright and database right 2015. Ordnance Survey 100032216

Legend:
- Local Authority boundary
- 531 - 17,365
- 381 - 530
- 286 - 380
- 211 - 285
- 55 - 210

Source: ONS and GLA Intelligence Unit

Map 2.16: Workplaces that employ less than 250 people by MSOA in London in 2014 as a percentage of the MSOA's total workplaces

Note: MSOA denotes Middle-layer Super Output Areas
Source: Inter-Departmental Business Register, Office for National Statistics
Contains National Statistics data © Crown copyright and database right 2015
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Legend:
Local Authority boundary
96 - 100
94 - 96
91 - 94
87 - 91
36 - 87

Source: ONS and GLA Intelligence Unit

Map 2.17: Workplaces that employ 250 or more people by MSOA in London in 2014 as a percentage of the MSOA's total workplaces

Note: MSOA denotes Middle-layer Super Output Areas
Source: Inter-Departmental Business Register, Office for National Statistics
Contains National Statistics data © Crown copyright and database right 2015
© Crown Copyright and database right 2015. Ordnance Survey 100032216

Legend:
Local Authority boundary
13 - 64
9 - 13
6 - 9
4 - 6
0 - 4

Source: ONS and GLA Intelligence Unit

Table 2.5: Number of businesses in the private sector and their associated employment and turnover, by number of employees and selected industry section in London, start 2015[26]

Business Size Group	Business Details	Manufacturing	Construction	Wholesale & Retail	Accommodation & Food Services	Info. & Comm.	Financial & Insurance Activities	Professional, scientific & technical activities	Admin. & Support Services	Arts, entertainment and recreation	All Businesses
0 employees (unregistered)[27]	Firms	11,535	132,070	24,370	2,990	34,670	7,000	70,850	41,985	61,880	544,920
	Jobs (1000s)	12	133	28	4	40	15	81	45	65	589
	Turnover (£m)[28]	321	5,288	1,288	98	1,425	-	4,612	1,539	2,381	21,936
0 employees (registered)	Firms	5,045	21,385	21,520	2,100	37,510	6,155	64,240	20,940	9,940	216,125
	Jobs (1000s)	5	22	23	2	38	4	66	22	11	224
	Turnover (£m)	621	5,094	3,844	391	6,222	-	11,856	3,831	1,353	39,678
1	Firms	450	1,245	3,170	1,340	255	110	3,740	3,240	610	18,050
	Jobs (1000s)	1	3	7	3	1	0	8	7	*	39
	Turnover (£m)	62	262	869	123	43	-	668	809	*	3,576
2-4	Firms	3,520	12,265	18,420	8,160	13,815	2,555	23,520	10,400	2,990	116,035
	Jobs (1000s)	10	32	55	27	33	7	62	29	8	321
	Turnover (£m)	1,078	6,838	15,749	1,204	3,980	-	7,495	6,601	1,003	51,872
5-9	Firms	1,645	2,945	8,175	4,685	2,820	1,225	6,825	3,565	945	41,680
	Jobs (1000s)	11	19	54	31	19	8	46	24	6	279
	Turnover (£m)	1,306	4,946	21,457	1,369	3,203	-	6,709	4,703	859	55,128
10-19	Firms	930	1,210	3,540	2,595	1,575	755	3,415	2,010	520	21,435
	Jobs (1000s)	13	16	48	35	21	10	47	27	7	293
	Turnover (£m)	1,425	3,604	40,281	1,698	3,997	-	6,789	4,479	787	69,941
20-49	Firms	515	405	1,515	1,545	1,020	495	1,710	1,125	185	10,570
	Jobs (1000s)	16	12	45	46	31	16	53	35	6	322
	Turnover (£m)	2,409	3,150	67,830	2,496	11,022	-	9,491	6,534	613	111,650

Size											Total
50-99	Firms	170	115	430	440	380	235	565	510	85	3,590
	Jobs (1000s)	12	8	29	30	26	17	40	36	6	249
	Turnover (£m)	1,792	1,957	23,217	1,722	6,596	-	6,583	6,899	*	57,193
100-199	Firms	80	45	180	190	180	155	250	225	30	1,595
	Jobs (1000s)	11	7	25	26	25	22	36	31	*	222
	Turnover (£m)	2,030	2,308	59,949	1,469	7,048	-	6,610	3,241	1,662	94,325
200-249	Firms	15	15	45	35	35	35	65	70	5	375
	Jobs (1000s)	3	4	10	8	7	8	15	15	*	84
	Turnover (£m)	845	1,076	6,386	483	1,213	-	3,575	3,386	*	19,750
250-499	Firms	25	25	70	70	60	75	120	135	20	700
	Jobs (1000s)	8	8	24	24	21	26	43	47	7	245
	Turnover (£m)	2,224	3,050	142,219	1,410	5,576	-	9,145	4,976	993	175,596
500+	Firms	30	15	110	80	75	90	95	115	20	760
	Jobs (1000s)	81	45	569	204	206	266	155	325	49	2,209
	Turnover (£m)	63,129	8,351	103,010	9,566	50,229	-	27,797	20,992	32,977	389,930
Total	Number	23,960	171,740	81,545	24,230	92,395	18,885	175,395	84,320	77,230	975,835
	Employment (1000s)	183	309	917	441	468	400	652	641	170	5,076
	Turnover (£m)	77,241	45,924	486,097	22,027	100,554	-	101,331	67,990	43,492	1,090,576

Source: BIS – Business Population Estimates. Note: * symbol replaces data that are deemed to be disclosive, – symbol indicates where data is not available.

2.5.3 The hubs of London

Although as shown above, concentration in employment or firms can be seen across different parts of London's geography, recent research commissioned by GLA Economics[29] has shown that certain areas of London are particularly dominant in terms of total firm or employment concentration. The research also showed that some of these hubs had grown considerably between 2004 and 2013 as shown by Tables 2.6 and 2.7, while Maps 2.18 and 2.19 show the location of these hubs in 2013. Further analysis of hubs for different sectors of the economy can be found in GLA Economics Working Paper 73.

Table 2.6: Postcode hubs by firm count (top five for retail and business), 2013 (with associated employment and 2004 data)

Postcode	2013		2004		Key building (if exists) name/details
	Firms	Employment	Firms	Employment	
W12 7GF	85	2,100	35	1,200	Westfield London
W1G 0PW	135	5,070	35	670	Cavendish Square
SW1Y 4LR	130	1,340	30	2,300	Regent Street
W5 5JY	65	1,430	75	1,500	Ealing Broadway Shopping Centre
NW4 3FP	30	1,660	30	1,620	Brent Cross Shopping Centre
SW9 6DE	75	1,580	30	1,010	Kennington Business Park
CR0 0XZ	210	1,000	95	830	Airport House
N7 9DP	130	730	95	750	The Busworks
NW5 1TL	70	3,630	60	1,780	Highgate Studios
EC3R 7DD	45	1,630	25	1,750	Minster Court

Source: TBR Observatory 2015 (TBR ref: W12/S7)

**Map 2.18: Top ten postcode hubs by firm count, London, 2013**

Source: TBR Observatory 2015. QGIS Development Team, 2015. QGIS Geographic Information System. Contains National Statistics data and Ordnance Survey data © Crown copyright and database right 2015 (TBR ref: W12/M5).

Table 2.7: Postcode hubs by employment (top five for retail and business), 2013 (with associated firm count and 2004 data)

Postcode	2013		2004		Key building (if exists) name/details
	Firms	Employment	Firms	Employment	
SE1 9RT	10	12,240	15	11,610	Guy's Hospital
E14 5HP	25	6,760	10	9,620	1 Churchill Place
EN1 3XA	*	10,800	Not in existence in 2004		Enfield Civic Centre
CR9 3JS	5	11,560	*	11,900	Taberner House
W14 8UD	55	10,690	10	3,390	N/A
SE1 7NA	50	8,600	70	9,600	Shell Centre
W2 1NY	5	8,770	10	110	St Marys Hospital
CR9 2BY	5	8,210	*	140	Lunar House
N11 1NP	10	6,170	5	80	North London Business Park
W2 1NW	5	5,730	5	5,740	Waterside House

*Source: TBR Observatory 2015 (TBR ref: W12/S7). * indicates data has been suppressed due to reasons of confidentiality.*

Map 2.19: Top 10 postcode hubs by employment, London, 2013

Source: TBR Observatory 2015. QGIS Development Team, 2015. QGIS Geographic Information System. Contains National Statistics data and Ordnance Survey data © Crown copyright and database right 2015 (TBR ref W12/M5).

2.5.4 The changing nature of output in London's local authorities

Until May 2016 there were no estimates of output at the LA level for all of London's LAs from the ONS, with the lowest geography being at the NUTS3 level which covered some individual London boroughs or combination of London LAs. However, in May 2016 the ONS published estimates of GVA by LA in England for the period 1997 to 2014[30]. It should be noted that this data was then revised in July 2016 to take account of ONS revisions to their estimates of output at the NUTS3 level. Also published was an estimate of LA output by broad industrial classification sectors. These estimates **are not national statistics**, however the data does allow for an examination of the changing nature of output in London at the LA level.

Map 2.20 thus shows the evolution of the importance of individual LAs in London to London's total GVA. As can be observed, although all LAs increased their GVA over this period, between 1997 and 2014 inner London LAs generally increased their share of London's economy while outer London LAs generally reduced their share of London's total GVA. However, the importance of London's LAs to output in the different broad sectors of London's economy was more mixed as shown in Maps C1 to C9 in Appendix 2.3 of this chapter[31]. Thus as can be seen outer London is more important to the Production sector in London in 2014, while Financial and insurance activities was generally more concentrated in inner London. It should also be noted that Appendix 2.3 of this chapter also provides maps examining the importance of these broad sectors to the total output of London's individual LAs to provide context to the industrial structure of London's LAs and shows the general declining importance of the Production sector over time to total output in London's LAs but also that the Real estate sector has gradually become generally more important to total output in London's LAs over time.

Map 2.20: Contribution of London's LAs to total output in London in 1997 and 2014[32]
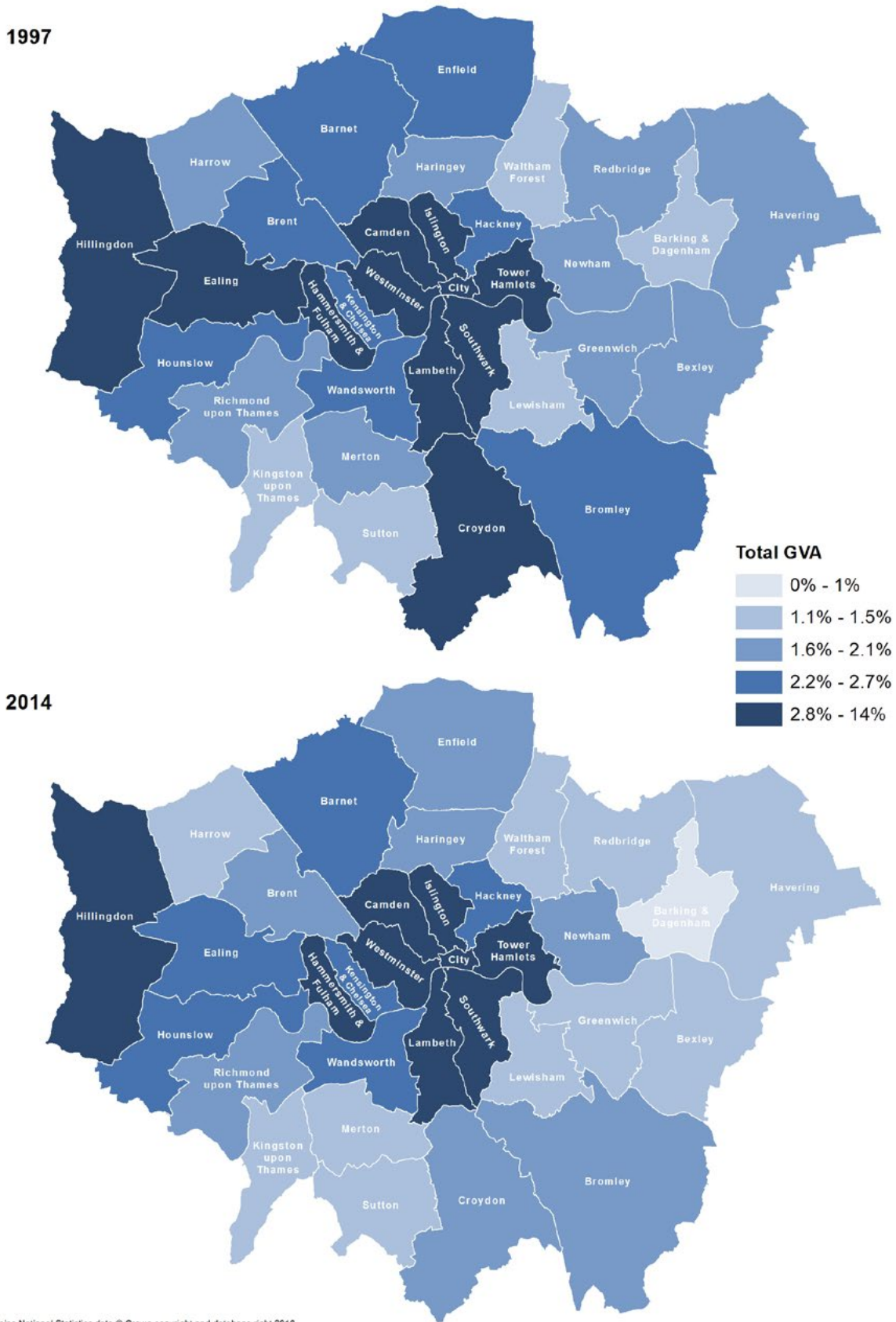
1997

2014

Total GVA

- 0% - 1%
- 1.1% - 1.5%
- 1.6% - 2.1%
- 2.2% - 2.7%
- 2.8% - 14%

Source: ONS & GLA Economics calculations

2.6 Selected sectors of the London economy

This section sets out to examine the spatial nature of selected broad sectors of the economy in London. It illustrates that while many internationally competitive activities take place in central London – other activities (for instance those supporting London's population) are spread across the capital. It should also be noted that GLA Economics has in the past examined the spatial nature of employment in the science and technology category[33] and the creative industries[34] and Appendix 2.4 of this chapter provides brief summaries and where necessary updates on these areas of the economy.

2.6.1 Employment clustering in London

Examining employment data in London highlights the importance of certain geographies for different sectors of London's economy as was highlighted in Map 2.8 for just the CAZ and NIOD. Appendix 2.5 of this chapter replicates that analysis for London as a whole as well as for the Greater South East. However, Map 2.21 using Census data but a different clustering methodology looks at some of the dominant employment sectors in London's workplace zones and highlights differences between inner and outer London[35]. Thus it shows that Financial and insurance activities and Professional, scientific and technical activities are of importance in inner London; while the Transportation and communication sector is generally more significant in outer London. Also highlighted is the importance of Public administration, Education and Human health activities in employment in areas of both inner and outer London in order in part to serve the population of these areas. Maps highlighting these individual clusters in more detail for both London and the Greater South East as a whole are also provided in Appendix 2.5 of this chapter. Although this map highlights the dominant employment sector in these workplace zones, other industrial sectors could also be clustered across these areas but are obscured by the dominant cluster. One methodology for finding these other employment clusters is given in Appendix 2.5 of this chapter.

Finally, Map 2.22 shows another way of looking at the nature of London's economic geography and the clustering of certain types of jobs, this time using COWZ-EW[36]. This is based on the workers characteristics and their workplaces, examining whether areas are similar or different depending on their workers and workplaces characteristics. Thus as can be seen from Map 2.22 the centre of London and the NIOD is dominated by "Top Jobs" but with other areas of this sort spread throughout London. Note that "Top Jobs" is defined as "high status employment in business, industry and public service. Primarily the highest status city centres but also top science and business parks"[37] and thus highlights the global nature of output in a number of bits of London. However, what is also shown is the importance of jobs servicing London's population with these jobs spread throughout large parts of the capital.

Map 2.21: Dominant employment clusters in London by workplace zones in 2011
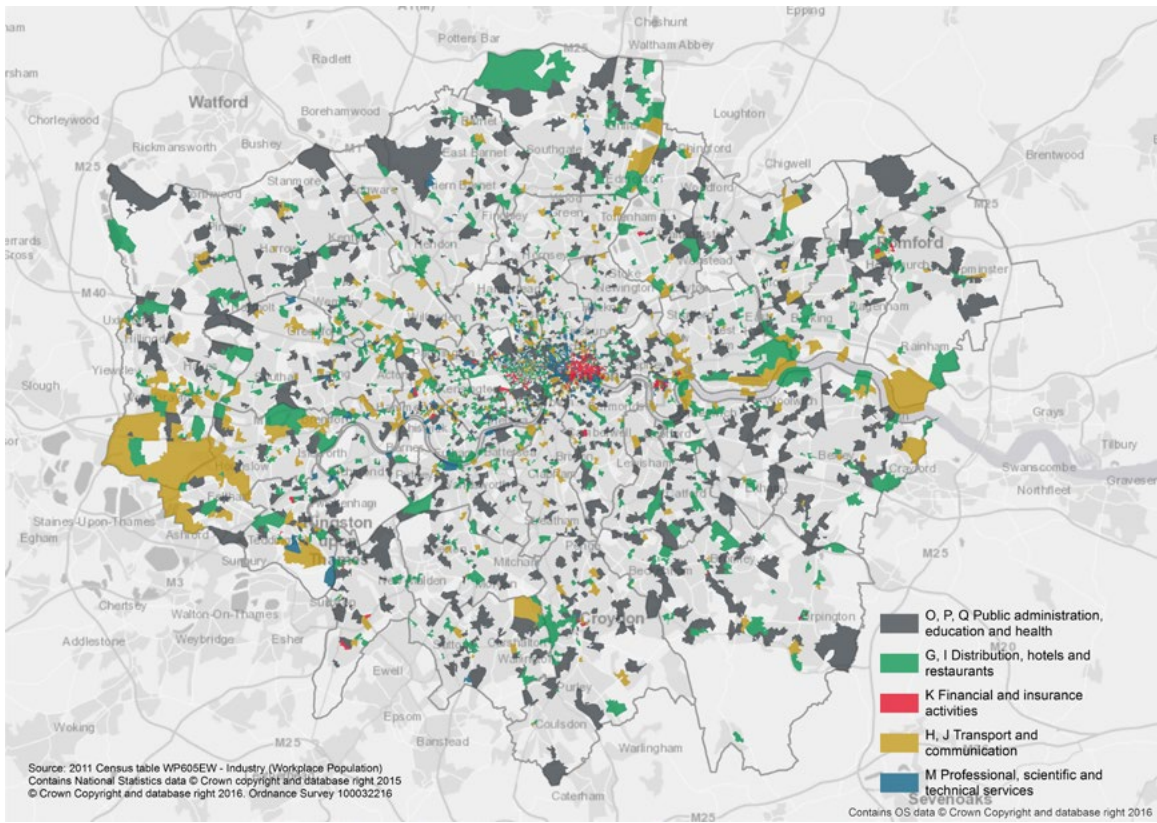
Source: Census and GLA Intelligence Unit Analysis

Map 2.22: Workplace zones type in London by COWZ-EW classification[38]
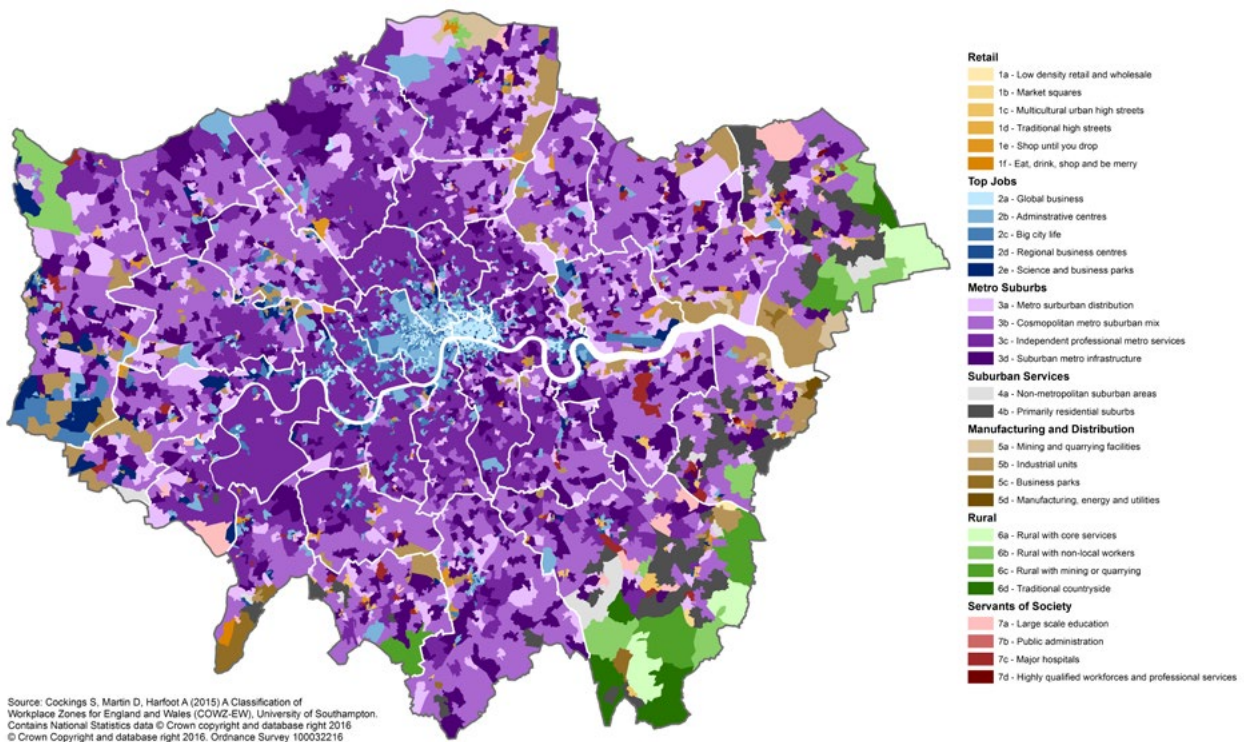

Source: Census data via DataShine COWZ-EW and GLA Intelligence Unit mapping

2.6.2 Employee concentration by broad sectors of the economy

This sub section examines the geography of employee jobs concentration by broad sectors in London in greater detail in order to give a better understanding of the economic geography of London beyond the clusters highlighted above. However, it should be noted that some sectors are not presented in this chapter, as those sectors cannot be analysed at low-level geographies because of data confidentiality reasons.

Map 2.23 shows that central London is an important area of employee jobs in the Accommodation and food service sector. There are also other smaller areas of employee jobs concentration in this sector across the rest of London.

Map 2.23: Employee concentration in Accommodation & food service activities in London in 2015
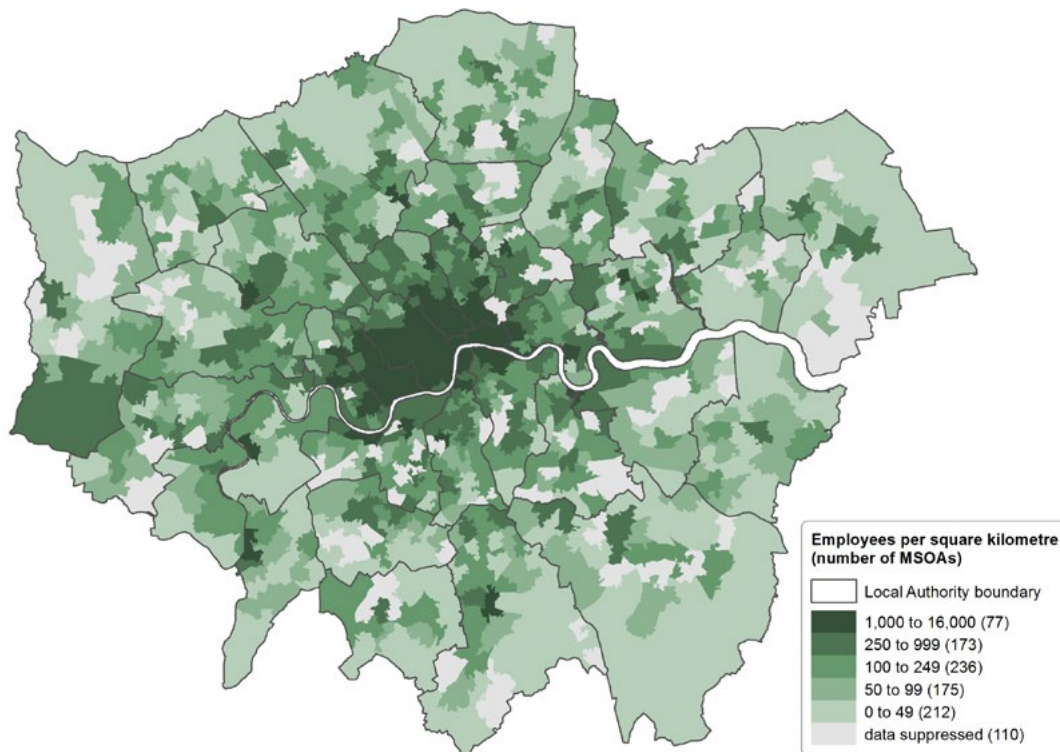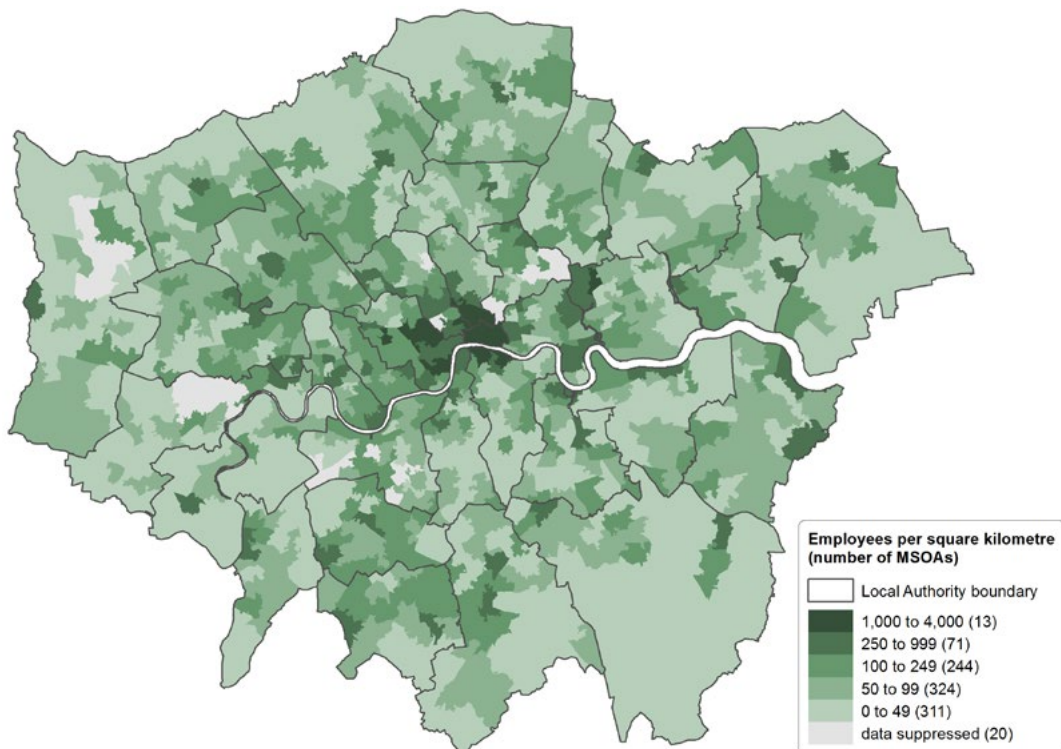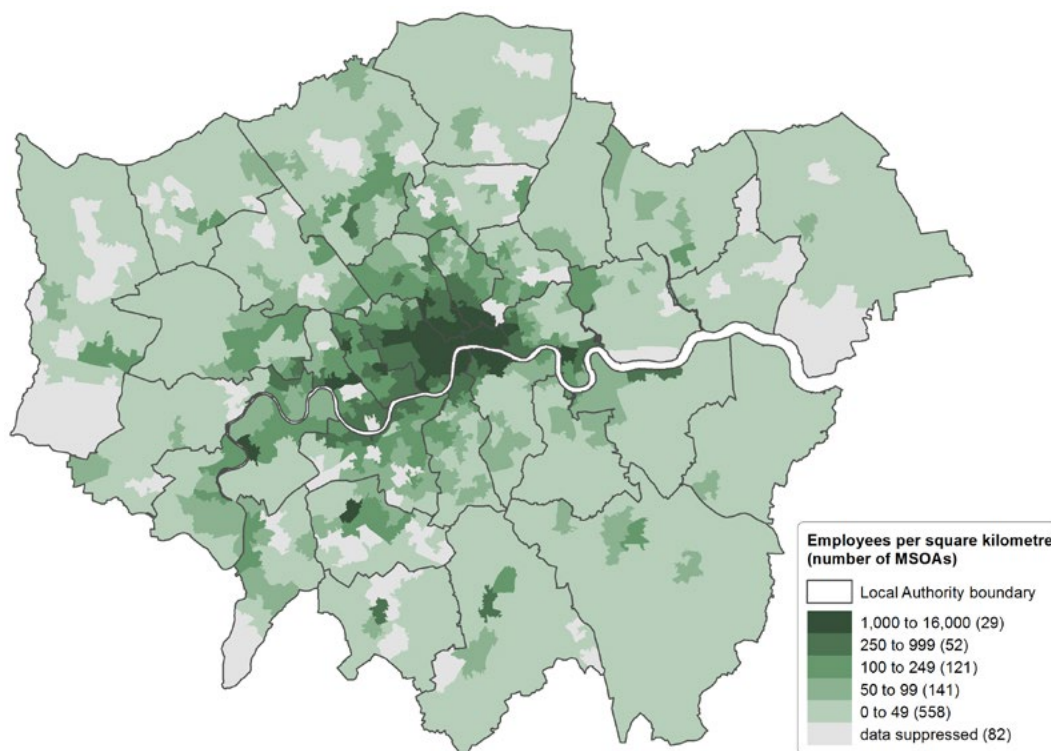

Note: MSOA denotes Middle-layer Super Output Areas, a geography used for the analysis of small area statistics
Source: Inter-Departmental Business Register, Office for National Statistics
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Source: IDBR

Employees in Administrative and support services are also heavily concentrated in central London and the NIOD but as seen from Map 2.24 other areas, especially in West London around the Thames and Heathrow, also see large numbers of employees in this sector.

Map 2.24: Employee concentration in Administrative and support services in London in 2015
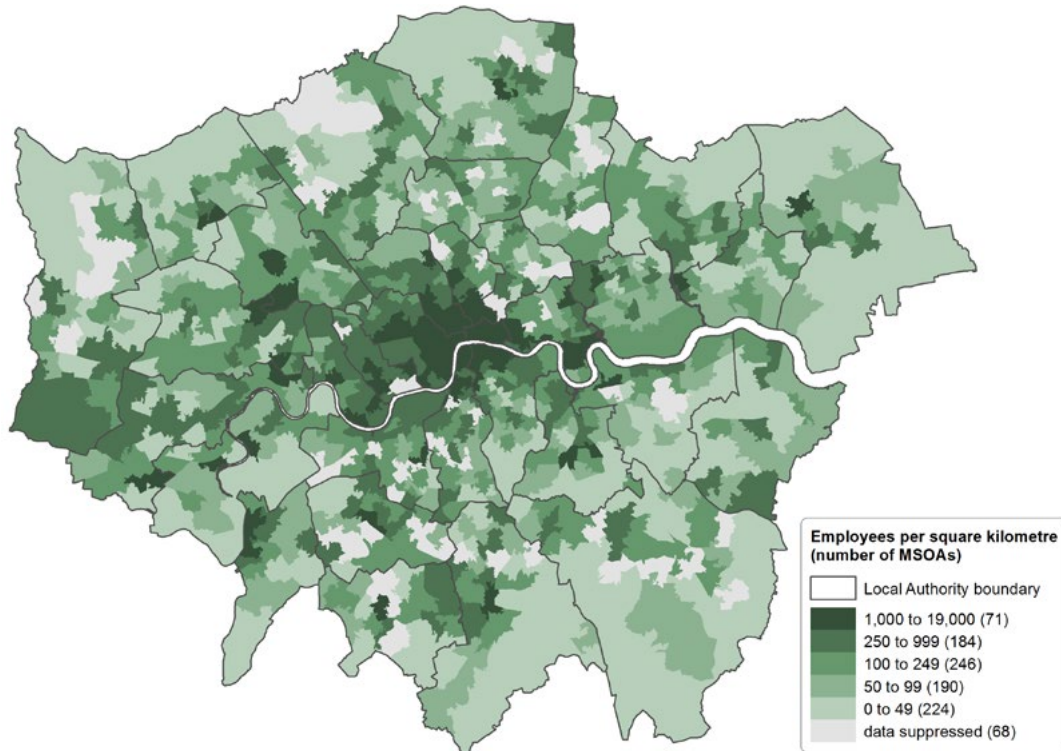
Employees per square kilometre
(number of MSOAs)

☐ Local Authority boundary

■ 1,000 to 19,000 (71)
■ 250 to 999 (184)
■ 100 to 249 (246)
■ 50 to 99 (190)
■ 0 to 49 (224)
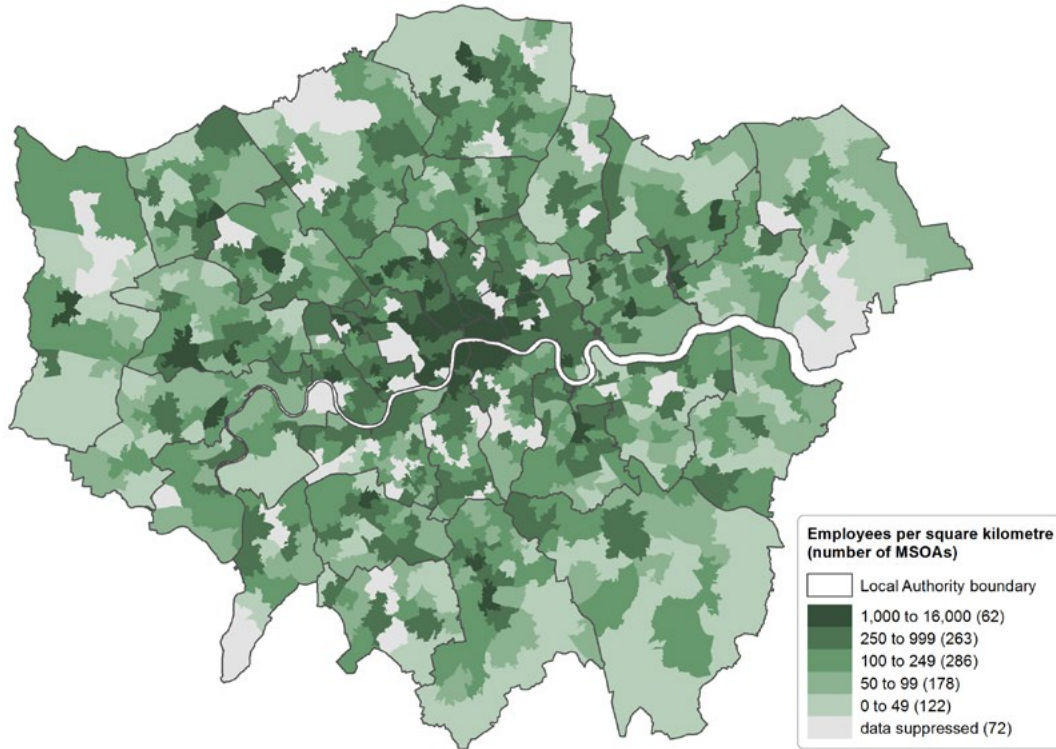☐ data suppressed (68)

Note: MSOA denotes Middle-layer Super Output Areas, a geography used for the analysis of small area statistics
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Source: IDBR

Map 2.25 shows that beyond central London there are concentrations of employees in Construction in London east of the city and west of the CAZ, as well as some areas of South London.

Map 2.25: Employee concentration in Construction in London in 2015

Employees per square kilometre
(number of MSOAs)

☐ Local Authority boundary

■ 1,000 to 4,000 (13)
■ 250 to 999 (71)
■ 100 to 249 (244)
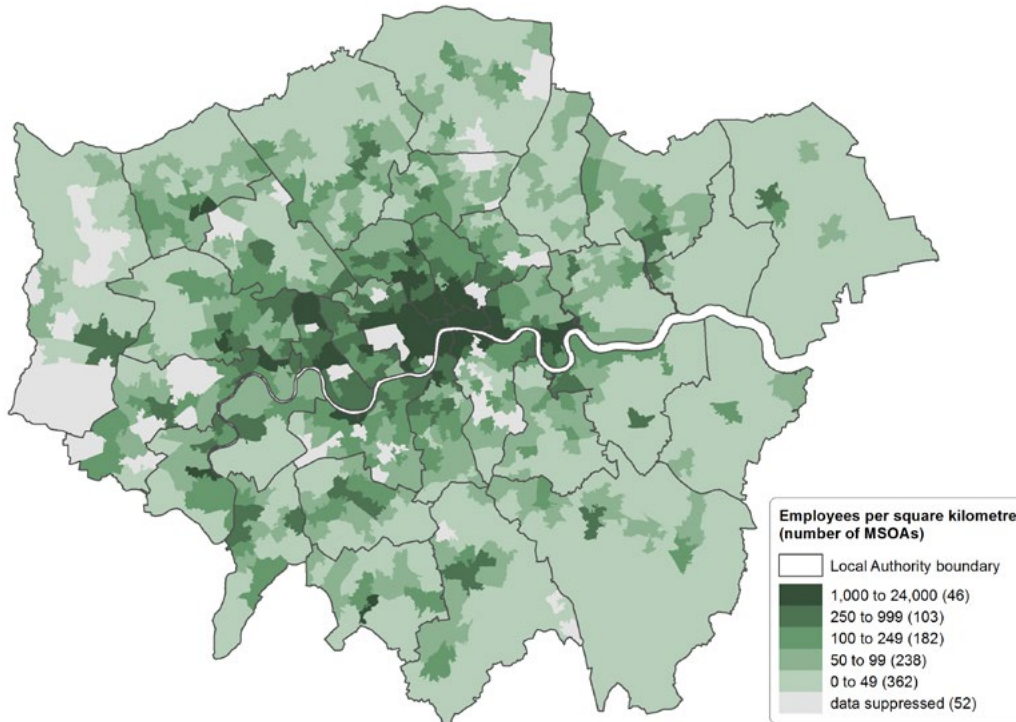■ 50 to 99 (324)
■ 0 to 49 (311)
☐ data suppressed (20)

Note: MSOA denotes Middle-layer Super Output Areas, a geography used for the analysis of small area statistics
Source: Inter-Departmental Business Register, Office for National Statistics
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Source: IDBR

Employees in Head offices and management consultancy as shown by Map 2.26 are unsurprisingly concentrated in central London, the NIOD and also around Heathrow.

Map 2.26: Employee concentration in Head offices and management consultancy in London in 2015

Employees per square kilometre (number of MSOAs)

- Local Authority boundary
- 1,000 to 16,000 (29)
- 250 to 999 (52)
- 100 to 249 (121)
- 50 to 99 (141)
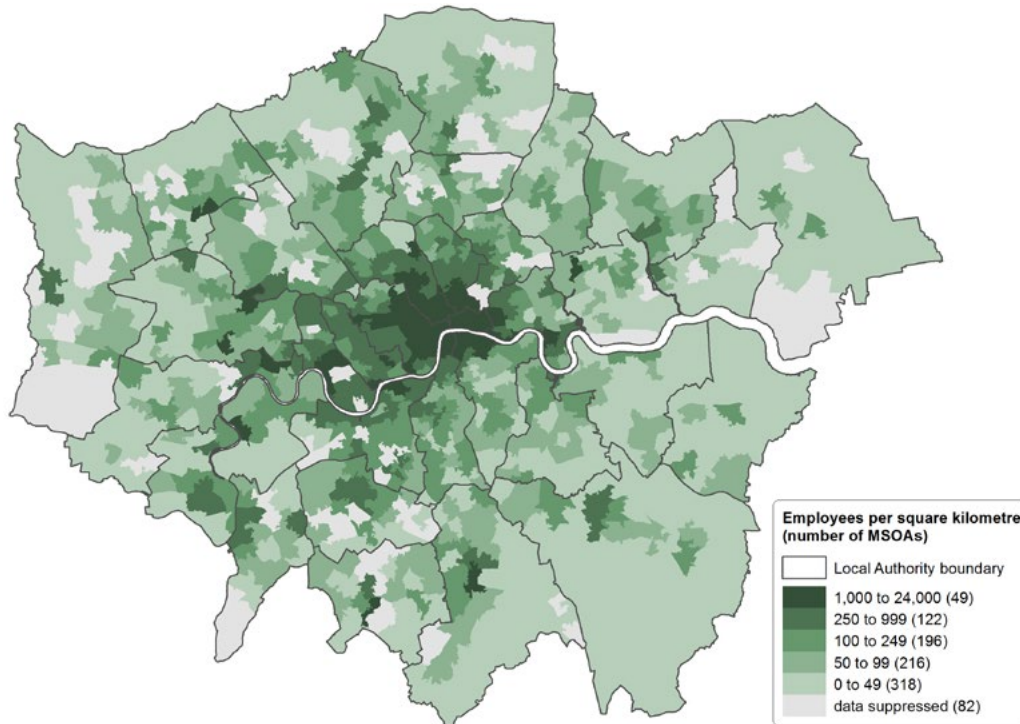- 0 to 49 (558)
- data suppressed (82)

Note: MSOA denotes Middle-layer Super Output Areas, a geography used for the analysis of small area statistics
Source: Inter-Departmental Business Register, Office for National Statistics
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Source: IDBR

Map 2.27 shows that employees in Human health and social work activities are highly concentrated in a number of areas of London, but in contrast to other activities are more spread out across London, most likely to meet the needs of the widely distributed population of London.

Map 2.27: Employee concentration in Human health and social work activities in London in 2015

Note: MSOA denotes Middle-layer Super Output Areas, a geography used for the analysis of small area statistics
Source: Inter-Departmental Business Register, Office for National Statistics
Contains National Statistics data © Crown copyright and database right 2016
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Source: IDBR

Map 2.28 shows that employees in Information and communications are concentrated in central London and the NIOD, as well as in areas of West London, parts of Richmond upon Thames and Sutton.

Map 2.28: Employee concentration in Information and communications in London in 2015

Employees per square kilometre
(number of MSOAs)

☐ Local Authority boundary

■ 1,000 to 24,000 (46)
■ 250 to 999 (103)
■ 100 to 249 (182)
■ 50 to 99 (238)
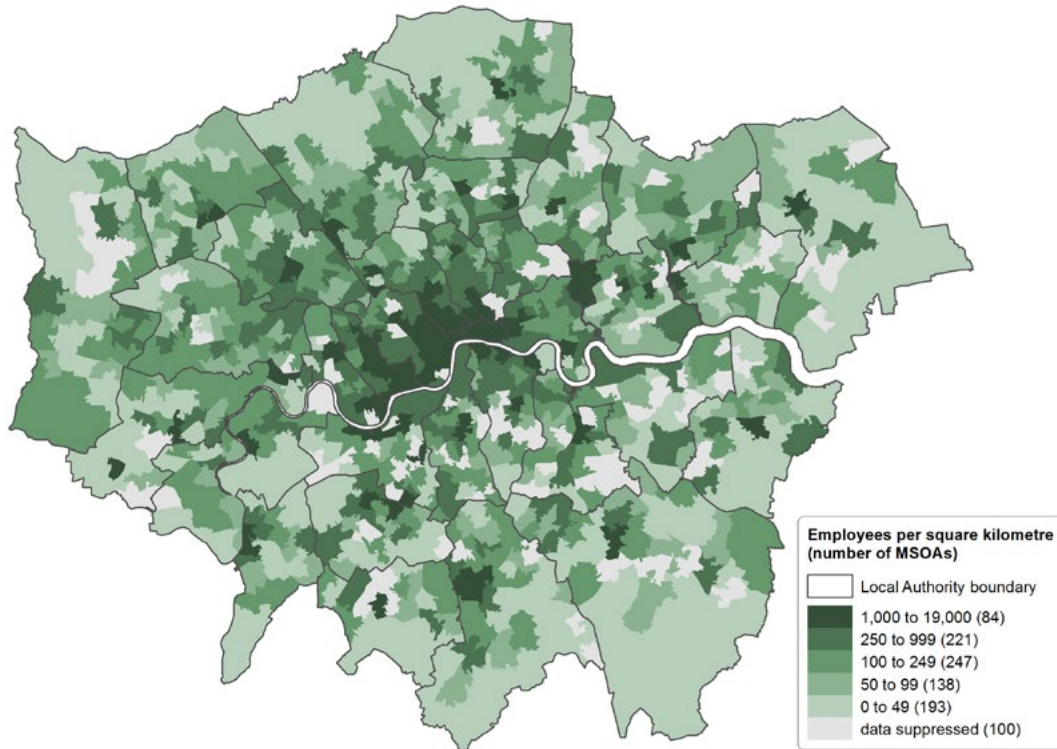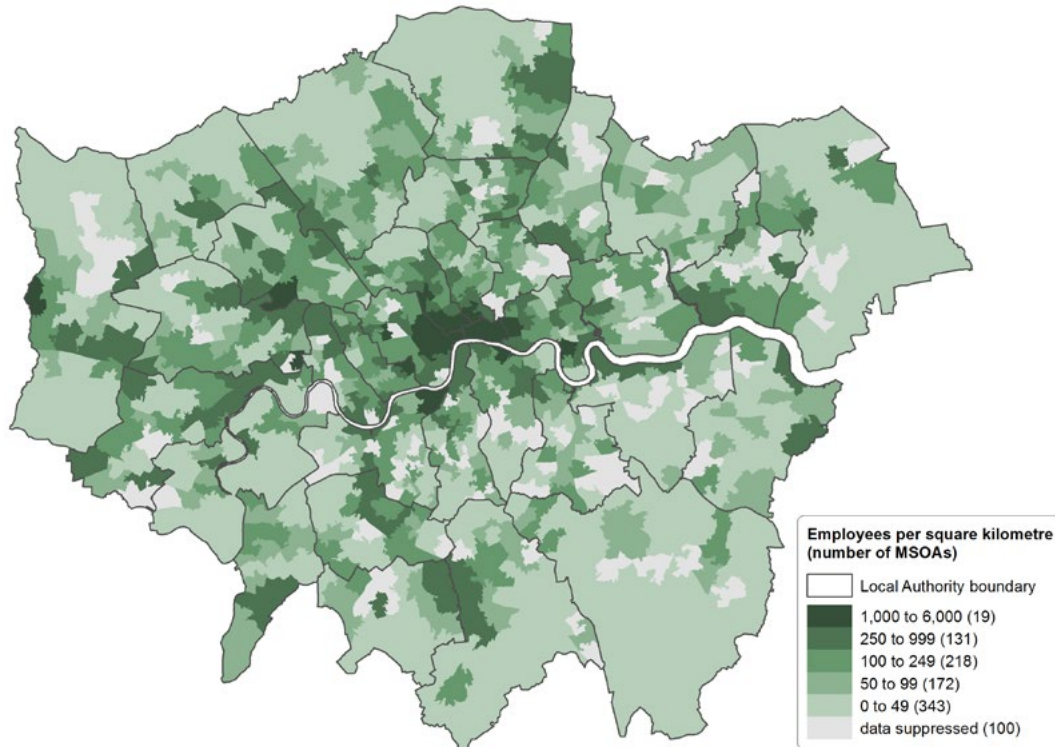■ 0 to 49 (362)
■ data suppressed (52)

Note: MSOA denotes Middle-layer Super Output Areas, a geography used for the analysis of small area statistics
Source: Inter-Departmental Business Register, Office for National Statistics
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Source: IDBR

Employees in Professional, scientific and technical activities (excluding Head office and management consultancy) are concentrated in central London, the NIOD and spreading into west London. However, Map 2.29 also shows areas of concentration in Croydon, Harrow, Newham, and Sutton.

Map 2.29: Employee concentration in Professional, scientific and technical activities (excluding Head office and management consultancy) in London in 2015

Employees per square kilometre
(number of MSOAs)

☐ Local Authority boundary

■ 1,000 to 24,000 (49)
■ 250 to 999 (122)
■ 100 to 249 (196)
■ 50 to 99 (216)
■ 0 to 49 (318)
☐ data suppressed (82)

Note: MSOA denotes Middle-layer Super Output Areas, a geography used for the analysis of small area statistics
Source: Inter-Departmental Business Register, Office for National Statistics
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Source: IDBR

Map 2.30 shows employees in Retail (excluding motor services) being concentrated in central London but with other areas of concentration spread across the whole of London and often associated with the various town centres in the capital.

Map 2.30: Employee concentration in Retail (excluding motor services) in London in 2015

Employees per square kilometre
(number of MSOAs)

☐ Local Authority boundary

■ 1,000 to 19,000 (84)
■ 250 to 999 (221)
■ 100 to 249 (247)
■ 50 to 99 (138)
■ 0 to 49 (193)
☐ data suppressed (100)

Note: MSOA denotes Middle-layer Super Output Areas, a geography used for the analysis of small area statistics
Source: Inter-Departmental Business Register, Office for National Statistics
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Source: IDBR

Map 2.31 shows that employees in Wholesale (including motor services) are concentrated in a broad swathe of Central and West London and around Heathrow. While other areas are visible in Barking and Dagenham, Bexley, Croydon, Enfield, Greenwich, Harrow, Havering, Hounslow, Kingston upon Thames, and Sutton.

Map 2.31: Employee concentration in Wholesale (including motor services) in London in 2015

Note: MSOA denotes Middle-layer Super Output Areas, a geography used for the analysis of small area statistics
Source: Inter-Departmental Business Register, Office for National Statistics
Contains National Statistics data © Crown copyright and database right 2016
Contains Ordnance Survey data © Crown copyright and database right 2016. Ordnance Survey 100032216

Source: IDBR

Other data could be used to examine employment concentration in London as was recently shown in a working paper for GLA Economics[39] at a slightly more aggregated geography for London, however the broad findings outlined above still hold true.

2.7 The lifecycle of firms in London

This section examines the lifecycle of firms in London from their birth or relocation into London to their migration out of London or their death if this occurs.

2.7.1 Firm births and deaths in London

As will be shown in more detail in Chapter 5 of this Evidence Bases London is a dynamic business area with it containing the most active enterprises of any UK nation or region and nearly one fifth of all UK enterprises. It also, outside of recessions, generally sees more business births than deaths (as shown by Figure 2.1) and thus has seen an expanding number of businesses over time. As noted, more detail on business start-ups and deaths and their spatial nature is given in Chapter 5 of this Evidence Base.

Figure 2.1: Annual business net-start up rate, London and the UK
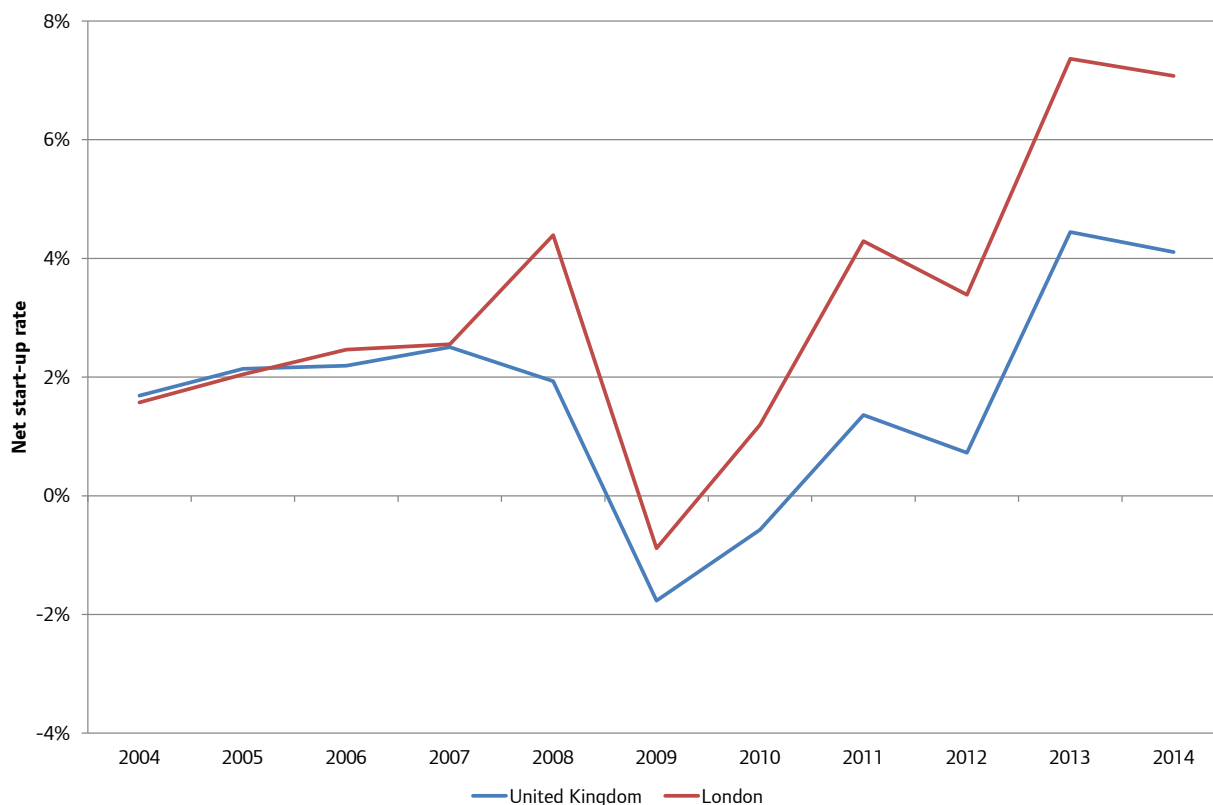
Source: ONS – Business Demography

2.7.2 Migration of firms from London

This sub section looks at the movement of firms and employment into and out of London and from or to the Greater South East and the UK over time. This examination should not be taken to imply that the eventual migration of firms from their founding region is guaranteed or is most likely but rather examines the flow of this migration for any firms that choose to relocate.

Concentration of internationally competitive businesses in the centre of London drives up the value of land. That drives businesses to be very productive, but the increased cost of this land has 'knock on' effects through a chain of substitution through the rest of London. Some companies and sectors find this high value of land difficult to live with and so move out of the capital. Thus although London generally creates more firms than the rest of the UK and generally sees growth in the number of firms based in the capital (as was shown above and will be shown in more detail in Chapter 5), research for GLA Economics has found that in terms of firms migrating into and out of London the capital has seen more firms and employment move out than move in from "the Greater South East and the rest of the UK. In 2012-13, 1,600 more firms migrated out of London than migrated in, resulting in a net loss of employment to the GSE and the rest of the UK of 10,470"[40].

This net firm migration could be in reaction to the cost of doing business in the capital due to the price of land. Maps 2.32a and 2.32b show net firm migration in and out of London, by London borough, in 2004 and 2013, although it should be noted that these maps do not include firm migration between London boroughs. As can be observed the maps indicate that in 2013, most London boroughs experienced net outward firm migration, with Sutton being the only London borough showing a noticeable net gain from firm migration. Maps 2.33a and 2.33b show that the destination of outwardly migrating London firms, over a number of years, was across most of the UK but with a heavier concentration into the wider Greater South East. Further analysis of firm migration is given in Chapter 5 of this Evidence Base.

Maps 2.32a & 2.32b: Net migration of businesses to and from London in 2004 and 2013 (as a percentage of business stock)
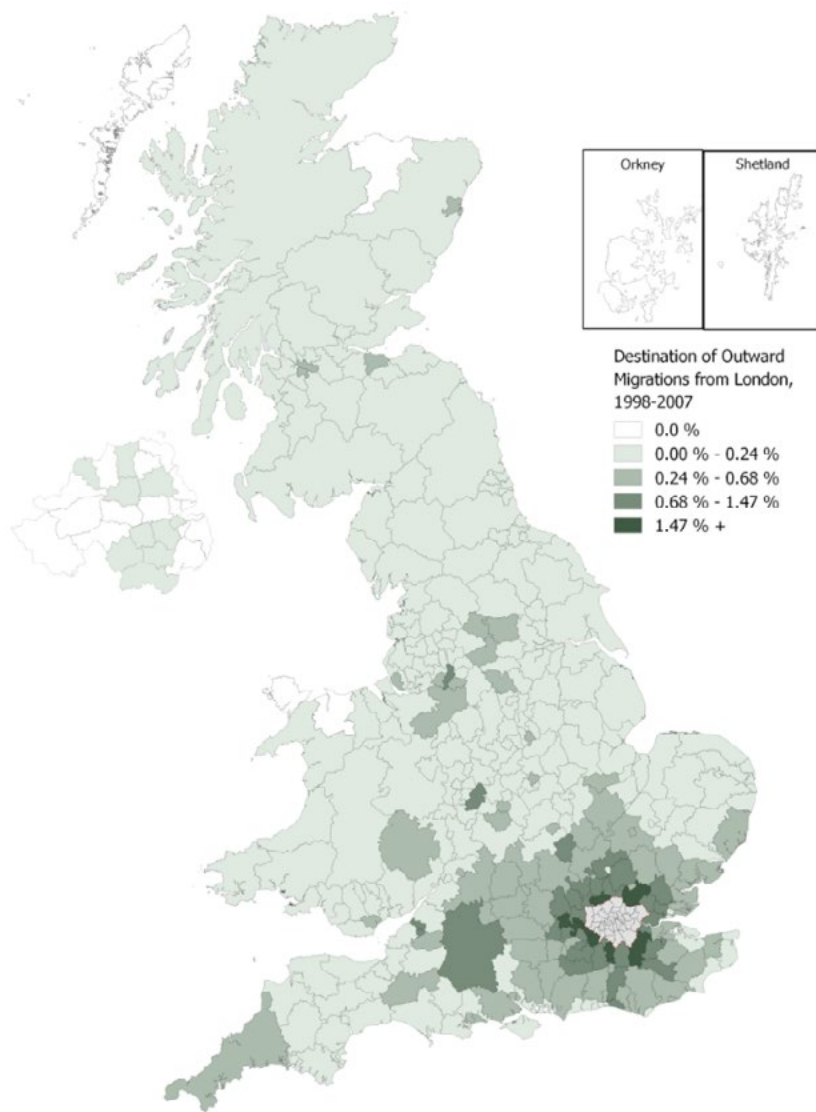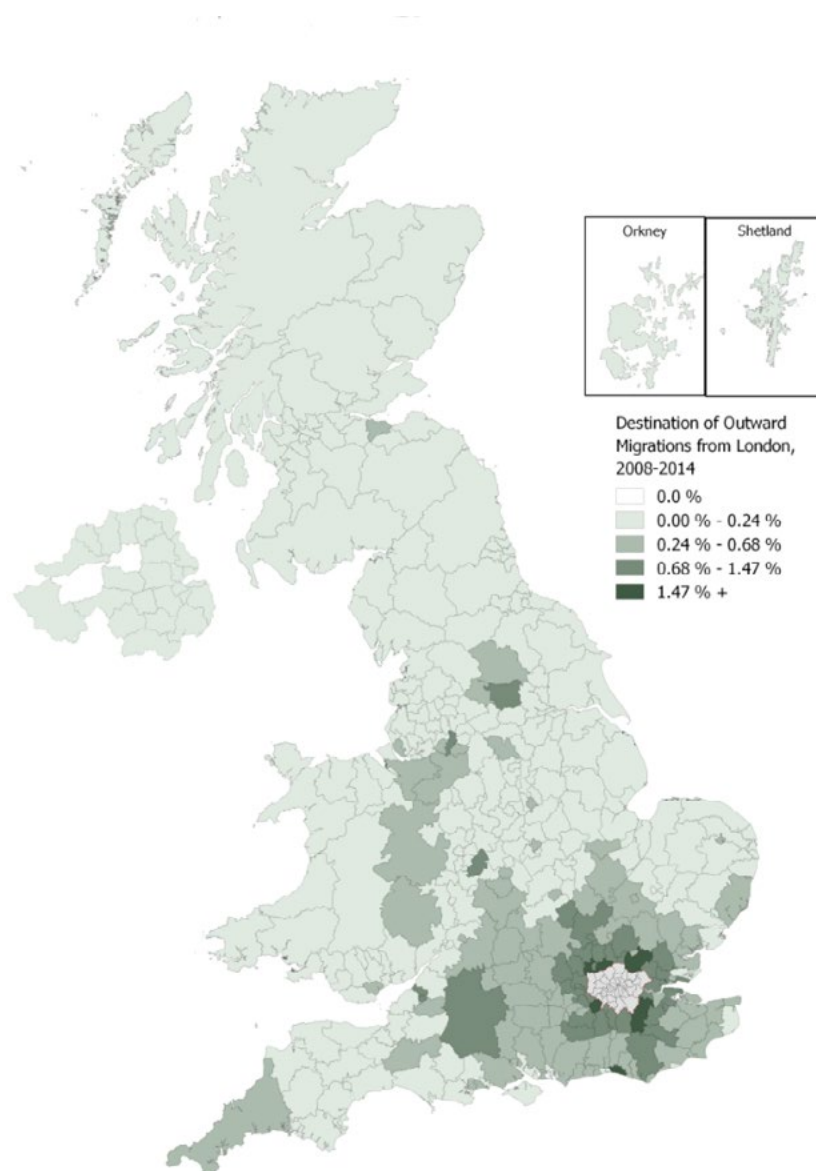**2004**

2013
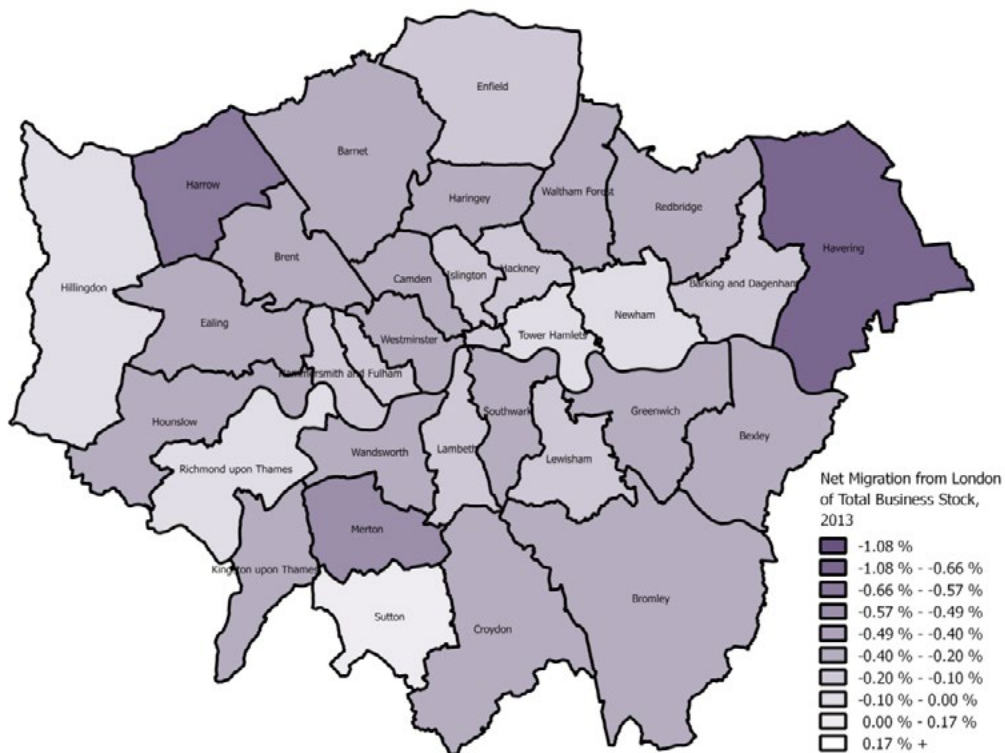
Source: TBR Observatory 2015. QGIS Development Team, 2015. QGIS Geographic Information System. Contains National Statistics data and Ordnance Survey data © Crown copyright and database right 2015 (TBR ref: W4/M1 & M2).

Maps 2.33a & 2.33b: Destination of outward migrating firms, 1998-2007 and 2008-2014, by local authority (percentage of all outward migration)
1998-2007

2008-2014

Destination of Outward
Migrations from London,
2008-2014

- 0.0 %
- 0.00 % - 0.24 %
- 0.24 % - 0.68 %
- 0.68 % - 1.47 %
- 1.47 % +

Source: TBR Observatory 2015. QGIS Development Team, 2015. QGIS Geographic Information System. Contains National Statistics data and Ordnance Survey data © Crown copyright and database right 2015. (TBR ref: W11/M1).

2.8 Conclusion

This chapter has shown how the forces of globalisation and agglomeration have led to sectoral specialisation which has also, to a degree, manifested itself in a spatial specialisation or concentration. Thus particular (and many) functions of London's economy have tended to locate in certain areas of London – particularly central London. And this is because central London offers a number of things that can't be found in combination in many other places. Central London offers good access to a large pool of high skilled labour (as shown later in this Evidence Base in Chapter 9) and good access to complementary inputs (so finance houses putting together merger deals for example have good access to legal services, accountancy and audit services, management consultancies etc.). Thus many businesses locating in central London want to be near one another. However, economic activities serving more local geographic markets take place across London as a whole. All of this though leads to demands on the transport network and also intense competition for land. The next two chapters of this Evidence Base examine these issues in more detail.

Chapter 2 endnotes

1 UK land area based on mean high water excluding area of inland water.

2 London First, January 2015, 'London 2036: An agenda for jobs and growth'.

3 ONS, March 2016, 'Major Towns and Cities – Methodological Note and User Guidance'.

4 ONS, 'Travel to Work Areas'.

5 Maps of these alternative TTWAs can be found at: ONS, September 2016, 'Alternative Travel to Work Areas'.

6 ONS, September 2016, 'Travel to work area analysis in Great Britain: 2016'.

7 Ibid.

8 Ibid.

9 More detail on Functional Urban Areas is available from Eurostat here: Eurostat, 'European cities – the EU-OECD functional urban area definition'.

10 For an example see: Cushman & Wakefield, 2011, 'European Cities Monitor'.

11 GLA Economics, September 2014, 'Growing Together II: London and the UK economy'.

12 These benefits have been shown by a number of academic studies such as: Andersson, F., Burgess, S., & Lane, J. I., (2007), 'Cities, matching and the productivity gains of agglomeration'. Journal of Urban Economics, 61 (1). Which found "that thicker urban labor markets are associated with more assortative matching in terms of worker and firm quality" and "that production complementarity and assortative matching is an important source of the urban productivity premium".

13 Graham, D., (2007), 'Agglomeration, productivity and transport investment'. Journal of Transport Economics and Policy, 41(3).

14 An area that contains Canary Wharf.

15 For a more in depth analysis of the CAZ, NIOD and their fringes please see: Douglass, G., August 2015, 'Working Paper 68: Work and life in the Central Activities Zone, northern part of the Isle of Dogs and their fringes'. GLA Economics.

16 ONS, 18 May 2016, 'Regional GVA(I) by Local Authority in England 1997 to 2014'.

17 Note both these maps are drawn from a north facing perspective and given the concentration of employees in the centre of the CAZ and NIOD may hide details to the north of these concentrations.

18 The area around Old Street Roundabout where a number of tech firms have congregated.

19 The clustering was carried out using GIS Hot Spot Analysis. Given a set of weighted features, it identifies statistically significant hot spots and cold spots using the Getis-Ord Gi* statistic. This is based on the value of a cell and the value of the cells immediately around it. A high value cell with high value cells around it will get the highest score.

In detail the Getis-Ord Gi* statistic is used to identify statistically significant hot spots and cold spots, with the 'Fixed Distance Band' parameter being used to reflect spatial relationships; the default distance calculated by the tool was used (2771m), which ensures each feature (geographical area) has at least one neighbour. ArcGIS describes this as:

"Each feature is analyzed within the context of neighbouring features. Neighbouring features inside the specified critical distance receive a weight of 1 and exert influence on computations for the target feature. Neighbouring features outside the critical distance receive a weight of zero and have no influence on a target feature's computations".

For more details on the employment clustering in the CAZ please see: Douglass, G., August 2015, 'Working Paper 68: Work and life in the Central Activities Zone, the northern part of the Isle of Dogs and their fringes'. GLA Economics.

20 External benefits that arise when economic activity takes place in a concentrated space.

21 ABI data was used for this map as BRES data does not go back to 2003.

22 Appendix C of: Douglass, G., August 2015, 'Working Paper 68: Work and life in the Central Activities Zone, the northern part of the Isle of Dogs and their fringes'. GLA Economics, provides more detail on the methodology used in the clustering analysis in this map.

23 Census data are adapted from data from the Office for National Statistics licenced under the Open Government Licence v.3.0.

24 This map was initially published in: Trends Business Research Ltd, February 2016, 'Working Paper 73: The changing spatial nature of business and employment in London'. GLA Economics.

25 Middle-layer Super Output Areas.

26 The following table provides background data on firms in London – such as the number, proportion employed within them, and estimated business turnover.

There are two main sources of data on business counts available:

· UK Business Counts (Office for National Statistics)

· Business Population Estimates (Department for Business, Innovation & Skills (BIS))

For this table, the BIS Business Population Estimates have been used.

Definitions:

The two sources differ in their scope, mostly in the treatment of unregistered businesses. These are businesses that are not registered for VAT or PAYE. Businesses which make gross revenues in excess of £83,000 must register with HMRC for VAT. Businesses must register for PAYE if employees are paid £112 or more a week, get expenses and benefits, have another job or get a pension.

Data from BIS are drawn from the Interdepartmental Business Register, but also include an estimate of unregistered businesses (drawing from household surveys carries out by the ONS), therefore the number of SMEs through this source will be much higher, especially in the number of zero-employee businesses. Data from the ONS are based upon the Interdepartmental Business Register and only includes businesses which are registered for VAT and PAYE.

Therefore, the BIS statistics are arguably a more complete dataset on all business activity, but both sources have different strengths (for example ONS business data can be used to estimate net business start-up rates, have a greater industry sector breakdown than the BIS statistics and can provide detail of local units – i.e. individual workplaces). A fuller background note on business statistics sources are available here.

27 Businesses with no employees can either be 'registered' for VAT or PAYE or are 'unregistered'.

28 BIS impute the turnover of unregistered businesses based on the turnover for zero-employee VAT/PAYE registered businesses at industrial sectoral level.

29 Trends Business Research Ltd, February 2016, 'Working Paper 73: The changing spatial nature of business and employment in London'. GLA Economics.

30 ONS, May 2016, 'Regional GVA(I) by Local Authority in England 1997 to 2014'. Note as highlighted in the text the data in this link was revised in July 2016 to take account of ONS revisions of their estimates of output at the NUTS3 level.

31 Note that the scale used for these maps varies between maps.

32 Note that the scale used for this map and the ones in Section C of the appendix to Chapter 2 varies between maps.

33 Douglass, G. & Hoffman, J., March 2015, 'Working Paper 64: The science and technology category in London'. GLA Economics.

34 Togni, L., October 2015, 'Working Paper 70: The creative industries in London'. GLA Economics.

35 Cluster analysis groups together areas with similar characteristics. K-means clustering was applied to grouped Industrial class data available for London's 2011 Census Workplace Zones. These classes were grouped as follows:

A, B, D, E: Agriculture, Mining, Electricity, Water supply*

C: Manufacturing

F: Construction

G, I: Distribution, hotels and restaurants

H,J: Transport and communication

K: Financial and insurance activities

L: Real estate activities

M: Professional, scientific and technical activities

N: Administrative and support service activities

O, P, Q: Public administration, education and health

R, S, T, U: Other

*variable is rejected after first round k-mean test, as it creates noise in the cluster results, so it is not included in the final k-mean analysis)

Running the k-means algorithm identified five clusters of Workplace Zones that demonstrated a strong similarity in the Industrial type of its workers, these were:

G, I: Distribution, hotels and restaurants

K: Financial and insurance activities

M: Professional, scientific and technical activities

O, P, Q: Public administration, education and health

H,J: Transport and communication

all other areas were not found to have a dominate industry type present so were grouped together.

36 Classification of Workplace Zones for England and Wales.

37 Cockings, S., Martin, D., & Harfoot, A., August 2015, 'A Classification of Workplace Zones for England and Wales (COWZ-EW): Annex A - Profiles of Supergroups'.

38 Classification Of Workplace Zones for England/Wales.

39 Trends Business Research Ltd, February 2016, 'Working Paper 73: The changing spatial nature of business and employment in London'. GLA Economics.

40 Ibid.