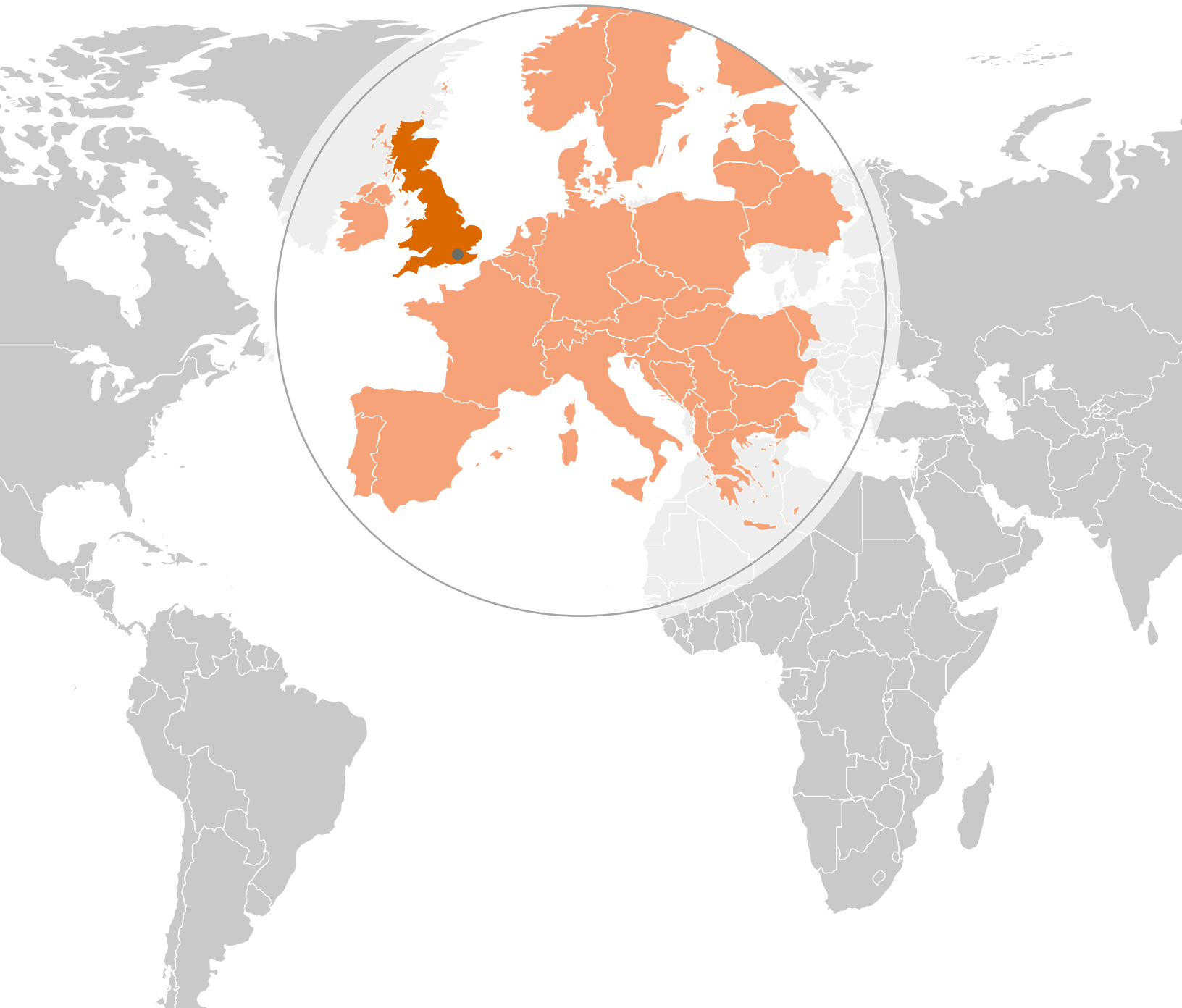




Facing Facts: The impact of migrants on London, its workforce and its economy

March 2017



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Foreword

The decision by the British people in June 2016 to leave the European Union will have significant socio-economic and political consequences.

One of the most critical will be the new migration regime that replaces the rights of EU citizens and their family members to move, work, and reside freely within the United Kingdom.

It is important to understand the role migrants play in the economy, when setting a new policy framework for migration.

This is what drives the new report from London First and PwC, which presents a clear picture of the capital's migrant workforce and the impact on London's economy.

The partnership between PwC and the ONS – the first of its kind – has enabled PwC to access and use detailed granular data from the ONS's secure Virtual Micro-Laboratory.

The report seeks to supersede assumptions and estimates with data derived from the most comprehensive review of population and labour force data to date.

We hope our analysis will make a valuable contribution to the debate and enable businesses to make informed decisions and future proof their workforce. Likewise, the fact base should support decisions that need to be made by government as it seeks to shape the UK's immigration system and, in tandem, build a robust skills system for the post-Brexit era.

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Executive Summary

The fact base put together by London First and PwC is the most comprehensive review of the data available to date. The partnership between PwC and the ONS – the first of its kind – has enabled PwC to access and use detailed granular data from the ONS’s Virtual Micro-Laboratory.

The aim of this report is to provide a factual summary of how migration to London from Europe and beyond has affected London’s population, workforce and economy. The intention is to assist Government politicians and policymakers in their development of the UK’s immigration policy as part of the Brexit negotiations. In addition, the report will assist business in its analysis of the impact of migration on talent within their own organisations and supply chains. Throughout the report, a migrant is defined as someone born outside of the UK but whose primary place of abode is within the UK.

The report paints a clear picture of where migrants to London over the period from 2005 to 2015 have come from, what they do when they arrive here, and what their overall economic impact is. The report also measures the economic impact of migrants on London’s economy using modelling which captures interactions between different sectors of the economy, households and the government.

Key findings

London’s growth, in part driven by the people it attracts from abroad, is creating more jobs and delivering economic benefits

- London’s population is growing
 - London’s population has grown from 7.4m in 2005 to 8.7m in 2015
 - This growth is a result of an increase in both UK born residents, rising by an annual average of 26,700 (a 0.4% average annual increase), and people born overseas, increasing at a faster rate with an annual average of 83,500 people (a 3.6% average annual increase)
 - 37% of London’s population was born outside of the UK, which is broadly comparable with other major cities in the West, but is higher than the rest of the UK’s migrant population, at 10%
 - London’s migrant population is not evenly spread: the borough of Newham has the largest proportion of migrant residents at 55.2%, with Havering the lowest at 13.6%
- London’s growing talent pool mirrors its economic growth
 - Migrants come to London for a variety of reasons
 - About half of all EU migrants initially move to London for employment and approximately 15% come to London to study. Just over a quarter of EU migrants come to London as a dependant of either a UK or foreign citizen.
 - Non-EU migrants have slightly different reasons for coming to London. Approximately 20% come for work, 20% to study and just under half come as the dependant of a UK or foreign citizen
 - Between 2005 and 2015, the total number of people working in London – the capital’s workforce - has grown by an average annual increase of 85,400 workers (2.3% each year). This reflects an increase in workers in all groups – UK born, EU born and non-EU born:
 - The number of UK born workers make up the majority of London’s workforce at 62% with the total number of UK born workers increasing by 20,800 people per year;
 - EU workers have increased by 32,900; and non-EU workers by 31,700 per year

- Migration is delivering benefits for London, and around the UK
 - On average, each migrant worker contributes a net additional £46,000 in Gross Value Added (GVA) per annum to London's economy
 - With approximately 1.8m migrant workers in London, their total contribution is around £83bn, approximately a quarter of London's Gross Value Added (22% of London's GVA per annum)
 - The economic contribution of workers born outside of the UK also helps to create additional jobs in the wider London economy
 - Our calculations imply that the additional GVA generated by 10 jobs from migrant workers will support an additional 4 jobs in the UK economy (note these jobs may go to migrant workers or those workers born in the UK). The equivalent job creation figure for workers born in the UK figure is 3 jobs.
 - Migrants in the London region also contribute positively to the rest of the UK economy
 - The contribution by London migrants to London's economy spills over to the rest of the UK economy, with London's migrant labour resulting in £30bn additional GVA per annum to the wider UK economy.

Underneath this overall picture, this study helps to understand what's happening in different sectors and roles

- London is a skilled city:
 - The type of work Londoners do is, on the whole, skilled, with a large component of workers in the professional services, finance and business services, health, education and IT-related sectors.
 - London's workforce is educated, with 43% holding a degree or equivalent qualification, compared to the UK average of 28%
- London is one of the world's most popular cities for international students:
 - As of 2015, Non-EU and EU students accounted for just under 30% of all Higher Education students in London. There are approximately 100,000 international undergraduate and postgraduate students in London, a figure that has shown strong growth over recent years.
 - Over the last 10 years, there has been a slight decline in overall numbers of students undertaking undergraduate or postgraduate degrees in London (382,000 to 360,000).
- Londoners perform a range of roles that, on the whole, varies by region of birth:
 - UK, Non-EU and EU-15 migrants tend to work in managerial and professional roles across the full range of industry sectors, whereas Post-2004 Accession Country migrants tend to undertake semi-routine and routine work, work in small businesses or are self-employed – often in the construction, tourism or wholesale & retail sectors.
- Migrants play an important role in many of London's key industries, and the report is illustrated with more detailed analysis of the Construction, Financial Services, NHS, Hospitality and Retail sectors in London. Key findings of these "case studies" are presented below:
- Construction
 - Construction is historically a highly cyclical sector, with significant volatility. However, since 2009, the construction industry in London has steadily increased its quarterly output from £5bn to £8bn, with much of this growth arising as part of the recovery from the credit crunch in 2013 onwards.

- The construction industry in London employs approximately 300,000 people, of whom 50% are UK born, 30% are born in the EU and 20% are born outside of the EU. The majority of workers in this sector are lower and mid-skilled.
- Demand for workers in the sector looks set to grow as London addresses its historic under-supply of homes and infrastructure. However, the industry has been unable to meet this demand with 'home-grown' workers and so has increasingly recruited migrant workers to fill the gaps. It is estimated that approximately 60,000 more construction workers are needed in London and the South East as of 2017.
- The UK-born construction workforce is aging, with just under a fifth due to retire within the next five years. Without migrant workers to make up the shortfall, London would be facing significant skills shortages in the construction industry, as the supply of younger workers – via channels such as apprenticeships – cannot meet demand at the rate needed.
- Financial Services
 - London has been long recognised as a global hub in financial services, and faces stiff competition from similar centres such as New York, Singapore and Hong Kong.
 - The sector covers a diverse range of skilled services, such as banking, insurance, securities trading and fund management.
 - Financial Services employs nearly 300,000 workers in London and accounts for just over one sixth of the total London economy.
 - Approximately 60% of the sector's workforce in London are UK-born, 25% are born outside of the EU and 15% born within the EU. This breakdown of workforce has remained relatively static over the last ten years.
- National Health Service
 - The NHS employs approximately 175,000 skilled people in London, approximately 25% of whom are born outside of the UK.
 - Migrant health sector workers have been employed by the UK since the 1930s. Across the whole of the UK, just under 10% of NHS vacancies are currently unfilled and the situation is even more pronounced in London.
 - Doctors from the EU make up approximately 13% of those in the NHS in London, with India being the highest country of birth for NHS doctors after UK (at 4% of the total).
 - After the UK, nurses born in the Philippines are the most numerous in the NHS in London at 5% of the total.
- Hospitality
 - Approximately 250,000 people (typically lower-skilled) are employed in the Hospitality Sector in London, which has a GVA of more than £11bn per annum.
 - Around 70% of London's hospitality workforce (175,000) are born outside the UK. At 100,000, non-EU workers are the biggest group within the sector, with EU workers numbering just over 75,000.
 - UK-born workers are in the minority in this sector in London, numbering just under 75,000.
- Wholesale & Retail
 - Wholesale & Retail is characterised by a young, flexible, lower-skilled workforce with a fifth of workers aged under 25 and a third working part-time.
 - London's workforce in this sector totals 250,000 – with 56% UK-born, 32% non-EU-born and 12% EU-born.
 - The sector in London alone has a GVA of more than £31bn – and has shown significant growth over recent years. On average, London's Wholesale and Retail workforce has grown by 9,000 workers per year – 3,800 of whom were UK-born workers, 1,800 EU-born workers and 3,300 non-EU-born workers.

1 Introduction

This section outlines the aims and objectives of this report and provides an overview of its scope. Further details of the methodology and data sources used are given in later sections.

1.1. Aim

The aim of this report is to provide policymakers with a factual summary of how migration to London from Europe and beyond has affected London's population, workforce and economy. Its analysis is derived from the most comprehensive and recent datasets available: a list of data sources used can be found in Appendix C.

This report intentionally does not include opinions, only data and analysis. In particular, it makes no reference to the opinions of the authors themselves or the organisations they represent.

1.2. Scope

This report looks at trends in migration to London between 2005 and 2015.

We explore this migration in three main ways:

- a summary of the main trends in migration to London, based on demographics such as region/country of origin, economic activity and other similar factors;
- an assessment of the impact of migrant labour on the London workforce, including impact by industry sector; and
- a high-level evaluation of the overall economic impact of inbound migration to London.

Where the data allows such analysis, we explore the relative contributions of EU and non-EU born workers.

1.3. Definition of terms

In this report we use the convention that an italicised-blue-bold font (viz. ***point estimate***) denotes a term used for the first time for which a definition can be found in the glossary given in Appendix A. Where we feel this will be of use, a concise definition of the term is presented in the main body of the text, but Appendix A should be consulted for further details.

1.4. Data and definitions

In this section we introduce some of the key concepts used throughout this report.

1.4.1. What data did we use?

The primary data source used in this work was the Labour Force Survey from 2005-2015 published by the Office for National Statistics, **ONS**. The Labour Force Survey is the largest household study in the **UK** and provides the official measures of employment and unemployment. The survey is published on a calendar quarterly basis and involves approximately 40,000 responding UK households each quarter – which is equivalent to approximately 100,000 individuals a quarter or 400,000 individuals a year¹.

All analysis of LFS data was conducted using the ONS Virtual Microdata Laboratory (VML) service, in accordance with the rules of the Approved Researcher scheme. The version of the data held in the VML has had all names, addresses and other identifying variables removed by ONS, prior to analysis, to protect confidentiality of the survey respondents.

Work on this report started in the latter part of 2016 and was concluded in early 2017. As a result, and due to the time taken to collate and process survey returns, the last **full** year of data we were able to obtain for the ONS Labour Force Survey was 2015. Where we were able to obtain data for **part** of 2016 – and where use of such data was meaningful – we have used it in this report.

Several other data sources have also been used in this report and these are documented in Appendix C.

This project and its technical content (including all data transformations, and conclusions drawn) have been peer-reviewed by a highly-experienced lead analyst from PwC, who was independent of the project team throughout its execution.

1.4.2. What is a migrant?

Given its criticality to this work, it is important to be clear from the outset on exactly what we mean by the term “***migrant***”.

There are several definitions one could use – and in Appendix B, we present a discussion of the relative pros and cons of these definitions. No definition is perfect and all definitions can be problematic from an analytic perspective².

¹ Source: ONS website – ons.gov.uk.

² See www.migrationobservatory.ox.ac.uk/resources/briefings/who-counts-as-a-migrant-definitions-and-their-consequences/ for an in-depth discussion of this point.

However, for the purposes of this report, a migrant is defined as someone born outside of the UK but whose primary place of abode is within the UK.

So, for example, a person born in South Africa, but living in the UK at the time of the Labour Force Survey would be classified as a **non-EU migrant**. A person born in Germany, but living in the UK at the time of data collation would be classified as an **EU migrant**.

Even if British citizenship is obtained after migrating to the UK, an individual would still be classified as a migrant if their country of birth lay outside of the UK – and regardless of rights to abode that might arise from status such as Commonwealth citizenship. Thus, a first generation migrant to UK would therefore be classified as a migrant in our analysis; whereas their children would be classified as UK-born residents, under the assumption they were born in UK and still reside here.

1.4.3. What do we mean by UK born?

In what follows, the term UK born refers to a person born within the United Kingdom of Great Britain and Northern Ireland – in others words, a person born within England, Scotland, Wales or Northern Ireland³.

1.4.4. What do we mean by an EU-migrant and non-EU migrant?

In this report, we use the term EU-migrant to refer to a person born within a member country of the EU, excluding the UK, who was living in **London** at the time of the ONS Labour Force Survey.

The term non-EU migrant refers to a person living in London at the time of the ONS Labour Force Survey and who was born in a country outside of the EU.

1.4.5. What do we mean by London?

We use the term “London” to mean the administrative area of the Greater London Authority.

1.4.6. How do we account for the City of London in our analysis?

The permanent population of the City of London is very small in comparison with that of the London boroughs. In 2011, the City of London had just 8,500 permanent residents compared to 239,900 in neighbouring Westminster. Indeed, it is much smaller than even the smallest London borough by population, which is Kensington & Chelsea with 158,400 residents⁴.

As a result, ONS add their data for the City of London to that for Tower Hamlets. We have adopted the same approach in this report, as to attempt to untangle data for the City of London from the other boroughs would likely introduce so many assumptions and approximations as to make the analysis meaningless – especially with such a comparatively small population in the first place.

³ The Isle of Man, Bailiwick of Guernsey and Bailiwick of Jersey are not part of the United Kingdom, being Crown dependencies.

⁴ Source: data.london.gov.uk/dataset/london-borough-profiles.

1.4.7. What do we mean by skilled, semi-skilled and low-skilled workers?

A skilled worker is a person who has specific proficiency, training, knowledge and ability in their profession. A skilled worker may have attended a college, university or technical school or he/she may have learned their skills on the job.

A low-skilled worker is one with little or no specific proficiency, training, knowledge and ability in their profession. Unskilled workers are generally characterised by lower levels of educational attainment.

A semi-skilled worker is a person falling between the definitions of skilled and low-skilled presented above.

In this report, we make no distinction between skilled and highly-skilled workers.

1.5. Some comments on the data used

The data used for this report has mainly been drawn from surveys undertaken by the ONS. It is widely agreed that ONS represents the gold-standard for statistical work and that the survey data captured by them is invariably of a high quality. However, by their very nature, surveys can never be 100% accurate and always introduce a margin of error when they are extrapolated to apply to a population as a whole. Such error is unavoidable and is something we discuss in greater detail in Appendix D.

Remembering that this report is aimed at policymakers and business, rather than statistical researchers, we have endeavoured to keep the document as accessible as possible. The analysis presented in the main body of the text uses *point estimates* of values, without referring to errors, which we discuss further in the Appendix referenced above. We present graphs without error bars shown on them, as we feel this makes them easier to read, without losing the essential messages that are being communicated. We have also taken a pragmatic approach to the level of precision to which values are quoted and have used rounding to the nearest 100 or 1000 where this is analytically justified.

1.6. Report structure

This report comprises of 4 chapters – this introductory chapter and 3 technical chapters. Each technical chapter opens with a summary of the key facts and figures, with more detailed discussion presented in the text that follows.

The first technical chapter explores how, at a high-level, inwards migration has affected the population of London.

The second looks at how migrants have contributed to the **workforce** in London, and is illustrated with a series of case studies, looking in greater detail at some of the main industries in which Londoners work.

The final chapter examines the impact of migrants on London's economy.

The document is concluded with a series of supporting appendices providing supplementary discussion and information.

1.7. Economic modelling approach

Chapter four examines the impact of migrants on London's economy. The analysis uses a Computable General Equilibrium (CGE) model to capture interactions between different sectors of the economy, households and the government. The key aspects of the model include:

- the consumption block – outlining the organisation of consumption within the CGE model;
- the production block – containing the structure of the productive side of the economy within the CGE model;
- the Government sector – taking into account the two roles government performs in the CGE model: collecting taxes and spending money; and
- the labour market and migration flows – incorporating a direct relationship between employment, wages and levels of economic activity.

For the detailed approach and structure of our CGE model, please see Appendix E of this report.

2 The High-Level Characteristics of London's Migrant Population

Chapter Summary

Over the last 100 years, the resident population of London has fluctuated – from a minimum of 6.7 million in 1988 to 8.7 million in 2015. Over the last 10 years, the resident population of London has increased from 7.4 million in 2005 to 8.7 million in 2015⁵.

Migrants accounts for some, but not all, of the 15.4% increase in London's population observed over the last 10 years. Over this period, the number of migrants living in London has increased by 83,500 per year, whereas the number of UK-born residents living in London has increased by an annual average of 26,700.

In percentage terms, the UK-born population of London has increased by an average of 0.4% per annum over the last 10 years, the EU-born population by 7.7% and the non-EU-born population by 2.4%.

As of 2015, approximately 37% of London's population was born outside of the UK. This is broadly comparable with other major cities in the West.

The countries in which most migrants to London were born are: India (3.3% of the total population of London), Poland (1.9%), Pakistan (1.5%), Nigeria (1.3%) and Ireland (1.2%).

The distribution of migrants across the 32 London boroughs is relatively uneven. Newham has the highest proportion of resident migrants at 55.2%, Havering has the lowest at 13.6%.

Nine London boroughs have seen an absolute percentage increase in the proportion of resident migrants of greater than 10% over the last ten years. Barking & Dagenham has seen the largest absolute percentage increase at 21% (from 18.4% in 2005 to 39.4% in 2015).

London differs markedly in its proportion of migrant residents when compared to the rest of the UK – at 37% in 2015, compared to the rest of the UK, at 10%. Outside of London the local authorities with the highest proportion of migrants in 2015 are Slough (38.6% – higher than London), Coventry (26.6%) and Nottingham (22.2%).

On average, the mean increase in migrant population in the London boroughs over the last 10 years is double that of the UK local authorities (26,000 vs. 13,000).

Summary Data

Year	2005	2015	Change	% Change
UK born	5,147,300	5,339,900	+192,600	+3.7%
EU born	545,500	963,000	+417,500	+76.5%
Non-EU born	1,753,200	2,169,300	+416,100	+23.7%
Non UK Total	2,298,700	3,132,300	+833,600	+36.3%
Total	7,446,000	8,472,200	+1,026,200	+13.8%

⁵ONS Mid Year Estimates (MYE)

Table 2a Summary data of London's population - Calculated from the ONS Labour Force Survey which shows minor differences in estimated values from the MYE figures due to different statistical estimation techniques

Analysis

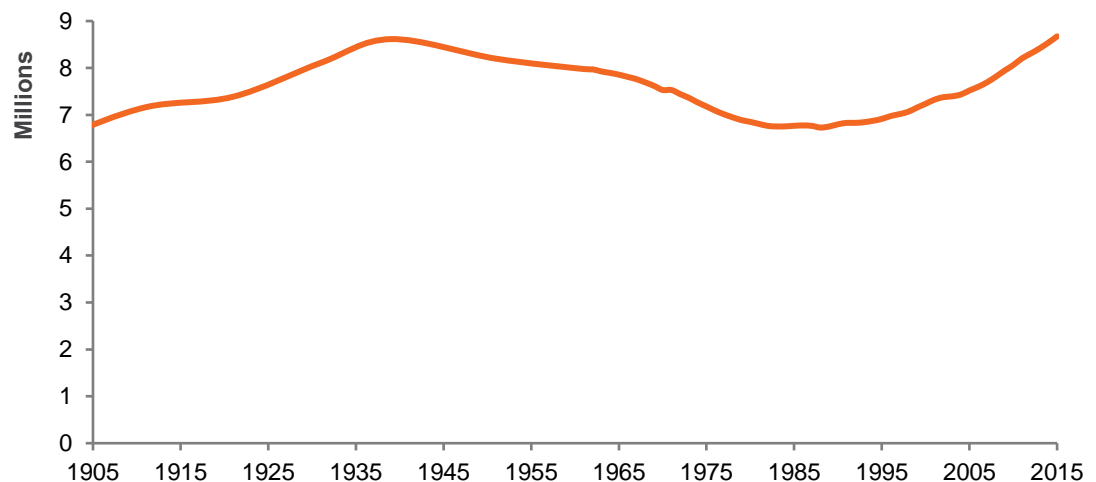
In this chapter, we provide an overview of how London's migrant population has changed over recent years. Our analysis of migration to London is from 2005 onwards, this is the year after citizens of the new EU accession member states (defined as **post-2004 accession countries**⁶) were permitted the right to live and work in the UK.

2.1. An overview of London's changing population

2.1.1. Historical trends

London's population reached its historic peak of 8.6 million in 1939, just before the outbreak of the Second World War. War-time casualties and evacuations were compounded post-war by slum clearance and the building of *new towns*⁷, such as Milton Keynes and Stevenage. The total population reached a low in the mid-1980s and then started to rise quickly and, in 2015, exceeded its 1939 peak, with little signs of slowing, as illustrated in Figure 2 a below.

Figure 2 a:
Population of
London,
1905 – 2015



Source: Census statistics (pre-1961), ONS mid-year statistics (1961 onwards)

⁶ See Appendix A for a listing of these countries.

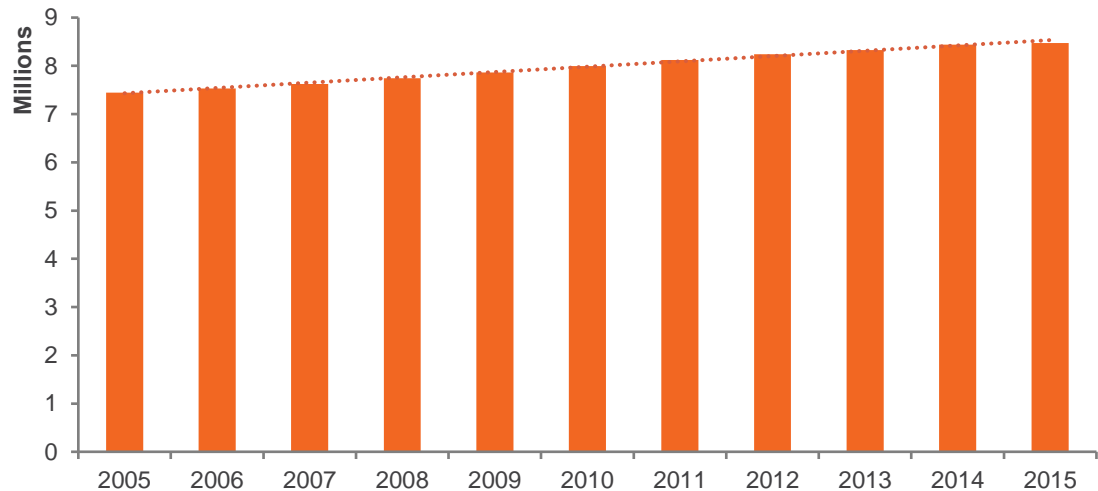
⁷ Defined as an included city in the New Towns Act 1946

2.1.2. Recent trends

Over the last 10 years, there has been a 15.4% increase in the population of London, from 7.4 million in 2005 to 8.7 million in 2015. This is shown in Figure 2 b below⁸:

This rate of growth is higher than at any time over the last 100 years.

Figure 2 b:
Population of
London,
2005 – 2015



Source: ONS mid-year statistics

Part, but not all, of this increase is due to the settlement of migrants in London, (as evidenced in Figure 1 c below). We explore the reasons for migrants coming to London in Section 3.2.

The graph shows very clearly that London's non-EU population is more than double the EU population.

In addition, and as the **trendlines** in Figure 2 c below show, the rate of increase of London's migrant (i.e. non-UK) population is significantly greater than that of the UK-born population. The non-UK trendlines slopes noticeably upwards, whereas the gradient of the UK trendline appears less steep (as confirmed by the percentage values below).

More detailed analysis shows that the average increase of the UK population in London over the period 2005-2015 was approximately 26,700 per year; that of the EU migrant population was 41,400 per year and that of the non-EU migrant population was 42,100 per year.

In terms of percentages, the recent rate of growth of London's population can be expressed as:

- for UK-born residents: **Average Annual Growth Rate** (AAGR) = 0.4%⁹;
- for EU-born residents: Average Annual Growth Rate = 7.7%¹⁰; and
- for non-EU born residents: Average Annual Growth Rate = 2.4%¹¹

⁸ Figure 2 a Figure 2 b have been generated using data from different datasets, between which there are minor variations in values.

⁹ This also equates to a Compound Annual Growth Rate (CAGR) of 0.4%, to 1 decimal place.

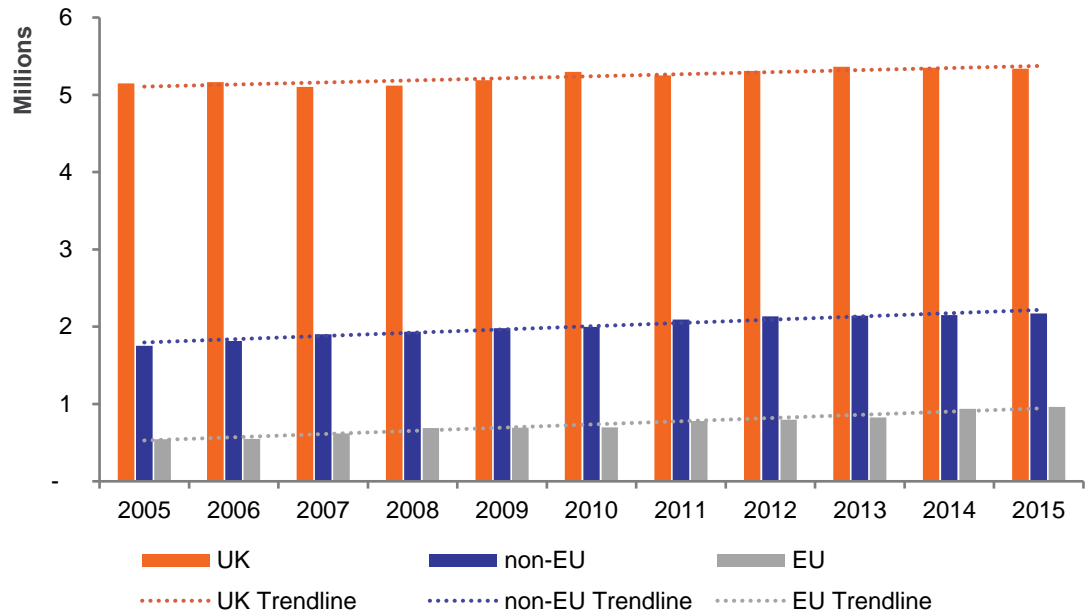
¹⁰ Equivalent to a CAGR of 5.8%

¹¹ Equivalent to a CAGR of 2.2%.

If we combine EU-born and non-EU born figures to yield a total non-UK figure, the Average Annual Growth Rate of London's migrant population over the last 10 years is 3.6%¹².

From the percentages presented above, we see that the population of non-EU-born residents in London is growing at 6 times the rate of UK-born residents, whereas the EU-born population is growing at more than 18 times the rate of the UK-born resident population of London.

Figure 2 c:
Population of London by UK, non-EU and EU-born, 2005-2015



Source: ONS Labour Force Survey

¹² Equivalent to a CAGR of 3.1%.

2.2. London's immigration timeline

To help place the analysis above in context, it is instructive to look at the historical timeline behind the major drivers of migration to London:

**Table 2 b:
Timeline of
immigration to
London**

Time	Event	Legislation
1945	Government asks Ireland and Europe to assist with severe skilled worker shortages	
1948	Windrush Generation. Non-British individuals encouraged to come to the UK to work. Recruitment campaigns undertaken in the West Indies. Individuals with Commonwealth nationality granted the right to work in the UK.	British Nationality Act 1948.
1949	Recruitment drives in Barbados.	
1950s	Ongoing labour shortage in the UK results in further overseas recruitment campaigns. Recruitment centres set up in the West Indies for bus drivers and conductors. Recruitment agents sent to Pakistan to recruit for textile and engineering firms.	
1956	Transport for London recruit in Barbados for conductors, underground staff and canteen assistants.	
1957	Right for the free movement of workers within the European Economic Community established	Treaty of Rome (1957)
1960s	Shortage of doctors and nurses resulting in huge recruitment drives in Bangladesh, India, Pakistan and Sri Lanka.	
1962	Work vouchers issued to immigrants based on employment prospects.	Commonwealth Immigrants Act 1962.
1965	3,000 to 5,000 Jamaicans recruited as NHS nurses.	
1966	Recruitment offices opened by Transport for London in Jamaica and Trinidad.	
1968	Rules tightened in response to concern over growing number of migrants. Potential migrants required to provide evidence that they had an ancestral link to UK.	Commonwealth Immigrants Act 1968.
Late 1960s	30 to 50% of doctors working for NHS from India, Pakistan, Bangladesh and Sri Lanka.	
1971	Introduction of work permits allowing temporary residence.	Immigration Act 1971.
Aug / Sept 1972	Entry granted to the UK for 28,000 Asians expelled from Africa.	
1973	UK joins EEC, with freedom of movement for EU workers.	
1980s	Work permits harder to obtain due to decline of manufacturing sector except in cases of specialist skills or professional trading.	
1981	Automatic right to citizenship removed for those born outside the UK & Overseas Territories.	British Nationality Act 1981.

Time	Event	Legislation
Feb 1992	Maastricht Treaty signed, leading to closer integration of EU member states and full freedom of movement for EU citizens. It also granted EU member state citizens Citizenship of the European Union in addition.	
Jan 1993	Concern over increase in asylum seekers. Fast track for asylum applications; detention of asylum seekers while claims being decided; reduction in asylum seekers' benefit entitlements.	Asylum and Immigration Appeals Act 1993
May 1996	Reduced asylum claims; further welfare restrictions.	Asylum and Immigration Act 1996.
Jan 1999	Benefits removed for asylum seekers; National Asylum Service to house asylum seekers and reduce pressure on local authorities.	Immigration and Asylum Act 1999.
2002	English test and citizenship exam introduced for immigrants; measures introduced to prevent sham marriages.	Nationality, Immigration and Asylum Act 2002.
Jan 2002	Highly Skilled Migration Programme (HSMP) introduced for highly skilled migrants with sought after skills.	
2004	Post Study Work Visa introduced for Science, Maths and Engineering graduates. Extended in 2006 to all Masters and PhD students, and in 2007 to all graduates as well as those with diplomas and post-graduate certificates. Category was withdrawn in April 2012	
2004 – 2011	Worker Registration Scheme: Nationals of A8 countries required to register within a month of joining an employer	
June 2005	Fresh Talent Working in Scotland introduced in Scotland to address population decrease and skill shortages	
Jan 2007	Bulgaria and Romania (A2 countries) joined EU: A2 nationals permitted to work in the UK under two schemes (highly skilled and skilled workers) and two quota-based schemes (low-skilled workers in the agricultural and food processing sectors). Restrictions had to be lifted by the end of 2013	
Feb 2008	Points-based System introduced as a system to enter the UK to work, study, invest and train with points awarded for age, education, income and work experience. Sponsorship required through an employer or education provider. Tier 1 General category allowed highly skilled individuals to enter the UK and take up employment between 2008 - 2015.	
Nov 2010	Announcement of a cap on the number of skilled workers from outside the European Economic Area allowed into the UK.	

Source: PwC Research

2.3. Population diversity in London

Defining and measuring population diversity is problematic from an analytical perspective and so we have adopted a pragmatic approach in this report.

We define diversity as being the number of different countries for which the migrant population exceeds a certain threshold level.

Using a threshold of 10,000¹³ to denote the point at which a migrant community becomes “settled” in London, we see that¹⁴ in 2005, there were 48 countries with a settled migrant community in London. By 2015, that number had risen to 61.

The ten countries with the largest settled migrant communities in London are presented in Table 2 c below. It is interesting to see how this list is populated with **EU** and **non-EU countries**, rich and poor.

Table 2 c:
Top 10 countries
with settled
communities in
London
(>10,000 people),
2015

Country	Number ¹⁵	Percentage of London's Total Population
India	287,000	3.3%
Poland	167,500	1.9%
Pakistan	127,000	1.5%
Nigeria	116,000	1.3%
Ireland	102,700	1.2%
Bangladesh	95,700	1.1%
France	89,400	1.0%
Italy	89,000	1.0%
Jamaica	86,200	1.0%
Romania	84,500	1.0%

Source: ONS Labour Force Survey

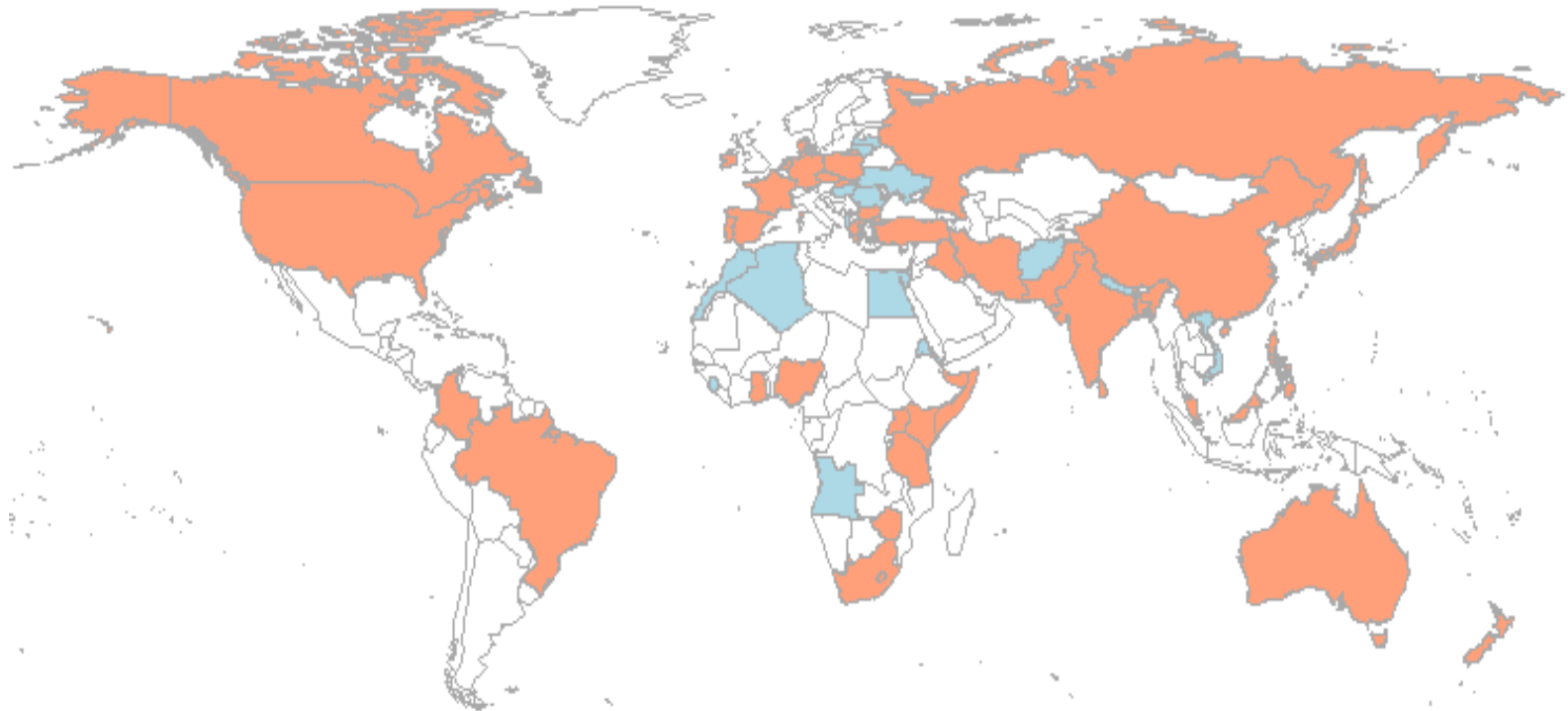
¹³ The threshold of 10,000 is somewhat arbitrary in nature but, in our judgement, reflects the minimum number for an established community in a major city such as London. Had we used a threshold of 5,000 (say) the values output of the analysis would be different, but the point of an increasingly diverse population in London would still stand.

¹⁴ Source: ONS Labour Force Survey.

¹⁵ Population values have been rounded to the nearest 100 and percentages have been rounded to the nearest 0.1%.

If we now plot on a map the countries of the world with settled communities in London (Figure 2 d below), we see the truly global nature of the London's migrant population. In this plot, orange countries are those with settled communities in London in 2005. Blue countries are the additional countries that had settled communities in London in 2015. No countries dropped below the 10,000 people threshold from 2005 to 2015.

Figure 2 d:
Countries with
settled
communities in
London
(>10,000 people),
2005 and 2015



Source: ONS Labour Force Survey – 2005 countries in orange, 2015 additional countries in blue.

2.4. Looking at London's boroughs

In this section we look at the distribution of London's migrant population across the 32 London boroughs.

Overall, the proportion of London's population that is born outside of the UK has increased from 31% to 37% from 2005 to 2015¹⁶.

However, when we look at how this figure breaks down at a borough level, we see a very mixed picture. Some boroughs have had relatively high migrant populations throughout the 2005-2015 period, whereas for others, the change in *migrant proportion*¹⁷ is marked.

By way of illustration, Kensington and Chelsea's migrant proportion is relatively high, yet relatively static, at 49.1% in 2005 and 49.5% in 2015. Harrow, on the other hand, has experienced a much higher increase over the period, from 33.1% in 2005 to 49.7% in 2015.

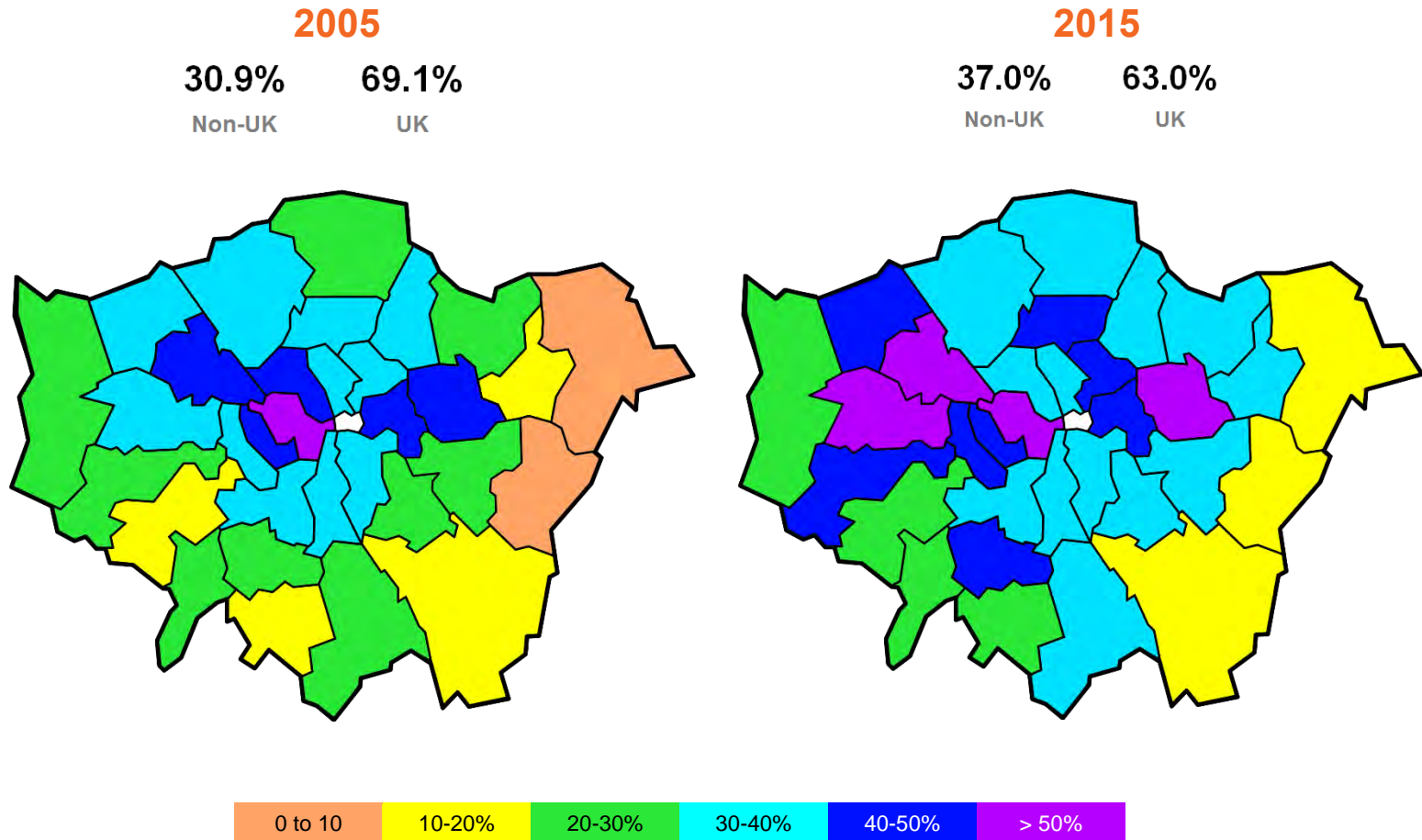
On the following pages (Map 1 and Map 2), we graphically present the distribution, by borough, of London's migrant population in 2005 and 2015.

¹⁶ See Page 26 for details.

¹⁷ The migrant proportion is the percentage of non-UK-born residents in a borough.

Map 1:
Percentage of non-UK born population by London borough, 2005 and 2015

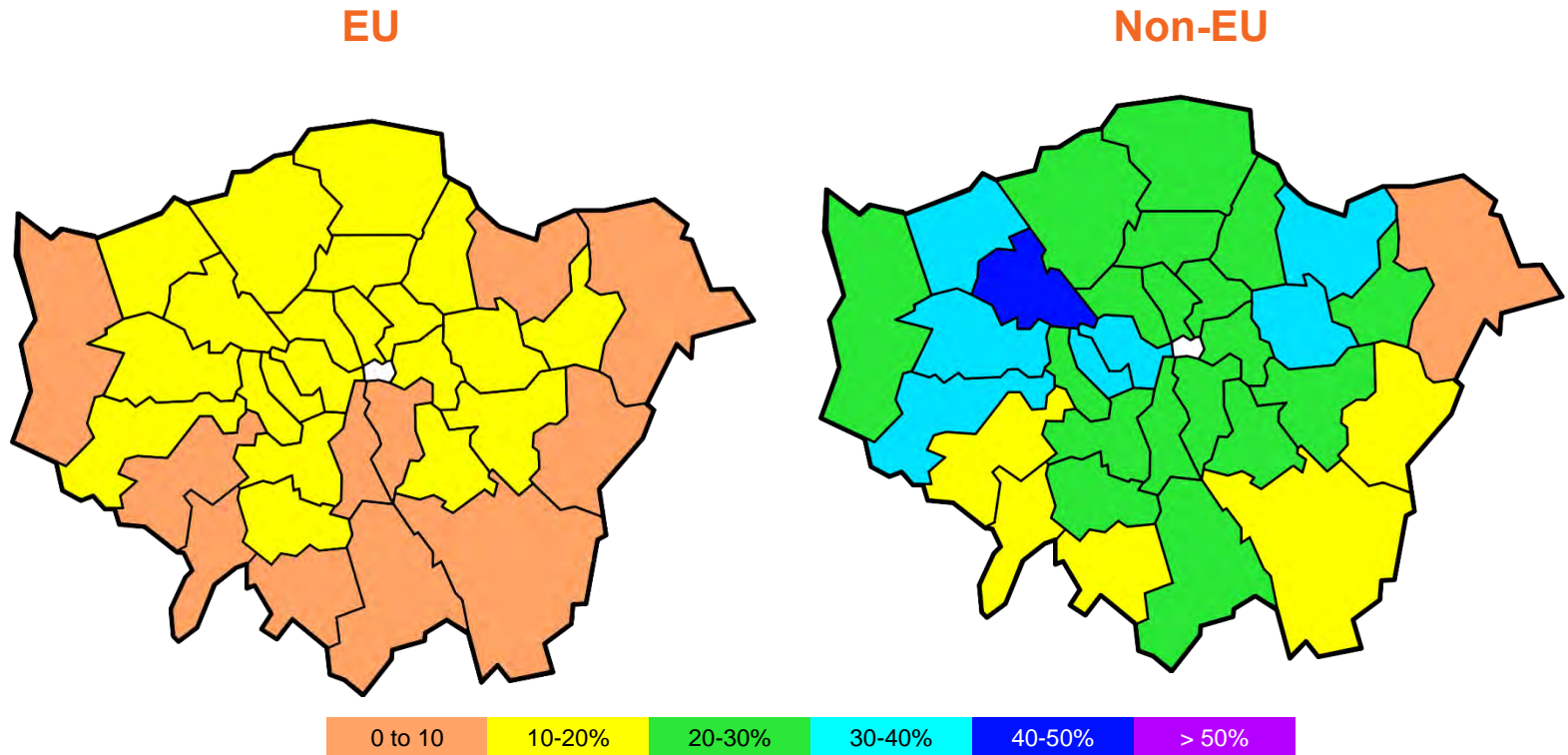
The distribution of migrants in London



Source: ONS Labour Force Survey

Map 2:
Percentage of EU
and non-EU-born
migrants by
London borough,
2015

EU and non-EU migrant population levels in London 2015



Source: ONS Labour Force Survey

Table 2 d below shows the boroughs with the highest percentage (>40%) of non-UK-born (migrant) residents in 2015. There are four London boroughs that, in 2015, had migrant populations of greater than 50% of their totals – Newham, Westminster, Brent and Ealing.

It is interesting to observe the mix of boroughs within the table, which contains traditionally affluent boroughs alongside those we might normally associate with higher levels of poverty¹⁸.

Table 2 d:
London boroughs
with the highest
proportion of
migrants (>40%),
2015

Borough	non UK ¹⁹ %	EU %	Non-EU %
Newham	55.2	18.7	36.5
Westminster	54.4	16.2	38.2
Brent	52.4	10.6	41.8
Ealing	50.0	15.7	34.3
Harrow	49.7	11.4	38.3
Kensington and Chelsea	49.5	14.3	35.3
Hounslow	43.1	10.3	32.7
Merton	40.9	16.0	24.9
Hammersmith and Fulham	40.7	18.9	21.8
Tower Hamlets	40.4	11.2	29.2
Hackney	40.3	15.2	25.1
Haringey	40.1	15.9	24.2

Source: ONS Labour Force Survey

The range of value across the London boroughs is significant. At the other end of the scale (<30% migrants) Bromley, Bexley and Havering all have less than 20% non-UK-born residents, as shown in Table 2 e below.

Table 2 e:
London boroughs
with the lowest
proportion of
migrants (<30%),
2015

Borough	non UK ²⁰ %	EU %	Non-EU %
Hillingdon	29.7	6.5	23.2
Kingston upon Thames	27.1	9.6	17.4
Sutton	23.5	5.5	18.0
Richmond upon Thames	22.0	8.4	13.6
Bromley	19.2	7.2	12.1
Bexley	17.8	4.6	13.2
Havering	13.6	4.9	8.8

Source: ONS Labour Force Survey

¹⁸ See www.londonspovetryprofile.org.uk/key-facts/overview-of-london-boroughs for further details.

¹⁹ Values in this table have been rounded to 1 decimal place.

²⁰ See footnote 23.

below in which we present absolute change in percentage value as well as absolute change in the number of migrants, rounded to the nearest 100:

**Table 2 f:
London boroughs
with the Greatest
Absolute Change
in Proportion of
Migrants,
2005 – 2015**

Borough	2005 ²⁰ non UK%	2015 non-UK %	Change %	Increase in Migrant Population
Barking and Dagenham	18.4	39.4	21.0	47,200
Greenwich	20.4	38.0	17.6	55,000
Harrow	33.1	49.7	16.6	49,000
Merton	26.6	40.8	14.2	33,100
Hounslow	29.7	43.0	13.3	48,500
Sutton	11.8	23.5	11.7	25,000
Redbridge	28.1	39.2	11.1	44,300
Ealing	39.6	50.0	10.4	49,100
Newham	44.9	55.2	10.3	66,000

Source: ONS Labour Force Survey

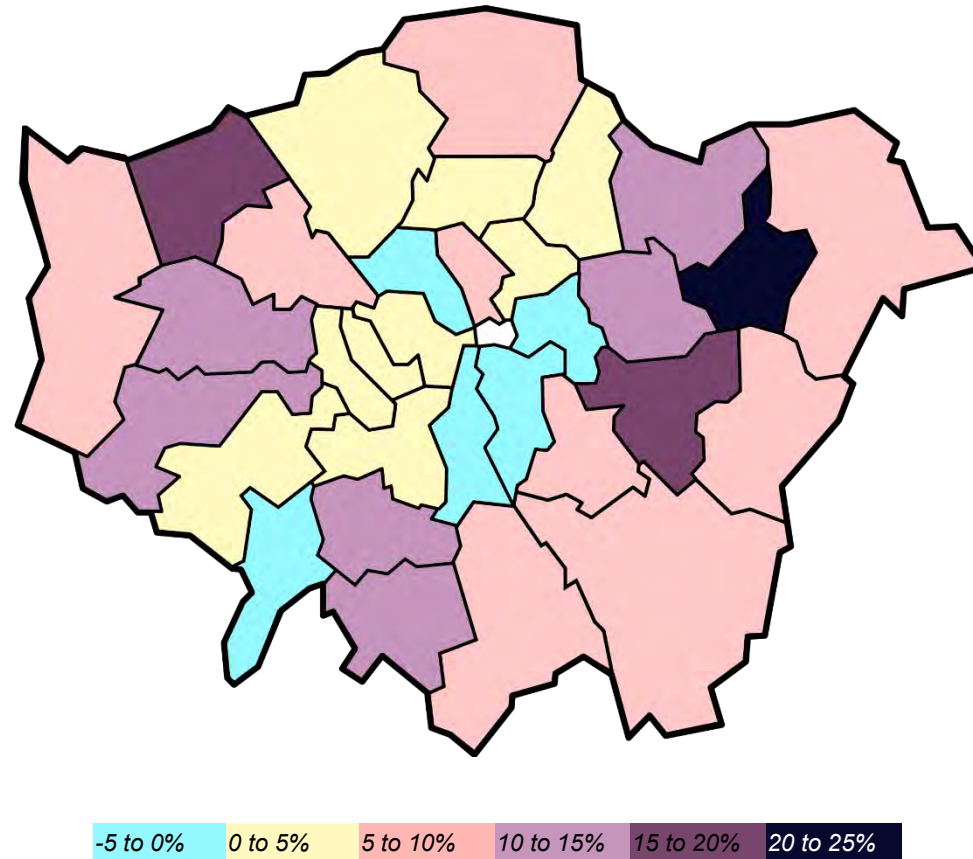
In 4 boroughs (Sutton, Barking & Dagenham, Greenwich and Merton), the reason for the large absolute change in their migrant proportions is because they had a relatively small number of migrants to start with in 2005 (less than 30% of their populations) compared to other London boroughs. However, for the remaining 5 boroughs in Table 1 d (Harrow, Hounslow, Redbridge, Ealing and Newham) the data suggests that there has been a significant increase in the proportion of migrants coupled with an already high original base figure in 2005.

There are 5 boroughs (Southwark, Kingston Upon Thames, Tower Hamlets, Camden and Lambeth) where there has been a small decrease in migrant proportion over the period 2005 – 2015. This is shown in Map 3.

²⁰ Percentage values in this table have been rounded to 1 decimal place. This may lead to rounding errors the in values quoted, especially in the column labelled "Change %".

London's changing population distribution

Map 3:
Absolute change in
migrant proportion
in London's
boroughs, 2005 –
2015



Source: ONS Labour Force Survey

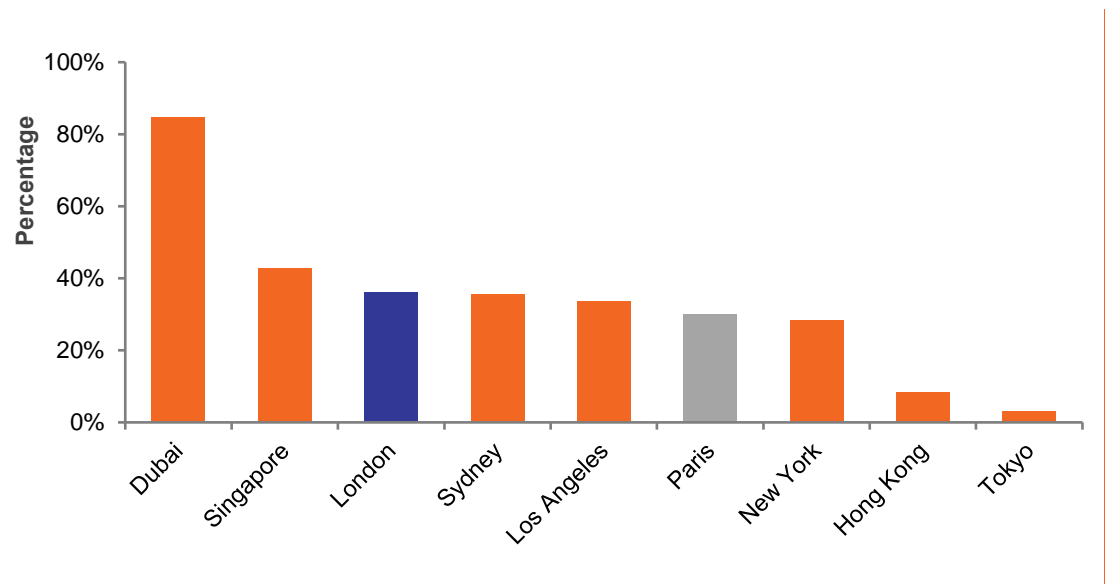
2.5. Comparison with other global cities

It is illustrative to see how London is benchmarked against comparable cities, and in this report we use the set of **global cities** defined by the Globalization and World Cities (GaWC) Research Network as the basis for our comparison.

Of these global cities, only Dubai (85%) and Singapore (43%) had a greater **foreign-national** proportion of their populations as of 2011 than London (37%). Sydney, Los Angeles, Paris and New York are broadly comparable to London, with a migrant population proportion greater than 25%, as shown in Figure 2 below. The data does not, however, afford any insight on the number of undocumented migrants in the cities we have compared.

Dubai is clearly an outlier in this data as it is so far removed from the other global cities in terms of the proportion of foreign nationals. This is because Dubai's economy is predicated on the basis of attracting migrant labour (largely from India, Bangladesh, Pakistan, Egypt and the Philippines) for its economy to operate.

Figure 2 e:
Proportion of
foreign nationals in
GaWC global cities,
2011 figures



Sources: See Appendix C.

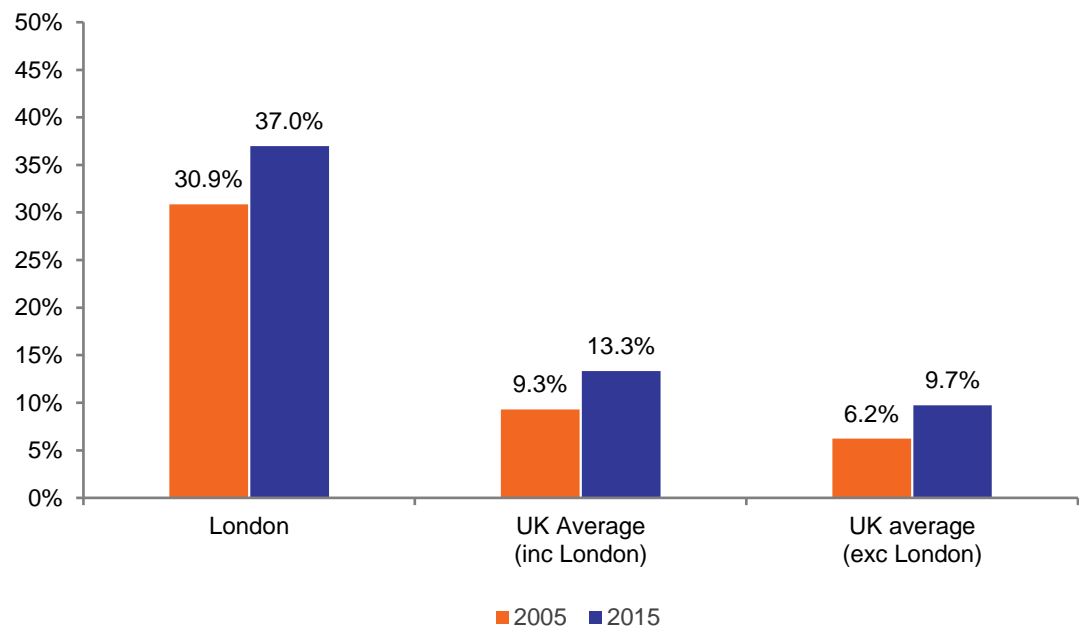
2.6. Comparing London to the rest of the UK

London differs markedly in its proportion of migrant residents when compared to the rest of the UK – at 37.0% in 2015, compared to the rest of the UK at 9.7%. In other words, the difference between the migrant proportions in London and the rest of the UK (overall average) is more than 25%.

In Section 3.2, we look at the reasons why migrants relocate to London, but here we note that London has far higher levels of inwards migration than the UK average – and also that the 10-year change in the percentage of migrants is also much higher than that for the rest of the UK (6.1% change for London vs. 3.5% change elsewhere in UK).

So whilst previous sections have suggested that the distribution of migrants within London is uneven, Figure 2 below suggest that the distribution of migrants is also uneven within the UK as a whole.

Figure 2 f:
Comparison of London's level of immigration with the rest of the UK, 2005 – 2015



Source: ONS Labour Force Survey

If we look at the 10 **local authority** areas in the rest of the UK that have the highest proportion of migrant residents (Table 2 g below) we see that:

- the 10 local authorities in the UK that have the highest migrant proportions in 2015 have also had the highest absolute change in migrant proportion over the last 10 years;
- there does not appear to be a geographical factor in the local authorities in Table 1 e below, in that authorities with high migrant proportions are distributed throughout the UK;
- Aberdeen is the only authority area from Scotland to appear in the table;
- there are no local authorities from either Wales or Northern Ireland in the top ten; and
- Slough is the only local authority area to have a higher proportion of migrants than London overall.

Table 2 g:
Local authorities
outside of London
with the greatest
absolute change in
proportion of
migrants,
2005 – 2015

Local Authority	2005 non UK% ²²	2015 non-UK %	Change %	Non-UK Population Increase
Slough	24.1%	38.6%	14.5%	26,700
Coventry	12.6%	26.6%	14.0%	50,900
Nottingham	8.8%	22.2%	13.4%	44,700
Oldham	6.6%	19.0%	12.4%	28,900
Reading	15.2%	27.3%	12.1%	21,200
Southampton	9.6%	20.8%	11.2%	29,300
Salford	4.0%	14.8%	10.9%	27,000
Peterborough	9.9%	20.5%	10.7%	22,600
Stoke-on-Trent	2.1%	12.6%	10.6%	26,800
Aberdeen City	7.4%	17.5%	10.1%	26,700

Source: ONS Labour Force Survey

As can be seen by comparing Table 2 f and Table 2 g above, the absolute changes in proportion of migrants away from London are, with the exception of Barking & Dagenham, Greenwich and Harrow, very similar to the values experienced for the London boroughs.

However, when we look at actual numbers, rather than percentages, we see that the local authorities away from London are, on the whole, accommodating far fewer new migrants than the London boroughs. So, for the rest of the UK (i.e. excluding London), the mean increase from 2005-2015 in non-UK population in each local authority area was approximately 13,000 – whereas for the London boroughs it was double this, at 26,000.

²² Values in this table have been rounded to 1 decimal place. This may lead to small errors in values quoted, especially in regards to the third column in the table, Change %.

3 London's Changing Workforce

Summary

As a subset of London's population, London's workforce is also changing. Having recovered from the credit crunch of 2008/9, the workforce of London is both growing and becoming more diverse.

Over the last 10 years, London's workforce has grown at an average rate of 2.3% each year – from 4.3 million in 2005 to 5.2 million in 2015. UK-born, EU-born and non-EU-born workers have all been part of this growth, which equates to an additional 85,400 workers per year. The number of EU-born workers in London has grown especially rapidly since 2005, with the total doubling in 10 years to nearly 625,000.

One of the key factors that influences where London's workforce lives is the relative price of purchasing a home, which has increased by an average of 92% over the last 10 years. Over the same period, average wages have increased by just 18%.

As a result, increasing numbers of London workers are commuting to London from more affordable accommodation outside the capital, with London's commuter workforce growing from approximately 730,000 to 900,000 over the last 10 years. However, this figure masks the rapid growth in the number of EU-born commuters, which has increased from 21,500 to 57,500.

In contrast to the increase in London's workforce over the last 10 years, the number of economically inactive people (which includes, but is broader than, the unemployed) has stayed relatively static at around 1.2 million.

The global economic crisis of 2008/09 had a major impact on London's workforce, increasing unemployment to 10.3% (443,000 people) in late 2011. Since then, total unemployment has decreased and stabilised at a level of approximately 6%.

Migrants come to London for a variety of reasons. About half of all EU migrants move to London for employment and approximately 15% come to London to study. Just over a quarter of EU migrants come to London as a dependent of either a UK or foreign citizen. Non-EU migrants have slightly different reasons for coming to London. Approximately 20% come for work, 20% to study and half come as the dependent of a UK or foreign citizen.

The type of work Londoners do is, on the whole, skilled, with a large component of workers in the professional services, finance and business services, health, education and IT-related sectors. London's workforce is educated, with 43% holding a degree or equivalent qualification. This is significantly higher than the UK average of 28%.

The roles typically performed by migrants vary quite significantly depending on the region of origin. Non-EU and EU-15 migrants tend to work in managerial and professional roles across the full range of industry sectors, whereas Post-2004 Accession Country migrants tend to undertake semi-routine and routine work, work in small businesses or are self-employed – often in the construction, tourism or wholesale & retail sectors.

The student population of London shows increasing numbers of international students are choosing London as their undergraduate and postgraduate centre of learning. There are approximately 100,000 international students in London, a figure that has shown strong growth over recent years, and that shows little sign of abating.

Analysis

In the previous chapter, we examined the high-level characteristics of the population of London and analysed how the capital's population has been affected by inwards migration. This chapter focuses on two of the key drivers of this migration – employment and education.

We explore how London's workforce has changed over the past decade – from its overall size and composition, through to a more detailed view on specific industries. We also look at how international students have changed the demographics of those in higher education in London.

When analysing employment data, we must be clear about the different sub-groups that make up London's workforce, based on whether individuals live and work in, or outside, London. See Table 3 a below:

Table 3 a:
How living and working in and outside London are analysed

		The person works	
		In London	Outside London
The person lives	In London	Included in figures for London's : Population Resident workforce	Included in figures for London's : Population Resident workforce
	Outside London	Included in figures for London's : Commuter workforce	Not included in figures for London

The key concept to note in the above table is that London's workforce is divided into two parts:

- London's **resident workforce** – people who live **and** work in London or elsewhere.
- London's **commuter workforce** – people who live **outside** London but work **in** London.

Sub-division of the EU countries

In this section, data permitting, we break down the migrant population from the EU into sub-groups. The aim is to see whether there is a significant difference between migrants from the different groups – and, in particular, whether there is a difference in the profile of the London labour market between migrants from post-2004 accession countries and those from countries who have been EU members for longer.

This report has used the following groupings:

- **EU-15** – countries that acceded prior to 2004²³.
- **Post-2004 accession countries** – countries that acceded to the EU in 2004 or later.

²³ Excluding UK, which we analyse separately.

3.1. The big picture

Summary Data

Table 3b Summary data of London's workforce (resident & commuter)

Year	2005 ²⁴	2015	Change	% Change
UK born	2,966,400	3,194,500	228,100	7.7%
EU born	326,700	682,300	355,600	108.8%
Non-EU born	1,025,300	1,292,700	267,400	26.1%
Non UK Total	1,352,000	1,974,900	622,900	46.1%
Total	4,318,500	5,169,400	850,900	19.7%

3.1.1. The total workforce

London's **total** workforce (residents **and** commuters) has shown a steady increase over the last 10 years, from 4.3 million in 2005 to 5.2 million in 2015, as shown in Figure 3 a below.

It is interesting to note that whilst there are more non-EU workers than EU workers in the London workforce, the gap is slowly closing and EU migrants are joining the workforce at a slightly higher rate than non-EU. In fact, over the last 10 years, the EU component of the total workforce in London has more than doubled – from 302,500 in 2005 to 647,900 in 2015.

On average, the UK workforce has increased by 20,800 people per year over the last 10 years; the EU workforce has increased by 32,900 workers per year and the non-EU workforce by 31,700 workers per year. The total increase in London's workforce is, on average, 85,400 workers per year over the last 10 years.

In percentage terms, the values quoted in the paragraph above correspond to an average annual percentage growth of:

- Total = 2.3%²⁵
- UK = 0.9%²⁶
- EU = 11.4%²⁷
- Non-EU = 3.4%²⁸

If we combine EU-born and non-EU born figures to yield a total non-UK figure, the Average Annual Growth Rate of the migrant workforce of London over the last 10 years is 5.4%²⁹.

²⁴ Values have been rounded to the nearest 100

²⁵ Equivalent to a CAGR of 2.1%

²⁶ CAGR = 0.8%

²⁷ CAGR = 7.9%

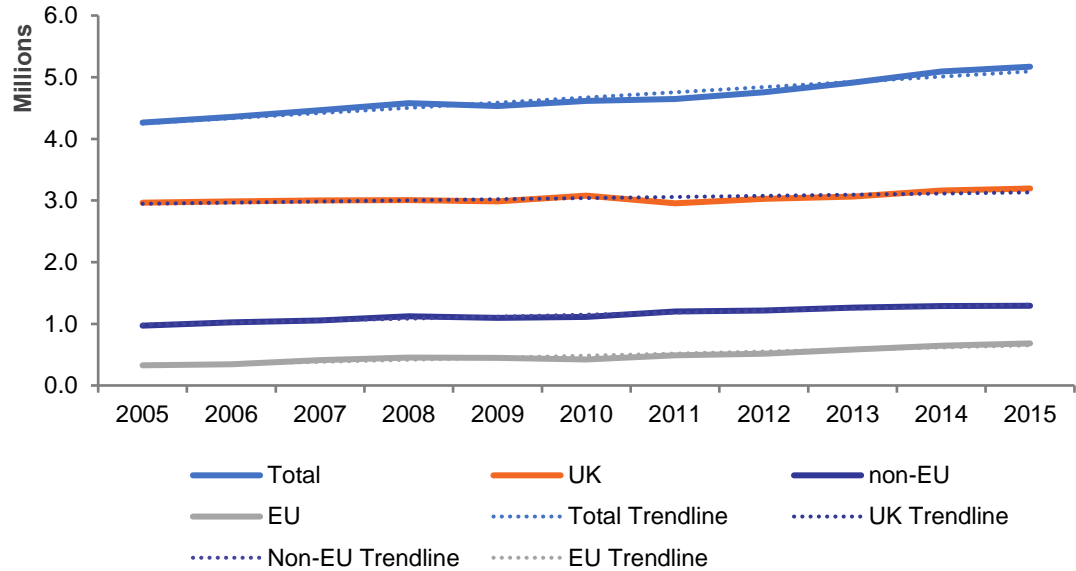
²⁸ CAGR = 3.0%

²⁹ CAGR = 4.4%

As with the population figures presented in Chapter 2, we see that the fastest growing component of London’s total workforce in terms of percentages is from EU-born migrants, which grew strongly over the last 10 years by an average of 11.4% per year.

However, the absolute number of EU migrants residing in London increased by approximately the same value as non-EU migrants – roughly 32,000 per year. It is because the 2005 value for the number of EU migrants is so much smaller than that of non-EU migrants that the same absolute increase in the number of migrants can translate into such different values for the respective percentage changes.

Figure 3 a:
The workforce of London (residents and commuters), 2005 – 2015



Source: ONS Labour Force Survey

3.1.2. The commuter workforce

The variation and distribution of London's commuter workforce is shown in Figure 3 b. The total number of commuters working in London has shown a 23% increase in growth over the last 10 years, from 728,700 in 2005 to 896,400 in 2015.

However, what is most striking about the graph is the large (albeit decreasing) proportion of UK workers that make up the total. In 2005, UK workers made up 88.3% of the total, and in 2015, it was 82.9%.

On average, the total number of workers commuting into London increased by 15,300 per year, of which UK-born commuters accounted for two thirds (10,000). Non-EU commuters grew by 2,500 per year and EU commuters by 2,800.

In percentage terms, the values quoted in the paragraph above correspond to an average annual percentage growth of:

- Total = 2.3%³⁰
- UK = 1.5%³¹
- EU = 16.7%³²
- Non-EU = 5.0%³³

If we combine EU-born and non-EU born figures to yield a total non-UK figure, the Average Annual Growth Rate of the migrant commuter workforce of London over the last 10 years is 8.0%³⁴.

It is also interesting to compare the above percentages for commuters with those for the total workforce. When we do so, we see that the London's workforce is not only becoming more migrant-based, it is also becoming increasingly commuter-based.

The data does not allow us to say what proportion of this increase arises from people relocating out of London and what proportion is due to workers relocating their place of work to London (e.g. because they have changed jobs to work in London, rather than elsewhere).

One of the reasons often given for workers moving out of London is that of a lack of affordable accommodation, due to an undersupply of housing relative to the city's population³⁵. This explanation seems reasonable especially when one notes that over the same period, 2005 – 2015, the average house selling price in London nearly doubled (increased by 92%), from £308,000 to £593,000³⁶. Average London wages, however, only increased by 18% in the same period³⁷.

³⁰ Equivalent to a CAGR of 2.1%

³¹ CAGR = 1.5%

³² CAGR = 10.3%

³³ CAGR = 4.2%

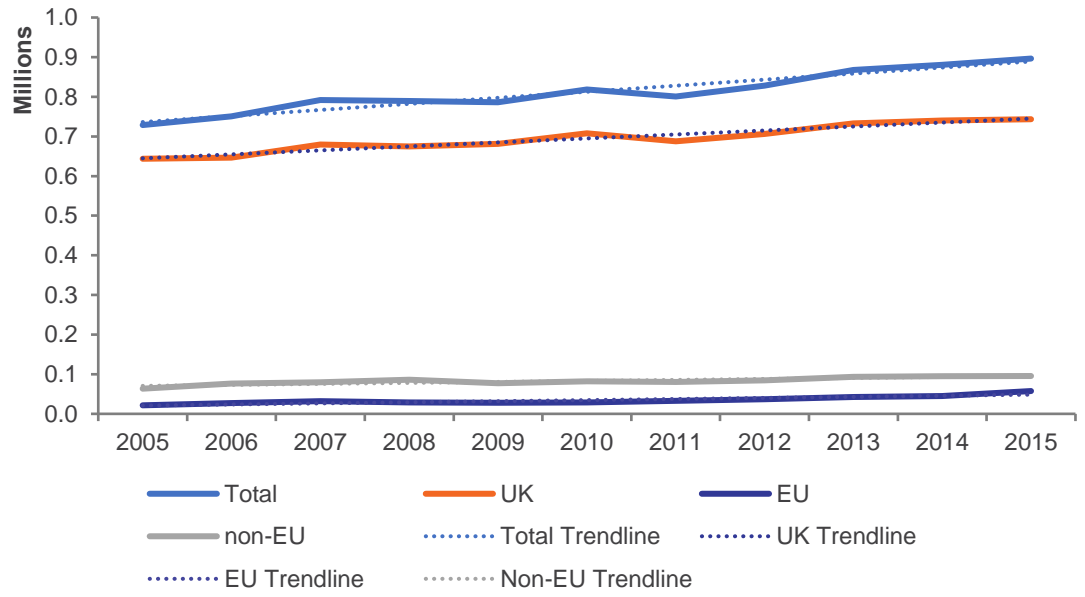
³⁴ CAGR = 6.0%

³⁵ Figures from the Mayor of London report "Housing in London 2015" suggest that in the decade 2001 – 2011, the average number of new homes built in London each year was 19,300. The average increase in dwelling stock each year was 26,800. The difference between these figures is due to the number of houses being converted to flats and also, to buildings being changed from industrial or commercial uses to residential. Over the period 2011-2014, the equivalent figures were: 19,000 new homes per year and 22,700 new dwellings. Compare this with a workforce growing at 85,400 per year over the same period and we see that the description "undersupply" is entirely appropriate.

³⁶ Mid-year, 3 month average values of the sales prices of all properties sold in London. Source: www.home.co.uk, based on Land Registry data,

³⁷ Source: ONS ASHE data.

Figure 3 b:
London's
commuter
workforce,
2005 – 2015

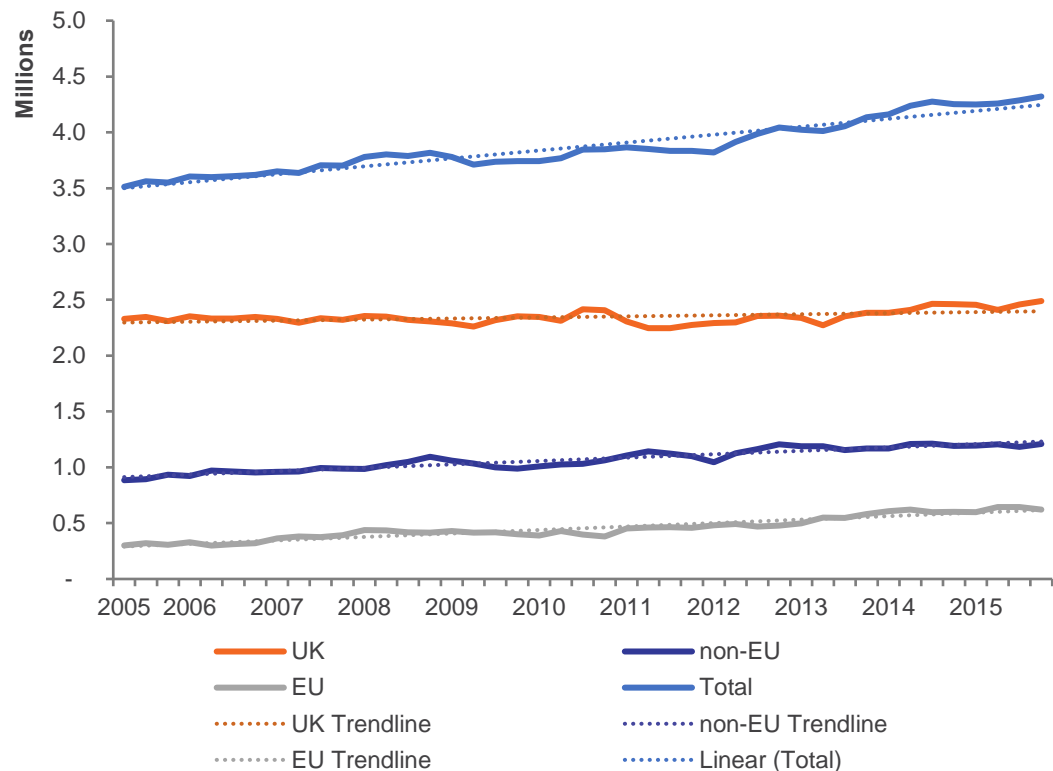


Source: ONS Labour Force Survey

3.1.3. The resident workforce

The composition of **London's resident workforce** from 3.5 million in 2005 to 4.3 million in 2015 as shown in Figure 3 c below:

Figure 3 c:
Composition of the
resident workforce
of London,
2005 – 2015



Source: ONS Labour Force Survey

From Figure 3 c we see the following key features, relating to the period from 2005 – 2015:³⁸

- UK-born workers make up the largest proportion of London's resident workforce, at just under 60% of the total;
- the UK-born workforce living in London has increased by approximately 128,300 (from 2,322,800 to 2,451,100) over the last 10 years;
- the number of EU-born workers living and working in London has increased by approximately 319,500 (from 305,200 to 624,700) over the same period;
- the number of non-EU-born workers living and working in London has increased by approximately 209,200 (from 907,000 to 1,197,200) over the last 10 years; and
- whilst the actual number of UK-born workers living in London has grown in absolute terms, due to the greater growth of EU and non-EU resident workers, the percentage of UK-born workers in London's resident workforce has decreased (from 66% to 57%). The percentage of non-UK-born workers has risen from 34% to 43% of London's resident workforce over the last 10 years.

³⁸ We have also added trendlines to this graph to show the general course the data. Such lines allow the user to see where values are higher or lower than would be expected if the data had remained exactly "on trend".

In percentage terms, the increases in London's resident workforce over the last decade correspond to average annual percentages of:

- Total = 2.1%³⁹
- UK = 0.6%⁴⁰
- EU = 10.5%⁴¹
- Non-EU = 3.2%⁴²

If we combine EU-born and non-EU born figures to yield a total non-UK figure, the Average Annual Growth Rate of the migrant resident workforce of London over the last 10 years is 5.0%⁴³

As with the workforce as whole, we see a doubling in the EU-born resident workforce in London over the last 10 years and EU-born workers now account for nearly 15% of the total of London resident workforce. Non-EU migrants also account for a larger proportion of London's resident workers, but their growth in number, whilst strong, is less marked than for EU-born workers.

³⁹ Equivalent to a CAGR of 1.9%

⁴⁰ CAGR = 0.5%

⁴¹ CAGR = 7.4%

⁴² CAGR = 2.8%

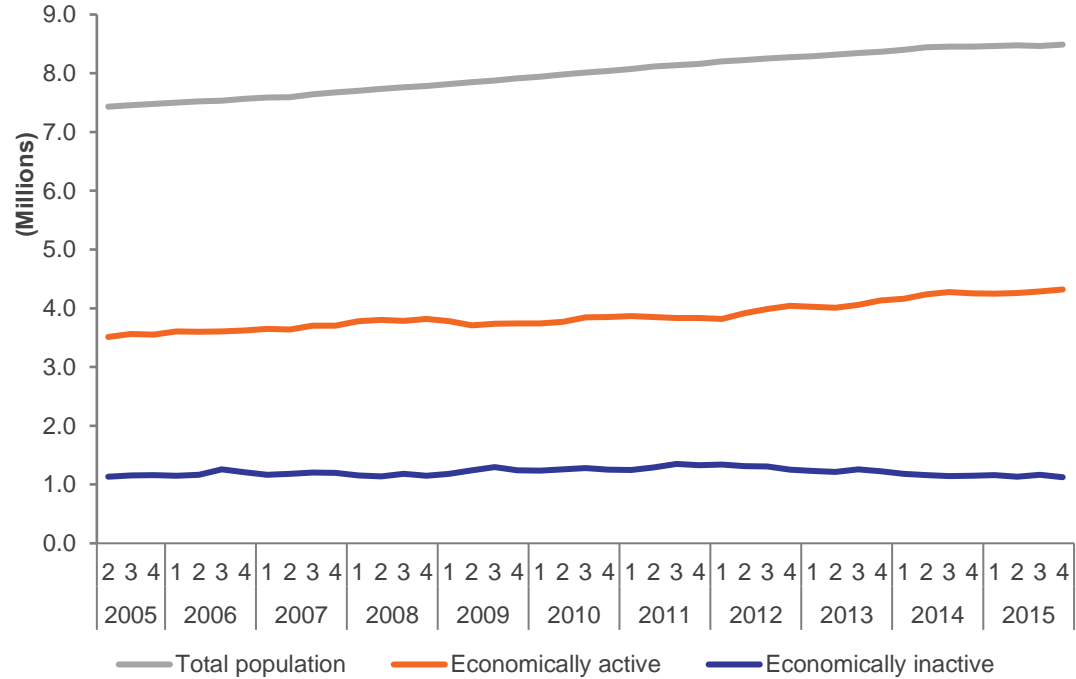
⁴³ CAGR = 4.2%

3.1.4. Economic activity and Inactivity in London

The total number of **economically active**⁴⁴ residents in London has risen by approximately 800,000 in 11 years to, from 3.5 million to 4.3 million.

By contrast, the number of **economically inactive**⁴⁵ residents has remained more or less static, at 1.2 million⁴⁶. See Figure 3 d below:

Figure 3 d:
Economic activity and inactivity in London, 2005 – 2015



Source: ONS Labour Force Survey

Whilst the total number of economically inactive⁴⁷ people in London has stayed relatively static at approximately 1.2 million, it is interesting to see how the composition of this total has changed over time – especially in recent years. See Figure 3 e for details.

Since 2005, the absolute number (and proportion) of economically inactive Londoners born in the UK has decreased from 608,800 to 537,400. Most noticeable within this period is the decrease from a mid-2011 peak of 697,000 to a period minimum at the end of 2015 of 537,400 – a difference of 159,600. In terms of percentages, the UK proportion of economically inactive Londoners has fallen from 53.7% in 2005 to 47.8% in 2015.

However, during this period, the number of economically inactive non EU born Londoners born outside of the EU has risen steadily – from 435,600 in early 2005 to 478,200 at the end

⁴⁴ In this report, “economically active” means a person aged between 16 and 65 that is either employed or self-employed at the time the Labour Force Survey takes place.

⁴⁵ Similarly, in this report, we define “economically inactive” to mean a person aged between 16 and 65, who does not fall within the economically active category. Examples of economically inactive persons include the unemployed, students, carers and people with a medical condition that prevents them from working.

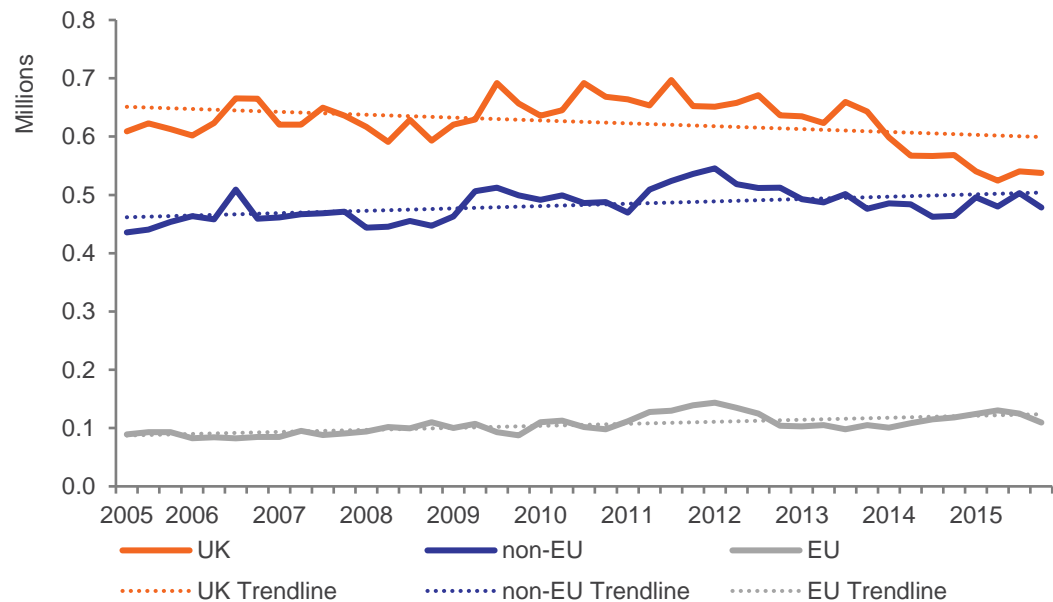
⁴⁶ The difference between the total population of London (blue line in Figure 2 c above) and the total number of economically active (brown line) and inactive residents (grey line) is accounted for by those younger than 16 or older than 65, who fall outside the definitions of economic activity and inactivity.

⁴⁷ For the avoidance of doubt it is repeated that in this report, the unemployed are characterised as being economically inactive, and not active.

of 2016 (an increase of 42,600 people). In percentage terms the non-EU proportion of economically inactive Londoners has risen from 38.4% to 42.5% over the last 10 years.

The number of economically inactive Londoners born in the EU has also increased – from 88,900 in 2005 to 109,400 – a change of 20,500. In percentage terms, the EU proportion of economically inactive Londoners has risen from 7.8% to 9.7% in the period 2005 to 2015.

Figure 3 e:
Economic
inactivity in
London by region
of birth,
2005-2015



Source: ONS Labour Force Survey

3.1.5. Unemployment in London

Unemployment is one, but far from the only, factor that contributes to the levels of economic inactivity in London. Other categories of economically inactive people include students (discussed in Section 3.9), non-working spouses, unpaid carers and people with long-term medical conditions that prevent them from working.

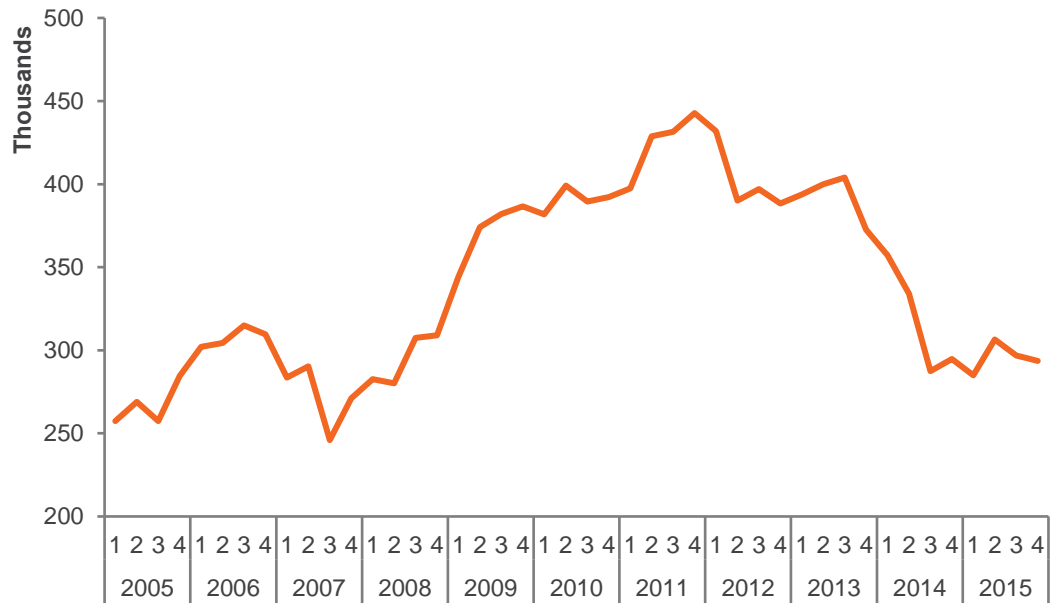
In Figure 3 f, we present the quarterly average number of unemployed persons in London over the period 2005 – 2015. The data does not allow provide a breakdown by region of birth, so we are only able to present a total figure.

Figure 3 g shows the unemployment rate in London over the same period, but as a percentage. The two graphs are superficially similar in form, but the percentage graph is affected by the increasing number of working age people in London over time and so is a slight distortion of the absolute values plot.

It is interesting to note the “delayed” peak of 442,700 that occurred in Quarter 4, 2011. This is interesting as the peak occurred approximately 2-3 years after the peak of the global economic crisis that occurred in 2008/09, the “credit crunch”.

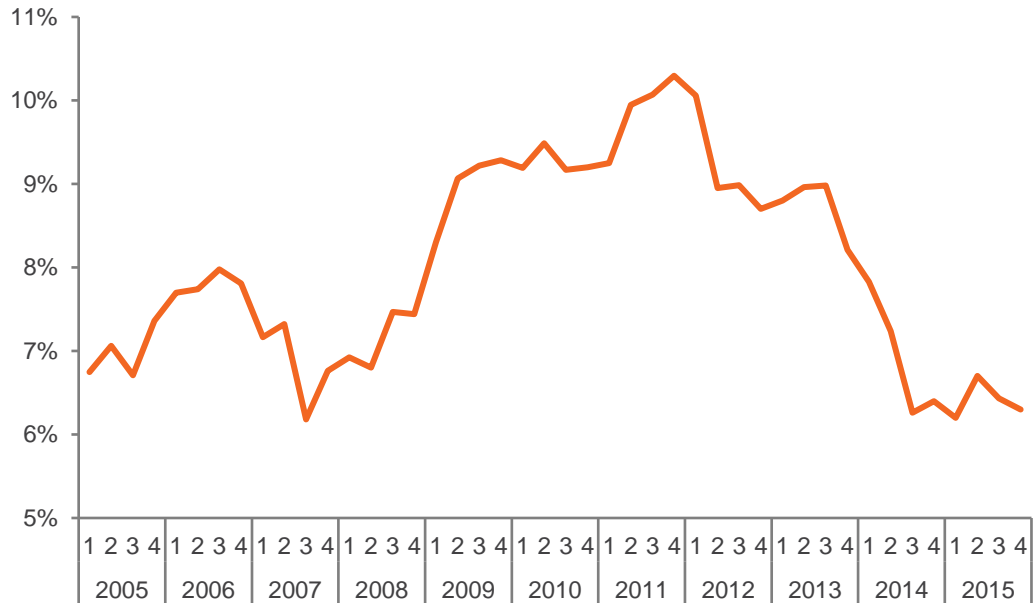
By 2015, unemployment had fallen to roughly the same levels as before the credit crunch and appears relatively static at just under 300,000 people⁴⁸.

Figure 3 f:
Unemployment in London (absolute values), 2005-2015



Source: London Datastore, data.london.gov.uk

Figure 3 g:
Unemployment in London (percent), 2005-2015



Source: London Datastore, data.london.gov.uk

⁴⁸ As of the date of publication of this report (February 2017), the unemployment rate in London was 5.6% (266,000 people). Source: ONS Labour Force Survey.

3.2. What brings people to London?

London attracts migrants for many reasons. As shown in Figure 3 h, those born in EU-15 countries and post-2004 EU accession countries come to London most often for employment – at 45% and 52% respectively⁴⁹. This contrasts with non-EU born migrants, with employment being the reason only 21% of the time.

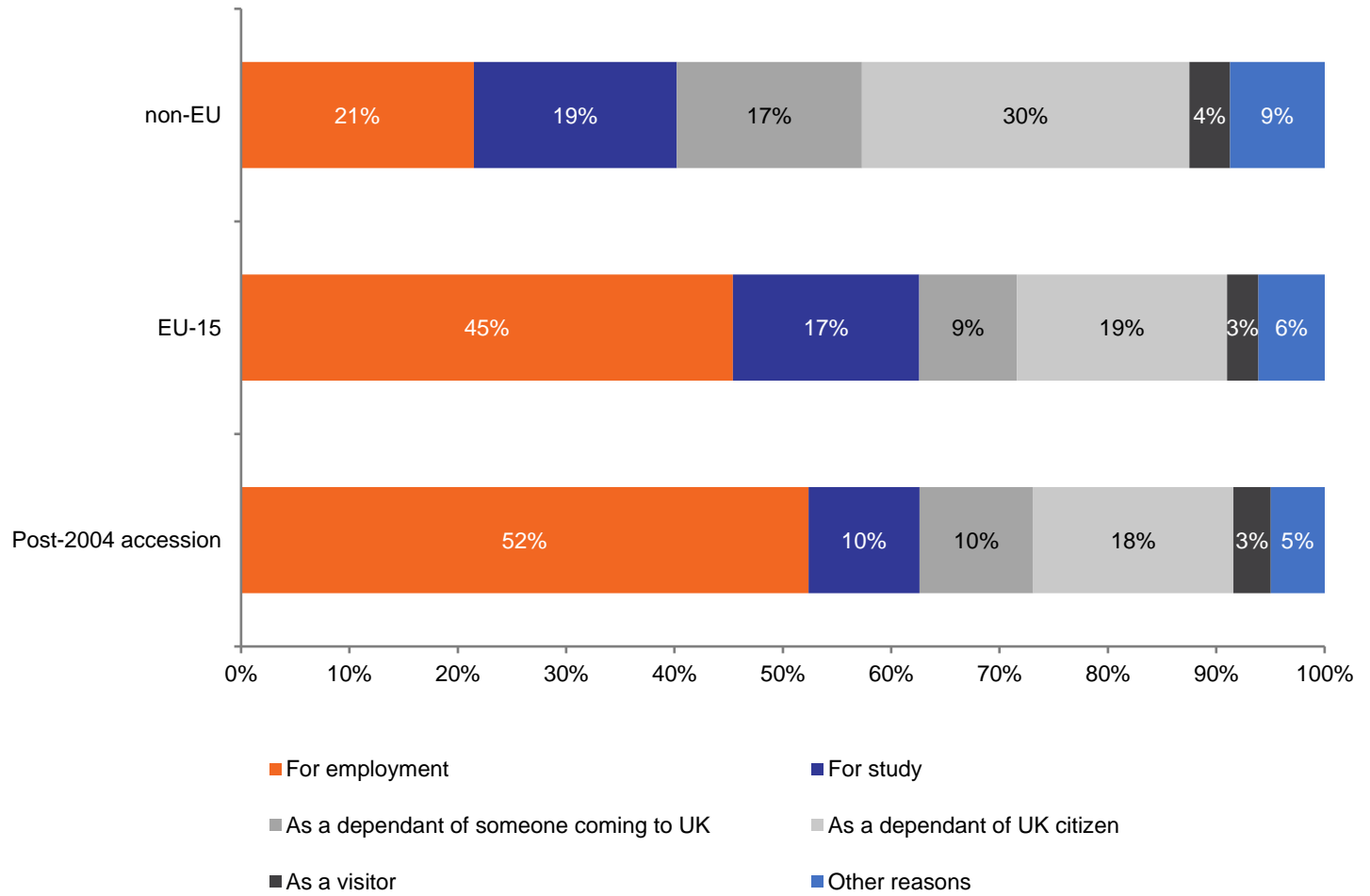
A visual inspection of the diagram shows that that the two EU graphs are roughly similar, but the non-EU looks very different in all categories.

It is interesting to note the high level of migration to London as a dependent of a UK citizen or as a dependent of someone coming to the UK. This suggests a proportionately high level of settlement within the non-EU community.

One possible explanation for the differences between EU and non-EU reasons for migration is the relative ease of access that EU nationals currently have to live and work in the UK as a result of the EU's right of freedom of movement. No visa is required for EU citizens, who have the right to work in the UK, just as they would in any country of the EU – including their country of birth. However, non-EU nationals do not have this right, and require a visa to live and work in the UK. This can act as barrier to a short-term relocation to the UK, and so non-EU migrants tend to come to London for longer-term reasons, such as to live with a spouse.

⁴⁹ Figure 3 h shows the initial reason for migrants coming to London – it is perfectly possible that a person could arrive in one category and change to another at a late stage (e.g. arriving as a dependent and later working).

Figure 3 h:
Reason for migration to London,
Oct-Dec 2015



Source: ONS Labour Force Survey

3.3. How does London's workforce compare with New York?

In Section 2.5, we compared London's population to the group of global cities defined by the GaWC. In this section, we compare London workforce with its closest competitor – New York.

According to the GaWC's most recent study⁵⁰, of the 307 world cities, London and New York are the only two classified as Alpha ++, which means they are "vastly more integrated with the global economy than all other cities".

London and New York share many characteristics in common – including a similar population (8.4 million in New York, 8.7 million in London) – and so the cities are often compared due to their contesting statuses as world leaders in areas such as finance, education, the arts and culture⁵¹.

Comparing workforces across the two cities also shows interesting parallels as well as differences (see Figure 3 i below). Of particular note in terms of differences, London has far more workers in the scientific, business services, IT and education sectors, whereas New York has more work in the Health sector^{52,53} as well as significantly more workers in public administration. The New York public administration figure covers all government workers.

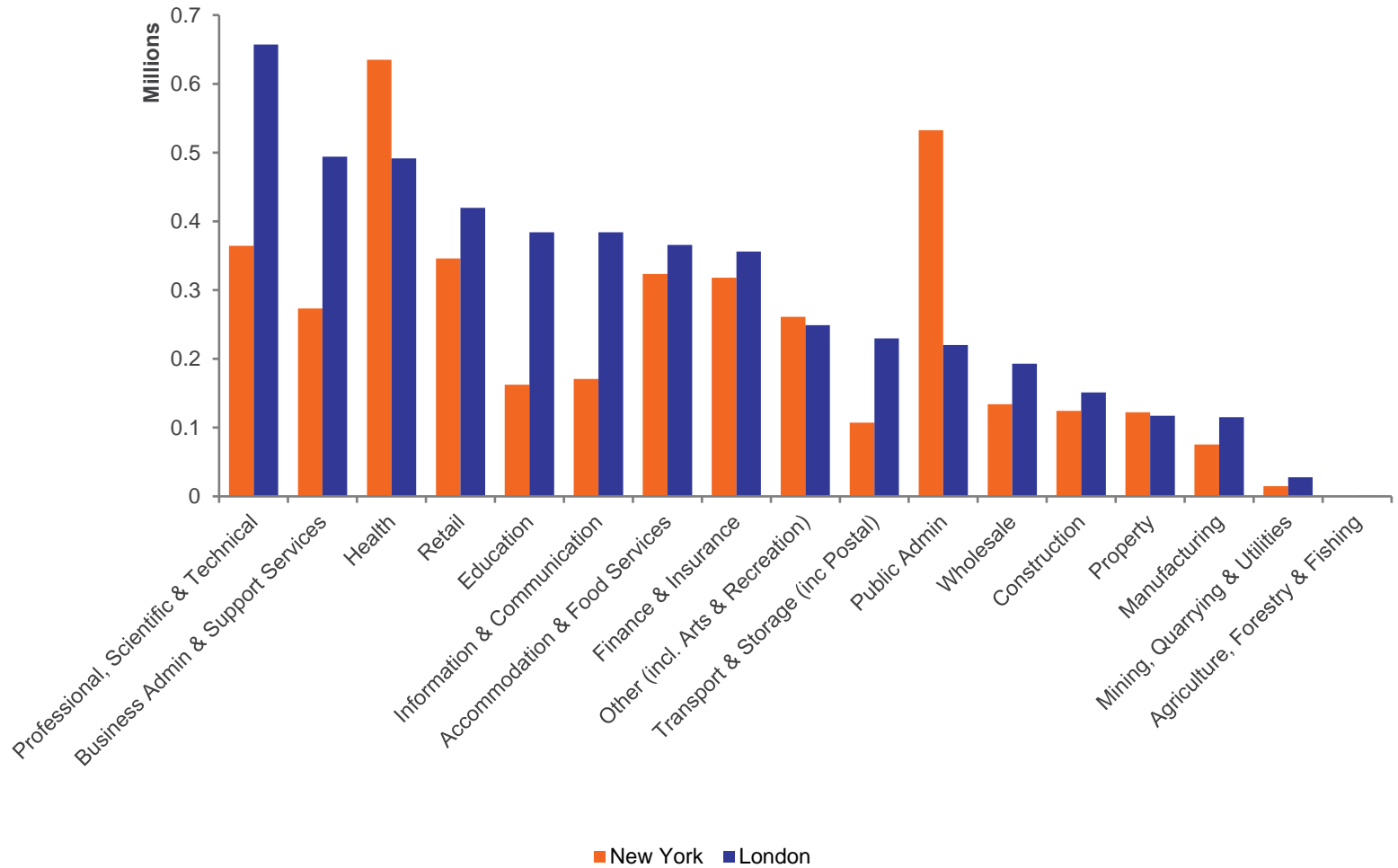
⁵⁰ See www.lboro.ac.uk/gawc/world2012t.html for GaWC world city rankings.

⁵¹ See uk.businessinsider.com/new-york-city-vs-london-comparison-2015-5 for one of numerous on-line articles in which the two cities are compared.

⁵² Many US IT and scientific workers are based in Silicon Valley, California, rather than New York. According to siliconvalleyindicators.org, the total workforce in Silicon Valley is approximately 1.3 million (2015 figures).

⁵³ The industries in each city have been compared by *SIC industry sector code* – see Appendix F for definitions. As US SIC codes largely overlap with UK ones used by the ONS, we are able to compare the two cities by their workforces relatively accurately.

Figure 3 i:
Comparison of
London's
workforce
composition with
New York's,
2014



Source: ONS Statistics (London), ACS (New York).

3.4. Work and study categories

A number of categories permitting employment exist under the current immigration rules. Specific requirements need to be met in order to qualify for each category, and the resultant visas are also restricted in respect to duration, financial requirements, providing a route to naturalisation and the ability to be accompanied by dependant family members. Individuals can qualify under certain categories without the need for sponsorship, whilst under certain points-based categories sponsorship is required through a licensed UK sponsor. There are a select number of categories of work visas which lead to settlement in the UK following the required number of years spent residing in the UK under the conditions of the relevant category.

Tier 1 Entrepreneur

This category is available to individuals who want to set up or run a business in the UK and have access to £200,000 of investments funds (restrictions apply)

Duration: 5 years

Minimum salary: N/A

Dependants allowed: Yes

Dependants right to work: Yes (some restrictions apply)

Route to Settlement: Yes (can be accelerated to 3 years in certain circumstances, this does not apply to dependants)

Tier 1 Graduate Entrepreneur

This category is available to graduates with recognised genuine and credible business ideas.

Duration: 2 years

Minimum salary: N/A

Dependants allowed: Yes

Dependants right to work: Yes (some restrictions apply)

Route to Settlement: No

Tier 1 Investor

This category is available to investors with £2,000,000 or more to invest in approved UK investments.

Duration: 5 years

Minimum salary: N/A

Dependants allowed: Yes

Dependants right to work: Yes

Route to Settlement: Yes (after 2 years if invested £10 million in the UK or after 3 years if invested £5 million in the UK, this does not apply to dependants)

Tier 2 (ICT)

This category is available to employees of an overseas entity who are being transferred to a UK branch. Sponsorship is required through a licensed UK employer. Workers can be transferred as short or long term staff or as graduate trainees.

Duration: 5 years or 9 years if high earner

Minimum salary:

Long term: £41,500; Short term: £30,000*; Graduate trainee: £23,000

*Sub category closing from 6 April 2017

Dependants allowed: Yes

Dependants right to work: Yes (some restrictions apply)

Route to Settlement: No

Tier 2 (General)

This category is available to individuals with a skilled job offer in the UK. Sponsorship is required through a licensed UK employer.

Duration: 6 years

Minimum salary: £25,000 (increasing to £30,000 from 6 April 2017)

Dependants allowed: Yes

Dependants right to work: Yes (some restrictions apply)

Route to Settlement: Yes (after 5 years)

Tier 4 General Student

This category is available to students over the age of 16 wanting to study a recognised course in the UK. Sponsorship is required through a licensed UK education provider. Work restrictions apply.

Duration: Length of course of study

Minimum salary: N/A

Dependants allowed: Yes (specific restrictions apply)

Dependants right to work: Yes

Route to Settlement: No

Tier 5 Government Authorised Exchange

This category is available to individuals coming to the UK for a limited period of time for work experience or training, for an Overseas Government Language Programme, research or fellowship through an approved government authorised exchange scheme. Sponsorship is required through a licensed sponsor.

Duration: 1 or 2 years (depending on the scheme they're applying for)

Minimum salary: National Minimum Wage

Dependants allowed: Yes

Dependants right to work: Yes

Route to Settlement: No

Tier 5 Youth Mobility Scheme

This category is available to individuals from Australia, Canada, Japan, Monaco, New Zealand, Hong Kong, Republic of Korea and Taiwan as well as holders of certain types of British nationality who are between 18 and 30 years of age.

Duration: 2 years

Minimum salary: N/A

Dependants allowed: No

Dependants right to work: N/A

Route to Settlement: No

UK Ancestry

This category is available to Commonwealth citizens with a grandparent born in the UK and who plan and are able to work in the UK.

Duration: 5 years

Minimum salary: N/A

Dependants allowed: Yes

Dependants right to work: Yes

Route to Settlement: Yes (after 5 years)

EEA Family Permit

This is a document available to non-EEA family members of EEA nationals to enable them to travel with or join their EEA national family member in the UK.

Duration: 6 months

Minimum salary: N/A

Dependants allowed: Yes

Dependants right to work: Yes

Route to Settlement: Yes (5 years in conjunction with EEA Residence Card)

EEA Residence Card

This is a document available to non-EEA family members of EEA nationals confirming their right to remain with their EEA national family member in the UK.

Duration: 5 years

Minimum salary: N/A

Dependants allowed: Yes

Dependants right to work: Yes

Route to Settlement: Yes (after 5 years)

EEA Registration Certificate

This is a document available to EEA nationals to confirm their right to live in the UK on the basis of exercising Treaty rights through employment, self-employment, study, self-sufficiency or as a job-seeker.

Duration: valid as long as the EEA national remains in the UK exercising treaty rights

Minimum salary: N/A

Dependants allowed: Yes

Dependants right to work: Yes

Route to Settlement: Yes (after 5 years exercising treaty rights)

EEA Permanent Residence

This is a settlement category available to EEA nationals and their non EEA family members who have been exercising Treaty rights in the UK for a period of 5 years through employment, self-employment, study, self-sufficiency or as a job-seeker.

Duration: Indefinite

Minimum salary: N/A

Dependants allowed: Yes

Dependants right to work: Yes

Route to Settlement: This is settlement

3.5. Skilled workers

Given the skilled jobs performed by a large portion of London's workforce⁵⁴, it is evident that businesses and educational institutions in London need access to a strong supply of talent, skills and experience.

To understand how this demand is met, approximately 120 London First members and non-members were surveyed⁵⁵, to ascertain the relative proportions of their skilled workforce from the UK, EU or non-EU. This survey covered a range of sectors and industries, as shown in Figure 3 j below. A skilled worker has been defined as a person who has specific proficiency, training, knowledge and ability in their profession (see Chapter 1 for further information).

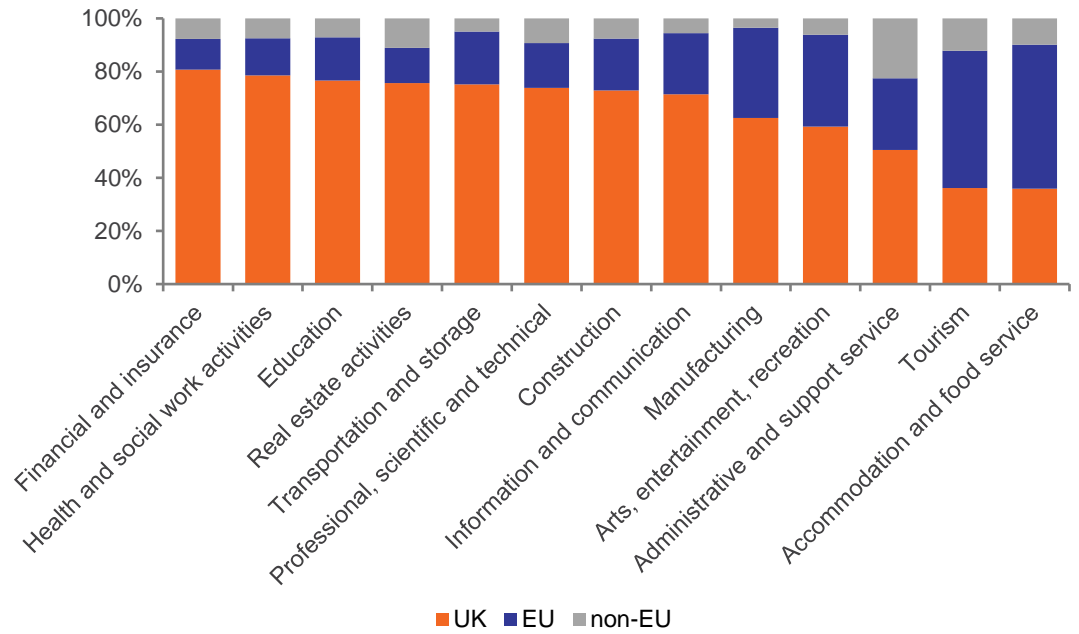
Members in the financial services and insurance industry show a high proportion of UK-born workers, contrasting with those in accommodation and food services with 35% UK-born, 55% EU-born and 10% non-EU born workers.

It is interesting to note that the sectors more associated with skilled workers (those on the left of the graph) tend to have a higher proportion of UK-born workers than those sectors that are traditionally less skilled.

⁵⁴ See Figure 2 i for details

⁵⁵ London First and PwC-run survey of LF members and selected London organisations

Figure 3 j:
Origin of skilled
workers for
surveyed London
businesses 2016



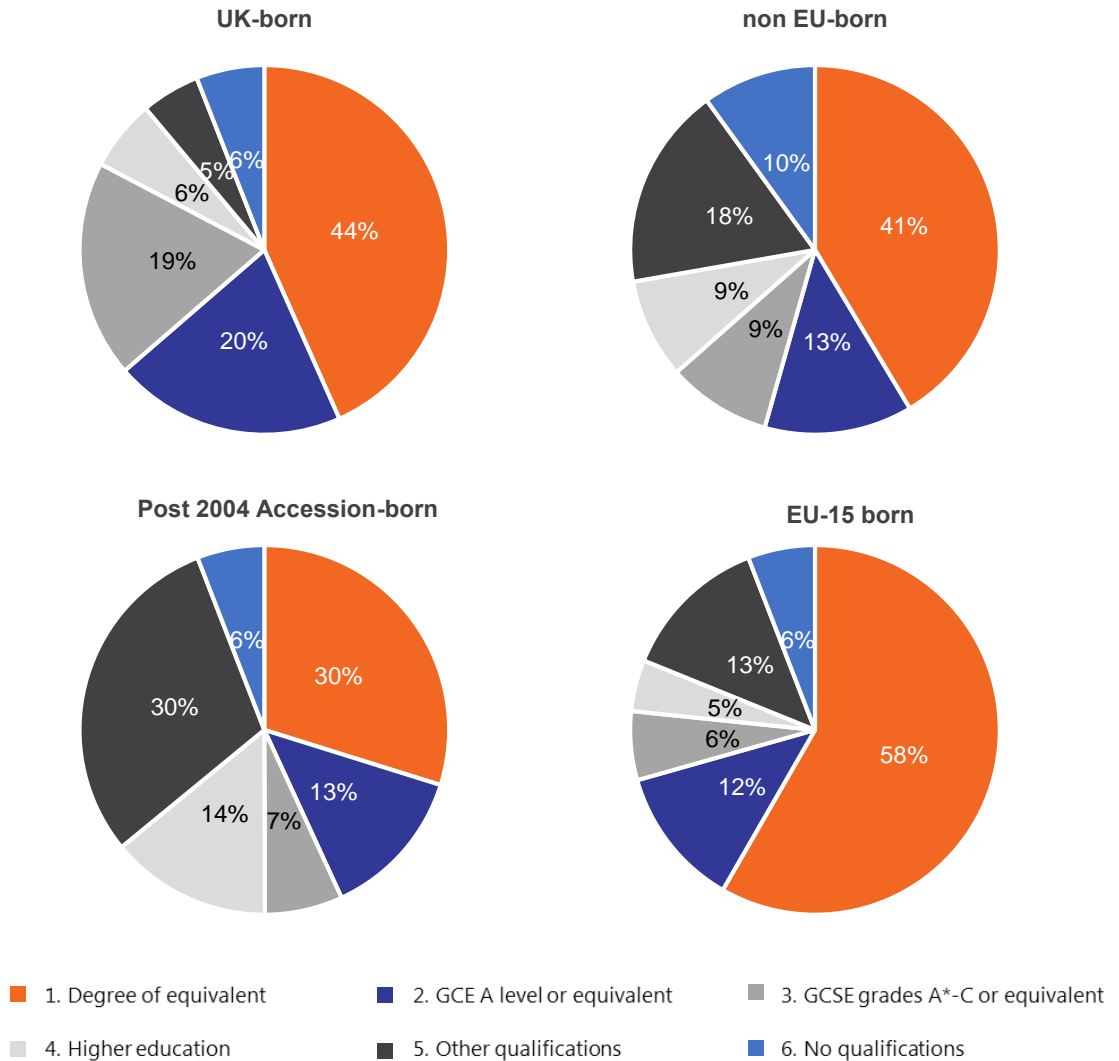
Source: London First/PwC member survey

3.6. London’s educated workforce

London’s workers tend to be more educated than the UK average – ONS statistics show that on average 43%⁵⁶ of Londoners of working age have a degree or equivalent, compared to the UK average of 28%⁵⁷.

Figure 3 k below shows the breakdown comparison between UK born and non UK born workers in terms of highest qualification. EU-15 workers in London in particular are very highly educated, with 58% holding a degree (or equivalent qualification).

Figure 3 k:
Highest qualification by region of birth in London, 2015



Source: ONS Labour Force Survey

Post-2004 accession EU and non-EU workers frequently hold “Other” (vocational/work-related or foreign) qualifications (at 18% and 30% respectively) – which are required for specific industries such as construction – or foreign higher education qualifications that are not classifiable by the ONS.

⁵⁶ Figure 3 k shows the breakdown of qualifications by region of birth. When one looks across all of these groups, the overall percentage of Londoners with a degree comes to 43%, which should not be confused with the UK-born figure of 44%

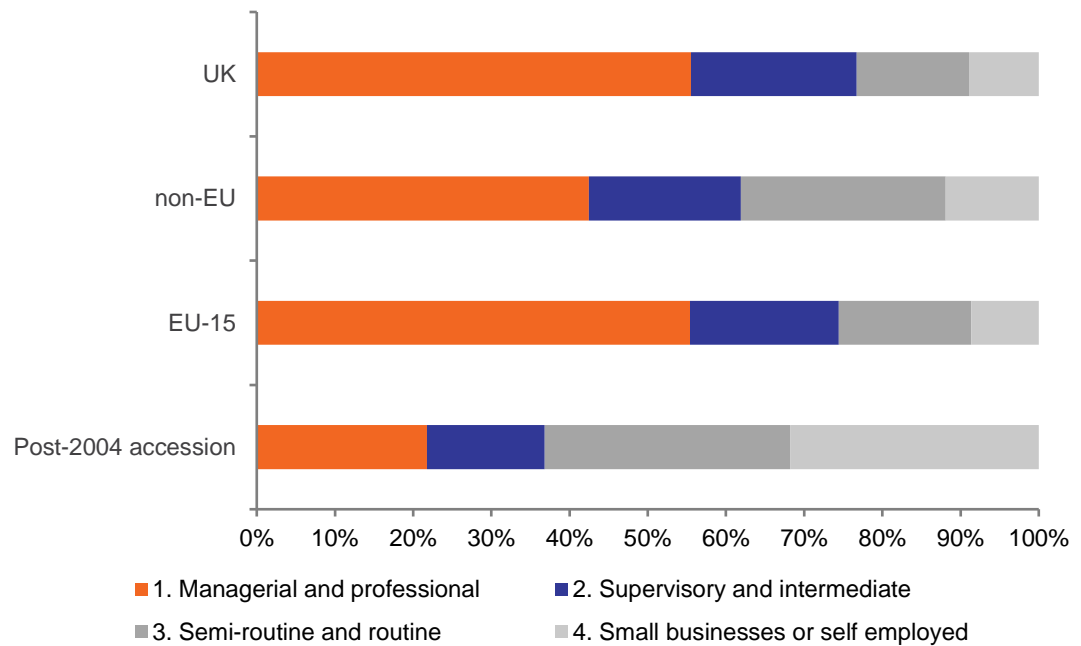
⁵⁷ Source: ONS Labour Force Survey.

3.7. The roles migrant workers perform

Figure 3 I below shows the type of roles taken in London (across all industries) by non-EU, EU-15 or post-2004 accession migrant workers. As can be seen from the figure, there are significant differences between the different migrant groups:

- UK and EU-15-born workers tend towards managerial and supervisory roles;
- Migrants from the post-2004 accession countries tend more towards semi-routine and routine roles;
- over 55% of EU-15 migrant workers are in managerial or professional roles, contrasting with post-2004 accession migrants at 22%. This is also reflected in the relative number of these migrants holding qualifications other than degrees, as commented in the previous section; and
- more than 60% of post-2004 accession migrants are in routine occupations or self-employment. One possible reason for this is their work in the construction industry, as discussed in Section 3.10.1.

Figure 3 I:
Roles performed
by London's
workers by region
of birth,
2015



Source: ONS Labour Force Survey

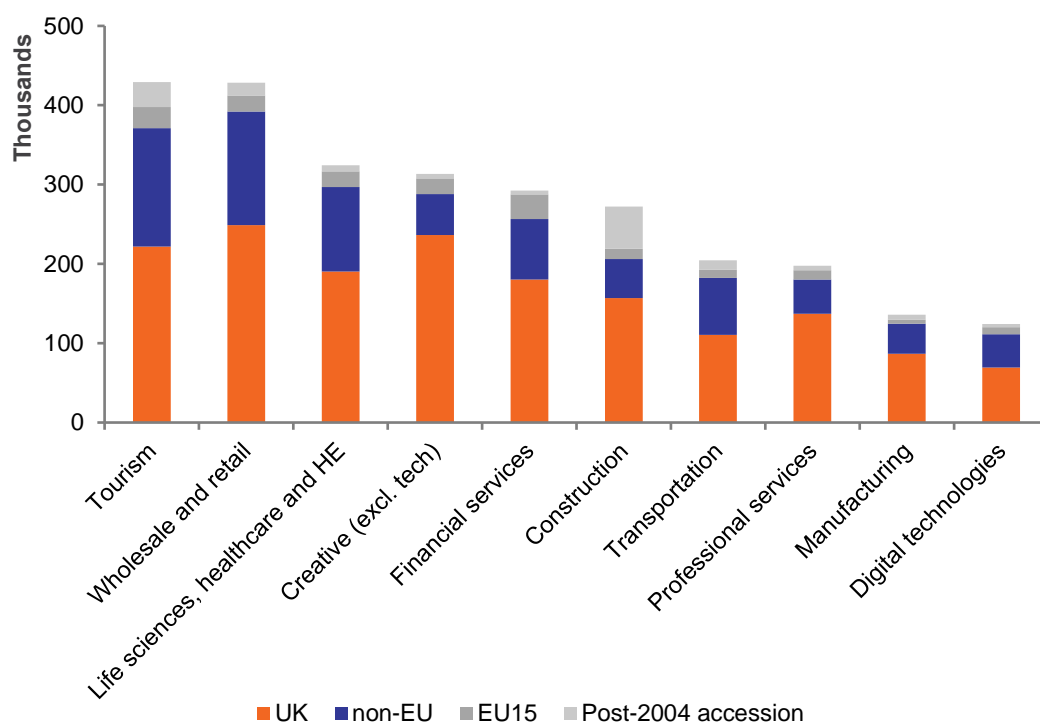
3.8. Migrant workers in different industries across London

Migrant workers span many industry sectors in London. In Figure 3 m and n⁵⁸, we show particular key industry sectors associated with London's economy, along with a breakdown of the sectors' workers by their region of birth. Note that these industries have been defined with ONS **SIC codes** alongside London First for this report – for further detail see Appendix F.

The range of values between the industry sectors is very noticeable. For example:

- the creative industries (excluding technology) have almost 400,000 workers in total, 75% of whom are UK-born - the highest proportion of UK-born workers in the sectors sampled. Of the remaining workforce in the creative sector, 14% are EU-born (9% EU-15 and 5% post-2004 accession) and 11% are non-EU born;
- the relatively high proportion of post-2004 workers in the construction and tourism sectors is also noticeable. These are sectors less associated with highly skilled workers – and this aligns with the roles and qualifications that post-2004 migrants tend to have;
- the large number of non-EU migrants in the tourism and retail sectors; and
- transportation is the sector with the lowest proportion of UK-born workers, at just 49%. There are just over 200,000 workers in the sector, 10% are EU-born (3% EU-15 and 7% post-2004 accession) and 41% non-EU born.

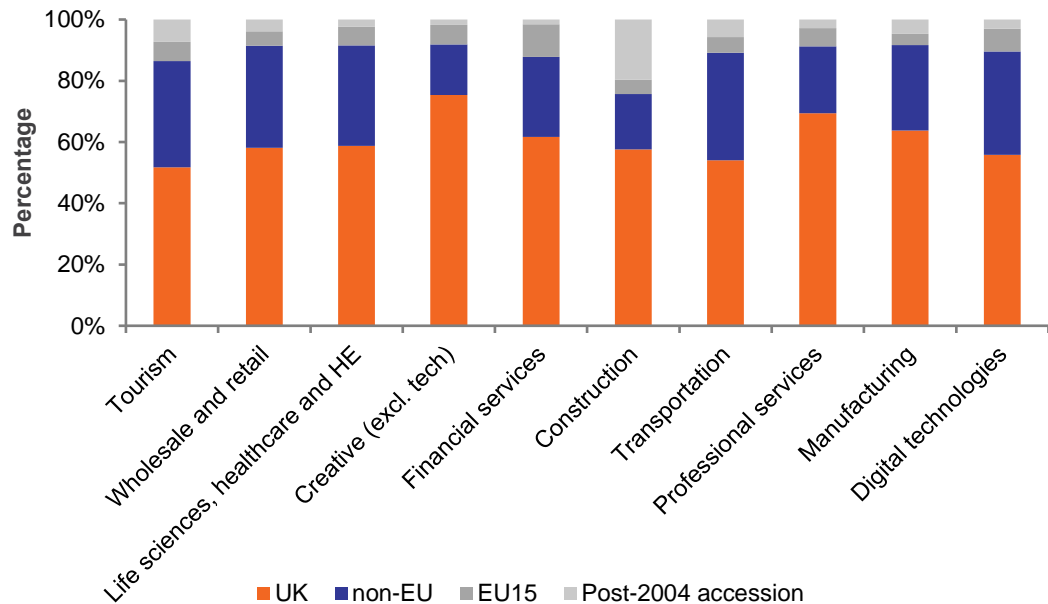
Figure 3 m:
The industry sectors covered by London's workforce (Absolute Values), 2015



Source: ONS Labour Force Survey

⁵⁸ For details of the industry mappings used with ONS SIC codes, see Appendix F

Figure 3 n:
The Industry
Sectors Covered
by London's
Workforce (%),
2015



Source: ONS Labour Force Survey

3.9. Students in London

N.B. For section 3.9, students classified by region (e.g. UK, EU) are identified by their country of domicile, rather than country of birth.

London is arguably one of the most prestigious cities in the world for higher education, with 4 of the top 30 universities in the world⁵⁹. International students⁶⁰ are increasing in the capital – and make up just under 30% of London's student numbers as of 2015 – a total of almost 100,000, as shown in Figure 3 o below.

Figure 3 o shows that over the last decade, total student numbers have decreased by just under 22,000 – from 381,600 in 2005 to 360,000 in 2015. In particular, there has been a rapid drop of over 46,000 from the peak of 407,800 in the 2010/11 academic year to 361,500 in 2015/16. The drop is a total decrease of more than 50,000 in the number of UK students studying in London over the period.

Tougher criteria for the issue of student visas to non-EU students were introduced by the UK Government in April 2012⁶¹. However, when we look at the figures for non-EU students in London, we see a small decrease in 2011/12 and 2012/2013, but since then, non-EU numbers have been steadily increasing and now exceed their pre-2012 levels. This is shown in Figure 3 p below.

On average, the number of non-EU students in London has increased by approximately 1,400 each year over the last 10 years. This represents an average rate of increase of 2.6% per annum.

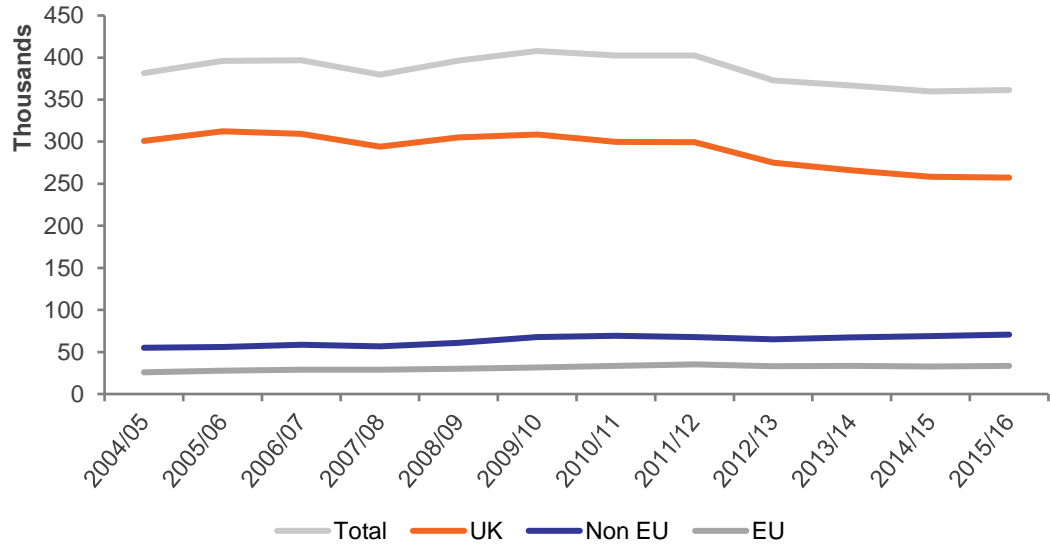
⁵⁹ See *Times Higher Education World University Rankings, 2015-16*

⁶⁰ We define a student as an individual studying either full or part time at a Higher Education institute recognised by HESA, the Higher Education Statistics Authority. See hesa.ac.uk for further details. Our figures exclude individuals pursuing courses at Further Education institutes as well as schoolchildren.

⁶¹ See www.gov.uk/government/news/major-changes-to-student-visa-system

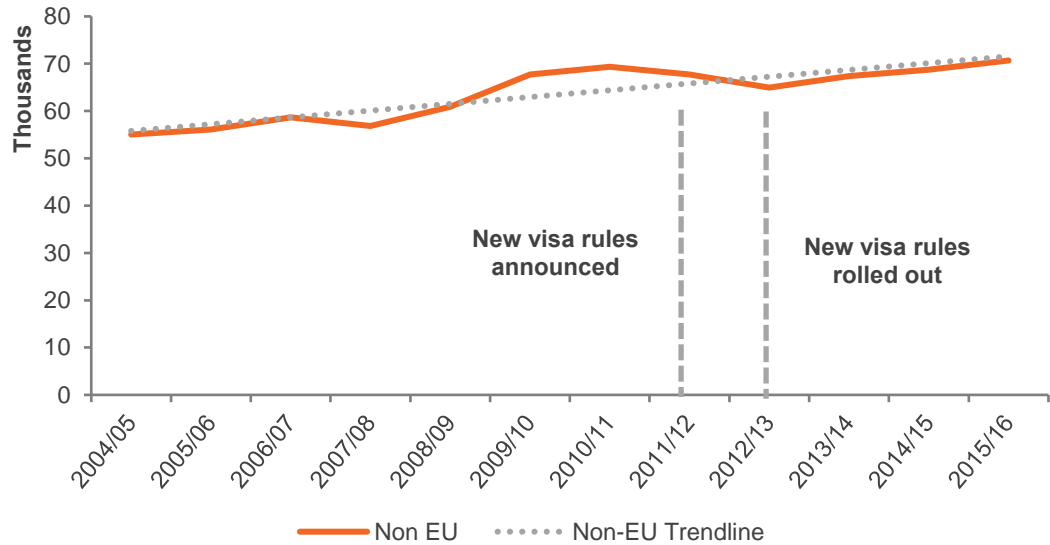
EU-students have, however, increased by approximately 700 per year on average, an average percentage increase of 2.7% each year.

Figure 3 o:
Total Number of Students Studying in London – Full and Part Time, 2004 – 2016



Source: HESA website, hesa.ac.uk

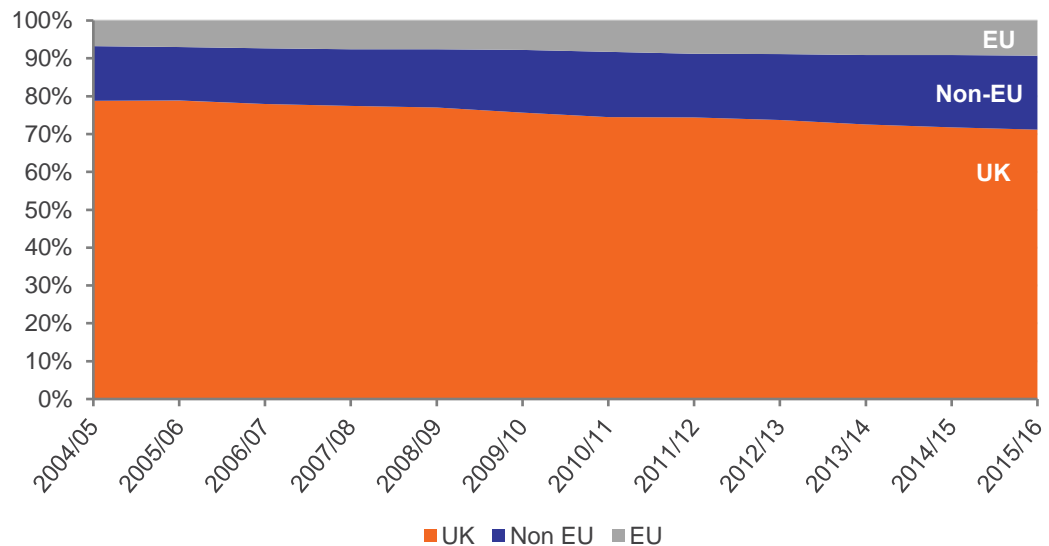
Figure 3 p:
Non-EU Students Studying in London – Full and Part Time, 2004 – 2016



Source: HESA website, hesa.ac.uk

In Figure 3 q below, we present the composition of London's student population which demonstrates clearly how the student community is increasingly becoming more international in nature, with the UK proportion decreasing from 79% in 2004/05 to 71% in 2015/16.

Figure 3 q:
Composition of London's student population – full & part time 2004 – 2016



Source: HESA website, hesa.ac.uk

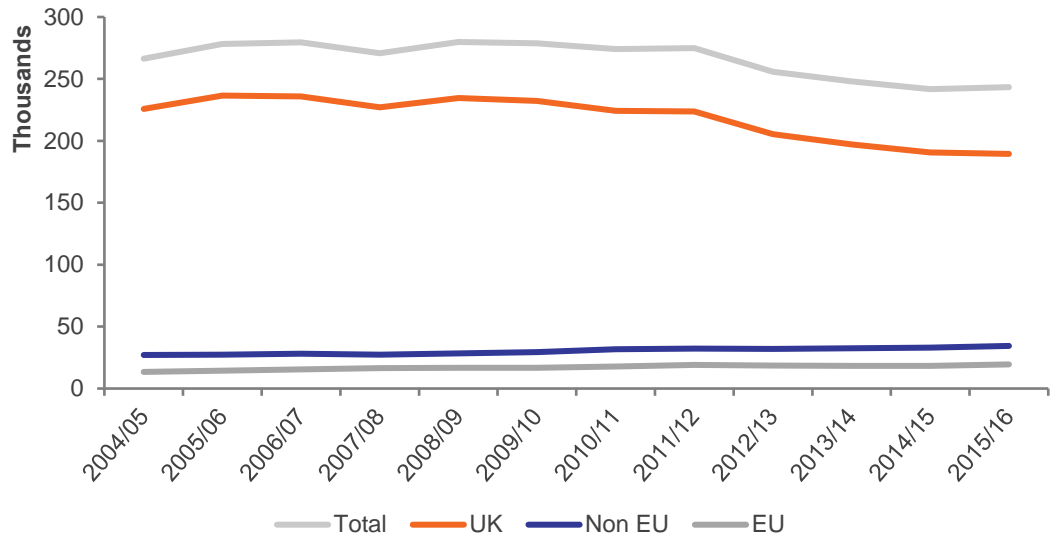
The report “*London Calling*” produced by London First and PwC suggests that non-UK students bring an average net benefit of £34,122 per student, with a total net benefit of £2.3 billion per annum. In addition, research conducted for *London Calling* suggests that 60% of international students are more likely to do business with London-based companies as a result of studying here.

In order to understand the decrease in student numbers in greater detail, we present in Figure 3 r and Figure 3 s below, the breakdown of London's undergraduate and postgraduate student populations.

By inspection, we see that postgraduate numbers have plateaued over the last 3-4 years, so it is a decrease in undergraduate numbers that is causing the total number of students in London to fall. In particular, it is the decrease in UK undergraduates that is depressing the total number, as EU and non-EU students numbers continue to rise for both undergraduates and postgraduates.

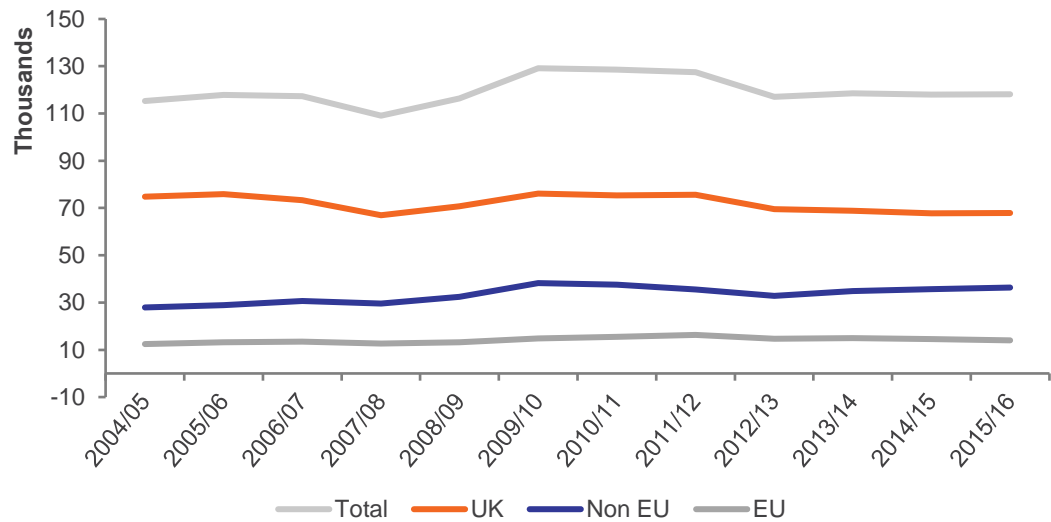
In percentage terms, the decrease in UK undergraduates studying in London over the last 5 years (2011/12 – 2015/16) is 15.3%. One possible reason for this is the cost of studying in London – especially in terms of accommodation and subsistence, for which cheaper alternatives can be found at universities outside of the capital.

Figure 3 r:
Undergraduate
students studying
in London 2004 –
2016



Source: HESA website, hesa.ac.uk

Figure 3 s:
Postgraduate
students studying
in London 2004 –
2016



Source: HESA website, hesa.ac.uk

3.10. Case studies

To place the findings of the earlier sections of this chapter in context, we have selected a series of case studies in sectors that are traditionally associated with migrant labour in London. The sectors we have chosen draw on skilled and un-skilled labour and all provide a significant contribution to the ongoing evolution of London as a place to live and work. The sectors are:

- the Construction Industry (as originally graphed in Figure 3.8);
- Financial Services (as originally graphed in Figure 3.8);
- the National Health Service (using NHS Digital data);
- Hospitality (Accommodation and Food Services – as originally graphed in Figure 3.8); and
- Wholesale and Retail (as originally graphed in Figure 3.8).

For the case studies in this section, we have used Standard Industrial Classification (*SIC*) codes to extract and map the relevant figures from ONS data. For further information on these mappings, please see Appendix F of the report⁶².

⁶² The date ranges for each case study were determined by examination of the data available, and so in some of the case studies, the period covered differs slightly from the period 2005 – 2015 we have analysed most frequently in this report.

3.10.1. The construction industry

Summary

The construction industry in London has seen a great deal of volatility over the 11 years analysed – largely as a result of the global financial crisis of 2008/9. Such volatility has been witnessed before in the sector as historically, the construction industry is highly cyclical in nature, with peaks and troughs observed in line with overall economic confidence and levels of investment.

The sector employs approximately 300,000 people in London, with approximately 50% UK-born, 30% EU born and 20% non-EU born. The number of workers in the industry has grown in the very recent past and this looks set to continue on an upwards trajectory.

Demand on the industry is increasing and the UK is unable to meet this demand with home-grown workers, as evidenced by the large number of unfilled job vacancies. The situation is further complicated with an aging UK-born construction workforce with 10-20% of the current workforce looking to retire in the next 5 years.

The shortfall of workers is therefore being met with migrant workers – a trend that is likely to increase for the foreseeable future.

Summary Data

Table 3 c:
Construction
sector summary
data

Year	2009	2015	Change	% Change
UK born	157,000	151,000	-6,000	-3.8%
EU born	66,000	85,000	+19,000	+28.8%
Non EU born	49,000	59,000	+10,000	+20.4%
Non UK Total	115,000	144,000	+29,000	+25.2%
Total	272,000	295,000	+23,000	+8.5%

Analysis

The construction industry in London has experienced significant volatility over the last few years, in terms of workforce numbers, workforce composition and overall Gross Value Added (GVA) output. Historically, the construction industry tends to be highly cyclical in nature, with peaks and troughs observed in line with overall economic confidence and levels of investment.

The financial crisis greatly affected private and public expenditure on large infrastructure projects and housing, as well as on smaller scale developments and activities (such as those undertaken by sole traders). This caused a significant dip in the number of workers in London's construction industry in 2010, as shown in Figure 3 t below.

We have separated out the total construction industry workforce into a single diagram, as the severity of the dip in the total workforce in 2010 tends to "disappear" when plotted on the same graph as the workforce breakdown by region of birth (Figure 3 u).

We estimate that the dip accounts for approximately 27,000 jobs or 10% of the total workforce. In other words, we estimate that the number of construction workers in London in 2010 would have been 27,000 higher, had the dip not occurred.

The logical explanation for the dip lies in the after-effects of the 2008/09 economic crisis. Due to the lead time associated with most building work, this would have taken longer to feed through the construction industry than was observed in shorter-term industries such as tourism and retail. If we refer back to Figure 3 g, the unemployment rate chart for London, there is a noticeable build up to the peak in 2010 – for which the dip in construction workforce shown below is likely to be one of the main factors.

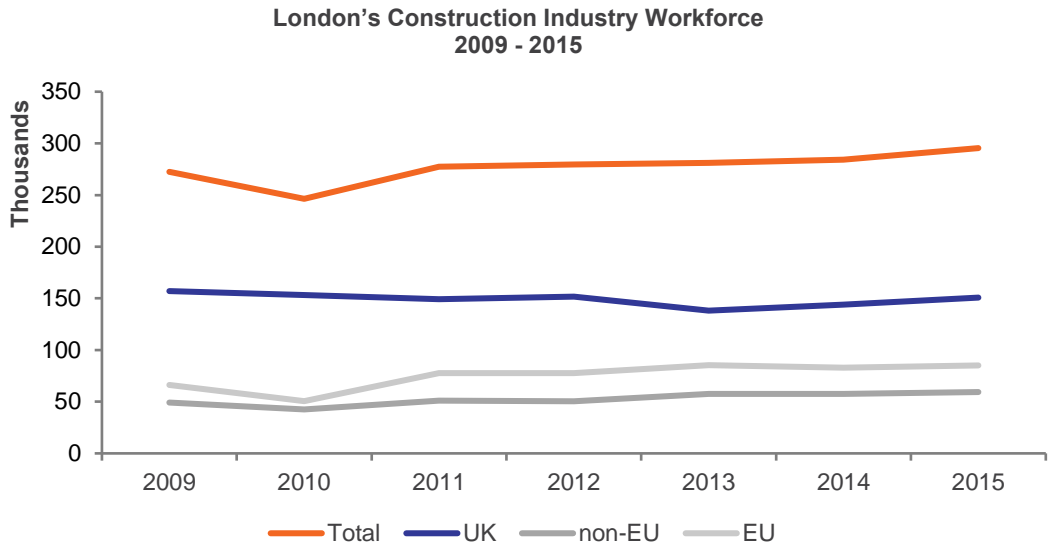
Since 2011 there has been an increase in the number of workers in the construction industry in London, rebounding to over 295,000 in 2015. This trend also aligns with the decrease in unemployment rate that has been observed since its 2011 peak.

Figure 3 t:
London's
construction
industry workforce,
2009 – 2015



Source: ONS Labour Force Survey

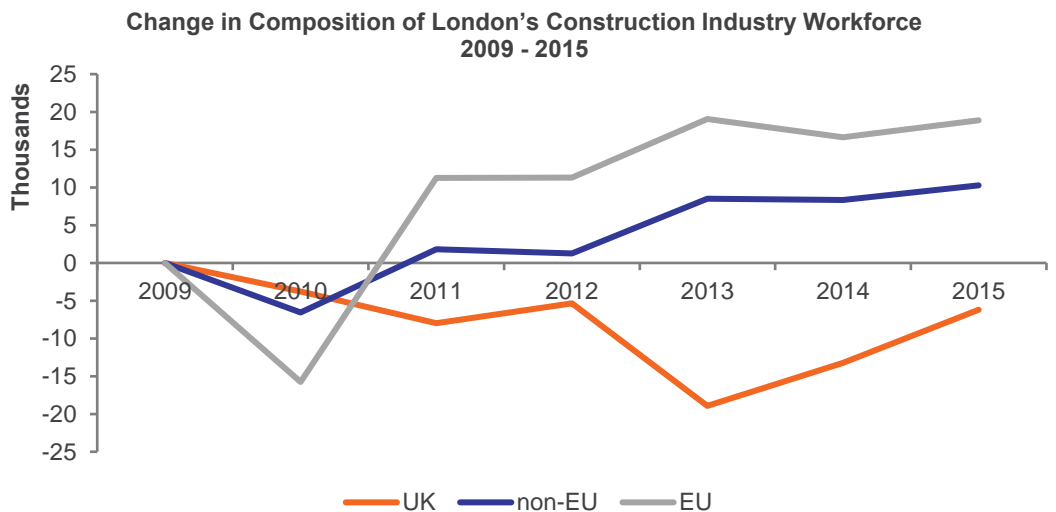
Figure 3 u:
Composition of London's construction industry workforce, 2009 – 2015



Source: ONS Labour Force Survey

Since 2010, non-EU and EU born workers in construction in London have increased steadily in numbers – as shown in Figure 3 v below. However, the number of UK workers continued to fall until 2013, when the levels increased – but still to a level approximately 5,000 workers below that of 2009. In other words, it appears that the effects of the credit crunch were more protracted for UK-born workers than for migrant workers, although the data does not allow us to say why this is the case.

Figure 3 v:
Change in composition of London's construction industry workforce, 2009 – 2015



Source: ONS Labour Force Survey

To place the above in context, it is necessary to understand how many UK workers are joining and leaving the construction industry over time – in other words, the effective churn. Whilst the data does not allow us to provide a detailed breakdown of the churn from the

construction industry, it is illustrative to look at the behaviour of two of its key drivers – apprenticeships and retirements⁶³.

According to the ONS, the number of apprenticeships offered within England has shown a 33% increase since 2012 (from just under 15,000 to approximately 20,000 – see Figure 3 w below). Whilst this figure is encouraging, it is not the full story, as data from the Construction Industry Training Board (CITB) paints a less positive picture⁶⁴. According to CITB data, the number of apprenticeships that were completed in Inner London fell from 730 in 2011/12 to 500 in 2013/14.

CITB data also suggests that the overall qualification level of construction workers in London is below that held in other parts of the UK. 52% of construction workers in Greater London hold some form of qualification, compared to 63% for the UK as a whole. Furthermore, 50% of construction workers in London hold NVQ Level 2 qualifications compared to 58% for the UK as a whole.

The situation is further compounded when one examines research from the ONS and CITB which shows that 19% (equivalent to 406,000 people in 2015) of the UK's construction are set to retire by 2023 (workers aged 55+). These figures are echoed in analysis published by the Chartered Institute of Building (CIOB)⁶⁵.

Interestingly, London, with the largest construction workforce in the UK (approximately 300,000 people), is set to perform better than the rest of the UK in terms of the estimated proportion of workers leaving the sector within the next 10 years, at 12% (equivalent to 36,000 workers). The inference of this lower value is that London's construction industry workforce is younger than that in the rest of the UK.

Figure 3 w:
Construction apprenticeships in England, 2009 – 2015



Source: Briefing Paper Number 06113, 21 November 2016 Apprenticeship Statistics: England

⁶³ An apprenticeship is not the only entry route into the construction industry, but examining the number of apprenticeships available gives a useful benchmark of numbers entering into the construction industry.

⁶⁴ See CITB's "Workforce Mobility and Skills Survey (2015)" for details

⁶⁵ CIOB analysis suggests that approximately 16% of the UK construction industry workforce is aged 60 or over – and this proportion is growing. See www.ciob.org for details.

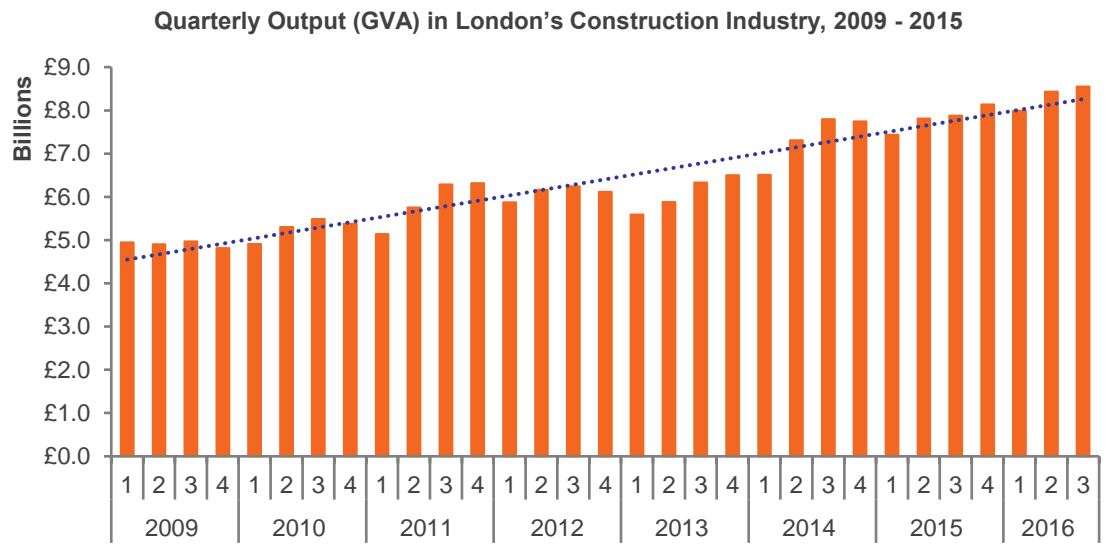
In summary, therefore, with increasing economic confidence post financial crisis of 2008/9, London's construction industry has struggled to meet the demands placed on it by using workers from the UK⁶⁶. The supply of UK-trained workers is problematic and the rate of UK retirees from the industry is increasing. The industry has therefore addressed these shortfalls by recruiting migrant workers – in particular, workers from EU countries, a trend that seems set to continue for the foreseeable future.

The output from London's construction industry

The increase in the construction industry's workforce since 2013 is reflected in the increase in output in the same time frame (as shown in Figure 3 x below). From 2009 to 2011 quarterly output remained relatively static at approximately £5 billion. However by 2014, quarterly output had risen to £8 billion and this figure continued to increase through 2016.

⁶⁶ According to the Construction Industry Training Board (CITB), an estimated 20% more construction workers were needed in London and the South East between 2014 and 2017. The CITB also states that across the UK, vacancies in the construction industry were running at 25,000 between March and May 2015, 30% more than a year earlier.

Figure 3 x:
Quarterly output (GVA) in London's construction industry, 2009 – 2015



Source: ONS Statistics

The increase in London's construction industry output is also reflected in its share as a proportion of the construction output of the UK as whole. Yearly GVA in London in 2015 represented 23% of the national GVA, compared to 17% in 2009 – see Table 3 d below:

Table 3 d:
Gross Value Add (GVA) of London's construction sector, 2009 – 2015

Year	National output/GVA (£M)	London output/GVA (£M)	London as a %
2009	113,028	19,636	17%
2010	122,666	21,077	17%
2011	125,365	23,497	19%
2012	116,732	24,393	21%
2013	118,429	24,306	21%
2014	128,072	29,365	23%
2015	134,386	31,269	23%

Source: ONS Statistics

3.10.2. Financial services

Summary

London is recognised as a global hub in financial services – which include banking, insurance, securities trading and fund management. London is the largest global market for foreign exchange trading and is a leading centre for trade in commodity derivatives.

The financial services industry employs approximately 1.1 million people across the UK, of which roughly one quarter (293,900) are based in London. Financial services account for just over one sixth (17.1%) of the total London economy.

Approximately 60% of the sector's workforce in London are UK-born, 25% are born outside of the EU and 15% born within the EU. This breakdown of workforce has remained relatively static over the last ten years, which is to be contrasted with other sectors, such as construction, where the proportion of migrant workers has changed far more.

Summary Data

Table 3 e: Financial services summary data

Year	2009	2015	Change	% Change
UK born	183,000	177,000	-6,000	-3.3%
EU-15 born	31,000	32,000	+1,000	+3.2%
Post-2004 Accession born	4,000	10,000	+6,000	+150%
Non EU born	76,000	76,000	0	0%
Non UK Total	111,000	118,000	+7,000	+6.3%
Total	294,000	295,000	+1,000	+0.3%

Analysis

Financial services is one of London's key industries. London is a global hub for finance and many financial institutions have significant operations based here. Banking is the largest employer in financial services, followed by insurance, securities markets and fund management⁶⁷. Professional services such as consultancy, legal services and dispute resolution whilst closely allied to financial services, are classified separately by analysts and so have not been included in this case study.

London is currently ranked first in the Z/Yen Group's 2016 Global Financial Centres Index – although the number 1 spot has been traded back and forth with New York since the ranking began. London is fractionally ahead of New York in the latest ranking, with Singapore and Hong Kong close behind in third and fourth place, respectively⁶⁸.

In terms of scale, the financial services sector employs approximately 1.1 million people across the whole of the UK, with approximately a quarter of this total in London (293,900). Across the UK, approximately 3.7% of the total workforce work in the financial services sector.

The main centres for financial services in London are the City of London (155,000 workers or 53% of the London total) and Canary Wharf (62,700 workers or 21% of the total). Approximately 76,200 Financial Services workers (26% of the total) are based elsewhere in London.

For the UK as a whole, the financial services sector made a total tax contribution of £65.6bn in the tax year to the end of March 2014, representing almost 11.5% of total government tax receipts. This figure includes taxes paid, as well as taxes collected, by the sector⁶⁹.

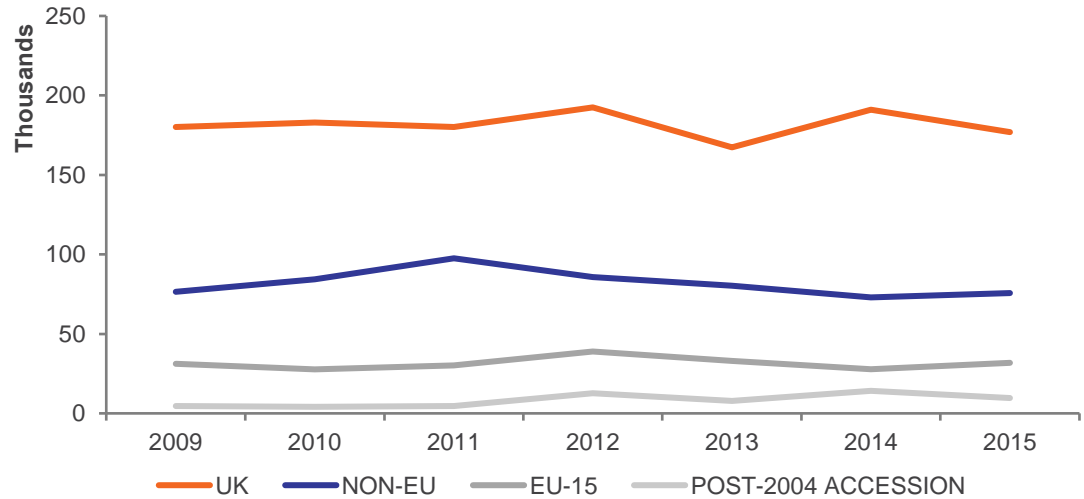
Figure 3 y below shows the number of people working in the financial services sector in London, broken down by country of birth, between 2009 and 2015.

⁶⁷ Source: "An Indispensable Industry – Financial Services in the UK" published by the City of London on www.cityoflondon.gov.uk, November 2013

⁶⁸ Source: www.zyen.com/research/gfci.html

⁶⁹ Source: www.cityoflondon.gov.uk

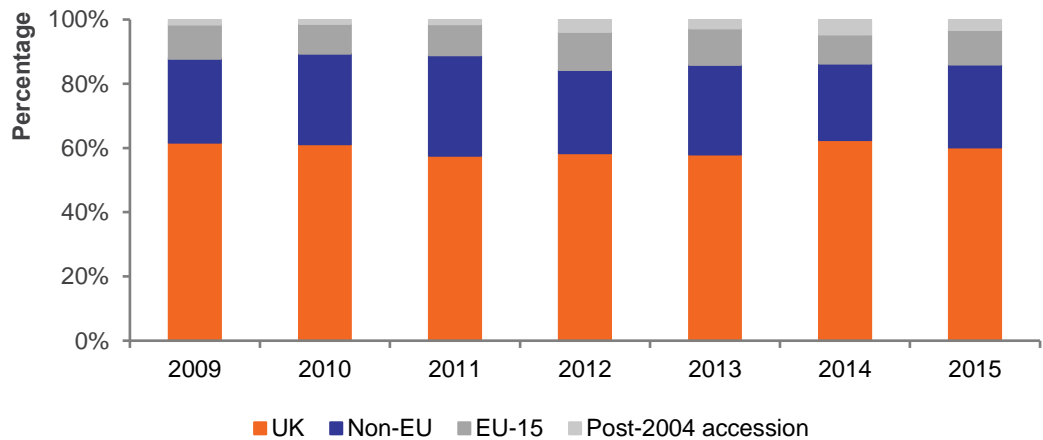
Figure 3 y:
Number and origin
of workers in
financial services
in London,
2009 – 2015



Source: ONS Labour Force Survey

Figure 3 z below shows the totals as percentages:

Figure 3 z:
Percentage and
origin of workers in
UK financial
services, 2009 –
2015



Source: ONS Labour Force Survey

There are two important conclusions to draw from the above charts.

Firstly, UK workers make up 60% of the total Financial Services workforce in London, with migrant workers making up the remaining 40%⁷⁰. Non-EU migrants account for 25% of the London Financial Services workforce and EU migrants 15%.

Secondly, the percentage of workers that are born in the UK is largely unchanged over the past 7 years – which is to be contrasted with the large variations seen in other sectors over recent years (for example, the construction industry).

⁷⁰ In the survey undertaken for London First reported in section 3.5, the number of survey returns received from Financial Service companies was very small, Hence we believe the estimate of values presented above, which are derived from ONS' more comprehensive surveys, present a much more accurate reflection of the proportion of financial workers from the different regions.

3.10.3. The National Health Service

Summary

The UK has recruited health care staff from overseas from the 1903s onwards. Indeed, ever since the National Health Service (NHS) was formed in 1948, migrant staff have played a key part as doctors, nurses, technical and non-technical staff.

The NHS employs approximately 175,000 people in London.

Across the UK, approximately 12% of all NHS roles are filled by migrant workers and in London, this figure is approximately 25%.

After UK-born residents at 13,300, medical staff born in Ireland are the most numerous in the NHS in London at 5,300.

Doctors from the EU make up approximately 13% of those in the NHS in London, with India being the highest country of birth for NHS doctors after UK (at 4% of the total).

After the UK, nurses born in the Philippines are the most numerous working in the NHS in London at 5% of the total.

Analysis

The NHS employs a total workforce of 1.2 million people in England – of whom 54.4% are professionally qualified⁷¹.

For decades, the NHS has depended on foreign workers to fill its staff shortages, as demand for healthcare from an ageing UK population rises⁷². In December 2015 the NHS in England, Wales and Northern Ireland had more than 23,443 vacant nursing posts and 6,207 available positions for doctors⁷³. That equates to a vacancy rate of 7% for doctors and 10% for nurses compared with an average vacancy rate of 2.7% for the general economy as assessed by the Office for National Statistics.

NHS trusts are increasingly looking overseas to fill these missing roles. 69% of all NHS trusts and health boards are actively recruiting staff from abroad⁷⁴. 12% of all NHS staff (across the whole UK) are nationals of a country other than the UK. In London, the reliance on foreign national workers is higher – at 25% on average across the three areas of London shown in Figure 3 aa below:

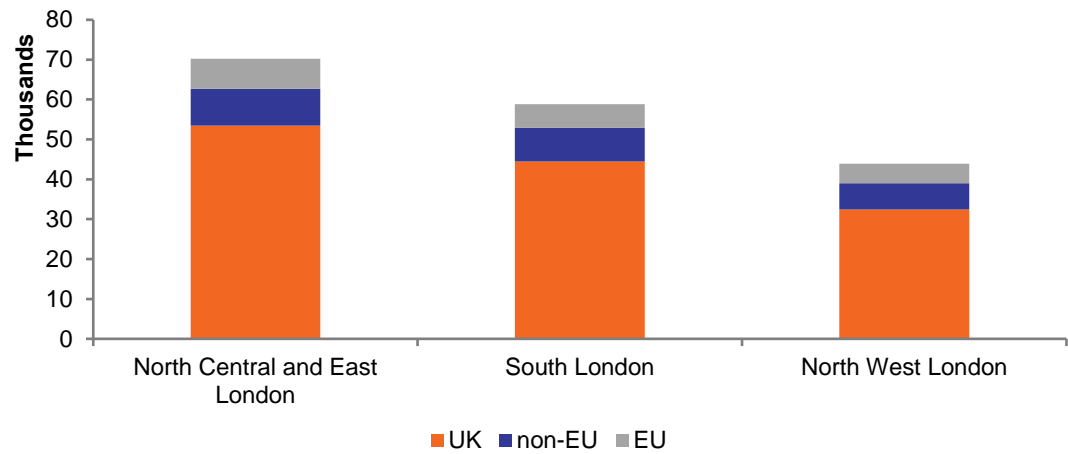
⁷¹ Source: content.digital.nhs.uk/catalogue/PUB23046/nhs-work-stat-oct-2016-pdf.pdf

⁷² According to History & Policy, a network of more than 500 academic historians, "Since the 1930s, successive governments have recruited doctors, nurses and other health workers from overseas to work in UK health services with the first mass recruitment waves of nurses from the African Caribbean in the 1950s and doctors from the Indian subcontinent in the 1960s." See the historyandpolicy.org website for further details.

⁷³ Being a fully devolved matter, figures for the NHS in Scotland are not included within this analysis

⁷⁴ Source: BBC website, bbc.co.uk

**Figure 3 aa:
NHS workers by
NHS London
region,
2015**



Source: data.gov.uk

The countries in which the most staff in the NHS in London are born, are (for all levels of staff and roles) shown in Table 3 f below:

**Table 3 f:
Country of birth of
NHS staff in
London
(all grades/roles),
2015**

Country	Number of NHS staff in London (all grades) ⁷⁵	Percentage of total (all grades)
Great Britain	130,300	75.3%
Ireland	5,300	3.0%
Philippines	4,400	2.5%
India	3,600	2.1%
Nigeria	2,900	1.7%
Spain	2,100	1.2%
Portugal	1,800	1.0%
Italy	1,600	1.0%
Poland	1,600	0.9%
Ghana	1,500	0.8%
Zimbabwe	1,100	0.7%

Source: NHS Digital

⁷⁵ Values rounded to the nearest 100.

If we now repeat the analysis for doctors (including locums) and qualified nursing, midwifery and health-visiting staff we see that the breakdown is as per Table 3 g and h below:

Table 3 g:
Country of birth of
NHS doctors
(including locums)
in London, 2015

Country	Number of NHS staff in London (all grades) ⁷⁶	Percentage of total (all grades)
Great Britain	17,060	74.0%
India	940	4.1%
Greece	600	2.6%
Ireland	580	2.5%
Italy	430	1.8%
Germany	280	1.2%
Pakistan	270	1.1%
Malaysia	250	1.1%
Spain	230	1.0%
Sri Lanka	140	0.6%
Australia	130	0.6%

Source: NHS Digital

Table 3 h:
Country of birth of
NHS nursing,
midwifery and
health-visiting staff
in London,
2015

Country	Number of NHS Nursing, Midwifery and Health-Visiting Staff in London ⁷⁷	Percentage of total (including locums)
Great Britain	37,840	69.2%
Philippines	2,640	4.8%
Ireland	2,500	4.6%
Spain	1,280	2.3%
India	1,100	2.0%
Portugal	970	1.8%
Nigeria	900	1.6%
Zimbabwe	830	1.5%
Italy	640	1.2%
Ghana	600	1.1%
Poland	400	0.7%

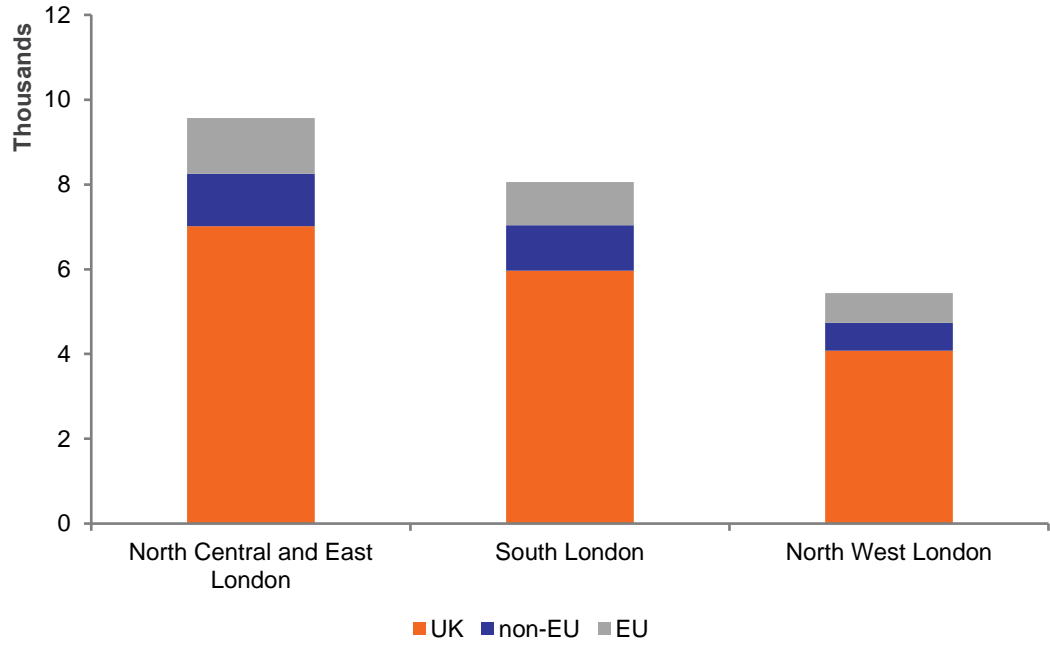
Source: NHS Digital

⁷⁶ Values rounded to the nearest 100.

⁷⁷ Values rounded to the nearest 10

Doctors from the EU in particular are in high number in the NHS in London – as shown below in Figure 3 ab – at over 3,000 in total. After India at 940, the next four highest countries are all from the EU – Greece, Ireland, Italy and Germany.

Figure 3 ab:
NHS London
doctors (including
locums) by region
of birth and NHS
region, 2015



Source: NHS Digital

3.10.4. Hospitality (Accommodation and Food Services)⁷⁸

Summary

The hospitality sector in London has experienced significant growth from 2011 onwards and, in London alone, has a GVA of over £11bn per annum.

Approximately 250,000 people are employed in the Hospitality Sector in London, around 70% of whom (175,000) are born outside the UK. At 100,000, non-EU workers are the biggest group within the sector, with EU workers numbering just over 75,000.

The hospitality sector in London is quite unusual in that UK workers make up the minority, with there being significantly more non-EU, and marginally more EU, workers than there are from UK.

Summary Data

Table 3 i:
Hospitality sector
summary data

Year	2006/07	2014/15	Change	% Change
UK born	52,000	69,000	+17,000	+33.0%
EU born	31,000	75,000	+44,000	142.0%
Non EU born	81,000	100,000	+19,000	23.5%
Non UK Total	112,000	175,000	+63,000	56.3%
Total	164,000	244,000	+80,000	48.8%

⁷⁸ For this case study, the Hospitality industry has been defined as codes grouped within the Accommodation and Food Services SIC letter (letter I in the UK SIC 2007 definition). For further explanation on SIC codes and industry classifications, please see Appendix F.

Analysis

UK Figures⁷⁹

In 2014, the UK hospitality sector employed approximately 2.9 million people, equivalent to 9% of total UK employment. Hospitality accounted for 17 per cent of total UK net employment growth between 2010 and 2014.

Hospitality is the UK's fourth biggest industry as measured by the number of workers employed⁸⁰. The UK hospitality industry contributed an estimated £57 billion to UK GDP in 2014, which equates to almost 4 per cent of total UK GDP.

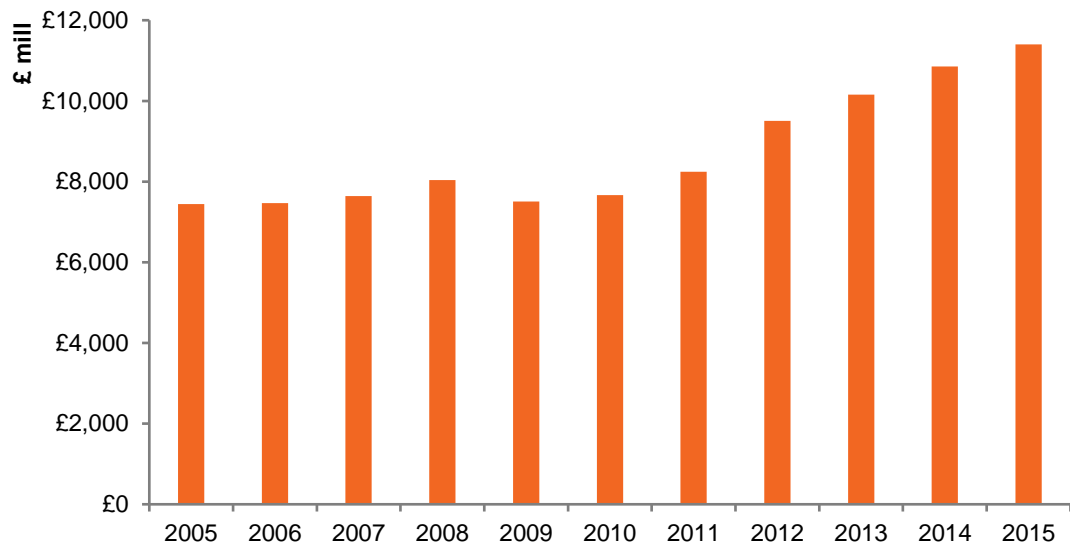
The Hospitality Sector in London

London's hospitality industry has experienced a high level of economic growth since 2010, as shown in Figure 3 ac below. This contrasts with the six years beforehand, 2005-2010, where little growth was observed.

As of 2015, the hospitality industry in London has a GVA of over £11 billion per year, making up 2.9% of London's £378.4 billion.

Several sources of data consulted for this report have suggested that the hospitality sector in London is under more pressure than in the regions, largely due to the over-supply of accommodation and food services in the capital, but the data available to us does not allow us to validate or disprove these claims.

Figure 3 ac:
GVA of the
accommodation
and food services
industry in London,
2005-2015



Source: ONS Statistics

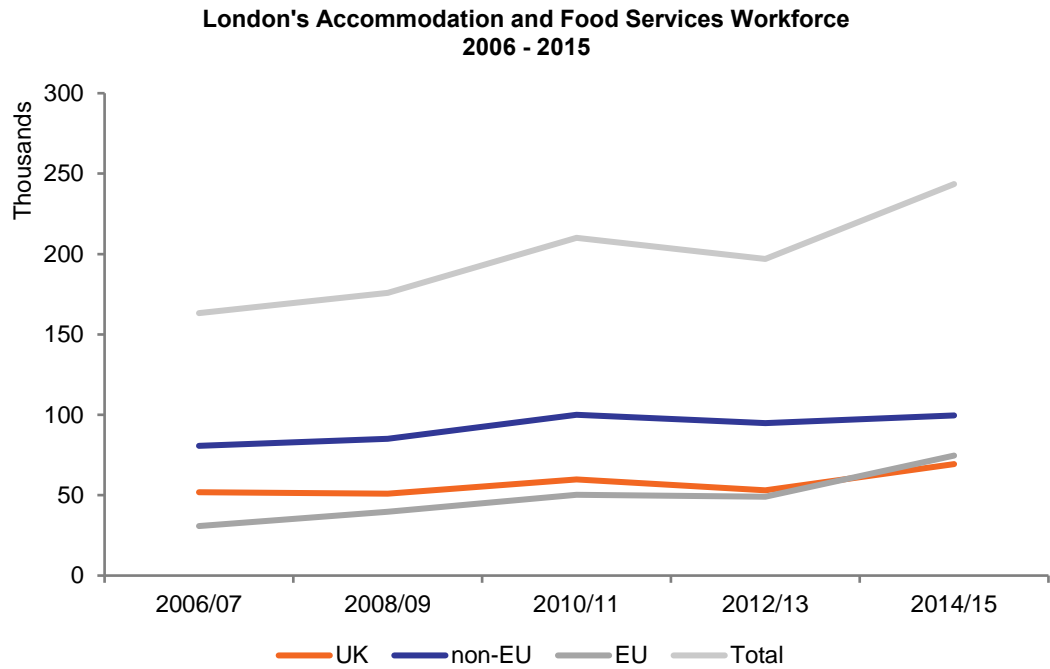
⁷⁹ Source: bha.org.uk/wordpress/wp-content/uploads/2015/09/Economic-contribution-of-the-UK-hospitality-industry.pdf

⁸⁰ Business services is the largest sector and wholesale and retail and healthcare are the second and third, respectively. See footnote 79 for source.

The hospitality industry's workforce in London has experienced similar growth since 2010/11, rising by almost 50,000 to 250,000 workers.

Somewhat unusually amongst the case studies presented in this report, the largest proportion of workers in the industry are non-UK born in 2014/15, and in the same period EU workers overtook UK workers to become the second highest demographic. See Figure 3 ad below:

Figure 3 ad:
Accommodation
and food services
industry workforce
in London,
2006-2015



Source: ONS Labour Force Survey

3.10.5. Wholesale and retail⁸¹

Summary

The Wholesale and Retail sector is characterised by a young, flexible workforce with a fifth of workers aged under 25 and a third working part-time.

Since 2013, London's Wholesale and Retail sector has seen significant growth in GVA of more than £5bn, which now stands at more than £31bn.

London's workforce in this sector totals 250,000 – over half of whom (56%) are UK-born. Non-EU-born and EU-born workers make up 32% and 12% respectively.

Over the last 10 years, the Wholesale and Retail workforce in London has grown, on average, by 9,000 workers per year – 3,800 of whom were UK-born workers, 1,800 EU-born workers and 3,300 non-EU-born workers.

Increasingly more retail transactions are performed on-line and, as of 2015, on-line retail accounted for 14% of all sales. Whilst the majority of sales (86%) are still performed face to face, the on-line trend shows little sign of abating and on-line selling will continue to have a significant sector impact – in London and elsewhere.

Summary Data

Table 3 j:
Wholesale and
retail sector
summary data

Year	2006/07	2014/15	Change	% Change
UK born	108,000	139,000	+31,000	+28.7%
EU born	14,000	29,000	+15,000	107.1%
Non EU born	52,000	78,000	+26,000	+50.0%
Non UK Total	66,000	107,000	+41,000	+62.1%
Total	174,000	246,000	+72,000	+41.4%

⁸¹ For this case study, the Wholesale and Retail industry has been defined as codes grouped within the Wholesale and Retail Trade SIC letter (letter G in the UK SIC 2007 definition). For further explanation on SIC codes and industry classifications, please see Appendix F.

Analysis

The Wholesale and Retail industry is the second largest industry sector in the UK⁸².

Sales and customer service staff make up over 50% of the sector workforce in the UK. The workforce is relatively flexible in employment and young in age, 21% of those working in retail and wholesale trade are aged 24 or below and 35% of sector employees work part-time. By comparison, just 9% of workers in all other industries work part time⁸³.

In London, Wholesale and Retail accounted for over 8% of the capital's 2015 Gross Value Add, at more than £30 billion. As can be seen in Figure 3 ae, the sector has experienced GVA growth of £5 billion since 2010, with much of this growth from 2013 onwards.

⁸² See footnote 79 for source

⁸³ ONS 2011 Census, figures are for industrial section G.

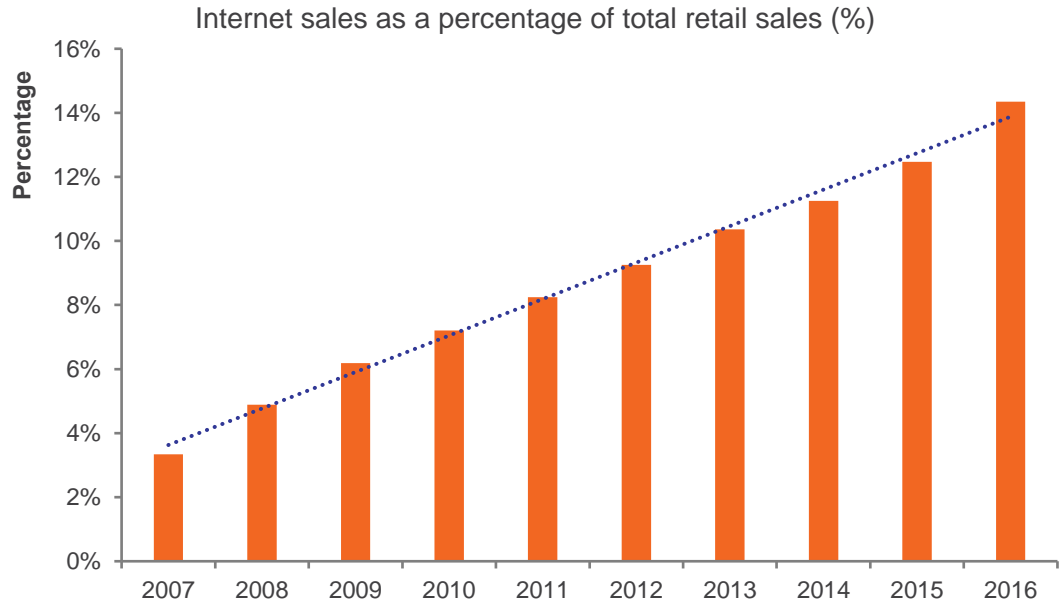
Figure 3 ae:
London's GVA in
the wholesale and
retail industry,
2005-2015



Source: ONS Statistics

The Wholesale and Retail industry is experiencing a high amount of change due to the continual expansion of internet and online sales, as shown in Figure 3 af below. Across the UK internet sales have risen from just under 4% to over 14% in 2015 of all retail sales, with little to suggest that this trend will change.

Figure 3 af:
Internet sales as a percentage of all retail sales in the UK, 2007-2015

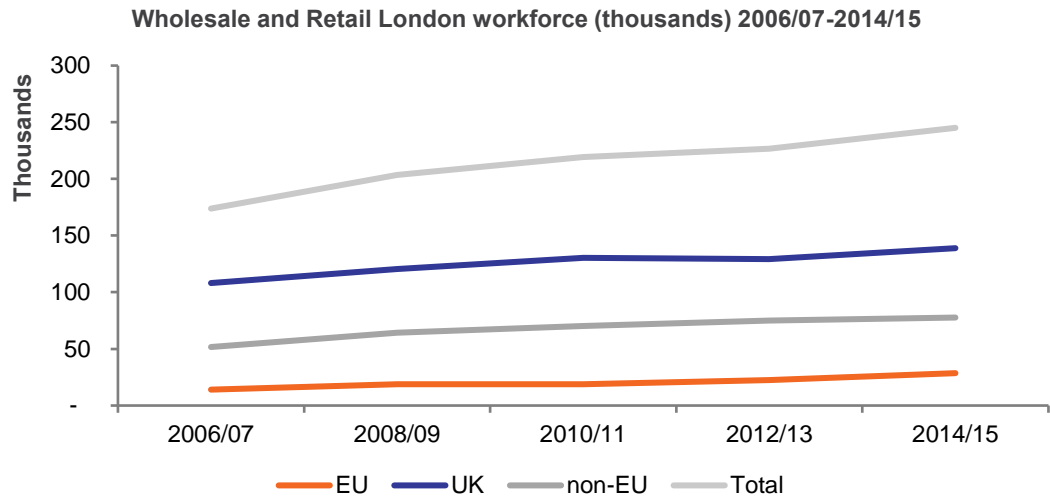


Source: ONS Statistics

However, at 14% of all sales in 2015, internet sales are still in the minority within the industry. 86% of all retail sales are not online, and therefore require customer-facing sales staff.

London's Wholesale and Retail workforce consists of almost 250,000 workers, 50% of which are UK-born as of 2014/15, shown in Figure 3 ag below. UK born, EU born and non-EU born workers make up 56.7% 11.7% and 31.7% of the workforce respectively.

Figure 3 ag:
Wholesale and retail industry workforce in London, 2006/07-2014/15



Source: ONS Labour Force Survey

4 The Impact of Migrants on London's Economy

Chapter Summary

- We estimate that on average EU and non-EU migrant workers in London contribute a net additional £46,000 in GVA per annum per FTE worker to the UK economy (2015 prices).
- This means that at the margin each additional migrant worker creates a positive effect on both London and the UK economy. Our calculation accounts for the fact that some of the jobs undertaken by migrant workers will be at the expense of UK born workers.
- This implies that total net additional GVA contribution by London EU and non-EU migrant workers is approximately £83bn. This equates to approximately 22% of all of London's GVA (£378 bn based on equivalent ONS data for 2015 – equivalent GVA for 2005 is £299 bn at 2015 prices).
- The model used in our analysis is multi-regional and distinguishes between London and the Rest of the UK. Our calculations imply that the additional GVA generated by 10 jobs from migrant workers will support an additional 4 jobs in the UK economy (note these jobs may go to migrant workers or those workers born in the UK). The equivalent job creation figure for workers born in the UK figure is 3 jobs.
- The primary driver of our results is that migrant workers bring flexibility to the UK labour market – they fill skills gaps in key sectors and sub regions of the UK and London economy.
- Based on the calculations above, the tax revenue associated with the net additional GVA created by migrant workers associated with the London economy is approximately £30bn per annum. This is approximately 4.5% of total Government tax receipts for the whole of the UK.
- The economic activity supported by migrant workers helps support the UK balance of payments. For each £1 of GVA generated by migrant workers 55 pence worth of exports are created. This equivalent GVA also supports 35 pence of imports.
- Using the average net additional value per migrant worker, and adjusting for productivity differences between sectors, we found that **Financial and Business Services** is the sector in which migrant labour produces the most value for London's economy. This sector contributed a total net additional GVA contribution of approximately £37bn. The next largest net impact is by **Wholesale, Retail, Transport and Communication**, contributing a total impact of approximately £20bn.

○ Chapter overview

Section 3.1 of this report highlights the percentage of London's workforce that is made up of EU (14%) and non-EU (28%) migrant workers. In this section we seek to model their net contribution to London's economy.

The remainder of this section is ordered as follows:

- **Section 4.2** describes the difference between gross and net economic impacts and the importance of our net measure.

- **Section 4.3** provides an overview of the patterns of migrant employment in London by industrial sector in terms of Gross Value Added (GVA), this data is used to underpin our modelling approach.
- **Section 4.3** provides an overview of our modelling approach.
- **Section 4.4** provides the results of the net economic analysis.

○ **The importance of using a net measure**

We use a net measure (rather than gross) as the basis for impact assessment. Our definition of a “net” measure is set out in the bullets below:

- Gross measures tend to focus on the “multiplier” effects of the impact of different economic scenarios. For instance, the approach looks at the positive economic gains associated with the various different interactions that migrant workers have with their employers, the suppliers of the businesses they work for and how they might spend their money.
- The difficulty with such an approach is that if we conducted separate multiplier analysis for both migrant and UK resident workers and then compared the sets of results as a percentage of GDP then their combined effect would amount to more than 100% of GDP. This is because the two approaches will both count overlapping effects regarding the proportion of supply chain income spent in the wider economy resulting from the economic contribution.⁸⁴
- Ultimately gross analysis is useful in determining the economic footprint associated with the impact of migrant workers, but it does not show their true “value added” i.e. their impact compared to a counterfactual of migrants not being present in the economy.
- We conduct our analysis on a net basis as this both removes the possibility of overlap and also accounts for the possibility that migrant workers might positively or negatively augment productivity and wages, might affect the demand for labour and potentially replace UK nationals from more highly paid jobs or from the labour market altogether.

○ **Patterns of migrant employment in London by industrial sector**

The previous analysis has shown the rising number of labour migrants in London, and how this labour is distributed between different sectors. All labour makes an economic contribution through its productive activities; economic contribution is measured in terms of Gross Value Added (GVA), a company-level equivalent of GDP, and employment.

From an industry perspective there are two areas where migrants are likely to contribute significantly to the economy: (i) industries where a large proportion of migrants are employed, such as Accommodation and Food services; and (ii) industries that are high value-adding, i.e. each employee contributes to GVA at a rate that is above the regional and national average, such as Financial and Business Services, and Retail Trade.

The relative importance of different sectors to London’s economy, and the significance of migrants to each sector’s total workforce is shown in Figure 4a below.

Financial, Insurance, Real Estate Renting and Business Activities (including Scientific) are less reliant on migrant labour, which still makes up 40% of the sector’s workforce, but their

⁸⁴ For instance: if a firm comprised solely of EU migrants purchased services or inputs from a firm comprised solely of UK national workers and vice versa, this would show up in both estimates of the impact and would in turn be counted twice.

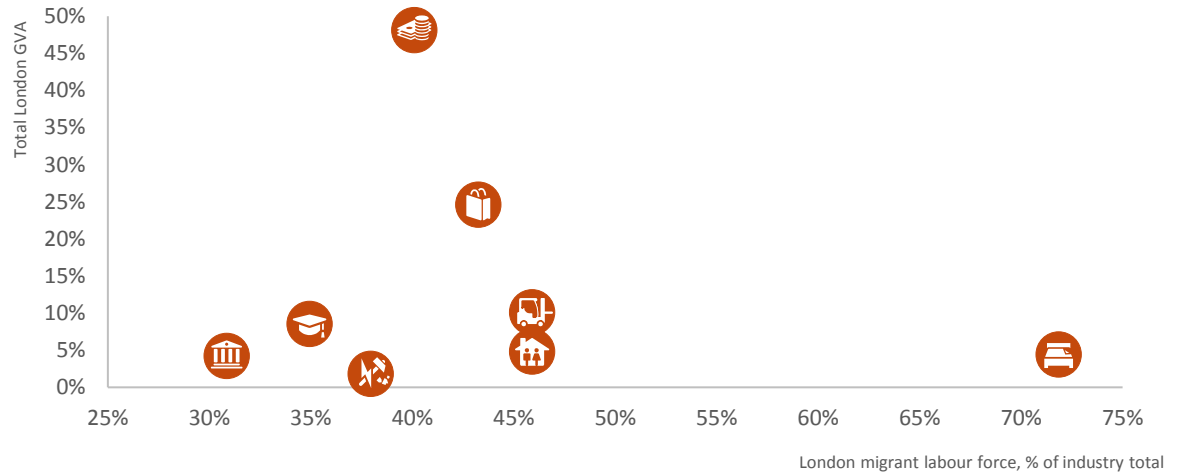
significance within the UK economy, contributing 48% of London's GVA in 2014/5, makes them an important sector of impact.

Wholesale, Retail, Transport, Storage and Communications are also important for considering migrant impact, with a moderate proportion of their workforce formed of migrants, and contributing around 24% of GVA to London's economy in 2014/5, the second highest sector in our analysis.

The other sectors in our analysis individually contribute less than 10% of London's GVA. The sector most reliant on migrant labour is the Accommodation and Food Services sector, where migrant labour makes up 72% of its total workforce. However, this sector produces only a small proportion of London's GVA, contributing around 3% in 2014/5. Within these, Households as Employers, Health and Social Work and Construction and Manufacturing have moderate proportions of their workforce as migrant labour (35% and 46%).

The Agriculture, Forestry, Fishing, Mining, Electricity, Gas & Water Supply sector, Education, Community, Social and Personal sector, and Construction and Manufacturing sectors have the least reliance on migrant employment and are the smallest sectors in London's economy.

Figure 4 a:
Industry migrant labour force as a percent of total, with total GVA



KEY

Financial, Insurance, Real Estate Renting And Business Activities (Incl. Scientific)	
Wholesale, Retail, Transport, Storage And Comms	
Construction And Manufacturing	
Households As Employers, Health And Social Work	
Education, Community, Social & Personal	
Accommodation And Food Services	
Public Admin And Defence, Extraterritorial Orgs	
Agriculture, Forestry, Fishing, Mining, Electricity, Gas & Water Supply	

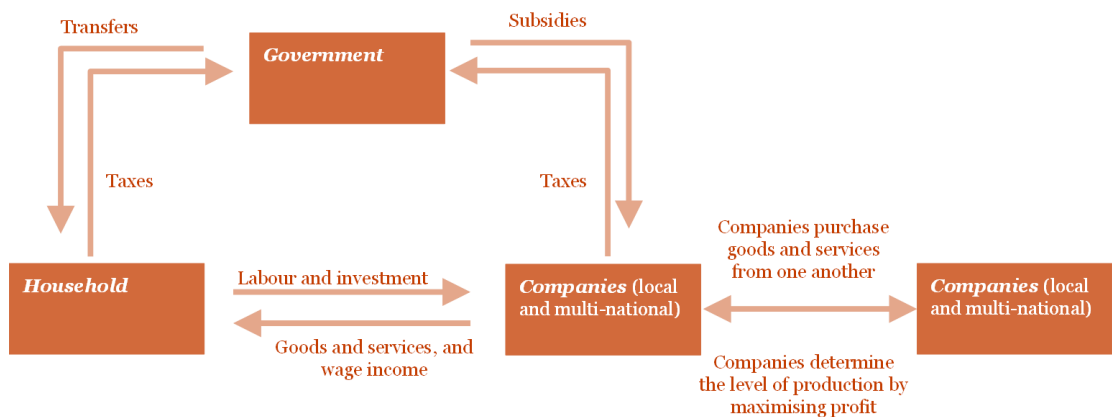
○ Our modelling approach

The net impact is estimated using a dynamic, 2 region multi-sectoral macroeconomic model of the UK economy (London and the Rest of the UK). It is known technically as a Computable General Equilibrium (CGE) model analysis.

CGE model analysis allows us to understand how the economy's structure is impacted by changes in the labour market and how employment and other factors adjust to the presence of migrant workers, therefore facilitating the calculation of the net impact of migration. CGE models are often used to investigate the effects of significant economic events, particularly where they affect the underlying factors in the economy, and to understand how events may proliferate over time. They are used widely by international institutions such as the World Bank, IMF and OECD as well as the UK Government.

A CGE model combines economic data and a complex system of equations in order to capture the interactions of the three main agents in an economy – households, businesses and the government (See Figure 4b for more detail). Each element is defined and linked through labour market or capital market flows, household consumption, intermediate product demand, taxes or government transfers.

Figure 4 b:
Flows between
different agents in
the CGE model



In the context of our model these flows happen within the two regions in our model (London and the rest of the UK), between the two regions and internationally. Trade, referring to the flow of goods and services between countries and UK regions, occurs between the UK and foreign countries, but also between London and other regions in the UK (e.g. the East Midlands, Yorkshire, Scotland), known as intra-UK trade, and between sectors. This also applies for labour and capital flows which flow between “London” and the “Rest of the UK”. In practical terms this means that workers can also commute between regions in our model and investors in one region can invest in another. The model is dynamic such that it captures the changes and progress in the economy over time, allowing it to make projections for a 20 year period, from 2016.

The model allows for disequilibrium in both goods, services and factor markets – this means that there may be either excess demand or supply of people, products or investment. In turn this can lead to unemployment, or businesses charging excess mark-up's when there are supply shortages.

We assume for the purposes of our analysis that the productivity associated with a migrant worker is the same as an equivalent UK born worker. Evidence of the scale of the impact of migration on economic growth and productivity is limited. We base our assumption on one of

the few studies available on this topic by Boubtane and Dumont (2013).⁸⁵ The authors examine the impact of migration on economic growth for 22 OECD countries between 1986 and 2006. They demonstrate a small but positive impact of the human capital brought by migrants on economic growth. The analysis also shows that an increase of 50% in net migration generates less than one tenth of a percentage-point variation in productivity growth.

In the next section we present our results for the net economic contribution of London's migrant workforce in 2016 prices. This is based on data on migrant employment between 2005 and 2015 that we extracted from the ONS's VML database; this is the same as detailed in the previous chapter. Employment is presented in full-time equivalents (FTE), where one FTE is an employee working on a full-time basis for a year.

In order to examine the net additional economic impact of migrant workers we simulate the effects of a marginal increase in migrant employment through our CGE model. By marginal increase we mean that we narrow the focus to the economic impact of 10% of all migrants in London (approximately one year's average inflow).⁸⁶ We vary our shock by the 8 different economic sectors in our model in line with the data presented in Figure 4a – sectors with a greater proportion of migrant workers will experience a greater adjustment in wages, prices and demand.

The outputs from this scenario are then scaled up by the total number of migrant worker to provide an average net economic contribution.

○ **Headline Results**

After accounting for the adjustments of UK-born workers and the structural impact on the economy, we estimate that the average net additional economic contribution of London's migrant workforce to London's economy to be approximately £46,000 per migrant worker in GVA terms at 2015 prices.

To reiterate this figure accounts for the net additional contribution of a migrant worker (so includes the fact that migrant workers will displace some UK residents' jobs). It has also been calculated independently of the economic cycle - our modelling suggests that migrants economic contribution will be lower when underlying economic performance is weaker and vice versa. But it should also be noted that the same principle applies to UK born workers. We have not produced a comparable figure for UK born workers as the scale and scope of UK born workers economic activity is quite different to that of migrant workers and we restrict our focus to whether their contribution is net positive or not.

Based on the data that is presented in Section 3, there are approximately 1.8million migrant workers operating in the London labour market. We have estimated that the average migrant worker contributes a net additional £46,000 in GVA per annum, which implies that total net additional GVA contribution by London workers is approximately £83bn. This equates to roughly 22% of all of London's GVA (£378bn in 2015 based on latest ONS data). Our calculations imply that the additional GVA generated by 10 jobs from migrant workers will support an additional 4 jobs in the wider UK economy (note these jobs may go to migrant

⁸⁵ Boubtane, E. and J.-C. Dumont (2013), "Immigration and Economic Growth in the OECD Countries 1986-2006: A Panel Data Analysis", Documents de Travail du Centre d'Economie de la Sorbonne, No. 2013.3,

⁸⁶ We did not attempt to estimate the net effect of *all* migrants because, in an alternative world where there has been no immigration into London from outside the UK, the economic structure of London would be so different that any counterfactual would be speculative and adjustments within the model would be overtly disruptive in terms of movements in wages, prices and capital returns that any outcome would be unrealistic. Therefore, we modelled instead the impact of 10% of migrant workers in London. This is equivalent to around 64,000 workers in London around the end of 2014. We then use this to compute an average per worker net economic contribution. .

workers or those workers born in the UK). The equivalent figure for UK born workers only is 3 jobs.

Based on the calculations above the tax revenue associated with the net additional GVA created by migrant workers associated with the London economy is approximately £30bn per annum. This is approximately 4.5% of total Government tax receipts for the whole of the UK. This figure is again presented as a net contribution i.e. it accounts for the consumption of public services by migrant workers. It assumes that migrant workers consume public services at the same rate as an average UK citizen.⁸⁷

▪ Key drivers of our results

Underpinning the headline results presented above is a complex set of economic determinants. In this section we discuss the way in which these determinants influence the headline results presented in the previous section. GVA is an income based measure (capturing the growth primarily of capital income and wages), but this income must be matched by equivalent demand from the rest of the economy. In effect the income drives demand, but the demand also drives income.

Demand comprises of four main drivers: consumption, investment, government spending and trade.

- **Consumption:** our modelling suggests that £1 in net additional economic activity created leads to net additional consumer spending of approximately 20pence.
- **Investment:** £1 in net additional economic activity created leads to net additional investment in the London economy of approximately 20pence. This investment benefits both UK born and migrant workers.
- **Government spending:** We have held government spending constant in our model. This acknowledges the inherent difficulty in predicting government response to changes in public finance within an economic model.
- **Trade between UK regions** (i.e. London and the rest of the UK): London generates a trade surplus with the rest of the UK economy – it supports economic activity across the rest of the UK mainland and in Northern Ireland. It buys imports from these regions, but also supplies critical goods and services. Our modelling suggests that for each £1 of GVA generated by migrant workers, London's trade surplus with the rest of the UK grows by around 30pence.
- **International trade:** the UK economy is a net importer of goods and services from overseas. The sectors that migrants primarily work in are net exporters e.g. financial services, and for each £1 of GVA generated by migrant workers in these sectors, 55pence of exports are created. This equivalent GVA also supports 35 pence of imports.

The contribution by London migrants to London's economy spills over to the rest of the UK economy, with London's migrant labour resulting in £30bn additional GVA per annum to the wider UK economy.

Within our model benefits are born through the following four channels:

⁸⁷ In our model, we assumed that government spending is constant and use lump-sum transfer to/from households as a balancing item. This means we do not need to make a value judgement in our modelling about how tax revenues paid by migrants are spent, or how migrant demands on public services are financed. Taking such an approach in economics is common and is known technically as the Harberger assumption in the public finance literature. This acknowledges the inherent difficulty in predicting government response to changes in public finance within an economic model

Figure 4c:
2014/5 Total GVA
Impact in 2016 Prices
of London's Migrant
Workforce (2006-
2015) by GDP
component

- **Direct impact** – migrants produce GVA through their productive activity in employment at a company.
- **Indirect impact** – the businesses in which migrant workers employed will buy goods and services from other upstream businesses in their supply chain. This creates additional jobs and GVA.
- **Induced impact** – migrant workers will spend their wages in the wider economy. This supports consumer demand and generates additional economic activity.
- **Catalytic impact** - migrants employed in the most productive sectors will drive innovation and technological change.

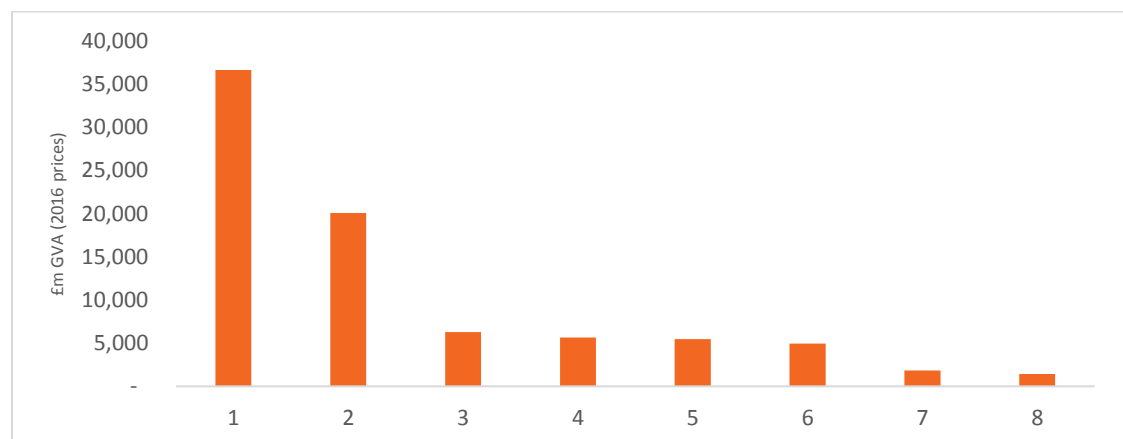
On the downside our modelling also suggests that migrants will dilute the stock of physical capital per worker which reduces the economy's capacity for growth. This effect serves to partially counteract the benefits described above.

In our analysis we have examined the impact of migrant workers on wage levels in London and the wider UK economy. Our modelling suggests that these effects are largely neutral over the long term (i.e. a 10 year period). We found that migrant workers can push wages down in aggregate as they compete with jobs for UK national workers, but at the same time, they also push wages up as they create increased economic activity and therefore increased demand for goods and services.

In aggregate and in the long term our modelling suggests that these two effects largely cancel each other out. However, there are significant sectoral differences and in the short term the outcome is highly dependent on the economic cycle (when the economy is weaker, our modelling suggests that migrant workers tend to depress wages overall). However, migrant workers bring flexibility to the UK labour market – filling skills gaps and shortages in overall supply specific in sub regions. This flexibility enhances London and the UK's economic efficiency as it prevents the labour market from overheating when demand increases and fill supply gaps that would not otherwise be filled.

▪ Sectoral contribution of migrant workers

As discussed in the previous section the total migrant population contributes 22% of London's total GVA. Figure 4d below indicates the breakdown of this contribution by sector.



**Figure 4d:
2014/5 Total GVA
Impact in 2016 Prices
of London's Migrant
Workforce (2006-
2015) by Sector**

Key £ (2016 prices)	Average net contribution per employee	Total net contribution of sector	% of London GVA
1. Financial, Insurance, Real Estate Renting And Business Activities (Incl. Scientific)	£89,000	£37bn	10%
2. Wholesale, Retail, Transport, Storage And Comms	£51,000	£20bn	5%
3. Construction And Manufacturing	£32,000	£6bn	2%
4. Education, Community, Social & Personal	£25,000	£6bn	2%
5. Households As Employers, Health And Social Work	£25,000	£5bn	1%
6. Accommodation And Food Services	£30,000	£5bn	1%
7. Public Admin And Defence, Extraterritorial Orgs	£28,000	£2bn	0.5%
8. Agriculture, Forestry, Fishing, Mining, Electricity, Gas & Water Supply	£87,000	£1bn	0.4%

We have estimated the average net contribution per employee in each sector by adjusting average net GVA per migrant worker for different sector productivity levels. These values have then been multiplied by the number of migrants in each sector to provide a total sector net GVA contribution. The above table shows the large range in average net contribution per employee (£25,000 - £89,000) between sectors, and in total sector net contribution (£1bn - £37bn).

As shown in Figure 4d, migrants that work in the Financial and Business Services sector contribute the most towards GVA; after controlling for adjustments in the economy, each London migrant worker contributes £89,000 in GVA to the economy. This suggests that in total, migrant labour within the Financial and Business Services sector contributes approximately £37bn of additional GVA, equivalent to 10% of London's economy.

The sector with the second highest level of GVA impact is Wholesale, Retail, Transport and Communications. We estimate the net impact of each migrant workers in Wholesale, Retail, Transport and Communications to be £51,000. Although this is a lot lower than the per worker value produced by Financial Services and Business Services, there is a large number of migrant workers in the sector. This per migrant value suggests that total migrant labour in the sector contributes approximately £20bn of GVA, equivalent to 5% of London's economy. In contrast, in the Agriculture, Forestry, Fishing, Mining, Electricity, Gas & Water Supply sector, each employee contributes a relatively large amount of net GVA (£87,000), however due to the small number of migrant workers in the sector, the total sector only contributes £1bn to GVA.

Appendices

Appendix A – Definition of Key Terms

**Table A1:
Glossary**

Term	Definition
Average Annual Growth Rate (AAGR)	<p>The percentage change in going from an initial value to a final value divided by the number of periods. It is the average annual rate of growth assuming that compounding does not occur.</p> <p>The AAGR is equivalent to a simple interest rate used in financial calculations.</p> <p>See also “Compound Annual Growth Rate (CAGR)”, as defined below.</p> <p>For small rates of growth (< 0.5%), the AAGR is approximately equal to the equivalent CAGR – especially when working to a small number of decimal places (1 or 2). However, due to the compounding effect in CAGR, as AAGR increases, so does the difference between the AAGR and the equivalent CAGR, with the CAGR always numerically smaller than the AAGR.</p>
Commuter workforce	<p>Individuals who are economically active (q.v.) in a given area, but who live outside the area in question.</p> <p>For example, London’s Commuter Workforce live outside London but work in London.</p>
Compound Annual Growth Rate (CAGR)	<p>The Compound Annual Growth Rate (CAGR) is a useful measure of growth over multiple time periods. It can be thought of as the growth rate required to get from an initial value to a final value if one assumes that the growth has been compounding over time.</p> <p>The CAGR is equivalent to a compound interest rate used in financial calculations.</p> <p>See also “Average Annual Growth Rate”, as defined above.</p>
Confidence interval	<p>A statistical measure of the range of values (margin of error) in which an estimated value is believed to lie. The width of the Confidence Interval increases as the degree of certainty (Confidence Level – q.v.) increases (and vice versa).</p> <p>For example, if an estimated value is quoted as 40 ± 2 at the 95% Confidence Level, then we are 95% certain that the actual (true) value lies in the range 38 – 42.</p> <p>In the example above, the value of 40 is referred to as a Point Estimate (q.v.)</p>
Confidence level	<p>A statistical measure of the certainty that an estimated value lies within the quoted margin of error or Confidence Interval (q.v.)</p> <p>Most analysts work at the 95% confidence level and, unless otherwise stated, this is the level used in this report.</p>
Economically active	<p>A person aged between 16 and 64 inclusive that is either employed or self-employed at the time the relevant data was collated.</p>
Economically inactive	<p>A person aged between 16 and 64 inclusive that is not economically active (q.v.) at the time the relevant data was collated.</p> <p>Examples include the unemployed, unpaid carers, students and stay-at-home parents.</p>

Term	Definition
EU countries	The countries within the European Union (as of 2016) excluding the United Kingdom (for comparison purposes against the UK). These are as follows: Austria, Belgium, Bulgaria, Cyprus, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain and Sweden.
EU migrant	A person born in one of the EU countries (q.v.) but living in UK at the time of data collation.
EU-15 countries	The member countries in the European Union prior to the accession of ten candidate countries on 1 May 2004, excluding the United Kingdom . The EU-15 comprises the following 14 countries (excluding the UK at the 15th, but have kept the term due to its accepted wide use): Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden.
Foreign-born	A person born outside of the UK. People born in British Overseas Territories are classified in this report as foreign-born.
Global city	An Alpha ++ or Alpha + city, as defined by the Globalization and World Cities Research Network, GaWC. See www.lboro.ac.uk/gawc for further details.
Industry sector	An industry sector of the economy – defined by groupings of Standard Industrial Classification (SIC) codes and used by the UK Office of National Statistics to define industries of UK and London economies. The current standard used is UK SIC 2007.
Local authority / unitary authority	A local authority district (London, also known as boroughs) or unitary authority district (UK) are responsible for the provision of all local government services within a district. ONS data provides a breakdown by these areas and thus they have been used to provide a more granular comparable analysis in London and England.
Migrant	Someone living in the UK at the time of the ONS Labour Force Survey, but who was born in another country – i.e. a foreign-born resident. For the justification of this key definition, please see Appendix B.
Migrant proportion	The percentage of non-UK born residents living in the area, borough, city or country in question.
Non-EU countries	All countries of the world that are not the UK and are not EU countries (q.v.)
Non-EU migrant	A person born in one of the non-EU countries (q.v.) but living in UK at the time of data collation.
ONS	The UK Office of National Statistics
Point estimate	The most likely value for an estimated parameter. In other words, the value most observers would quote in isolation. For example if a value is estimated as 40 ± 2 , the value 40 is called the Point Estimate.
Post-2004 accession countries	The 12 member countries in the European Union acceding either in or after 2004. These countries are commonly known as the A10 group (acceding in 2004) and the A2 group (acceding in 2007):

Term	Definition
	<p>A10 countries – Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia.</p> <p>A2 countries – Romania and Bulgaria.</p> <p>Note that this population does not include Croatia, considered as non-EU for the purposes of this report due to its late accession in 2013.</p>
Resident workforce	<p>People who live, and are economically active (q.v.), in the area in question. For example, London's Resident Workforce live and work in London (q.v.)</p>
SIC industry sector code	<p>Standard Industrial Classification codes used by the ONS. For details see www.gov.uk/government/publications/standard-industrial-classification-of-economic-activities-sic</p>
Trendline	<p>A line (or curve) indicating the general course or tendency of a dataset. It is used to indicate where values are higher and lower than might be expected if the data were to stay exactly "on trend".</p>
UK	<p>The United Kingdom of Great Britain and Northern Ireland</p>
Workforce	<p>The total number of economically active (q.v.) people in a given area. The sum of the Resident Workforce and the Commuter Workforce.</p>

Appendix B – Defining a Migrant

There are several options to use when creating the definition of a “migrant”, each of which would result in substantially different consequences when viewing a population’s data. We have analysed the relative merits and faults of each in order to reach the decision of using the definition migrant as **a person born outside of the UK** for the purposes of this report.

The Migration Observatory’s “*Who Counts as a Migrant? Definitions and their Consequences*” outlines the challenges facing analysts and policymakers, particularly when using different sets of migrant data to understand the impact of decisions they make⁸⁸.

One option is to define a migrant by their **nationality**, i.e. a person residing in the UK without British nationality would be classified as a foreign national. An example of a strength of this definition is that it would allow us to distinguish between German citizens who have immigrated to the UK and British citizens born on the British armed forces bases that existed in Germany over the past few decades. However, given the naturalisation process of foreign born citizens, this can mask contributions from people who have immigrated and, since then, gained UK nationality.

Alternatively, we could define a minimum **period of time** for which a UK resident must have lived in the UK. This would appear to be a fair and simple approach, but would ultimately require the definition of a “cut-off” point. Such an approach would be difficult to justify, save for basing this value on opinion. It would also prove impossible to distinguish between young children by nationality or country of birth.

Therefore the decision for the study team lay between **nationality** and **country of birth**, especially as these are specific categories within the ONS’ Labour Force Survey.

We have therefore analysed the Labour Force Survey data to understand the differences between the two definitions. The output of this analysis is shown in Table B1 and Table B2 below.

⁸⁸ See www.migrationobservatory.ox.ac.uk for further details.

We sampled the data at the start and end of the last 11-year period, namely 2005 and 2015.

The highlighted cells show the percentage of overlap between people whose nationality and country of origin are aligned to the same category.

As can be seen on several occasions (highlighted in green), the percentage is high (80%+) and therefore there would not be a significant difference between analysis performed on nationality or country of birth. However significant variation (highlighted in yellow) can be seen in the non-EU and post-2004 accession country categories, where almost half of people born abroad would identify as UK nationals. This is not an attempt to redefine their nationality, but for those individuals to not be able to contribute to statistics regarding migration would diminish the contribution of migrants to the UK and London, and thus the completeness of our report.

It was therefore decided to proceed on the basis of using country of birth to define migration status, and this is the approach adopted in this report.

2005

Table B1:
Country /
Nationality
analysis, 2005

Nationality	Country of Birth ⁸⁹				
		Post-2004 accession	EU-15	non-EU	UK
Post-2004 accession		60%	0%*	0%*	0%
EU-15		1%	81%	3%	0%
non-EU		1%	3%	50%	1%
UK		37%	16%	47%	99%

2015

Table B2:
Country /
Nationality
analysis, 2015

Nationality	Country of Birth				
		Post-2004 accession	EU-15	non-EU	UK
Post-2004 accession		88%	1%	1%	1%
EU-15		0%	87%	6%	1%
non-EU		0%*	1%	38%	1%
UK		11%	11%	56%	97%

Source: ONS Labour Force Survey

⁸⁹ Figures are accurate to nearest percent. Value redacted where number was too small to be extracted from ONS.

Appendix C – Data Sources

We have used a number of data sources in this report to support its messages.

The main data sources used are listed below:

Data source	Provider
Labour Force Survey (Annual Population Survey)	Office for National Statistics
Regional gross value added (income approach) reference tables	Office for National Statistics
Census statistics	Office for National Statistics
NHS monthly workforce statistics	NHS Digital and data.gov.uk
Education statistics and workforce	Higher Education Statistics Agency
Skilled workforce survey data	London First members and selected organisations
Proportion of foreign nationals in Global cities (Figure 2)	Dubai, Singapore – United Nations estimates London – Office for National Statistics Sydney – Australia Bureau of Statistics Los Angeles, New York – American Community Survey Frankfurt, Milan, Paris – Eurostat Hong Kong – Hong Kong government website Japan – Ministry of Justice, Japan
New York City industry sector workforce	American Community Survey

Appendix D – Statistical Uncertainty and Sampling

The majority of data analysed in this report, has been drawn from surveys undertaken by the Office for National Statistics, ONS.

Other than for empirical surveys, all involve a degree of sampling, in which a subset of the overall “population” is selected, with conclusions drawn about this subset (also called a “sample”) applied to the overall “population” from which it is drawn.

So, for example, if we wanted to assess UK voting intentions in a general election, we might sample 1,000 people of various ages, demographics and locations in the UK and then use a technique called statistical inference to apply the findings of this sample to the UK population as a whole.

However, we need to be careful as to exactly what we mean by the statistical term “population”. In many cases, the statistical population refers to an actual population, but this is not always the case. For example, if we want to draw conclusions about the UK population as a whole, then our sample must be representative of the whole of the UK. If we wanted to draw conclusions about the members of a sports club (say), then our sample must be representative of the club membership, which may or may not be the same thing as being representative of the whole of the UK. By way of illustration of this last point, a survey of the membership of a Womens’ Golf Club would sample only females, whereas a survey of the overall UK population would need to capture the views of both male and female respondents of all demographics.

If, however, we have too many people of a particular demographic in our sample or pick too many people from a particular part of the country (say), our sample is unlikely to be truly representative and the conclusions we draw may be invalid. Samples that are not truly representative of the population they claim to represent are described by statisticians as being “biased”.

Extrapolating from a sample to an overall population introduces uncertainty. For example, in our hypothetical survey of voting intentions, we might have been (unintentionally) biased with our sample and picked too many supporters of one particular party. Or we might have picked people who felt obliged to hide their true voting intentions. Similarly, we wouldn’t intuitively expect a sample-based survey to make predictions that are accurate to the last person or the *n*th decimal place – and this is indeed the case when one examines the statistical theory underpinning surveys. If we wanted absolute accuracy in our survey, we would have to include every single person in the population in the survey sample.

In statistics, we reflect the uncertainty arising from a sample using two measures called the **Confidence Level** and the **Confidence Interval**. The Confidence Level measures our certainty in the results we have obtained; whereas the Confidence Interval quantifies the margin of error we believe the survey might contain.

So, for example, in a poll of voting intentions, support for a given party might be quoted as 40 ± 3% at the 95% Confidence Level. In other words, we are 95% certain that the true value for the UK population as whole lies in the range 37% – 43%. The value of 40%, the most likely value of support for the party, is called a **Point Estimate** and is the value most observers tend to quote in isolation.

In this report, and unless stated otherwise, the Confidence Level for all values quoted is 95%, which is the Confidence Level used most often in statistical investigations.

However, the Confidence Interval (i.e. the margin of error) is determined on a case-by-case (value-by-value) basis, based on an analysis of the number of respondents, the size of the population, the item being estimated and so on.

For ease of reference, therefore, we use Point Estimates of values in this report.

For the avoidance of doubt, when we refer to Confidence Levels and Confidence Intervals for our data, this is no way suggesting that the source data is somehow flawed or that we do not believe it. Confidence Levels and Intervals are inevitable when we use sampling techniques to estimate values for a population as a whole – even with the highest quality data available, such as that produced by the ONS.

Appendix E – CGE Modelling

This appendix sets out in more detail the key technical features of the CGE model used in our analysis of the economic contribution of migrants in London’s workforce.

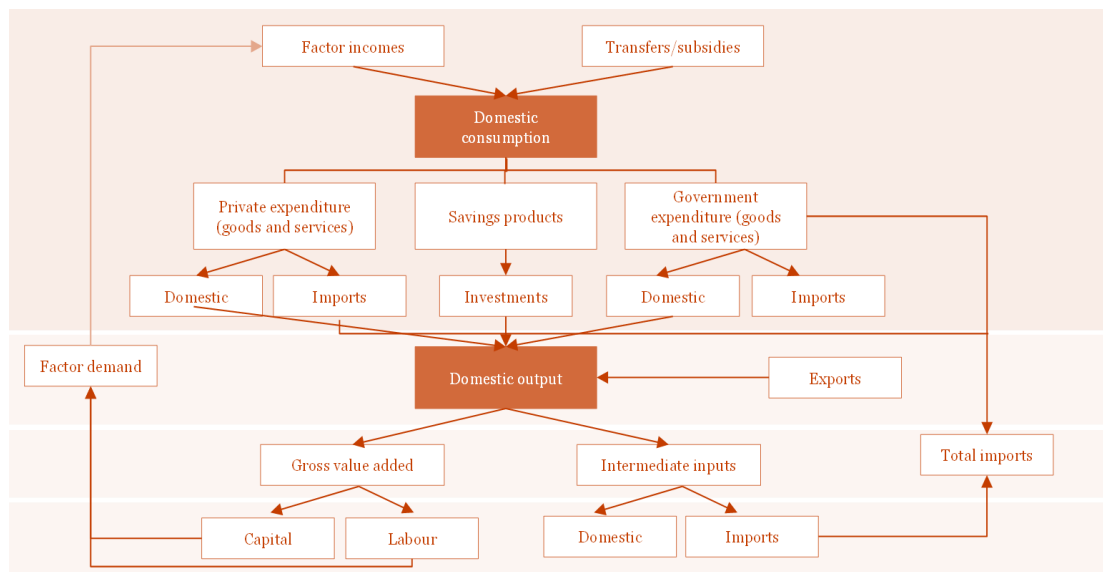
D.1 Model structure overview

CGE models capture interactions between different sectors of the economy, households and the government. As they are “general equilibrium” in nature they are specifically designed to capture these interactions, as opposed to “partial equilibrium” models that evaluate economic issues from the perspective of a single household or sector of the economy. They are based on a circular flow of income model which illustrates how economic agents receive and spend income in the economy.

The primary data source underpinning the model are the ONS Supply and Use Tables (SUTs). These data are explicitly designed to reflect business, household and government interactions across the economy – they show, by product and industry sector, what businesses produce, the wages they pay, the profits they make, patterns of consumer and government spending as well as trade and investment. The SUT dataset is supplemented by additional tax payment data published by HM Revenue and Customs (HMRC) and labour market data published by the ONS.

In Figure D.1, we provide a summary of the circular flow in the context of the CGE model. We have split the economy into two main components, or “blocks” as they are often referred to when describing CGE models. The consumption block outlines the structure of consumption within the economy and identifies sources of income and how that income can be spent. The production block explains the organisation of the productive side of the economy and how domestic output is determined. The diagram we have used to present these blocks does not capture every single economic linkage in the CGE model. However, it summarises the most important economic interactions in an intuitive way.

Figure D.1 – Economic interactions in the CGE model



D.2 The consumption block

The consumption block outlines the organisation of consumption within the CGE model. In our model there are two sources of income: factor incomes, such as wages and gross operating surplus, and government transfers/subsidies from the redistribution of taxes

collected. This income can then be spent in three ways: government expenditure, private expenditure, and savings products – otherwise known as national savings. Private and government expenditure lead to demand for domestic and imported goods, while savings products drive investments in the economy. The CGE model accounts for international capital mobility through the balance of payments, i.e. a current account deficit must be matched by a capital account surplus.

D.3 The production block

The production block contains the structure of the productive side of the economy within the CGE model. Demand from domestic and foreign consumers results in output being sold in both markets; firms decide on the amount they want to supply to each market, while recognising that there is a cost involved in changing markets. In the model, output produced in sector i can be exported overseas or be consumed in the country. When an economic scenario is imposed on the model, the proportions that are exported and consumed adjust according to changes in relative export and domestic prices that are determined endogenously within the model.

Domestic output comprises intermediate inputs used in the production process, both imported and domestically produced, and Gross Value Added (GVA). Inputs are either sourced from domestic producers, or they are imported from outside the UK.

D.4 The Government sector

Government performs two roles in the CGE model: collecting taxes and spending money. The CGE model has built in “closure rules” to maintain fiscal balances. For instance, if the government chose to cut the corporate tax rate, then this would need to be financed from government spending, transfer payments, debt, or increases in other taxes. Furthermore, if the corporate tax cut increased the level of activity in the UK, then tax receipts in the UK would increase. As these effects ripple through the economy, the model would also automatically invoke the debt closure rule to bring fiscal positions back into balance.

D.5 The labour market and migration flows

A dynamic labour market function underpins the CGE model. It incorporates a direct relationship between employment, wages and levels of economic activity. Its core properties are as follows:

- Changes in wages can lead to workers entering or exiting the labour market;
- Workers can move between sectors as these expand or contract depending on the level of economic activity;
- If workers move between sectors, it is assumed they need to retrain (e.g. an investment banker cannot turn into a chef overnight). The model assumes a temporary loss in productivity as people retrain and consequently their wages fall during this period. This decline in wages approximates a degree of labour market rigidity in the model; and
- The wage sensitivity of migration flows is governed by a separate elasticity parameter.

Data on employee compensation are taken from ONS GVA figures, with gross wages being a subcomponent of employee compensation, the other component being benefits in kind (BIKs). BIKs consist of a range of financial and non-financial employee remuneration such as company mobile phones, vehicles, accommodation allowances etc. Employee compensation data are broken down by sector in the model.

Appendix F – SIC Code Definitions

SIC Codes (2007 classification) used for case study analysis from 2005-2015
(Description given is the official government text.)

Industry	SIC 07	Description
Construction	41.10	Development of building projects
Construction	41.20	Constr of res and non-res buildings
Construction	42.11	Construction of roads and motrways
Construction	42.12	Constr railwys & undgrnd railwys
Construction	42.13	Constructn of bridges and tunnels
Construction	42.21	Constr of utility proj for fluids
Construction	42.22	Constr util proj for elec & telcom
Construction	42.91	Construction of water projects
Construction	42.99	Constr other civil eng proj n.e.c.
Construction	43.11	Demolition
Construction	43.12	Site preparation
Construction	43.13	Test drilling and boring
Construction	43.21	Electrical installation
Construction	43.22	Plumbng, heat & air-con installatn
Construction	43.29	Other construction installation
Construction	43.31	Plastering
Construction	43.32	Joinery installation
Construction	43.33	Floor and wall covering
Construction	43.34	Painting and glazing
Construction	43.39	Othr buildng completn & finishing
Construction	43.91	Roofing activities
Construction	43.99	Othr specsd constr actv n.e.c.
Wholesale and retail	45.11	Sale of cars & light motor vehles
Wholesale and retail	45.19	Sale of other motor vehicles
Wholesale and retail	45.20	Maintenance & repair motor vehles
Wholesale and retail	45.31	Wsale trade motor veh parts & acc
Wholesale and retail	45.32	Ret trade of motor veh parts & acc
Wholesale and retail	45.40	Sale, main, rep mtrcycle & rel prt
Wholesale and retail	46.11	Agnts inv in sale of agri raw mat
Wholesale and retail	46.12	Agnts inv sale fuelmetind chem
Wholesale and retail	46.13	Agnts inv in sale timb & bldng mat
Wholesale and retail	46.14	Agnts inv sale ind eqmtshipsairc

Industry	SIC 07	Description
Wholesale and retail	46.15	Agnts inv sale hhold gdsironmngry
Wholesale and retail	46.16	Agnts inv sale text & lether goods
Wholesale and retail	46.17	Agnts inv in sale food, bev & tob
Wholesale and retail	46.18	Agnts specs sale othr part prod
Wholesale and retail	46.19	Agents inv in sale variety goods
Wholesale and retail	46.21	Wsale grainuman tobseedsanml fd
Wholesale and retail	46.22	Wholesale of flowers and plants
Wholesale and retail	46.23	Wholesale of live animals
Wholesale and retail	46.24	Wsale of hides, skins and leather
Wholesale and retail	46.31	Wholesale of fruit and vegetables
Wholesale and retail	46.32	Wholesale of meat and meat products
Wholesale and retail	46.33	Wsale dairy prod, edible oilsfats
Wholesale and retail	46.34	Wholesale of beverages
Wholesale and retail	46.35	Wholesale of tobacco products
Wholesale and retail	46.36	Wsale of sugar & choc & sugar conf
Wholesale and retail	46.37	Wsale coffee, tea, cocoa & spices
Wholesale and retail	46.38	Wsale of oth food, inc seafood
Wholesale and retail	46.39	Non-spec wsale of food, bev & tob
Wholesale and retail	46.41	Wholesale of textiles
Wholesale and retail	46.42	Wholesale of clothing and footwear
Wholesale and retail	46.43	Wsale of electrical household appl
Wholesale and retail	46.44	Wsale china & glasswre & clean mat
Wholesale and retail	46.45	Wholesale of perfume and cosmetics
Wholesale and retail	46.46	Wholesale of pharmaceutical goods
Wholesale and retail	46.47	Wsale furn, carpts & lightng eqmt
Wholesale and retail	46.48	Wholesale of watches and jewellery
Wholesale and retail	46.49	Wholesale of other household goods
Wholesale and retail	46.51	Wsale comp, comp perp eqmt & sftwr
Wholesale and retail	46.52	Wsale elctrnc & telecom eqmt & prt
Wholesale and retail	46.61	Wsale of agric mchnry, eqmt & supp
Wholesale and retail	46.62	Wholesale of machine tools
Wholesale and retail	46.63	Wsale mining, cons & civ eng mcry
Wholesale and retail	46.64	Wsale of mchnry for textile ind
Wholesale and retail	46.65	Wholesale of office furniture
Wholesale and retail	46.66	Wsale of other off machinry & eqmt
Wholesale and retail	46.69	Wsale of other machinery & eqmt
Wholesale and retail	46.71	Wsale solliqgas fuel & rlted prod
Wholesale and retail	46.72	Wholesale of metals and metal ores

Industry	SIC 07	Description
Wholesale and retail	46.73	Wsale wood, constr mat & san eqmt
Wholesale and retail	46.74	Wholesale of DIY eqmt & supp
Wholesale and retail	46.75	Wholesale of chemical products
Wholesale and retail	46.76	Wsale of other intermediate prod
Wholesale and retail	46.77	Wholesale of waste and scrap
Wholesale and retail	46.90	Non-specialised wholesale trade
Wholesale and retail	47.11	Ret sale non-spec str foodbevtab
Wholesale and retail	47.19	Oth ret sale in non-spec stores
Wholesale and retail	47.21	Ret sale fruit & veg in spec store
Wholesale and retail	47.22	Ret sale meat & rel prod spec str
Wholesale and retail	47.23	Ret sale of seafood in spec stores
Wholesale and retail	47.24	Ret sale of bakery prod spec stres
Wholesale and retail	47.25	Ret sale of bev in spec stores
Wholesale and retail	47.26	Ret sale of tob prod in spec stres
Wholesale and retail	47.29	Othr ret sale of food in spec str
Wholesale and retail	47.30	Ret sale of auto fuel in spec str
Wholesale and retail	47.41	Ret sale PC eqmt & acc spec str
Wholesale and retail	47.42	Ret sale of telcom eqp spec store
Wholesale and retail	47.43	Ret sale aud & vid eqmt spec str
Wholesale and retail	47.51	Ret sale of text in specsd stores
Wholesale and retail	47.52	Ret sale hardware eqmt spec str
Wholesale and retail	47.53	Ret sale of dçr eqmt spec stores
Wholesale and retail	47.53	Ret sale of dr eqmt spec stores
Wholesale and retail	47.54	Ret sale of white goods spec stres
Wholesale and retail	47.59	Ret sale of fixfit in spec str
Wholesale and retail	47.61	Ret sale of books in specsd stores
Wholesale and retail	47.62	Ret sale newsp & stat in spec str
Wholesale and retail	47.63	Ret sale mus & vid rec spec str
Wholesale and retail	47.64	Ret sale of sprt eqmt in spec str
Wholesale and retail	47.65	Ret sale of games & toys spec stre
Wholesale and retail	47.71	Ret sale of clothing in spec stres
Wholesale and retail	47.72	Ret sale ftwr & lthr gds spec str
Wholesale and retail	47.73	Disp chemist in specsd stores
Wholesale and retail	47.74	Ret sale of med eqmt in spec stres
Wholesale and retail	47.75	Ret sale cos & toltries spec str
Wholesale and retail	47.76	Ret sale flwrs & pets in spec str
Wholesale and retail	47.77	Ret sale jewelry items in spec str
Wholesale and retail	47.78	Oth ret sale new gds in spec str

Industry	SIC 07	Description
Wholesale and retail	47.79	Ret sale of secnd-hnd goods in str
Wholesale and retail	47.81	Ret sale; stlls & mrkt fd,bev,tobc
Wholesale and retail	47.82	Ret sale; stlls & mrkt clthg, ftwr
Wholesale and retail	47.89	Ret sale via stalls & mrkt oth gds
Wholesale and retail	47.91	Ret sale mail order houses, intrnt
Wholesale and retail	47.99	Othr ret sale exc stores etc
Financial services	64.11	Central banking
Financial services	64.19	Other monetary intermediation
Financial services	64.20	Activities of holding companies
Financial services	64.30	Trusts, funds & sim financial ents
Financial services	64.91	Financial leasing
Financial services	64.92	Other credit granting
Financial services	64.99	Oth fin ser,exc ins & pen fund,nec
Financial services	65.11	Life insurance
Financial services	65.12	Non-life insurance
Financial services	65.20	Reinsurance
Financial services	65.30	Pension funding
Financial services	66.11	Administration of financial markts
Financial services	66.12	Sec & commodity contrcts brokerage
Financial services	66.19	Oth act ax fin ser,ex in & pen fnd
Financial services	66.21	Risk and damage evaluation
Financial services	66.22	Actv of insurance agents & brokers
Financial services	66.29	Othr actv aux to ins & pensn fndng
Financial services	66.30	Fund management activities

Appendix H – Acknowledgements

We would like to thank the following for their contribution in the preparation of this report, without whom this publication would not have been possible:

- Julia Onslow-Cole, Global Head of Immigration & Legal Markets Leader, PwC
- Andrea Als, Director, Government Liaison Lead for Immigration, PwC
- Andrew Cameron, Head of Data Analytics, PwC
- Darren Seymour-Russell, Senior Manager, Data Analytics, PwC
- William Leighton, Manager, Data Analytics, PwC
- Thomas Andrews, Senior Associate, Data Analytics, PwC
- Jonathan Gillham, Director, Economic Modelling and Econometrics, PwC
- Jasmine Whitbread, Chief Executive, London First
- John Dickie, Director of Strategy & Policy, London First
- Mark Hilton, Executive Director, Education & Employment, London First

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