GLAECONOMICS

London labour market projections

LONDON ENTERPRISE PANEL

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Contents

Caveats and issues to be aware of

Projections and forecasts are typically based on a number of simplifying assumptions and are, in part at least, only as reliable as the data on which they are based.

These facts should not be underestimated when considering the employment projections (and associated occupation and qualification projections) set out in this report because there are both significant simplifying assumptions and data limitations (including quite frequent data revisions) associated with this analysis.

As a result, this report does not claim to illustrate the exact path of London's labour market into the future with associated, precise, estimations of the numbers of people required to be trained in various qualifications. Instead, the report provides a description of London's labour market as it stands today, together with a broad indication of the possible future path of London's labour market (and associated qualification requirements) based on a number of simplifying assumptions. The aim is that by being clear about the data limitations and simplifying assumptions used, readers can determine for themselves the amount of weight they place on the reported findings.

More detail on some of the most significant limitations which readers should bear in mind when considering the results from this analysis are set out in Appendix 1.

Executive summary

London is specialised in a range of service activities ...

Over the past 30 years or so London has seen strong growth in employment of professional and business support services. Over the same period there has been a large decline in manufacturing employment.

London currently specialises in finance and insurance; professional, scientific and technical activities (eg management consultancy, legal activities and accountancy); information and communication (including computer programming, motion picture activities and publishing); real estate; and, business support services (cleaning and private security for example). It does not specialise in land-intensive activities such as agriculture; mining and quarrying; manufacturing; and electricity and gas.

... which tend to require a high level of qualifications.

Over 60 per cent of jobs in professional and business support services; public services; information and communication; and finance and insurance (which themselves account for 60 per cent of jobs in London) are in the manager and administrators; professional; or, associate professional and technical occupations.

These three occupation categories are currently filled in London with a high proportion of people holding an ordinary or higher degree (typically around 60 per cent or more for each occupation category).

Overall, just under half of all jobs in London are held by people holding an ordinary or higher degree.

London's labour market has proved surprisingly resilient during the recent recession ...

London's labour market has shown surprising resilience in the period since the recession. Whilst the decline in output experienced in the recession was sharper than that experienced in both the 1990s and 1980s recessions, unemployment has risen, and employment fallen, by less this time around.

... with employment forecast to grow over the next few years ...

GLA Economics' latest medium term projection is for London's employment to grow in each year from 2012 to 2015.

... and employment projected to grow by over 850,000 over the next 30 years or so.

The number of jobs in London is projected to increase from 4,896,000 in 2011 to 5,757,000 in 2036. This equates to annual average growth of just over 35,000 jobs per year and results in over 850,000 more jobs in London by 2036.

Employment growth is projected to occur in some service sectors ...

In the next few years GLA Economics forecast employment growth in most sectors. Over the longer term, just under half of all the employment increase expected in London in the period to 2036 is in the professional, real estate, scientific and technical activities sector. Information and communication, administrative and support service activities, and accommodation and food service activities are also expected to see large increases in employment numbers. This suggests a continuation of London's specialisation in these areas.

... but with continuing projected declines in manufacturing and some other sectors.

In the shorter term GLA Economics forecast declines in employment in manufacturing and other (public and private) services. In the longer term, manufacturing, wholesale, transportation and storage, and public administration are all projected to see declines in employment in London over the period to 2036.

Projected growth in professional occupations and managers and administrators ...

This development of London's industrial structure is projected to increase the demand for professional occupations significantly in London (an increase of over half a million professional occupations is projected by 2036). Managers and administrators are also projected to see a large rise in numbers (increasing by 222,000 over the same period). These two occupation groupings are projected to account for around 45 per cent of all jobs in London in 2036.

... but continuing decline in clerical and secretarial occupations ...

Clerical and secretarial occupations are the only occupation group expected to see a decline in demand in London over the period to 2036 (projected to decline by 325,000 between 2011 and 2036). As a result, clerical and secretarial occupations are projected to decline to around 5 per cent of London's jobs by 2036.

... leading to increased demand for higher level qualifications.

These projected shifts in employment and occupations are projected to increase significantly the demand for ordinary and higher degree level qualifications over the period to 2036. Demand for ordinary and higher degree level qualifications is projected to increase by 800,000 over this period. As a result, the proportion of jobs in London requiring either an ordinary or higher degree is projected to reach 53 per cent by 2036, with the proportion of jobs with no qualifications reaching less than 5 per cent.

Moreover, the annual level of turnover in the labour market is significant ...

Whilst such projections provide a useful indication of the likely trends in London's employment over time, on their own, it can be argued that such projections provide a misleading picture of the potential future job opportunities and qualification requirements for London's existing and future workforce. This is because the labour market is not a static entity; instead it is subject to significant flows.

Over the course of a year, for example, many people leave their jobs for various destinations. Some people will retire, some will choose to leave London (and not commute back in), some will take time off work to have children, some will shift from one occupation or sector to another, some will fall long-term sick and some will die. For the capital's economy to continue to function effectively all these moves out of employment have to be replenished.

... with at least half a million people leaving their occupation in 2012 in London ...

Analysis suggests that just over half a million people left their occupation in London in 2012. This illustrates that there is a potentially significant level of education and training requirements each and every year in London's labour market just from replenishing those that leave their occupation within a year. This requirement is well in excess of that illustrated through the analysis of employment stock projections (where a 'net' increase of just over 35,000 jobs a year is projected) and for a number of reasons is likely to be an underestimate of the actual level of turnover.

… with much of the replenishment coming from 'within' the labour market.

Much of this out-flow from occupations in any single year will be replenished by those who may be considered as being within the labour market, for example those moving into employment from other occupations, those moving back into employment from a period of 'economic inactivity' (for instance returning after a period of sickness or after a period of maternity leave), or those moving back into employment from a period of unemployment. However, part of the replenishment comes from what might be considered as 'outside' the labour market - from 'in-migration' (that is from outside London's borders) and from education for instance. In addition, much of the replenishment from 'within' the labour market may well have education and training requirements.

London's population is subject to significant flows …

Turning to the supply of labour to London's economy, in each year over the past decade or so, more than 150,000 international migrants have moved to London. This inflow to London's population has been partly offset by an outflow of at least 80,000 London residents emigrating overseas in each year. Domestically, in each year over the past decade or so, at least 150,000 people have moved to London from other regions of the UK. This inflow to London's population has been more than offset by the more than 200,000 London residents moving to other regions of the UK each year.

… with commuters adding to London's workforce.

In 2011, those that lived and work in London were supplemented by almost 800,000 commuters into the capital, equivalent to around 16 per cent of jobs in London. This is an increase of around 100,000 over the last decade or so.

London's working age population is projected to increase by almost 1 million between now and 2036 …

London's population aged between 16 and 64 (London's working age population) is projected to increase from 5.7 million in 2011 to over 6.6 million by 2036.

… and to become increasingly highly skilled.

The proportion of London's working age population that is qualified to at least ordinary degree level is projected to increase over the projection period to 44 per cent (having sat at 24 per cent in 1997). The proportion without any qualifications is projected to more than halve from its 1997 share of 16 per cent to 7 per cent in 2036.

The projected growth in London's working age population in employment is slightly lower than the projected growth in jobs in London …

Assuming a static employment rate over the projection period, suggests the number of London residents in employment will increase by around 680,000. This is lower than the projected extra 861,000 jobs over the projection period.

… but once the potential growth in older workers employment and potential trends in commuting are accounted for, the employment and population projections do not seem out of line with a balanced labour market (in terms of quantities).

It is likely that over the projection period there will be an increase in the employment of people aged 65 or over. Moreover, over the past decade and a half the ratio of commuters to resident workers in London has remained reasonably stable. Once account is taken of the potential future trends in these two areas (ie the employment of older workers and commuting into London (from outside London's boundaries)), then (depending on the exact assumptions made) the level of jobs projected for London's economy and the population projections appear to be broadly consistent with a balanced labour market (in terms of quantities).

The projected growth in London's working age population in employment and qualified to at least ordinary degree level is lower than the projected growth in London jobs at this qualification level …

The employment projections show an increase of 800,000 jobs requiring at least an ordinary degree over the projection period (2011 to 2036). The population projections show an increase in the number of London residents of working age population in employment and qualified to at least ordinary degree level of 560,000.

… suggesting an increase in the employment rate for London residents with at least an ordinary degree to balance the demand for and supply of labour at this qualification level.

For the reasons outlined above, there is likely to be an increase in the number of older workers (those aged 65 and over) in London's labour market over the projection period, many of whom may be qualified to degree level or higher. There may also be an increase in the number of commuters qualified to degree level or higher over the projection period. Whilst accounting for these potential future trends, it would appear that there is likely to need to be an increase in the employment rate for London residents' with at least an ordinary degree to bring the labour market into balance (in terms of quantities). That is, the level of jobs projected for London's economy and the population projections are largely consistent with a balanced labour market (in terms of quantities), albeit with potentially some increase in the employment rate of London residents qualified to degree level or higher.

1. Introduction

The objective of this work is to provide the London Enterprise Panel with an overview of London's labour market and its likely short and long term path together with its potential future skills/qualifications requirements.

The paper starts with a consideration of how employment in London has evolved over time and the resulting specialisations in London's employment structure. The paper then looks at a long-run projection for London's employment (over the period of the London Plan), broken down by sector. The analysis also looks at the likely changes in occupations and required qualifications as a result of these projections. The final consideration in terms of London's labour market demand is an analysis of the level of annual churn in London's labour market and the potential qualification requirements deriving from this.

The paper then turns to the supply side of London's labour market focusing on how London's population has changed over time, how its qualification profile has changed and the types of degrees currently being studied in London. The projection for London's working age population over the London Plan period is then considered together with the potential future qualification profile of London's working age population.

The paper then briefly summarises the balance between the demand for and supply of labour suggested from this analysis. A series of appendices provide more detail on the methodologies used in projecting employment and population for example as well as a shorter term forecast for London's employment (and related occupation and qualification requirements) and employee and population projections by London borough.

2. London's demand for labour

Main findings

- Over the past 30 years or so London has seen strong growth in employment of professional and business support services.
- Just under half of all jobs in London are held by people holding an ordinary or higher degree.
- London's labour market has shown surprising resilience in the period since the recession with unemployment rising, and employment falling, by less than in previous (recent) recessions.
- GLA Economics' medium term projection is for London's employment to grow in each year from 2012 to 2015.
- In the longer term the number of jobs in London is projected to increase by, on average, 35,000 jobs per year – resulting in over 850,000 more jobs in London by 2036.
- Just under half of all this employment increase is expected to come from the professional, real estate, scientific and technical activities sector.
- The demand for professional occupations is projected to increase significantly in London (by over half a million) in the period to 2036.
- As a result, the demand for ordinary and higher degree level qualifications are projected to increase significantly (by over 800,000) over the period to 2036.
- The proportion of jobs in London requiring either an ordinary or higher degree is projected to reach 53 per cent by 2036, with the proportion of jobs with no qualifications reaching less than 5 per cent.
- There is significant turnover in the labour market; analysis suggests that just over half a million people will leave their occupation in London in 2012 (although this is likely to be an underestimate of the actual level of turnover).
- This level of turnover suggests a potentially significant education and training requirement over time even in areas projected to decline in employment over the projection period.

Introduction

This section starts with a consideration of how employment in London has evolved over time and the resulting specialisations in London's employment structure. It then looks at a long-run projection for London's employment broken down by sector. The analysis also looks at the likely changes in occupations and required qualifications as a result of these projections. The section concludes with a consideration of the level of annual churn in London's labour market and the potential qualification requirements deriving from this.

London's economy and its impact on London's labour market

In considering London's future employment trajectory and its associated demand for skills it is useful to have an understanding of the main forces impacting on the London economy. To that end, ultimately, growth in an economy's income per head depends very much on the ability to raise productivity, i.e., the economy's ability to produce more for a given level of resource. There are many spurs to productivity including improvements in the skills and abilities of an economy's workforce - the subject of this analysis. Another, important, spur to productivity, which has implications for the skills and qualifications required in an economy, is an economy's openness to trade. Indeed, both economic theory and evidence show that economies which trade more tend to grow faster[1].

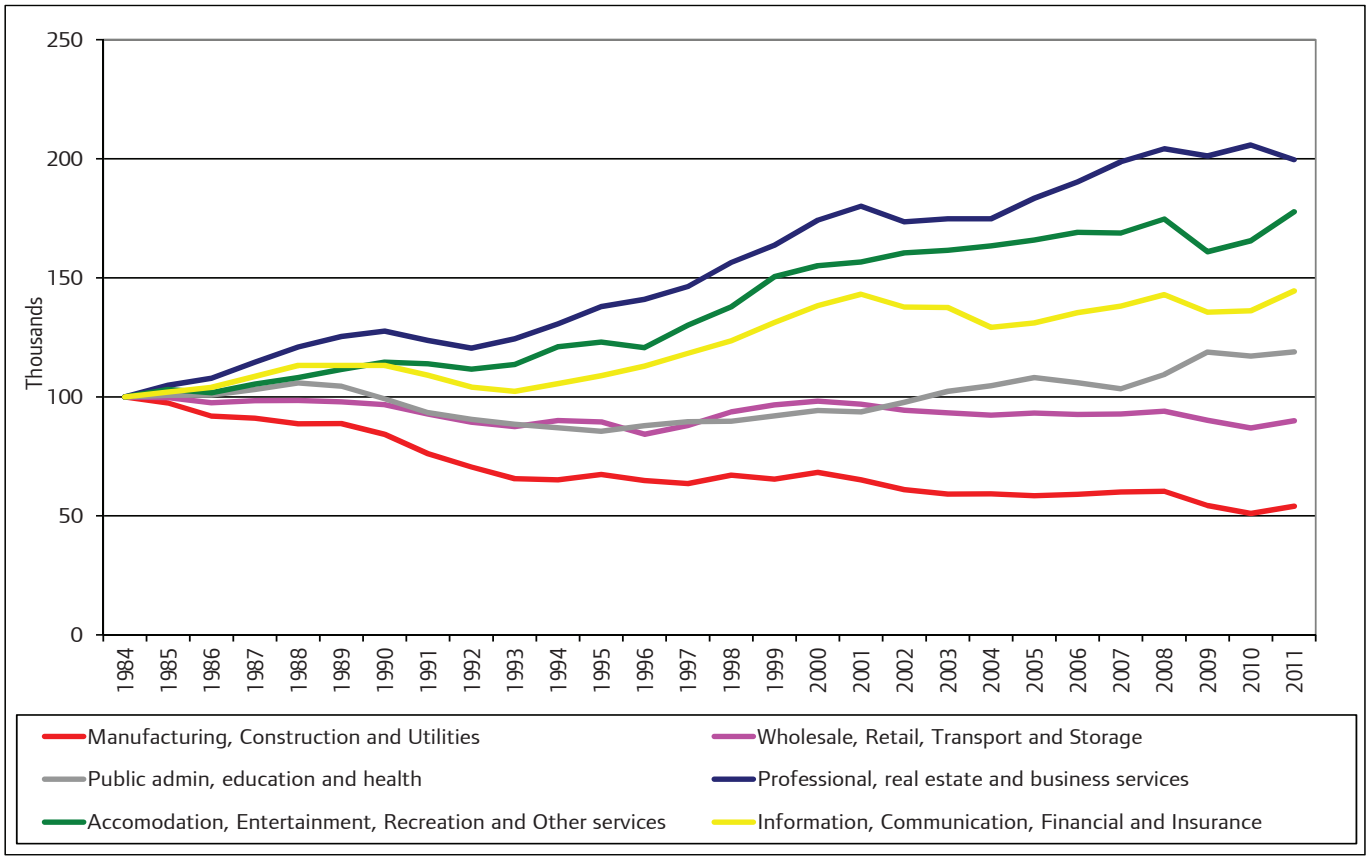
Openness to trade increases the returns to innovation, itself a driver of growth and productivity, on account of increased market size and also enables the economy to benefit from access to new technology (by importing new technology from other places). Perhaps most importantly, openness to trade brings greater competition which encourages firms to be as efficient as possible. In effect it encourages different countries and/or regions to concentrate on different areas of production, focusing on their respective comparative advantage[2].

Structural change and specialisation

This drive to higher productivity through competition, innovation and openness to trade has contributed to structural change in the UK economy (as elsewhere in the world), encouraging domestic resources to shift from less productive to more productive uses. As shown later, this shift has had significant consequences for the skills and qualifications workers need to work in London's economy.

As a result of such economic forces, London has seen a significant shift toward service activities over past decades[3]. This is shown in Figure 2.1.

Figure 2.1: Change in broad London sectors over time

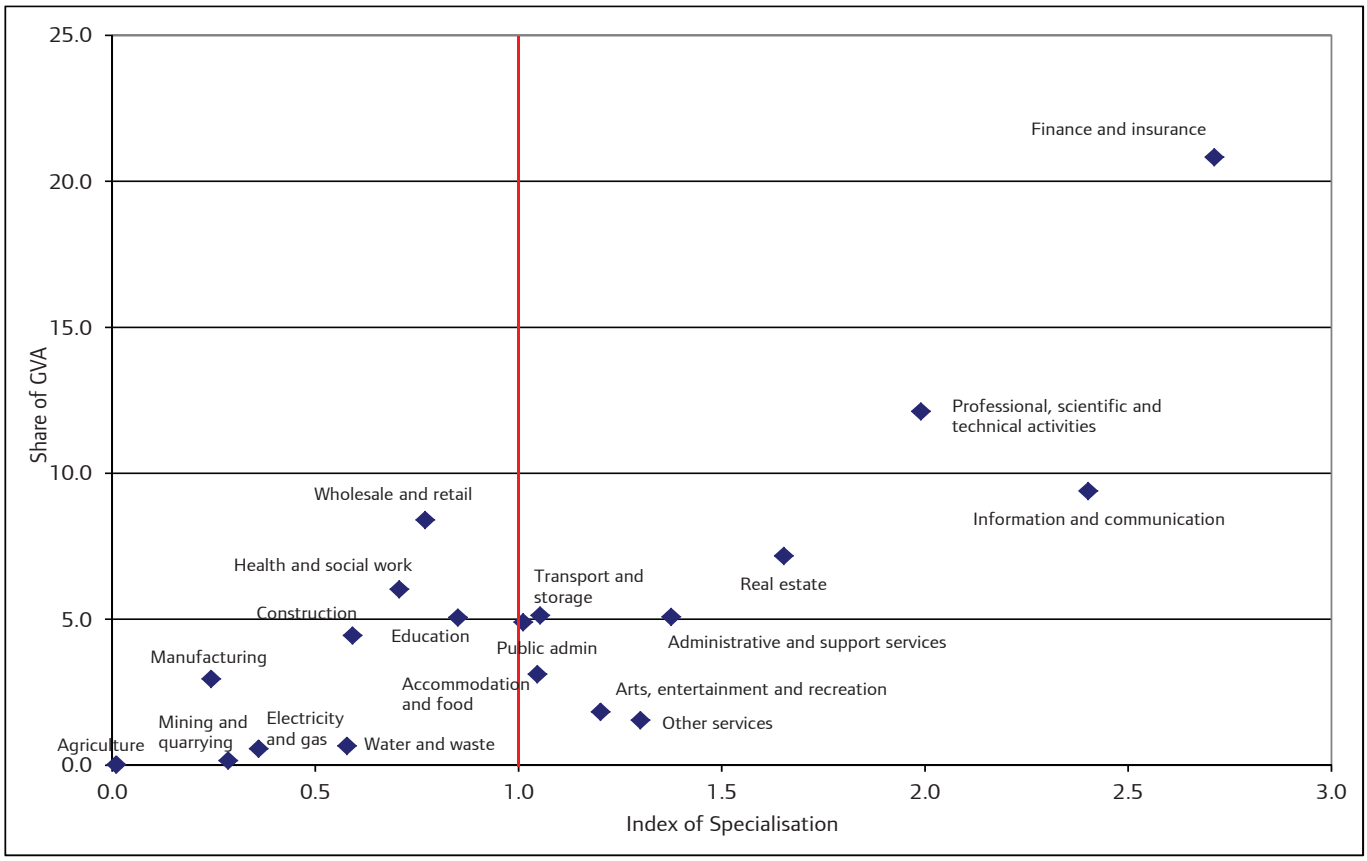


Source: 1996 to 2011: ONS Workforce Jobs series; before 1996: GLAE Economics using various ONS sources and modelling assumptions

The chart shows that over the past couple of decades or so employment in many service sector areas have shown strong growth (particularly business service type sectors). The professional, real estate and business service category includes activities such as management consultancy, legal, accountancy, architectural, real estate as well as business support services such as cleaning, private security and employment agencies for example. Significant activities within the accommodation, entertainment, recreation and other services category include restaurants, hotels, event catering, public houses, sports and personal services for example. Significant activities within the information, communication, financial and insurance category include financial and insurance activities, computer programming, motion picture activities and publishing. Over the same period employment in manufacturing has fallen significantly.

Figure 2.2 looks in more detail at the current industrial structure of London's economy. The chart shows that economic activity in London is concentrated in financial and insurance services, and some other business services.

Figure 2.2: London's broad sectors: Index of Specialisation[4] (relative to the rest of Great Britain) and share of London's total output



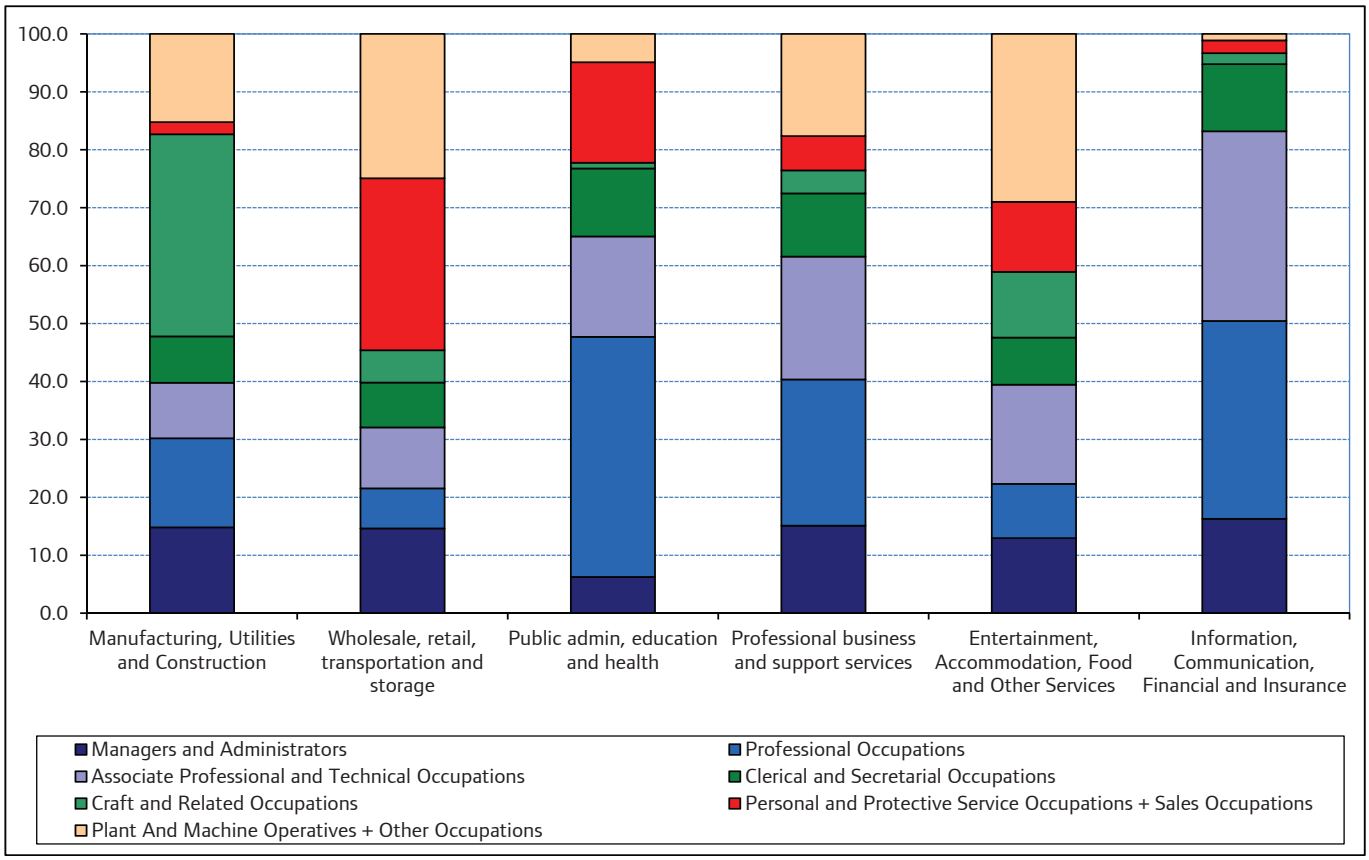
Source: GLA Economics based on data from the ONS Business Register and Employment Survey (BRES) and ONS Regional Gross Value Added (GVA) series

These broad sector headings hide a range of different economic activities and differing degrees of specialisation within particular sectors. When examined at a more disaggregated level, London specialises in such things as securities, fund management (amongst other financial services), media and other creative activities (for example: television, film, music, publishing, computer consultancy and programming) and other professional services (like legal, accountancy, management consultancy, advertising, market research and architectural activities). Its employment is not concentrated in land-intensive sectors such as agriculture, manufacturing, primary industries and freight transport.

Appendix 2 breaks down the employment data into more detailed sub-sectors (by Standard Industrial Classification [SIC] code) allowing for a more comprehensive analysis of the employment structure of London's economy.

This shift of employment into services has impacted on the types of occupations found in London's labour market. The London Story[5] showed that London employers have increasingly employed high skilled workers over recent decades. Analysis suggests that the growth in London's employment over the past two decades has been in managers, professionals and associate professional occupations. Figure 2.3 shows the occupation profile of London's broad sectors in 2011. The chart shows that managers, professional and associate professional occupations account for 60 per cent or more of all occupations in finance, insurance, information and communication services, professional business and business support services and public sector activities (with these three broad sectors accounting for 60 per cent of jobs in London in 2011).

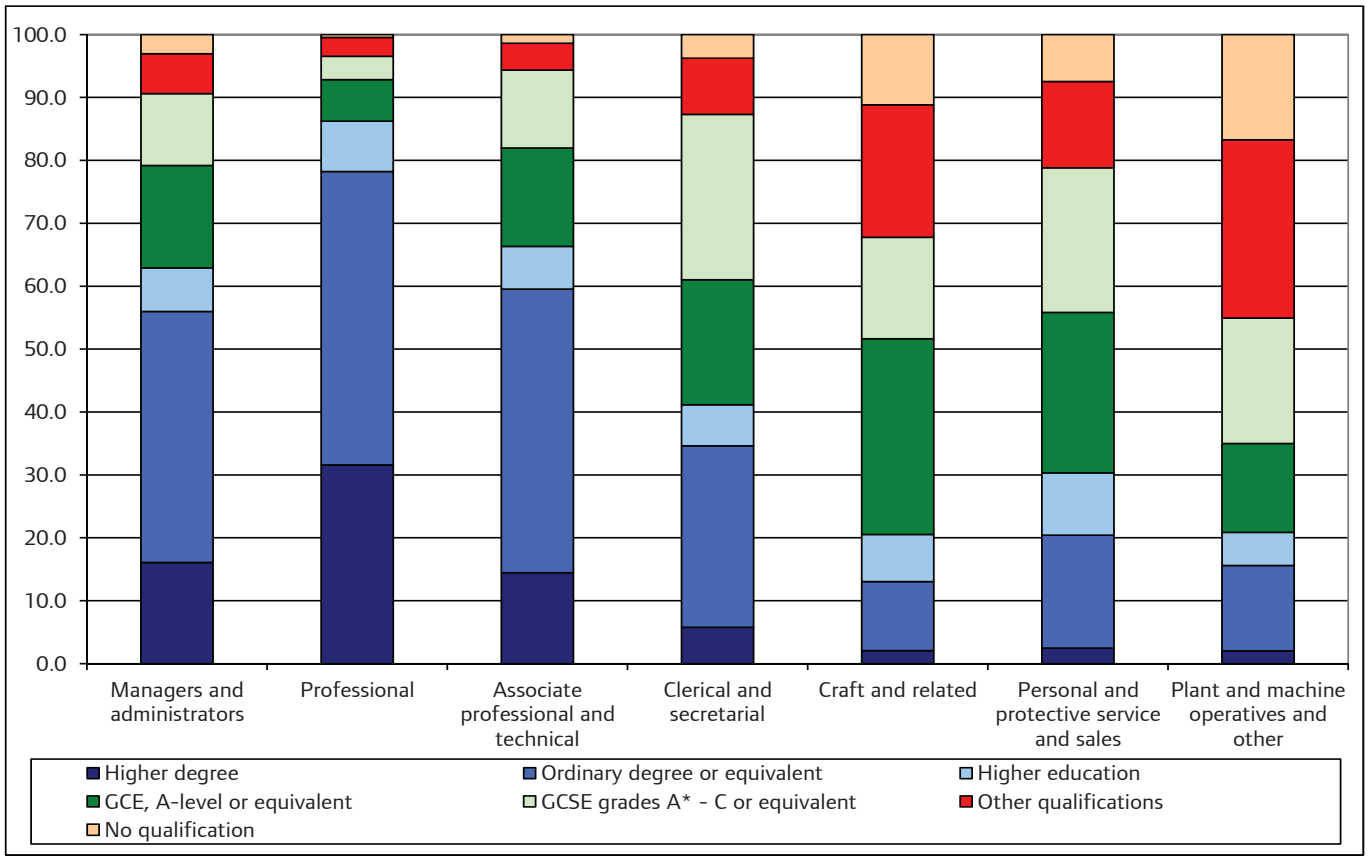
Figure 2.3: Share of occupations within broad sectors in London, 2011



Source: GLA Economics based on data from various ONS sources

As Figure 2.4 shows, these three occupations tend to employ a high proportion of highly qualified individuals. For example, almost 80 per cent of jobs in professional occupations are held by people educated to ordinary or higher degree level.

Figure 2.4: Share of qualifications within occupations in London, 2011



Source: GLA Economics based on data from various ONS sources

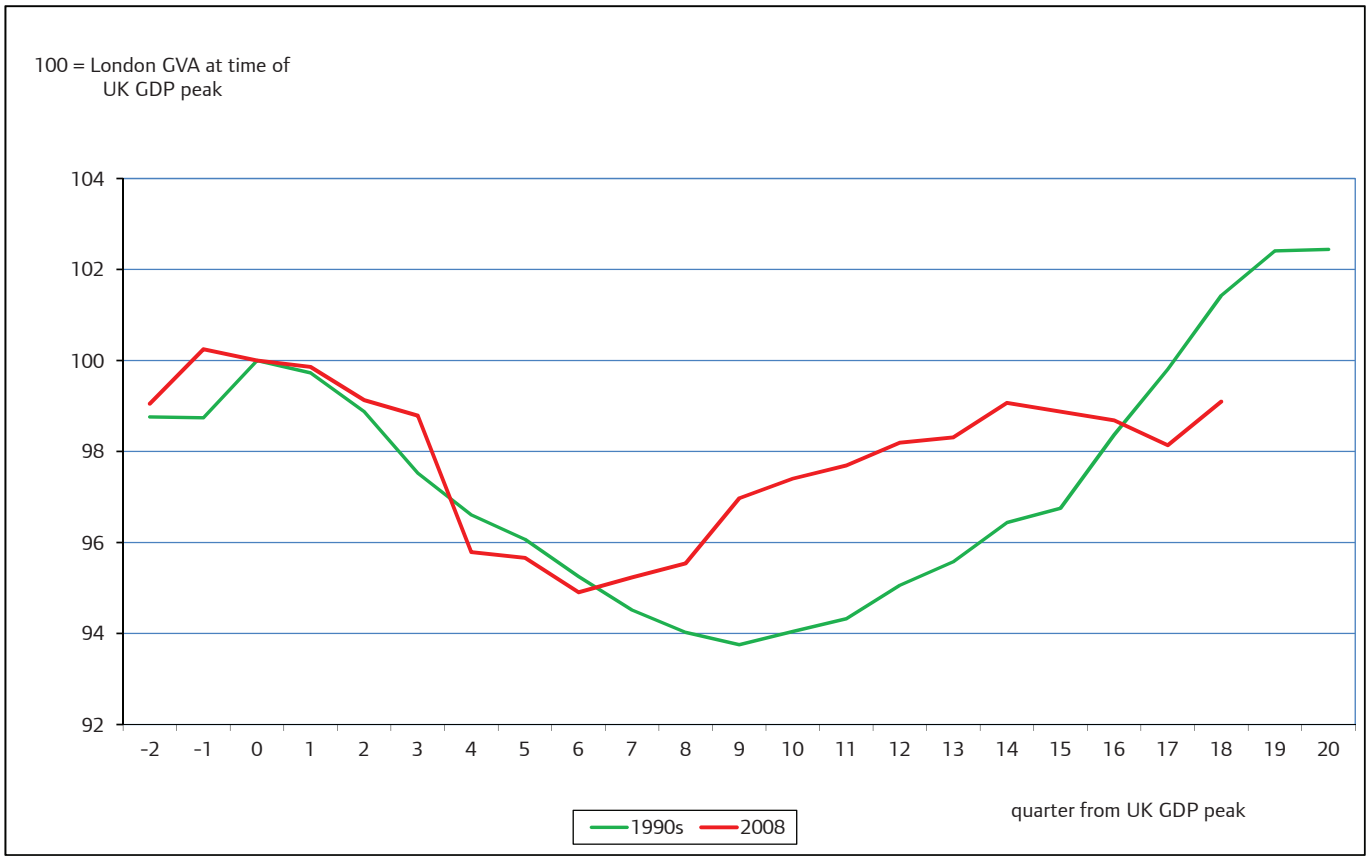
Overall, almost half (46 per cent) of London's jobs in 2011 were filled by people holding ordinary or higher degree level qualifications.

London's labour market performance since the recession

Compared to the experience of recent recessions, London's labour market has shown surprising resilience in the period since the recession. The decline in output experienced in the recession was steeper, and for the UK larger, than that experienced in both the 1990s and 1980s recessions; however, unemployment has risen, and employment fallen, by less this time around.

Experian's estimates of real GVA[6] shows London's GVA fell by 5.3 per cent over seven quarters during this recession compared to a 6.2 per cent decline over nine quarters in the 1990s[7] (see Figure 2.5).

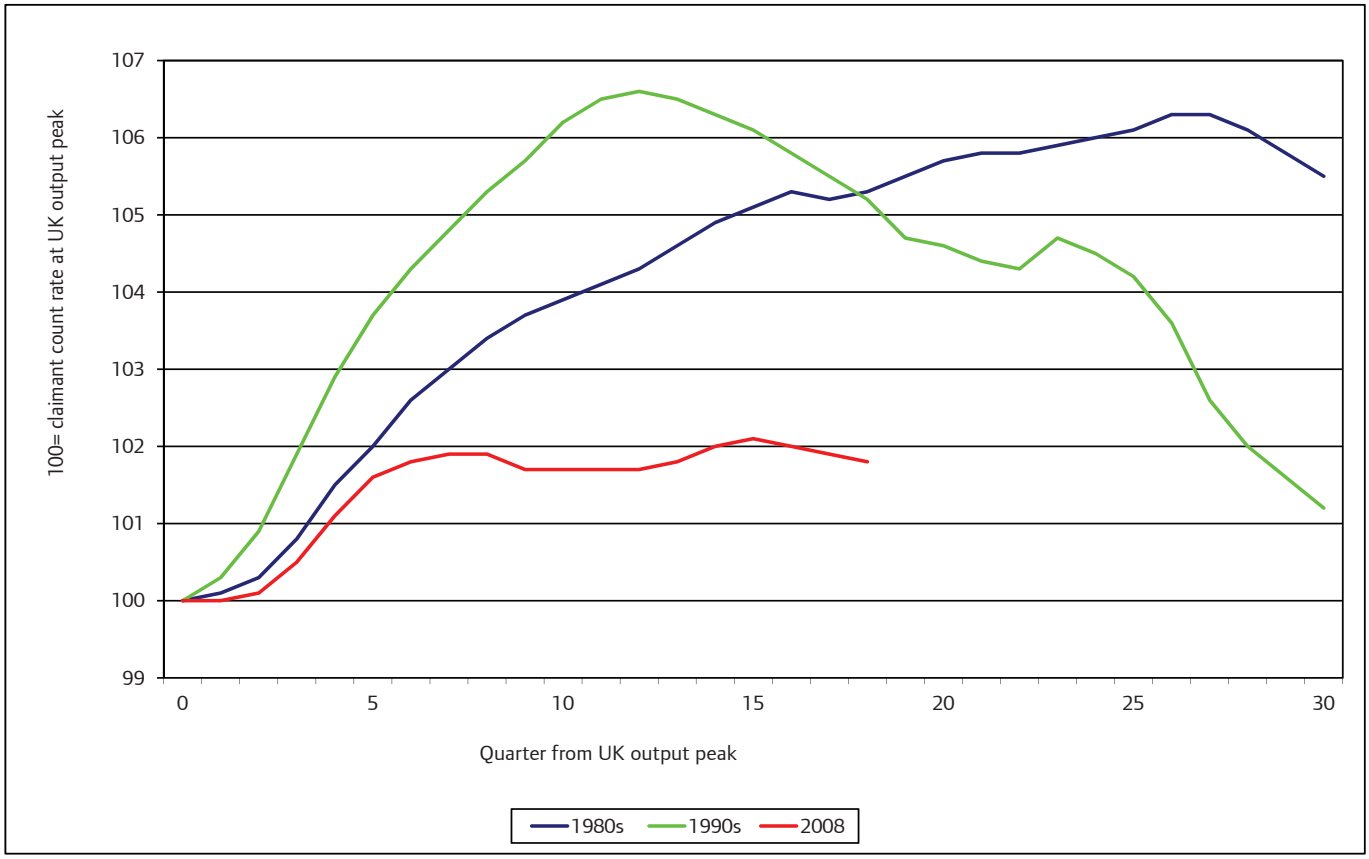
Figure 2.5: Percentage change in London GVA[a] from UK GDP peak



a At constant prices
Source: Experian

Given that London's output during this latest recession did not fall by as much (in total), or last as long, as in the 1990s (according to Experian's estimates) it is perhaps not too surprising that London's labour market has also been less impacted. London's claimant count rate[8], has risen by 1.8 percentage points to date since the start of the recent recession, compared to 5.2 and 5.3 percentage points in the 1990s and 1980s recessions respectively[9]. Further, whilst it may still be too early to say definitively, London's claimant count rate seems to have peaked at 2.1 percentage points above its rate when UK output peaked. In the 1990s and 1980s recessions the claimant count unemployment rate increased by 6.6 and 6.3 percentage points respectively before declining (see Figure 2.6).

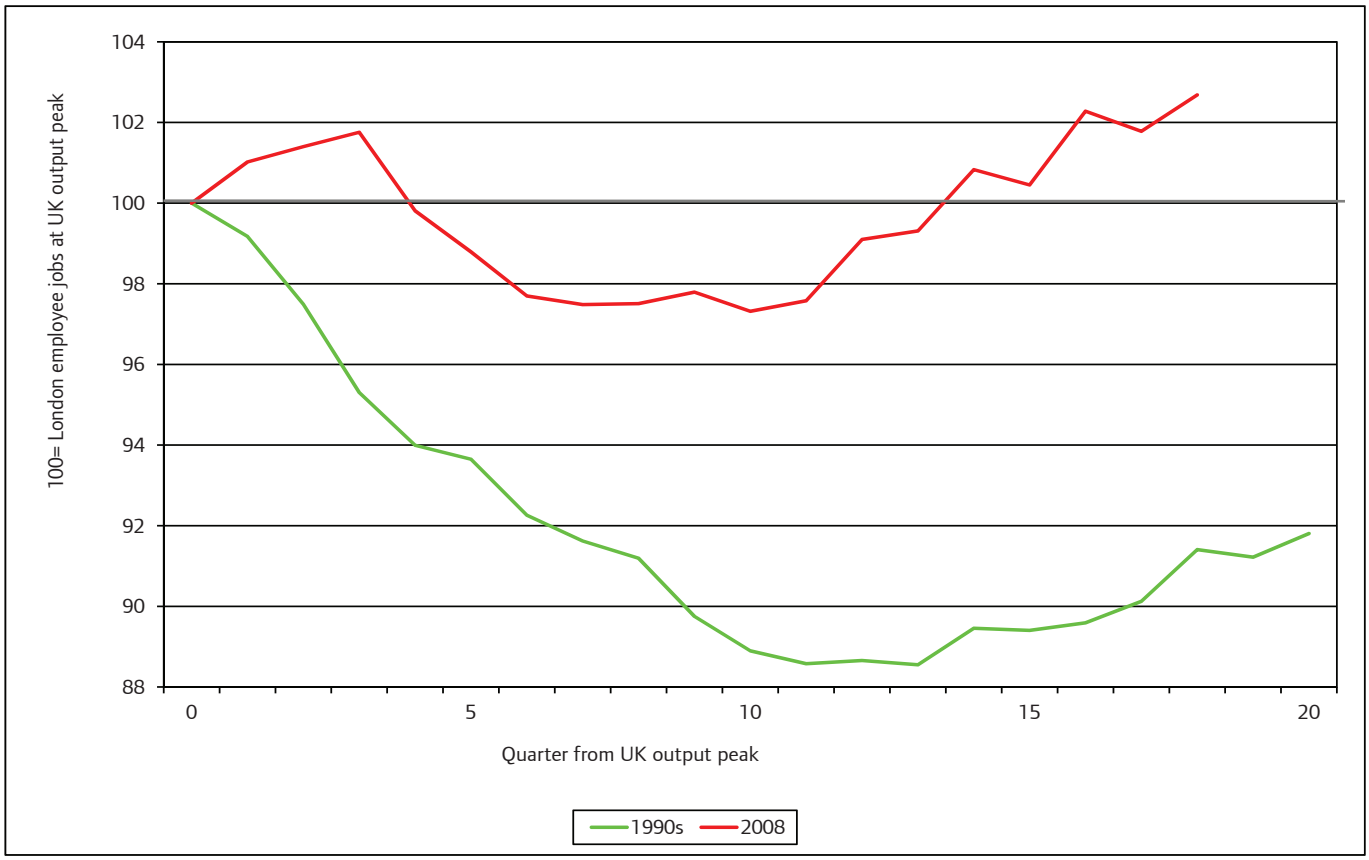
Figure 2.6: Percentage point change in London claimant count unemployment rate[a] from UK output peaks



a Numerator = claimant count (seasonally adjusted); Denominator = workforce jobs + claimant count, seasonally adjusted.
Source: ONS

Employee jobs[10] in London in this recession have also been less affected than previously and less so than the GVA declines would have implied. Within three and a half years from the UK GDP peak, employee jobs had recovered to their pre-recession peak levels. Employee jobs are now 2.7 per cent higher than their pre-recession level, but were 8.6 per cent lower in the same space of time in the 1990s.

Figure 2.7: Percentage change in London employee jobs from UK output peaks



Source: Workforce Jobs series, ONS

The difference in the percentage fall in employee jobs during the 1990s and 2008 in London (11.3 percentage points) is significantly larger than that for the UK (3.0 percentage points). This is more to do with London experiencing a much greater decline than the UK in employee jobs during the 1990s recession.

In summary, estimates from Experian suggest that, unlike the UK, London did not experience as great a decline in output during the 2008 recession as it had during the 1990s. Nevertheless, the shorter period over which output declined in London in 2008 means that the rate of decline was significantly faster than the recessions of the 1990s and 1980s. At the same time, both the UK's and London's labour market have held up relatively well and, although London's labour market deteriorated by more than the UK during the 1990s recession, it has performed better than the UK's labour market during the 2008 recession (see Table 2.1).

Table 2.1: Summary of output and labour market indicator performances for London and the UK over recessions

		London	UK
Peak to trough output decline (%[1])	2008	5.3	6.3
	1990s	6.2	2.9
	1980s	-	4.6
Year-on-year growth of output over peak-to	2008	-3.1	-5.1
	1990s	-2.8	-2.4
	1980s	-	-3.7
Percentage point change in claimant rate[2]	2008	1.8	2.4
	1990s	5.2	3.2
	1980s	5.3	6.3
Change in employee job numbers (%[2])	2008	2.7	-1.6
	1990s	-8.6	-4.6
	1980s	-	-8.5

1 London figures are derived from Experian's regional GVA estimates. UK figures are derived from ONS GDP estimates.
2 From UK output peak to eighteen quarters (four and a half years) after.

The reasons behind the labour market's resilience during the recent recession and subsequently is the focus of much research at the moment[11]. Some analysis by GLA Economics[12] seems to suggest that moderation in real wages (especially relative to other countries), continued employment growth in the public sector and strong levels of corporate profitability moving into the recession (and correspondingly low rates of business failures during the recession) were the main factors that might explain this surprisingly strong labour market performance during the recession and, to some extent at least, since.

London's projected demand for labour

GLA Economics produce a medium term forecast for London's economy every six months. The labour market impacts over the next three years or so from the latest forecast are set out in Appendix 3.

Employment projections

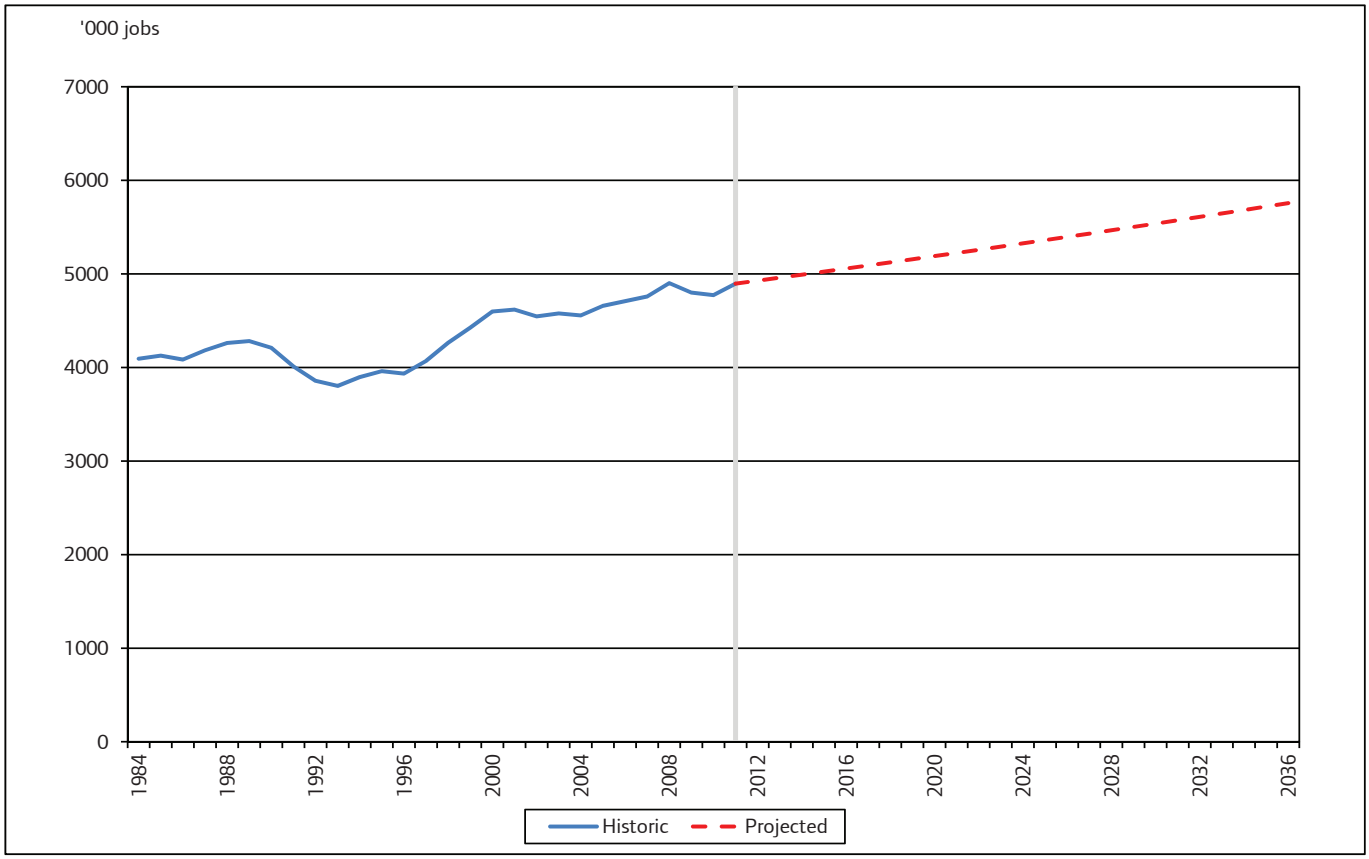
Looking at the longer term, GLA Economics project employment to grow by around 0.7 per cent per annum on average from 2012 to 2036. This means that the number of jobs in London is projected to increase by 861,000 from the 2011 value of 4,896,000 to 5,757,000 in 2036 (this equates to annual average growth of just under 36,000 jobs per year). Given the level of uncertainty around the economy and its impact on the labour market at the moment two different scenarios around this central projection are set out in Appendix 4. One scenario sets out the position with a faster growth assumption, the other with a slower growth assumption.

Box 2.1: Methodology for GLA Economics employment projections

GLA Economics' long-run employment projections use historic data on the relationship between employment and output together with an assumption of future output growth to project employment over the long term. As such the projections do not attempt to plot the exact path of employment over time, accounting for each and every economic cycle, but rather look at the likely long-term trend in employment. The projections for sectors are also constructed in this way, but to ensure that the sector level results add up to the London-wide employment projections they are constrained to that total. Further detail on the methodology is provided in Appendix 5.

The shorter-term forecast for London's employment, covering the next few years, is provided in Appendix 3.

Figure 2.8: London's historic and projected employment (1984-2036)



Source: GLA Economics Working Paper 52, Workforce Jobs series (ONS), GLA Economics calculations

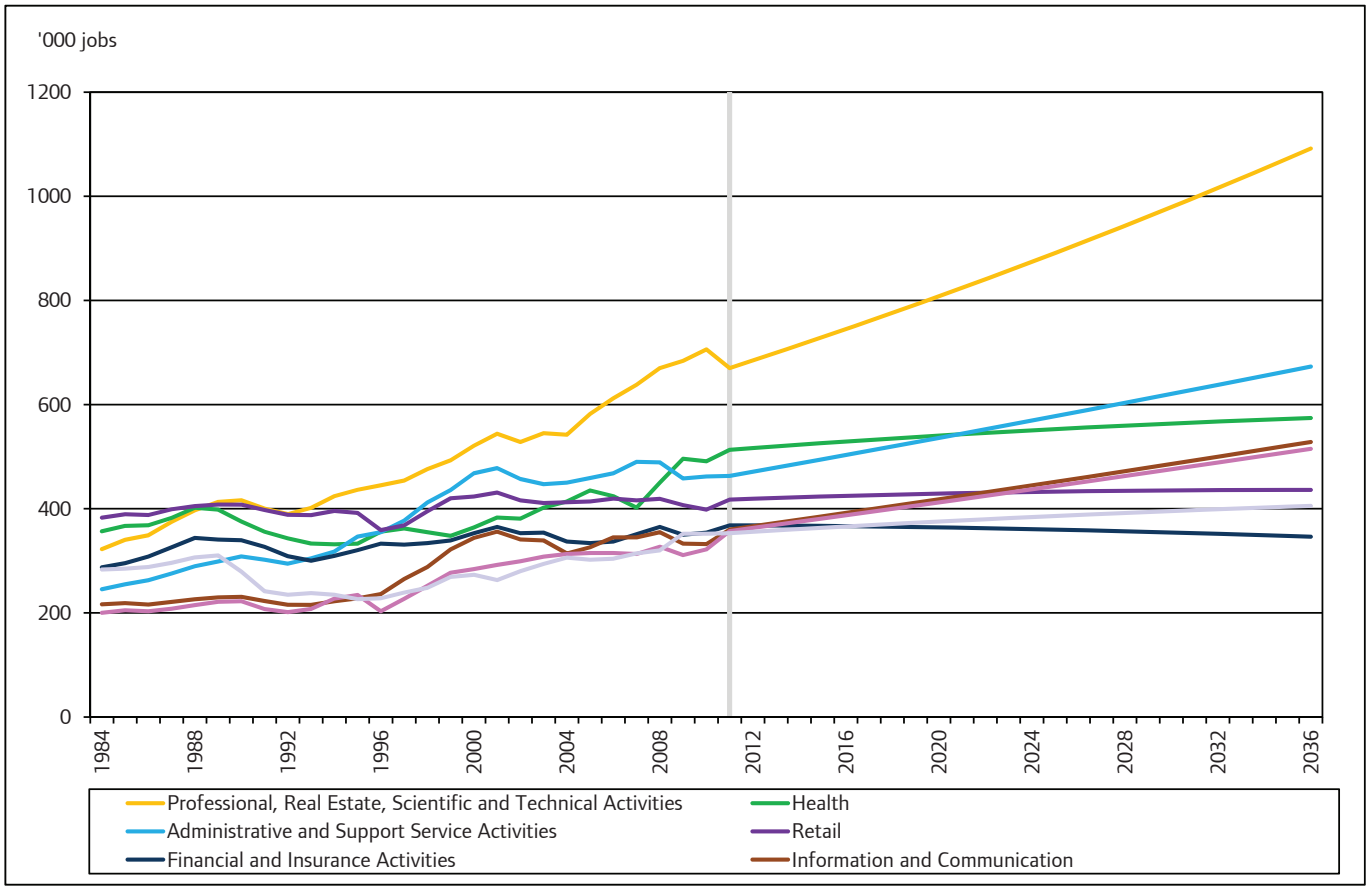
Whilst London-wide employment is projected to grow this is not the case for all sectors within London. Indeed, there are large differences in projected employment amongst sectors. Table 2.2 shows that employment growth for sectors is projected to range from 2.0 per cent year-on-year growth (for professional, real estate, scientific and technical activities) to a 5.2 per cent year-on-year decline (for manufacturing). Figures 2.9 and 2.10 also show how projected employment numbers differ across sectors. Professional, real estate, scientific and technical activities are projected to see an increase of 422,000 jobs by 2036. This accounts for just under half of all the employment increase expected in London. Information and communication, administrative and support service activities, and accommodation and food service activities are also expected to see large increases in employment numbers.

Table 2.2: Summary of employment projections by sector, 2011-2036

	Employment growth per annum with London output growth of 2.5% per annum	Absolute change in employment numbers ('000 jobs)
Professional, Real Estate, Scientific and Technical Activities	2.0%	422
Information and Communication	1.5%	168
Administrative and Support Service Activities	1.5%	210
Accomodation and Food Service Activities	1.5%	158
Other Services	1.3%	52
Arts, Entertainment and Recreation	0.9%	41
Total London Employment	0.7%	861
Education	0.5%	52
Health	0.4%	61
Retail	0.2%	19
Construction	-0.1%	-7
Financial and Insurance Activities	-0.3%	-22
Public Administration and Defence	-1.0%	-48
Transportation and Storage	-1.1%	-66
Wholesale	-1.8%	-66
Primary & Utilities	-3.3%	-18
Manufacturing	-5.2%	-95

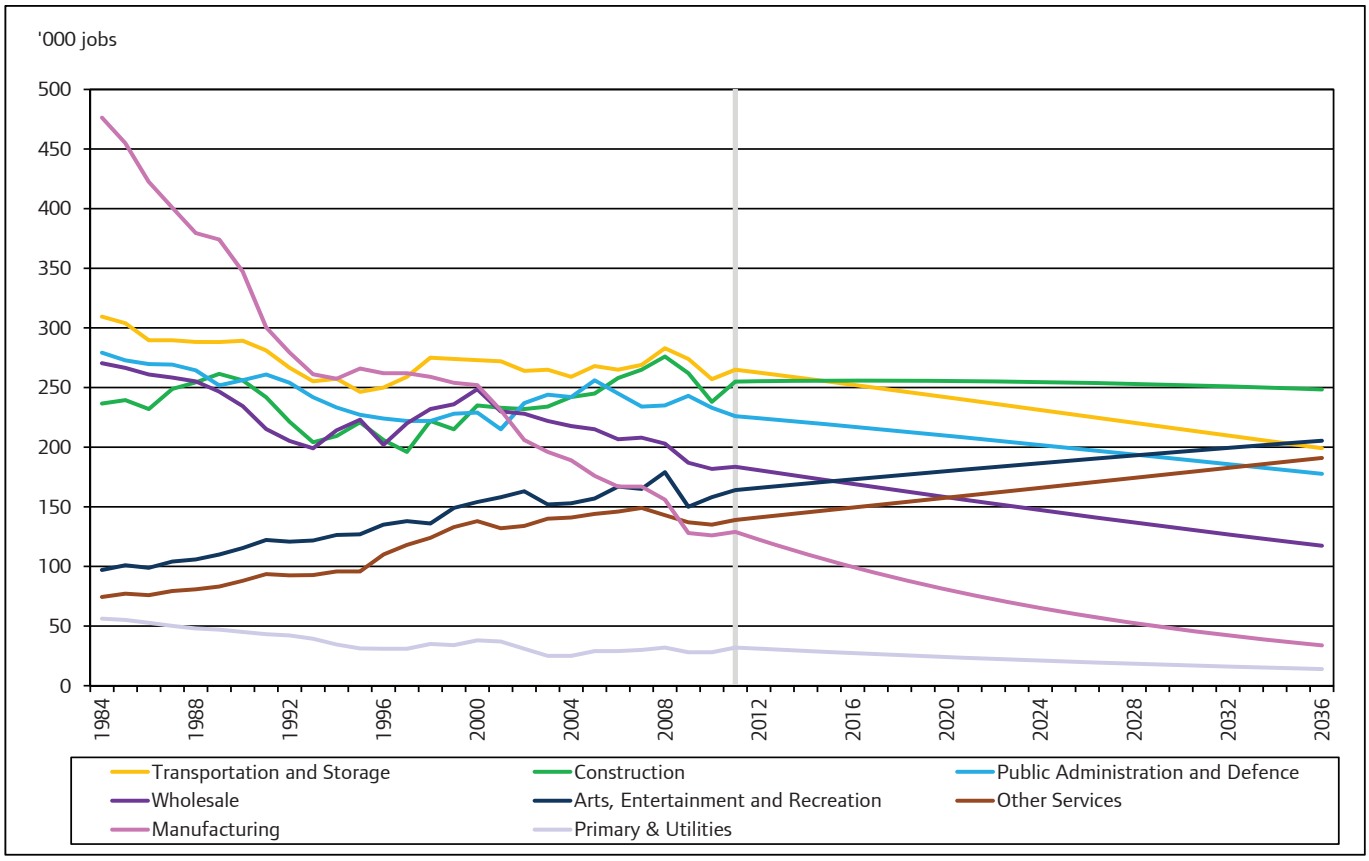
Source: GLA Economics calculations

Figure 2.9: Employment projections for London's larger sectors



Source: GLA Economics Working Paper 52, Workforce Jobs series (ONS), GLA Economics calculations

Figure 2.10: Employment projections for London's smaller sectors



Source: GLA Economics Working Paper 52, Workforce Jobs series (ONS), GLA Economics calculations

Occupation projections

The employment data used to inform on London's employment structure and projections of London's employment does not contain information on occupations. Such information has to be derived from alternative sources. In order to provide information on occupations in London the Annual Population Survey (APS) has been used for 2004-11 together with the Labour Force Survey (LFS) for the earlier periods (2001-2003). However, it should be noted that these surveys, because of their sample size at the London level, produce less robust results than the employment surveys used for projecting employment. Moreover, the amount of historical data available on occupations is more limited than that for employment. As a result, a relatively limited amount (of less robust) data has been used to project occupations when compared to the employment projections. For this reason, caution is required when using the occupation projections - particularly at longer time horizons.

To construct occupation projections for London, the shares of occupation within sectors over time are used as a guide to future trends of occupation shares by sector. The occupation shares can then be applied to the sector employment results (derived from the employment projections) to derive absolute figures for occupations by sector. Further details of the methodology used can be found in Appendix 5.

A summary of the expected demand for occupations is presented in Tables 2.3 and 2.4 and Figure 2.11. Demand for professional occupations in London is projected to see a large increase from its current position. A total 549,000 more jobs (equivalent to a 1.6 per cent year-on-year increase) is expected between 2011 and 2036 (Table 2.3). This makes up nearly two thirds of the total job increases expected in London over this period. A large proportion of the increase in professional occupations (nearly a quarter) is expected to come from the information and communication sector (Table 2.4).

Table 2.3: Average year-on-year change in occupations within sectors (2011 to 2036)

	Managers and Administrators	Professional Occupations	Associate Professional and Technical Occupations	Clerical and Secretarial Occupations	Craft and Related Occupations	Personal and Protective Service Occupations + Sales Occupations	Plant And Machine Operatives + Other Occupations	Total
Primary & utilities	-2.5%	-2.6%	-4.1%	-10.3%	-6.1%	-12.9%	-2.2%	-3.4%
Manufacturing	-3.9%	-1.8%	-7.1%	-8.9%	-9.3%	-4.1%	-12.0%	-5.4%
Construction	0.6%	1.9%	-6.2%	-5.4%	0.0%	-6.8%	-0.9%	-0.1%
Wholesale	-1.8%	2.0%	-4.0%	-4.5%	-0.4%	-2.9%	-1.8%	-1.8%
Retail	-0.1%	3.6%	-0.1%	-3.5%	-2.3%	0.3%	-2.3%	0.2%
Transportation and Storage	-2.4%	1.4%	-1.3%	-3.4%	-0.9%	0.2%	-1.6%	-1.2%
Accomodation and Food Service Activities	0.0%	7.6%	3.1%	-0.3%	0.6%	1.3%	1.9%	1.5%
Information and Communication	3.6%	2.4%	0.7%	-6.1%	-4.6%	-6.3%	-4.9%	1.6%
Financial and Insurance Activities	0.6%	1.9%	-0.9%	-6.5%	-1.9%	-3.3%	-7.8%	-0.3%
Professional, Real Estate, Scientific and Technical Activities	3.6%	0.6%	2.1%	-4.7%	10.8%	0.4%	-0.4%	2.1%
Administrative and Support Service Activities	1.4%	1.6%	-4.3%	-4.5%	3.6%	-3.5%	3.4%	1.6%
Public Admin and Defence	-0.8%	1.2%	-1.8%	-5.7%	-8.0%	2.2%	-1.4%	-1.0%
Education	0.0%	0.8%	3.6%	-4.4%	-2.9%	-0.2%	-5.6%	0.6%
Health	0.5%	0.8%	1.5%	-2.8%	-0.4%	0.5%	-1.8%	0.5%
Arts, Entertainment and Recreation	2.4%	5.7%	-1.2%	-5.5%	-2.9%	1.7%	-4.1%	0.9%
Other Services	1.2%	4.5%	1.9%	-5.2%	-4.4%	-0.6%	-7.2%	1.3%
Total London	**1.3%**	**1.6%**	**0.3%**	**-4.4%**	**1.8%**	**0.0%**	**0.9%**	**0.7%**

Source: GLA Economics calculations

Table 2.4: Absolute change in occupation employment (jobs) by sector (000s, 2011 to 2036)

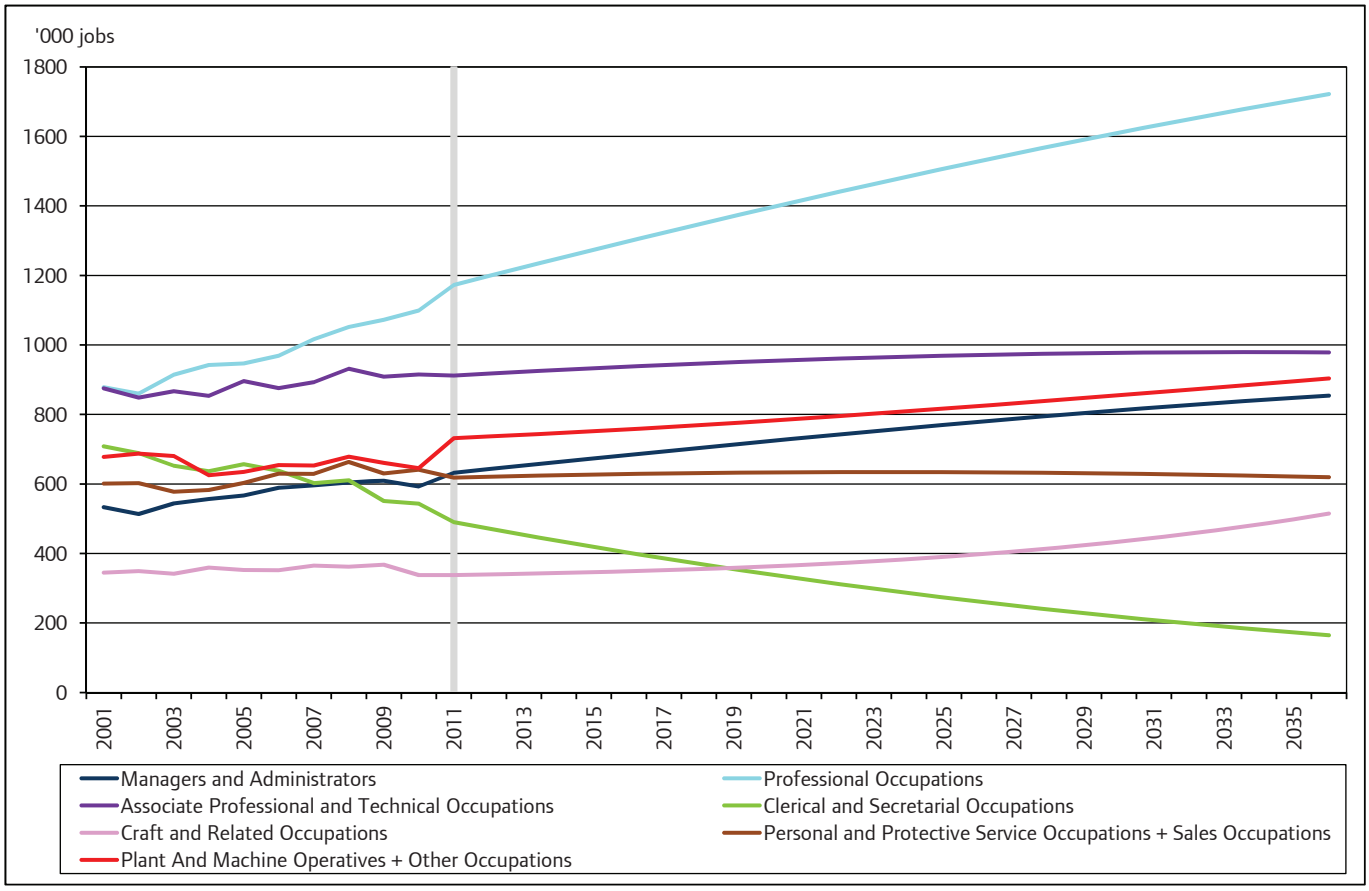
	Managers and Administrators	Professional Occupations	Associate Professional and Technical Occupations	Clerical and Secretarial Occupations	Craft and Related Occupations	Personal and Protective Service Occupations + Sales Occupations	Plant And Machine Operatives + Other Occupations	Total
Primary & utilities	-2	-3	-2	-3	-3	-1	-4	-18
Manufacturing	-14	-8	-20	-12	-19	-3	-19	-95
Construction	5	20	-9	-12	-1	-3	-7	-7
Wholesale	-13	7	-20	-14	-2	-9	-13	-66
Retail	-1	41	-1	-14	-6	18	-18	19
Transportation and Storage	-10	7	-6	-12	-2	1	-44	-66
Accomodation and Food Service Activities	0	24	16	-2	11	11	98	158
Information and Communication	54	127	21	-16	-8	-6	-3	168
Financial and Insurance Activities	13	50	-25	-51	-1	-5	-3	-22
Professional, Real Estate, Scientific and Technical Activities	148	39	109	-56	181	2	-1	422
Administrative and Support Service Activities	25	14	-43	-28	38	-28	232	210
Public Admin and Defence	-4	18	-28	-37	-2	7	-2	-48
Education	0	40	51	-14	-2	-3	-20	52
Health	4	45	30	-28	0	17	-8	61
Arts, Entertainment and Recreation	13	66	-18	-15	-2	6	-8	41
Other Services	4	62	14	-10	-4	-5	-10	52
Total London	**222**	**549**	**67**	**-325**	**176**	**1**	**171**	**862**

Source: GLA Economics calculations
Note: Total London may not add to total from London-wide employment projections due to rounding.

Clerical and secretarial occupations are the only occupation group expected to see a London-wide decline in demand. The number of jobs in this occupation group is projected to decline by 325,000 from 2011 to a total of 165,000 by 2036. This equates to a year-on-year decline of 4.4 per cent. Almost half of this trend is driven by declining demand from the finance and insurance, professional/real estate/scientific/technical activities and public administration and defence sectors.

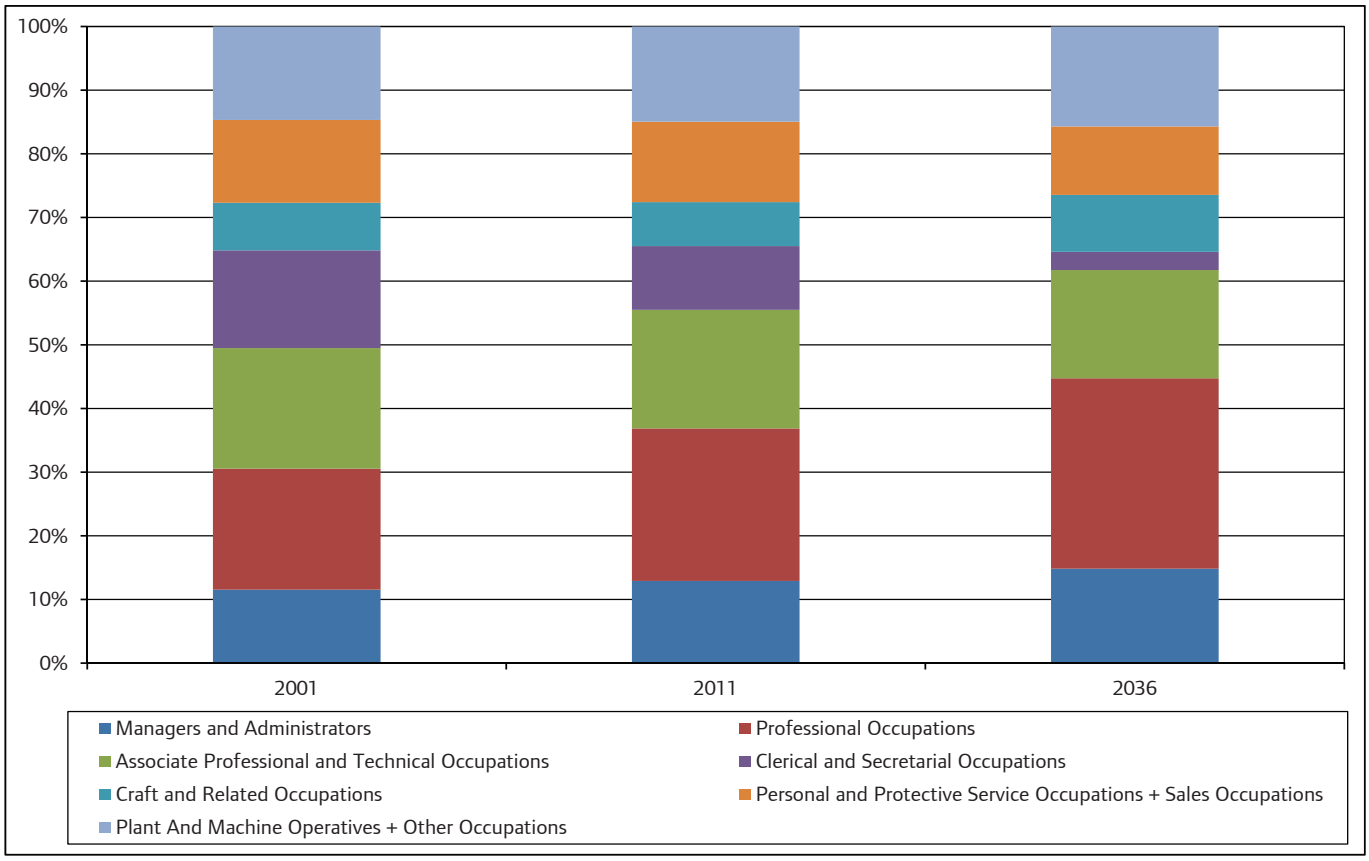
Managers and administrators are also projected to see a large rise in the number of jobs, increasing by 222,000 (or 1.3 per cent increase per annum) over the 2011 to 2036 period. This increase is largely driven by an increase in the professional, real estate, scientific and technical activities sector.

Figure 2.11: Changes in Occupation Demand (2001 to 2036)



Source: ONS Annual Population Survey, ONS Labour Force Survey, ONS Workforce Jobs series and GLA Economics calculations

Figure 2.12: Changes in occupation shares



Source: ONS Annual Population Survey, ONS Labour Force Survey, ONS Workforce Jobs series and GLA Economics calculations

Figure 2.12 shows the change in the shares of occupations in London's jobs over time. It shows that in 2001 just over 30 per cent of London's jobs were in managerial or professional occupations. This share is projected to increase to just under 45 per cent by 2036. In contrast clerical and secretarial occupations are projected to decrease from accounting for just under 15 per cent of London's jobs in 2001 to less than 5 per cent in 2036. As shown in Tables 2.3 and 2.4 this decline in clerical and secretarial occupations is seen across all London's sectors.

Qualification projections

Information on the qualifications held by those working in jobs in London is taken from the APS (for the same reason that this source was used for occupations data). It should be noted that in 2011, ONS changed the approach to collecting data on people's highest educational qualifications in order to obtain more information on qualifications obtained abroad, which had previously been reported as 'other'. This change produced a structural break in the time series. GLA Economics has developed a method to project this change backwards for earlier years (see Appendix 5 for more information).

To construct the likely projection of qualifications held by those working in jobs in London a slightly different methodology to that used for occupations was used. The shares of qualification held by occupation is used as a guide to future trends of qualification by occupation. However, given the growth in the numbers of people holding a degree or higher over the past decade or so, using this methodology without constraint would produce, by 2036, largely implausible results (because of the recent, almost explosive, increases in the numbers holding a degree or higher). As a result, the qualification projections were constrained on the basis that the recent growth in graduate degrees is unlikely to be sustainable into the future. Further details of the methodology used can be found in Appendix 5.

A summary of the expected demand for qualifications is presented in Tables 2.5 and 2.6 and Figure 2.13. The number of jobs in London requiring higher degrees is projected to rise by 1.7 per cent per annum over the 2011 to 2036 period. This is largely driven by the projected increase in professional occupations over this

period. The number of jobs requiring ordinary degrees or equivalent is also projected to see large increases, again driven by growth in professional occupations.

Table 2.5: Year-on-Year Change in Qualification Employment within Occupations (2011 to 2036)

	Higher degree	Ordinary degree or equiva-lent	Higher educa-tion	GCE, A-level or equiva-lent	GCSE grades A* - C or equiva-lent	Other qualifi-cations	No qual-ification	Total
Managers and Administrators	1.9%	1.6%	1.0%	0.7%	0.9%	0.5%	-1.0%	1.3%
Professional Occupations	2.0%	1.6%	1.2%	0.9%	1.4%	0.3%	1.8%	1.6%
Associate Professional and Technical Occupations	1.1%	0.7%	-0.1%	-0.6%	-0.3%	-1.6%	-1.1%	0.3%
Clerical and Secretarial Occupations	-2.4%	-3.3%	-3.7%	-5.0%	-5.0%	-8.3%	-8.9%	-4.4%
Craft and Related Occupations	2.9%	2.6%	2.1%	0.6%	1.9%	2.7%	0.8%	1.8%
Personal and Protective Service Occupations + Sales Occupations	1.7%	0.9%	0.5%	0.1%	-0.6%	-0.6%	-1.4%	0.0%
Plant And Machine Operatives + Other Occupations	2.6%	1.5%	0.9%	0.1%	1.0%	0.9%	0.5%	0.9%
Total London	**1.7%**	**1.1%**	**0.6%**	**-0.1%**	**-0.1%**	**0.5%**	**-0.2%**	**0.7%**

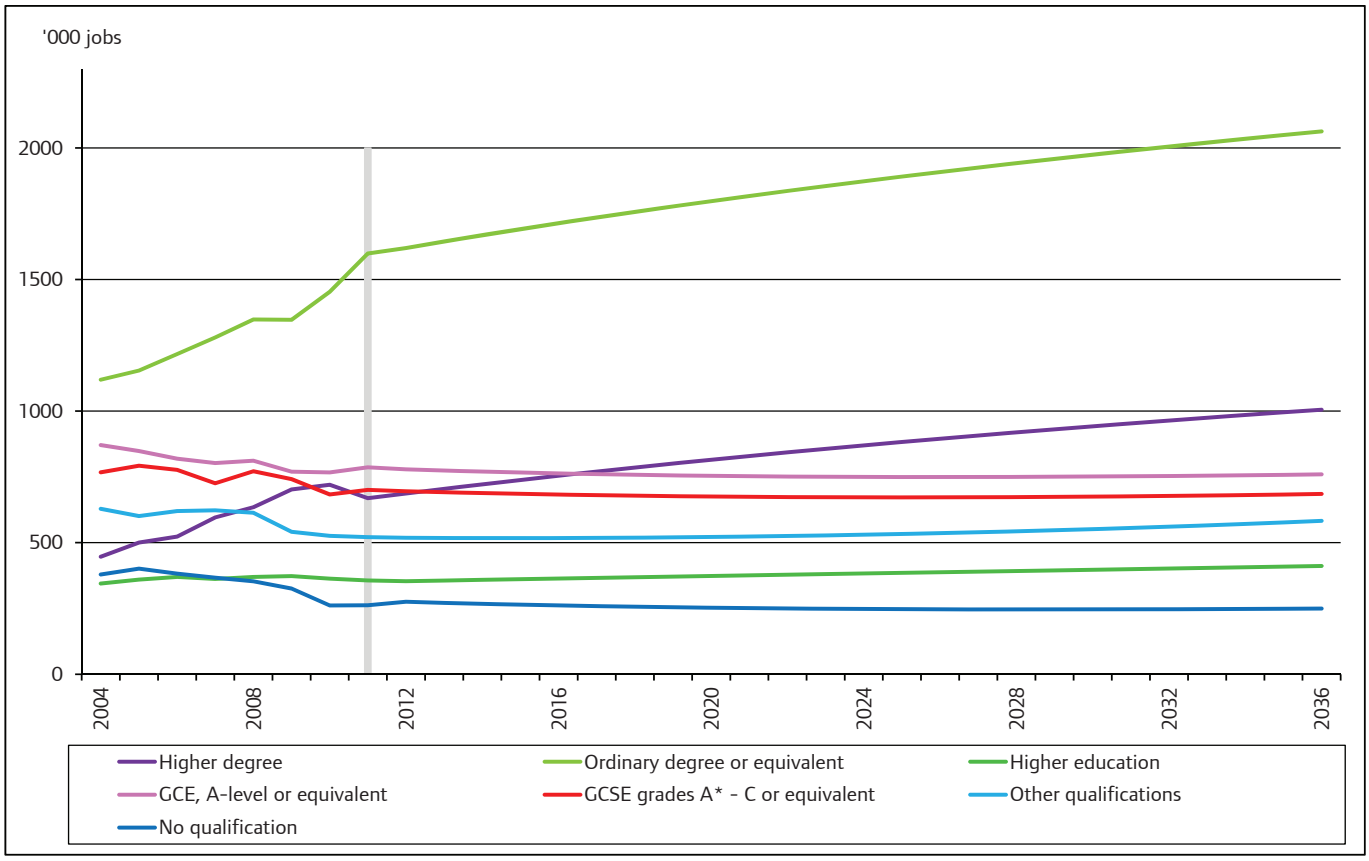
Source: GLA Economics calculations

Table 2.6: Absolute change in qualification employment (jobs) by occupation (000s, 2011 to 2036)

	Higher degree	Ordinary degree or equiva-lent	Higher educa-tion	GCE, A-level or equiva-lent	GCSE grades A* - C or equiva-lent	Other qualifi-cations	No qual-ification	Total
Managers and Administrators	57	116	11	20	18	5	-4	222
Professional Occupations	224	253	30	19	17	2	3	549
Associate Professional and Technical Occupations	40	71	-1	-19	-9	-12	-3	67
Clerical and Secretarial Occupations	-12	-79	-19	-69	-91	-38	-16	-325
Craft and Related Occupations	7	32	16	17	31	65	8	176
Personal and Protective Service Occupations + Sales Occupations	7	27	8	4	-20	-11	-14	1
Plant And Machine Operatives + Other Occupations	13	44	10	2	38	52	14	171
Total London	**336**	**464**	**55**	**-27**	**-15**	**62**	**-13**	**862**

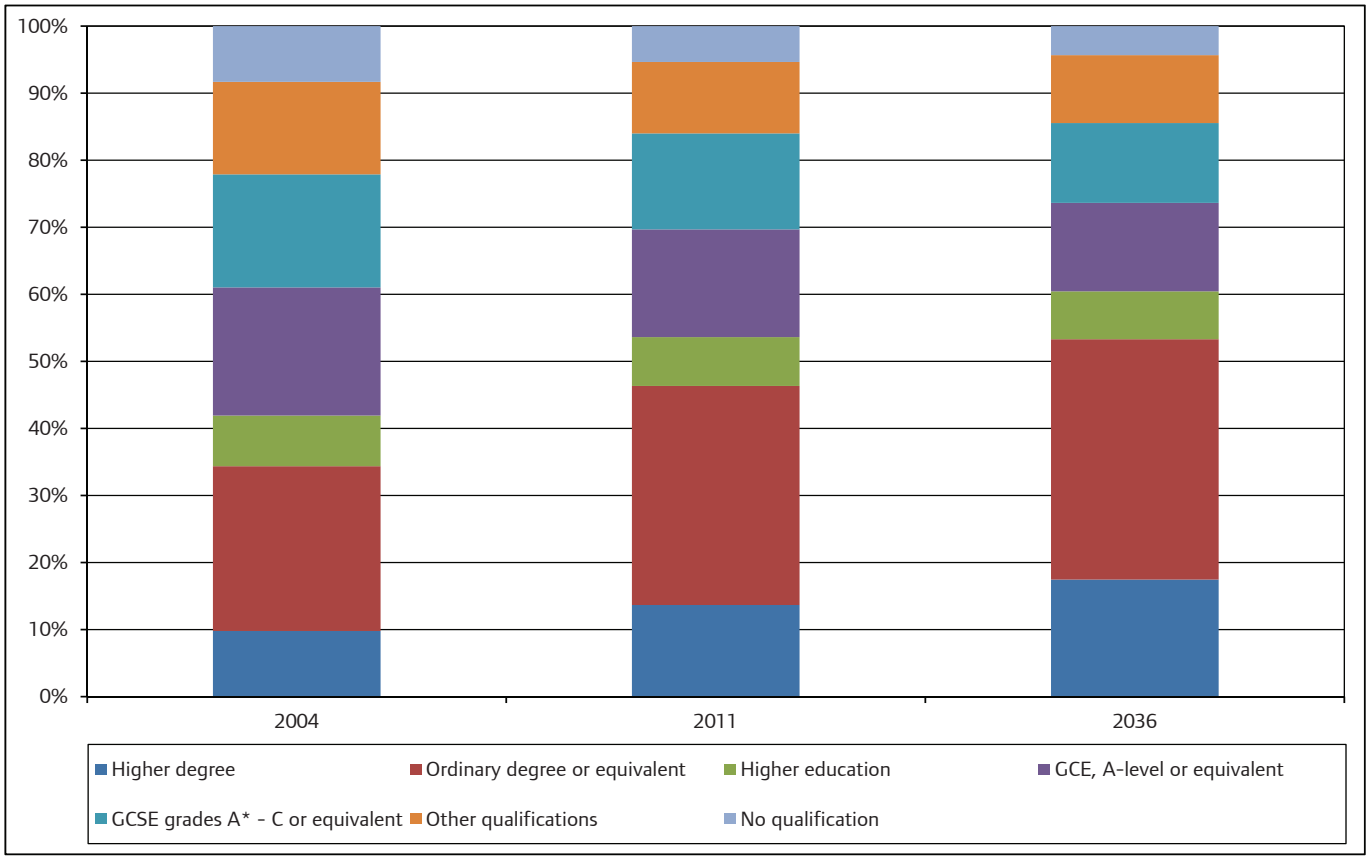
Source: GLA Economics calculations

Figure 2.13: Changes in Qualification Demand (2001 to 2036)



Source: ONS Annual Population Survey, ONS Workforce Jobs series and GLA Economics calculations

Figure 2.14: Shares of qualifications as a percentage of all jobs



Source: ONS Annual Population Survey, ONS Workforce Jobs series and GLA Economics calculations

The proportion of jobs in London requiring either an ordinary or higher degree is projected to reach 53 per cent by 2036 - up from 46 per cent in 2011. The proportion requiring a higher education qualification of some sort or another rises to just over 60 per cent by 2036 (ie just over three out of every five jobs will require a higher education qualification).

Labour market turnover

The earlier employment, occupation and qualification projection sections have provided an outline of the potential future path of the **stock** of employment. Whilst this provides a useful indication of the likely areas of change within the capital's economy, on their own, such projections would provide a misleading picture of the potential future job opportunities and qualification requirements for London's existing and future workforce. This is because the labour market is not a static entity; instead it is subject to significant **flows**.

Over the course of a year, for example, many people leave their jobs for various destinations. Some people will retire, some will choose to leave London (and not commute back in), some will take time off work to have children, some will shift from one occupation or sector to another, some will fall long-term sick and some will die. For the capital's economy to continue to function effectively all these moves out of employment will have to be replenished. The annual out-flow from employment, which needs to be replaced, is sometimes referred to as the level of gross replacement demand. The majority of this gross replacement demand is usually satisfied from within the labour market - for example, by people moving from one job to another, from people returning from long-term sickness or unemployment etc. However, an appreciation of these flows highlights that even in sectors or occupational classes which are projected to be in decline, new staff will be required to replenish those leaving employment and this is likely to derive some training, skill or qualification requirements.

Whilst the concept of labour market churn and replacement demand is a relatively easy one to comprehend, estimating it through modelling with existing data sources is rather more difficult. The methodology used by GLA Economics is outlined in Box 2.2.

Box 2.2: Methodology for modelling replacement demand

Employment flows within the London population aged 16 to 64 were examined between 2001 and 2012 utilising data provided by the ONS (the Labour Force Survey (April to June quarter) was used for this purpose). Data on the proportion of London's employed workforce who left their occupation and data on the proportion entering London's employed workforce was collected for each year. The data available suggest that, for the most part, the proportions leaving for various destinations (or joining from various origins) do not vary significantly over time (accepting some variation for the stage of the cycle). As a result, the proportions leaving employment, and joining employment were averaged over the 2001 to 2012 period. For the purposes of projecting the level of replacement demand, these average 'leaving' and 'joining' rates are assumed to remain constant in future years.

These proportions are then applied to the employment projections outlined earlier to estimate the number of jobs likely to 'turnover' (in terms of changes in occupation) in any single year. Whilst the figures relate to jobs, for ease of exposition, in this section we refer to people moving occupations (whilst accepting this is a simplification).

Turnover by occupation

Table 2.7: Summary of estimated average outflows from occupations in 2012 (using data from 2001 to 2012)

Occupation	Percentage outflow from occupation (%)	Absolute number leaving the occupation
Managers and administrators	9.1	59,800
Professional	6.7	83,100
Associate professional and technical	9.8	91,900
Clerical and secretarial	11.8	56,500
Craft and related	8.9	30,900
Personal and protective services and sales	13.9	87,500
Plant and machine operatives and elementary	13.8	103,300
TOTAL	**10.4**	**512,900**

Source: GLA Economics calculations using data from Labour Force Survey (April to June quarters) and GLA Economics' employment projections

Table 2.7 shows that, using the average rate at which individuals left their occupation over the 2001 to 2012 time period and applying it to the projection for the number of jobs in London in 2012, just over half a million people are projected to leave their occupation in 2012. This illustrates that there is a potentially significant level of education and training requirements each and every year in London's labour market just from replenishing those that leave their occupation within a year - well in excess of that illustrated through the analysis of employment stock projections.

It should be noted that in this analysis, due to data limitations, occupations are used as a means of getting at the potential 'replacement demand' generated through labour market turnover in any given year. However, for a number of reasons, this may well underestimate the actual level of turnover that generates replacement demand and associated education and training requirements. First, this analysis does not pick up any individuals who leave their employment but subsequently take up another job in the same occupation. It is more than likely that at least some of these individuals will have education and training requirements. Second, the data source used for this analysis only looks at changes that occur over the period of a year. It may well be that many individuals change jobs or occupations more than once within the course of a single year, again potentially deriving education and training needs. As a result, the thrust of the labour market turnover analysis is to illustrate the fact that there are likely to be substantial and on-going education and training needs across London's workforce, irrespective of the employment projections set out earlier.

As noted earlier, much of the out-flow from occupations in any single year is replenished by those who may be considered as being within the labour market, for example those moving into employment from other occupations, those moving back into employment from a period of 'economic inactivity' (for instance returning after a period of sickness or after a period of maternity leave), or those moving back into employment from a period of unemployment. Part of the replenishment however comes from what might be considered as 'outside' the labour market - particularly just in replenishing those that leave their occupation within a year from 'in-migration' (that is from outside London's borders) and from education.

Table 2.8: Summary of estimated flows out of, and into, occupations in 2012 (based on data from 2001 to 2012)

Occupation	Absolute number leaving the occupation	Met by internal supply*	Net requirement from education/ new entrants
Managers and administrators	59,800	45,000	14,800
Professional	83,100	65,400	17,700
Associate professional and technical	91,900	78,000	13,900
Clerical and secretarial	56,500	47,600	8,900
Craft and related	30,900	19,600	11,300
Personal and protective services and sales	87,500	66,600	20,900
Plant and machine operatives and elementary	103,300	82,200	21,100
TOTAL	**512,900**	**404,300**	**108,600**
*Note: 'Met by internal supply' means met by all inflows excluding inflows from education or from 16 year olds entering the labour market.			

Source: GLA Economics calculations using data from Labour Force Survey (April to June quarters) and GLA Economics' employment projections

Table 2.8 shows the extent to which the outflows from each occupation are met by other inflows (excluding inflows from education and from 16 year olds). It shows that the vast majority of outflows from each occupation are met by inflows from other occupations, from inflows from unemployment or inflows from other states.

Table 2.9 shows the results of applying the same assumptions to the projected employment levels in 2036. The Table shows that, in line with the projected growth in employment, the amount of turnover in the labour increases as well. The table shows that over 575,000 people are projected to leave their occupation over the course of the year in 2036 - again highlighting the potentially substantial and on-going education and training needs across London's workforce.

Table 2.9: Summary of estimated flows out of, and into, occupations in 2036 (assuming earlier employment stock projections).

Occupation	Absolute number leaving the occupation	Met by internal supply*	Net requirement from education/ new entrants
Managers and administrators	79,500	59,800	19,700
Professional	119,300	93,800	25,500
Associate professional and technical	98,000	83,200	14,800
Clerical and secretarial	19,700	16,600	3,100
Craft and related	46,700	29,600	17,100
Personal and protective services and sales	87,400	66,600	20,800
Plant and machine operatives and elementary	126,700	100,800	25,900
TOTAL	**577,300**	**450,400**	**126,900**
*Note: 'Met by internal supply' means met by all inflows excluding inflows from education or from 16 year olds entering the labour market.			

Source: GLA Economics calculations using data from Labour Force Survey (April to June quarters) and GLA Economics' employment projections

Table 2.9 shows that in spite of the decline projected in some occupations, each year there is likely to be a significant level of turnover in each occupational class - meaning there is a potential requirement for education and training needs across all occupational classes.

Turnover by qualification

As noted above, the level of turnover in the labour market may result in education and training requirements to fill the jobs vacated in any single year. To provide an indication as to the potential education and training requirements derived from turnover in the labour market this section looks at the likely qualification requirements of the jobs vacated in any single year.

This analysis should be considered as indicative only as it relies on some further simplifying assumptions. The main simplifying assumption (made, in part, due to data limitations) is that the qualification requirements of the jobs vacated in any occupation class are the same as the qualification profile for that occupation class as a whole.

Table 2.10: Summary of likely qualification requirements resulting from labour market turnover in 2012 and 2036

	2012		2036	
Qualification level	**Absolute number leaving the occupation**	**Not met by internal supply**	**Absolute number leaving the occupation**	**Not met by internal supply**
Higher degree	56,000	11,900	79,000	17,400
Ordinary degree or equivalent	146,400	31,000	181,100	39,800
Other Higher Education	37,000	7,800	42,500	9,300
'A' level or equivalent	90,000	19,100	87,100	19,200
GCSE Grades A*-C or equivalent	80,800	17,100	79,700	17,500
Other qualification	66,000	14,000	75,200	16,500
No qualification	36,700	7,800	32,700	7,200
TOTAL	**512,900**	**108,600**	**577,300**	**126,900**

Source: GLA Economics calculations using data from Labour Force Survey (April to June quarters) and GLA Economics' employment projections

Table 2.10 shows that in 2012 around 47 per cent of the likely qualification requirement from those vacating their occupation are at the higher education (or higher) level. This requirement is projected to increase to over 50 per cent by 2036.

Nevertheless the main finding from the turnover work is that in any single year there will be a large level of turnover in London's labour market, across occupations and likely across the qualification spectrum as well. This is likely to result in potentially significant education and training requirements over time even in areas projected to decline in employment over time.

3. London's supply of labour

Main findings

- Over the past decade or so, more than 150,000 international migrants have moved to London each year
- This inflow to London's population has been partly offset by an outflow of at least 80,000 London residents emigrating overseas in each year.
- Domestically, in each year over the past decade or so, at least 150,000 people have moved to London from other regions of the UK.
- This inflow to London's population has been more than offset by the more than 200,000 London residents moving to other regions of the UK each year.
- In 2011, those that live and work in London were supplemented by almost 800,000 commuters into the capital, equivalent to around 16 per cent of all jobs in London. This is an increase of around 100,000 over the last decade or so.
- London's population aged between 16 and 64 (London's working age population) is projected to increase from 5.7 million in 2011 to over 6.6 million by 2036.
- The highest qualification level of London's population is projected to continue to increase over time with 44 per cent of London's population projected to have an ordinary degree or higher qualification by 2036 (up from 24 per cent in 1997).
- The economic activity projections suggest there will be an increase of 680,000 in the number of Londoners in employment between 2011 and 2036.
- Using unconstrained population projections suggests London's working age population could increase by 1.2 million over the projection period.
- Applying the economic activity assumptions to this figure suggests that over 800,000 more London residents would be in employment by 2036.

Introduction

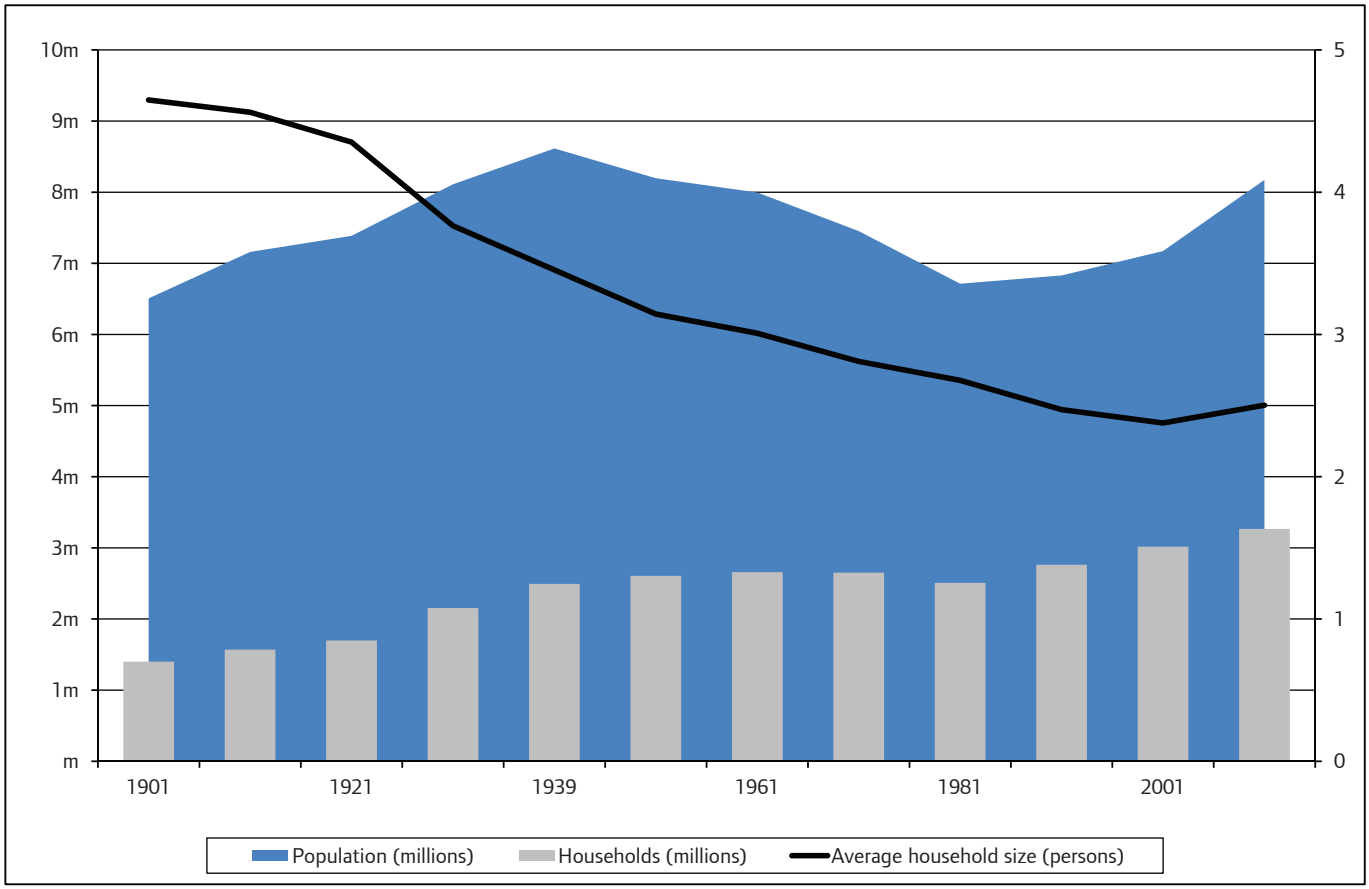
This section starts with a consideration of how London's population has evolved over time. It then looks at a long-run projection for London's working age population and breaks this down by an estimate of those likely to be in work and those likely to not be in work. The analysis also looks at the likely changes in qualifications of the working age population as a result of these projections (again broken down by an estimate of those likely to be in work and those likely to not be in work).

London's population over time

Following a peak in London's total population of 8.6 million in 1939, the post-war period saw the number of people living in London fall steadily to a low of 6.8 million in the early 1980s. Since then the population has followed an upward trend. According to the 2011 Census, London's total population stood at 8.2 million, an increase of 1 million people (or 14 per cent) on the 2001 estimate.

The way people live has also changed dramatically over this period. The London of the 1930s was characterised by larger households with 8.6 million people housed in just 2.5 million households at an average of 3.5 persons per household. In contrast, today's population make up 3.27 million households at an average of 2.5 persons per household.

Figure 3.1: Trends in London's individual and household populations 1901-2011



Source: Census

Of the 8.2 million total, 5.7 million people are aged 16-64; in what follows this group is referred to as the working age population (see Box 3.1). Between 1992 and 2011 the working-age population grew at an average annual rate of just under 1 per cent with a peak of over 2 per cent in 2001 and a low of 0 per cent in 1993.

Box 3.1: Changes affecting the point at which people retire

There are a number of, relatively recent, changes which are likely to increase the point at which people choose to retire.

In recent years, the Government has raised the future State Pension Age for both men and women.

Recent years have also seen a significant decline in the availability of final salary pension schemes and their replacement with, arguably, less generous defined contribution schemes. There has also been a decline in annuity rates over recent times.

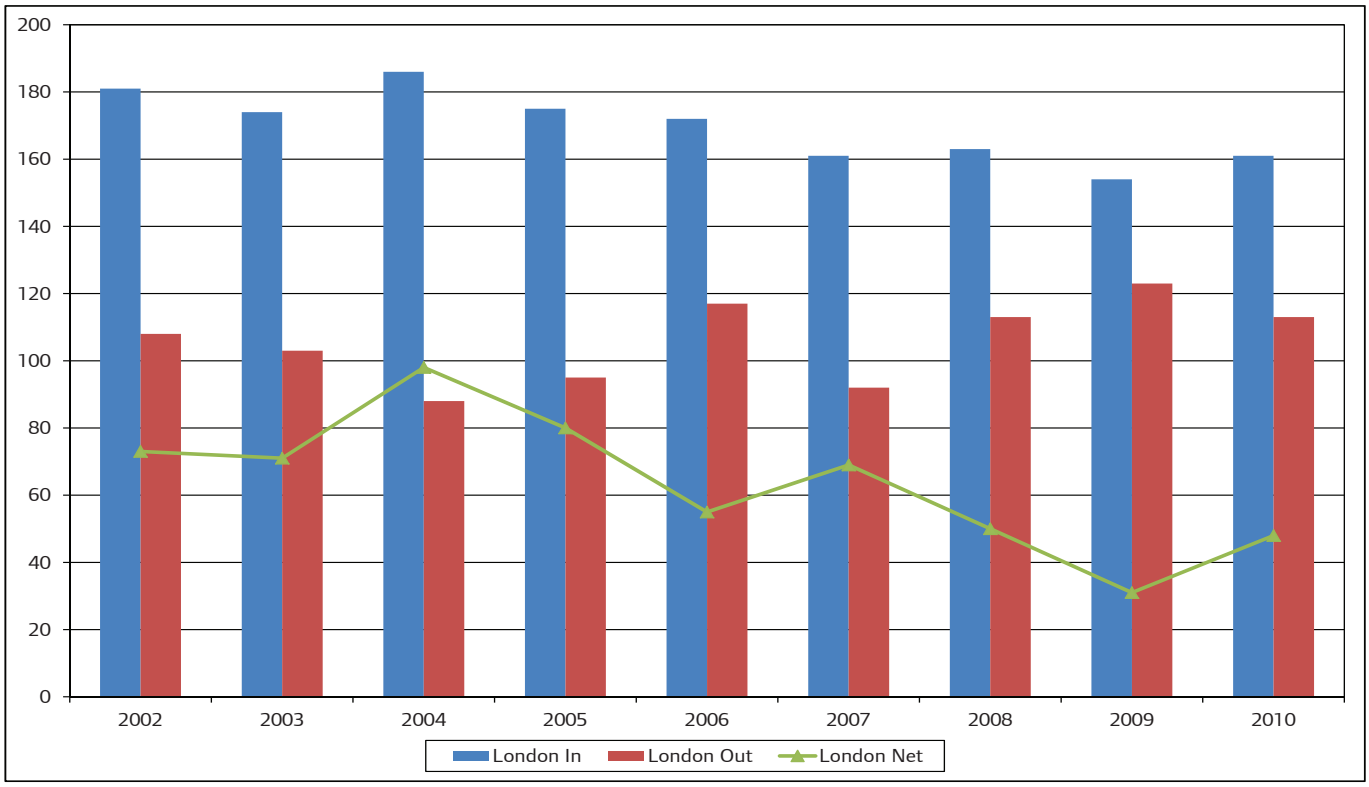
Recent changes around the 'default retirement age' (the Employment Equality (Repeal of Retirement Age Provisions) Regulations 2011) mean that it is possible that many people aged over 65 will continue to work.

These changes are relatively recent such that statistics on their combined impact are rather limited at this stage. In particular, it is difficult to interpret what the exact long-term impact of these changes is likely to be.

For the purposes of considering the supply of labour to London's labour market, analysis has focused primarily on the population aged 16 to 64. In 2011, this age group accounted for around 98 per cent of all jobs in London. However, it is acknowledged that the over 65 age group is likely to play a greater part in London's labour market in the future than it has to date.

The components of change in London's population are complex. The 2011 Census showed London continues to see the results of high fertility rates manifested in the numbers in the size of the pre-school aged population, with six local authorities in the top ten nationally in terms of the proportion of the population aged 0-4. This is the continuation of a decade long trend which will contribute to a swelling working-age population in the coming years. The capital also continues to be a net importer of long-term international migrants (LTIMs). In 2010, inflows of LTIMs to London totalled 161,000 while outflows amounted to 113,000 generating a net inflow of just under 50,000 migrants (see Figure 3.2).

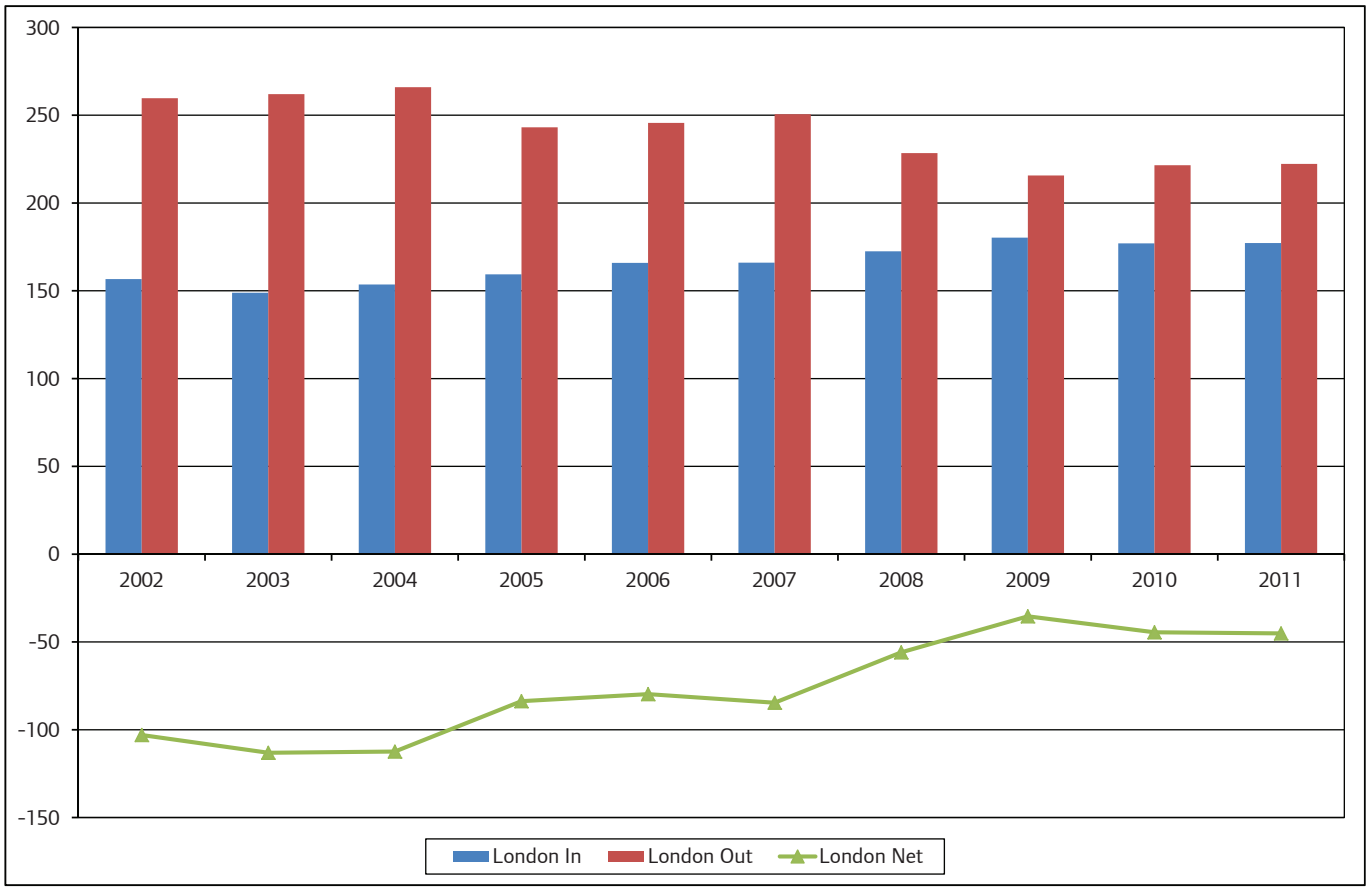
Figure 3.2: Long-Term International Migration, London, 12-month periods ending at quarter 4 of year given, thousands



Source: Long-Term International Migration (LTIM) estimates year ending December 2011, ONS

In terms of domestic long-term internal migrants, London has traditionally been a large exporter, though trends in the numbers arriving in and leaving the capital have converged in recent years resulting in a much smaller outflow of people. In 2003 net outflow totalled 113,000, by 2011 this had fallen to 45,000 (see Figure 3.3).

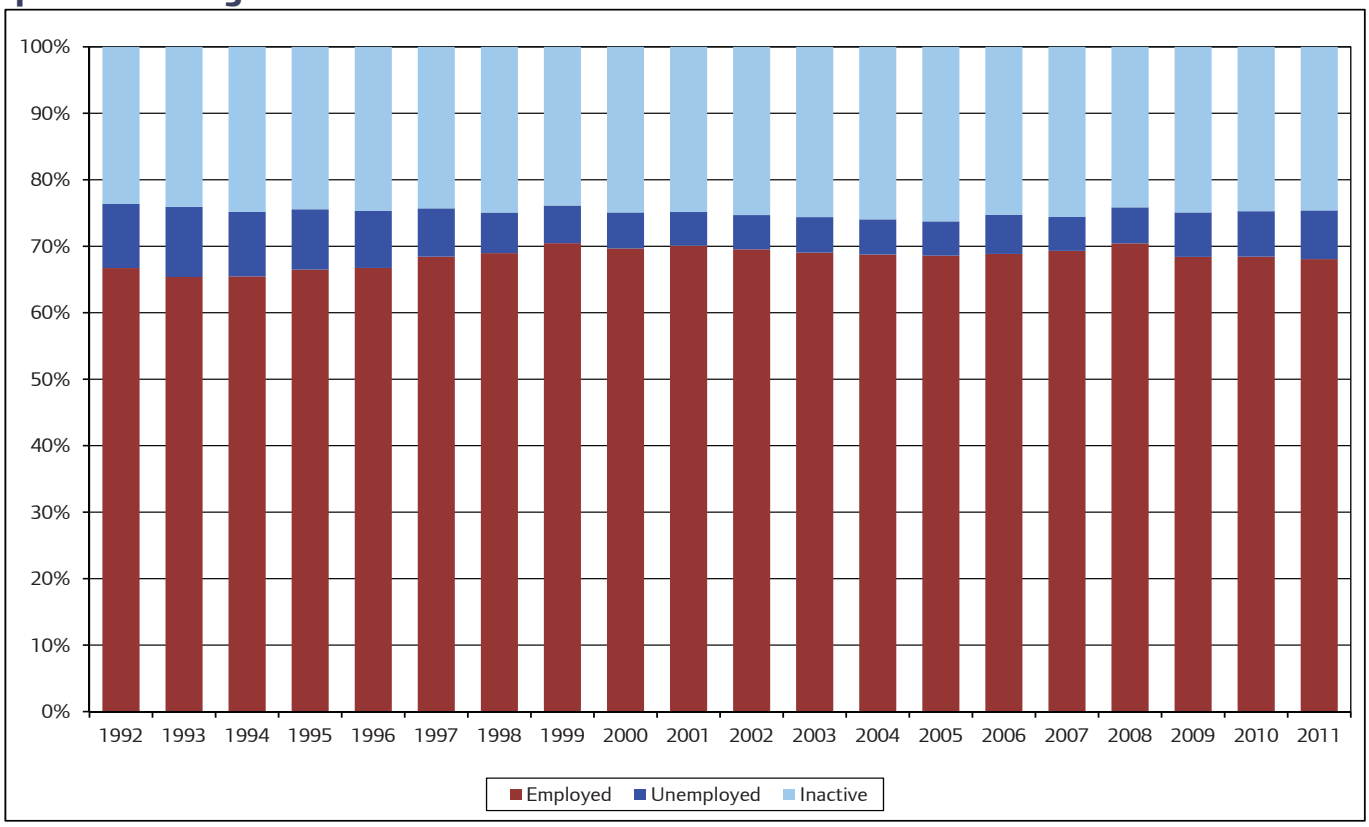
Figure 3.3: Internal (UK) migration, London, 12-month periods ending at quarter 3 of year given, thousands



Source: NHS Central Register moves within the UK and Isle of Man year ending September 2011, ONS/Patient Register Data Service

Figure 3.4 shows London's working aged population by economic status between 1992 and 2011. In 1992, following the 1990s recession, 66.7 per cent of working age Londoners were in employment. This share rose steadily to a 2001 employment rate of 70.1 per cent before falling back during the early part of the last decade and then climbing again to a pre-recession peak of 70.4 per cent in 2008. By 2011, the employment rate stood at 68.1 per cent, the lowest since 1997. However, 2012 has seen more encouraging news in terms of both employment levels and the employment rate. The latest available figures (September – November 2012) show 69.7 per cent of working age Londoners were in employment.

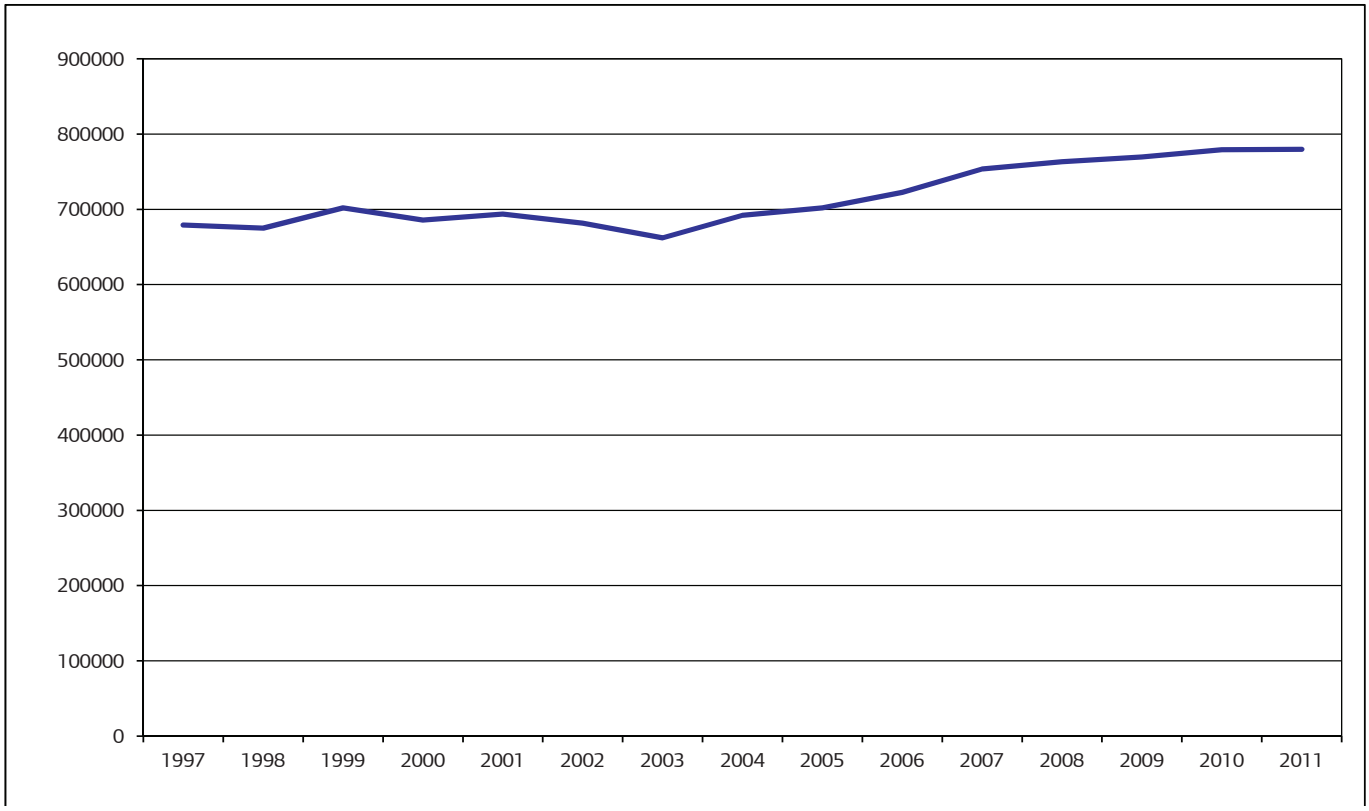
Figure 3.4: London's population aged 16-64 by economic status, 1992-2011, four quarter averages



Source: Labour Force Survey, ONS

However, supply to London's labour market is not restricted to the population resident within its boundaries. In 2011, those that live and work in London were supplemented by almost 800,000 commuters into the capital, equivalent to around 16 per cent of jobs in London.

Figure 3.5: Working-age commuters to London, 1992 – 2011



Source: Labour Force Survey

London's projected supply of labour

Population projections

According to GLA projections, the working age population will surpass the six million mark by 2017. By around 2025 GLA projections show a levelling off of numbers in this age-group, though this is in large part due to a lack of detail surrounding likely future housing stock which acts as a constraint on the GLA projections (see Figure 3.6)[13].

Box 3.2: GLA Population Projections – Methodology

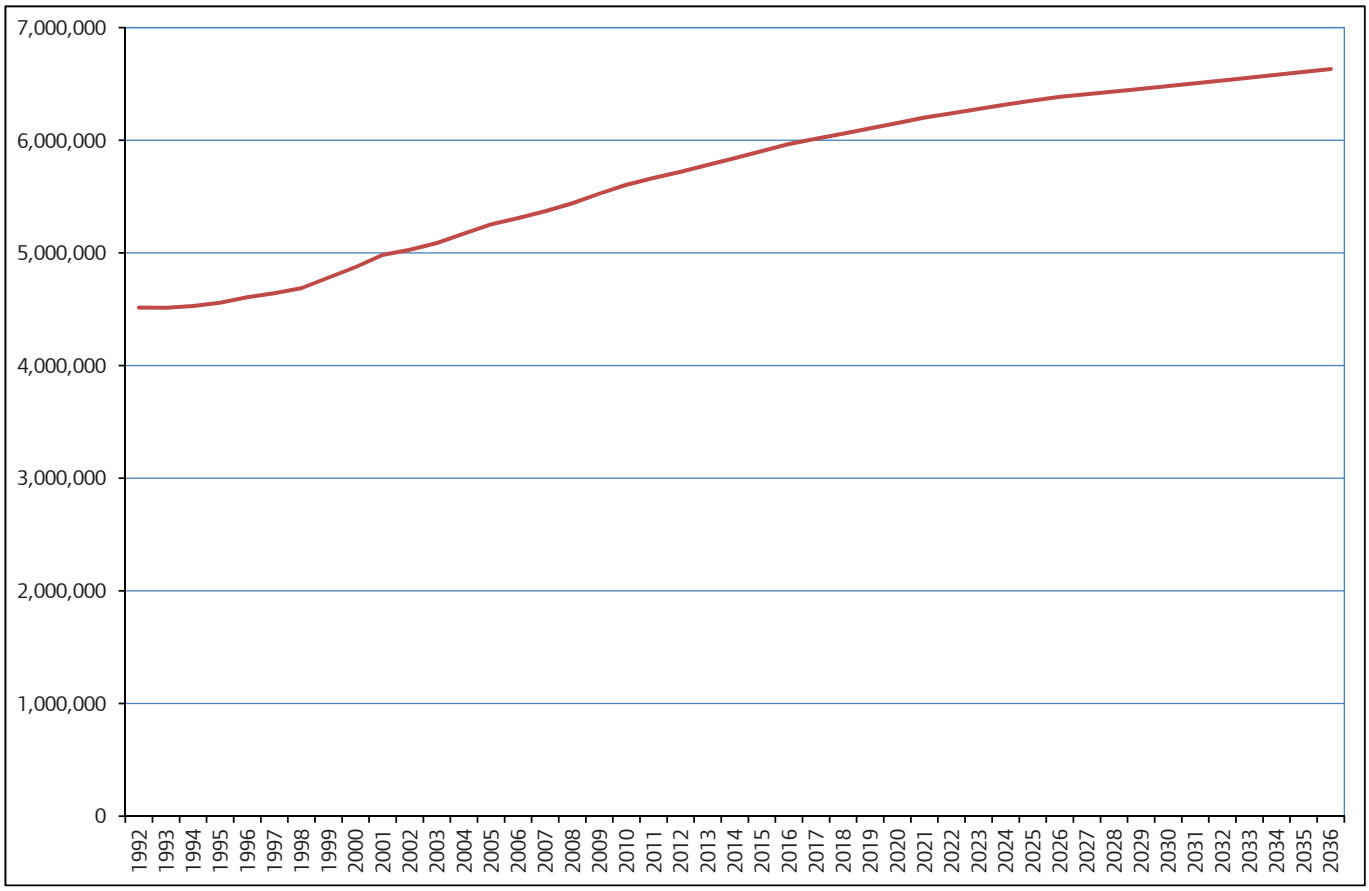
The GLA produces population projections at local authority level for Greater London. For the 2011 round of projections, the 2001 mid-year estimate populations were used as the base population. An initial, unconstrained, projection was produced from this using a cohort component model to apply actual and forecast births, deaths and migration.

This initial projection is then constrained to projected numbers of dwellings. To do this, population projections are converted into households using household formation rates derived from the DCLG 2008-based household projections. The resulting households are compared with the estimates of available household spaces. Migration parameters are adjusted until a population is generated that yields a set of households consistent with the available dwellings.

For these projections, the development trajectories adopted are based on capacity identified in the 2009 Strategic Housing and Land Availability Assesment (SHLAA). Because the trajectories are based upon a limited identified capacity, the annual rate of development declines significantly beyond 2021. Coupled with an assumed decrease in average household size over time, the result is a much reduced rate of population increase beyond 2021 compared with the period up to that point (and compared with the unconstrained projections). More detail on this methodology is set out in Appendix 6.

It is important to bear this feature of the projections in mind when interpreting the results of projecting London's labour market supply and its skills profile since projected shares of economic status and qualification levels are applied to these base populations.

Figure 3.6: London's population aged 16-64



Source: ONS Mid-Year Population Estimates 1992-2000, GLA Population Projections 2001-2036

Economic activity projections

Projections of economic status within the working age population have been produced to give an indication of likely supply to the labour market in future years. The projections split the population into two groups; 'in work' and 'not in work'. To be clear, those 'not in work' are comprised of the unemployed and the economically inactive. These two groups have been aggregated to mitigate issues with sampling variability, particularly among the unemployed which are traditionally the smallest sub-group. In order to project future numbers of each group, the average share of the population accounted for by each group over the period 1992 to 2011 is taken and held constant against the overall working age population projections. The shares are as follows: in work = 68.4; not in work = 31.6.

According to these projections, the number of London residents in work is projected to increase by 680,000 over the projection period. Given the nature of the population projections (ie constraining to housing stock over time), this breaks down into an increase of 386,000 over the next decade but with only 294,000 more in the following decade and a half[14].

Qualification projections

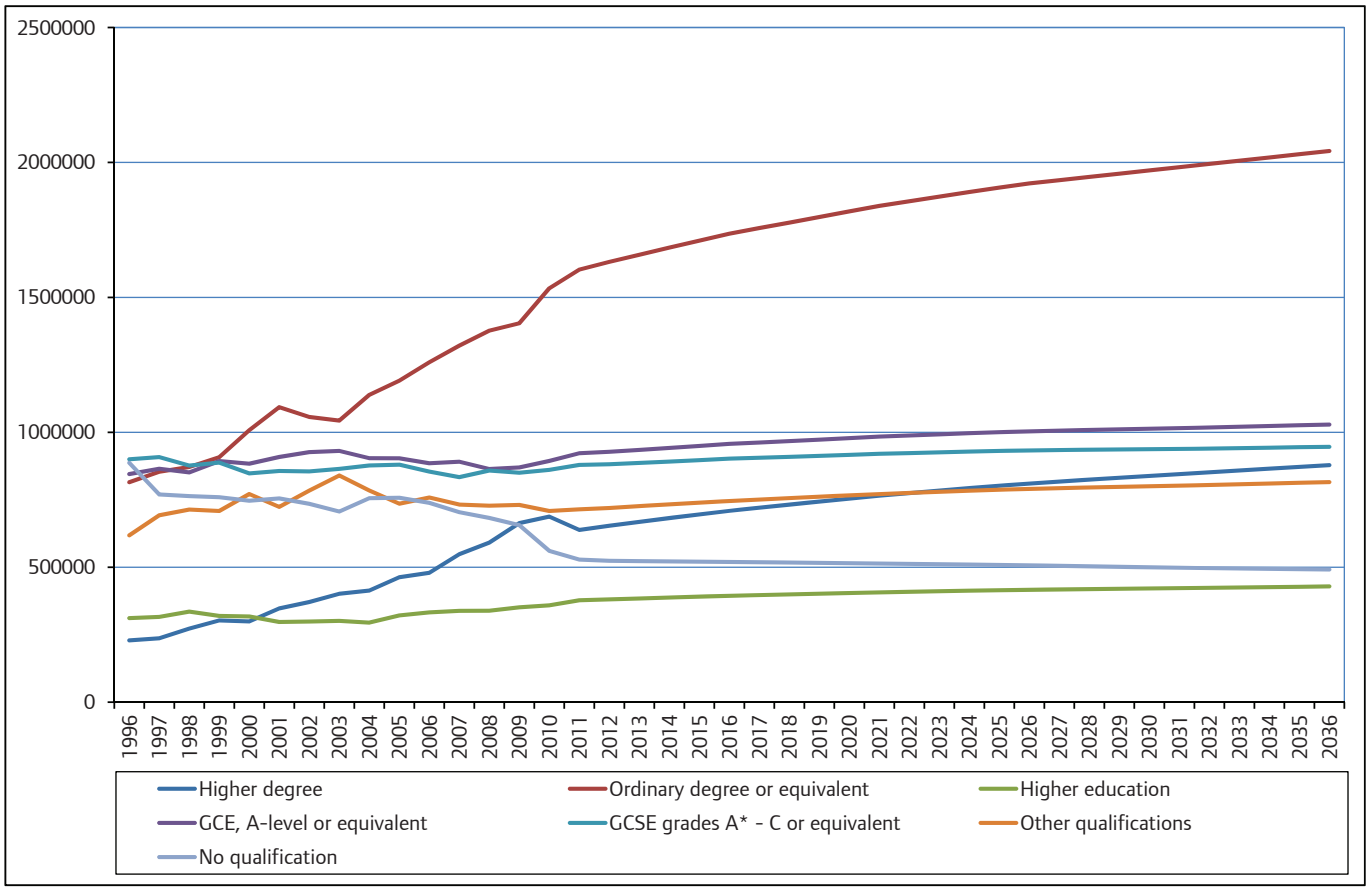
As noted earlier, changes to the approach to collecting data on people's highest educational qualifications in 2011 resulted in a structural break in the qualifications time series (see Appendix 5 for more details).

Projections of the qualification levels of labour market supply use the same methodology as applied to the employment projections with the exception that the projected shares are applied to the population projections discussed earlier in this section. For more information on the method used to project qualification shares please see Appendix 5.

Qualifications of the working age population

London's supply of labour will be more highly qualified in 2036 than it was in 2011. As Figure 3.7 and Tables 3.1 and 3.2 show, the strongest growth in terms of qualifications will occur in the higher and ordinary degree categories with average annual growth rates of 1.3 and 1.0 per cent respectively. This growth will yield an increase of more than 680,000 individuals qualified to at least ordinary degree level between 2011 and 2036. The only qualification category to see a decline in numbers over this period is the no qualification group, where an average year on year change of -0.3 per cent will lead to a reduction of 37,000 in the numbers of people who do not have qualifications by the end of the period.

Figure 3.7: Changes in qualification of the population aged 16-64, London, 2001 – 2036



Source: GLA estimates and projections based on data from the Labour Force Survey and the Annual Population Survey, ONS

Table 3.1: Average year on year change in numbers within qualifications, population aged 16-64, London, 2011-2036, per cent

Higher degree	Ordinary degree or equivalent	Higher education	GCE, A-level or equivalent	GCSE grades A* - C or equivalent	Other qualifications	No qualification	Total
1.3	1.0	0.5	0.5	0.3	0.6	-0.3	0.7

Source: GLA Projections

Table 3.2: Absolute change in qualifications of the population aged 16-64, London, 2011-2036, thousands

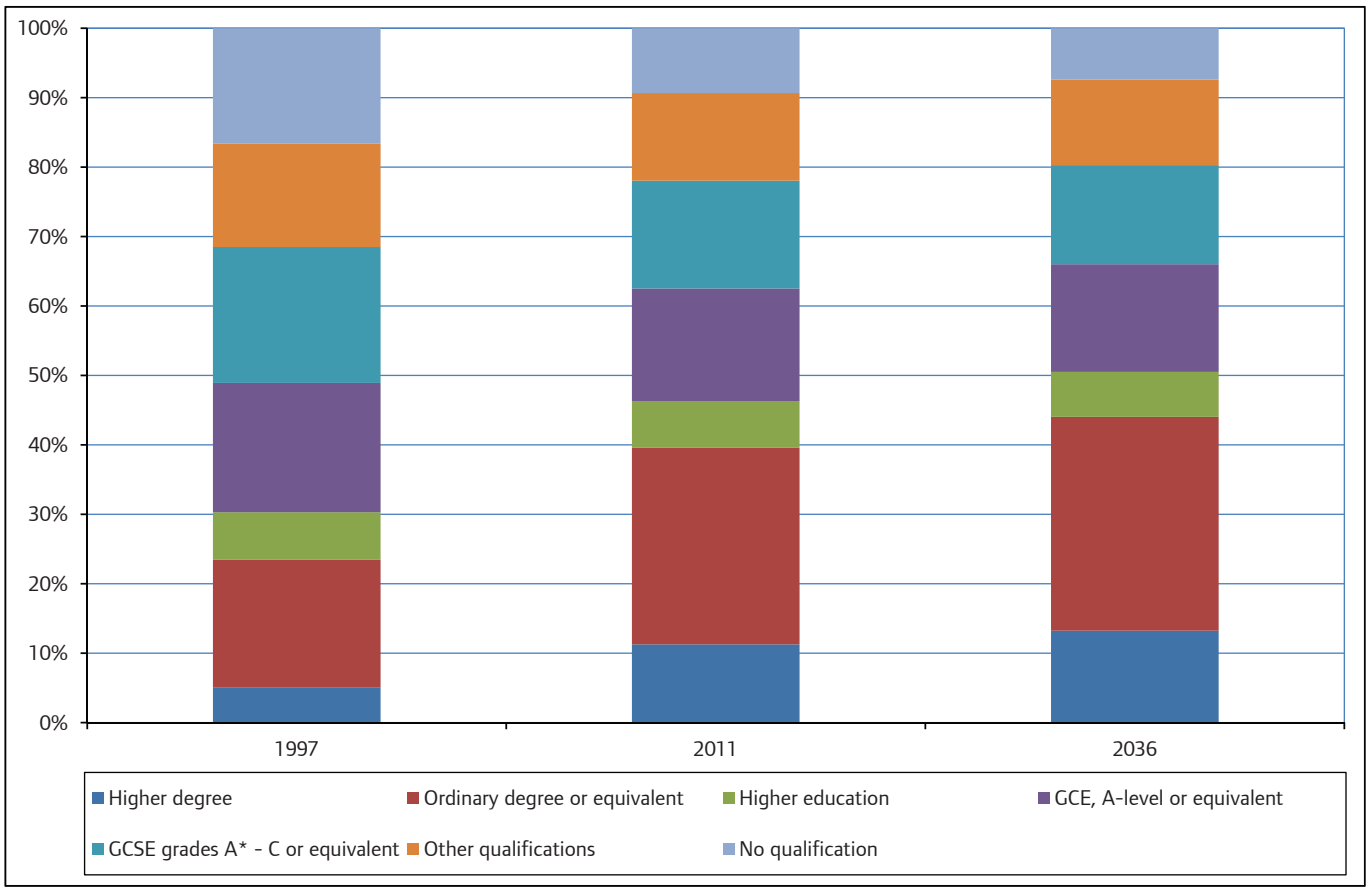
	Higher degree	Ordinary degree or equivalent	Higher education	GCE, A-level or equivalent	GCSE grades A* - C or equivalent	Other qualifications	No qualification	Total
Constrained	240	439	51	106	67	101	-37	968
Unconstrained	267	501	64	138	96	126	-22	1,170

Source: GLA Projections

As a result of the above, the two qualification categories which see the largest increases in their share of the total are ordinary and higher degree. In 1997, the two categories accounted for 23.5 per cent of the total. By 2011, 40 per cent of the working age population were qualified to at least ordinary degree level and by 2036 this will increase still further to 44 per cent. In contrast the largest reduction in terms of qualification share will be those with no qualifications. The proportion without any qualifications will have more than halved from its 1997 share of 16 per cent to 7 per cent in 2036.

The increase in higher education qualifications is considered in more detail in Appendix 7. That appendix looks at the growth in higher education in London in recent years, the type of subjects studied and the quality of some of London's higher education offer. The appendix shows that just over two-thirds of London graduates take employment (or further study) in London following the completion of their studies, though this varies by subject. It shows that London is not an insignificant first destination for many graduates from other Russell Group universities. The appendix also shows some analysis of degree subject (focusing on single degree subjects) by sector.

Figure 3.8: Qualification share as a percentage of population aged 16-64, London, 1997, 2011, 2036

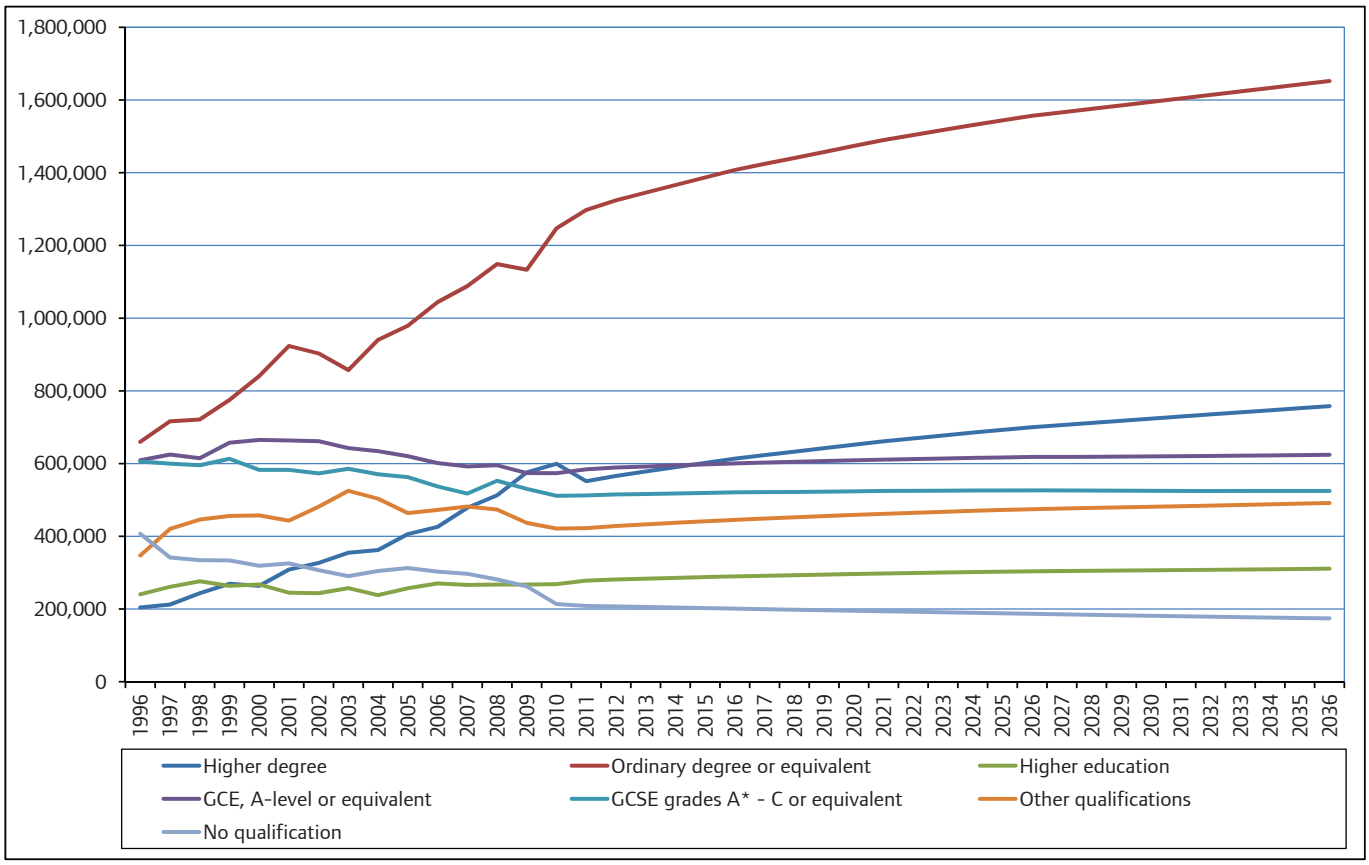


Source: GLA estimates and projections based on data from the Labour Force Survey and the Annual Population Survey, ONS

Qualifications of the in-employment group

There are significant differences within the population in terms of skills profile, with those in work more highly qualified than those who are not in work. As noted earlier, the number of Londoners in work is projected to increase in absolute terms over the projection period. Within this overall increase, separate qualification categories will either expand or contract (see Tables 3.3 and 3.4). For instance, those qualified to at least ordinary degree level are projected to increase by 560,000, however, those who do not have qualifications are projected to see a fall in absolute terms of 34,000.[15]

Figure 3.9: Changes in qualification of the in-employment population aged 16-64, London, 2001 – 2036



Source: GLA estimates and projections based on data from the Labour Force Survey and the Annual Population Survey, ONS

Table 3.3: Average year on year change in numbers within qualifications, in-employment population aged 16-64, London, 2011-2036, per cent

Source: GLA Projections

Higher degree	Ordinary degree or equivalent	Higher education	GCE, A-level or equivalent	GCSE grades A* - C or equivalent	Other qualifications	No qualification	Total
1.3	1.0	0.5	0.3	0.1	0.6	-0.7	0.7

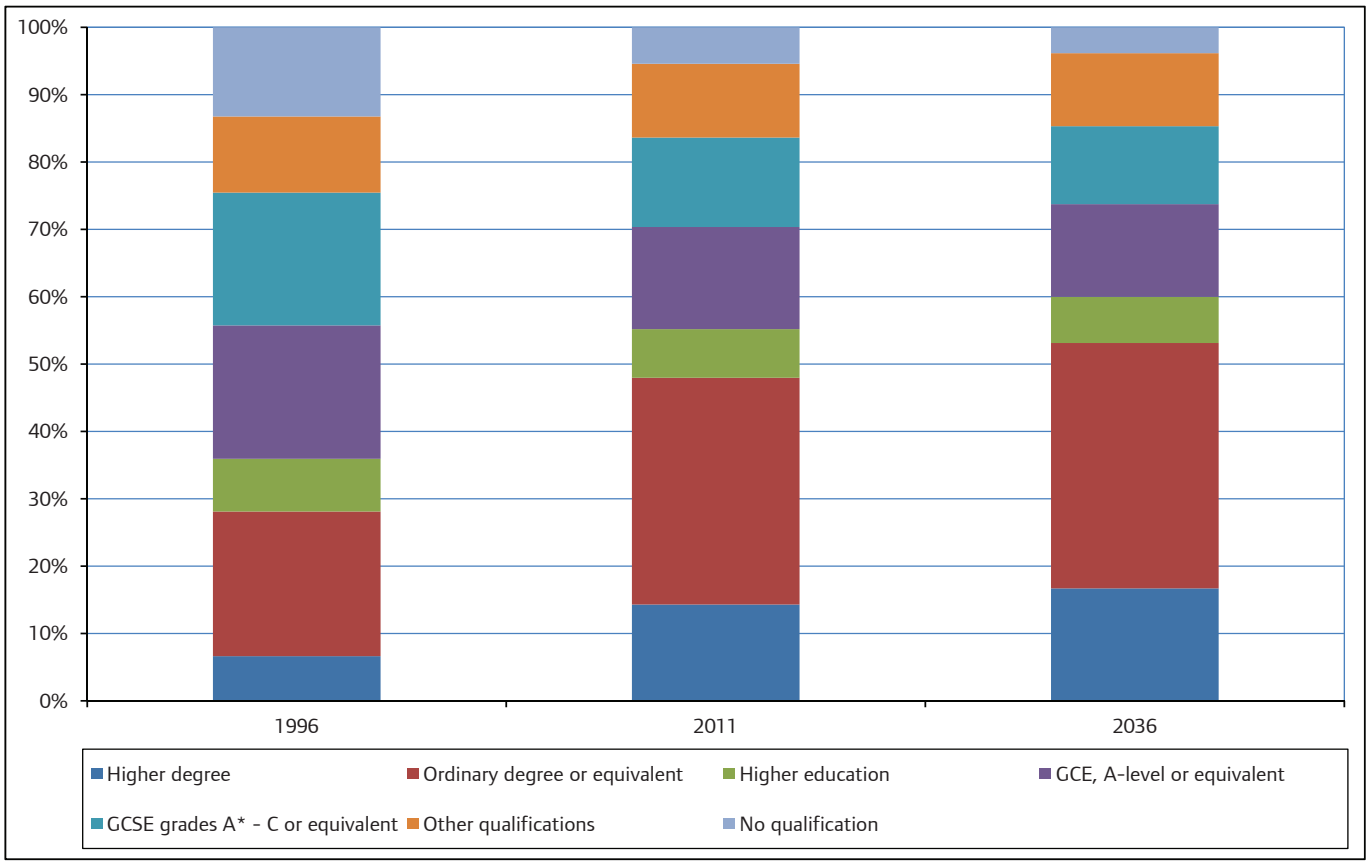
Table 3.4: Absolute change in qualifications, in-employment population aged 16-64, London, 2011-2036, thousands

Source: GLA Projections

	Higher degree	Ordinary degree or equivalent	Higher education	GCE, A-level or equivalent	GCSE grades A* - C or equivalent	Other qualifications	No qualification	Total
Constrained	206	354	33	40	13	69	-34	681
Unconstrained	229	405	42	59	29	84	-29	819

In 1996, taken together, those with an ordinary or higher degree accounted for less than 30 per cent of the total in-employment population, by 2011 this had risen to 48 per cent and by 2018 the share is projected to pass 50 per cent, finishing at 53 per cent in 2036. Again those with no qualifications is projected to see the largest proportional fall in their share of the in-employment total going from 13 per cent to 4 per cent between 1996 and 2036. It is increasingly clear that in order to find paid employment in London an individual is likely to need a qualification of some description (Figure 3.10).

Figure 3.10: Qualification share as a percentage of in-employment population aged 16-64, London, 1996, 2011, 2036

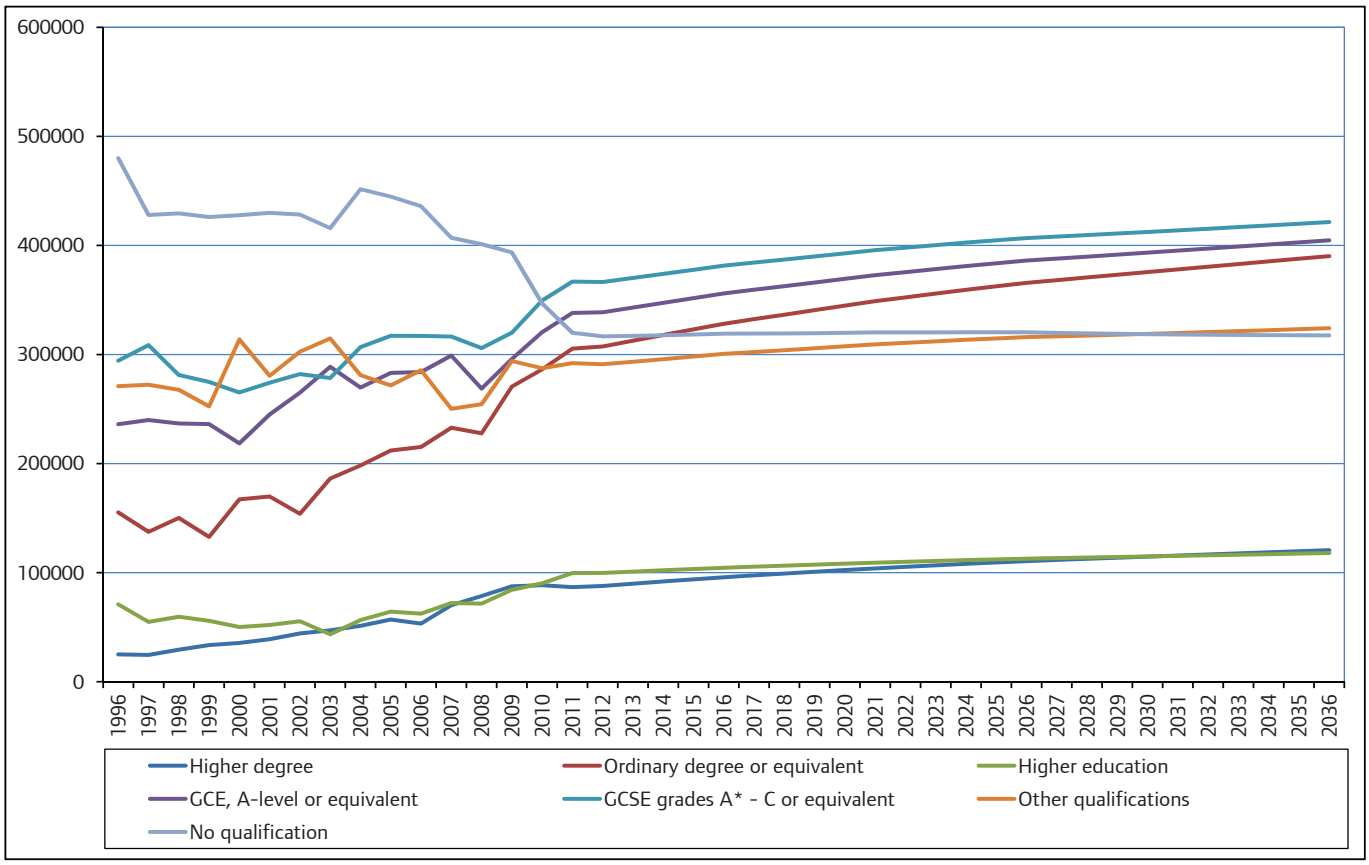


Source: GLA estimates and projections based on data from the Labour Force Survey and the Annual Population Survey, ONS

Qualifications of the not-in-work group

Between 2011 and 2036 the not-in-work, working age population is projected to expand by 288,000 people. As mentioned earlier this group is less well qualified than those who are in work. However, the projections suggest that the skill level of the not-in-work population will improve over the projection period. Those qualified to at least ordinary degree level are projected to account for 24.4 per cent of the total in 2036 compared with 21.9 per cent in 2011. In contrast the share of those without qualifications is projected to fall from almost 18 per cent in 2011 to 15 per cent in 2036.

Figure 3.11: Changes in qualification of the not-in-employment population aged 16-64, London, 2001 – 2036



Source: GLA estimates and projections based on data from the Labour Force Survey and the Annual Population Survey, ONS

Table 3.5: Average year on year change in numbers within qualifications, not-in-employment population aged 16-64, London, 2011-2036, per cent

Higher degree	Ordinary degree or equivalent	Higher education	GCE, A-level or equivalent	GCSE grades A* - C or equivalent	Other qualifications	No qualification	Total
1.4	1.0	0.7	0.8	0.6	0.4	0.0	0.6

Source: GLA Projections

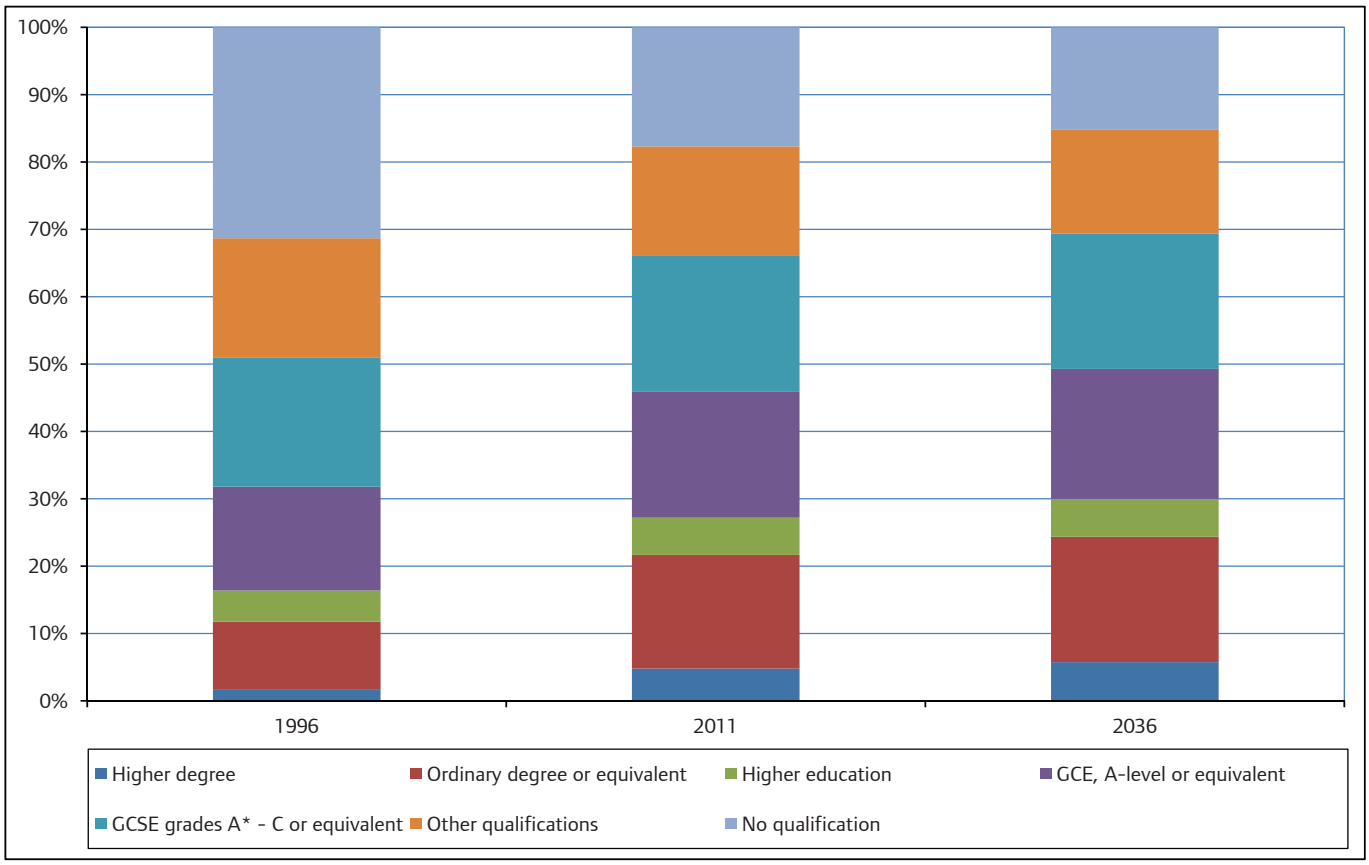
Table 3.6: Absolute change in qualifications, not-in-employment population aged 16-64, London, 2011-2036, thousands

	Higher degree	Ordinary degree or equivalent	Higher education	GCE, A-level or equivalent	GCSE grades A* - C or equivalent	Other qualifications	No qualification	Total
Constrained	34	85	18	67	55	32	-2	288
Unconstrained	38	97	22	79	67	42	7	352

Source: GLA Projections

Figure 3.12 shows the gradual trend in improved qualification levels among the not in work population. The proportion qualified to at least ordinary degree level will double between 1996 and 2036, whilst the share of those without qualifications halves over the same period. There is comparatively little change among other qualifications groups.

Figure 3.12: Qualification share as a percentage of not-in-employment population aged 16-64, London, 1996, 2011, 2036

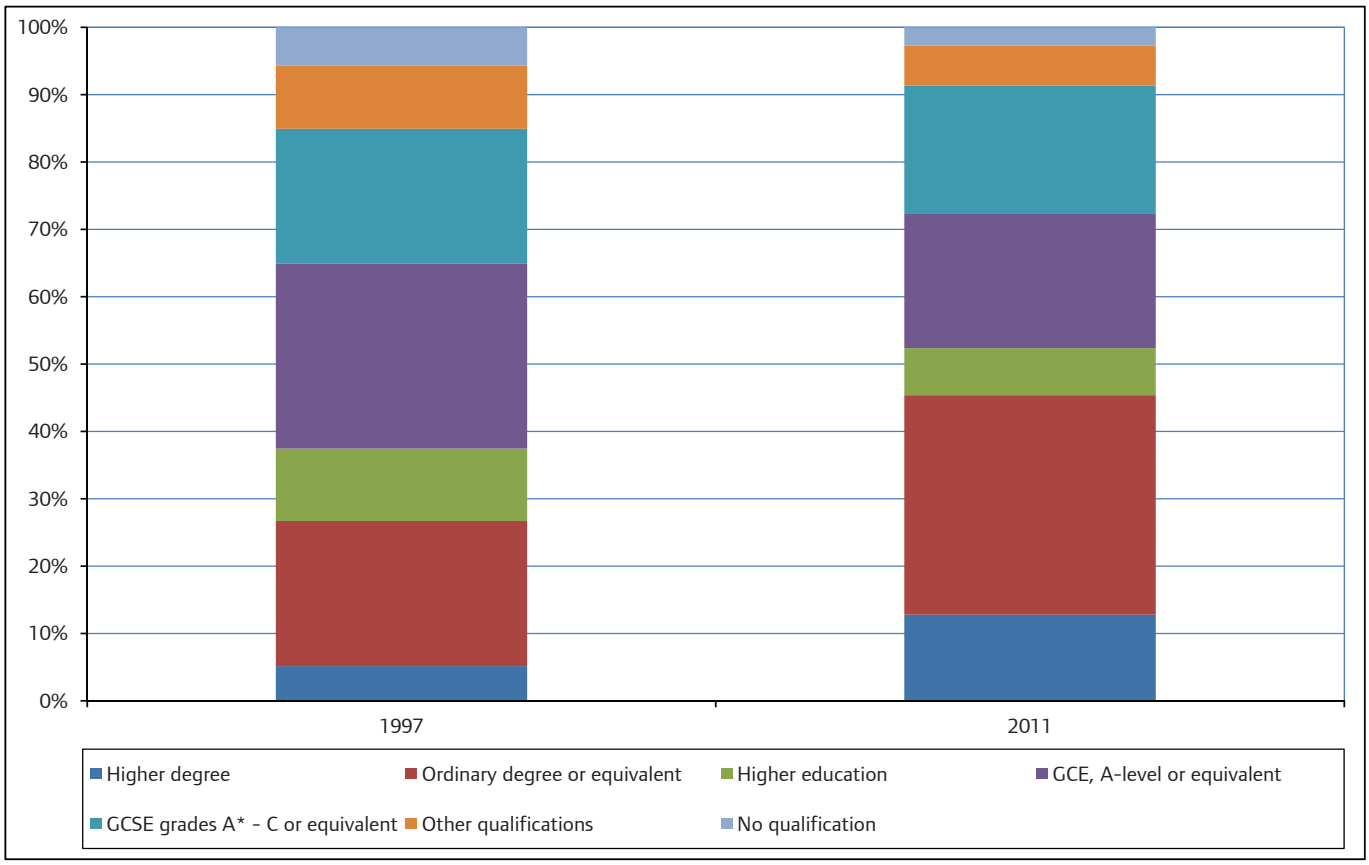


Source: GLA estimates and projections based on data from the Labour Force Survey and the Annual Population Survey, ONS

Qualifications of commuters

Commuters are an important component of supply to the London labour market and in 2011 accounted for around 16 per cent of the capital's jobs. Figure 3.13 shows that commuters to the capital (those that are employed in Greater London but are resident outside its boundaries) have become increasingly highly skilled over the last 15 years. Those qualified to ordinary degree level or higher accounted for 46 per cent of the commuter population in 2011 compared with 27 per cent in 1997. This is broadly similar to the equivalent share among those who are both employed and resident in London. All other qualification categories have seen a decline in share over this time with the partial exception of those whose highest qualification is GCSE where there has been a fall in share of just one percentage point.

Figure 3.13: Qualification share as a percentage of the in-commuter population aged 16-64, 1997 and 2011, per cent



Source: ONS Labour Force Survey and Annual Population Survey

4. Assessment of the balance between demand and supply of labour in London

Main findings

- The employment projections show an increase in the number of jobs in London of 861,000 between 2011 and 2036.
- London's working age population, in employment, is projected to increase by 681,000 between 2011 and 2036.
- Taking account of potential future trends in the employment of older workers and commuting, suggests that the level of jobs projected for London's economy and the population projections are largely consistent with a balanced labour market (in terms of quantities).
- The employment projections show an increase in the number of jobs requiring degree level or higher qualifications of 800,000 between 2011 and 2036.
- The number of London residents qualified to degree level or higher and in employment is projected to increase by 560,000 between 2011 and 2036.
- Taking account of potential future trends in the employment of older workers and commuting (at degree level or higher), suggests that the level of jobs projected for London's economy and the population projections are largely consistent with a balanced labour market (in terms of quantities), albeit with potentially some increase in the employment rate of London residents qualified to degree level or higher.

Introduction

This section brings together the employment projection analysis set out in Section 2 and the population projection analysis set out in Section 3 to consider the extent to which the demand for and supply of labour are in balance over the projection period.

Overall balance of demand and supply for labour

The employment projections set out in Section 2, show an increase in the number of jobs in London of 861,000 over the projection period.

Section 3 shows that London's working age population is projected to increase by almost one million over the 2011 to 2036 period. The economic activity assumptions used in that Section suggests this breaks down into an increase of 681,000 London residents in work and 288,000 not in work.

If, for the purposes of this section we assume that each job matches to one person[16] then there are around 180,000 extra jobs to be accounted for as between the two sets of projections (ie 861,000 - 681,000). There are a number of ways that these 'extra jobs' could be accounted for. For instance, the jobs could be accounted for: by London residents - raising the employment rate in London[17]; by commuters - increasing the level of commuting into London from outside its boundaries; and, by an increase in the employment of older workers (ie those aged 65 or over).

Taking each of these possibilities in turn, if all the jobs were taken by London residents then it would lead to an increase in the employment rate of just under 3 percentage points.

If, instead, all the jobs were taken up by an increase in commuting then the level of commuting into London from outside its boundaries would increase by around 23 per cent over the projection period (25 years). This compares to an increase in commuting of around 15 per cent over the past 14 years or so.

An increase in employment for the 65 and over age group is a realistic proposition given the forces acting to encourage longer working lives (see for instance Box 3.1). If all the 'extra jobs' were taken by those aged 65 or over it would lead to a near three-fold increase in the employment of this age group over the projection period (equivalent to an increase in this age group's employment rate of around 12 percentage points).

Perhaps more realistically these 'extra jobs' are likely to be accommodated by a combination of all three of these factors in combination with price signals from the market (in terms of changes in wages over time). To that end, analysis using a number of different assumptions about the future growth in commuting and the employment of older workers suggests that a variation in the employment rate of London residents of between +/- 2 percentage points is likely to be sufficient to see the labour market in balance. Whilst, the extent to which the labour market will be in balance in 2036 will depend on a range of factors, this analysis suggests that, broadly speaking, the employment projections and population projections do not appear to be wildly inconsistent with one another in terms of London's future labour market balance.

The demand and supply for degree or higher qualifications

In terms of qualifications, the employment projections suggest an increase in demand for degree or higher level qualifications of 800,000 over the projection period. The population projections suggest an increase in the number of London residents at degree or higher, in-work, of 560,000.

Again this suggests the need to account for around 240,000 jobs as between the two projections. Similarly to the analysis above these 'extra jobs' could be accounted for through an increase in the employment rate of London residents qualified to degree or higher; an increase in commuters qualified to degree level or higher; and, an increase in the employment of older workers with a degree or higher level qualification.

Analysis using a number of different assumptions about the future growth in commuting and the employment of older workers suggests an increase in the employment rate of London residents qualified to degree level or higher of between 0.5 to 7 percentage points is likely to be sufficient to see the labour market in balance. Whilst, the extent to which the labour market will be in balance in 2036 will depend on a range of factors, this analysis suggests that, broadly speaking, the employment projections and population projections do not appear to be wildly inconsistent with one another in terms of London's future labour market balance at this qualification level.

Unconstrained population projections

The analysis of the balance of demand and supply has to this point considered the GLA's constrained population projections.

The analysis is largely similar when using the unconstrained population projections. Looking at total labour market balance - the growth in jobs of 861,000 can largely be accounted for by London residents in employment (growth of 819,000). This suggests little requirement for jobs to be taken by either increased commuting or older workers. In the unconstrained population scenario there is, therefore, a greater likelihood of a slight reduction in London residents' employment rate (to account for any increase in older worker employment or commuting) when compared to the constrained population projection scenario.

In terms of qualifications, the growth in degree or higher level jobs (of 800,000) can largely be accounted for by London residents in employment (634,000). The unconstrained population projection scenario suggests there is less pressure on the employment rate of London residents qualified to degree or higher to increase than in the constrained population projection scenario.

Glossary

Claimant count unemployment

The claimant count records the number of people claiming Jobseeker's Allowance (JSA). People claiming JSA must declare that they are out of work but capable of, available for, and actively seeking work during the week in which the claim is made. This administrative measure will be affected by the forthcoming transition to Universal Credit.

Claimant count unemployment rate

The number of claimant count unemployed residents in an area expressed as a percentage of the sum of claimants and workforce jobs in the area. Published at national or regional level.

Commuter

In this document a commuter is someone who crosses over the Greater London boundary for the purposes of accessing a workplace on a regular basis.

Default Retirement Age

Between October 2006 and September 2011 a Default Retirement Age of 65 was in force, meaning that employers could not retire employees below age 65 unless the decision could be 'objectively justified'. In October 2011, the Default Retirement Age was abolished and it became illegal to retire an employee of any age without objective justification.

Demography/Demographics

Demography refers to the scientific discipline that deals with aspects of population – including change, births, deaths, and migration. It often involves making projections of future populations levels and structural compositions.

Economic activity

Economically active people are those adults who are actively engaged in the economy and are in, or are seeking work. In strict terms we include people of working age who are either in employment, or are unemployed but actively seeking work and are available for work.

Economic activity rate

The economic activity rate is the proportion of a population engaged in economic activity. It is conventionally measured by dividing the economically active by the population of working age. Activity rates can also be calculated for specific groups such as males or females or for age groups.

Economic growth

The increase in the value of goods and services produced by an economy and usually measured (at the London level) by GVA.

Economic inactivity

Economically inactive people are those adults who are not employed or actively engaged in seeking work such as retirees, students, people looking after the family home and the sick and disabled. In strict terms, the economically inactive includes those not in employment, not classified as unemployed (by the ILO measure), or not either actively seeking work or available for work.

Economic inactivity rate

The economic inactivity rate is the number of economically inactive people expressed as a percentage of the total working age population. It can be calculated for any population group.

Employee

Someone who works for a person or organisation other than themselves. The relationship between employee and employer is usually defined by a contract of employment, which sets out the obligations of each party. An employee job is one held by an employee, or which is vacant, waiting to be filled. An employee may hold more than one employee job (e.g. two part-time jobs).

Employment

Generally, employment includes both those who are contracted into employment (employees) and the self-employed. There are also two ways of looking at employment: the number of people in employment or the number of jobs. These two concepts represent slightly different things, as one person can have more than one job. People aged 16 or over are classed as employed by the Labour Force Survey (LFS), if they have done at least one hour of work in the reference week surveyed or are temporarily away from a job (e.g. on holiday). Employed people can be classified into one of four categories: employees, self employed, unpaid family worker (doing unpaid work for a family-run business) or participating in a government supported training programme. Much of the demand side analysis in this document uses the concept of jobs.

Employment rate

Employment rates can be presented for any population group as the proportion of that group who are in employment. The main presentation of employment rates is the proportion of the population of working age who are in employment.

Expansion demand

Expansion demand is the need for new employees as a result of net growth in economy. It is a product of both expansion and contraction in total employment in employing organisations. For example, if in the London economy the manufacturing sector decreased employment by 30,000 employees, yet the financial services were expanding their total number of employees by 80,000 – the economy's total expansion demand would be the difference of the two: 50,000 employees.

Forecasting

Forecasting is concerned with the production of estimates of future events. They can be based on the output of econometric models, based on previous performance and patterns, assumed to be a guide to the future, or they can be based on individuals' (e.g. employers, analysts) views on what is likely to happen. Forecasts should always be used with care, increasingly so as they become more detailed or localised, or try to look further into the future. It is never possible to predict the future with absolute certainty: there are many uncertainties, as well as gaps in our knowledge and understanding of past and present performance as a guide to future events. Sudden shocks or changes are also by their nature unpredictable.

Further education institutions (FE(I))

Usually a college, delivering post-compulsory education and courses, often of a vocational nature.

Gross value added (GVA)

GVA is the total value of output of goods and services produced in an area less 'intermediate consumption' (the value of goods and services used to produce the output).

Higher education institution (HEI)

A Higher Education Institution is an organisation that delivers courses of higher education qualifications and degrees. A higher education institution is usually a university but also sometimes specific schools and institutes whose purpose is to provide higher-level education which is accredited by a university.

Higher education statistics agency (HESA)

The Higher Education Statistics Agency (HESA) is a central body responsible for collecting and compiling statistical data on Higher Education establishments in the UK. HESA was set up in 1992 and receives data from all the UK universities. These data are held centrally and analysed to give trends in higher education. HESA collects three main streams of records from its institutions, related to: student data; staff data; and finance data. Website: http://www.hesa.ac.uk

Household

A single person or group of people living at the same address as their only or main residence, who either share one meal a day together or share the living accommodation (i.e. a living room).

Human capital

Human capital is a loose catch-all term for the practical knowledge, acquired skills and learned abilities of an individual that make them potentially productive and thus equip him or her to earn income in exchange for labour. Varying levels of past investment in human capital provides one of the main explanation for the size of wage and salary differentials among individuals.

ILO unemployment

The ILO (International Labour Organisation) definition of unemployment is the internationally agreed definition, used by the Statistical Office of the European Union (Eurostat), the Organisation for Economic Co-operation and Development (OECD), and many other countries, including the UK. Under ILO guidelines, all people aged 16 and over can be classified into one of three states: in employment; ILO unemployed; or economically inactive. ILO unemployed people are:

- without a job, want a job, have actively sought work in the last four weeks and are
- available to start work in the next two weeks or
- out of work, have found a job and are waiting to start it in the next two weeks.

In general, anybody who carries out at least one hour's paid work in a week, or who is temporarily away from a job (e.g. on holiday) is in employment. Those who are out of work but do not meet the criteria of ILO unemployment are economically inactive.

Index

A method of showing numbers relative to a fixed base (often 1 or 100). In labour market data, it is often used to show changes in a variable (e.g. unemployment) in different areas over a period of time, starting from a fixed point, e.g. January 2010. Using employment as an example, if an index over three years were created, with January 2010 chosen as the first point (i.e. set as 100), and unemployment halved over the period to January 2012, the index value at that point would be 50.

Industry

Industry is used in economics terms to categorise the activity of an employing organisation and is also referred to as a sector of the economy.

Labour demand

Demand is generally the quantity of a good or service that people wish to buy. Labour demand refers to the total number of workers or even working hours required by employers, and is usually measured in this document by the number of jobs. Demand is influenced by the customer's (employer's) purchasing power, the price of the good or service (the wages and other costs of employing someone) and the availability of alternatives (e.g. machines).

Labour force

The labour force is the number of people potentially available for work and is sometimes also called the economically active population. The size of the economically active population is given as those people on the labour market at any time, and includes those in work and those seeking work. It does not have to be restricted to working age people. Often, some people that are older than retirement age remain economically active.

Labour market

Labour refers to actual and potential people's input into economic production. Actual in terms of people in work, potential in terms of people who are not in work but could notionally work. A market is an organised exchange between buyers and sellers of a good or service. The labour market is the mechanism, or market place in which buyers and sellers of labour engage. The term labour market is not so strictly defined in practice and usage though – it is used widely in its broadest sense to cover a wide range of issues that are concerned with labour and the market for labour over time, and generally is concerned with elements of labour supply and labour demand, and how these interact. For example, we are still interested in children and the subjects they study as this has implications for labour supply in the future.

Labour supply

The labour supply is made up of the total of workers making their services available to employers. The supply of labour is determined by a number of factors, including the population of working age, their economic activity rate, the number and nature of available jobs, wage levels and the influence of alternative sources of income. Individuals can offer varying levels of times and days they will work, skills and experiences they can potentially provide an employer with, or attach various conditions to making their labour available (such as working hours, pay and other benefits).

Labour turnover

Labour turnover is the total of both the inflow and outflow of workers employed by an enterprise. Workers may leave an employer for reasons of changing job, caring responsibilities, retirement, or even death. Employers may dismiss their employees because of poor performance, or because they are no longer required due to changes in technology or demand. Even where a company's headcount is static, a significant percentage of the workforce will often leave and be replaced over the course of a year.

London Plan

The Mayor's spatial development strategy for Greater London.

Migration

Migration is the movement of people between different areas. There can be "push" and "pull" reasons for migration. In labour market usage, the availability of suitable employment opportunities is a major factor influencing migration.

'Not in work'

All those of working age who are either unemployed or who are in some way economically inactive. This is a far wider definition than just those who are 'unemployed'.

Occupation

Occupation is a classification or description of a job, type of job, job title or job role. For example, 'nursing' would be described as an occupation. When discussing occupations, their names usually infer details about the kind of work performed or job – a set of tasks or duties, usually structured by employers; and the levels and types of skill deployed in the job.

Officially, the UK government sets out systematic classifications of occupations in its Standard Occupational Classification (SOC). When analysing the labour market and aspects of employment, SOC is often used to divide up people or employees by the types of job they do.

Office for National Statistics (ONS)

The Office for National Statistics is the UK government agency responsible for collection and publication of official statistics. In 2008, ONS became independent and answerable to the UK Statistics Authority. As the UKs largest statistical producer, it is at the centre of the UK statistical system. A wide range of information, guides and statistics can be accessed at: http://www.ons.gov.uk/ons/index.html

Productivity

The value of output (goods and services) produced per unit of input (productive resources) used. Thus an increase in productivity means producing more goods and services with the same amount of resources, or producing the same goods and services with fewer resources, or some combination of these two possibilities. While productivity is often measured or referred to only in terms of the productivity of labour (output per man-hour), a more precise and complete view of the sources of productivity incorporates the effects of all inputs to production, including capital, land and materials.

Projections

Projections is a term often used to refer to estimates of future values of future performance of the economy. Projections can commonly be an extension of existing trends. They are commonly differentiated from forecasts - which may include fluctuations and cycles - by being linear and constant. Projections are often used for demographics, which are much less subject to short-term fluctuations and changes than business and economic trends.

Qualifications

In a labour market context, a qualification is an endowment or achievement (often formally certified) that demonstrates an individual's competence and proficiency in a specified area of activity. Qualifications are often used as conditions of entry to particular jobs, and sometimes as a proxy for measuring the broader and more amorphous concept of skills. However, not all skills require or lead to qualifications, and vice versa.

Replacement demand

Replacement demand is demand for new employees created by the need to replace employees that permanently leave their jobs because they retire, are deceased, migrate from the area, or move to another occupation.

Russell Group

Initially established in 1994 as a group of 19 leading universities in the UK engaged in public research. In 2012 the Group admitted five new members, all of which had previously been members of the '1994 Group' of smaller universities established in response to the formation of the Russell Group.

Sampling error/variability

When surveys of people, organisations and businesses, are conducted most of the time only a proportion of them are surveyed. It is often unrealistic to survey absolutely everyone – they may not all respond and reply, and it may be too costly. So a sample of the population is taken and the results are interpreted as indicative of the whole population. However, there is a risk that surveying a subset of the population cannot be guaranteed to be exactly representative of the full group's views, actions, or characteristics. Therefore there is the likelihood of some kind of variability or sampling error. Careful design of surveys and choice of sampling techniques can reduce the likely extent of variability but it can never be eliminated. The likely size of sampling error can be estimated using mathematical and statistical techniques.

Seasonally adjusted

Features of the labour market that statistics are collected on, such as unemployment are affected by seasonal influences like weather, the opening and closing of schools, holidays and other seasonal events. Seasonal events will hide underlying trends that could be significant for interpreting an economic time series. Removal of seasonal influences from the statistical counts should allow for assessing only the real changes over time, thus allowing for a better analysis of the more important underlying reasons for month-to-month changes.

Self-employment

Self employed individuals work for themselves and generally pay their National Insurance themselves. The self-employed can be sole traders, or business owners, including partners. Unlike those with employee-status jobs, the self-employed generally will not have a formal contract of employment with the organisation contracting their services.

Skill(s)

At its broadest level, a skill is a special ability to do something. In the context of the labour market it relates to a special ability to perform a task in work. In defining what a skill is, it is not a clear and unambiguous concept – for example a skill may be a personal characteristic such as friendliness (for use in work tasks that require customer contact); or it may be learnt such as numeracy. A skill can be simple and easy to learn, or it may be very complex and require many years to learn.

As a result, skills can be difficult to measure – qualifications are sometimes used to indicate types and levels of skill, but the two concepts are not the same. An individual can have a skill without it being represented by a qualification. Some skills are hard to accredit to qualifications, especially personal characteristics or attributes.

Standard deviation

The standard deviation offers some measure of the 'closeness of fit' of a calculated average to the population or set of values that it is calculated from. For example, calculating the standard deviation in the weekly hours of full time employees will show how well the average (40 hours in 2002) captures the diversity of working weeks: if the cases are clustered together (i.e. most people work close to the average of 40 hours), the standard deviation is small. When the examples are spread far apart (i.e. if the average is based on a wide variety of results) there is a large standard deviation.

Standard error

The standard error is an estimate of the scale of the standard deviation, and a means of expressing the accuracy and reliability of results from a random sample survey. The standard error of a statistic depends on the sample size. In general, the larger the sample size the smaller the standard error, although the error cannot be completely removed.

Standard Industrial Classification (SIC)

Standard Industrial Classifications (or SIC) is a method of classifying industries into certain groups or categories by activity according to an established standard set by the UK government. The Standard Industrial Classification sometimes uses letters or codes as shorthand to describe the type of industry – for example, you may find an industry referred to as SIC61 rather than by its name or title (Telecommunications). This analysis has used SIC(2007).

Standard Occupational Classification (SOC)

The Standard Occupational Classification (SOC) is a classification system used to define occupational areas and job types according to an established standard set by the UK government. The structure of the SOC is based on two main concepts:

- the kind of work performed or job – a set of tasks or duties, usually structured by employers
- the concept of skill – defined for as the skill level - the complexity of the tasks and duties to be performed; and skill specialisation – the field of knowledge required for competent, thorough and efficient conduct of the tasks.

State pension age

The age at which someone can claim a state pension, although people can choose to defer the receipt of their state pension beyond this age. Currently the state pension age for men is 65. It was 60 for women until 5 April 2010, but women's state pension age began to increase thereafter and will reach 65 by November 2018. In reality, people do not necessarily retire at state pension age – they can and do retire if they are younger or older.

Time series data

Time series data are values or results obtained over intervals of time. They are usually gained from the measurement of one variable (e.g. the number of people in employment), using the same method over consistent intervals of time. An example of time series data would be the Labour Force Survey (LFS) results that have been used to track unemployment on a consistent basis every quarter since 1992.

Training

Training is the process of coaching in or accustoming an individual to a mode of behaviour or performance; or to make proficient with specialized instruction and practice. In the labour market context it refers to the process of improving workforce skills, either by employer instruction or by educational institutions, on or off the job, and with or without formal qualifications.

UCAS points score

A means of differentiating students at A level and other post-GCSE examinations. For example, at A-level an A* counts as 140 UCAS points whereas an E grade at AS level counts as only 20 UCAS points. The system is not used universally by UK universities.

Unemployment

Unemployment, in terms of its use to describe a group of people whom we may be concerned about, it is more correctly described as 'people who are not in work or employment but who want to work'. However, there are a variety of ways of precisely classifying and measuring it. Unemployment has long been one of the most difficult and contentious of labour market statistical measures. In the UK there are two key statistical measures of unemployment - that of the International Labour Organisation (ILO) and the Claimant Count.

The most widely recognised definition of unemployment is that of the ILO, the measure used by the Labour Force Survey. This records as unemployed, those who have undertaken no paid work in reference week (i.e. when they are interviewed), are starting, or are available to start work in the next fortnight and have actively sought work in the preceding four weeks. No account is taken of the individual's age, family status or eligibility for unemployment related benefits. This definition is commonly referred to as ILO unemployment.

The Claimant Count is an administrative measure of those eligible for unemployment related benefits, i.e. Jobseekers Allowance, National Insurance credits. Those eligible for these benefits do not include all those in the ILO measure and the eligibility criteria for the relevant benefits have been altered over time. Therefore, the claimant count is often seen as a partial measure of unemployment. It is, however, free from sampling errors (it is a 100% count) and is available for very small geographical areas and by age and duration of benefit claim.

Unit wage costs

The Office for National Statistics calculates unit wage costs as the average of total wages and salaries per job.

Wages

Wages (and earnings) relate solely to financial income from paid work, e.g. salaries and bonuses but not including non-financial perks. These terms are not synonymous with income, which is a more widely encompassing definition, including benefits, share dividends and bank/building society interest, etc. Only limited official information is available on earnings at the local level, mostly related to average hourly and weekly earnings.

Workforce

The number of people available for work. A generic term that can be used in reference to a country or area, a particular type of work, or even an individual organisation.

Workforce jobs

Workforce jobs are calculated by summing employee jobs, self-employment jobs from the Labour Force Survey, HM Forces and government-supported trainees. They are a measure of jobs rather than people. For example if a person holds two jobs, each job will be counted in the workforce jobs total.

Working age

Working age is defined in this work as all those aged between 16 and 64.

Workplaces

A specific site or geographic location where people are employed. Workplaces differ from enterprises, employers or organisations - which may be a collection of workplaces controlled from a central point. This can affect the way statistics are gathered: for example, employees at a local workplace may be recorded by their employer's registered address, which may be in a different area.

Office for National Statistics data sources

Annual Population Survey (APS)

The APS uses data combined from two waves from the main Labour Force Survey (LFS) with data collected on a local sample boost. The data sets comprise 12 months of survey data and are disseminated quarterly. The achieved sample size is approximately 320,000 respondents. The APS provides information on the same topics as the LFS but, because of the larger sample size, more detailed breakdowns can be produced including analyses of industry sector and occupation at the London level.

Business Register Employment Survey (BRES)

BRES publishes employee and employment estimates at detailed geographical and industrial levels. It collects comprehensive employment information from businesses in England, Scotland and Wales. Independently collected Northern Ireland data are then combined to produce estimates on a UK basis. BRES uses the IDBR as its sampling frame.

BRES is regarded as the definitive source of employee and employment statistics by industry. Employment is obtained by adding the number of working owners to the number of employees employed by a business. In terms of data, the survey sample of approximately 80,000 businesses is weighted up to represent the GB economy covering all sectors.

One of the strengths of BRES is that estimates are provided at detailed geographical levels. It should be noted BRES is a sample survey and produces estimated employment figures. These estimates are of a good quality at higher levels of geography (for example region), but the quality of the estimates deteriorates as the geographies get smaller.

BRES is an annual publication. The first BRES estimates were for 2009 and were published in December 2010. Both BRES, and the Annual Business Inquiry part 1 (ABI/1) which it replaced, are snapshots; they are not designed to be used as time series figures.

Inter Departmental Business Register (IDBR)

The IDBR is a list of about two million businesses registered in the UK and contains data on employment, business size and financial performance. It is used for selecting samples for surveys of businesses and to produce analyses of business activity, location and size. It is maintained largely by updates from HM Revenue & Customs, Companies House and surveys conducted by ONS specifically for maintaining the Register.

The IDBR covers all parts of the economy, but misses some very small businesses and some non-profit making organisations. It provides more than 99% coverage of economic activity. For research purposes, the IDBR allows detailed analysis of employing organisations and workplaces in terms of numbers of enterprises, employment and turnover. Further analysis can be undertaken by industrial classification, location and legal status.

Labour Force Survey (LFS)

The LFS is the largest regular household survey in the UK. It collects information about the personal and economic circumstances of those interviewed, including age, gender, employment and unemployment, skills and qualifications and pay.

The sample is made up of approximately 41,000 responding UK households per quarter. Respondents are interviewed for five successive waves at three-monthly intervals and 20% of the sample is replaced every quarter. The LFS is designed to be representative of the entire population of the UK.

The LFS is conducted using standardised techniques under the auspices of the International Labour Organisation (ILO), making EU and international comparisons possible. It provides the official measure of unemployment using the ILO definition (see Glossary).

Mid-Year Population Estimates

The Mid-Year Population Estimates refer to the population that is usually resident on 30 June of the reference year. They are published annually. This product is the official set of population estimates for the UK and its constituent countries, the regions of England and Wales and for local authorities, consisting of a consistent time series of annually published estimates from 1981 onwards. The estimates are compiled using the cohort component method and a combination of registration, survey and administrative data sources.

Estimates for Mid-2011 are based on results of the 2011 Census, updated to the mid-year reference date. Estimates for Mid-2002 to Mid-2010 for England and Wales have been revised in line with the 2011 Census and were published on 13 December 2012. Revisions for estimates at sub-national level are planned for publication in Spring 2013.

Regional Gross Value Added (GVA) statistics

Regional Gross Value Added (GVA) is a legal requirement of the European Union (EU) statistical body, Eurostat. Estimates are compiled in compliance with the European System of Accounts 1995 and are consistent with the standards set out in the United Nations System of National Accounts 1993. They are published annually in December.

GVA is the value generated by any unit engaged in the production of goods and services. It is measured at current basic prices, excluding taxes (less subsidies) on products. GVA plus taxes (less subsidies) on products is equivalent to Gross Domestic Product (GDP).

Regional GVA is measured using the income approach, which involves adding up the income generated by resident individuals or corporations in the production of goods and services. It is calculated gross of deductions for consumption of fixed capital, which is the amount of fixed assets used up in the process of production in any period.

The GVA estimates are shown by Nomenclature of Units for Territorial Statistics (NUTS) regions. NUTS is a hierarchical classification of spatial units that provides a breakdown of the EU's territory for producing comparable regional statistics.

Workforce Jobs (WFJ) series

WFJ is a quarterly measure of jobs in the UK and is the preferred measure of short-term employment change by industry. It is a compound measure that draws on a range of sources and is the sum of Employee Jobs (EJ), Self-Employment Jobs (SEJ), Government-Supported Trainees (GST) and Her Majesty's Forces (HMF). The London jobs series compiled by GLA Intelligence uses the EJ and SEJ components of the WFJ series.

The WFJ series is a measure of jobs rather than people. For example if a person holds two jobs, both jobs will be counted in the total.

The components of the WFJ series come from different sources: EJ is measured primarily by employer surveys, SEJ is from the LFS and GST and HMF are from administrative sources. EJ, which is by far the largest component, comes mainly from the Short Term Employment Surveys (STES). The sample for STES is approximately 24,100 businesses per quarter. In common with other business surveys conducted by ONS, the sampling frame for WFJ is the IDBR.

Further information on ONS sources is available at:

www.ons.gov.uk/ons/guide-method/method-quality/quality/quality-information/index.html

Appendix 1: Caveats and issues to be aware of

This appendix sets out some of the most significant limitations which readers should bear in mind when considering the results from the analysis in this paper.

GVA data

Data on London's GVA is used in developing the employment projections. However, there is no official source of real GVA available at the regional level. Instead, nominal GVA data is produced by the Office for National Statistics (ONS) on an annual basis (although with a significant lag - London's nominal GVA for 2011 was released in December 2012 for example). The regional GVA series is available from 1997 onwards. As a result, a number of assumptions about London's GVA have to be made in the development of employment projections - namely how to produce a real GVA series for London for available data and how to best estimate London's GVA prior to 1997 (and for most recent data where this is not available from official sources).

Employment data

The time horizon to be considered by the next London Plan is the period to 2036 - almost two and a half decades away. To project employment over this period with a reasonable degree of confidence, a significant historical period of data would be desirable. Instead, official data on London's employment over time is only available on a consistent basis back to 1996. As a result, using official data only, 16 years of historic data would be used to project employment 24 years into the future. GLA Economics has developed a consistent employment time series for London jobs back to 1984 using ONS business surveys (in particular Workforce Jobs series) and the Labour Force Survey. Whilst this provides 28 years of historical data, this length of data is far from ideal when projecting forward employment. Similar issues are encountered when producing estimates of employment by industry sector on a consistent basis over time.

Occupation data

The ONS's Workforce Jobs series – which is the main source of data for the historical series of London jobs by sector – does not contain information on occupations. Such information has to be derived from alternative survey sources: ONS's Labour Force Survey and the Annual Population Survey. These only provide a time series for occupations on a consistent basis from 2001. In addition, whilst estimates of occupations by sector can be produced from this source, because of its sample size at the London level, some of these estimates are subject to significant sampling variability. As a result, a relatively limited amount of data has been used to project occupations when compared to the employment projections. This means that the occupation projections (and the qualification projections which are derived from these projections) should be treated with even more care than the employment projections because of the additional data limitations and necessary simplifying assumptions.

Qualification data

Data on highest educational qualification is taken from the same sources as the occupation data: the Labour Force Survey and the Annual Population Survey. In 2011, the ONS improved the questions on people's educational qualifications in order to obtain more information on qualifications obtained abroad, which had previously been reported as 'other'. This produced a structural break in the time series between 2010 and 2011. To produce the consistent time series required for its projections, GLA Economics needed to find a way to deal with this structural break. It developed a method of projecting the change backwards for earlier years, making a number of assumptions (see Appendix 5).

Turnover analysis

To fully understand the dynamics of the labour market it would be useful to have data on individuals moving between jobs. Unfortunately such data does not exist. Instead, in order to provide an indication of the level of turnover in the labour market only, changes in broad occupations have been used. However, this may well underestimate the actual level of turnover in the labour market. First, this analysis does not pick up any individuals who leave their employment but subsequently take up another job in the same occupation. Second, the data source used for this analysis only looks at changes that occur over the period of a year. It may well be that many individuals change jobs or occupations more than once within the course of a single year. As a result, the thrust of the labour market turnover analysis is to illustrate the fact that there are likely to be substantial and on-going education and training needs across London's workforce - although the absolute scale is likely to be underestimated.

Model and methodological simplifications

The models and methodologies used in this analysis are aimed at providing a simplified model of the real world in order to provide a best estimate of what is likely to occur in the future. It is important to appreciate that such models/methodologies are, therefore, subject to a number of simplifying assumptions: the appendices set these out. The projections, therefore, aim to provide a broad indication of the future path of London's labour market (and associated qualification requirements) based on a number of transparent, simplifying assumptions. Nevertheless, the results from projecting labour market indicators are likely to be subject to particular uncertainty at the moment given the general level of uncertainty in a number of areas – for instance debate about the underlying level of productivity growth in the labour market; the impact of tuition fees on the take up of higher education in the longer term; the impact of changes (and future changes) to legislation on migration to the UK; the impact of changes in state pension age, the nature of state and private pensions and the default retirement age; and, more generally uncertainty as to the future path of economic growth for example.

All of this suggests that this analysis should be treated with a degree of caution when interpreting the results.

Appendix 2: London's detailed employment (employees) structure and index of specialisation

Table A.2.1: London's industrial structure and main specialisations, 2011

Sector	London employee jobs	Share of total London employee jobs	London share of GB employee jobs	Index of specialisation
Total London economy	**4,287,049**	**100**	**16.1**	**1.0**
K : Financial and insurance activities	**354,406**	**8.3**	**34.0**	**2.8**
of which:				
6430 : Trusts, funds and similar financial entities	7,750	0.2	72.0	13.3
6612 : Security and commodity contracts brokerage	37,438	0.9	68.6	11.4
6630 : Fund management activities	21,089	0.5	67.7	10.9
6499 : Other financial service activities, except insurance and pension funding, n.e.c.	15,059	0.4	51.5	5.5
6619 : Other activities auxiliary to financial services, except insurance and pension funding	47,304	1.1	38.5	3.3
6419 : Other monetary intermediation	144,103	3.4	32.8	2.5
6622 : Activities of insurance agents and brokers	31,164	0.7	29.3	2.2
6629 : Other activities auxiliary to insurance and pension funding	19,139	0.4	24.1	1.7
J : Information and communication	**328,256**	**7.7**	**31.5**	**2.4**
of which:				
6020 : Television programming and broadcasting activities	14,596	0.3	82.8	25.0
5912 : Motion picture, video and television programme post-production activities	9,433	0.2	81.0	22.2
6391 : News agency activities	7,788	0.2	77.4	17.8
5920 : Sound recording and music publishing activities	5,220	0.1	72.9	14.0

Sector	London employee jobs	Share of total London employee jobs	London share of GB employee jobs	Index of specialisation
5911 : Motion picture, video and television programme production activities	34,421	0.8	67.8	11
5814 : Publishing of journals and periodicals	22,331	0.5	57.0	6.9
5811 : Book publishing	10,603	0.2	46.0	4.4
6202 : Computer consultancy activities	81,541	1.9	28.5	2.1
6209 : Other information technology and computer service activities	34,625	0.8	27.3	2.0
5813 : Publishing of newspapers	11,862	0.3	26.1	1.8
6201 : Computer programming activities	29,380	0.7	25.6	1.8
M : Professional, scientific and technical activities	**522,767**	**12.2**	**27.1**	**1.9**
of which:				
7021 : Public relations and communication activities	8,841	0.2	56.3	6.7
7311 : Advertising agencies	34,744	0.8	41.8	3.7
7320 : Market research and public opinion polling	20,241	0.5	41.6	3.7
7312 : Media representation	6,065	0.1	41.1	3.6
7410 : Specialised design activities	13,512	0.3	39.9	3.5
7111 : Architectural activities	21,158	0.5	36.8	3.0
7420 : Photographic activities	5,707	0.1	35.1	2.8
6910 : Legal activities	91,998	2.1	32.2	2.5
6920 : Accounting, bookkeeping and auditing activities; tax consultancy	75,233	1.8	29.3	2.2
7022 : Business and other management consultancy activities	92,312	2.2	29.0	2.1
7490 : Other professional, scientific and technical activities n.e.c.	22,882	0.5	28.8	2.1
7010 : Activities of head offices	49,107	1.1	25.3	1.8
L : Real estate activities	**99,461**	**2.3**	**24.5**	**1.5**
of which:				
6832 : Management of real estate on a fee or contract basis	25,520	0.6	30.5	2.3
6831 : Real estate agencies	32,907	0.8	28.2	2.0
N : Administrative and support service activities	**450,082**	**10.5**	**20.7**	**1.4**
of which:				
8230 : Convention and trade show organizers	5,811	0.1	34.3	2.7

Sector	London employee jobs	Share of total London employee jobs	London share of GB employee jobs	Index of specialisation
7810 : Activities of employment placement agencies	47,115	1.1	32	2.4
8010 : Private security activities	54,711	1.3	30.1	2.2
7912 : Tour operator activities	6,545	0.2	26.8	1.9
8299 : Other business support service activities n.e.c.	47,116	1.1	25.1	1.7
7911 : Travel agency activities	12,436	0.3	23.2	1.6
8121 : General cleaning of buildings	86,356	2.0	22.7	1.5
S : Other service activities	**111,880**	**2.6**	**20.3**	**1.3**
of which:				
9412 : Activities of professional membership organisations	13,052	0.3	47.8	4.8
9411 : Activities of business and employers membership organisations	5,511	0.1	41.2	3.6
9491 : Activities of religious organisations	16,935	0.4	29.0	2.1
R : Arts, entertainment and recreation	**113,627**	**2.7**	**17.5**	**1.1**
of which:				
9001 : Performing arts	10,737	0.3	37.3	3.1
9003 : Artistic creation	6,638	0.2	34.0	2.7
9102 : Museum activities	8,378	0.2	30.9	2.3
9313 : Fitness facilities	9,144	0.2	24.4	1.7
H : Transportation and storage	**207,541**	**4.8**	**17.1**	**1.1**
of which:				
5110 : Passenger air transport	34,884	0.8	51.7	5.6
4931 : Urban and suburban passenger land transport	46,140	1.1	36.4	3.0
5223 : Service activities incidental to air transportation	12,539	0.3	28.9	2.1
4910 : Passenger rail transport, interurban	10,511	0.2	24.3	1.7
5221 : Service activities incidental to land transportation	15,314	0.4	22.3	1.5
I : Accommodation and food service activities	**308,758**	**7.2**	**17.0**	**1.1**
of which:				
5629 : Other food service activities	7,588	0.2	30.2	2.2
5621 : Event catering activities	48,163	1.1	23.0	1.6
O : Public administration and defence; compulsory social security	**223,434**	**5.2**	**16.1**	**1.0**

Sector	London employee jobs	Share of total London employee jobs	London share of GB employee jobs	Index of specialisation
P : Education	**348,171**	**8.1**	**13.9**	**0.9**
G : Wholesale and retail trade; repair of motor vehicles and motorcycles	**548,002**	**12.8**	**12.9**	**0.8**
of which:				
4634 : Wholesale of beverages	7,817	0.2	26.6	1.9
4742 : Retail sale of telecommunications equipment in specialised stores	6,056	0.1	24.2	1.7
4645 : Wholesale of perfume and cosmetics	5,202	0.1	23.0	1.5
Q : Human health and social work activities	**413,938**	**9.7**	**11.8**	**0.7**
F : Construction	**126,453**	**2.9**	**10.4**	**0.6**
of which:				
4110 : Development of building projects	18,602	0.4	31.8	2.4
E : Water supply; sewerage, waste management and remediation activities	**17,149**	**0.4**	**9.8**	**0.6**
D : Electricity, gas, steam and air conditioning supply	**7,329**	**0.2**	**6.4**	**0.4**
B : Mining and quarrying	**2,950**	**0.1**	**5.2**	**0.3**
C : Manufacturing	**102,285**	**2.4**	**4.4**	**0.2**
A : Agriculture, forestry and fishing	**561**	**0.0**	**0.3**	**0.0**

Note: 4 digit SIC codes are included where the code accounts for 5,000 or more employees in London and has an index of specialisation greater than or equal to 1.5

Appendix 3: Medium-term projections

Introduction

This appendix considers the likely path of London's employment over the period 2012 to 2015 using information from GLA Economics' medium-term forecasting model. The appendix then looks at what this medium term outlook for London's employment, by sector, means for the likely path of occupations and qualification requirements in the next few years.

Medium-term forecast for London's employment

It is necessary to distinguish carefully between the GLA's long-term employment projections, which have been presented previously, and this medium-term forecast, which is based on the GLA's medium-term planning projections. Trend projections, which are what the long-term projections are, do not incorporate cyclical variations. The actual course of employment will vary around the projection.

Trend projections are essential for planning purposes in order to provide the capacity required to accommodate the needs of the economy over the long-term. However, for shorter-term business planning purposes, estimates of the numbers of jobs in each year are required. The medium-term planning projections provide these estimates. As time progresses and more data become available, it becomes possible to identify turning points in the data; whether underlying trends are continuing; and/or, new trends are being established.

It should be noted that any economic forecast is what the forecaster views as the economy's most likely future path and as such is inherently uncertain. Both model and data uncertainty as well as unpredictable events contribute to the potential for forecast error. GLA Economics' medium-term forecast is based on an in-house model built by Volterra Consulting Limited.

The medium-term forecast model forecasts employment for seven broad sectors of the economy as well as for total employment. These sectors are:

- manufacturing
- construction
- transportation and storage
- distribution, accommodation and food service activities
- financial services
- business services
- other (public & private) services

Further details on these sectors are provided in Appendix A of the Autumn 2012 London's Economic Outlook[18]. Further, in the results presented here the historic level data for 2011 will be used as the staring point for any levels estimate.

Overall employment forecast

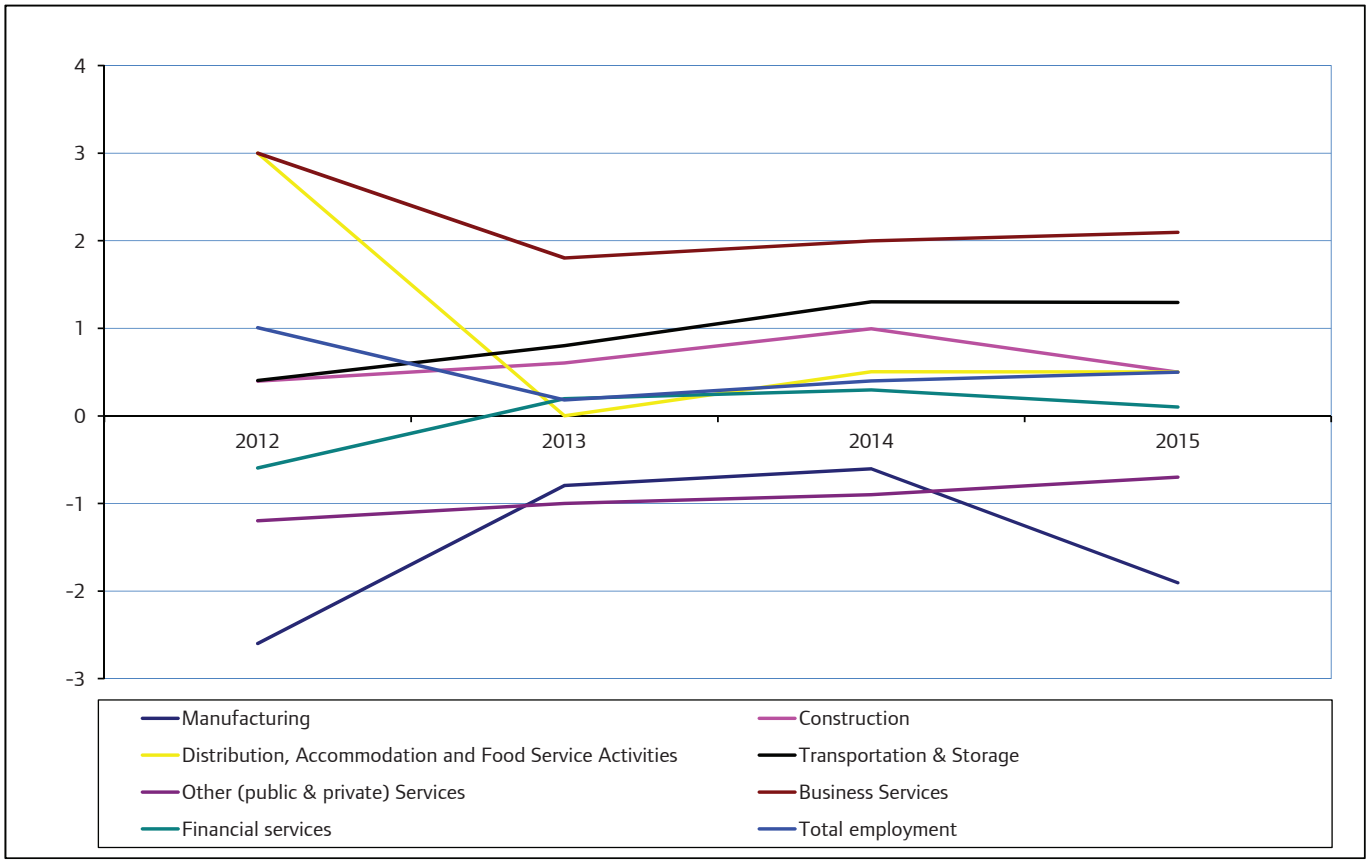
The medium term forecast growth rates for total and sector employment in London is provided in Table A.3.1 and Chart A.3.1 below. Following respectable growth in 2012, total employment is forecast to grow at a modest but increasing rate over the remainder of the forecast period. A similar picture holds true for most of the individual sectors, although manufacturing and other (public & private) services are forecast to experience declines in employment over the forecast period.

Table A.3.1: Summary of sector and total employment forecast (per cent)

Annual growth rates	2012	2013	2014	2015
Manufacturing	-2.6	-0.8	-0.6	-1.9
Construction	0.4	0.6	1.0	0.5
Transportation and storage	0.4	0.8	1.3	1.3
Distribution, accommodation and food service activities	3.0	0.0	0.5	0.5
Financial services	-0.6	0.2	0.3	0.1
Business services	3.0	1.8	2.0	2.1
Other (public & private) services	-1.2	-1.0	-0.9	-0.7
London civilian workforce jobs total	**1.0**	**0.2**	**0.4**	**0.5**

Source: GLA Economics' medium-term forecast

Chart A.3.1: Summary of sector and total employment forecast (per cent)



Source: GLA Economics' medium-term forecast

The forecast level for sector and total employment in London for 2012 to 2015 is given in Table A.3.2 below. Total employment is forecast to reach just under five million jobs by 2015 (an increase of just over 50,000 jobs from 2012), with the largest employing sectors remaining business services, other (public & private) services and distribution, accommodation and food service activities.

Table A.3.2: Summary of sector and total employment forecast (level)

Employment level (thousands)	2012	2013	2014	2015
Manufacturing	126	125	124	122
Construction	256	258	260	261
Transportation and storage	266	268	272	275
Distribution, accommodation and food service activities	987	987	992	997
Financial services	366	367	368	368
Business services	1538	1565	1597	1630
Other (public & private) services	1378	1365	1352	1343
London civilian workforce jobs total	**4944**	**4953**	**4973**	**4998**

Source: GLA Economics' medium-term forecast

Medium-term occupation projections

Occupation projections for each sector were performed under the assumption that each occupation in a given sector grew from their starting level in 2011 at the same rate as the sector as a whole. This methodology was used as there is limited available evidence to justify assuming divergent occupation growth rates over the medium-term forecast horizon. A forecast for total occupation levels in London over 2012 to 2015 was also performed, with this adjusted to take account of all sectors of London's economy. The results for total occupation levels is given in Table A.3.3 below.

Table A.3.3: Summary of total employment forecast for occupations (level)

Employment level (thousands)	2012	2013	2014	2015
Managers and Administrators	641	643	647	651
Professional Occupations	1181	1183	1186	1191
Associate Professional and Technical Occupations	921	924	928	933
Clerical and Secretarial Occupations	493	494	495	497
Craft and Related Occupations	341	342	344	345
Personal and Protective Service Occupations + Sales Occupations	628	626	626	627
Plant And Machine Operatives + Other Occupations	739	742	747	753
Total	**4944**	**4953**	**4973**	**4998**

Source: GLA Economics' medium-term forecast

Medium-term potential qualification requirements

Potential qualification requirements for London's total workforce were also calculated over the medium term; with it assumed that the required qualification levels would grow from their level in 2011 in line with the growth rate of total employment, Table A.3.4 below summaries the results.

Table A.3.4: Summary of total qualification for London's workforce (level)

Qualification level (thousands)	2012	2013	2014	2015
Higher degree	676	677	680	683
Ordinary degree or equivalent	1615	1618	1624	1633
Higher education	360	361	362	364
GCE, A-level or equivalent	794	796	799	803
GCSE grades A* - C or equivalent	708	709	712	715
Other qualifications	526	527	529	532
No qualification	265	265	266	268
Total	**4944**	**4953**	**4973**	**4998**

Source: GLA Economics' medium-term forecast

Appendix 4: Long-run employment projection scenarios

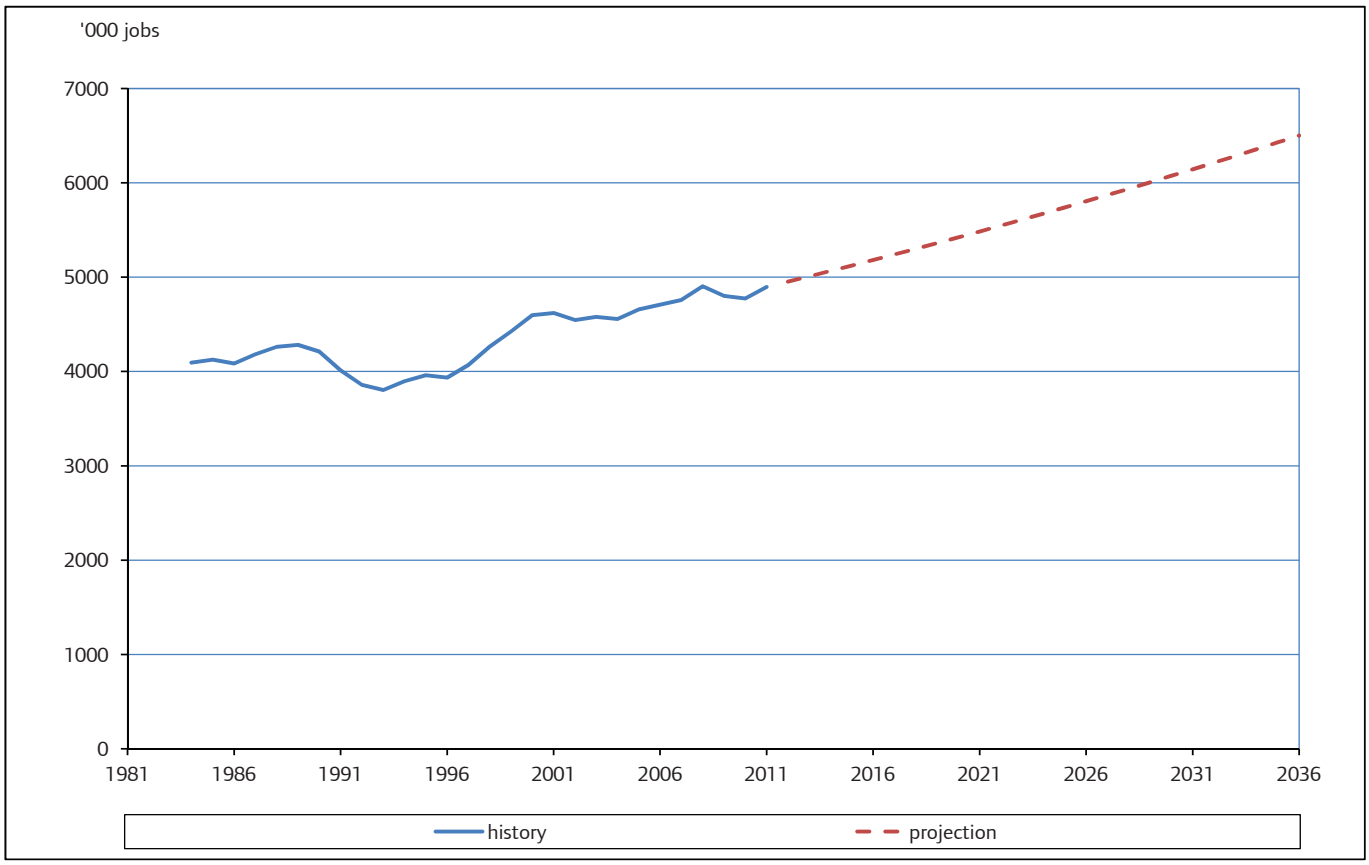
This appendix looks at two scenarios around the GLA's central projections for employment over time. The first scenario looks at a scenario where growth is faster than is assumed in the central projections whilst the second scenario looks at the projection if growth is slower than assumed.

Scenario 1: Faster than assumed growth

The methodology for the two scenarios considered is the same as that for the central scenario (explained in Appendix 5) except rather than assume a year-on-year growth rate in London's output of 2.5 per cent the faster growth scenario assumes a growth rate of 3.0 per cent and the slower growth scenario assumes 2.0 per cent. The results from the two scenarios show how sensitive our central projection results are to the growth assumption.

If London's output were to grow at 3.0 per cent year-on-year employment would be projected to grow at 1.1 per cent each year from 2012 to 2036. This means that the number of jobs in London will increase by 1,606,000 from the 2011 value of 4,896,000. This equates to a 32.8 per cent increase.

Figure A.4.1: London's historic and projected employment with faster growth (1984-2036)



Whilst London-wide employment is projected to grow even more this is still not the case for all sectors within London. Large differences are still expected across sectors. Table A.4.1 shows that employment growth for sectors is projected to range from 2.5 per cent year-on-year growth (for Professional, Real Estate, Scientific and Technical Activities) to a 4.7 per cent year-on-year decline (for Manufacturing). Figures A.4.2 and A.4.3 also show how projected employment numbers differ across sectors. Professional, real estate, scientific and technical activities are projected to see an increase of 563,000 jobs by 2036. This accounts for over a third of all the employment increase expected in London. Information and communication, administrative and support service activities, and accommodation and food service activities are also expected to see large increases in employment numbers.

Table A.4.1: Summary of employment projections by sector, 2011-2036

	Employment growth per annum with London output growth of 3.0% per annum	Absolute change in employment numbers ('000 jobs)
Professional, Real Estate, Scientific and technical activities	2.5%	563
Information and Communication	2.0%	237
Administrative and support service activities	2.0%	297
Accomodation and food service activities	2.0%	225
Other services	1.8%	77
Arts, entertainment and recreation	1.4%	68
All sectors	**1.1%**	**1606**
Education	1.0%	105
Health	0.9%	136
Retail	0.7%	75
Construction	0.4%	26
Financial and insurance activities	0.2%	23
Public Admin and defence	-0.5%	-25
Transportation and Storage	-0.7%	-40
Wholesale	-1.3%	-51
Primary & utilities	-2.8%	-16
Manufacturing	-4.7%	-91

Figure A.4.2: Employment projections for London's largest sectors

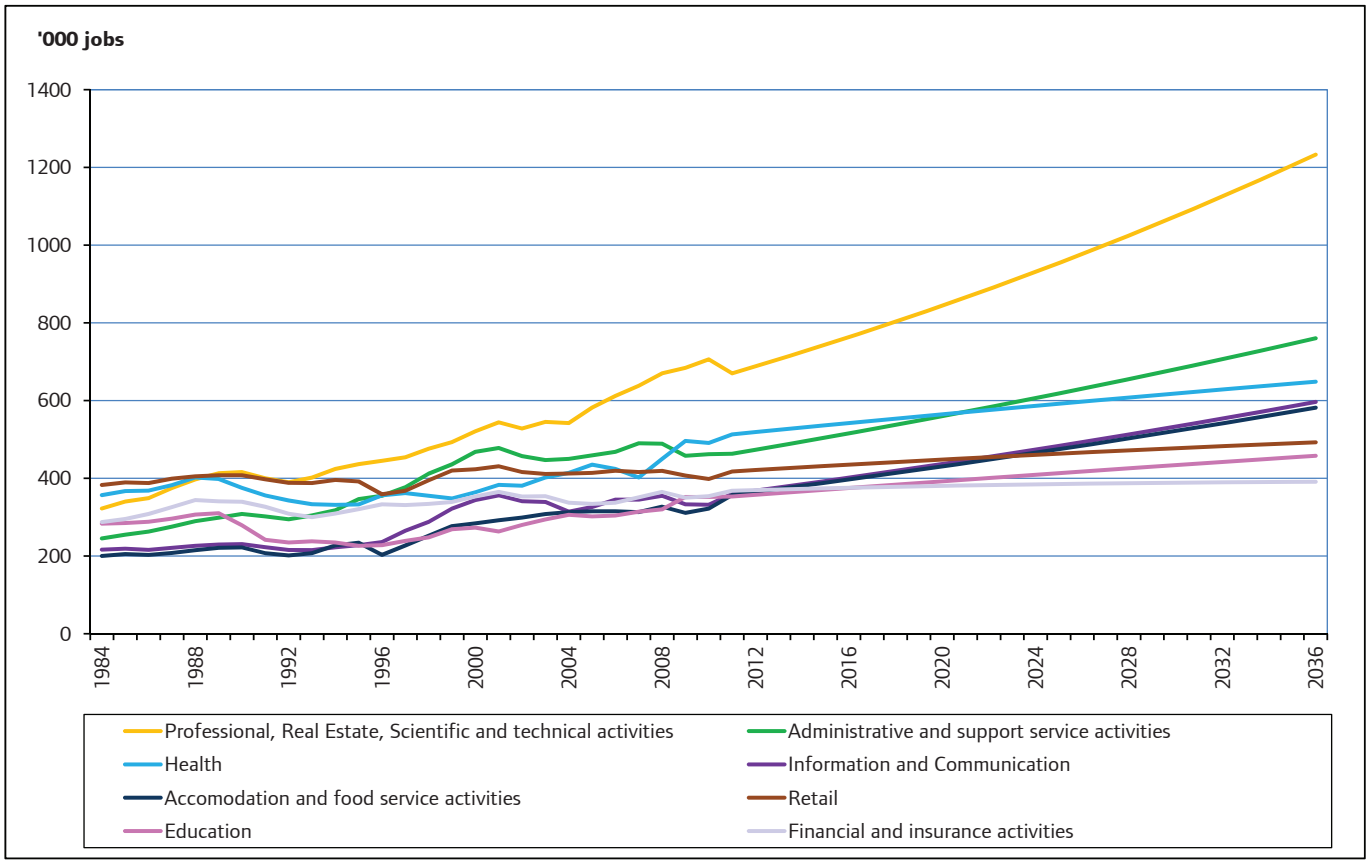
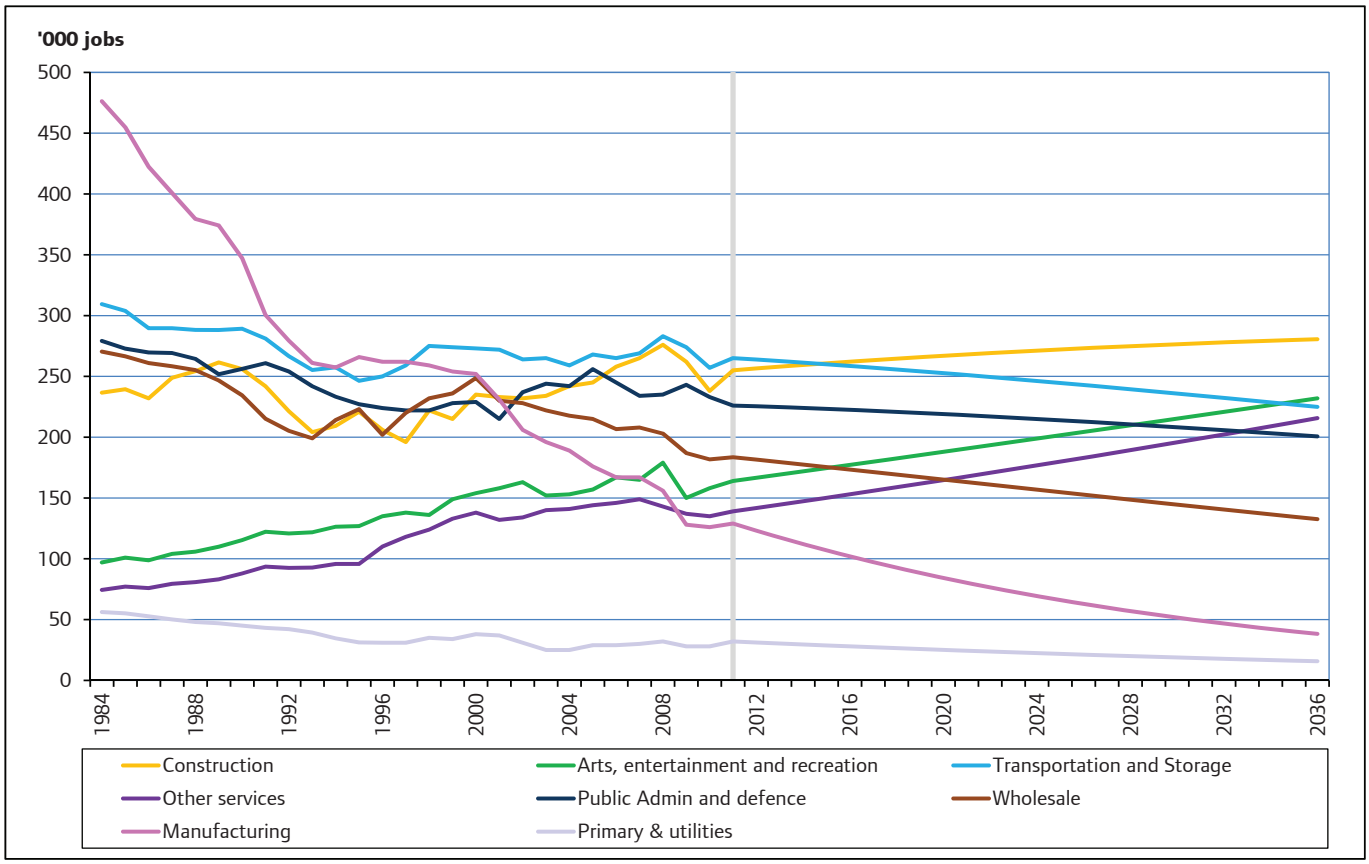


Figure A.4.3: Employment projections for London's smallest sectors



Scenario 1: Occupation Projections (faster growth)

The methodology used to construct occupation projections for sectors is the same as the central scenario (see Appendix 5) except that the faster growth scenario employment projections are used.

A summary of the expected demand for occupations is presented in Tables A.4.2 and A.4.3 and Figure A.4.4. Demand for Professional Occupation in London is projected to see a large increase from its current position. A total 771,000 more jobs (equivalent to a 2.1 per cent year-on-year increase) is expected between 2011 and 2036 (Table A.4.2). This makes up nearly half of the total job increases expected in London over this period. A large proportion of the increase in Professional Occupations (over a fifth) is expected to come from the Information and Communication sector (Table A.4.3).

Table A.4.2: Year-on-Year Change in Occupation Employment within Sectors (2011 to 2036)

	Managers and Administrators	Professional Occupations	Associate Professional and Technical Occupations	Clerical and Secretarial Occupations	Craft and Related Occupations	Personal and Protective Service Occupations + Sales Occupations	Plant And Machine Operatives + Other Occupations	Total
Primary & utilities	-2.0%	-2.1%	-3.6%	-9.9%	-5.7%	-12.4%	-1.7%	-2.9%
Manufacturing	-3.4%	-1.3%	-6.6%	-8.4%	-8.9%	-3.6%	-11.5%	-4.9%
Construction	1.1%	2.4%	-5.7%	-4.9%	0.5%	-6.3%	-0.4%	0.4%
Wholesale	-1.3%	2.5%	-3.5%	-4.0%	0.1%	-2.4%	-1.3%	-1.3%
Retail	0.4%	4.1%	0.4%	-3.0%	-1.9%	0.9%	-1.8%	0.7%
Transportation and Storage	-1.9%	1.9%	-0.8%	-2.9%	-0.4%	0.7%	-1.1%	-0.7%
Accomodation and Food Service Activities	0.5%	8.2%	3.6%	0.2%	1.2%	1.8%	2.5%	2.1%
Information and Communication	4.1%	2.9%	1.2%	-5.6%	-4.1%	-5.9%	-4.4%	2.1%
Financial and Insurance Activities	1.1%	2.5%	-0.4%	-6.0%	-1.4%	-2.8%	-7.3%	0.3%
Professional, Real Estate, Scientific and Technical Activities	4.2%	1.1%	2.6%	-4.3%	11.4%	0.9%	0.1%	2.6%
Administrative and Support Service Activities	1.9%	2.1%	-3.8%	-4.0%	4.1%	-3.0%	4.0%	2.1%
Public Admin and Defence	-0.2%	1.7%	-1.3%	-5.2%	-7.6%	2.7%	-0.9%	-0.5%
Education	0.5%	1.3%	4.1%	-3.9%	-2.4%	0.3%	-5.1%	1.1%
Health	1.0%	1.4%	2.0%	-2.3%	0.1%	1.1%	-1.3%	1.0%
Arts, Entertainment and Recreation	2.9%	6.2%	-0.7%	-5.0%	-2.4%	2.2%	-3.7%	1.5%
Other Services	1.8%	5.0%	2.5%	-4.7%	-3.9%	-0.0%	-6.7%	1.8%
Total London	**1.8%**	**2.1%**	**0.8%**	**-4.0%**	**2.3%**	**0.5%**	**1.4%**	**1.2%**

Table A.4.3: Absolute change in occupation employment by sector (000s, 2011 to 2036)

	Managers and Administrators	Professional Occupations	Associate Professional and Technical Occupations	Clerical and Secretarial Occupations	Craft and Related Occupations	Personal and Protective Service Occupations + Sales Occupations	Plant And Machine Operatives + Other Occupations	Total
Primary & utilities	-2	-3	-2	-3	-3	-1	-3	-16
Manufacturing	-13	-6	-20	-12	-19	-3	-19	-91
Construction	10	27	-9	-12	14	-2	-3	26
Wholesale	-10	9	-19	-14	0	-8	-10	-51
Retail	7	50	3	-13	-5	47	-15	75
Transportation and Storage	-8	10	-4	-11	-1	6	-32	-40
Accomodation and Food Service Activities	8	27	20	1	20	17	132	225
Information and Communication	66	164	38	-16	-8	-5	-3	237
Financial and Insurance Activities	24	68	-12	-49	0	-5	-3	23
Professional, Real Estate, Scientific and Technical Activities	181	77	146	-53	207	5	0	563
Administrative and Support Service Activities	36	19	-40	-26	46	-25	287	297
Public Admin and Defence	-1	28	-22	-36	-2	9	-1	-25
Education	1	71	63	-13	-2	4	-19	105
Health	10	77	43	-24	0	35	-6	136
Arts, Entertainment and Recreation	17	78	-11	-14	-2	8	-8	68
Other Services	7	74	19	-10	-4	0	-9	77
Total London	**333**	**771**	**193**	**-304**	**243**	**82**	**288**	**1,607**

Note: Total London may not add to total from London-wide employment projections due to rounding.

Clerical and Secretarial Occupations are still the only occupation group expected to see a London-wide decline in demand. These are projected to decline by 304,000 from 2011 to a total of 186,000 by 2036. This equates to a year-on-year decline of 4.0 per cent.

Managers and administrators also projected to see large rise in numbers = 333,000 (equivalent to 1.8 per cent annual growth). This growth is largely driven by an increase in professional/real estate/scientific and technical activities sector.

Figure A.4.4: Changes in Occupation Demand (2001 to 2036)

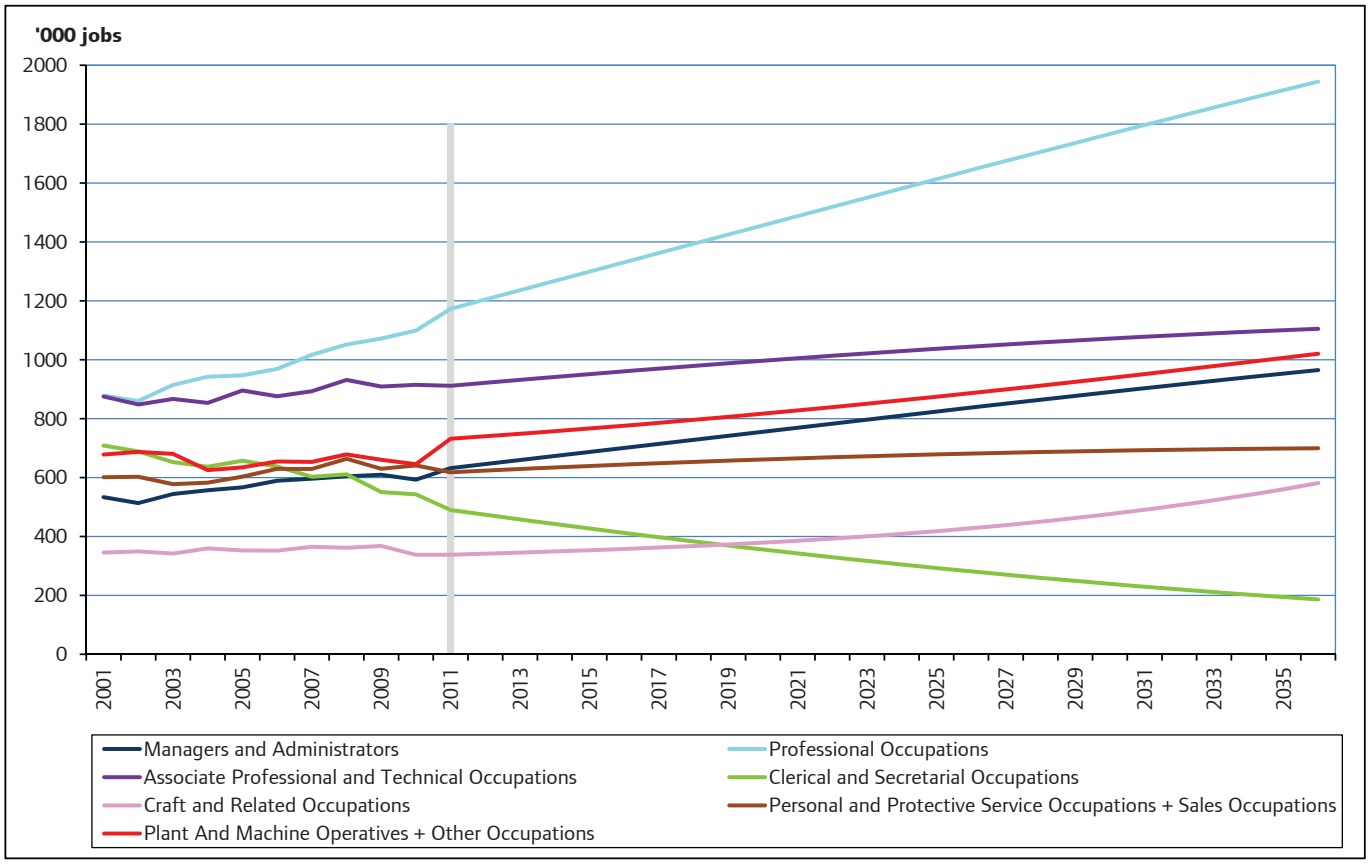
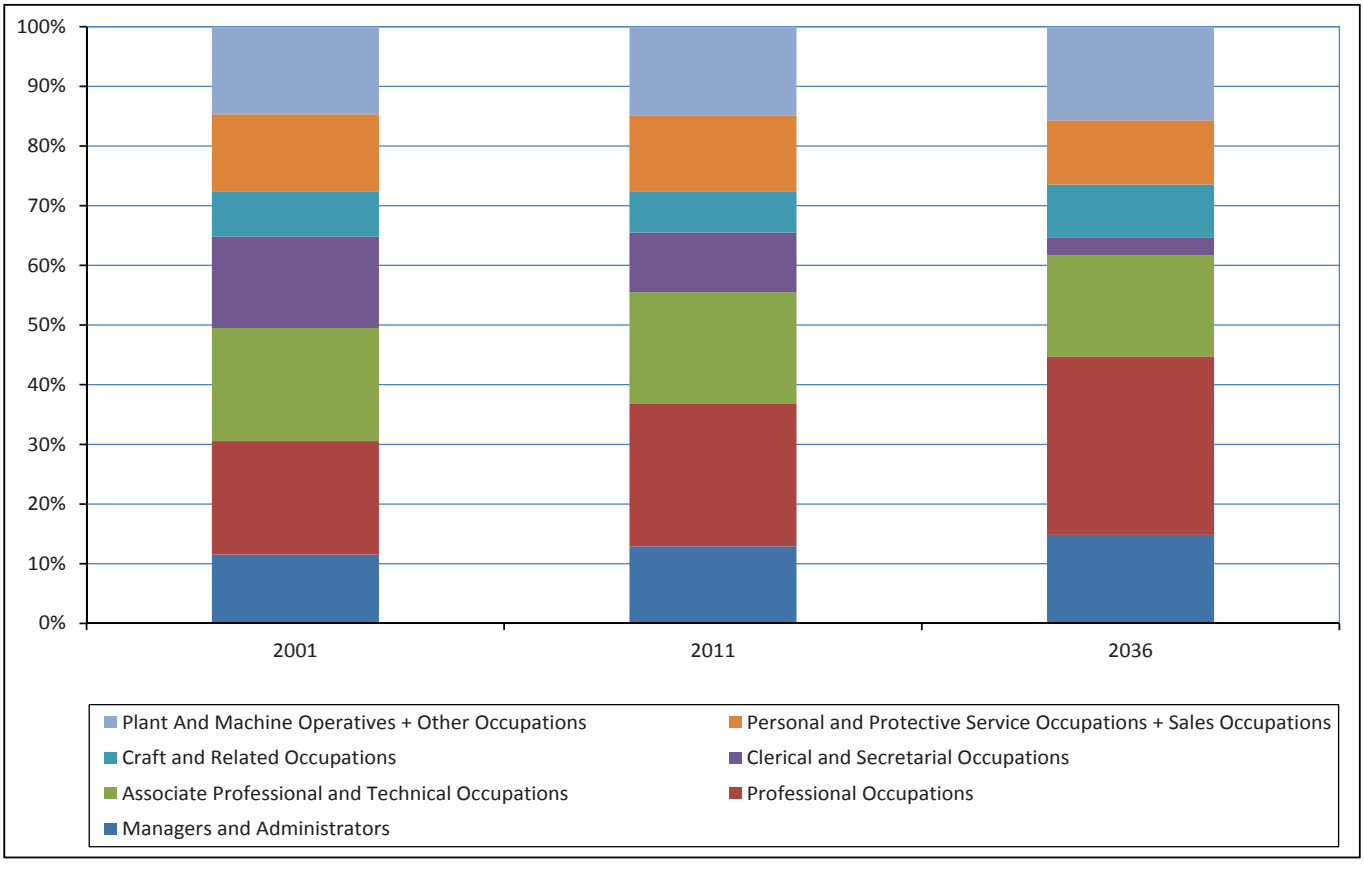


Figure A.4.5: Changes in occupation shares



Qualification Projections (faster growth)

Looking at qualifications, the highest growth rate of any qualification class is in higher degrees, where growth of 2.2 per cent per annum is projected for the 2011-2036 period.

Table A.4.4: Year-on-Year Change in Qualification Employment within Occupations (2011 to 2036)

	Higher degree	Ordinary degree or equivalent	Higher education	GCE, A-level or equivalent	GCSE grades A* - C or equivalent	Other qualifications	No qualification	Total
Managers and Administrators	2.4%	2.1%	1.5%	1.2%	1.4%	1.0%	-0.5%	1.8%
Professional Occupations	2.5%	2.1%	1.7%	1.4%	1.9%	0.8%	2.3%	2.1%
Associate Professional and Technical Occupations	1.6%	1.2%	0.4%	-0.1%	0.2%	-1.1%	-0.6%	0.8%
Clerical and Secretarial Occupations	-1.9%	-2.9%	-3.2%	-4.5%	-4.5%	-7.8%	-8.5%	-4.0%
Craft and Related Occupations	3.4%	3.1%	2.6%	1.1%	2.4%	3.3%	1.3%	2.3%
Personal and Protective Service Occupations + Sales Occupations	2.2%	1.4%	1.0%	0.6%	-0.1%	-0.1%	-0.9%	0.5%
Plant And Machine Operatives + Other Occupations	3.1%	2.1%	1.4%	0.6%	1.5%	1.4%	1.0%	1.4%
Total London	**2.2%**	**1.6%**	**1.1%**	**0.4%**	**0.4%**	**1.0%**	**0.3%**	**1.2%**

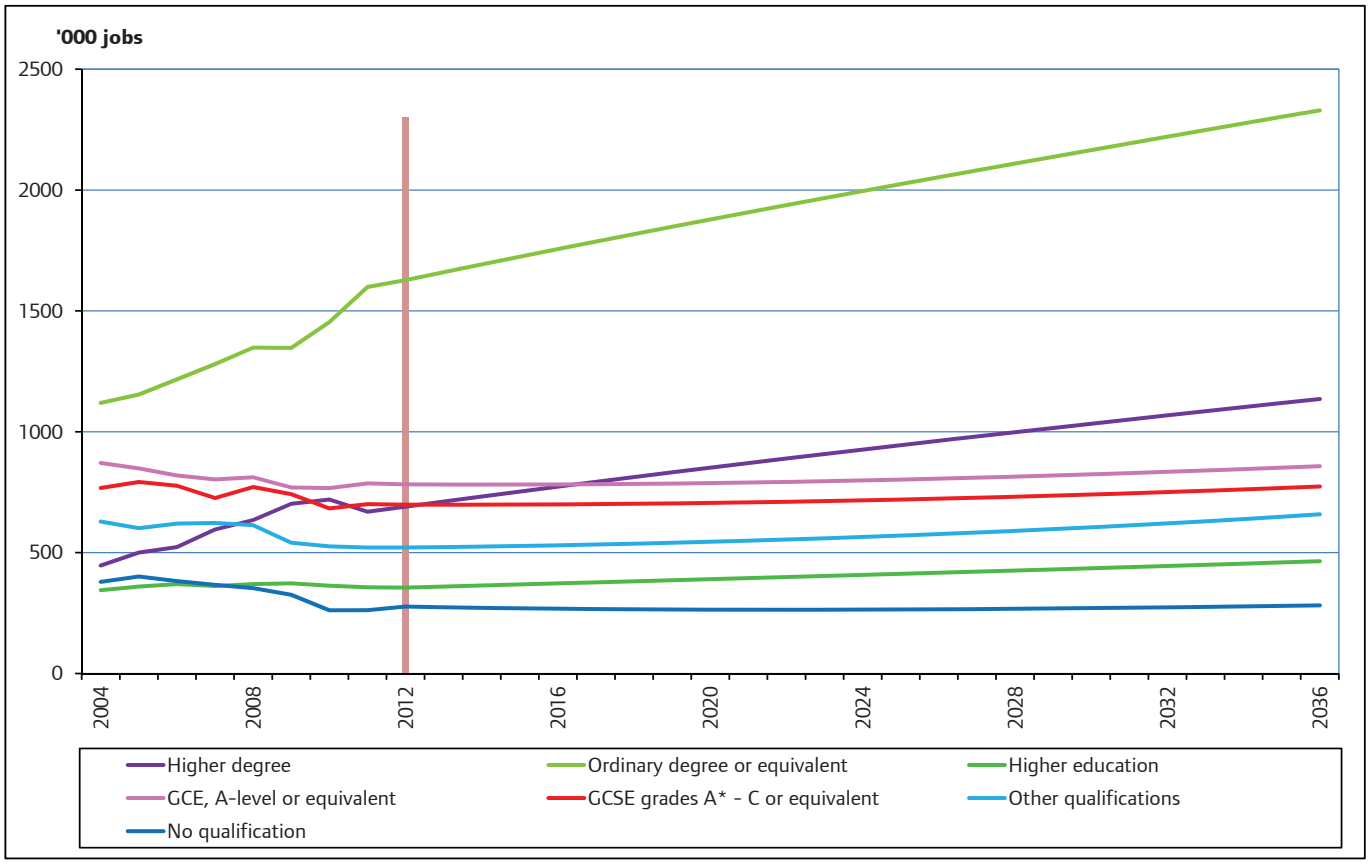
In terms of absolute increases, ordinary degree or equivalent are projected to see the greatest absolute increase in numbers (increase of 731,000, equal to 45 per cent of total increase in jobs). This growth is largely driven by the growth in professional occupations.

Higher degrees are also projected to see large increases in numbers, an increase of 466,000 over the projection period. Again, this is largely driven by demand from professional occupations.

Table A.4.5: Absolute change in qualification employment by occupation (000s, 2011 to 2036)

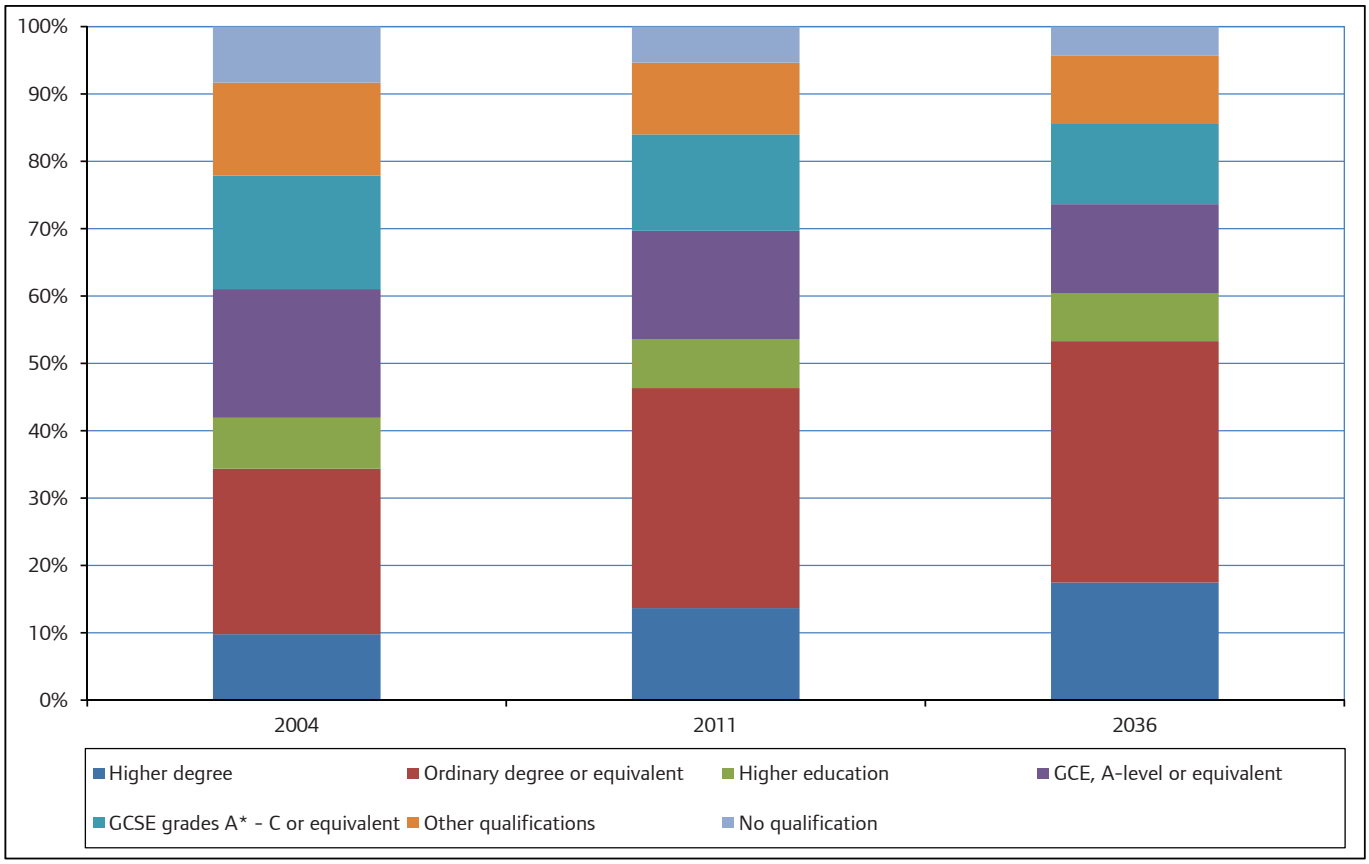
	Higher degree	Ordinary degree or equivalent	Higher education	GCE, A-level or equivalent	GCSE grades A* - C or equivalent	Other qualifications	No qualification	Total
Managers and Administrators	78	163	19	36	29	11	-2	333
Professional Occupations	301	356	46	32	25	7	4	771
Associate Professional and Technical Occupations	62	134	7	-3	5	-9	-2	193
Clerical and Secretarial Occupations	-10	-71	-17	-65	-86	-38	-16	-304
Craft and Related Occupations	9	41	21	33	42	83	14	243
Personal and Protective Service Occupations + Sales Occupations	10	45	17	24	-4	-2	-9	82
Plant And Machine Operatives + Other Occupations	16	62	16	15	62	85	32	288
Total London	**466**	**731**	**108**	**71**	**73**	**137**	**20**	**1607**

Figure A.4.6: Changes in Qualification Demand (2001 to 2036)



In 2004, 34 per cent of jobs had the highest qualification of higher degree or ordinary degree/equivalent. This share grew to 46 per cent in 2011 and is projected to reach 53 per cent by 2036 (figure A.4.7). This is unchanged from the central projection in the main text.

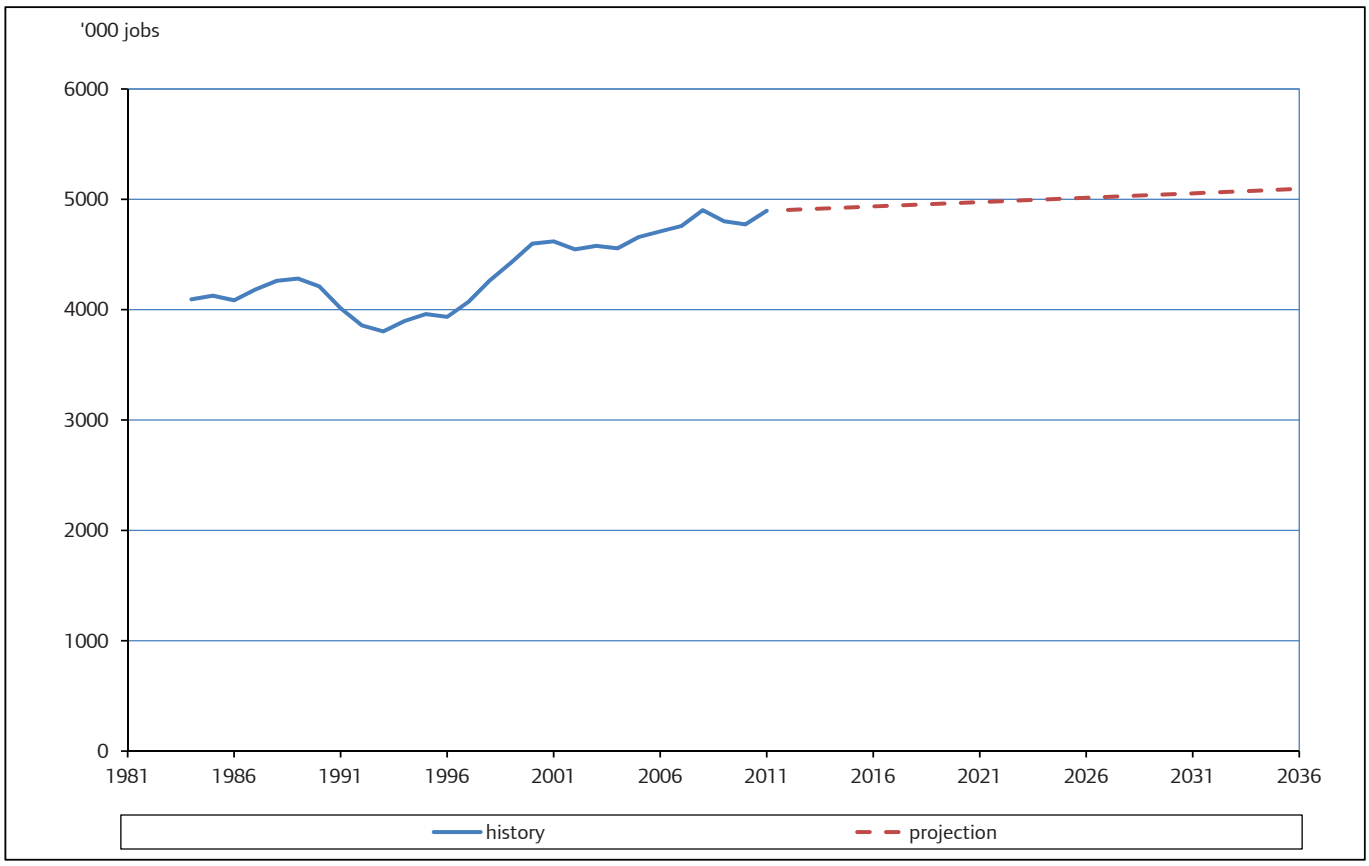
Figure A.4.7: Shares of qualifications as a total of all jobs



Scenario 2: Slower growth assumption

If London's output were to grow at 2.0 per cent year-on-year (as compared to the central projection assumption of 2.5 per cent year-on-year) employment would be projected to grow at 0.2 per cent each year from 2012 to 2036. This means that the number of jobs in London will increase by 198,000 from the 2011 value of 4,896,000. This equates to a 4.1 per cent increase.

Figure A.4.8: London's historic and projected employment with slower growth assumption (1984-2036)



Whilst London-wide employment is projected to grow this is not the case for all sectors within London. Indeed, there are large differences in expected employment amongst sectors. Table A.4.6 shows that employment growth for sectors is projected to range from 1.5 per cent year-on-year growth (for Professional, Real Estate, Scientific and Technical Activities) to a 5.7 per cent year-on-year decline (for Manufacturing). Figures A.4.9 and A.4.10 also show how projected employment numbers differ across sectors. Professional, real estate, scientific and technical activities are projected to see an increase of 296,000 jobs by 2036. This is almost one and a half times as large as the total change in jobs across London sectors. Information and communication, administrative and support service activities, and accommodation and food service activities are also expected to see large increases in employment numbers.

Table A.4.6: Summary of employment projections by sector, 2011-2036

	Employment growth per annum with London output growth of 2.0% per annum	Absolute change in employment numbers ('000 jobs)
Professional, Real Estate, Scientific and technical activities	1.5%	296
Information and Communication	1.0%	107
Administrative and support service activities	1.0%	133
Accomodation and food service activities	1.0%	99
Other services	0.8%	30
Arts, entertainment and recreation	0.4%	18
All sectors	**0.2%**	**198**
Education	0.1%	6
Health	0.0%	-5
Retail	-0.3%	-32
Construction	-0.6%	-35
Financial and insurance activities	-0.7%	-62
Public Admin and defence	-1.4%	-69
Transportation and Storage	-1.6%	-89
Wholesale	-2.3%	-80
Primary & utilities	-3.7%	-20
Manufacturing	-5.7%	-99

Figure A.4.9: Employment projections for London's largest sectors

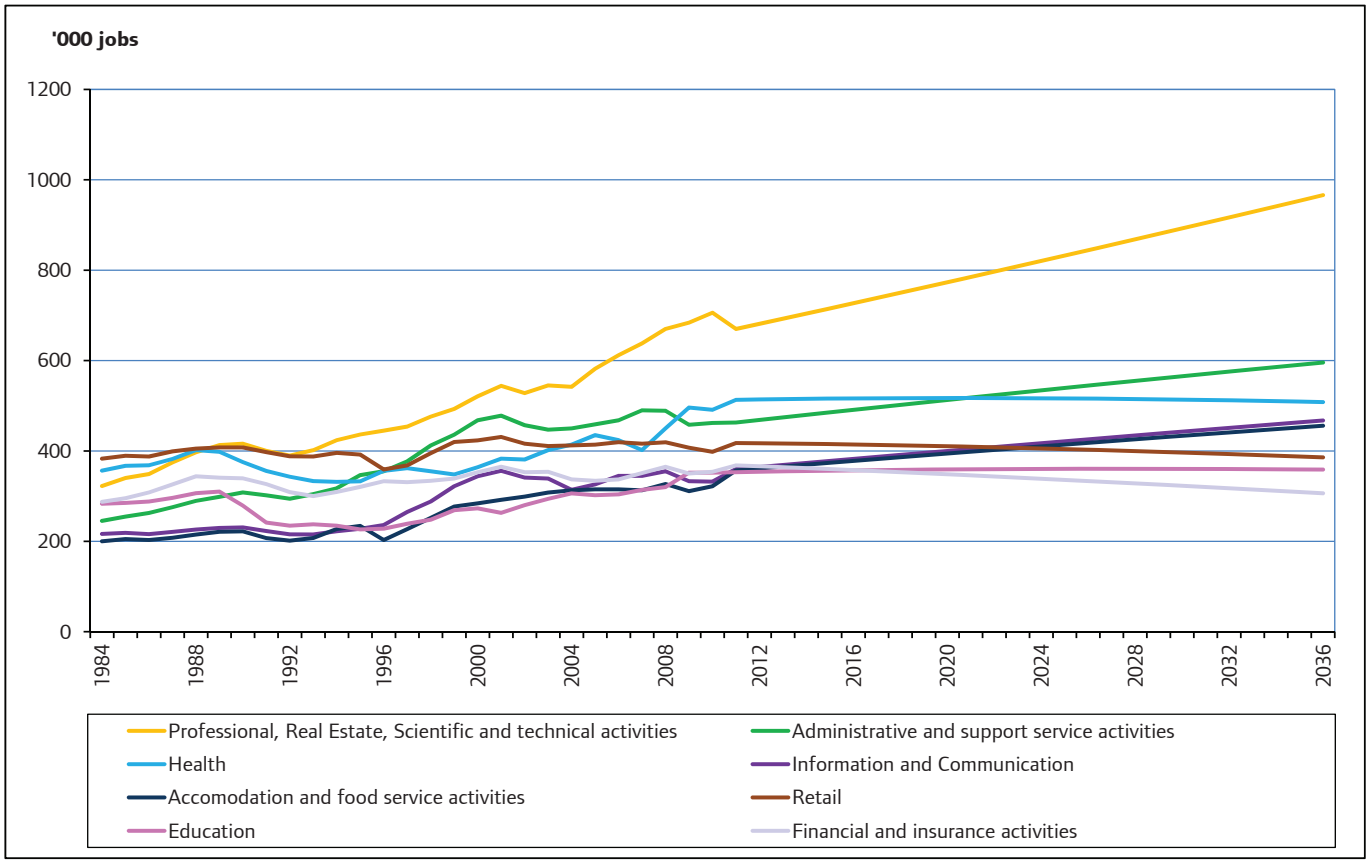
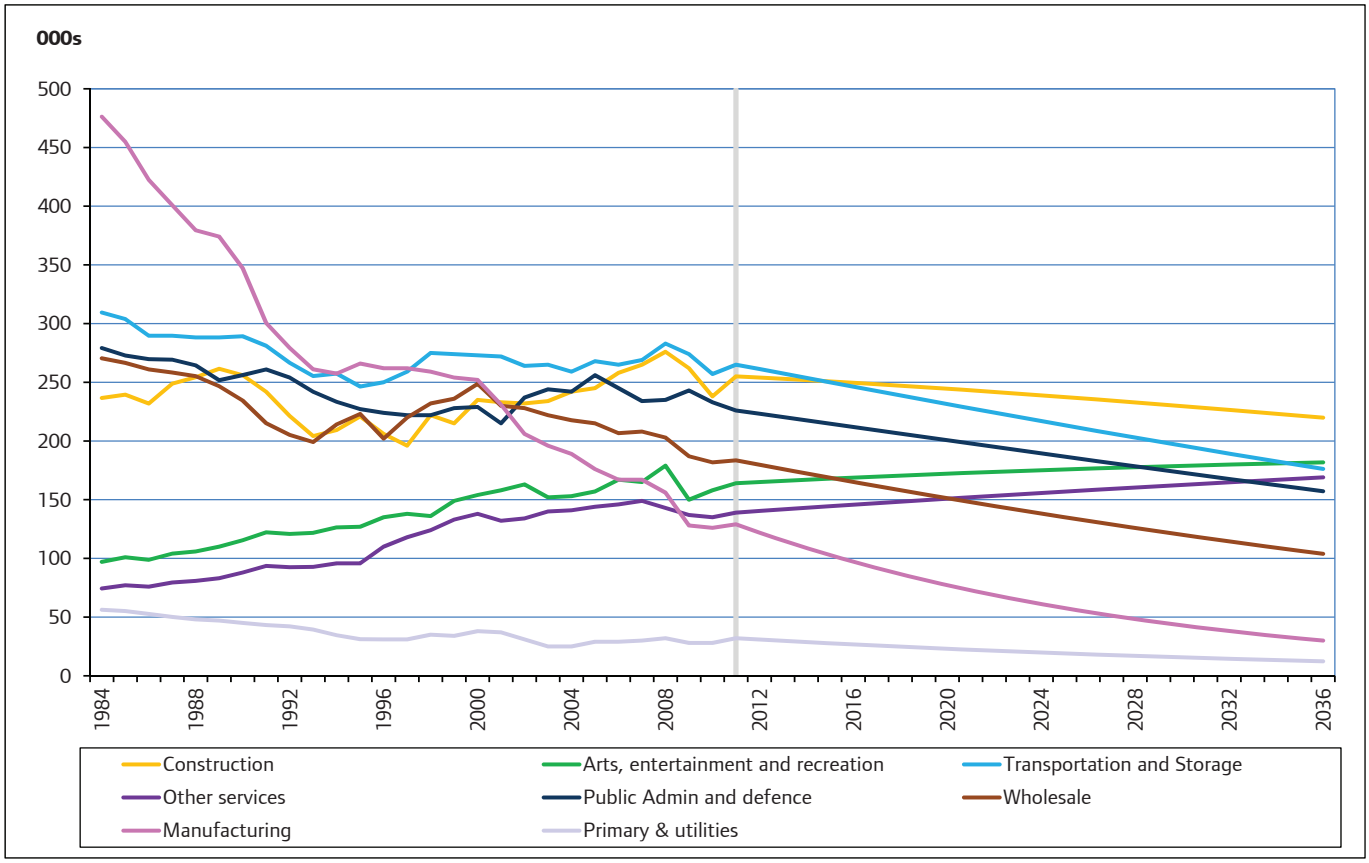


Figure A.4.10: Employment projections for London's smallest sectors



Occupation Projections (slower growth)

The methodology used to construct occupation projections for sectors is the same as the central scenario (see Appendix 5) except that the slower growth scenario employment projections are used.

A summary of the expected demand for occupations is presented in Tables A.4.7 and A.4.8 and Figure 4. Demand for Professional Occupation in London is projected to see an increase from its current position. A total 351,000 more jobs (equivalent t o a 1.1 per cent year-on-year increase) is expected between 2011 and 2036 (Table A.4.7). This is 1.7 times larger than the total job increases expected in London over this period. A large proportion of the increase in Professional Occupations (over a quarter) is expected to come from the Information and Communication sector (Table A.4.8).

Table A.4.7: Year-on-Year Change in Occupation Employment within Sectors (2011 to 2036)

	Managers and Administrators	Professional Occupations	Associate Professional and Technical Occupations	Clerical and Secretarial Occupations	Craft and Related Occupations	Personal and Protective Service Occupations + Sales Occupations	Plant And Machine Operatives + Other Occupations	Total
Primary & utilities	-3.0%	-3.1%	-4.6%	-10.8%	-6.6%	-13.3%	-2.7%	-3.9%
Manufacturing	-4.4%	-2.3%	-7.6%	-9.4%	-9.8%	-4.6%	-12.4%	-5.9%
Construction	0.1%	1.4%	-6.7%	-5.9%	-0.6%	-7.3%	-1.4%	-0.6%
Wholesale	-2.3%	1.5%	-4.5%	-5.0%	-0.9%	-3.4%	-2.3%	-2.3%
Retail	-0.6%	3.1%	-0.6%	-4.0%	-2.8%	-0.2%	-2.7%	-0.3%
Transportation and Storage	-2.8%	0.8%	-1.8%	-3.9%	-1.4%	-0.3%	-2.1%	-1.7%
Accomodation and Food Service Activities	-0.5%	7.1%	2.6%	-0.9%	0.1%	0.8%	1.4%	1.0%
Information and Communication	3.0%	1.9%	0.2%	-6.5%	-5.1%	-6.8%	-5.4%	1.1%
Financial and Insurance Activities	0.1%	1.4%	-1.4%	-7.0%	-2.4%	-3.8%	-8.3%	-0.8%
Professional, Real Estate, Scientific and Technical Activities	3.1%	0.1%	1.5%	-5.2%	10.3%	-0.1%	-0.9%	1.5%
Administrative and Support Service Activities	0.9%	1.1%	-4.8%	-5.0%	3.1%	-4.0%	2.9%	1.1%
Public Admin and Defence	-1.3%	0.7%	-2.3%	-6.1%	-8.5%	1.7%	-1.9%	-1.5%
Education	-0.5%	0.3%	3.0%	-4.9%	-3.4%	-0.8%	-6.0%	0.1%
Health	0.0%	0.3%	1.0%	-3.3%	-0.9%	0.0%	-2.3%	0.0%
Arts, Entertainment and Recreation	1.9%	5.1%	-1.7%	-6.0%	-3.4%	1.2%	-4.6%	0.4%
Other Services	0.7%	4.0%	1.4%	-5.7%	-4.9%	-1.1%	-7.7%	0.8%
Total London	**0.7%**	**1.1%**	**-0.2%**	**-4.9%**	**1.2%**	**-0.5%**	**0.4%**	**0.2%**

Table A.4.8: Absolute change in occupation employment by sector (000s, 2011 to 2036)

	Managers and Administrators	Professional Occupations	Associate Professional and Technical Occupations	Clerical and Secretarial Occupations	Craft and Related Occupations	Personal and Protective Service Occupations + Sales Occupations	Plant And Machine Operatives + Other Occupations	Total
Primary & utilities	-2	-3	-2	-3	-3	-1	-5	-20
Manufacturing	-15	-10	-21	-12	-19	-3	-19	-99
Construction	1	14	-10	-13	-15	-3	-10	-35
Wholesale	-16	5	-22	-15	-5	-10	-16	-80
Retail	-9	33	-5	-15	-7	-8	-21	-32
Transportation and Storage	-12	4	-8	-13	-3	-2	-54	-89
Accomodation and Food Service Activities	-6	20	12	-4	2	6	67	99
Information and Communication	43	93	5	-17	-9	-6	-4	107
Financial and Insurance Activities	2	35	-37	-52	-1	-6	-3	-62
Professional, Real Estate, Scientific and Technical Activities	118	5	77	-59	158	0	-3	296
Administrative and Support Service Activities	15	9	-46	-30	30	-30	184	133
Public Admin and Defence	-6	10	-34	-39	-2	5	-2	-69
Education	-1	13	41	-15	-2	-10	-21	6
Health	0	17	19	-31	-1	1	-9	-5
Arts, Entertainment and Recreation	10	56	-25	-16	-2	4	-9	18
Other Services	2	51	10	-11	-4	-8	-10	30
Total London	**124**	**351**	**-46**	**-344**	**117**	**-70**	**67**	**199**

Note: Total London may not add to total from London-wide employment projections due to rounding.

Clerical and Secretarial Occupations are still expected to decline. Under the slower growth scenario, associate professional/technical occupation and personal/protective/service occupation jobs are also projected to decline - both affected by declines in administrative and support service activities.

Managers and administrators are projected to see a rise in numbers of 124,000 (equivalent to growth of around 0.7 per cent a year). This growth is largely driven by an increase in the professional/real estate/ scientific and technical activities sector.

Figure A.4.11: Changes in Occupation Demand (2001 to 2036)

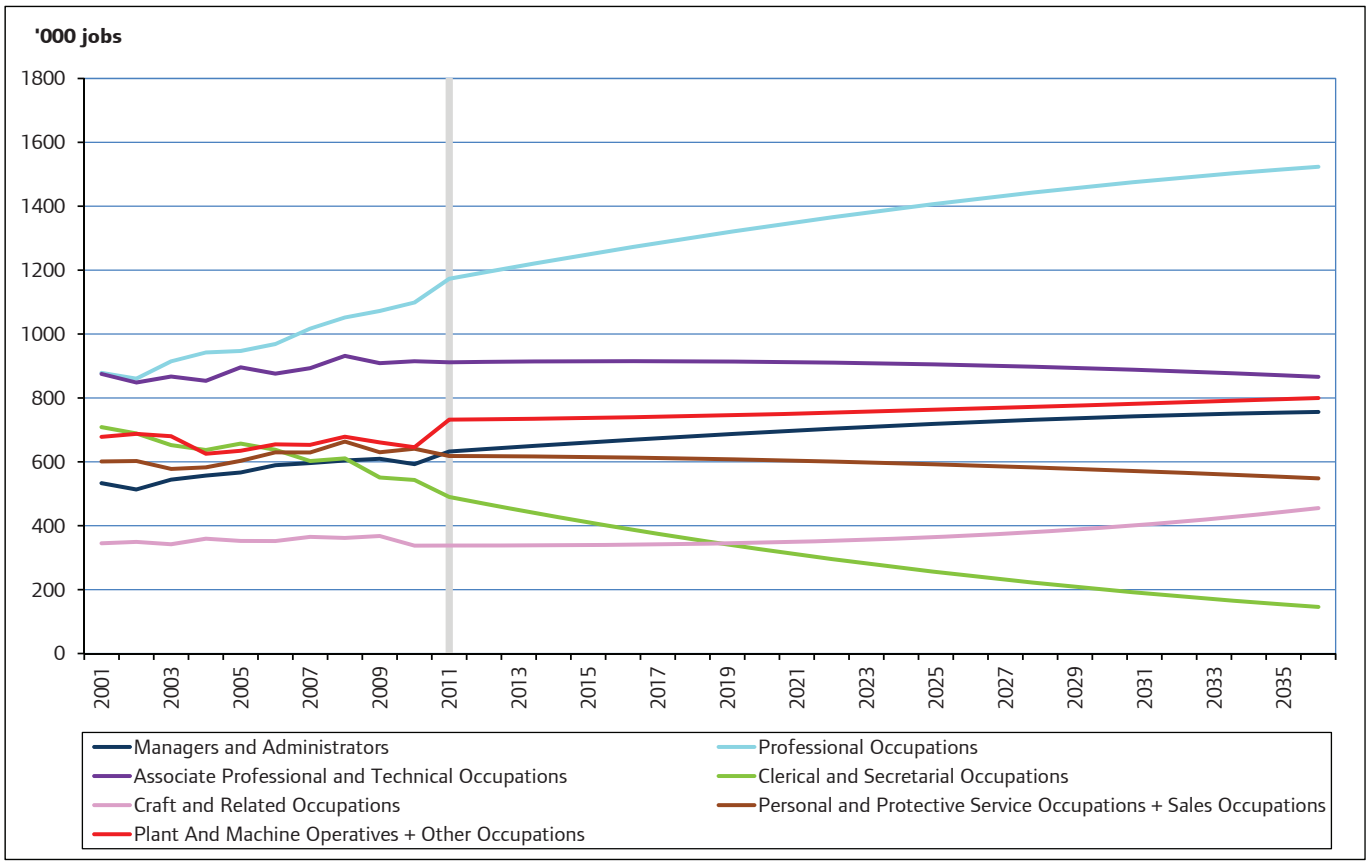
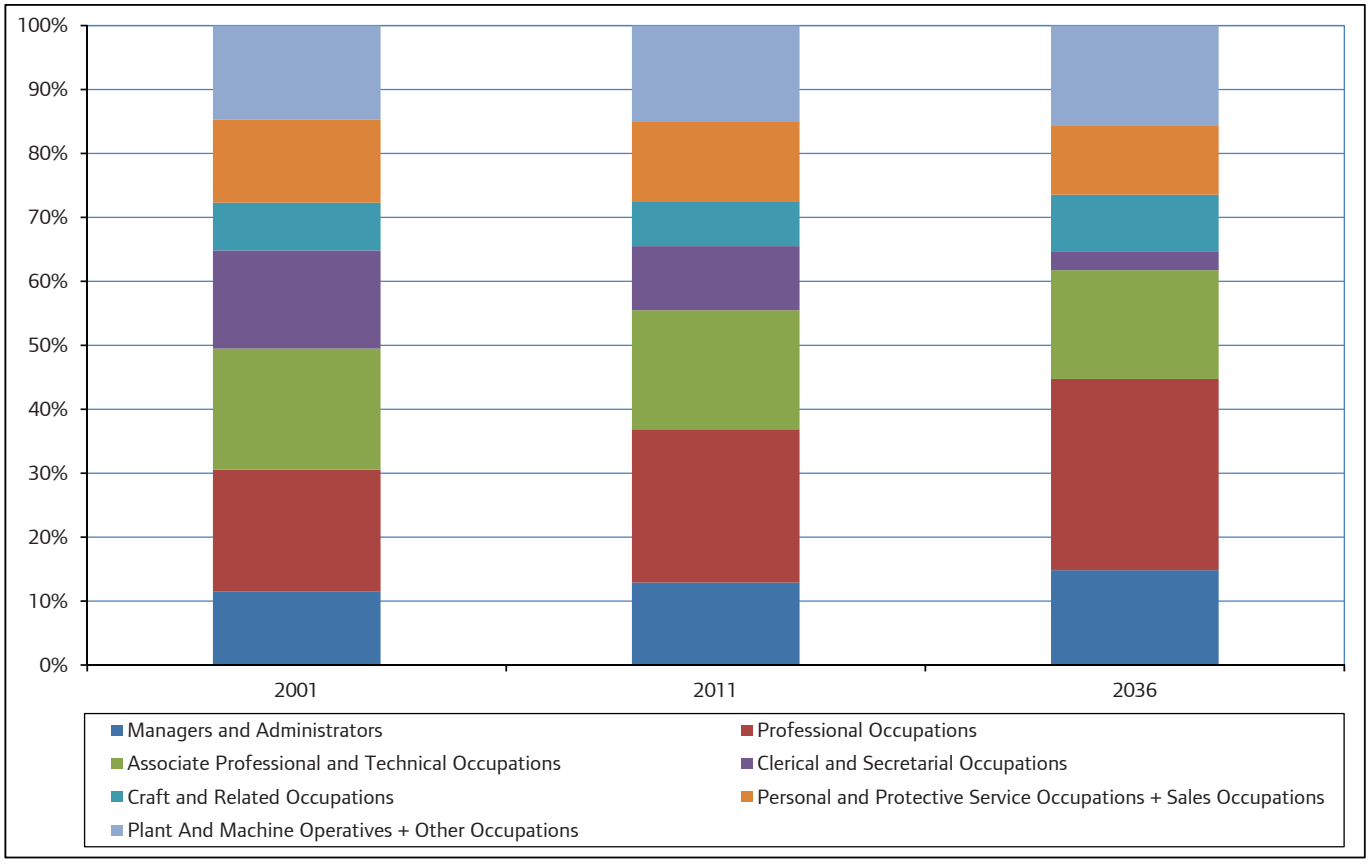


Figure A.4.12: Changes in occupation shares



Qualification Projections (slower growth)

Looking at qualifications, the highest growth rate is for higher degrees (with growth equivalent to 1.2 per cent per annum over the 2011 to 2036 period).

Table A.4.9: Year-on-Year Change in Qualification Employment within Occupations (2011 to 2036)

	Higher degree	Ordinary degree or equivalent	Higher education	GCE, A-level or equivalent	GCSE grades A* - C or equivalent	Other qualifications	No qualification	Total
Managers and Administrators	1.4%	1.1%	0.5%	0.2%	0.4%	0.0%	-1.5%	0.7%
Professional Occupations	1.5%	1.1%	0.6%	0.4%	0.9%	-0.2%	1.3%	1.1%
Associate Professional and Technical Occupations	0.6%	0.2%	-0.6%	-1.1%	-0.8%	-2.1%	-1.6%	-0.2%
Clerical and Secretarial Occupations	-2.9%	-3.8%	-4.2%	-5.5%	-5.5%	-8.7%	-9.4%	-4.9%
Craft and Related Occupations	2.4%	2.1%	1.5%	0.1%	1.4%	2.2%	0.3%	1.2%
Personal and Protective Service Occupations + Sales Occupations	1.2%	0.4%	0.0%	-0.4%	-1.1%	-1.1%	-1.9%	-0.5%
Plant And Machine Operatives + Other Occupations	2.1%	1.0%	0.4%	-0.4%	0.5%	0.4%	-0.1%	0.4%
Total London	**1.2%**	**0.6%**	**0.1%**	**-0.7%**	**-0.6%**	**0.0%**	**-0.7%**	**0.2%**

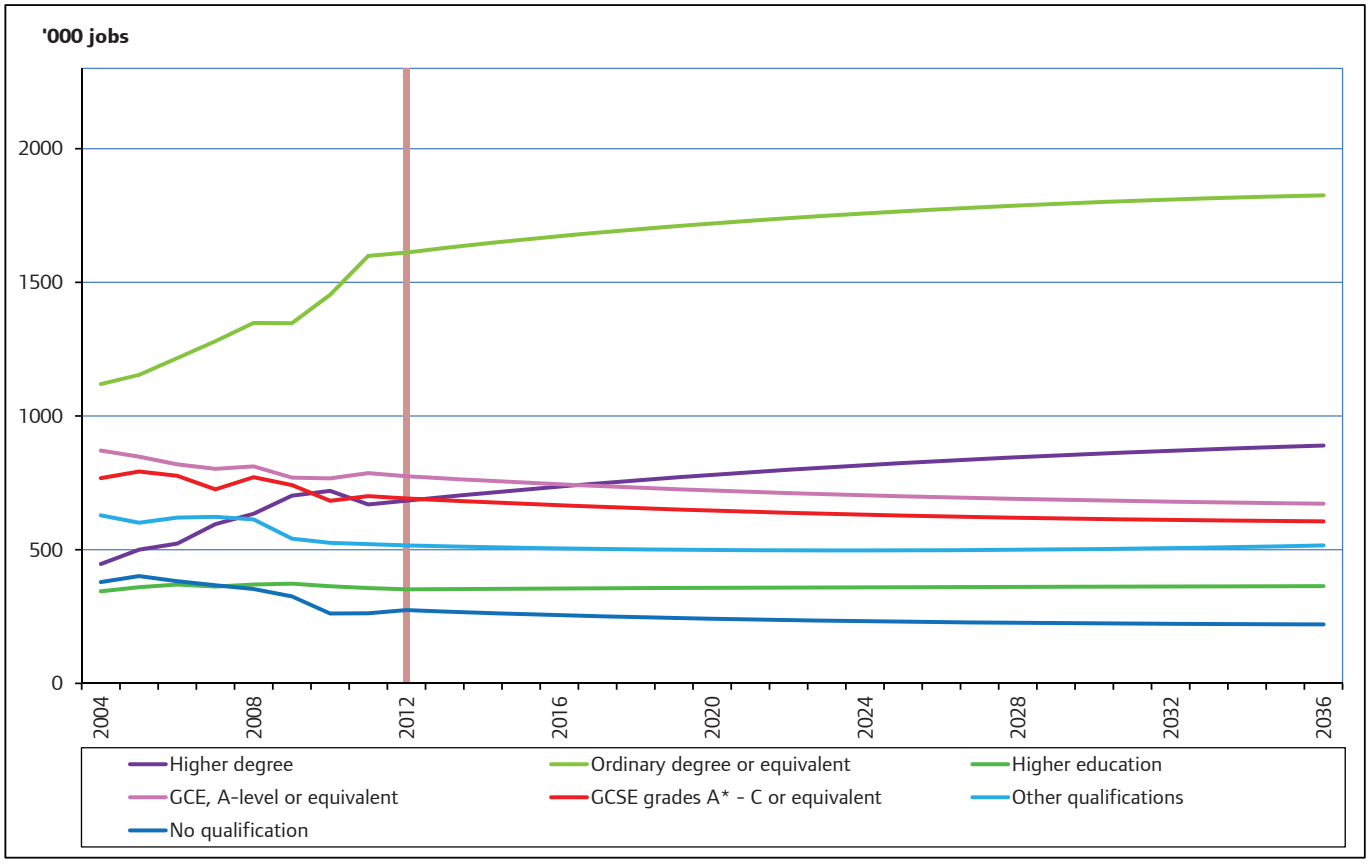
Ordinary degree or equivalent is projected to see the greatest absolute increase in numbers with an increase of 226,000 over the projection period. This is largely driven by growth in professional occupations.

Higher degrees are also projected to see large increases in numbers of around 220,000 from 2011-2036. Again, this is largely driven by demand from professional occupations.

Table A.4.10: Absolute change in qualification employment by occupation (000s, 2011 to 2036)

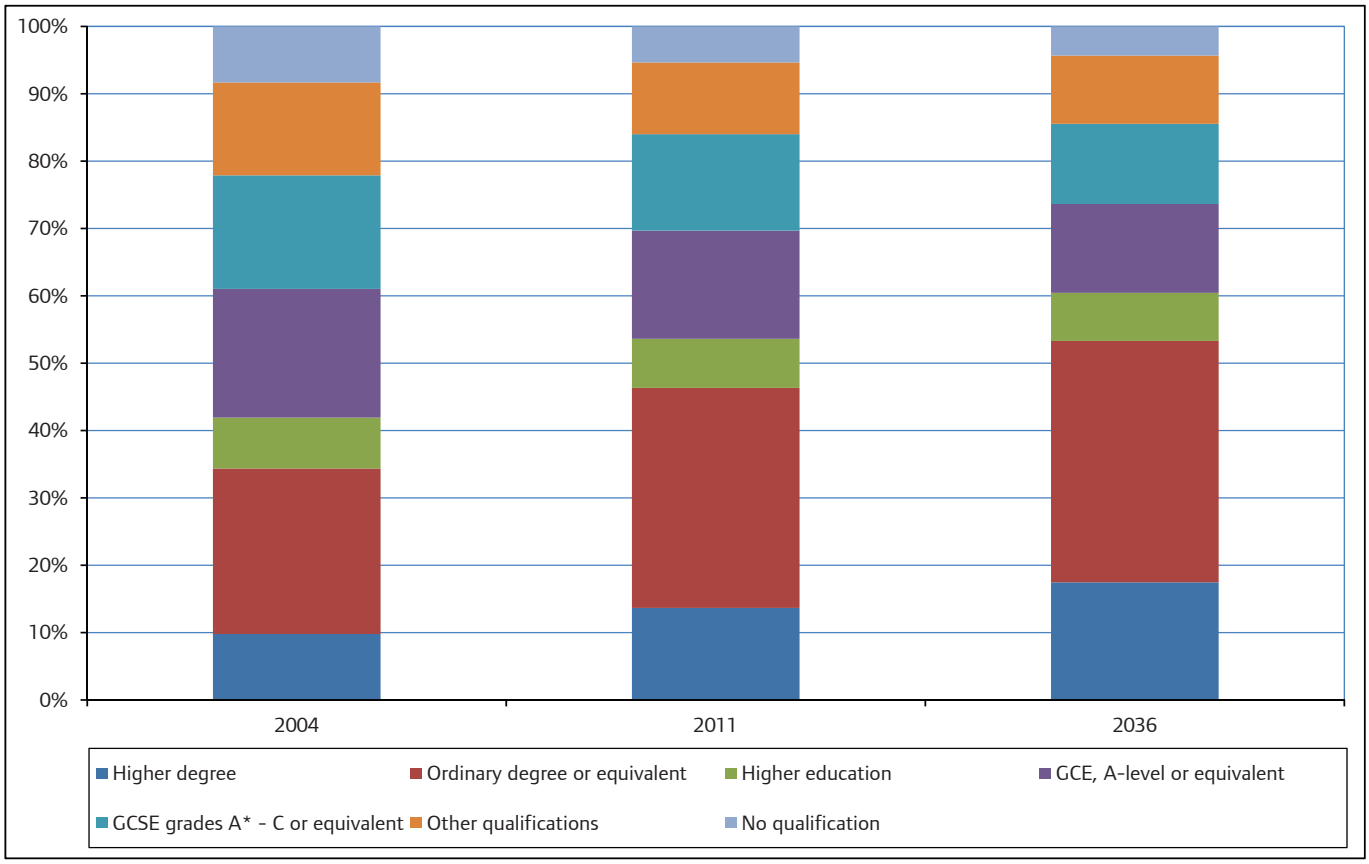
	Higher degree	Ordinary degree or equiva-lent	Higher educa-tion	GCE, A-level or equiva-lent	GCSE grades A* - C or equiva-lent	Other qualifi-cations	No qual-ification	Total
Managers and Administrators	39	73	5	6	7	0	-6	124
Professional Occupations	156	161	16	8	10	-2	2	351
Associate Professional and Technical Occupations	20	16	-8	-33	-21	-15	-4	-46
Clerical and Secretarial Occupations	-14	-86	-20	-72	-95	-39	-17	-344
Craft and Related Occupations	5	24	11	3	21	50	3	117
Personal and Protective Service Occupations + Sales Occupations	5	11	0	-15	-34	-20	-17	-70
Plant And Machine Operatives + Other Occupations	10	27	4	-10	17	22	-2	67
Total London	**220**	**226**	**7**	**-114**	**-94**	**-5**	**-41**	**199**

Figure A.4.13: Changes in Qualification Demand (2001 to 2036)



In 2004, 34 per cent of jobs had a highest qualification of higher degree or ordinary degree/equivalent. This increased to 46 per cent by 2011 and is projected to reach 53 per cent by 2036 (figure A.4.14). This projection is unchanged from central scenario in the main text.

Figure A.4.14: Shares of qualifications as a total of all jobs



Appendix 5: Employment projections methodology

To construct long-term employment projections for London, GLA Economics use a trend-based methodology. This looks at the historical relationships between output and employment (or productivity) to ascertain the future relationship between the two. This provides an indication of the output growth required to keep employment in London stable (or for the employment growth rate to be zero). Combined with an assumed output growth rate for London, these two assumptions determine the projected employment growth. Further details on the methodology can be found in GLA Economics Working Paper 51: Employment Projection for London by sector and trend-based projections by borough, December 2011[19].

The methodology clearly relies on good output and employment data for London. Any changes (and new data) in the historic series to either of these will affect the projections.

GLA Economics use the headline workplace-based GVA (or output) estimates from the ONS Regional Accounts publication. Since the last employment projections were published in 2011 (Working Paper 51) the available time series for London's output (or London's workplace-based current price GVA) is significantly shorter. Historically, the Office for National Statistics (ONS) published London GVA data from 1989. However, as part of the move to estimate regional GVA on a Standard Industrial Classification 2007 (SIC 2007) basis the official series now only goes back to 1997. To estimate London's GVA prior to this the UK's GVA growth rate has been applied. This method has also been used to estimate London's GVA for 2011. As in Working Paper 51, London's GVA estimates have been converted to real prices (i.e. adjusted for inflation) by using the UK GVA deflator.

Table A.5.1 shows the revisions for London's output. On average, the revisions have increased output by 0.4 percentage points. However, three years – 1989, 2002 and 2009 – have the largest revisions. If these outliers are removed, the average revision falls to 0.3 percentage points.

For employment, GLA Economics have developed a consistent time series for London jobs back to 1984 using ONS business surveys (in particular the Workforce Jobs series) and the Labour Force Survey. There have been revisions to London's historic employment numbers since GLA Economics' last employment projections (Table A.5.2). The only significant change (with a percentage change greater than 0 per cent at one decimal place) was for 2010 data. This change is associated with ONS Workforce Jobs series revisions published in March 2012. Nonetheless, this revision of 1.3 per cent is relatively small compared to some revisions previously seen (see, for example, Table 1 in Working Paper 51).

Table A.5.1: London real GVA growth – current and previous data[20]

	Working Paper 51 data (2011)	Current data (2012)	Change (percentage points)
1985	3.8	4.1	0.3
1986	2.8	4.1	1.3
1987	3.8	5.2	1.4
1988	4.2	5.3	1.1
1989	4.8	2.6	-2.1
1990	0.7	2.3	1.6
1991	-2.5	-1.4	1.1
1992	-0.4	1.1	1.5
1993	2.9	3.2	0.3
1994	3.4	4.4	1.0
1995	2.0	2.9	0.9
1996	3.9	3.0	-0.9
1997	4.9	3.9	-1.0
1998	6.2	6.0	-0.2
1999	6.2	5.9	-0.3
2000	5.6	4.3	-1.4
2001	1.5	3.1	1.6
2002	1.4	4.2	2.7
2003	4.1	4.2	0.0
2004	3.4	3.0	-0.4
2005	3.8	3.1	-0.7
2006	3.7	4.2	0.4
2007	4.7	4.9	0.1
2008	1.9	1.2	-0.7
2009	-4.4	-1.5	2.9
2010	1.3	-0.1	-1.4
2011		1.0	
Average growth (1985-2010)	2.8	3.2	

Source: GLA Economics based on ONS Regional GVA data

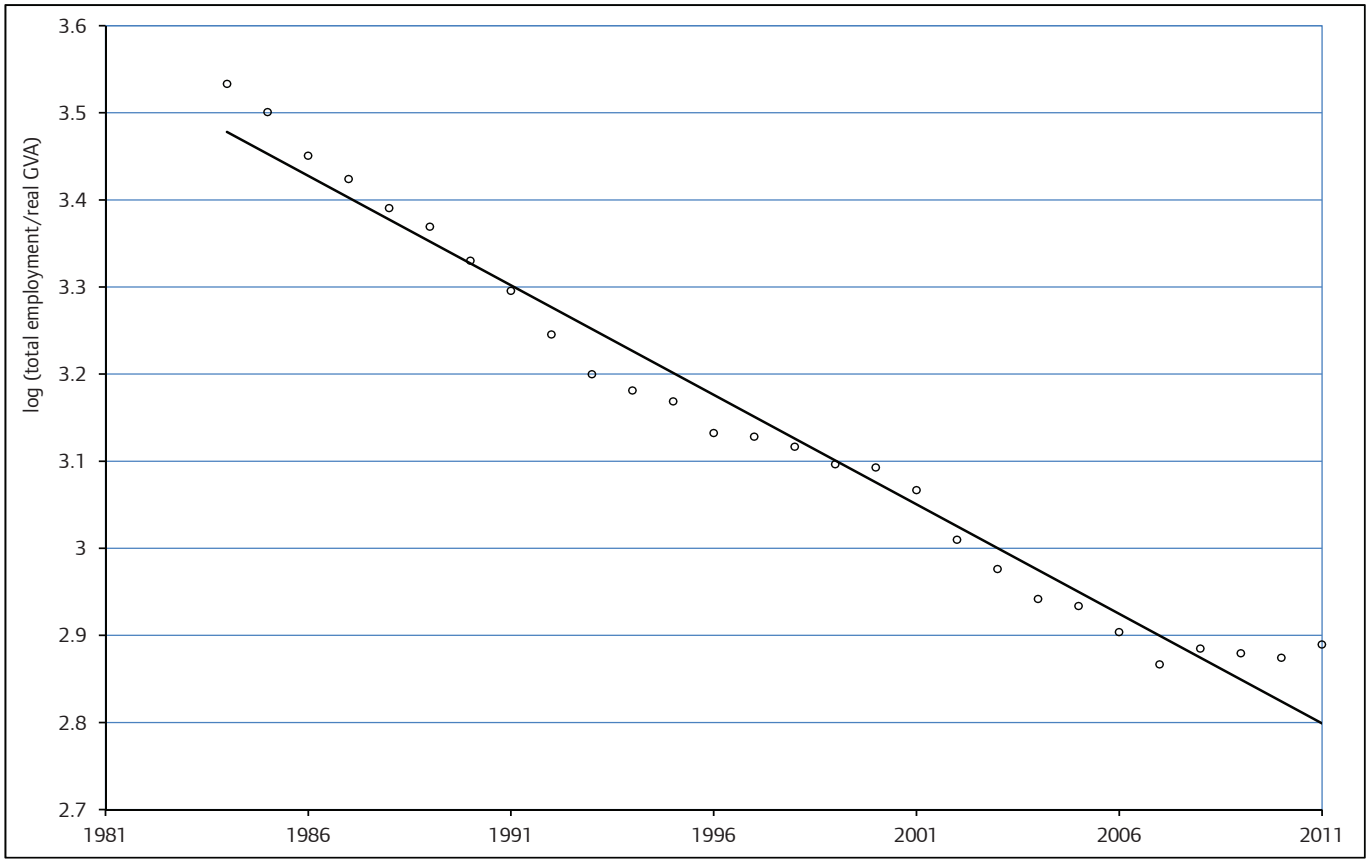
Table A.5.2: Total London employment – current and previous data[21]

	Working Paper 51 data (2011)	Current data (2012)	Change (000s)	Change (%)
1984	4,094	4,094	0.0	0.0
1985	4,126	4,126	0.0	0.0
1986	4,085	4,085	0.0	0.0
1987	4,183	4,183	0.0	0.0
1988	4,262	4,262	0.0	0.0
1989	4,282	4,282	0.0	0.0
1990	4,211	4,211	0.0	0.0
1991	4,012	4,012	0.0	0.0
1992	3,858	3,858	0.0	0.0
1993	3,803	3,803	0.0	0.0
1994	3,897	3,897	0.0	0.0
1995	3,960	3,960	0.0	0.0
1996	3,934	3,935	1.0	0.0
1997	4,070	4,070	0.5	0.0
1998	4,263	4,264	1.1	0.0
1999	4,426	4,426	-0.1	0.0
2000	4,598	4,598	0.4	0.0
2001	4,619	4,619	-0.4	0.0
2002	4,546	4,546	0.1	0.0
2003	4,577	4,578	0.7	0.0
2004	4,556	4,556	0.3	0.0
2005	4,658	4,658	-0.2	0.0
2006	4,709	4,709	0.2	0.0
2007	4,759	4,758	-0.9	0.0
2008	4,903	4,902	-0.8	0.0
2009	4,803	4,801	-2.1	0.0
2010	4,837	4,773	-63.9	-1.3
2011		4,896		

Source: GLA Economics based on ONS data (particularly Workforce Jobs Series)

The changes to London's historical output and employment series have affected historical productivity (output per job). Figure A.5.1 shows the logged ratio of employment to output (the inverse of productivity). On such a chart the negative gradient is equal to the output growth that is required to maintain stable employment. In Figure A.5.1 a fitted local regression curve (or trendline) has been added to highlight the historical trend. The gradient of this trendline over the period 1984 to 2011 is -2.5, which implies that output growth of 2.5 per cent would have been required for employment to remain stable over this period.

Figure A.5.1: Log of total employment as a proportion of total output in London (1984-2011)[22]



As in Working Paper 51, half of the medium term trend and half of the long term trend have been used to project future productivity. This produces a projection of productivity growth of 1.8 per cent per annum. Combined with a forecast output growth of 2.5 per cent per annum (unchanged from Working Paper 51) this yields a growth rate of 0.7 per cent per annum.

London's Sector Employment Projections

Employment projections for London's sectors are constructed in a similar way to the London-wide projections. GLA Economics begin by examining the historic trend of employment (employees and self-employed jobs) as in Table A.5.2, broken down by sector, against London level GVA for each sector (or, more specifically, logged sector employment over London GVA). Depending on the characteristics of the historic productivity trends in each sector a judgement is made on the trends that are most likely to direct future developments. To reconcile the forecasts that this method produces with that produced for London as a whole, the sector forecasts are constrained to the London total using the sector forecast proportions. The results of this method and the trend periods used in the projections are summarised in Table A.5.3.

Table A.5.3: Summary of trends used and results for sector employment projections

	Trend for projections to 2036	Resultant productivty trend (per cent per annum)	Output growth required for stable employment	Employment growth per annum with London output growth of 2.5% per annum
Primary & utilities	from 1984 to 2011	5.8	6.0%	-3.3%
Manufacturing	from 1984 to 2011	7.9	8.1%	-5.2%
Construction	3/4 trend from 1984 to 2011 1/4 trend from 1999 to 2011	2.6	2.6%	-0.1%
Wholesale	from 1984 to 2011	4.3	4.4%	-1.8%
Retail	1/2 trend from 1984 to 2011 1/2 trend from 2005 to 2011	2.3	2.3%	0.2%
Transportation and Storage	from 1984 to 2011	3.7	3.7%	-1.1%
Accomodation and food service activities	from 1984 to 2011	1.1	1.0%	1.5%
Information and Communication	from 1984 to 2011	1.0	0.9%	1.5%
Financial and insurance activities	1/2 trend from 1984 to 2011 1/2 trend from 1996 to 2011	2.8	2.8%	-0.3%
Professional, Real Estate, Scientific and technical activities	from 1984 to 2011	0.6	0.5%	2.0%
Administrative and support service activities	3/4 trend from 1984 to 2011 1/4 trend from 1998 to 2011	1.0	1.0%	1.5%
Public Admin and defence	3/4 trend from 1984 to 2011 1/4 trend from 1998 to 2011	3.5	3.5%	-1.0%
Education	1/2 trend from 1984 to 2011 1/2 trend from 1990 to 2011	2.0	1.9%	0.5%
Health	3/4 trend from 1984 to 2011 1/4 trend from 1991 to 2011	2.1	2.0%	0.4%
Arts, entertainment and recreation	1/2 from 1984 to 2011 1/2 from 1996 to 2011	1.6	1.6%	0.9%
Other services	1/2 from 1984 to 2011 1/2 from 1996 to 2011	1.2	1.2%	1.3%
Total London Employment	**1/2 from 1984 to 2011 1/2 from 2003 to 2011**	**1.8**	**1.8%**	**0.7%**

London's Occupations by Sector

The methodology used to estimate occupational demand by sector is similar to the methodology used for sector employment. The method begins by analysing the relationship between employment in each occupation and London total employment (specifically, log of employment by occupation over total employment). This is done separately for each sector and for the SOC 2010 occupations listed in Table A.5.4. It should be noted that the data for employment by occupation within sectors are only available on a consistent basis from 2001 onwards[23].

Given the short time series available for occupation-level employment, the trend over the entire period is used to project forward i.e. the overall trend (between occupation employment and total employment) from 2001 to 2011 is projected to continue until 2036. However, for the education sector this method did not seem sensible as there were clear breaks in the series for a couple of occupations. Specifically a different trend was taken for the following two occupations within the education sector:

- Professional occupations: here half the trend from 2001 to 2011 and half the trend from 2007 to 2011 is taken,
- Associate professional and technical occupations: here half the trend from 2001 to 2011 and half the trend from 2004 to 2011 is taken.

Table A.5.4: SOC 2010 Occupation Groups Used

1	Managers and Administrators
2	Professional Occupations
3	Associate Professional and Technical Occupations
4	Clerical and Secretarial Occupations
5	Craft and Related Occupations
6 + 7	Personal and Protective Service Occupations + Sales Occupations
8 + 9	Plant And Machine Operatives + Other Occupations

The results from this method provide GLA Economics with estimates based on the ONS LFS and APS. However, this is different to the data for London-wide and sector level employment forecast. Employment for London as a whole and by sector comes from GLA Economics' London historic jobs series. In order to make the occupation level analysis consistent, the shares of employment by occupation for each sector have been applied to the historic jobs series (as recommended by the ONS). This has been done for both the historic and projected occupation employment (using the projected employee and self-employed jobs for the latter).

London level occupation projections are then derived by summing numbers across individual sectors.

London's Qualification by Occupation

Historic data on the highest qualification held by those employed comes from the same source as the data for occupation employment i.e. from the ONS LFS/APS and is available from 2001. The qualification groups which are used in this work are listed in Table A.5.5. However, in 2011 the ONS changed the approach to collecting data on people's highest educational qualifications in order to obtain more information on qualifications obtained abroad, which had previously been reported as 'other'. This produced a structural break in the time series between 2010 and 2011. GLA Economics developed a method to project this change backwards for earlier years (see Figure A.5.2).

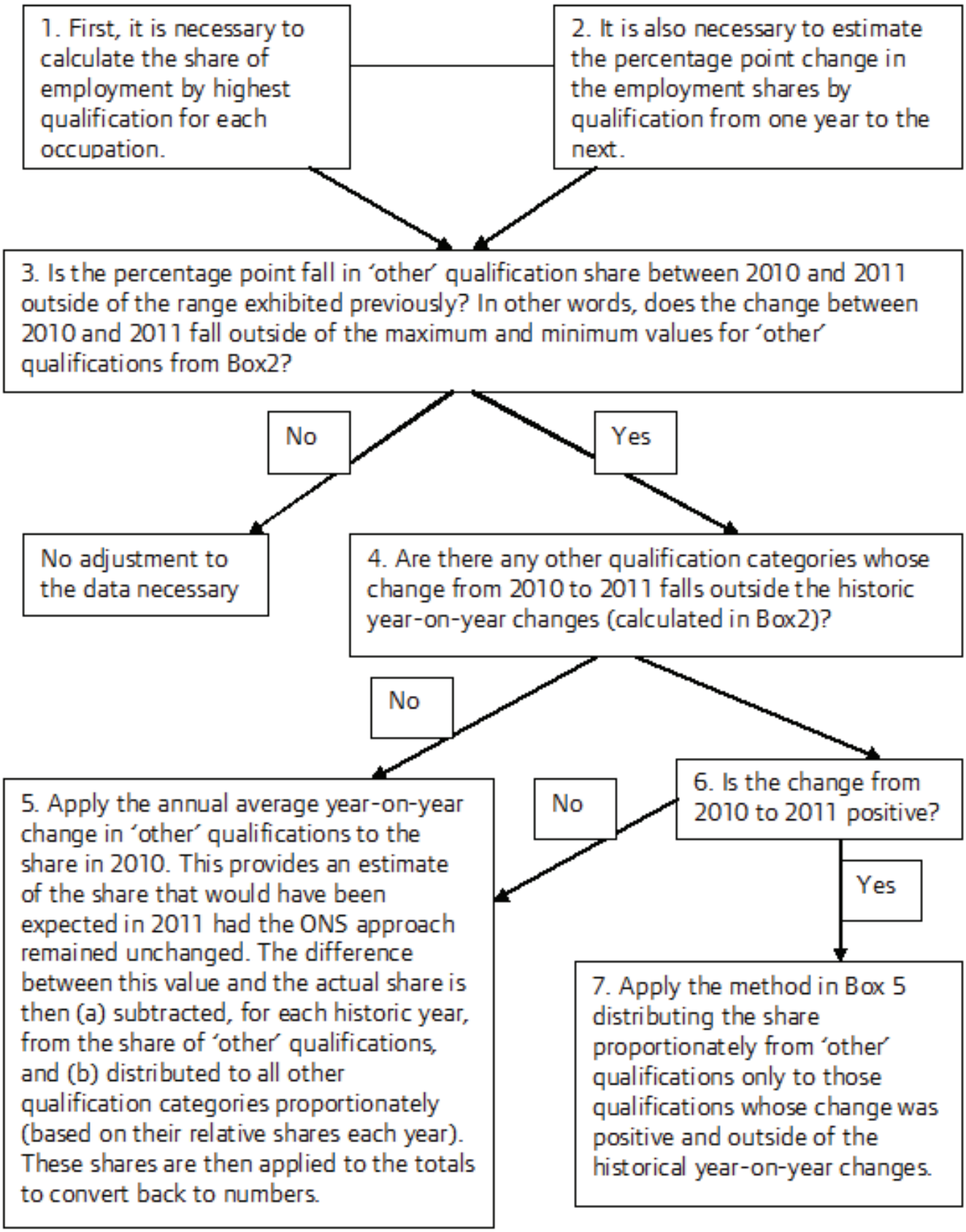
Table A.5.5: Highest Qualification Categories Used

1	Higher degree
2	Ordinary degree or equivalent
3	Higher education
4	GCE, A-level or equivalent
5	GCSE grades A*-C or equivalent
6	Other qualifications
7	No qualification

Once the historic data has been adjusted (so that it is consistent with the 2011 ONS method) the trend for each qualification (for each occupation) is projected using a logarithmic time trend[24]. The trend is projected off from the last data point available (2011). This method ensures that qualifications do not grow uniformly over time, but instead, and arguably more realistically, approach some finite number (i.e. it ensures that the growth of qualification employment is asymptotic over time). These are then converted to shares within each occupation (based on the total that results from applying the method to all qualification categories)[25]. These shares are then applied to the occupation-level employment projections. Note that since the occupation projections were reconciled to be consistent with the historic London jobs series this process ensures that the qualification projections (based on LFS/APS employment) are also consistent with the London jobs projections. Finally, the historic data are reconciled to London jobs series employment projections by applying the shares to the historic occupation totals.

London total qualification projections are then taken as the sum of each qualification across occupations.

Figure A.5.2: Smoothing method to control for 2011 step change in ONS 'highest qualification' method



Borough Employment Projections

Borough employment projections[26] are generated by applying a set of rules to three different projections for borough employment. These are, employment based on:

- Continued historic trends,
- Transport accessibility, and
- Workplace capacity.

The rationale is that trend-based forecasts for employment in the Boroughs need to be "reality checked" against forecasts for transport (to get employees to jobs) and forecasts for workspace (to accommodate employees once they have arrived). Our 'rules' for resolving differences between the three sets of forecasts are set out in detail below. Briefly, they constrain projected Borough employment below the trend-based forecast if there is either inadequate forecast transport or inadequate forecast workspace, or they allow the trend-based forecast to be exceeded if there is either plentiful forecast transport or plentiful forecast workspace.

The method for each of these is described below.

Borough employment based on continued historic trends

As explained in GLA Economics Working Paper 51, borough employment projections are based on employee numbers only (i.e. they do not include the self-employed). The historic series uses information from the Census of Employment (1981-1990), the Annual Employment Survey (1991-1997), the Annual Business Inquiry (1998-2007) and the Business Register and Employment Survey (2008- 2011). More information on how these have been constructed into one consistent series can be found in GLA Economics Working Paper 52[27].

In order to construct borough employment projections it is necessary to first construct projections for London as a whole for employees only. This is done using a similar method described above. First, we look at the historic trend of London employee jobs and GVA (or productivity) as well as the implied self-employment jobs (taken as the difference of London employee and self-employed jobs and London employee jobs only) and GVA to ascertain the future relationship for employees and self-employed (separately) with GVA. For the implied self-employment jobs the entire historical trend is used to project forward. For employee jobs, half the trend from 1984-2011 and half the trend from 2003-2011 is taken. A forecast 2.5 per cent per annum GVA growth rate is then applied to determine employment growth rates. To reconcile the forecasts that this method produces with that produced for London employees and self-employed combined, the forecasts are constrained using the employee to self-employed forecast proportions. This method produces a 0.6 per cent year-on-year growth rate for employee jobs in London from 2012 to 2036.

The borough-level employee jobs are then estimated using the same method to project sector-level employment. In other words, the historic trends of employment by borough against London GVA are analysed. Depending on the characteristics of the historic productivity trends in each borough a judgement is made on the trends that are most likely to direct future developments (ignoring transport and workplace capacity constraints). The results are then constrained to the total London-wide employee job projections (as estimated above) using the borough forecast proportions. The results of this method and the trend periods used in the projections are summarised in Table A.5.6. Full results of the borough level employee projections (including an assessment of capacity and accessibility at the borough level are set out in Appendix 8).

Table A.5.6: Summary of trends used and results for sector employment projections

	Trend for projections to 2036	Resultant productivty trend (per cent per annum)	Employeee growth per annum with London output growth of 2.5% per annum	Employee change from 2011 to 2036 with London output growth of 2.5% per annum
Barking and Dagenham	from 1981 to 2011	4.7	-1.7%	-16,610
Barnet	from 1981 to 2011	2.7	0.2%	6,330
Bexley	from 1981 to 2011	2.8	0.2%	2,910
Brent	from 1981 to 2011	3.6	-0.7%	-15,310
Bromley	from 1981 to 2011	2.6	0.4%	8,790
Camden	from 1981 to 2011	2.4	0.6%	43,390
City of London	1/2 trend from 1981-2011 1/2 trend from 1990-2011	2.8	0.2%	16,680
Croydon	1/2 trend from 1981-2011 1/2 trend from 1996-2011	3.8	-0.8%	-20,820
Ealing	from 1981 to 2011	3.5	-0.6%	-15,900
Enfield	from 1981 to 2011	3.2	-0.3%	-5,760
Greenwich	1/2 trend from 1981-2011 1/2 trend from 1994-2011	2.7	0.2%	4,240
Hackney	from 1981 to 2011	2.8	0.2%	3,990
Hammersmith and Fulham	from 1981 to 2011	1.8	1.2%	41,130
Haringey	1/2 trend from 1981-2011 1/2 trend from 1996-2011	3.2	-0.3%	-3,900
Harrow	from 1981 to 2011	2.8	0.2%	2,970
Havering	from 1981 to 2011	2.8	0.1%	2,130
Hillingdon	from 1981 to 2011	2.1	0.8%	40,210
Hounslow	from 1981 to 2011	2.5	0.5%	15,600
Islington	from 1981 to 2011	1.7	1.3%	66,200
Kensington and Chelsea	from 1981 to 2011	2.4	0.5%	16,380
Kingston-upon-Thames	from 1981 to 2011	2.8	0.1%	2,300
Lambeth	1/2 trend from 1981-2011 1/2 trend from 1996-2011	2.7	0.2%	6,450
Lewisham	1/2 trend from 1981-2011 1/2 trend from 1996-2011	3.0	-0.1%	-1,380
Merton	from 1981 to 2011	2.5	0.4%	7,120
Newham	from 1981 to 2011	2.3	0.7%	13,980
Redbridge	1/2 trend from 1981-2011 1/2 trend from 1996-2011	2.6	0.3%	5,340
Richmond-upon-Thames	from 1981 to 2011	2.4	0.6%	10,600
Southwark	1/2 trend from 1981-2011 1/2 trend from 2004-2011	0.9	2.1%	122,730
Sutton	from 1981 to 2011	2.8	0.2%	3,240
Tower Hamlets	from 1981 to 2011	0.2	2.8%	230,330
Waltham Forest	from 1981 to 2011	2.5	0.4%	6,270
Wandsworth	1/2 trend from 1981-2011 1/2 trend from 1996-2011	2.4	0.5%	14,550
Westminster, City of	1/2 trend from 1981-2011 1/2 trend from 1990-2011	2.7	0.2%	39,190
All London Employees	1/2 trend from 1984-2011 1/2 trend from 2003-2011	2.0	0.6%	653,350

Note: Change in employee jobs rounded to the nearest 10

Borough employment based on transport accessibility

Projections by Borough of the employment (employees only) that can be sustained, given improvements in transport infrastructure, are made by modelling the relative "pull" of the London boroughs, projected by a 'gravity model' reflecting changes in accessibility resulting from scheduled investments in London's transport. These projections were done for us by SKM Colin Buchanan.

Borough employment based on workplace capacity

Projections by Borough of the employment (employees only) that can be sustained given new sites for businesses. These projections were done for us by Roger Tym & Partners (part of Peter Brett Associates).

Once all three methods have been estimated a set of rules are employed to determine what employment by borough is actually expected to be (see Appendix 8 for the results). The rules are as follows:

Ordering of Projections	Projection Rule	Justification/Comments
If Trend > Capacity	At Trend projection if Trend < Capacity + 10% for all boroughs. At Capacity + 10% if trend is above this enhanced level of capacity	The trend projection is feasible if employers have scope to reach it by squeezing in extra workers. If not then the capacity constrains employment even after allowing for such squeezing in.
If Trend > Accessibility	To Accessibility projection for most boroughs. To Trend if Trend < Accessibility + 10% for Camden, Islington, Kensington and Chelsea, Tower Hamlets, Hammersmith and Fulham, Southwark, and Lambeth. To Accessibility +10% for Camden, Islington, Kensington and Chelsea, Tower Hamlets, Hammersmith and Fulham, Southwark, and Lambeth, if Trend > Accessibility +10% for these boroughs.	The trend projection for certain inner London boroughs is feasible if workers are willing to travel for longer into them. Otherwise the accessibility-based projection constrains employment. For certain inner London boroughs it constrains employment after allowing for some additional willingness to travel on the part of workers.
If Trend > both Capacity and Accessibility	Use rules above. Employment constrained to whichever constraint produces the lowest number.	
If Trend < Capacity	To Capacity based projection	A plentiful supply of site capacity increases the attractiveness of the location so that historic performance can be bettered.
If Trend < Accessibility	To Accessibility based projection	Improved accessibility increases the attractiveness of the location so that historic performance can be bettered.
If Trend < both Capacity and Accessibility	To the lowest of the Capacity and Accessibility based projections	The historic trend can be bettered, to the extent allowed by the lower of the Capacity and Accessibility factors

Appendix 6: Population projections methodology

1) Population Projections: Projection process explained

The GLAs borough-level population projections are produced using a cohort component projection model. Estimates and projections are produced from the starting point of the 2001 mid-year estimate. This starting population is aged-on a year, and deaths, births and migration are accounted for such that an estimated population for mid-year 2002 is arrived at. This process is repeated, using the final population calculated in each loop as the starting population for the next.

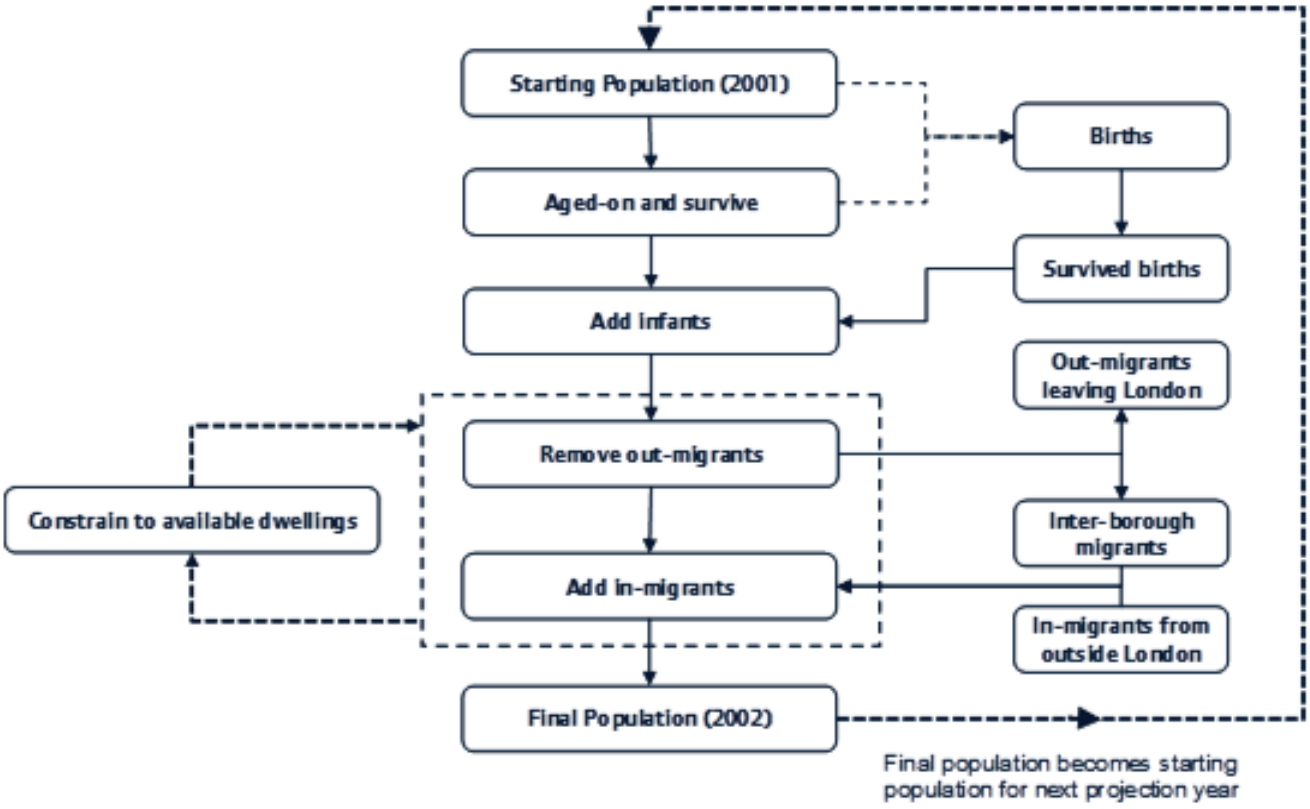
Beyond the last year with actual data available, values for births, deaths and migration flows are projected using age specific probabilities for fertility, mortality and migration generated from historical trends. At this stage the projection is unconstrained by development.

The process of generating the final projected population is an iterative one. Candidate population projections are created and converted into households by applying a set of Household Representative Rates (HRR) - derived from the DCLG household projections. The number of households that the population forms is compared to the available household spaces implied by the housing trajectory. Migration flows are adjusted until a population is found which yields a number of households that matches the available household spaces.

This process is undertaken for each borough individually and the London total is an aggregation of the borough level results.

Figure A.6.1 illustrates the process of producing the GLAs borough-level projections.

Figure A.6.1: Overview of the projection process (borough model)



The data used in the 2011 projections are listed below:

Births and Deaths

Births from historic ONS mid-year estimates (MYE) were used for births to mid-year 2002 to 2010. ONS calendar year births for 2010 were used as a proxy for births to mid-year 2011.

Fertility and mortality trends

Age Specific Fertility Rate (ASFR) and Age Specific Mortality Rate (ASMR) trends beyond 2011 were taken from the "Principle" assumptions used in the 2010-based ONS National Population Projections (NPP) for England. Proportional changes in these rates were used to roll the estimated 2011 ASFR rate forward to 2031.

Dwellings

Historic dwelling changes

For 2002 to 2004, borough-supplied figures were used. For 2005 to 2011, completions data from the London Development Database were used together with CLG vacancy data to estimate changes in the number of dwelling spaces available.

Projected dwelling changes

If no development data was provided by the local authority, development trajectories were based on the Strategic Housing and Land Availability Assessment (SHLAA) carried out in 2009. Where ward-level development data was provided by local authorities, this was used as supplied. If borough-level data only was provided, then this was distributed between wards according to the proportions in the SHLAA.

Migration data

Domestic flows

For 2002 to 2010, domestic migration flows were taken from moves recorded in the National Health Service Central Register (NHSCR).

International flows
For 2002 to 2005, international flows were based on the ONS MYE values, modified to fit with capacity as estimated using development data/CLG household formation rates.

For 2006 to 2010, the ONS inflow estimates using the Migration Statistics Improvement Programme (MSIP) methodology were used unchanged.

Migration rates and characteristics
Age and gender characteristics of migrant flows are based on data from the 2001 Census. Adjustments were made – primarily to the rates governing migration to domestic locations outside of London – such that the numbers of children and the elderly better fit with other sources of evidence (namely child benefit claims and GP registrations).

Future migration trends
International inflows are assumed constant beyond 2010 and fixed at the mean inflow for the last five years of historic data.

All other migration flows are projected forward using constant age and gender specific probabilities. The probabilities used are an average of the previous five years of probabilities that have been scaled to fit estimated flows and populations.

Household formation rates
Rates were taken from the 2008-based DCLG household projections. For three boroughs (Newham, Tower Hamlets and Waltham Forest), household formation rates were adjusted to give total populations more consistent with other sources of evidence (the revised international flows from MSIP and the boroughs' own population count data that made use of cross-linked administrative datasets).

Additional sources of information
Age specific migration rate data from the 2001 Census was modified such that the final projections of 0-15 year old children gave better agreement with GP registration and child benefit claim data.

2) HESA leaver and destination surveys
The data used in the Higher Education section of the report are predominantly based on results from the Higher Education Statistics Agency's Destinations of Leavers from Higher Education Survey.

The DLHE survey covers full-time and part-time qualifiers who were of UK and other EU domicile at the point of entry, it excludes those domiciled outside the EU. The survey includes those qualifiers who completed their programmes during the academic year 2010/11, that is, the period 1 August 2010 to 31 July 2011. The reference date for those obtaining the qualification between 1 August 2010 and 31 December 2010 was 19 April 2011, and the reference date for those obtaining the qualification between 1 January 2011 and 31 July 2011 was 10 January 2012.

The purpose of splitting the collection in this way is to bring the gap between the date of qualification and the reference date closer to the six-month target. The survey covers qualifiers from the 165 UK higher education institutions (HEIs). Of these, 164 were publicly-funded and one, The University of Buckingham, was privately funded.

The data capture is undertaken by HEIs but the procedure is prescribed by HESA and, with some degree of detailed flexibility, is uniform across all institutions, regardless of size, nature, and location. A standard questionnaire printed by HESA is used; this is also available in Welsh, for use on request in Welsh institutions only.

Data from the DLHE return has been linked to the student record collection to allow analysis by student characteristics such as level of qualification, mode of study and subject of study.

3) UCAS points data

The UCAS points data used in this report were provided under strict terms of use by the Universities and Colleges Admissions Service. The particular breakdowns used are not available through the UCAS website.

For further information regarding UCAS statistics please visit the website below or use the contact details provided beneath.

http://www.ucas.com/about_us/stat_services/stats_online/

datainsight@ucas.ac.uk or 01242 544 896

4) Shanghai University's Academic Ranking of World Universities

For more information on the rankings used in this report, please visit the website below

http://www.arwu.org/

Appendix 7: Higher Education in London

This appendix looks the higher education system in London. It starts by looking at the numbers entering higher education in London and how that has changed over the past 15 years or so. The appendix looks at the subjects studied and what region graduates from London universities first start to work in (and how that varies by subject). The appendix also briefly considers the ranking of some of London's higher education institutions.

Numbers entering London's higher education system

Over the past twenty years or so there has been a significant expansion of higher education in the UK. Since 1995/6 the total number of students at London Higher Education Institutions (HEIs) has increased from 257,000 to 410,000 by 2010/11 - an increase of 60 per cent over the period (an additional 150,000 students).

In London the rate of growth in higher education students has been highest for postgraduate study (increasing by 92 per cent between 1995/6 and 2010/11). The number of overseas students at London HEIs has also increased significantly - rising from 39,000 in 1995/6 to over 100,000 in 2010/11.

Table A.7.1: London and UK higher education institution student enrolment trends

	London HEIs (000s)				UK HEIs total (000s)			
	1995-96	2007-08	2010-11	% change 1995-96 to 2010-11	1995-96	2007-08	2010-11	% change 1995-96 to 2010-11
Total students	257	367	410	60	1,720	2,400	2,562	49
Undergraduate	190	250	274	44	1,350	1,805	1,913	42
Postgraduate	67	102	129	92	370	501	589	59
Further education	-	15	8		-	94	61	
Writing up or sabbatical	-	9	6		-	50	44	
Full-time	170	244	294	73	1,108	1,495	1,694	53
Part-time	87	124	116	34	612	904	868	42
UK HE students	217	272	300	38	1,524	1,964	2,073	36
Overseas HE students	39	79	103	163	196	342	428	118

Source: Students in Higher Education Institutions (Higher Education Statistics Agency)

Of the overall expansion of 153,000 enrolments between 1995/96, 49,000 are accounted for by Group 1 institutions (includes Imperial, LSE, SOAS, UCL, Birkbeck etc) and a further 36,000 for Group 2 institutions (includes Brunel, Kingston, Roehampton etc). That is, almost half of all growth in enrolments are accounted for by the two highest ranked sets of institutions.

Table A.7.2 shows that the pattern of enrolments and qualifiers by degree subject is very similar as between London and UK HEIs. London has a slightly higher share of enrolments/qualifiers for medicine & dentistry and creative arts & design and computer science.

Table A.7.2: London and UK higher education institution student enrolment and qualifier patterns by subject area (2010-11)

	Enrolments by subject area (% total)			Qualifiers by subject (% total)		
	London HEIs	UK HEIs excluding London	percentage point difference	London HEIs	UK HEIs excluding London	percentage point difference
Medicine & dentistry	5	2	2.3	4	2	2.4
Subjects allied to medicine	12	13	-0.3	12	11	0.7
Biological sciences	7	8	-1.6	6	7	-1.6
Veterinary science	0	0	0.2	0	0	0.2
Agriculture & related subjects	0	1	-0.5	0	1	-0.5
Physical sciences	2	4	-1.9	2	4	-1.7
Mathematical sciences	2	2	-0.2	1	1	-0.1
Computer science	5	4	1.0	5	4	1.1
Engineering & technology	6	7	-0.6	6	7	-0.9
Architecture, building & planning	3	3	0.3	3	3	0.3
Social studies total	9	9	-0.3	10	9	0.4
Law total	4	4	0.6	5	4	1.0
Business & administrative studies	15	15	0.0	16	18	-1.7
Mass communications & documentation	3	2	1.1	3	2	1.2
Languages	4	6	-1.9	4	5	-1.6
Historical & philosophical studies	3	4	-1.2	3	4	-1.1
Creative arts & design	11	7	5.0	11	7	4.2
Education	8	10	-2.0	9	11	-2.4
Total	100	100	0.0	100	100	0.0

Source: Students in Higher Education Institutions (Higher Education Statistics Agency)

Table A.7.3 shows the percentage of leavers from London HEIs by subject area. It shows that the percentage of leavers from non-medical STEM subjects has fallen over time (particularly among physical sciences and engineering & technology). In contrast, both creative arts & design and education have seen significant increases in the percentage of leavers that those subjects account for over the period 1996-96 to 2010-11.

Table A.7.3: London higher education institution student enrolment leaver trends by subject. Percentage of leavers by subject, 1995-96 to 2010-11

	Leavers by subject (percentage of total)			
	1995-96	2004-05	2007-08	2010-11
Medicine & dentistry	3	4	4	6
Subjects allied to medicine	7	11	11	10
Biological sciences	5	6	6	6
Veterinary science	0	0	0	0
Agriculture & related subjects	0	0	0	0
Physical sciences	5	3	2	2
Mathematical sciences	2	1	1	1
Computer science	5	7	4	4
Engineering & technology	10	5	5	4
Architecture, building & planning	3	3	3	4
Social studies	11	8	9	8
Law	5	5	5	4
Business & administrative studies	13	13	13	13
Mass communications & documentation	1	4	4	4
Languages	5	4	4	4
Historical & philosophical studies	4	3	3	3
Creative arts & design	9	12	13	13
Education	10	13	13	14
Combined	4	0	0	0
Total	100	100	100	100

Source: HESA Destinations of Leavers from Higher Education Institutions Survey

Tables A.7.4 and A.7.5 look at the employment (or study)[28] destination of leavers from London HEIs, in terms of region, both 6 months and 3 years after graduation. Almost seven in ten graduates from London HEIs in 2010/11 entered employment in London. The next most popular employment destination for graduates of London HEIs was the South East, followed by the East region. Overall just over 12,000 graduates who studied in London chose employment outside London in 2010/11, 6 months after graduating (down 5,000 on the 2007/08 figure). The first destination survey suggests that a greater proportion of those who previously sought employment overseas appear to be remaining in the UK and entering employment in London.

Table A.7.4: London higher education institution leaver employment destination trend (first destination)

Employment Destination	2004-05	2007-08	2010-11*	Qualifiers from London HEIs taking up employment outside London, 2010-11
London	65	66	69	
South East	13	13	13	5,240
East of England	6	6	6	2,480
South West	2	2	2	915
East Midlands	1	1	1	420
West Midlands	1	1	1	570
Yorkshire and the Humber	1	1	1	360
Noth West	1	1	1	420
North East	0	0	0	130
Scotland	0	0	1	220
Wales	0	0	0	195
Northern Ireland	0	0	0	60
Outside UK	6	7	3	1180
Totals	100	100	100	12190

Source: HESA first destination survey

Table A.7.5: London higher education institution leaver employment destination trend (3 - year destination)

	Longitudinal employment desintation (% London HEI leaver total 2004/05*)	Longitudinal employment desintation (% London HEI leaver total 2006/07*)
London	68	71.6
South East	15	12.0
East of England	6	7.1
South West	2	2.3
East Midlands	1	1.1
West Midlands	1	1.4
Yorkshire and the Humber	1	1.0
Noth West	1	1.0
North East	0	0.4
Scotland	3	0.9
Wales	1	0.7
Northern Ireland	1	0.4
Outside UK	-	-
Totals	100	100

Source: HESA longitudinal destination survey

Turning to London's attractiveness to graduates who studied outside London, Table A.7.6 shows that London attracts graduates from across the UK, but particularly from the neighbouring regions of the South East and East. Moreover, the attractiveness of London appears to rise between 6 months and 3 years after graduation. In every region except Northern Ireland a greater proportion of students are in employment in London 3 years after graduation when compared to 6 months after graduation. Overall, in 2010/11, just over 25,000 graduates who studied outside London subsequently took up employment in the capital, more than double the estimated number studying in London but finding employment outside London.

Table A.7.6 Trend in leavers to first employment destination London by higher education institution location

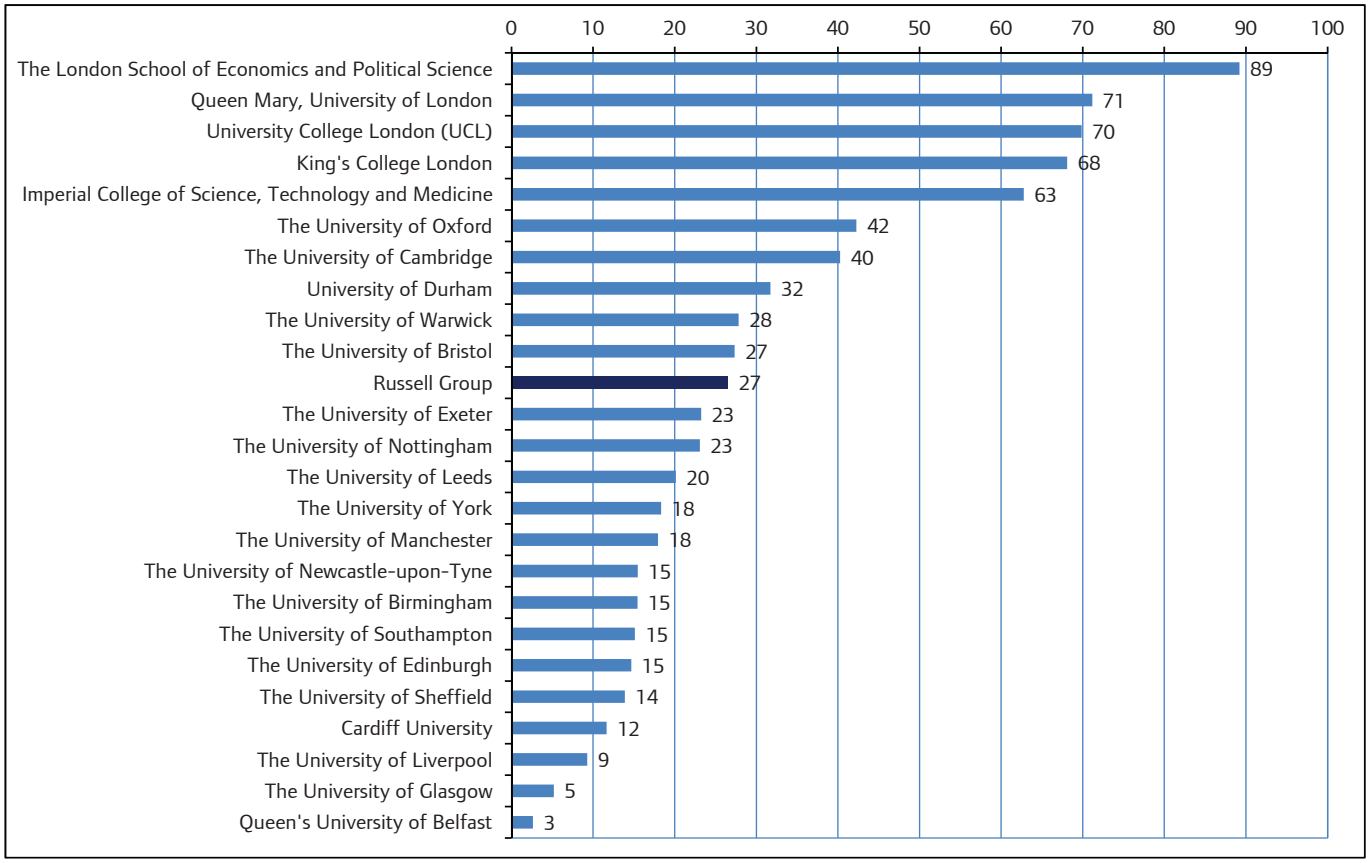
HEI location	HEI location (Percentage entering first destination employment in London) 2004-05	2007-08	2010-11	'Injection'. 2010-11 qualifiers from non-London HEIs taking up employment in London, 2010-11	2010 Longitudinal Survey of 2006-07 leavers. 2010 employment destination (% qualifiers in each region taking up employment in London in 2010)
London	65	66	70.8		71.6
South East	17	19	23.1	6,645	26.9
East of England	19	20	21.8	3,350	30.9
South West	12	13	14.7	3,240	22.4
West Midlands	8	8	9.2	2,060	14.6
East Midlands	9	13	13.5	2,830	20.1
Yorkshire and the Humber	7	8	9.1	2,230	13.7
North West	5	6	6.5	2,065	9.6
North East	7	8	9.0	1,300	20.1
Scotland	4	4	4.9	1,060	6.5
Wales	4	5	5.3	785	7.1
Northern Ireland	0	1	1.6	90	1.5
UK domiciled	18	18	**20.3	~25,655	23.6

Source: HESA first destination and longitudinal destination surveys

Figure A.7.1 looks at the proportion of students that first take up employment in London following their studies for each of the UKs Russell Group universities. Unsurprisingly, the London institutions dominate the highest shares of leavers entering employment in the capital. Indeed the top five institutions are all in London, followed by Oxford and Cambridge.

Outside London and Oxbridge, Durham, Warwick and Bristol universities have the next largest shares of leavers taking up their first employment in London.

Figure A.7.1: Russell Group of universities - percentage of HEI leavers' first employment destination is London, 2010-11



Source: HESA first destinations survey

Table A.7.7 shows that London is most successful at retaining graduates in subjects like mathematical science, law, business and administrative studies and mass communication and documentation. It is less successful at retaining graduates from veterinary science, medicine and dentistry, engineering and technology and physical sciences. Over the last six years London has become more successful in retaining graduates across every subject grouping.

In terms of 'attraction rates', the capital attracts a relatively high share of mathematical science, languages and historical and philosophical study graduates. In comparison, London attracts a relatively small share of medicine and dentistry, veterinary science, education and engineering and technology graduates.

Table A.7.7: Retention and attraction trends of HEI graduates' first destination to London by subject area

	Retention rates			Attraction rates		
	Percentage of London HEI leavers with London as first employment destination			Percentage of non-London UK HEI leavers with London as first employment destination		
	2004-05	2007-08	2010-11	2004-05	2007-08	2010-11
Medicine & dentistry	50	45	51	2	6	7
Subjects allied to medicine	67	68	69	4	5	6
Biological sciences	63	68	70	9	9	11
Veterinary science	6	15	17	3	4	2
Agriculture & related subjects	34	31	34	4	4	4
Physical sciences	55	51	62	8	9	12
Mathematical sciences	74	77	83	16	21	25
Computer science	75	73	78	9	10	12
Engineering & technology	45	46	51	7	9	9
Architecture, building & planning	67	63	70	10	12	16
Social studies	71	71	80	13	15	16
Law	72	69	81	10	10	12
Business & administrative studies	70	71	81	11	13	16
Mass communications & documentation	75	74	81	14	16	17
Languages	69	68	76	15	18	21
Historical & philosophical studies	72	73	74	15	17	20
Creative arts & design	62	67	69	13	16	16
Education	62	66	72	4	3	4
Combined	62	66	94	9	11	14

Source: HESA first destinations survey

Table A.7.8 shows that London has three HEIs in the top 100 global HEIs according to the Shanghai Jiao Tong University rankings.

Table A.7.8: Shanghai Jiao Tong University international university academic rankings 2004, 2009 and 2011

University	Ranking			Change 2004 to 2009	Change 2004 to 2011
	2004	2009	2011*		
Harvard	1	1	1	0	0
Stanford	2	2	2	0	0
Cambridge	3	4	5	-1	-2
Oxford	8	10	10	-2	-2
UCL	25	21	20	4	5
Imperial College London	23	26	24	-3	-1
Manchester	78	41	38	37	40
Edinburgh	47	53	53	-6	-6
Bristol	60	61	70	-1	-10
King's College London	77	65	68	12	9
Sheffield	69	81	97	-12	-28
Nottingham	80	83	85	-3	-5
Birmingham	93	94	102-150	-1	-
Queen Mary and Westfield College	202-301	152-200	201-30	-	-

Source: Academic Ranking of World Universities - 2011, Shanghai Jiao Tong University

Table A.7.9 and Figure A.7.2 look at the entry requirements to higher education in London HEIs in terms of UCAS point scores.

Table A.7.9 shows that for both London and the UK as a whole the average points score of accepted students is rising, particularly in the share of those amassing 360 points or more. Overall, London HEIs are require slightly less in terms of UCAS points than the UK average.

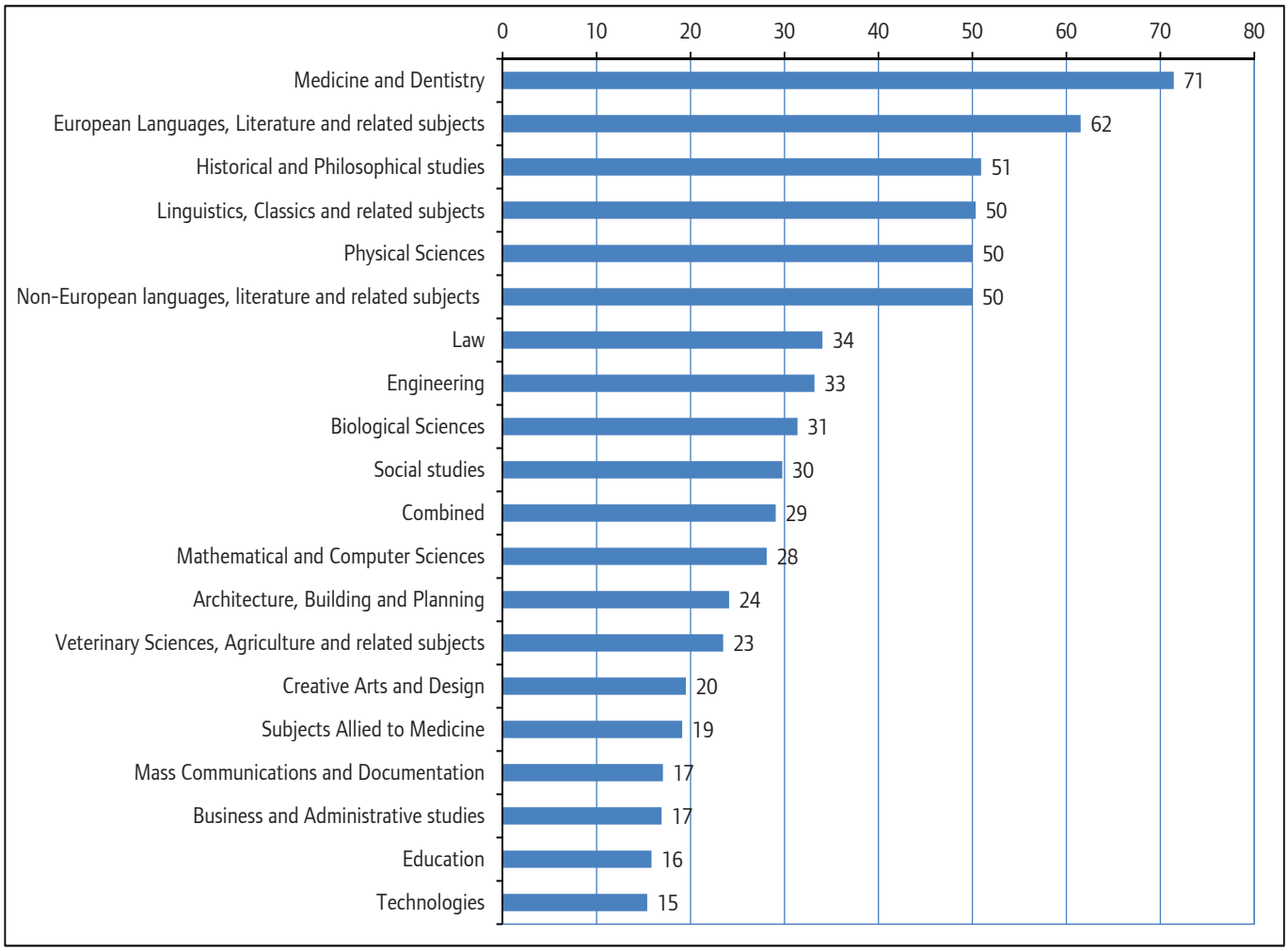
Table A.7.9: UK and London Higher Education Institution UCAS acceptance trends

	UCAS points		
All UK HEIs	80-239	240-359	360+
2002	33.0	36.0	31.0
2005	26.0	36.0	38.0
2009	20.0	36.0	44.0
2011	16.0	36.0	47.9
London HEIs			
2002	37.0	33.0	30.0
2005	36.0	34.0	31.0
2009	27.0	33.0	40.0
2011	22.3	33.5	44.2

Source: UCAS, GLA Intelligence Unit

Figure A.7.2 shows the wide variation across subject areas in terms of the share of total acceptances accounted for by students with 360 or more UCAS points. More than seven in ten students accepted onto medicine and dentistry courses in 2011 had at least 360 points, compared to just 15 per cent in technologies. A total of six subject areas had at least a fifty per cent share whilst a further five had less than 20 per cent of successful applicants achieving 360 plus UCAS points.

Figure A.7.2 Percentage of acceptances to UK Higher Education Institutions with 360+ UCAS points (2011)



Source: UCAS, GLA Intelligence Unit

Single degree subject by sector

This section of the appendix presents two tables looking at the relationship between single degree subject and sector. Table A.7.10 shows the percentage of jobs in each sector by single subject degree area. Table A.7.11 shows the percentage of each sector's jobs which are accounted for by different single subject degree areas. For instance, the tables show that of the jobs within the Finance and Insurance sector held by people who have a single subject degree, 33 per cent are held by people who have a degree in business and administrative studies. Similarly, of the jobs held by people who have a degree in medicine and dentistry, 79 per cent are in the human health and social work sector.

Table A.7.10: Percentage[1] of jobs in each sector by subject of single subject degree, 2004-2011

Subject of single subject degree	Primary & utilities	Manufacturing	Construction	Wholesale and motor trades	Retail	Transportation and storage	Accommodation and food service activities	Information and communication
Medicine and dentistry	2	1	..	..	0	0	1	0
Subjects related to medicine (incl. pharmacology and nursing)	3	4	1	2	13	3	2	1
Biological sciences (incl. psychology)	5	7	3	5	5	5	6	3
Veterinary science, agriculture and related subjects	..	1	2	1	1	1	1	0
Physical and environmental sciences	15	8	4	5	5	6	1	4
Mathematical sciences and computing	9	8	4	6	7	10	8	21
Engineering	17	16	22	8	4	18	5	7
Technologies (incl. mining, metallurgy, polymers & textiles)	1	2	0	3	1	1	1	1
Architecture, building and planning	3	2	21	1	1	3	2	0
Social sciences	5	7	10	14	9	9	10	7
Law	4	4	3	4	4	5	5	4
Business and administrative studies (incl. management, finance and accounting)	17	19	18	30	21	23	35	12
Mass communication and documentation (incl. journalism and publishing)	..	2	1	..	3	1	2	9
Linguistics, classics and related subjects (incl. English literature)	3	3	2	2	4	2	3	8
European languages and literature	2	1	0	2	2	3	1	2
Other languages and literature	..	1	..	..	1	1	1	1
History, archaeology, philosophy and religious studies	5	5	3	4	5	3	5	7
Creative arts and design (incl. music, drama and film studies)	2	9	5	9	14	4	10	11
Education	3	1	1	1	1	1	1	1
All degrees	100	100	100	100	100	100	100	100

Source: Annual Population Survey
Notes:
The symbol '..' denotes values which have been suppressed for disclosure control
1. Percentage calculated using annual averages for years 2004 to 2011. Average used due to the variability of the underlying data which produces unreliable results for single years

Table A.7.10 cont: Percentage[1] of jobs in each sector by subject of single subject degree, 2004-2011

Subject of single subject degree	Financial and insurance activities	Real Estate, Professional, Scientific & technical	Administrative and support service activities	Public administration and defence; compulsory social security	Education	Human health and social work activities	Arts, entertainment and recreation	Other service activities
Medicine and dentistry	0	0	..	2	1	14	0	1
Subjects related to medicine (incl. pharmacology and nursing)	1	1	4	7	4	38	1	5
Biological sciences (incl. psychology)	3	5	4	8	7	10	5	7
Veterinary science, agriculture and related subjects	0	1	..	0	0	0	1	1
Physical and environmental sciences	6	5	3	6	5	2	2	5
Mathematical sciences and computing	15	5	6	6	5	2	2	4
Engineering	6	6	4	3	2	1	2	4
Technologies (incl. mining, metallurgy, polymers & textiles)	1	1	1	0	1	0	1	1
Architecture, building and planning	1	10	2	2	1	0	1	3
Social sciences	17	9	12	17	9	12	5	10
Law	7	16	5	13	1	2	3	6
Business and administrative studies (incl. management, finance and accounting)	33	19	23	12	7	6	7	14
Mass communication and documentation (incl. journalism and publishing)	1	2	4	2	2	2	6	2
Linguistics, classics and related subjects (incl. English literature)	2	3	6	4	6	2	7	5
European languages and literature	2	1	2	2	2	1	1	2
Other languages and literature	0	0	1	1	1	0	1	2
History, archaeology, philosophy and religious studies	4	5	8	8	7	3	11	14
Creative arts and design (incl. music, drama and film studies)	1	9	13	3	12	3	38	9
Education	0	0	2	3	28	2	3	5
All degrees	100	100	100	100	100	100	100	100

Source: Annual Population Survey
Notes:
The symbol '..' denotes values which have been suppressed for disclosure control
1. Percentage calculated using annual averages for years 2004 to 2011. Average used due to the variability of the underlying data which produces unreliable results for single years

Table A.7.11: Percentage[1] of jobs from each subject of single subject degree[2] by sector[3], 2004-2011

Subject of single subject degree	Primary & utilities	Manufacturing	Construction	Wholesale and motor trades	Retail	Transportation and storage	Accommodation and food service activities	Information and communication
Medicine and dentistry	1	1	..	..	0	0	0	1
Subjects related to medicine (incl. pharmacology and nursing)	0	2	0	0	7	1	0	1
Biological sciences (incl. psychology)	1	4	1	1	3	2	2	6
Veterinary science, agriculture and related subjects	..	6	9	3	5	6	3	4
Physical and environmental sciences	3	6	3	1	4	3	0	10
Mathematical sciences and computing	1	3	1	1	4	3	2	29
Engineering	2	10	13	2	3	8	1	14
Technologies (incl. mining, metallurgy, polymers & textiles)	1	11	2	5	7	3	2	11
Architecture, building and planning	1	1	20	1	2	2	1	1
Social sciences	0	2	3	2	3	2	1	7
Law	0	2	2	1	2	2	1	6
Business and administrative studies (incl. management, finance and accounting)	1	4	4	2	5	3	3	8
Mass communication and documentation (incl. journalism and publishing)	..	3	1	..	4	1	1	35
Linguistics, classics and related subjects (incl. English literature)	1	3	2	1	4	1	1	20
European languages and literature	1	3	1	1	5	4	1	11
Other languages and literature	..	4	..	..	5	3	3	19
History, archaeology, philosophy and religious studies	1	3	2	1	4	1	1	12
Creative arts and design (incl. music, drama and film studies)	0	4	2	1	7	1	2	13
Education	0	1	1	0	1	1	0	2

Source: Annual Population Survey
Notes:
The symbol '..' denotes values which have been suppressed for disclosure control
1. Percentage calculated using annual averages for years 2004 to 2011. Average used due to the variability of the underlying data which produces unreliable results for single years.

Table A.7.11 cont: Percentage[1] of jobs from each subject of single subject degree[2] by sector[3], 2004-2011

Subject of single subject degree	Financial and insurance activities	Real Estate, Professional, Scientific & technical	Administrative and support service activities	Public administration and defence; compulsory social security	Education	Human health and social work activities	Arts, entertainment and recreation	Other service activities	All sectors
Medicine and dentistry	1	2	..	7	5	79	1	1	100
Subjects related to medicine (incl. pharmacology and nursing)	1	3	2	8	6	66	1	1	100
Biological sciences (incl. psychology)	6	16	2	12	15	22	3	2	100
Veterinary science, agriculture and related subjects	6	26	..	6	5	9	5	3	100
Physical and environmental sciences	14	19	3	11	14	5	2	2	100
Mathematical sciences and computing	21	12	2	6	8	3	1	1	100
Engineering	11	18	2	5	5	3	1	1	100
Technologies (incl. mining, metallurgy, polymers & textiles)	9	15	6	3	13	2	8	2	100
Architecture, building and planning	2	54	2	6	3	2	2	2	100
Social sciences	17	15	4	13	10	15	2	2	100
Law	11	44	2	17	3	4	2	2	100
Business and administrative studies (incl. management, finance and accounting)	22	22	5	6	5	5	2	2	100
Mass communication and documentation (incl. journalism and publishing)	2	16	5	6	8	8	8	2	100
Linguistics, classics and related subjects (incl. English literature)	5	13	5	9	20	6	7	2	100
European languages and literature	12	16	5	9	17	7	4	3	100
Other languages and literature	8	10	5	12	12	5	6	6	100
History, archaeology, philosophy and religious studies	7	16	5	12	16	7	8	5	100
Creative arts and design (incl. music, drama and film studies)	2	18	5	3	17	4	19	2	100
Education	1	2	2	6	75	5	3	2	100

Source: Annual Population Survey

Notes:

The symbol '..' denotes values which have been suppressed for disclosure control

1. Percentage calculated using annual averages for years 2004 to 2011. Average used due to the variability of the underlying data which produces unreliable results for single years.

Appendix 8: Borough level projections

Introduction

This appendix outlines the employee projections (consistent with the London level projections) at the borough level. Appendix 5 sets out the methodology for preparing these borough level employee projections. The appendix then presents the population projections at the borough level. Appendix 6 sets out the methodology for preparing these borough level population projections.

Borough level employee projections

Table A.8.1 outlines the (triangulated) borough employee projections over the projection period. The table shows that the number of employees is projected to increase by 653,000 over the projection period.

Six boroughs, Westminster, City, Camden, Islington, Southwark and Tower Hamlets account for half of all employee growth projected for London as a whole over the projection period.

Borough level population projections

Table A.8.2 outlines the borough population projections over the projection period. The table shows that 8 boroughs, Tower Hamlets, Newham, Southwark, Greenwich, Lambeth, Barnet, Barking & Dagenham and Islington account for just over half of the total population growth projected over the 2011 to 2036 period.

Table A.8.1: Borough employee triangulated projections 2001 - 2036

	2001	2006	2011	2016	2021	2026	2031	2036
Barking and Dagenham	48	45	47	47	48	50	52	53
Barnet	113	110	111	113	118	123	119	122
Bexley	64	63	62	67	64	64	66	67
Brent	99	93	96	97	100	104	108	112
Bromley	96	105	94	96	98	100	102	104
Camden	262	260	286	298	310	321	333	345
City of London	326	322	361	372	382	393	405	417
Croydon	138	128	112	113	118	122	126	130
Ealing	116	119	116	116	118	120	123	126
Enfield	96	93	91	91	92	93	95	97
Greenwich	63	65	68	70	73	76	79	82
Hackney	93	79	88	88	90	93	96	100
Hammersmith and Fulham	110	119	119	126	135	141	146	152
Haringey	61	62	58	58	60	64	67	71
Harrow	69	68	63	64	65	65	66	67
Havering	75	75	69	73	76	71	72	72
Hillingdon	174	185	180	195	196	203	206	209
Hounslow	133	116	124	124	128	132	137	142
Islington	156	170	177	193	201	208	215	223
Kensington and Chelsea	128	113	112	115	119	123	127	128
Kingston-upon-Thames	77	74	69	69	70	71	73	75
Lambeth	116	120	124	128	128	131	136	140
Lewisham	63	61	58	60	63	65	68	71
Merton	65	65	68	68	71	73	76	76
Newham	75	73	74	77	80	83	86	89
Redbridge	64	60	64	66	69	71	69	70
Richmond-upon-Thames	70	68	71	73	75	78	79	80
Southwark	166	162	184	198	204	211	219	227
Sutton	65	63	66	63	65	68	70	73
Tower Hamlets	160	196	229	231	238	245	253	261
Waltham Forest	56	59	57	60	62	64	63	64
Wandsworth	103	107	102	107	112	115	123	127
Westminster, City of	585	584	608	616	631	648	668	688
All Boroughs	**4,086**	**4,081**	**4,208**	**4,332**	**4,459**	**4,590**	**4,724**	**4,861**

Source: GLA Economics projections based on data from Business Register and Employment Survey, Colin Buchanan and Roger Tym & Partners

Table A.8.2: Borough working age population projections (constrained and unconstrained) Population aged 16-64

	Constrained			Unconstrained		
	2011	2036	Difference	2011	2036	Difference
Barking & Dagenham	119,200	168,600	49,400	119,200	167,300	48,100
Barnet	235,400	290,800	55,400	235,400	289,600	54,200
Bexley	147,700	155,200	7,500	147,700	167,100	19,400
Brent	216,500	240,400	23,900	216,500	260,100	43,600
Bromley	197,400	203,300	5,900	197,400	222,800	25,400
Camden	160,500	187,100	26,600	160,500	192,400	31,900
City of London	5,700	8,200	2,500	5,700	6,500	800
Croydon	240,900	276,500	35,600	240,900	284,400	43,500
Ealing	233,700	260,800	27,100	233,700	269,300	35,600
Enfield	204,500	218,500	14,000	204,500	256,800	52,300
Greenwich	173,700	231,500	57,800	173,700	202,300	28,600
Hackney	178,600	219,800	41,200	178,600	222,100	43,500
Hammersmith & Fulham	136,300	154,800	18,500	136,300	148,300	12,000
Haringey	181,100	208,400	27,300	181,100	218,400	37,300
Harrow	158,400	171,900	13,500	158,400	185,800	27,400
Havering	150,800	174,500	23,700	150,800	181,400	30,600
Hillingdon	182,800	201,500	18,700	182,800	225,500	42,700
Hounslow	176,200	189,000	12,800	176,200	215,400	39,200
Islington	155,400	200,800	45,400	155,400	194,800	39,400
Kensington & Chelsea	114,500	121,200	6,700	114,500	111,500	-3,000
Kingston upon Thames	109,500	117,900	8,400	109,500	129,400	19,900
Lambeth	226,400	282,700	56,300	226,400	269,500	43,100
Lewisham	193,400	230,600	37,200	193,400	236,900	43,500
Merton	138,300	147,300	9,000	138,300	163,600	25,300
Newham	219,600	297,800	78,200	219,600	294,800	75,200
Redbridge	184,400	203,700	19,300	184,400	242,900	58,500
Richmond upon Thames	124,900	125,000	100	124,900	137,400	12,500
Southwark	212,900	274,000	61,100	212,900	256,800	43,900
Sutton	125,400	127,300	1,900	125,400	149,000	23,600
Tower Hamlets	190,000	288,100	98,100	190,000	263,500	73,500
Waltham Forest	178,600	203,900	25,300	178,600	224,000	45,400
Wandsworth	229,400	269,300	39,900	229,400	260,900	31,500
Westminster	162,200	182,300	20,100	162,200	183,900	21,700

Source: GLA Population Projections, 2012 Round

Appendix 9: Accessibility Employment Projections for London – technical report
Appendix 10: London Employment Sites Database

Appendix 9: Accessibility Employment Projections for London – technical report. This appendix is available as a separate pdf to this report.

Appendix 10: London Employment Sites Database. This appendix is available as a separate pdf to this report.

Endnotes

1 Trade and the Global Economy: The role of international trade in productivity, economic reform and growth', HM Treasury 2004 (chapter 2).

2 See for example, Krugman and Obstfeld (2003).

3 Figure 2.1 aggregates different SIC 2007 sector categories for ease of exposition. As a result, Manufacturing, construction and utilities consists of SIC codes A-F; Wholesale, retail, transportation and storage consists of SIC codes G-H; Public admin, health and education consists of SIC codes O-Q; Professional, real estate and business services consists of SIC codes L-N; Accommodation, entertainment, recreation and other services consists of SIC codes I and R-U; and, information, communication, financial and insurance consists of SIC codes J-K.

4 For the purposes of this work the index of specialisation is calculated as: (London employment in sector / London total employment) / (Rest of GB employment in sector / Rest of GB total employment). Therefore if the index of specialisation is greater than 1, then this shows that London has a greater share of its total jobs in the sector being examined than does the rest of GB. As such it can be regarded as an area in which London has some specialisation. The higher the index of specialisation above 1.00, the greater the degree of specialisation. By contrast if the index of specialisation is less than 1, then this shows that the rest of GB has a greater share of its total jobs in the sector being examined than does London. The closer the index of specialisation gets to zero, the smaller London's role in the sector being considered is compared to the rest of GB. The index of specialisation is calculated using employee data from the Business Register and Employment Survey (BRES) for 2011 (see Appendix 2). Regional GVA is 2010 (industry) data (released December 2012).

5 Globalisation, Skills and Employment: The London Story, GLA Economics, 2007 - see: http://www.london.gov.uk/lseb/docs/thelondonstory.pdf

6 Experian estimates of real GVA are used because estimates of regional GVA, on a timely basis, are not produced by the ONS (and inflation-adjusted estimates are not produced at all). The Experian numbers are therefore used here to provide an indication of how London's economy is likely to have performed over the recession. Data for the 1990s recession from Experian is based on old ONS GVA data on a SIC 2003 basis (the new GVA data on SIC 2007 basis only goes back to 1997). For more information on how the Experian estimates are calculated please see: http://www.london.gov.uk/publication/working-paper-44-londons-labour-market-recent-recession (in particular page 9).

7 The corresponding GVA numbers for the UK – based on Experian estimates, which are an unrevised version of the latest ONS estimates – show a 5.9 per cent GVA fall over six quarters during this recession but only a 1.7 per cent GVA decline over five quarters in the 1990s. Note that the fall in GVA in the UK during the 1990s recession is smaller than the GDP fall of 2.5 per cent. When compiling the National Accounts the ONS ensure that these two measures (ABMI measuring GDP and ABMM measuring GVA) have an equal growth rate in the latest quarter and differ by no more than 0.2 in the back series when looking at quarter-on-quarter growth. However, these tolerances do not seem to have always been in place, and the 0.8 per cent difference in output decline during the 1990s recession is likely to be a cumulative effect of differences along the quarterly path.

8 Note that ILO unemployment figures for London do not start until 1992 and cannot therefore be used to assess labour market performance over the 1990s recession.

9 The 'peak periods' are 1979 Q4 (for the 1980s recession); 1990 Q2 (for the 1990s recession); and, 2008 Q1 (for the most recent downturn).

10 Note that ILO employment rate figures for London do not start until 1992 and do not therefore cover the 1990's recession.

11 See for example: The productivity conundrum: interpreting the recent behaviour of the economy, ONS (http://www.ons.gov.uk/ons/rel/elmr/the-productivity-conundrum/interpreting-the-recent-behaviour-of-the-economy/art-interpreting-the-recent-behaviour-of-the-economy.html); The productivity conundrum: explanations and preliminary analysis, ONS (http://www.ons.gov.uk/ons/rel/elmr/the-productivity-conundrum/explanations-and-preliminary-analysis/art-explanations-and-preliminary-analysis.html); Bank of England Inflation Report, November 2012 (in particular page 33 - http://www.bankofengland.co.uk/publications/Documents/inflationreport/ir12nov.pdf); and, The labour market, productivity and inflation (speech given by Martin Weale – see: http://www.bankofengland.co.uk/publications/Documents/speeches/2012/speech621.pdf).

12 London's labour market in the recent recession, GLA Economics, 2010, see: http://www.london.gov.uk/publication/working-paper-44-londons-labour-market-recent-recession

13 Whilst the GLA population projections which are used for London Plan purposes are constrained by information about the future housing stock, unconstrained population projections are also produced. Such unconstrained population projections see London's working age population increasing by more than 1.2 million over the 2011 to 2036 period (or annual growth of around 0.9 per cent per annum).

14 Based on unconstrained projections these figures are broadly speaking 820,000 more people in work and around 350,000 more people not in work by 2036.

15 For unconstrained population projections those qualified to at least ordinary degree level increase by 634,000 whilst those with no qualifications would decrease in number by 29,000.

16 This is a simplification as some people in the labour market have two, or more, jobs.

17 As set out in Section 3 the economic activity assumptions assume a static employment rate over time.

18 See: http://www.london.gov.uk/publication/london%E2%80%99s-economic-outlook-autumn-2012

19 See: http://www.london.gov.uk/publication/working-paper-51-employment-projections-london-sector-and-trend-based-projections-borough

20 Due to data limitations the GVA growth rate used for 1985 to 1989 and 2010 in Working Paper 51 and for 1985 to 1997 and 2011 for the current data is the growth rate of UK GVA and not specifically the growth rate for London's GVA.

21 2011 data for the current data series is a provisional estimate as the data has yet to be benchmarked to Business Register and Employment Survey (BRES).

22 Due to data availability, the GVA growth rate used for 1984 to 1996 and 2011 is the growth rate of UK GVA and not specifically the growth rate for London GVA.

23 Data prior to 2011 are based on a Standard Occupational Classification 1990 (SOC 1990) for which there is no available conversion matrix. Data from 2001 to 2003 come from the ONS Labour Force Survey April-June quarter. Data from 2004-2011 are from the ONS Annual Population Data. Further details on the historical data is available on the ONS website (reference number 000344): http://www.ons.gov.uk/ons/about-ons/what-we-do/publication-scheme/published-ad-hoc-data/labour-market/august-2012/index.html.

24 Specifically, by applying a least-squares linear regression where employment for each qualification is a dependant on logarithmic time.

25 Data on highest qualification by occupation is available from 2001. However, for Plant and Machine Operatives and Other Occupations (SOC groups 8 and 9) some data before 2004 is disclosive, and thus unavailable. As a result, only the trend from 2004 is used to project qualification within the plant/machine operatives and other service occupations group.

26 For a fuller account see http://www.london.gov.uk/who-runs-london/mayor/publications/business-and-economy/employment-projections-2031

27 See: http://www.london.gov.uk/publication/working-paper-52-londons-jobs-history-technical-paper

28 The follow up surveys ask leavers if they are in work or work and further study. In what follows we just use 'work' to cover both destination types.

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