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Potential impacts of immigration policies based on skills and salary thresholds in London: Occupational analysis

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1 Introduction

The Government recently set out plans for a future ‘skills-based’ immigration system post-Brexit.¹ To understand the potential impacts on the London labour market, this note draws on a range of ONS data to update key findings on the role played by EEA workers in London.² It also provides an assessment of the scope for labour market adjustment by detailed occupation, replicating at a regional level economic analysis carried out by the [Home Office](#) on the government’s proposals.

Background

In December 2018 the Government published a [White Paper](#) setting out its plans for UK immigration post-Brexit. In-line with recommendations from the [Migration Advisory Committee](#) (MAC) the White Paper makes the case for a single ‘skills-based’ immigration system once free movement of persons with the European Economic Area (EEA) ends.³ The proposals prioritise migration for high and medium-skilled work and do not include a long-term route for lower-skilled work, although family migration and temporary routes could provide additional sources of labour.⁴

This prioritisation is to be realised through a combination of skills and salary thresholds under a skilled workers route, i.e. through changes to the existing Tier 2 route. Key measures include:

- Extending eligibility for the work visa system to include occupations at intermediate skills levels (RQF levels 3-5), not just graduate level jobs (RQF levels 6+) as at present.
- Retaining the current minimum salary threshold for experienced workers at £30,000 per year, subject to a period of engagement with businesses and employers.

This contrasts with the current immigration system where migrants from the EEA at all skill and salary levels can come to the UK to work.

There are concerns about the potential impact of these proposals for employers who are currently reliant on EEA workers, especially given the high share of jobs which currently pay less than £30,000 per year in the UK, including in London.⁵ The White Paper acknowledges that in some circumstances there may be flexibility to allow migration at lower salary levels. For example, where specific skills are in shortage, or for new graduates as in the current Tier 2 system. Government is also planning discussions with businesses and employers on the appropriate salary thresholds.

Scope of this work

In the long run the labour market will reach a new balance – one which accounts for not just changes to the supply of EEA and non-EEA workers but also in the demand for labour (e.g. linked to changes in trade and population). Further to the points noted above, the Government has also advocated temporary work visas as a transitional measure and asked the MAC to review the Shortage Occupation List (SOL).⁶ This note does not incorporate either of these measures and it remains unclear to what extent they meet the needs of employers and the migrants London would like to attract.⁷ For example, the SOL is not currently linked to

¹ HM Government (2018) [The UK’s future skills-based immigration system](#)

² An extensive selection of evidence is covered in the GLA’s [response](#) to the MAC’s call for evidence on the role of EEA workers.

³ For a list of European Economic Area (EEA) countries please see Appendix A.

⁴ Two main temporary visa options would be available for jobs at any skill level. The first is a new short-term work visa of up to 12 months; the second is an expansion of the Youth Mobility Scheme to some or all EU countries (exactly which countries remains unclear). See, for example: Sumption, M. (2019) [Is Employer Sponsorship a Good Way to Manage Labour Migration?](#)

⁵ 46% of employee jobs in London were paid below this level in 2017. Source: ONS Annual Survey of Hours and Earnings 2017

⁶ Migration Advisory Committee (2019) [Full review of the Shortage Occupation List](#)

⁷ For useful discussions, see, for example: Sumption, M. (2019) [Is Employer Sponsorship a Good Way to Manage Labour Migration?](#) and Consterdine, E. (2019) [Youth Mobility Scheme: The Panacea for Ending Free Movement?](#)

lower salary thresholds while temporary migration implies higher employee turnover and lower incentives to invest in training.⁸ It is also worth noting that EEA migrants have ‘a choice of destination’ which may not be the UK.⁹

Thus the move to a ‘skills-based’ immigration system is likely to pose labour market challenges, at least in the short to medium term.¹⁰ There are risks of labour shortages having negative impacts on business performance including through loss of orders to competitors or higher operating costs.¹¹ In sectors where there are fewer alternatives to EEA workers, some businesses might ‘grow more slowly, contract or even disappear’.¹² Lower employment in one occupation could also lead to undesirable spillovers for other occupations (e.g. if ‘bottlenecks’ constrain economic activity).¹³

This note therefore offers an initial assessment of the occupations most likely to face difficulties in adjusting to the modelled policy proposals to get a sense of the relative importance of the (potential) impacts in London. It assumes that the impact of a reduction in the availability of EEA workers will depend, to some degree, on the characteristics of an occupation and wider economic factors. For example, to what extent employers have been reliant on EEA workers in recent years or are already encountering difficulties in filling vacancies in certain occupations. It also assumes that certain roles will be of higher economic value or contribute more to public service delivery.

At the same time, this note does not offer definitive judgments about the impact of every aspect of the government’s proposals for the future immigration system. Instead the intention is to indicate, based on published data, the occupations likely to be more or less affected by the introduction of a RQF3 skills threshold and £30,000 salary threshold for long-term EEA migrants, suggesting areas where there may be a need to consider the impact of policy proposals carefully.

This note addresses the following research questions:

- What role do EEA workers currently play in the London labour market and how does this differ from the rest of the UK?
- In which occupations is the greatest disruption most likely from the proposed changes to the UK immigration system post-Brexit?

An accompanying GLA Economics note looks closer at the occupations directly impacted by the RQF3 skills and £30,000 salary thresholds, as well as the impact of lowering the salary threshold.

Structure

The rest of the note continues as follows. Section 2 summarises the key findings of our analysis. Section 3 sets out the main overarching points regarding our approach to analysing the role of EEA workers and potential for labour market adjustment. Section 4 reviews the latest evidence about the role of EEA workers in London and trends over recent years. And Section 5 looks at the potential for labour market adjustment and relative importance by detailed occupational group in London, based on recent Home Office analysis.¹⁴

⁸ Note: most long-term EU migrants to the UK currently also stay for more than two years, and often remain with the same employer for many years. Source: Sumption, M. (2018) [Exploiting the Opportunity? Low-Skilled Work Migration After Brexit](#)

⁹ Migration Advisory Committee (2018) [EEA migration in the UK: Final report](#)

¹⁰ Whereas, in the very long run, evidence suggests that employment growth is closely linked to growth in the labour force.

¹¹ The Employer Skills Survey (2017) outlined the main impacts reported by London employers who had difficulty filling vacancies because of skills shortages in 2017. The most common reported impact is felt on other staff through increased workloads (79%). Other impacts include those posing a direct financial impact on the establishment, such as a loss of business orders to competitors and increased operating costs (both 44%). More medium-term impacts include delays to the development of new products or services (40%) as well as difficulties introducing new working practices (33%) or technologies (22%).

¹² Migration Advisory Committee (2018) [EEA-workers In the UK labour market: Interim Update](#)

¹³ Migration Advisory Committee (2019) [Full review of the Shortage Occupation List](#)

¹⁴ Home Office (2018) [Technical paper to accompany the ‘The UK’s future skills-based immigration system’ economic appraisal](#)

2 Summary of key findings

In summary, the analysis presented in this note shows that:

- Workers born in the rest of the EEA have made an increasingly significant contribution to London's labour market since 2004 across a range of higher and lower-skilled occupations. **14% of jobs in the capital are now held by EEA workers**, a far higher proportion than in the rest of the UK, although rate of growth appears to have slowed since the time of the 2016 EU Referendum.
- To assess which occupations may face the greatest difficulties in adjusting to the modelled policy proposals and get a sense of the relative importance of the (potential) impacts, we replicate the Home Office approach and consider three broad indicators:
 - High wage / high contribution to public services – this indicator looks at the relative importance of occupations, either economic (proxied by high average wages) or social (proxied by high contribution to public service industries) value.
 - Recent reliance on EEA workers – this indicator considers the change in jobs held by EEA workers by detailed occupational group from 2012 to 2017.
 - Potential difficulty for adjustment – this indicator aims to measure the ability of occupations to adjust to unexpected changes in the labour market, either by substituting labour for labour or by substituting capital for labour.
- These three sets of indicators have nine sub-components, against which we analyse and rank 90 three-digit occupations. Using this approach we identify:
 - **62 out of 90 three-digit occupations as being highly affected by the modelled policy in London.** These are occupations with at least 10,000 jobs and which are either lower-skilled (below RQF level 3) or are medium and higher-skilled roles where at least 25% of employee jobs earn below £30,000 a year.¹⁵ They represent the focus of this analysis.
 - Of these occupations we identify **37 as having limited scope to adjust to labour supply shortages or a high recent reliance on EEA workers**, most of which are medium or higher-skilled occupations (RQF level 3 or above) and would require more training time than jobs at lower levels. We also identify a further four occupations as having high relative (economic or social) value.
 - Combined these 41 occupations account for over half of the current stock of jobs in the capital, including two-thirds of the jobs currently held by EEA workers. Note, however, it's primarily the flow of migrants into these roles that would be (directly) affected by the proposed changes to immigration policy, not the stock.
 - **In several of these roles the share of jobs held by EEA workers and employee jobs paid below £30,000 a year also far exceed the London average.** On this basis certain roles, such as 'Construction & Building Trades', 'Elementary Cleaning' and 'Childcare Services', seem particularly exposed to the modelled policy. Many of these are lower-skilled (below RQF3) occupations and would be unable to recruit long-term migrants regardless of salary levels.

¹⁵ At least 25% of employee jobs below £30,000 a year with a 1 percentage point margin of error for sub-national estimates.

3 Our approach

Data and data uncertainty

The information presented in this note is based on GLA Economics analysis of data provided by the Office for National Statistics (ONS), including data from the [Annual Population Survey](#) (APS) and [Annual Survey of Hours and Earnings](#) (ASHE). This analysis is subject to several sources of uncertainty and should be treated with some caution. For example, there are issues related to:

- Data sources – imperfect data (e.g. survey data) means that confidence intervals can be large. This is particularly true for detailed occupations and at a sub-national level.
- Assumptions – any labour market modelling requires the use of evidence-based judgements, for example about indicators for labour market adjustment. Where data is missing at a London level we also impute data based on what information is available.
- Behavioural response and change – predicting behaviour change is inherently uncertain, including the ability for employers to respond to changes in the supply of EEA migrants.¹⁶

Further assumptions

Our methodology for estimating indicators of labour market adjustment is set out in detail in Section 5. However, there are several points to keep in mind about the general approach adopted:

- In-line with previous GLA Economics analysis, the data is mainly presented on a jobs and not a workers basis. This includes people working but not living in the capital and differs from the number of workers because some people have more than one job.
- The analysis is based on data on current stocks rather than inflows.¹⁷
 - Assuming most EEA citizens already living in the UK would have a right to remain post-Brexit, the stock of jobs held by EEA workers would mainly be affected to the extent that future flows of EEA citizens change.
 - However, flows of workers do not necessarily represent a large proportion of the overall stock of jobs. Future inflows of migrants will also be affected by a range of factors, and not changes to UK government policy alone.
 - Another caveat when considering the potential impact of the policy proposals is the assumption that the current stock of workers is reflective of the flows of EEA migrants (e.g. that current salary levels are broadly representative).
- Data on salary levels comes from the ONS Annual Survey of Hours and Earnings and only covers employee jobs held for at least one year. It does not cover employees not paid during the reference period, nor the self-employed. The latter typically have lower earnings than employees, albeit earnings are higher in London and have risen over time.¹⁸
- Data on jobs comes from the ONS Annual Population Survey and covers both employees and the self-employed. Our analysis does not differentiate between the two and assumes, in effect, that self-employed EEA workers would be subject to the same rules as other skilled workers post-Brexit. In reality, the impact may vary depending on the routes used.¹⁹

¹⁶ Home Office (2018) [Technical paper to accompany the 'The UK's future skills-based immigration system' economic appraisal](#)

¹⁷ It is important to distinguish between 'stocks' and 'flows' of migrants. The [agreement reached between the UK and the European Union on citizens' rights](#) suggests that most EEA citizens already in the UK would have a right to remain after the UK leaves the EU. And while recent data suggests a reduction in net migration to the UK from the EU, net migration of EU citizens to London remained positive in 2016. For more detail see: ONS (2017) [Migration Statistics Quarterly Report: November 2017](#)

¹⁸ ONS (2018) [Trends in self-employment in the UK](#)

¹⁹ 69% of the jobs held by EEA workers in London were permanent roles in 2016, 27% were self-employed and 4% were temporary roles. Going forward, EEA citizens would be able to come to the UK as self-employed through the entrepreneur and exceptional talent routes, providing they meet the relevant (demanding) eligibility requirements, or may be able to come to the UK through the new skilled worker route, temporary work

Definitions

Occupations are defined according to the Standard Occupation Classification (SOC) based on the tasks carried out in the role. Due to sample size limitations our analysis only disaggregates as far as three-digit SOC groups. Occupational skill level is, however, determined at a four-digit level, with multiple four-digits making up each three-digit group (Appendix A). Where there are multiple four-digit occupations with different skill levels we assume the overall skill level for the three-digit group is equal to the skill level in which most UK workers (from all countries) are based.²⁰

Finally, in most of what follows, and consistent with recent MAC reports, country-of-birth is used to define migrants as those not born in the UK. There are, however, several ways of defining migration – none of which are perfect.²¹ The choice of measure largely depends on the purpose for which the data is being used. One main benefit of using country-of-birth is that it offers a consistent measure, suitable for analysing stocks of workers in the labour market over time.²² Our focus is on the role of workers born in the rest of the European Economic Area ('EEA workers').

routes, or as service suppliers through Mode 4 arrangements. There may also be behavioural changes as those who have previously come to the UK as self-employed may switch to employee jobs

²⁰ ONS (2019) Annual Population Survey [Nomis 27 Feb 2019]

²¹ For example, see: House of Commons Library (2017) [Migration Statistics. Briefing Paper: number SN06077](#)

²² Whereas an individual's nationality can change over time and there is a risk that self-reported answers on nationality can reflect cultural affiliation rather than legal status. At the same time, country-of-birth classifies as 'migrants' people who were born abroad but who are nationals of the country in which they live (e.g. children born to armed forces personnel overseas).

4 The role of EEA workers in the London labour market

This section summarises the latest data on the role of EEA workers in the London labour market and how this differs from the rest of the UK. It highlights how the number of jobs has changed over time by country of birth and looks at what types of jobs EEA workers currently perform.

EEA workers play a greater role in London’s labour market than in the rest of the UK

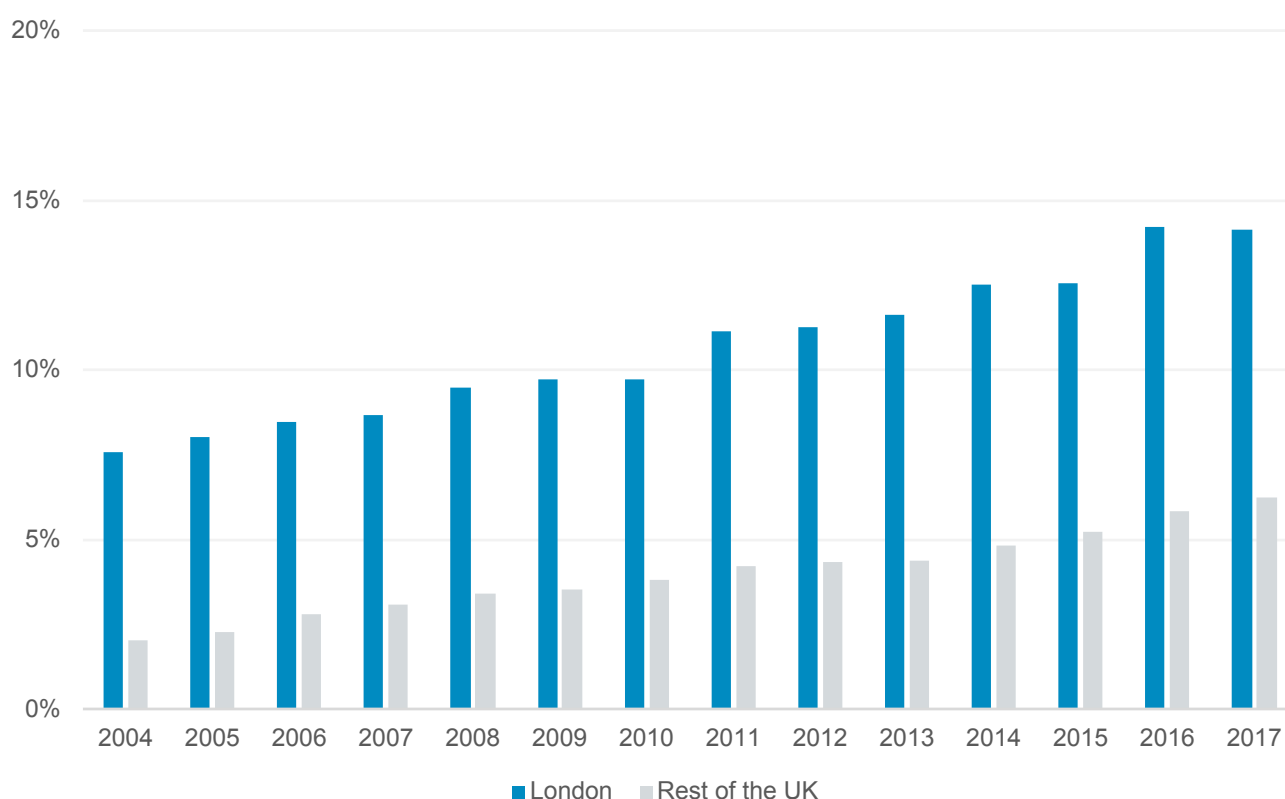
Looking across the UK as a whole in 2017, almost one in three of the jobs held by workers born in the rest of the EEA was located in the capital.²³ Within London over 14% – approximately 762,000 – of jobs are held by EEA workers, with another 1.4 million or 26% of jobs filled by people born outside the EEA. The equivalent figures for the rest of the UK are 6% and 8% respectively.²⁴

This follows rapid growth in jobs filled by people born in the rest of the EEA in recent years:

- As Figure 1 shows, EEA workers held less than 8% of London’s jobs in 2004, rising to over 14% of jobs in 2017. In the rest of the UK the share of jobs held by EEA workers increased from 2% to 6% over the same period.
- Focusing specifically on jobs growth over the last five years, around 30% of the *net change* in jobs in London since 2012 is accounted for by a rise in jobs held by EEA workers, compared to 36% in the rest of the UK.

Figure 1: EEA workers now hold 14% of jobs in London, up from 8% in 2004

Percentage of jobs held by EEA workers, London and Rest of the UK, 2004-2017



Source: ONS Annual Population Survey

²³ Unless otherwise stated references to the EEA in this note exclude the UK – see Appendix A.

²⁴ ONS (2018) [European Economic Area jobs by region various breakdowns 2004 to 2017](#)

There is some evidence that migration trends may have decelerated since 2016. For example, the latest ONS long-term international migration statistics indicate that, while the number of EU citizens coming to the UK continues to add to the population, EU net migration has fallen to a level similar to that seen in 2012 (mainly due to lower EU immigration).²⁵ Quarterly estimates from the ONS Labour Force Survey also suggest that the stock of jobs held by EEA workers in London has stalled since April to June 2016, although recent changes remain within the margin of error.²⁶

Employers recruit EEA workers for a number of reasons

The reasons why employers recruit EEA workers vary depending on the skills sought and needs of different sectors. Although recruitment and selection patterns can create path dependencies over time²⁷, employers generally do not report an explicit preference for migrant workers but instead make recruitment decisions based on the supply of applicants available to them. For example:

- An inadequate supply of local (UK) workers with the right skills is often cited as a factor in recruiting EEA workers, particularly for lower-skilled jobs, which may be especially relevant in the context of record low unemployment.
- There are also specific issues for sectors with cyclical patterns of demand to attract and retain staff, with EEA workers generally considered more flexible than local (UK) workers, and more prepared to do jobs the local population find unattractive.
- Recruitment of EU nationals is a particularly common way of trying to fill hard-to-fill vacancies in the capital: half of London employers reported looking to EU nationals to fill hard-to-fill vacancies in 2017, well above the UK average (34%).²⁸
- EEA job holders in London also tend to be highly qualified, with 56% holding degree level qualifications or above in 2017. Yet, a relatively high proportion work in non-graduate roles, suggesting that their skill levels may not always be fully utilised.²⁹

In this context there is uncertainty about how employers would respond to a sharp reduction in the supply of EEA workers. The MAC has expressed concerns about general preparedness for a changing and tightening labour market,³⁰ while many employers have voiced concerns about the future immigration system: which skills will be included and what salary thresholds will be set.³¹

EEA workers hold a range of higher and lower-skilled roles

EEA workers account for a particularly high share of the London labour force in certain industries, especially in Accommodation and food services (28% of jobs in 2017) and Construction (34%). At the same time, they also account for a significant number of jobs in high value-added services such as Professional, scientific and technical activities, Financial and insurance activities and Information and communication; as well as in public service sectors like Health and Education.³²

Within industry groups many of London's EEA workers are in roles that require a higher level of skills which take several years to acquire. But workers born in the rest of the EEA also account for a large and growing proportion of jobs in elementary roles, which tend to require fewer qualifications and only short periods of

²⁵ ONS (2019) [Migration Statistics Quarterly Report: May 2019](#)

²⁶ ONS (2019) [Jobs held by those born in the EEA, in London and the regions of the UK, 2014 to 2018](#)

²⁷ Green, A. (2019) [Low-Skilled Employment in a New Immigration Regime](#)

²⁸ Department for Education (2018) [Employer skills survey 2017](#)

²⁹ Several factors contribute to higher rates of over-qualification for migrant workers, including poor language proficiency and lack of local labour market experience. See: GLA Economics (2018) [EEA workers in the London labour market](#). It's less clear to what extent over-qualification could be a temporary phenomenon allowing EEA workers to progress to higher-skilled roles later.

³⁰ Migration Advisory Committee (2018) [EEA-workers in the UK labour market: Interim Update](#)

³¹ See, for example: Migration Advisory Committee (2019) [Full review of the Shortage Occupation List](#)

³² For more detail see: GLA Economics (2018) [EEA workers in the London labour market](#)

training. Table 1 presents a breakdown of the jobs held by EEA workers by major occupational group (one-digit SOC) in London. It shows that:

- In absolute terms, EEA workers in London hold the highest number of jobs in Professional roles (148,000 jobs), followed by lower-skilled Elementary roles (115,000).
- In terms of the *density* of jobs, it's Skilled Trades and Elementary roles that have the highest proportions of jobs held by EEA workers – 29% and 27% of jobs respectively.³³
- The difference in the percentage of jobs held by EEA workers between London and the rest of the UK becomes even more marked when looking at middle and lower-skilled roles.

Table 1: EEA workers are often employed in professional roles, but account for the highest proportion of jobs in Skilled Trades

Jobs filled by EEA-born workers by major occupational group, London and Rest of the UK, 2017

Skill level (SOC)	Major occupational group	No. of jobs, London (000s)	% of jobs, London	% of jobs, Rest of the UK
Upper	Managers & Senior Officials	82	12%	4%
	Professionals	148	11%	5%
Middle	Associate Professional & Tech.	110	11%	4%
	Skilled Trades	111	29%	6%
	Administrative & Secretarial	57	11%	4%
	Caring, Leisure & Other Services	49	14%	6%
	Sales & Customer Services	47	14%	4%
	Plant & Machine Operatives	43	20%	13%
Lower	Elementary	115	27%	13%
All jobs		762	14%	6%

Source: ONS Annual Population Survey (using the SOC structure to estimate three skill levels)³⁴

Although these broad occupational categories offer a useful overview, in practice these categories also contain a wide range of jobs including workers with varying levels of pay, qualifications and working conditions. The next section looks more closely at the potential for labour market adjustment using more detailed occupational categories.

³³ Skilled Trades may be of particular interest given the level of training required and high incidence of skills shortages reported in these roles. Source: Department for Education (2018) [Employer skills survey 2017: UK findings](#)

³⁴ Skill level is defined here with respect to the 'duration of training and/or work experience recognised in the field of employment concerned as being normally required in order to perform the activities related to a job in a competent and efficient manner'. Source: ONS [SOC2010 volume 1: structure and descriptions of unit groups](#)

5 Scope for labour market adjustment and relative importance

This note has so far focused on labour market trends at a relatively high-level; it has made no assumptions about the scope to adjust to changes in EEA labour supply. In reality, employers recruiting for some roles will be more able to respond than others. Hence the following section sets out some analysis on the scope for labour market adjustment by detailed occupational group.

This analysis is based on a Home Office study which accompanied the government's Immigration White Paper.³⁵ That work relied on several critical, and debateable, assumptions; the results should therefore be treated with caution and interpreted with methodological shortcomings in mind.

Approach and rationale

A reduction in the availability of EEA workers is likely to affect recruitment in some occupations more than others. This is, to a large extent, dependant on the characteristics of an occupation, industry and wider economic factors. For example, to what extent an occupation has been reliant on EEA migrants account for recent jobs growth or is already encountering difficulties in filling vacancies. Some of these occupations will be of high economic value (e.g. 'Sales Associates') or make an important contribution to the delivery of public services (e.g. 'Nursing Professionals').

To better understand where the greatest impacts may be felt in London, we assess the scope for detailed (three-digit) occupations to adjust to changes in long-term EEA migration based on the introduction of an RQF3 skills threshold and £30,000 salary threshold. The aim is to provide further context as to the relative importance of impacts on the labour market – considering both the size and cost (monetary and social) of the disruption across the labour market – and to draw attention to areas where policy proposals may need further consideration.

To do this, the Home Office developed a bespoke framework of three headline indicators based on published data, each consisting of two or more sub-components. These are:

1. High wage / high contribution to public services

- 1.1. *High wage*
- 1.2. *High contribution to public services*

2. Recent reliance on EEA workers

- 2.1. *Absolute EEA employment growth*
- 2.2. *EEA employment growth in growing occupations*
- 2.3. *EEA employment growth in shrinking occupations*

3. Potential scope for adjustment

- 3.1. *Scope for automation*
- 3.2. *Real wage growth*
- 3.3. *Underemployment*
- 3.4. *Hard-to-fill vacancies as a proportion of total employment*

³⁵ Home Office (2018) [Technical paper to accompany the 'The UK's future skills-based immigration system' economic appraisal](#)

Methodology

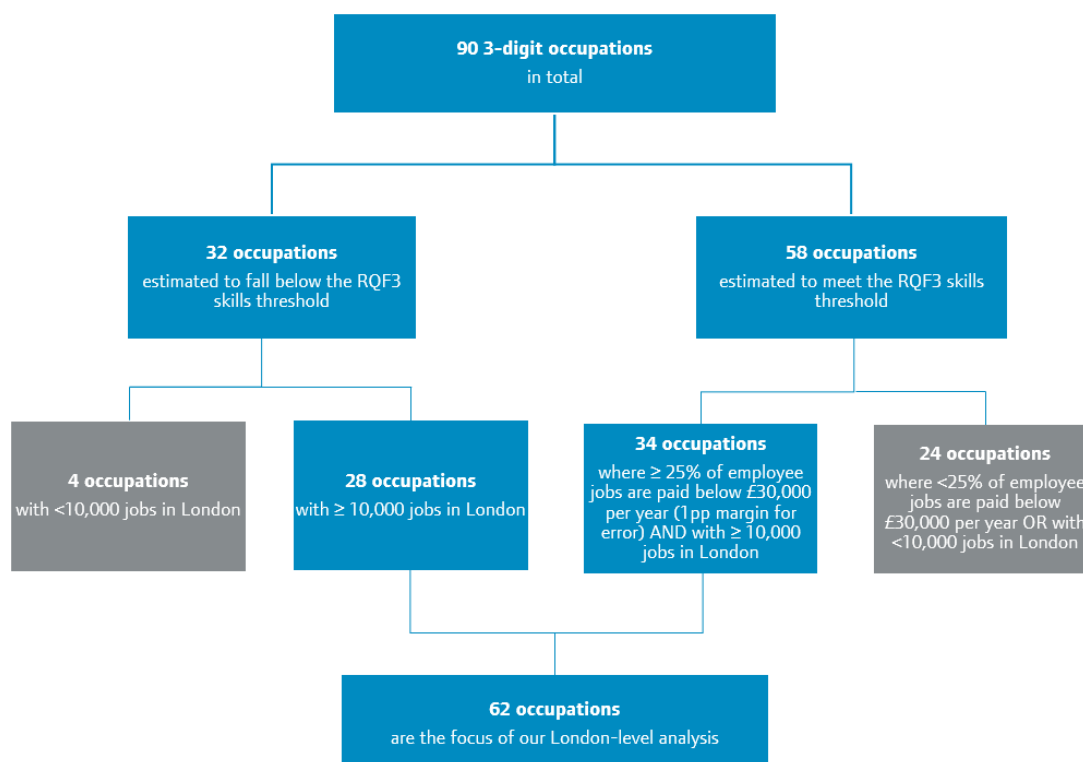
We follow the Home Office process of analysing and ranking three-digit occupational groups:



We describe each indicator and their sub-components below. It is worth reiterating that, in several cases, we adapt the Home Office approach to overcome gaps in data availability at the London level. While this has only a small impact on the occupations in the final ranking, filling data gaps ensures important occupations are not lost simply because of data shortfalls. It also means that the overall number of occupations identified is more comparable between London and the UK.³⁶

In-line with the Home Office we also restrict the focus of our analysis to three-digit occupations ‘most affected’ by the modelled policy. This means we look at occupations below RQF level 3, as well as medium and higher-skilled roles where at least 25% of employee jobs earn below £30,000 a year (with a 1 percentage point margin of error for London, to reflect wider confidence intervals for sub-national estimates).³⁷ Because we’re working with sub-national data we also remove all occupations from our analysis with fewer than 10,000 jobs since these, by definition, only account for a small share of jobs and data reliability is more of an issue.³⁸ See Figure 2 for an illustration.

Figure 2: 3-digit occupations which are the focus of our analysis at the London level



³⁶ Since for most indicators we order and then identify a proportion of ‘top ranked’ occupations and missing data means taking a proportion from a smaller data set. See footnote 69 for an illustration.

³⁷ Further analysis of which occupations are most affected by the skills and salary thresholds can be found in an accompanying GLA Economics paper. This note also explains how earnings data has been imputed where data is missing at the London level.

³⁸ Note: this step only removes occupations for London and not the UK as a whole.

Taken together the result of these criteria is to exclude 28 out of 90 three-digit occupations from our rankings for London and 10 for the UK.³⁹ In other words, there are 62 occupations which are the focus of our analysis at a London level and 80 occupations which are the focus of our analysis across the UK as a whole (a more detailed summary is provided in Appendix B). This variation between areas reflects both higher wage levels and lower jobs numbers in the capital (compared to the UK as a whole).

1 High wage / high contribution to public services

This indicator looks at the relative value of occupations affected, either economic (as proxied by high average wages) or social (as proxied by high contribution to public service industries) value. Some areas of the labour market provide greater economic value; it is therefore important to recognise how labour supply changes relate to occupations that contribute disproportionately to economic output (e.g. GDP/GVA). Other parts of the labour market contribute less to economic output but provide greater social value; through, for example, the delivery of key public services.

1.1 High wage

This sub-component aims to measure which occupations are of high relative importance to the wider economy. Following the Home Office we rank occupations based on their average wage, and identify the top quartile as being of high relative importance. While the Home Office study is not clear how they calculate average earnings, we focus on the median since we are interested in 'typical' average earnings, and the median is less sensitive to outliers in the earnings distribution.

Where data on median salary levels is missing for three-digit occupational groups at a London level, we impute an estimate. This is based on the following rules:

- i. Where the median value is missing but the mean value is available at a London level, we apply the ratio of mean to median earnings for the three-digit SOC at the UK level (or closest SOC level if the three-digit ratio is missing) to the mean value in London.⁴⁰
- ii. Where neither the mean nor the median value is available at a London level, we apply the ratio of median earnings for the three-digit to two-digit SOC at the UK level to the two-digit SOC in London (in most cases, this gives a comparable estimate).

Overall, we impute average earnings for 19 of 90 three-digit occupational groups in London. This includes two occupations we identify in the top quartile when we rank median wages in the capital; although in each of these cases mean salary level is available, and inclusion for this sub-component is consistent with our UK level rankings.⁴¹

1.2 High contribution to public services

According to the Home Office study this sub-component considers occupations which:

'... contribute highly to the delivery of public services, based on their EEA workforce share in the following sectors: social work, care, public administration, education and medical services. Occupations

³⁹ We identify 58 three-digit occupational groups which meet the RQF3 skills threshold. Of these, there are 10 where fewer than 25% of employee jobs were paying less than £30,000 per year at the UK level or where this data is unavailable (based on 2018 ASHE estimates). In London, there are 25 occupations where fewer than 25% of employee jobs were paying below £30,000 a year or where this data is unavailable, although we have not excluded 'Health professionals' (24%) from our analysis since it falls within our margin for error. In addition, there are another four lower-skilled occupations with fewer than 10,000 jobs in the capital. As a result, there are 18 three-digit occupational groups which are excluded at a London level but not for the UK as a whole.

⁴⁰ In two cases where the median is missing but the mean is available at a London level, the UK ratio of mean to median earnings is not available for the three-digit SOC. To estimate the median value in-line with rule (i) we apply the ratio of median to mean earnings at the two-digit level for 'Elementary security occupations' and the one-digit level for 'Sports and fitness occupations'.

⁴¹ These occupations are 'Health and Social Services Managers and Directors' and 'Other Drivers and Transport Operatives'.

can work across a number of different sectors, in order to consider the main occupations specific to these sectors we consider the share of EEA workers in each occupation within these five sectors.⁴²

However, it's not entirely clear how the Home Office defined these sectors in terms of their Standard Industrial Classification (SIC) codes or exactly which occupations are included within them. We have therefore analysed this sub-component based on the share of jobs held by EEA workers in occupations which contribute highly in the following industrial groups: O: Public Administration and Defence; P: Education; and, Q: Human Health and Social Work Activities.

Our analysis involves two stages. First, we calculate the contribution of each three-digit occupational group to jobs in sectors OPQ (for all workers in London). Second, we calculate the share of jobs held by EEA workers in each occupation (across all sectors). A final ranking is reached by combining the occupational contribution to sectors OPQ with the share of jobs held by EEA workers, with those in the top decile indicated as making a high contribution to public services.⁴³ This approach is consistent with the fact that workers in one occupation can work across a number of different sectors – implying that occupational shortages in one sector are likely to affect others.

Where data on the contribution of an occupation to sectors OPQ is unavailable at a London level, or where estimates are considered unreliable⁴⁴, we assume that an occupation's contribution is the same as at the UK level.⁴⁵ This has little impact on our results since roles with missing data account for fewer jobs in sectors OPQ. Where data is missing on the share of jobs held by EEA workers by occupation in London, and in the absence of any other information, we again assume a figure in-line with the UK average for that occupation – given the higher share of jobs held by EEA workers in the capital, this is likely to be a cautious estimate in most cases.⁴⁶

2 Recent reliance on EEA workers

The extent to which occupations need to adjust to labour market changes could also vary depending on how reliant they have been on EEA workers in recent years; occupations that have been more reliant on EEA workers may face a more 'pressing need to adjust'.⁴⁷ This indicator therefore considers the change in jobs held by EEA workers by three-digit occupational group from 2012 to 2017⁴⁸, excluding occupations where data is unavailable (which is usually due to very small samples) or where UK sample sizes are lower than 30 in more than four years during this period (which would suggest that estimates are not very robust).⁴⁹

We analyse three sub-components within this indicator, with occupations ranking in the top quartile for at least one of them identified as having a 'high reliance' on EEA workers.

⁴² Home Office (2018) [Technical paper to accompany the 'The UK's future skills-based immigration system' economic appraisal](#)

⁴³ This approach values occupations which contribute to sectors OPQ and/or where a high share of jobs is held by EEA workers. To illustrate: if we estimate that a given occupation accounted for 20% of jobs in sectors OPQ in London in 2015-2017 and 10% of jobs in that occupation were held by EEA workers in 2017, its 'final score' for this measure would equal (20% x 10%) 2%.

⁴⁴ i.e. the coefficient of variation for the estimate exceeds 20%.

⁴⁵ We impute data on the share of jobs in sectors OPQ for 47 of 90 three-digit occupations in London. The share of jobs in OPQ is relatively low in these roles: 16 are not the focus of the analysis, and none feature in the final ranking for this measure.

⁴⁶ We impute data on the share of jobs held by EEA workers for 16 three-digit occupations in London which lack data due to disclosure control and/or data quality reasons. Eight are not the focus of the analysis and only one ('Caring personal services') occupation is included in the top decile for high contribution to public services (consistent with the UK level ranking).

⁴⁷ Home Office (2018) [Technical paper to accompany the 'The UK's future skills-based immigration system' economic appraisal](#)

⁴⁸ Note: the Home Office's study based this indicator on the period 2012-2016; we include an extra year of published APS data.

⁴⁹ Three-digit occupations that record small sample sizes from the APS are excluded from this indicator. We base this on an average unweighted count below 30 observations in over four years from 2012-2017 at the UK level, whereas the Home Office study excluded occupations based on an average unweighted count below 30 observations from 2012-2016. Our criterion excludes 17 three-digit occupations from the analysis – although, by definition, these only account for a small proportion of the workforce. Source: ONS (2019) [Number of jobs broken down by occupation \(SOC2010\) three-digit minor group and country of birth](#)

2.1 Absolute EEA employment growth

We consider occupations based on their annual average growth in jobs held by EEA workers from 2012 to 2017 and identify the top quartile. Due to missing data for some three-digit groups we include the same number of occupations in the top quartile for London as for the UK as a whole.⁵⁰ This does not directly impact on the roles in the top quartile but means that we include the top 16 rather than 11 occupations for London (in-line with our UK ranking). This approach is preferable to imputing data since roles with missing data are likely to be small in terms of employment growth.

2.2 EEA employment growth in growing occupations

We consider occupations based on the share of jobs growth from 2012 to 2017 which is driven by an increase in jobs held by EEA workers, identifying the top quartile of this ranking. Where data on EEA workers is not available at a London level, and the occupation is growing overall, we assume the share of growth accounted for by jobs held by EEA workers is equal to the UK average for the occupation.

This affects a small number of occupations, with one included in the top ranking for this measure.⁵¹ As noted in Section 4, EEA workers have made a similar contribution to net jobs growth in London and the rest of the UK during the period 2012-2017 (30% and 36% respectively).

2.3 EEA employment growth in shrinking occupations

We also consider occupations with an increase in jobs held by EEA workers whilst shrinking overall (i.e. due to declining jobs held by UK and/or non-EEA workers). We identify two occupations in the top quartile for London and three for the UK. There are no issues with missing data for shrinking occupations in London, so no data imputation is required here.

3 Potential scope for adjustment

This indicator aims to capture the ability of occupations to adjust to unexpected changes in labour supply, either by substituting labour for labour or capital for labour. It consists of four sub-components.

Occupations that rank in the top quartile for at least two sub-components are identified as those that are likely to face adjustment difficulties. In-line with the Home Office report the occupations in the top decile for high contribution to public services are also automatically included under this indicator. This is because 'wages within such sectors are driven primarily by government policy, and so they are unlikely to adjust automatically to market forces and any change would have implications for public finances'.⁵²

3.1 Scope for automation

This sub-component is included as a proxy for the ability of employers to substitute capital for labour within an occupation.⁵³ Using automation as a transparent form of capital substitution, we consider the share of jobs at risk of automation by three-digit occupation.⁵⁴ Those with a low automation probability rank highly here, signifying limited scope to substitute capital for labour.

The Home Office study applied automation probabilities based on a much cited 2013 study by Carl Benedikt Frey and Michael Osborne. We build-on their approach by using new ONS estimates of the probability of automation in England for 2011-2017. This work had not been released when the Home Office published

⁵⁰ i.e. for London we take the top 16 occupations, which is the same number as the top quartile for the UK.

⁵¹ We impute data for seven three-digit occupational groups in London which are the focus of the analysis and do meet the sample size criteria, with one ('Elementary Sales Occupations') included in the top quartile for this measure in the capital. This is consistent with its inclusion in the top quartile of the ranking at the UK level.

⁵² Home Office (2018) [Technical paper to accompany the 'The UK's future skills-based immigration system' economic appraisal](#)

⁵³ Some international evidence suggests investment in technology is a common response to a decline in migrant labour. Source: Select Committee on Economic Affairs (2017) [Corrected oral evidence: Brexit and the Labour Market](#). Tuesday 28 February 2017.

⁵⁴ Automation probabilities consider recent technological advances such as advanced robotics to assess the potential for job automation over some unspecified years, interpreted by the Home Office report as the medium to long run.

their analysis and is based on the Frey and Osborne study with a modified version of the task-based approach developed by the OECD.⁵⁵ Where there are multiple four-digit occupations with different automation probabilities we calculate the overall probability for the three-digit SOC group based on a simple average of probabilities at the four-digit level.

This approach implicitly assumes that automation probabilities are the same in London and the rest of England within occupations. Although automation barriers and opportunities may differ for the same occupations between places, we do not have a ready way of modelling regional variation. It's also worth noting that the ONS estimates only give a broad indication of the likelihood of automation over the coming decades. They do not specify the prospects for automation in the short term, whilst it's likely utilisation will lag what is technologically possible.⁵⁶

3.2 Real wage growth

Real wage growth is included by the Home Office to signal whether occupations are already experiencing labour shortages. In theory, occupations struggling to recruit should raise wages to become more attractive to potential workers, especially where that occupation is governed predominantly by market forces (i.e. private rather than public sector jobs). The Home Office methodology therefore assumes that for roles already showing high wage growth a further reduction in labour supply risks exacerbating existing shortages.

On that basis this sub-component considers occupations based on their real median wage growth between 2014 and 2017, adjusting wages to account for inflation.⁵⁷ We take occupations with positive wage growth to rank highly. Where data is unavailable at a London level, or where estimates are considered unreliable for practical purposes⁵⁸, we substitute the missing data with the rate of growth in median earnings derived from the relevant two-digit SOC at a London level. This affects one occupation we identify in the top quartile for real wage growth in the capital.⁵⁹

This measure is, however, somewhat ambiguous. In some cases, rising earnings in recent years could be a positive sign, suggesting that occupation may be able to further adjust wages to meet a £30,000 threshold, thereby responding to shortages. In other cases, recent wage growth could be driven by increases in the statutory minimum wage rather than any specific labour shortages.⁶⁰

3.3 Underemployment

In occupations with high rates of underemployment (people willing to work longer hours for the same rate of pay) employers should be able to respond to a reduction in labour supply by increasing the hours worked of the current workforce. On the other hand, if only a small proportion of current job holders would like to work more hours, this implies a low rate of underemployment in these roles, suggesting less scope to adjust to labour shortages.

⁵⁵ ONS (2019) [The probability of automation in England: 2011 and 2017](#). Note: this approach accounts for the fact that high risk occupations contain a share of tasks that would be difficult to automate and is considered superior to the previous one.

⁵⁶ Arntz, M., Gregory, T. & Zierahn, U. (2016) [The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis](#). OECD Social, Employment and Migration Working Papers, No. 189, OECD Publishing, Paris

⁵⁷ Using the ONS Consumer Prices Index including owner occupiers' housing costs (CPIH).

⁵⁸ i.e. the coefficient of variation for the estimate exceeds 20%.

⁵⁹ We impute data for 26 three-digit occupational groups at a London level, 13 of which are the focus of this analysis. Of these, one is identified in the top quartile for real wage growth in London ('Elementary construction occupations'). This is substantiated by positive recent wage growth at a UK level, although this occupation does not feature in the top quartile of the UK ranking.

⁶⁰ According to the Resolution Foundation, for example, relatively rapid increases in the minimum wage have boosted wage growth for lower earners in recent years. Source: Resolution Foundation (2018) [Low Pay Britain 2018](#)

This sub-component therefore considers occupations based on the share of jobs where the current job holder would be willing to work longer hours, at their current basic rate of pay, given the opportunity for the years 2015-2017.⁶¹ Occupations with minimal underemployment rank highly.

Where data is unavailable for a three-digit occupational group at a London level due to disclosure control and/or data quality reasons we assume that the share of underemployment in London is equal to the UK average for that occupation. This affects six occupations which are the focus of our analysis, one of which is included in the top quartile of the ranking in London.⁶²

3.4 Hard-to-fill vacancies as a proportion of total employment

Hard-to-fill vacancy rates are also included to gauge whether an occupation is already experiencing labour market shortages. If the current number of hard-to-fill vacancies accounts for a high share of employment it suggests that there are already issues for that role, making it difficult to hire. This could occur for different reasons, including skills shortages or difficulties in attracting applicants when the right skills are available (e.g. linked to pay or working conditions).

The analysis therefore ranks occupations based on their rate of hard-to-fill vacancies as a proportion of jobs in 2017. Occupations with a high rate of hard-to-fill vacancies rank highly. Note: there are two occupations where jobs data is missing for London due to disclosure control and/or data quality reasons. However, these are roles with a relatively low number of hard-to-fill vacancies (in absolute terms) and no imputation is used for this sub-component.⁶³

Data

The analysis uses several published data sources, summarised in Table 2.

Table 2: Sources of data used for each indicator

Indicator	Data Source	Year
1.1 High Wage	ONS ASHE	2018
1.2 High contribution to public services	ONS APS	2015-2017 (3-year pooled data) / 2017
2.1-2.3 Recent reliance on migrant labour	ONS APS	2012-2017
3.1 Scope for Automation	ONS APS	2011-2017
3.2 Real wage growth	ONS ASHE / ONS CPIH	2014-2017
3.3 Underemployment	ONS APS	2015-2017 (3-year pooled data)
3.4 Hard-to-fill vacancies	DfE Employer Skills Survey / ONS APS	2017 (ESS and APS)

⁶¹ We follow the main ONS definition of underemployment here. There is also a 'quality' dimension to underemployment which is commonly picked up in measures of skills 'under-utilisation'. The former offers a more direct indication of employers' ability to adjust in the short-medium term while 'under-utilisation' often relates to a more complex range of factors, such as skills (mis)match and employer and employee characteristics which could be overcome in time. Source: ONS (2019) [Number of jobs of those who would like to work longer hours, broken down by three-digit occupation \(SOC 2010\), London and the UK, 2015 to 2017 combined](#)

⁶² We impute data for 16 three-digit occupational groups in London, including six which are the focus of the analysis. The occupation included in the top quartile of the London ranking based on imputed data is 'Health and Social Services Managers and Directors'. This occupation is also identified in the top quartile for this sub-component at the UK level.

⁶³ 'Managers and Proprietors in Agriculture Related Services' and 'Managers and Proprietors in Health and Care Services'.

Further assumptions and limitations to be aware of

As noted already, the focus of this analysis is on the impact of key measures proposed in the Immigration White Paper. Specifically: the RQF3 skills and £30,000 minimum salary thresholds.

Yet there is not one single minimum salary threshold under the existing Tier 2 visa system. There are currently exemptions in-place for certain roles (e.g. nurses) and a lower threshold of £20,800 for new entrants (i.e. young people getting first visas). Following the Home Office study this variation is not considered here; neither does this analysis account for the potential impacts of introducing a transitional short-term work route or reflect any demand-side implications of the UK's future trade relationship with the EU, which remain uncertain.⁽ⁱ⁾

Scope for adjustment is based on four sub-components which assess the ability of occupations to substitute labour for labour or capital for labour. While offering an initial view of occupations facing challenges, this does not capture all the ways that employers might adjust to policy changes. For example, employers may be able to make use of the proposed temporary visa route to different degrees depending on their business models. As noted throughout the section above, several of the measures used rely on critical and debateable assumptions and may be imperfect proxies (e.g. wage growth), while other possible measures could be missing.

The identification of occupations is also affected by judgements around thresholds which are somewhat arbitrary. For example, occupations need to be in the top quartile for more than one of the 'hard to adjust' criteria to be identified as facing adjustment difficulties. There is a risk that vulnerable occupations which fall just below these margins are overlooked in our results (which, for this reason, should not be interpreted as a definitive list of *all* affected occupations).

Finally, this analysis relies on the assumption that outcomes observed in the past are representative of future trends. The dynamic nature of the labour market could mean that this is not the case. For example, the ability of occupations to adjust to a labour supply change will also depend on factors related to the wider economic environment, such as changes in trade.

Source: (i) Cambridge Econometrics (2018) [Preparing for Brexit](#). Note: trade impacts would itself be expected to affect migration flows, influencing EEA workers' decisions to come to the UK.

Results

Our analysis identifies:⁶⁴

1.1 High wage: 16 three-digit occupations which are likely to be of economic importance (based on median earnings for all employees). Of these, 15 are medium or higher-skilled occupations and one is lower-skilled. Occupations in the top quartile for this sub-component in London have median employee earnings of at least £34,000 per year, compared to £30,000 at the UK level.

1.2 High contribution to public services: seven three-digit occupations where EEA workers play a significant part in jobs which contribute highly to the delivery of public services. Of those identified, three are classified as higher-skilled and four are lower-skilled. Together these occupations account for over half (51%) of jobs in sectors OPQ in London in 2015-17, including roles such as 'Health professionals', 'Childcare and related personal services' and 'Teaching and educational professionals'.⁶⁵ The roles identified in London are also identified at the UK level.

2. Recent reliance on EEA workers: 22 three-digit occupations as 'high reliance' occupations. This includes nine medium or higher-skilled occupations and 13 lower-skilled occupations. Those that rank highly for absolute growth in EEA employment had (total) growth of at least 4,400 jobs held by EEA workers between 2012 and 2017, and 3,100 in shrinking occupations across the same period. For growing occupations identified based on their high share EEA employment growth, jobs held by EEA workers accounted for at least 48% of net jobs growth.

3. Potential scope for adjustment: 23 three-digit occupations that could face adjustment difficulties, including 16 medium or higher-skilled occupations and seven lower-skilled roles.⁶⁶

- 3.1 For those occupations that ranked in the top quartile for (limited) scope for automation the estimated probability of automation is at least under 37%. The least automatable roles include 'Health Professionals' and 'Teaching and Educational Professionals' (both 23%).
- 3.2 For occupations ranked highly for (low) underemployment fewer than 5% of current job holders would like to work longer hours at the current basic rate of pay. The occupations identified with the lowest rates of underemployment are 'Customer Service Managers and Supervisors' (2%) and 'Science, Engineering and Production Technicians' (3%).
- 3.3 Hard-to-fill vacancy rates were at least 1% for occupations in the top quartile of this sub-component. Among these, the roles reporting the highest absolute number of hard-to-fill vacancies in London are 'Caring Personal Services' and 'Other Elementary Services'.
- 3.4 Finally, occupations highly ranked for real wage growth experienced at least 4% growth from 2014 to 2017. A number of the roles identified under this sub-component are 'low-paying', suggesting that rises in the minimum wage could be playing a part here.⁶⁷

It is also worth noting the significant number of occupations which appear under more than one indicator in London (18). This includes six roles identified under all three indicators, namely: 'Health Professionals', 'Teaching & Educational Professionals', 'Transport & Logistics Managers', 'Sales Associate Professionals', 'Childcare Services' and 'Secretarial Occupations'. These roles are both likely to face labour market adjustment difficulties and are of high value (economic or social).

These results are summarised in Figures 3 and 4, with a UK comparison provided in Figures 5 and 6.

⁶⁴ Note: because of variations in the approach to identifying occupations under each indicator we identify different numbers of occupations under each of the following categories.

⁶⁵ Note: this estimate includes one imputed proportion ('Caring personal services') based on data at the UK level.

⁶⁶ Note: occupations important to public service delivery are also assumed to face labour market adjustment difficulties.

⁶⁷ For a definition of 'low-paying' see: Low Pay Commission (2018) [National Minimum Wage: Low Pay Commission Report 2018](#)

Figure 3: Medium and higher-skilled (RQF level 3 and above) occupations facing labour market adjustment difficulties and/or of high relative value, London

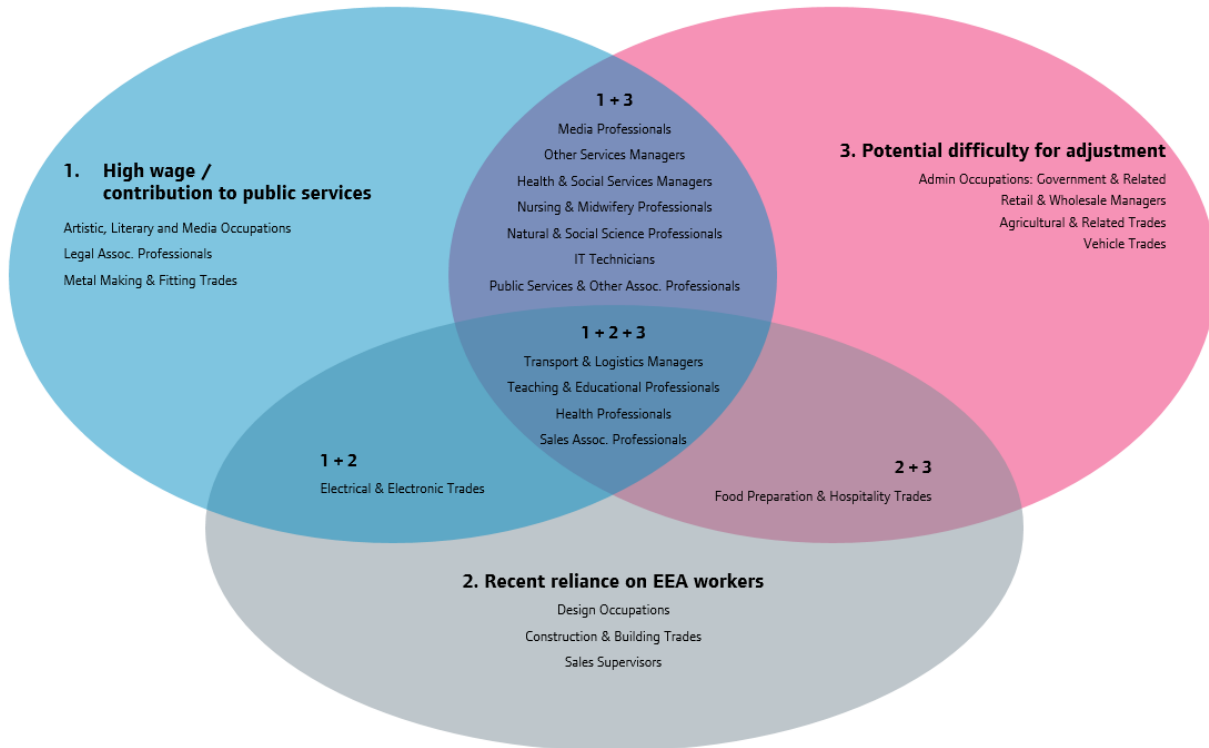


Figure 4: Lower-skilled (below RQF level 3) occupations facing labour market adjustment difficulties and/or of high relative value, London

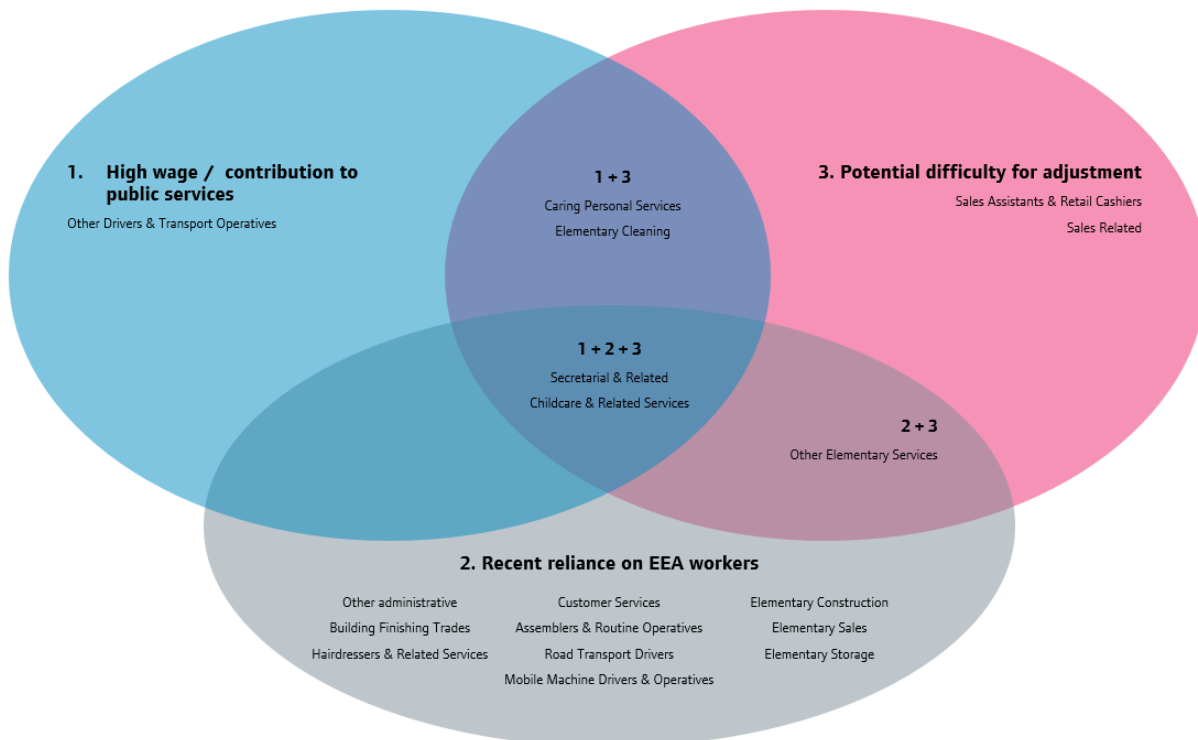


Figure 5: Medium and higher-skilled (RQF level 3 and above) occupations facing labour market adjustment difficulties and/or of high relative value, UK

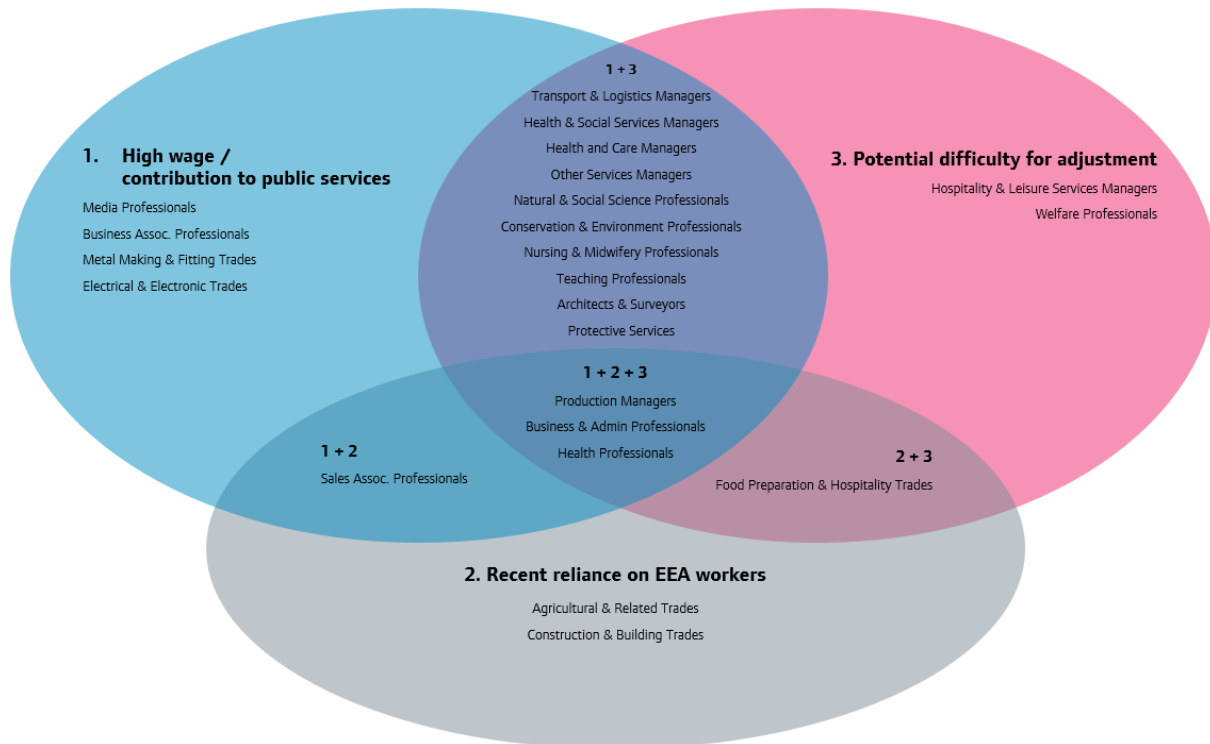
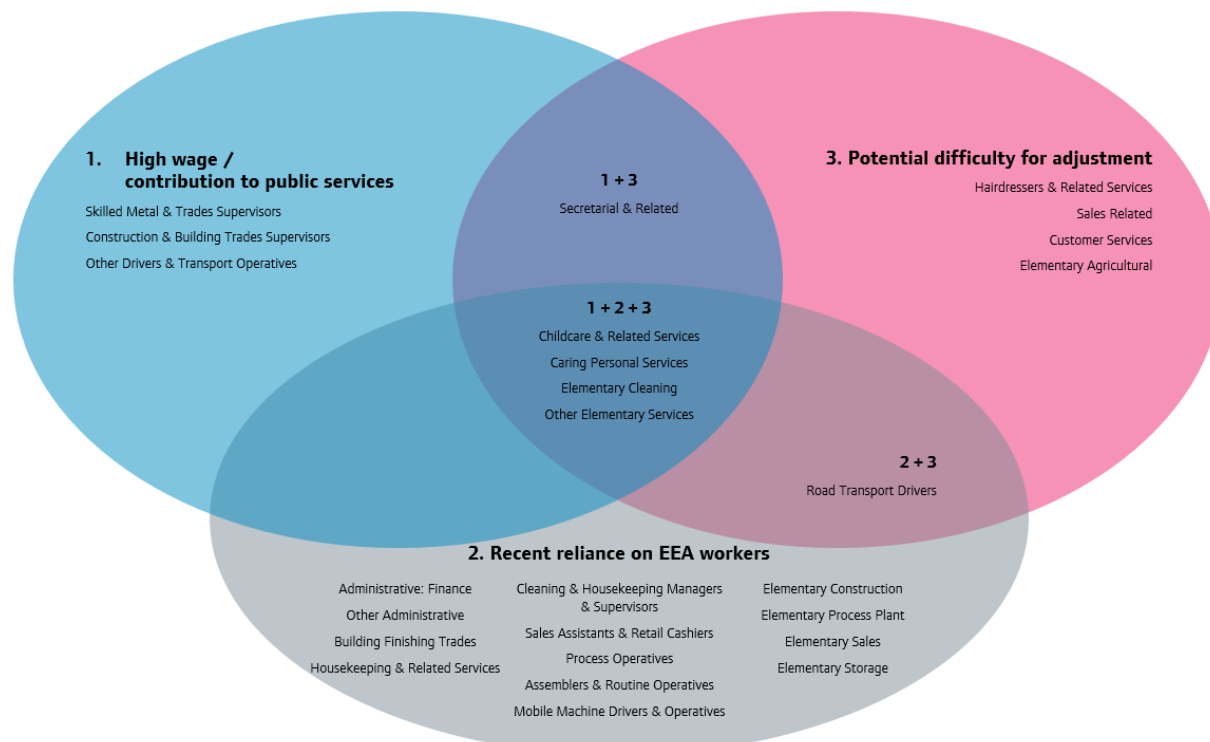


Figure 6: Lower-skilled (below RQF level 3) occupations facing labour market adjustment difficulties and/or of high relative value, UK



Discussion of results

In total, 41 out of 90 three-digit occupational groups in London have been identified as being highly affected by the modelled policy and either being of high (economic or social) value, highly reliant on EEA workers in recent years, and/or facing adjustment difficulties. Together these occupations account for over half (57% or 3.05 million) of all jobs in the capital, including two-thirds (65% or 496,000) of jobs held by EEA workers.⁶⁸ It should be noted that, while we are looking at data on the current *stock* of jobs, the policy proposals will directly affect the *flow* of migrants into these roles.

As a headline comparison our analysis identifies 49 occupations at the UK level, whereas the original Home Office study had identified 50 (Table 3). Excluding occupations with fewer than 10,000 jobs, combined with generally higher salary levels in the capital, mean that we identify a lower number of roles facing labour market adjustment difficulties and/or of high relative value in London compared to the UK as a whole. Because fewer occupations are the focus of our London level analysis, and several sub-components rank and identify only the top quartile (or decile) of occupations, we pick-up fewer job roles in the capital.^{69,70} However, this does not mean that London would be less affected than the rest of the UK, especially given the relative contributions made by EEA workers (Section 4).

Table 3: Number of 3-digit occupational groups identified as facing labour market adjustment difficulties and/or of high relative value, London and UK

Geography – study	Lower-skilled	Medium / higher-skilled	Total
London – GLAE (2019)	18	23	41
UK – GLAE (2019)	26	23	49
UK – Home Office (2018)	23	27	50

Indeed, there is considerable overlap in the occupations identified as facing labour market adjustment difficulties and/or of high relative value in London and the UK as a whole. Table 4 indicates the extent to which the roles identified at the London level also appear at a UK level based on the analysis carried out for this note (see Appendix C for a more detailed breakdown).

- Overall, three-quarters (32 out of 41) of the roles identified in London also appear at the UK level, suggesting common areas of challenge post-Brexit.⁷¹
- There is a particularly strong overlap in terms of occupations of high economic or social value (80% of roles identified in London also appear at the UK level)
- There is slightly less overlap in terms of recent reliance on EEA workers (64%) and adjustment difficulties (61%) – the latter is largely down to variations in wage growth by geography.

⁶⁸ ONS Annual Population Survey 2018. Note: total jobs is based on the sum of three-digit occupations for which data is available. The share of jobs held by EEA workers is based on 2017 data for 72 out of 90 three-digit occupations. Where 2017 data is not available for London we impute data based on the: (i) 2016 estimate (5 roles); (ii) 2015 estimate (4); or (iii) 2017 UK estimate (9).

⁶⁹ There are two reasons why we identify fewer occupations in London compared to the UK as a whole: (i) occupations with fewer than 10,000 jobs have been excluded from our analysis (this affects 15 roles at the London level and none at the UK level); and (ii) salary levels are generally higher in the capital, meaning that fewer roles are the focus of our analysis (i.e. where at least 25% of employee jobs earn below £30,000 per year). So, for example, the top quartile of occupations facing adjustment difficulties in London identifies the 16 highest ranked job roles out of 62 occupations compared to 20 out of 80 occupations at a UK level.

⁷⁰ Point (ii) above also helps to explain why we have identified fewer occupations at the UK level than the Home Office study; because our work is based on more recent earnings data than the original study some occupations have now fallen below the 25% threshold for inclusion in the analysis that previously did not. For example, 'IT Professionals' and 'Architects' featured in the Home Office study but were not the focus of our analysis because fewer than 25% of UK employee jobs now earn less than £30,000 per year according to the ONS Annual Survey of Hours and Earnings 2018.

⁷¹ This drops to 27 occupations when compared to the Home Office's original (2018) study. However, these differences are partly down to the inclusion of an extra year of data as well as differences in underlying data sources (e.g. for automation probabilities).

Altogether there are also nine roles which are identified at a London level which do not appear under *any* indicators at the UK level. These are all medium-skilled occupations and includes roles such as: ‘Artistic & Media Occupations’, ‘Design Occupations’, ‘IT Technicians’ and ‘Legal Associates’.⁷²

Table 4: Overlap between occupations identified at a London and UK level by indicator – based on GLA Economics (2019) analysis

Indicator	Occupations identified at the London level	Number also identified at the UK level*	Percentage also identified at UK level*
All indicators	41	32	78%
1. High wage / high contribution to public services	20	16	80%
2. Recent reliance on EEA workers (2012-2017)	22	14	64%
3. Potential difficulty for adjustment	23	14	61%

*Under the same indicator only.

To give a better picture of the potential labour market impacts, Figure 7 (overleaf) further combines the results of the London level analysis with estimates of the percentage of jobs held by EEA workers and employee jobs paid less than £30,000 per year for occupations with at least 10,000 jobs. The top-right quadrant shows the occupational groups where both the percentage of jobs held by EEA workers and of employee jobs paid below £30,000 are above the London average – a further indication of labour market challenges post-Brexit. The size of the circles indicates the total number of jobs in each three-digit occupational group in London. Several points are worth noting:

- As expected, more of the job roles identified as facing labour market adjustment difficulties and/or being of high relative value (the blue circles) are located towards the top-right quadrant. These are occupations where a high share of jobs is: (i) held by EEA workers; and (ii) paying less than £30,000 per year (e.g. ‘Building & Finishing Trades’ or ‘Elementary Cleaning’). They seem highly exposed to the modelled policy, while several are lower-skilled (bold borders) and would be unable to recruit long-term migrants regardless of salary levels.⁷³
- Conversely, occupations which were not the focus of our analysis (the pink circles) are mainly in the bottom-left quadrant. These roles, which by definition have a lower share of employee jobs earning under £30,000, also tend to have a lower proportion of jobs held by EEA workers.
- Indeed, the largest occupational groups in terms of total jobs generally have a lower than average share of jobs held by EEA workers and several are not highly affected by the proposed policy changes (pink circles). Yet, while some highly affected occupations are relatively small in jobs terms (e.g. ‘Machine Drivers’), others account for a far larger number of jobs in the capital (e.g. ‘Sales Associate Professionals’ or ‘Construction & Building Trades’).

Table 5 provides an additional breakdown of these data points for each of the three-digit occupations facing labour market adjustment difficulties and/or of high relative value in London.

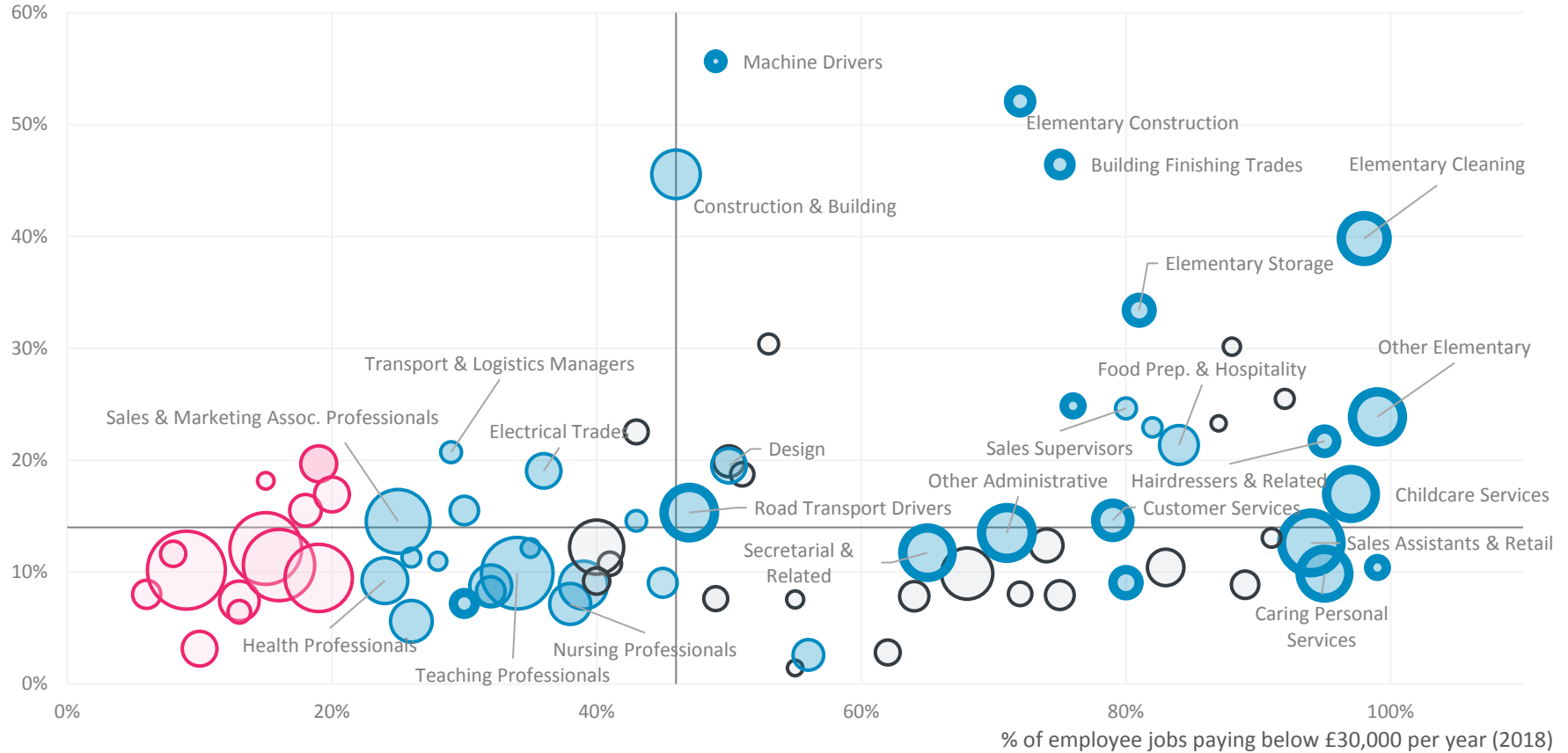
⁷² As well as: ‘Administrative Occupations: Government and Related’, ‘Managers and Directors in Retail and Wholesale’, ‘Public Services and Other Associate Professionals’, ‘Sales Supervisors’, and ‘Vehicle Trades’.

⁷³ These occupations could, for example, have more difficulty adjusting wages to meet a £30,000 minimum salary threshold or be vulnerable to an increase in outflows of EEA workers. Note: part-time earnings are calculated at a gross annual rate.

Figure 7: Selected 3-digit occupational groups in London, by adjustment status

(blue circles = adjustment difficulties/high relative value; pink circles = less affected roles; circle size = total jobs; **bold border** = occupations below RQF3)

% of jobs held EEA workers
(2017)



Source: GLA Economics analysis of ONS APS / ASHE data. Note: excludes three-digit occupations with fewer than 10,000 jobs. The vertical and horizontal represent the 2017 average proportions of jobs held by EEA workers in London (14%) and paid below £30,000 (46%). Where data is missing the proportion of jobs held by EEA workers has been imputed – this affects 9 three-digit occupations with at least 10,000 jobs in London. Lower-skilled occupations identified as facing adjustment difficulties have bold borders.

Table 5: Summary of all 3-digit occupational groups facing labour market adjustment difficulties and/or of high relative value, London

Ranked by estimated number of jobs held by EEA workers paying below £30,000: (a) x (b) x (c)

SOC description (3-digit)	Total jobs (000s) (a)	% held by EEA workers (b)	% paid below £30k (c)	1. High wage / public services	2. High reliance	3. Difficulty adjust.
Elementary Cleaning	107	40%	98%	Yes	No	Yes
Other Elementary Services	127	24%	99%	No	Yes	Yes
Construction & Building Trades	120	46%	46%	No	Yes	No
Sales Assistants & Retail Cashiers	180	13%	94%	No	Yes	Yes
Childcare & Related Personal	121	17%	97%	Yes	Yes	Yes
Food Preparation & Hospitality	77	21%	84%	No	Yes	Yes
Other Administrative	131	13%	71%	No	Yes	No
Caring Personal Services	121	10%*	95%	Yes	No	Yes
Elementary Construction	27	52%	72%	No	Yes	No
Secretarial & Related	124	12%	65%	Yes	Yes	Yes
Road Transport Drivers	130	15%	47%	No	Yes	No
Elementary Storage	34	33%	81%	No	Yes	No
Building Finishing Trades	26	46%	75%	No	Yes	No
Teaching & Educational Prof.	260	10%	34%	Yes	Yes	Yes
Sales Assoc. Prof.	207	15%	25%	Yes	Yes	Yes
Artistic, Literary & Media	149	12%	40%	Yes	No	No
Customer Services	60	15%	79%	No	Yes	No
Hairdressers & Related Services	30	22%	95%	No	Yes	No
Design Occupations	61	20%	50%	No	Yes	No
Sales Supervisors	22	25%	80%	No	Yes	No
Other Services Managers	118	9%	39%	Yes	No	Yes
Electrical & Electronic Trades	60	19%	36%	Yes	Yes	No
Agriculture & Related	19	23%	82%	No	No	Yes
Assemblers & Routine Ops.	16	25%	76%	No	Yes	No
Mobile Machine Drivers & Ops.	11	56%	49%	No	Yes	No
Public Services & Other Assoc. Prof.	89	9%	32%	Yes	No	Yes
Sales Related	35	9%	80%	No	No	Yes
Health Professionals	107	9%	24%	Yes	Yes	Yes
Nursing & Midwifery Professionals	85	7%	38%	Yes	No	Yes
Natural & Social Science Prof.	41	16%	30%	Yes	No	Yes
Retail and Wholesale Managers	42	9%	45%	No	No	Yes
Elementary Sales	16	10%**	99%	No	Yes	No
Media Professionals	88	6%	26%	Yes	No	Yes
Vehicle Trades	21	15%	43%	No	No	Yes
Transport & Logistics Managers	22	21%	29%	Yes	Yes	Yes
IT Technicians	42	8%	32%	Yes	No	Yes
Administrative: Government	48	3%	56%	No	No	Yes
Metal & Machine Making Trades	17	12%**	35%	Yes	No	No
Health & Social Services Managers	18	11%	26%	Yes	No	Yes
Other Drivers & Transport Ops.	24	7%	30%	Yes	No	No
Legal Assoc. Professionals	16	11%	28%	Yes	No	No

Source: GLA Economics analysis of ONS APS / ASHE data. Columns highlighted if: identified under criteria for labour market adjustment challenges (1-3); total jobs ≥50,000; % jobs held by EEA workers ≥14% (London average); % paid below £30k ≥46% (London average). Note: excludes three-digit occupational groups with fewer than 10,000 jobs; *London data is not available for 2017 so estimated based on 2016 data / ** 2015 data.

Appendix A

EEA country groupings used in this note

The European Economic Area (EEA) includes the following countries: Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, the Republic of Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the UK. Although for the purpose of this note we do not include those born in the UK when we refer to 'EEA workers'.

Note:

- Although Iceland, Liechtenstein and Norway are not members of the European Union (EU), their citizens have the same rights as EU citizens to enter, live in and work in the UK.
- Irish citizens, as nationals of the Common Travel Area, will continue to be free to enter and remain in the UK post-Brexit.⁷⁴ For this work it was not possible, due to sample sizes, to provide a breakdown of workers born in the Republic of Ireland by detailed occupation separately from other EEA workers. This group accounted for 6% of EEA job holders in 2017.

Standard Occupational Classification

As noted in Section 1, occupations are generally classified by the Standard Occupation Classification (SOC) based on the tasks/duties carried out in the job. The classification goes down to 4 levels (commonly referred to as digits because of the numbering system used). As an illustration: the four-digit occupation coded 1181 ('Health Services & Public Health Managers and Directors') sits in the one-digit group of 'Managers, Directors and Senior Officials' through the following hierarchy:

- Group 1 (1-digit): Managers, Directors & Senior Officials
 - Sub-Major Group 11 (2-digit): Corporate Managers & Directors
 - Minor Group 118 (3-digit): Health & Social Services Managers & Directors
 - Unit Group 1181 (4-digit): Health Services & Public Health Managers and Directors

The analysis presented here only disaggregated occupations as far as the three-digit or minor occupational groups. This is due to sample size limitations. The Office for National Statistics provides more details of the Standard Occupation Classification hierarchy [here](#).

⁷⁴ Home Office (2018) [Policy equality statement \(immigration\)](#)

Appendix B

As noted in Section 4, we restrict the focus of our analysis on scope for labour market adjustment and relative importance to the three-digit occupations 'most affected' by the modelled policy. This means we include roles below RQF level 3, as well as medium and higher-skilled roles where at least 25% of employee jobs earn below £30,000 a year (with a 1 percentage point margin of error for London to reflect wider confidence intervals for sub-national estimates). We also remove occupations from our analysis with fewer than 10,000 jobs since these, by definition, only account for a small share of jobs and data reliability becomes more of an issue. A complete list of three-digit occupations are the focus of our analysis at both the London and UK levels is included in the table below.

Table 6: 3-digit occupations which are/are not the focus of our analysis

3-digit SOC	Description	London	UK
111	Chief Executives & Senior Officials	No	No
112	Production Managers & Directors	No	Yes
113	Functional Managers & Directors	No	No
115	Financial Institution Managers & Directors	No	No
116	Managers & Directors in Transport & Logistics	Yes	Yes
117	Senior Officers in Protective Services	No (<10,000)	No
118	Health & Social Services Managers & Directors	Yes	Yes
119	Managers & Directors in Retail & Wholesale	Yes	Yes
121	Managers & Proprietors in Agriculture Related Services	No (<10,000)	Yes
122	Managers & Proprietors in Hospitality & Leisure Services	Yes	Yes
124	Managers & Proprietors in Health & Care Services	No	Yes
125	Managers & Proprietors in Other Services	Yes	Yes
211	Natural & Social Science Professionals	Yes	Yes
212	Engineering Professionals	No	No
213	IT Professionals	No	No
214	Conservation & Environment Professionals	No (<10,000)	Yes
215	Research & Development Managers	No	No
221	Health Professionals	Yes	Yes
222	Therapy Professionals	Yes	Yes
223	Nursing & Midwifery Professionals	Yes	Yes
231	Teaching & Educational Professionals	Yes	Yes
241	Legal Professionals	No	No
242	Business, Research & Administrative Professionals	No	Yes
243	Architects, Town Planners & Surveyors	No	Yes
244	Welfare Professionals	Yes	Yes
245	Librarians & Related Professionals	Yes	Yes
246	Quality & Regulatory Professionals	No	No
247	Media Professionals	Yes	Yes
311	Science, Engineering & Production Technicians	Yes	Yes
312	Draughtspersons & Related Architectural Technicians	No (<10,000)	Yes
313	Information Technology Technicians	Yes	Yes
321	Health Associate Professionals	Yes	Yes

323	Welfare & Housing Associate Professionals	Yes	Yes
331	Protective Service Occupations	No	Yes
341	Artistic, Literary & Media Occupations	Yes	Yes
342	Design Occupations	Yes	Yes
344	Sports & Fitness Occupations	Yes	Yes
351	Transport Associate Professionals	No (<10,000)	No
352	Legal Associate Professionals	Yes	Yes
353	Business, Finance & Related Associate Professionals	No	Yes
354	Sales, Marketing & Related Associate Professionals	Yes	Yes
355	Conservation & Environmental Associate Professionals	No*	Yes
356	Public Services & Other Associate Professionals	Yes	Yes
411	Admin Occupations: Government & Related	Yes	Yes
412	Admin Occupations: Finance	Yes	Yes
413	Admin Occupations: Records	Yes	Yes
415	Other Administrative Occupations	Yes	Yes
416	Administrative Occupations: Office Managers	Yes	Yes
421	Secretarial & Related Occupations	Yes	Yes
511	Agricultural & Related Trades	Yes	Yes
521	Metal Forming, Welding & Related Trades	No*	Yes
522	Metal Machining & Instrument Making Trades	Yes	Yes
523	Vehicle Trades	Yes	Yes
524	Electrical & Electronic Trades	Yes	Yes
525	Skilled Metal, Electrical & Electronic Trades Supervisors	No (<10,000)	Yes
531	Construction & Building Trades	Yes	Yes
532	Building Finishing Trades	Yes	Yes
533	Construction & Building Trades Supervisors	No (<10,000)	Yes
541	Textiles & Garments Trades	No (<10,000)	Yes
542	Printing Trades	No (<10,000)	Yes
543	Food Preparation & Hospitality Trades	No (<10,000)	Yes
544	Other Skilled Trades	Yes	Yes
612	Childcare & Related Personal Services	Yes	Yes
613	Animal Care & Control Services	No (<10,000)	Yes
614	Caring Personal Services	Yes	Yes
621	Leisure & Travel Services	Yes	Yes
622	Hairdressers & Related Services	Yes	Yes
623	Housekeeping & Related Services	Yes	Yes
624	Cleaning & Housekeeping Managers	Yes	Yes
711	Sales Assistants & Retail Cashiers	Yes	Yes
712	Sales Related Occupations	Yes	Yes
713	Sales Supervisors	Yes	Yes
721	Customer Service Occupations	Yes	Yes
722	Customer Service Managers & Supervisors	Yes	Yes
811	Process Operatives	Yes	Yes
812	Plant & Machine Operatives	No (<10,000)	Yes
813	Assemblers & Routine Operatives	Yes	Yes
814	Construction Operatives	Yes	Yes

821	Road Transport Drivers	Yes	Yes
822	Mobile Machine Drivers & Operatives	Yes	Yes
823	Other Drivers & Transport Operatives	Yes	Yes
911	Elementary Agricultural	No (<10,000)	Yes
912	Elementary Construction	Yes	Yes
913	Elementary Process Plant	Yes	Yes
921	Elementary Administration	Yes	Yes
923	Elementary Cleaning	Yes	Yes
924	Elementary Security	Yes	Yes
925	Elementary Sales	Yes	Yes
926	Elementary Storage	Yes	Yes
927	Other Elementary Services	Yes	Yes

Appendix C

As also discussed in Section 4 there is considerable overlap between the occupations identified as facing labour market adjustment difficulties and/or of high relative value in London and the UK. The table below provides a breakdown of three-digit occupations based on whether they have been identified at the London or UK levels based on our analysis alongside the results from the original Home Office study. Note: the latter is based on slightly different data sources and timeframes.

Table 7: 3-digit occupational groups identified as facing labour market adjustment difficulties and/or of high relative value, London and UK

3-digit SOC	Description	London – GLAE (2019)	UK – GLAE (2019)	UK – Home Office (2018)
111	Chief Executives & Senior Officials	No	No	No
112	Production Managers & Directors	No	Yes	Yes
113	Functional Managers & Directors	No	No	No
115	Financial Institution Managers & Directors	No	No	No
116	Managers & Directors in Transport & Logistics	Yes	Yes	No
117	Senior Officers in Protective Services	No	No	No
118	Health & Social Services Managers	Yes	Yes	Yes
119	Managers & Directors in Retail & Wholesale	Yes	No	Yes
121	Managers in Agriculture Related Services	No	No	Yes
122	Managers in Hospitality & Leisure Services	No	Yes	No
124	Managers in Health & Care Services	No	Yes	Yes
125	Managers in Other Services	Yes	Yes	No
211	Natural & Social Science Professionals	Yes	Yes	Yes
212	Engineering Professionals	No	No	No
213	IT Professionals	No	No	Yes
214	Conservation & Environment Professionals	No	Yes	Yes
215	Research & Development Managers	No	No	No
221	Health Professionals	Yes	Yes	Yes
222	Therapy Professionals	No	No	No
223	Nursing & Midwifery Professionals	Yes	Yes	Yes
231	Teaching & Educational Professionals	Yes	Yes	Yes
241	Legal Professionals	No	No	No
242	Business, Research & Admin Professionals	No	Yes	Yes
243	Architects, Town Planners & Surveyors	No	Yes	Yes
244	Welfare Professionals	No	Yes	Yes
245	Librarians & Related Professionals	No	No	No
246	Quality & Regulatory Professionals	No	No	Yes
247	Media Professionals	Yes	Yes	Yes
311	Science, Engineering & Production Tech.	No	No	Yes
312	Draughtspersons & Architectural Technicians	No	No	No
313	Information Technology Technicians	Yes	No	No
321	Health Associate Professionals	No	No	No

323	Welfare & Housing Associate Professionals	No	No	Yes
331	Protective Service Occupations	No	Yes	Yes
341	Artistic, Literary & Media Occupations	Yes	No	No
342	Design Occupations	Yes	No	Yes
344	Sports & Fitness Occupations	No	No	No
351	Transport Associate Professionals	No	No	No
352	Legal Associate Professionals	Yes	No	No
353	Business, Finance & Related Assoc. Prof.	No	Yes	No
354	Sales, Marketing & Related Assoc. Prof.	Yes	Yes	Yes
355	Conservation & Environmental Assoc. Prof.	No	No	No
356	Public Services & Other Assoc. Professionals	Yes	No	No
411	Admin Occupations: Government & Related	Yes	No	No
412	Admin Occupations: Finance	No	Yes	No
413	Admin Occupations: Records	No	No	No
415	Other Admin Occupations	Yes	Yes	Yes
416	Admin Occupations: Office Managers	No	No	Yes
421	Secretarial & Related Occupations	Yes	Yes	Yes
511	Agricultural & Related Trades	Yes	Yes	Yes
521	Metal Forming, Welding & Related Trades	No	No	Yes
522	Metal Machining & Instrument Making Trades	Yes	Yes	No
523	Vehicle Trades	Yes	No	No
524	Electrical & Electronic Trades	Yes	Yes	No
525	Skilled Metal & Electronic Trades Supervisors	No	Yes	Yes
531	Construction & Building Trades	Yes	Yes	Yes
532	Building Finishing Trades	Yes	Yes	No
533	Construction & Building Trades Supervisors	No	Yes	Yes
541	Textiles & Garments Trades	No	No	No
542	Printing Trades	No	No	No
543	Food Preparation & Hospitality Trades	Yes	Yes	Yes
544	Other Skilled Trades	No	No	No
612	Childcare & Related Personal Services	Yes	Yes	Yes
613	Animal Care & Control Services	No	No	No
614	Caring Personal Services	Yes	Yes	Yes
621	Leisure & Travel Services	No	No	No
622	Hairdressers & Related Services	Yes	Yes	Yes
623	Housekeeping & Related Services	No	Yes	No
624	Cleaning & Housekeeping Managers	No	Yes	Yes
711	Sales Assistants & Retail Cashiers	Yes	Yes	Yes
712	Sales Related Occupations	Yes	Yes	Yes
713	Sales Supervisors	Yes	No	No
721	Customer Service Occupations	Yes	Yes	Yes
722	Customer Service Managers	No	No	No
811	Process Operatives	No	Yes	Yes

812	Plant & Machine Operatives	No	No	Yes
813	Assemblers & Routine Operatives	Yes	Yes	Yes
814	Construction Operatives	No	No	Yes
821	Road Transport Drivers	Yes	Yes	Yes
822	Mobile Machine Drivers & Operatives	Yes	Yes	Yes
823	Other Drivers & Transport Operatives	Yes	Yes	Yes
911	Elementary Agricultural Occupations	No	Yes	No
912	Elementary Construction Occupations	Yes	Yes	No
913	Elementary Process Plant Occupations	No	Yes	Yes
921	Elementary Administration Occupations	No	No	No
923	Elementary Cleaning Occupations	Yes	Yes	Yes
924	Elementary Security Occupations	No	No	No
925	Elementary Sales Occupations	Yes	Yes	No
926	Elementary Storage Occupations	Yes	Yes	Yes
927	Other Elementary Services Occupations	Yes	Yes	Yes

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