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Shifting sands: Anticipating changes in the future labour market and supporting the workers at greatest risk

Working Paper 5 of The Skills Imperative 2035: Essential skills for tomorrow's workforce

Michael Scott, Luke Bocock, Dr Juan Manuel Del Pozo Segura and Jude Hillary, National Foundation for Educational Research

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The Skills Imperative 2035

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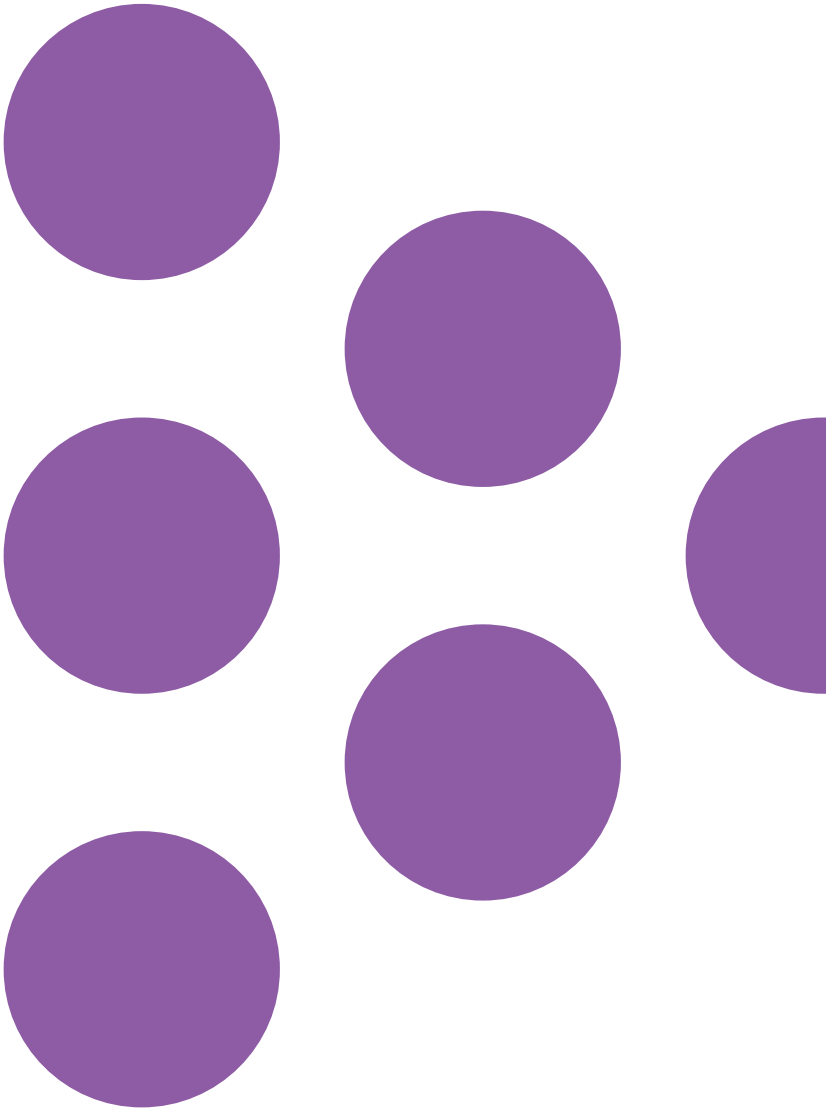

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Glossary

Essential Employment Skills (EES)	Six skills identified in 'The Skills Imperative 2035: An analysis of the demand for skills in the labour market in 2035' as being most in-demand by employers in the future. They are (1) communication, (2) collaboration, (3) problem solving and decision making, (4) organising, planning & prioritising work, (5) creative thinking and (6) 'information literacy' (skills related to gathering, processing, and using information) (Dickerson et al., 2023).
Standard Occupational Classification (SOC)	The SOC system is the main system for classifying occupational information in the UK. Jobs are classified by their skill level and context. The UK introduced this classification system in 1990 (SOC90). It has been revised every ten years, with the latest update taking place in 2020. There are four levels to SOC: major groups (1-digit level), sub-major groups (2-digits), minor groups (3-digits) and unit groups (4-digits). Jobs are classified by their skill level and context.
Higher skill-level occupations	In this report, we define these as the occupations in the first three major occupational groups in the SOC (SOC1 to SOC3).
Mid and lower skill-level occupations	In this report, we define these as the occupations in the bottom six major occupational groups in the SOC (SOC4 to SOC9).
Skills Requirements (We also use Skills Utilisation interchangeably.)	The skills people need to do their jobs. In this report, we have analysed skills utilisation using data from Dickerson et al., 2023 (for all skills) and Bocock, Del Pozo Segura and Hillary, 2024 (for comparing EES requirements to EES supply).
Skills Supply	The skills people possess. In this report, we have analysed supply of Essential Employment Skills (see above) using data from Bocock, Del Pozo Segura and Hillary, 2024.
Skills Gap	Skills Supply minus Skills Requirement. A positive gap indicates skills under-utilisation (i.e someone is not using a skill they possess), whereas a negative gap indicates skills deficiency. In this report, we have analysed gaps in Essential Employment Skills (see above) using data from Bocock, Del Pozo Segura and Hillary, 2024.
Qualification levels (e.g. Level 3, Level 4+)	Qualifications are classified using the Regulated Qualifications Framework (RQF) - No qualification: Entry level qualifications below level 1; Level 1: Low grade GCSE (grade 3 and under) and equivalent; Level 2: High grade GCSE (grade 4 and above); Level 3: A level and equivalent; Level 4-6: Higher education, including undergraduate degrees; Level 7-8: Postgraduate degree level and equivalent.
Risk Quintiles	We categorise all occupational minor groups in the Standard Occupational Classification into five quintiles based on their projected proportional change in employment (PCE) and change in employment share (CES), with risk quintile one being the category most exposed to employment risk and risk quintile five being the least exposed (see Section 3).
High-Risk Occupations	Occupations in risk quintiles Q1 and Q2 (see Section 3).
Low-Risk Occupations	Occupations in risk quintiles Q3, Q4 or Q5 (see Section 3).
Successful Transitions	Job-to-job transitions from a high-risk occupation (in Q1 or Q2) to a low-risk occupation (in Q3-Q5). Successful transitions are broken down into Lateral moves and Upgrades.
Lateral Moves	Job-to-job transitions from a high-risk occupation (in Q1 or Q2) to a low-risk occupation (in Q3-Q5), where the average hourly wage of the destination occupation is less than £15 per hour.
Upgrades	Job-to-job transitions from a high-risk occupation (in Q1 or Q2) to a low-risk occupation (in Q3-Q5), where the average hourly wage of destination occupation is more than £15 per hour.

Overview of The Skills Imperative 2035 Research Programme

The Skills Imperative 2035: Essential skills for tomorrow's workforce' is a five-year research programme, led by NFER and funded by the Nuffield Foundation, which aims to help government, business, and other stakeholders address future skills shortages by identifying the skills that will be most vital across the labour market, estimating future gaps in these skills, examining the determinants of skill development and identifying the groups most at risk of changes in employment and skills requirements between now and 2035.

Previous Skills Imperative 2035 research indicates that the structure of the labour market is likely to continue to change – slowly, but steadily and inexorably – impacting on the jobs that are available in the future. Some occupations (for example, professional workers and health care workers) are expected to grow their share of UK employment, whilst others (for example, administrative jobs and elementary occupations) are likely to experience job losses. Our projections indicate job growth will be predominately concentrated in professional occupations, which tend to be better paid. This creates opportunities, both for young people yet to enter the labour market and for adults trying to move up the occupational hierarchy. By contrast, workers in the occupations most susceptible to technology change tend to be lower-skilled and lower-paid. They include workers in administrative and secretarial work, elementary work and some sales jobs, particularly in retail. These workers are most at risk of being adversely affected by anticipated changes in the structure of the labour market.

Anticipated shifts in the occupational structure of employment also have implications for the skills needed to do the jobs that will be available in future. The Skills Imperative 2035 has identified a set of skills that are intensively utilised across the labour market today, but which will be in even greater demand in 2035. These six 'Essential Employment Skills' (EES) are: communication; collaboration; problem solving and decision making; organising, planning and prioritising work; creative thinking; and information literacy. These EES skills are growing in importance across the labour market. In our most recent paper, we reported that nearly one in five workers in higher skill level occupations have substantial EES-related skills deficiencies, while workers in lower skill level occupations tend to have the highest average levels of skills under-utilisation. Tapping into these latent skills is likely to be increasingly important for employers, individuals and the economy.

In this working paper, we utilise our 2035 employment and skills projections, together with the results of our Essential Employment Skills Survey, to further examine the impact of anticipated changes in employment and skills requirements on the people already in the labour market. We identify the groups most at risk of being displaced by technology and consider how they can make transitions into growing occupations, either from an existing job or after becoming unemployed. We examine the transitions workers in these occupations have typically made in the labour market recently and explore the barriers that might prevent them successfully transitioning into growing occupations in future. We also identify the factors strongly associated with recent, successful transitions out of 'high-risk' occupations.

Later in 2024/25, we will publish a report which explores perspectives from across the skills system about the specific responses required from government and others to support more workers in high-risk occupations to transition into low-risk occupations. After that, we will move on to examine the factors associated with young people's skill development throughout childhood and adolescence, and explore the policy responses required to better support young people's cognitive and non-cognitive development, through and beyond the education system.

Executive Summary

Overview

The global economy is changing. New technologies, coupled with major demographic and environmental changes, are anticipated to disrupt the labour market in the coming decades. These changes offer opportunities to improve living standards by moving capital and labour into more productive occupations, which typically offer workers better wages. However, they also carry threats, particularly for workers in occupations that are projected to decline and who lack the skills and qualifications to move into growing, more highly skilled occupations.

Recent periods of technological change have resulted in job polarisation; growth in low and high skill jobs and erosion of mid-skill jobs. However, there are reasons to believe that – without intervention – large-scale unemployment is more likely in the future. This is principally for two reasons: first, relatively few lower-skilled occupations are projected to grow (whereas substantial growth is projected in professional occupations) and second, there are significant mismatches between the skills and qualifications that workers utilise in lower-skilled occupations and the job demands of growing occupations. Consequently, more than a million jobs in lower-skilled occupations could disappear in the coming decade.

Mitigating the effects of change on these groups should be as much of a priority for government, employers and the wider sector as seizing the benefits of growth in the number of professional jobs. This could be achieved in two ways. First, by supporting more workers displaced from declining occupations to move into growing occupations, either before they fall out of work or in the immediate aftermath of being made unemployed. Second, by ensuring more young people have the skills needed to enter growing occupations when they enter the labour market. In this stage of The Skills Imperative 2035 we focus on supporting existing workers most at risk of being displaced by technology to transition, and in subsequent phases we focus on equipping young people to enter growing occupations.

Key Messages

1. Around 12 million people in England work in occupations that are projected to decline between now and 2035. More than a million jobs in these occupations could disappear in the coming decade. Whilst there will be some new opportunities within these occupations, displaced workers will increasingly need to consider alternative, growing occupations to remain in work.

2. Workers in secretarial, administrative, sales, and various elementary occupations, along with skilled tradespeople working in construction or electrical work, are at highest risk of job displacement. This puts these workers at greatest risk of falling out of the labour market or experiencing downward pressures on their wages.

3. Workers in high-risk occupations require the lowest average skill levels, and lowest levels of transferable EES. They possess the lowest levels of EES, on average. Whilst some of these workers report not currently utilising all the EES they possess, they are generally not well positioned to move into growing areas of the labour market that require higher skills.

4. Workers in high-risk occupations are more likely to be at either end of the age distribution and located outside London and the South East.

5. Over the past decade, workers in the highest-risk occupations have been significantly more likely to transition either into unemployment or economic inactivity between one year and the next. Workers in high-risk occupations were also more likely to change jobs and were more likely to work part-time.

6. Over the past decade, only a small proportion of workers in high-risk occupations successfully moved into a growing occupation. When they changed jobs, around three quarters of workers in high-risk occupations moved into other jobs in high-risk occupations. However, as the number of jobs in these high-risk occupations are projected to decrease in the future, workers who get displaced are likely to increasingly need to look towards alternative growing occupations to get back into the labour market.

7. There are strong incentives to move into growing occupations, provided workers can overcome the barriers to doing so. Where workers in high-risk occupations have successfully transitioned into a growing occupation historically, they tend to experience relatively large wage increases.

8. We can classify successful transitions from high-risk occupations into growing occupations as either lateral moves or upgrades. Lateral moves are transitions into growing occupations with similar skills requirements and median hourly wages to high-risk occupations. There is some evidence that workers in high-risk occupations have EES levels similar to those needed to make lateral moves, but some skill development is probably required.

9. Upgrades are transitions into growing occupations that are, on average, substantially better paid than high-risk occupations, but which also tend to require higher skill and qualification levels. To make such a move, most workers will typically need to demonstrate that they have, or can acquire, stronger or additional skills, without which they may find their lack of skills to be a significant barrier to making these moves.

10. Mismatches between workers' qualifications and the job demands of growing occupations may also pose a significant barrier to successful transitions. Of workers in high-risk occupations, just over a quarter are qualified at Level 4 or above (equivalent to at least the first year of a degree). By contrast, over 50 per cent of workers in growing occupations have qualifications at Level 4 or above. These barriers are larger for upgrades but also exist for some lateral moves.

11. Workers in high-risk occupations who are qualified at Level 4 or above are around twelve times more likely to upgrade into a growing occupation compared to workers with no qualifications, after we control for other observable factors. Level 3 qualifications are also strongly predictive of upgrades. Higher qualifications are also associated with lateral moves, although to a lesser degree than upgrades.

12. There is some evidence that training is predictive of successful transitions, but less so than qualifications. We cannot distinguish between different types of training in the data, which may mean the potential impact of more intensive types of training is being diluted.

13. Older workers in high-risk occupations are historically very unlikely to make lateral moves or upgrades. Over 40 per cent of workers in high-risk occupations are aged above 45, but only around 15 per cent of such workers who make lateral moves or upgrades fall into that age band. Helping these people make successful moves could retain them as active members of the labour force for longer.

14. The data suggests workers outside of London have less opportunity to move to growing occupations. Workers in London are more likely to make upgrades than workers elsewhere and workers in the South are more likely to make lateral moves too.

Overall, our research reinforces the importance of supporting more workers in high-risk occupations to move into growing occupations.

Later this year, we will be holding a roundtable to bring together perspectives from stakeholders across the skills system to discuss the policy and other implications of our findings from across the research programme. During this we will identify actions to support workers in high-risk occupations to successfully transition into growing lower risk occupations or get back into the labour market. Following the roundtable, we will publish a report summarising key points and recommendations.

In later phases of The Skills Imperative 2035, we will turn our attention to the challenge of how to increase young people's average skill levels, so that more are equipped to enter growing occupations.

1. Introduction

Labour market changes create risks as well as potential rewards

Previous research for The Skills Imperative 2035 indicates the structure of the labour market is likely to continue to change – slowly, but steadily and inexorably – impacting on the jobs that are available (Taylor et al., 2022; Wilson et al., 2022). These changes create risks as well as potential rewards.

This change is, first and foremost, driven by advancements in technology. Whereas robotic processes have replaced those workers in manufacturing sectors doing mostly manual tasks, software has been performing cognitive tasks such as administration and data entry, and generative artificial intelligence (AI) is now set to expand the scope and scale of cognitive tasks that technology can perform in place of humans.

Automation does not only remove jobs; it also creates new jobs and changes existing jobs (Carney, 2018; Costa et al., 2024). Whilst many tasks are moved away from humans, new tasks and types of work are regularly created as technology advances, meaning automation has distributional implications as well as productivity benefits. Indeed, most jobs today have been transformed by technology over the past 100 years, from farming to medicine, without seeing wholesale replacement by machines. In a recent study, KPMG found that generative AI could impact 40 per cent of jobs in the UK, affecting 2.5 per cent of all tasks (KPMG, 2023). They also found new tasks linked to managing these new forms of technology could offset around half the displacement. However, technology has tended to disproportionately replace the tasks that lower skilled workers do (more so than higher-skilled workers), whilst creating new types of tasks that are higher-skilled (Acemoglu and Restrepo, 2020). Consequently, automation reduces the demand for lower-skilled workers, posing a risk for these workers, particularly those in high-risk occupations.

Other trends compound the risks of automation to lower-skilled workers. The Covid-19 pandemic accelerated the pace of digitisation, automation and AI adoption and highlighted that when lower-skilled people are displaced they tend to move to other jobs at a similar skill level in other declining occupations centred on similar types of task. The UK population is getting older and evidence has consistently shown that as workers get older, they are less likely to have participated recently in training, and that people are less likely to move jobs the older they get (Hall, Jones and Evans, 2023; Cominetti et al., 2021).

Employment projections produced earlier in The Skills Imperative 2035 suggest job growth will be concentrated in professional occupations (Wilson et al., 2022), which tend to be better paid and more fulfilling. This creates opportunities, both for young people yet to enter the labour market and for adults trying to move up the occupational hierarchy. By contrast, workers in the occupations most susceptible to technology change tend to be lower-skilled, lower-paid, and less satisfied. They include workers in administrative and secretarial work, elementary work and some sales jobs, particularly in retail.

In the worst-case scenario, over a million jobs in lower-skilled occupations would be lost.

England has experienced significant shifts in the labour market before, without this resulting in high levels of unemployment relative to historical standards (ONS, 2024). But there are reasons to believe it may be different this time around.

Firstly, we are unlikely to see further job polarisation. Whilst mid-skilled, mid-paid jobs in manufacturing declined substantially in the 1970s and 1980s, this was accompanied by rising demand for low- skilled workers in various service sectors and parts of the public sector, and since around 1990 a growth in higher paying, higher-skilled professional occupations. Job polarisation limited the number of displaced workers falling out of the labour market altogether. However, job growth is now concentrated in higher-skilled professional occupations and current employment projections do not anticipate significant growth in lower skilled occupations as a whole. Displaced, lower-skilled workers are unlikely to be as easily absorbed into professional occupations, meaning many are at risk of falling out of the labour market altogether.

Second, projected changes in skills requirements could widen the gaps that exist between the skills required in high-risk occupations and the skills requirements of low-risk occupations. Projections produced for The Skills Imperative 2035 clearly identify a set of skills that are already highly utilised, but which will be even more intensively utilised in the future, particularly in growing professional occupations and lower-skilled, growing service sector occupations (Dickerson et al., 2023). We call these skills 'Essential Employment Skills' (EES)[1]. Workers in high-risk occupations are at risk of being displaced by a set of changes that are reducing the wider pool of alternative roles with similar skills profiles. The way in which EES are demanded in growing areas suggests that, if workers in high-risk occupations can develop (or demonstrate) those skills alongside role-specific requirements, then this will help them make successful transitions into those occupations.

Our employment projections reinforce the findings of other studies, for example work by The Resolution Foundation that found demand for 'social skills and abstract skills' in the workplace has increased over the past 25 years, with other routine tasks being displaced (Cominetti et al., 2022). Seminal work from the USA has also emphasised that routine forms of work are on a technologically-driven decline as machines take up a large share of the production base (Acemoglu and Autor, 2011). Growing occupations have higher demand for analytical and interpersonal skills that do not involve following routines. Other recent studies have emphasised the importance of computers, advanced software, and AI in replacing workers engaged primarily in routine, cognitive tasks whereas, on the flipside, non-routine work tends to be augmented, or even created, by technology (Autor, 2015).

Opportunities for workers in high-risk occupations to move into growing occupations with similar skills profiles will be limited.

Job transitions from high-risk occupations to low-risk occupations are dependent on people's skills - specifically, the degree of skills alignment between the occupation they start off in and the occupation they want to move to - as well as the possibility of them retraining or upskilling to bridge the skills gap between occupations. Some existing studies have explored how mismatches between skills and job demands can act as barriers to successful career transitions (CIPD, 2018). Transitioning is more feasible where the overall skill level required in both occupations is similar, and where there is considerable overlap in the types of skills required to perform both jobs. This suggests that 'lateral moves' into lower-skilled jobs in growing occupations are more feasible for lower-skilled workers in high-risk occupations, whereas transitions into better paid, growing occupations that require higher levels of skills and qualifications are harder. Existing evidence produced for this programme suggests many workers in lower-skilled occupations under-utilise their existing skills, which suggests that some people may not need to improve their EES to make lateral moves relatively comfortably from these jobs (Bocock, Del Pozo Segura and Hillary, 2024).

As shown in Figure 1, employment projections produced earlier in The Skills Imperative 2035 (Wilson et al., 2022) suggest that there will be growth in a set of low-paid, lower-skilled occupations. This growth could add roughly as

1 *See Glossary*

many jobs by 2035 as the decline in the number of workers in other lower-skilled occupations that we have labelled 'high risk' because they are projected to decline. Whilst this provides some cause for optimism, it does not account for mismatches in the types of skills and qualifications required across occupations, the fact that many people may not want to work in the specific lower paid occupations that are anticipated to grow, or the need to meet increasing demand for workers in better paid, growing occupations.

Finally, there is widespread speculation that the AI exposure risk on the horizon is far greater than that currently experienced, as AI becomes integrated with other software programmes and databases and therefore more able to execute a broader range of tasks. This could increase the number of existing workers or occupations at risk of job displacement without stimulating a corresponding increase in other occupations requiring similar skill levels. It could also lead to a mismatch between the number of workers at risk of displacement and the number of jobs created in occupations requiring similar skill levels.

This paper unpacks the dynamics that have been outlined here, which are likely to shape the UK labour market and the skills demanded across the economy in the decade ahead. The way it does this is outlined in the next section.

Figure 1 – Higher Risk Occupation, Lower Paid Growing Occupations and Better Paid Growing Occupations (England)

Source: Employment numbers and qualifications from analysis using The Skills Imperative 2035 labour market projections (see Working Paper 2). Qualifications uses data for 2021. Hourly wages from analysis using Annual Population Survey (APS) 2021/22.

2. Research Design and Methodology

In this section, we describe the methodological approach used throughout this paper.

In Section 3, we identify the occupations at highest risk

Anticipated changes in the labour market are likely to lead to a relative reduction in job opportunities in some occupations, whilst creating new jobs in other occupations. We have used long-term employment projections to identify which occupations face the greatest risk. In our employment forecasts (The Skills Imperative 2035: Occupational Outlook – Long run employment prospects for the UK) we identified the occupational minor groups (SOC three-digit level) that are likely to decline between 2020 and 2035 (Wilson et al., 2022).[2]

We assign each minor occupational group to one of five 'risk quintiles'. We do this by calculating the projected change in employment share and projected change in employment and creating a single composite factor score that uses these two measures. We assign each minor group to a risk quintile based on its factor score, where the first quintile contains the occupations that are most at risk. To ensure our findings are robust across forecasts, we repeat the process above using the Automation Scenario from the long-run employment forecasts (Wilson et al., 2022).

Changes in skills requirements within occupations also pose a risk to workers already in those occupations. Previous periods of occupational realignment have been driven by changing demand for skills. We use data on skills requirements (or 'utilisation') produced for The Skills Imperative 2035: An analysis of the demand for skills in the labour market in 2035 to profile the level of each of the 161 skills in the 102 occupational minor groups (Dickerson et al., 2023). These profiles also summarise the overall level of skills required in each occupation. We also compare the Essential Employment Skills (EES) requirements of the occupations in each risk quintile, based on the average skills requirements across the six EES domains in the occupations in each risk quintile. Finally, we use evidence from NFER's Essential Employment Skills Survey, which measures the supply of these skills among workers, to compare the average EES skills supply of workers in the occupations in each risk quintile (Bocock, Del Pozo Segura and Hillary, 2024).

We also identify the worker characteristics that are over-represented in high-risk occupations to alert policy makers to the distributional impacts of occupational change. We compare the characteristics of workers across the different occupational risk quintiles to highlight important differences in the levels of risk facing workers from different backgrounds. To do this, we use both our employment projections data and Annual Population Survey (APS) data from 2021.[3]

In Section 4, we look at workers' historic labour market transitions from 2012 to 2022.

To understand how these groups of workers have historically transitioned in the labour market, we analyse transitions that were recorded in the APS two-year longitudinal samples between 2012/2013 and 2021/2022. This data captures information on respondents in two consecutive years, providing us with a snapshot of transitions from one year to the next, in a typical two-year period. We include in our sample only people with data from both years, weighted to account for varying rates of attrition amongst different groups. We use this data to review the rate at which people tend to move from work to unemployment or inactivity within a year, and how this varies by the workers' initial occupation. We then identify workers' transitions between jobs, for each year between 2012 and 2022[4], looking at the occupational risk quintile of their initial and subsequent job to see how they move between risk quintiles. Finally, we look at how people's wages change when they move job.

2 *Following the identification of a coding error in the source data supplied by ONS, the analysis both 'Long run employment prospects in the UK' and 'An analysis of the demand for skills in the labour market in 2023' was revised to account for the corrected data. This report uses corrected data only. Please see Bocock (2024) for more information.*

3 *The first wave of the two-year longitudinal panel for 2020/2021 because these panels are used extensively elsewhere in this report.*

4 *Rather than simply using the variables about respondents' occupation in Year 1 and Year 2, which is liable to falsely detecting someone changing jobs (because their occupation is coded differently in each year), we use data about when the person started their current employment in Year 2 to detect a new job. Where workers report having two jobs in either wave, we do not treat them as changing jobs. It is also important to note that workers may have a spell of unemployment or inactivity between jobs in Year 1 and Year 2. This is a similar approach to that used previously in the literature, for example Cominetti et al., 2021.*

In Section 5, we identify growing occupations that workers in high-risk occupations could move into and classify them as lateral moves and upgrades.

To explore the types of transitions workers could make from higher to lower risk occupations, we split the potential destinations (all of which are lower risk, growing occupations) into two groups - called lateral moves and upgrades - depending on the median hourly wage amongst those workers in the cross-sectional APS in 2021. Lower risk occupations with lower levels of pay (below £15 per hour) are labelled 'lateral moves' because moves to these occupations from higher risk occupations are less likely to be accompanied by large increases in wages. Conversely, lower-risk occupations with higher levels of pay (above £15 per hour) are termed 'upgrades'. We then use data about qualifications, training, skills utilisation and skills supply to examine potential barriers that high-risk occupation workers may face when considering or attempting to make either a lateral move or an upgrade.

In Section 6, we identify factors that are associated with lateral moves and upgrades.

To identify potential enablers of lateral moves and upgrades we perform descriptive analysis and multinomial logistic regression using the pooled longitudinal APS data outlined above. Over 100,000 workers are included in our sample because they were working in an occupation in either Q1 or Q2 in the first year of the relevant survey. We identify six outcomes depending on their responses to the wave in the second year: moving to inactivity, moving to unemployment, not changing jobs, changing jobs and moving to an occupation in Q1 and Q2, changing jobs and making a 'lateral move', or changing jobs and making an 'upgrade'. As the two-year longitudinal APS only features people who responded in both years, we did not need to filter non-respondents out. To simplify the analysis, we highlight the results concerning lateral moves and upgrades in this report.

Our regression analysis allows us to examine the relationship between these outcomes and a given factor, for example someone's highest qualification level, after netting the effects of differences in a broad range of other individual factors that are observable in our data. The different outcomes outlined above are categorical and mutually exclusive, so we use multinomial regressions across these six outcomes to identify the partial effect of our observable variables on the outcomes. We control for: age (linear and squared), region, ethnicity, full-time vs part-time, number of dependent children (linear and squared), marriage status, years in current employment (linear and squared), main job occupation, main job industry, second job indicator, relationship with head of household, work from home indicator, and the EES score of the respondent's occupational minor group in wave one (from Dickerson et al., 2023). We estimate partial effects, calculating the proportional change in the probability of each outcome for a change in our explanatory variables of interest, which are categorical variables.

3. Identifying the workers at greatest risk

Key Findings

Employment projections produced earlier in The Skills Imperative 2035 clearly show some occupational groups are likely to fare significantly worse than others between now and 2035, principally because the tasks they perform are most exposed to automation risk. Workers in the 20 per cent of occupations most vulnerable to occupational decline are secretaries, administrative workers, retail workers, elementary service workers, and construction workers. Workers in the next 20 per cent of occupations at highest risk include related occupations, as well as plant, process, and machine operators. By contrast, professional, managerial and some care occupations are projected to grow significantly.

Workers in high-risk occupations work in jobs with lower skills requirements and also utilise less transferable analytical, interpersonal, and Essential Employment Skills (EES). This increases their risk to job displacement and puts downward pressure on their wages. Where these occupations do specialise in comparison to others, it is in manual or routine skills. Older and younger workers are disproportionately likely to do these jobs, as are part-time workers and those working outside of London and the South East. The highest risk occupations are concentrated in the trade, accommodation and transport industrial sectors, as well as construction. Women are more likely to work in the highest risk occupations than men.

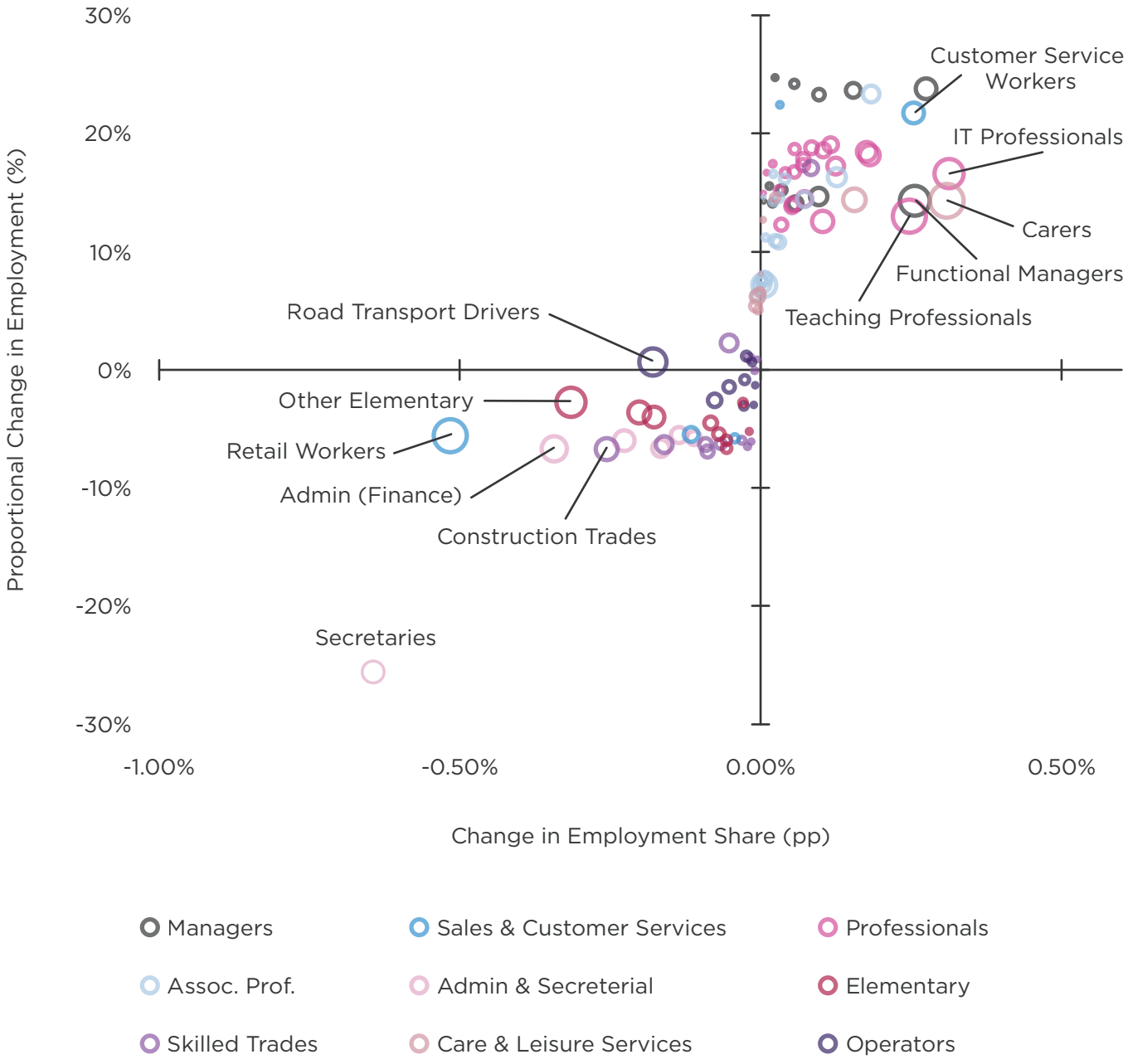
Workers in high-risk occupations are least qualified and least likely to receive training, and so consequently also least well positioned to move into growing occupations. They are also paid less already, leaving them with considerable barriers to overcome if they are to move into growing occupations.

The occupations at greatest risk are secretaries, administrative workers, sales workers, elementary workers and some skilled trades.

Employment projections produced earlier in The Skills Imperative 2035 (Wilson et al., 2022) indicated that administrative and secretarial occupations are ubiquitously set for a decline; the projections suggest demand for secretaries will fall by over 20 per cent over fifteen years. Demand for some elementary occupations which represent large numbers of people, such as hospitality workers and cleaners, is also projected to significantly decline. Indeed, almost all elementary occupations are projected to see some decline. Jobs in sales occupations (e.g., retail work) are also likely to decline, as are most skilled trades, with skilled metal, electrical and electronic trades and skilled construction and building trades hit harder than other types of skill trade, such as those working in food preparation or agriculture. Conversely, professional and managerial occupations, as well as caring and leisure, and customer services, are forecast to grow significantly.

Utilising these projections, we rank different occupations by employment risk at a more granular level. Figure 2 shows how proportional change in employment (PCE) and the change in employment share (CES) in our employment projections compare across minor occupational groups. The two metrics are closely related. However, if two occupational groups have the same PCE, then the larger of the two will have a larger CES value. Figure 2 shows that administrative and secretarial, sales and customer services, and elementary major groups are the occupations likely to decline the most.

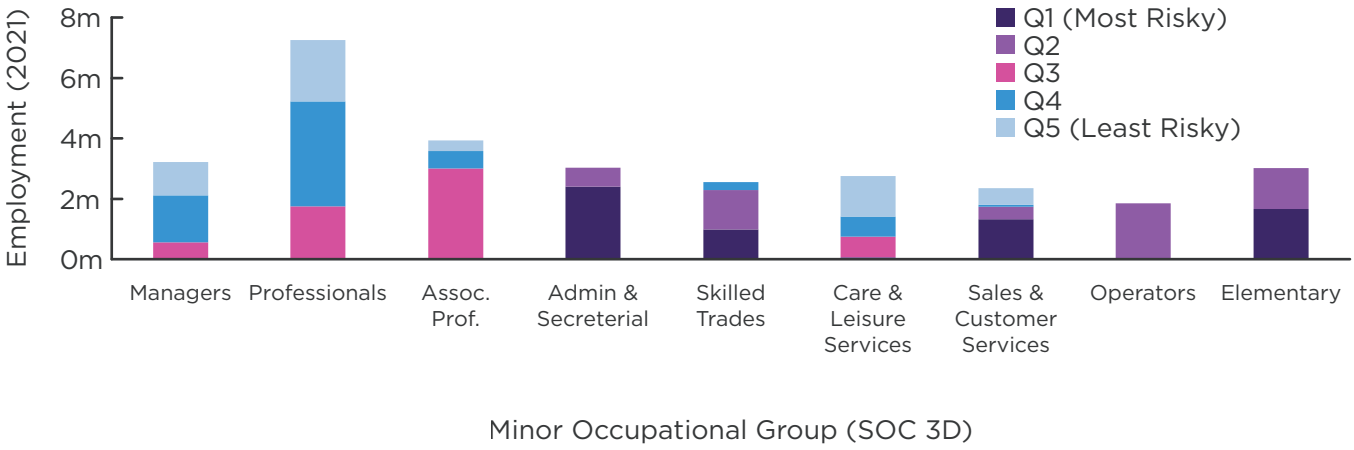
Figure 2 – The projected decline or growth of each occupational group in England, 2021 to 2035, Baseline scenario (Bubble size = Employment in 2021)



Source: Analysis using The Skills Imperative 2035 labour market projections (see Working Paper 2). Change in Employment Share (CES) plotted against Proportional Change in Employment (PCE).

We produce one combined factor score for the change in each occupation's size (from both their PCE and CES) and rank all occupations by this factor score. We categorise all occupations into one of five risk quintiles based on this score, with risk quintile 1 representing the occupations at greatest risk of decline and risk quintile 5 representing those at lowest risk. Figure 3 shows the number of jobs in each Risk quintile, broken down by major occupational group. Risk quintile 1 contains groups of secretarial workers, administrative workers, sales workers, elementary workers and some skilled trades. Risk quintile 2 contains similar occupations, as well as operators. Minor groups within the same major occupational group tend to be clustered in the same risk quintile. For example, all occupations in the elementary, operators and administrative worker major groups are in the top two risk quintiles. By contrast, managers, professionals and associate professionals are clustered in the lowest risk quintiles, along with carers and customer service occupations. A full list of which occupational minor groups are in each risk quintile is presented in Annex 2.

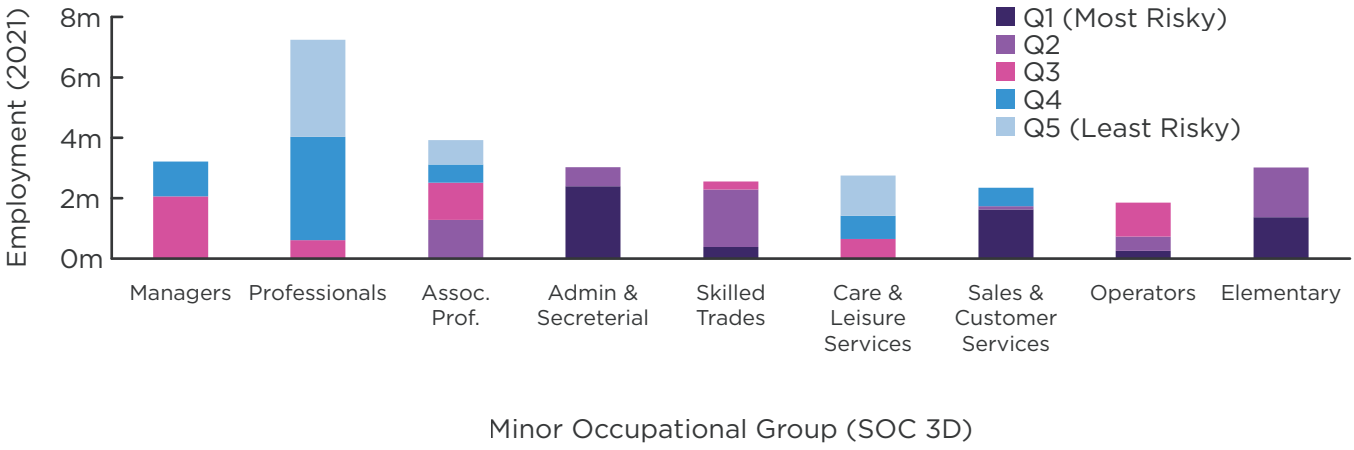
Figure 3 – Number of workers in England in each occupational Risk Quintile, by Major Occupational Group, Baseline employment scenario (England, 2021)



Source: Analysis using The Skills Imperative 2035 labour market projections (see Working Paper 2).

When we replicate our analysis using employment projections from our alternative employment scenarios - which assume a more rapid uptake of automation and AI-related technologies – the assignment of minor occupations to each risk quintile is affected, but the main conclusions remain very similar. Figure 4 shows that a more rapid adoption of automation and AI-related technologies poses a risk to some minor associate professional groups but, conversely, it may reduce the risks for operators, at least compared to associate professionals. However, in all scenarios, administrators and secretaries, elementary workers, retail workers, and skilled tradespeople face the highest levels of employment risk over the next 10 to 15 years.

Figure 4 – Number of workers in England in each occupational Risk Quintile, by Major Occupational Group, Automation Scenario (England, 2021)



Source: Analysis using The Skills Imperative 2035 labour market projections (see Working Paper 2).

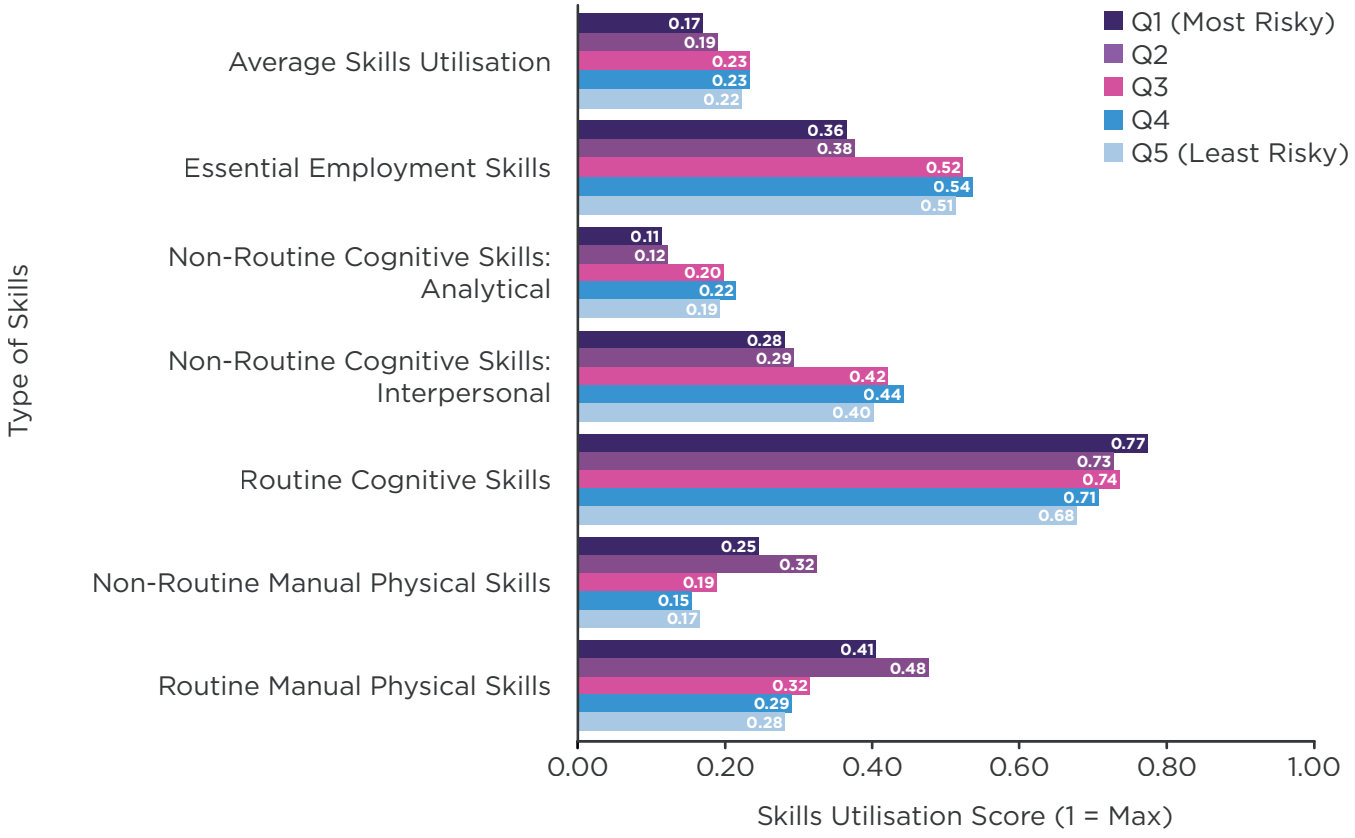
Skills Imperative 2035 projections also include replacement demand, which measures the number of job openings created by people leaving the workforce. Whilst some people who are displaced from high-risk occupations may be able to find their way back into similar jobs by replacing other workers who retire or leave the labour market for other reasons, many (up to 1.2 million) will not. Replacement demand is factored into the projections and our analysis (not shown) also shows that occupations that are projected to fall tend to have lower rates of replacement demand too. The risk facing these occupations should therefore not be dismissed due to replacement demand.

Workers in high-risk occupations tend to work in jobs with lower skill requirements, have lower levels of EES, and are more likely to perform routine tasks.

The ability of workers in high-risk occupations[5] to transition into growing areas of the labour market is dependent on the degree of alignment between their skills and the skills required in growing occupations. Existing research has highlighted that skills mismatches can act as barriers to successful career transitions out of high-risk occupations and into growing occupations (e.g. CIPD, 2018).

Figure 5 draws on data about the skill requirements of different occupations (Dickerson et al., 2023). It suggests that there is a clear dichotomy between the 40 per cent of workers in high-risk occupations and the 60 per cent of workers in low-risk occupations, whereas there is less difference in overall skills utilisation within growing occupations (Q3, Q4 and Q5). High-risk occupations (Q1 and Q2) tend to utilise skills to a lesser extent overall than occupations in the lowest risk quintiles (Q3-5), based on a comparison of the average utilisation of 161 skills across 102 occupations in our skills projections. Skills requirements across risk quintiles Q3 to Q5 do not vary substantially. Figure 5 also shows that occupations in the highest risk quintiles utilise manual skills more intensively; these are not skills which are in high demand outside of high-risk occupations. Workers in Q1 occupations do not appear to use any other type of skills significantly more than other occupations, which may mean they are more easily replaced (by other workers or machines). These findings suggest that the difference between the skills demand in high-risk occupations and the skills required in growing occupations may pose significant barriers to successful transitions out of high-risk occupations and into growing occupations.

Figure 5 – Average Skills Utilisation by Risk Quintile of Occupation (England, 2020)



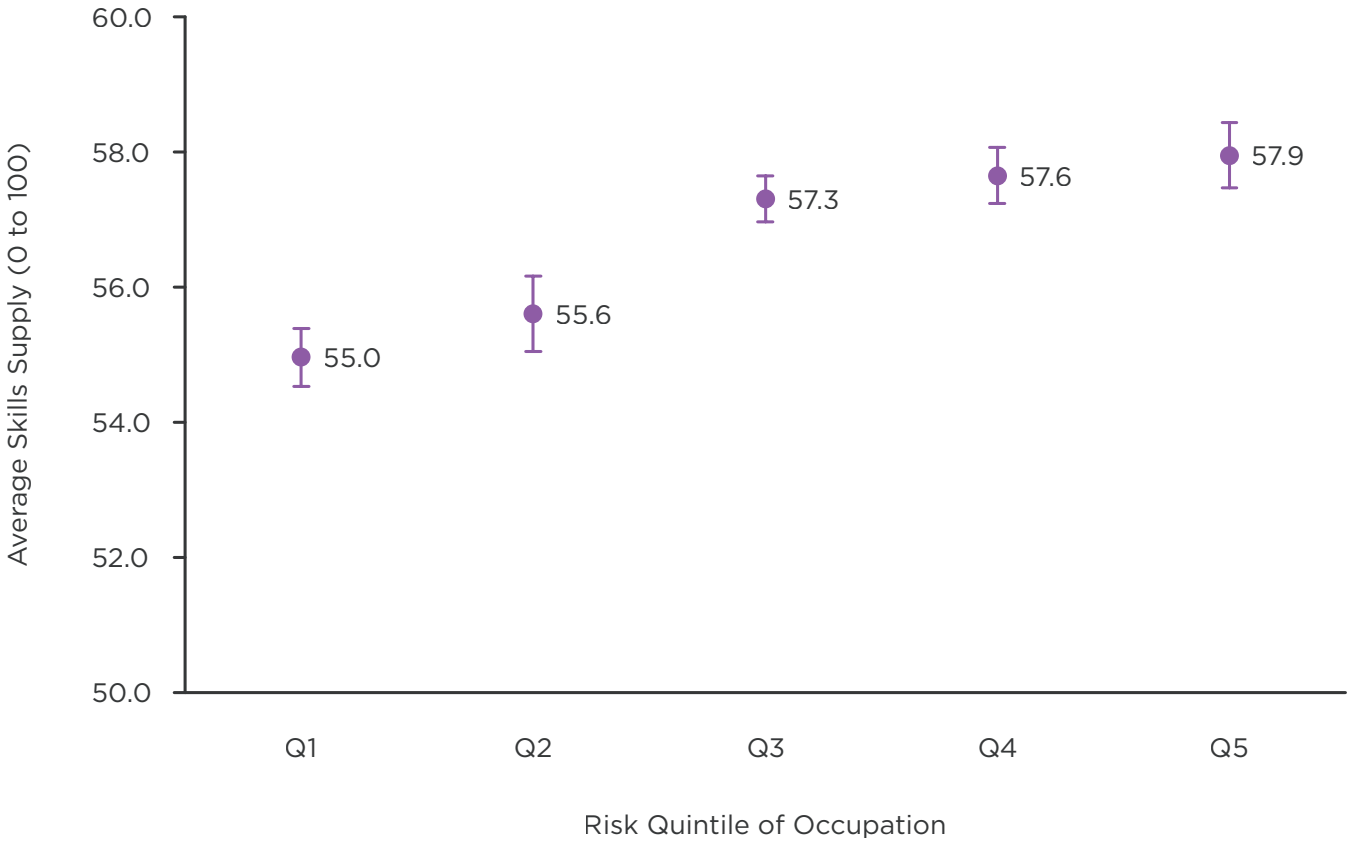
Source: Analysis using The Skills Imperative 2035 skills projections (see Working Paper 3).

5 *We call all occupations in Q1 and Q2 'high-risk' occupations throughout this paper. These are generally the occupations that are projected to decline either in terms of proportional change in employment or change in employment share, or both.*

Previous research for The Skills Imperative 2035 clearly identified a set of Essential Employment Skills (EES) that will be utilised most intensively across the labour market in 2035 (Dickerson et al., 2023). Figure 5 shows that occupations in the highest risk quintiles utilise EES relatively less intensively in their jobs than their counterparts in growing occupations. There is a clear distinction in EES utilisation between high-risk and low-risk occupations. To check the sensitivity of this finding to the set of skills we classified as EES, we also compare average utilisation of analytical and interpersonal skills between the occupations in each of our risk quintiles, borrowing from a well-used classification of different types of task to identify skills which are 'analytical' and 'interpersonal' (Acemoglu and Autor, 2011). Figure 5 shows that differences between risk quintiles in the utilisation of analytical and interpersonal skills are very similar to differences in average EES utilisation. These mismatches may pose a considerable barrier to successful transitions by workers in high-risk occupations into growing occupations and highlight the importance in increasing EES levels to help people make successful transitions.

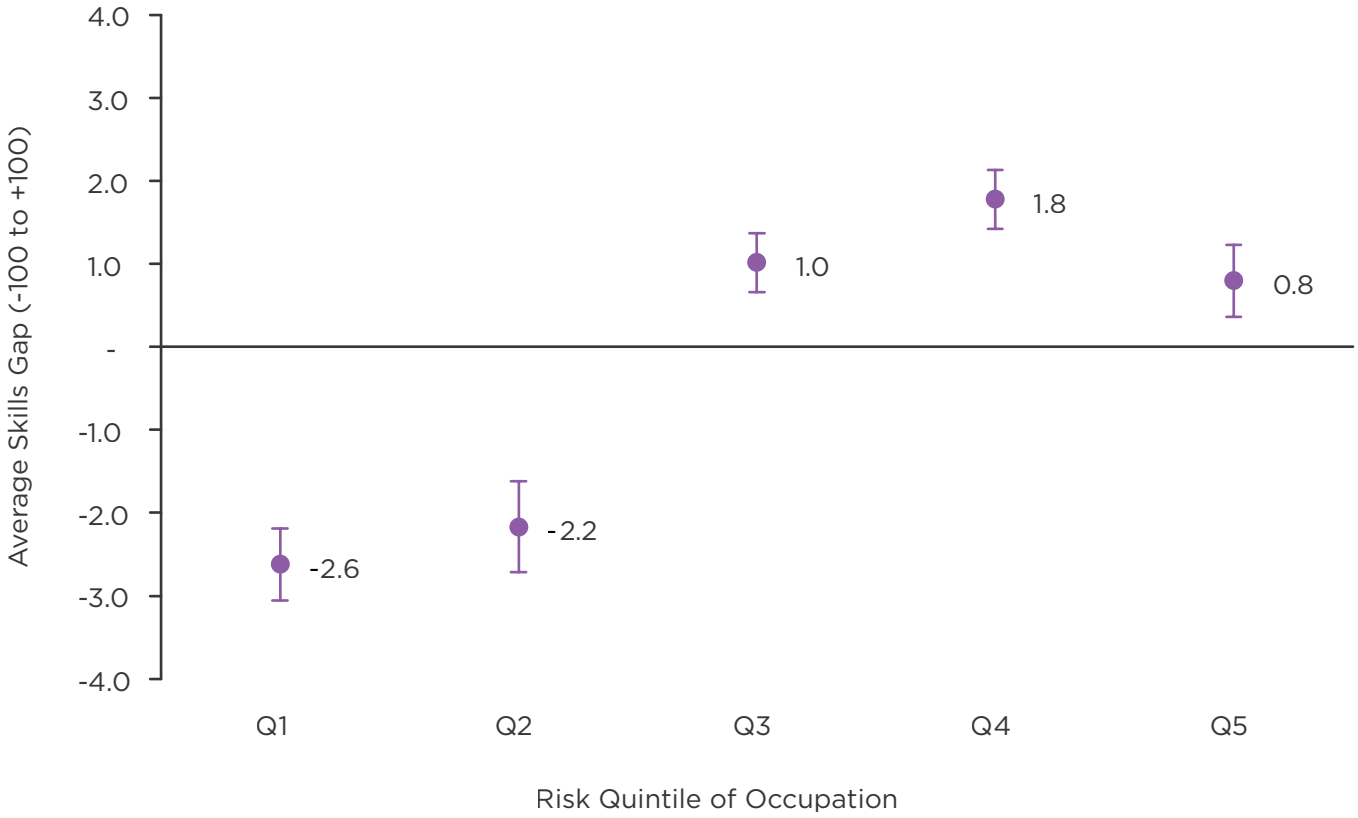
Data from the NFER Essential Employment Skills Survey about the supply of EES presents a mixed picture as to how big a barrier EES mismatches are likely to pose to successful transitions (Bocock, Del Pozo Segura and Hillary, 2024). On the one hand, average EES supply levels are lower amongst workers in high-risk occupations compared to low-risk occupations, as shown in Figure 6. However, our survey results suggest workers in high-risk occupations tend to have under-utilised EES, as shown in Figure 7, which presents the average EES skills gap of workers in each risk quintile. Negative gaps indicate skills under-utilisation and positive gaps indicate skills deficiency. The data implies that workers in high-risk occupations possess higher levels of EES than the skills required to do their current jobs, on average. Many workers in high-risk occupations may, therefore, have the EES they would require to move into a growing occupation, assuming they have accurately assessed the skills requirement of their jobs. If they do, then this suggests these workers, and those supporting them (including employers or prospective employers), should place an emphasis on recognising, describing and demonstrating their skill levels so that they can make successful transitions into low-risk occupations.

Figure 6 – Average Essential Employment Skills Supply by Risk Quintile of Occupation (England, 2020)



Source: Analysis using The Skills Imperative 2035 skills projections (see Working Paper 3).

Figure 7 – Average Essential Employment Skills Gap by Occupational Risk Quintile (England, 2020)



Source: Analysis using The Skills Imperative 2035 skills projections (see Working Paper 3).

Overall, our analysis suggests that routine cognitive tasks are most exposed to automation risk, and that the highest-risk occupations (Q1) are typically centred on performing these tasks. Research has also shown routine jobs are typically easier to move outside of the UK (Gagliardi, Iammarino and Rodriguez-Pose, 2015), compounding the effects of automation. The automation of routine cognitive tasks represents the continuation of a longstanding trend (Acemoglu and Autor, 2011). By contrast, workers in the second highest-risk quintile (Q2), whilst also regularly performing routine tasks, typically utilise manual skills more intensively than their counterparts in other risk quintiles, including those in Q1. Our analysis suggests workers in Q2 occupations are at a relatively lower level of risk than workers in Q1 occupations. This may be because manual tasks are harder to automate or outsource than routine cognitive tasks.

Workers in the highest risk occupations tend to be at either end of the age distribution and are more likely to be based outside of London and the South East than other workers. Women are more likely to be in the highest risk quintile.

Figure 8 shows how the composition of each risk quintile varies by different characteristics[6]. Workers in high-risk occupations are more likely to be at either end of the age distribution (either 16-24 or 55+), more likely to reside in the North or Midlands, most likely to work part-time, more likely to work in trade, accommodation and transport, construction or manufacturing, and more likely to have no or only low-level qualifications. Women are more likely to be in

6 *Note this does not include people who are not working, either because they are unemployed or economically inactive.*

the highest risk quintile, whereas men are more likely to be in the second-highest risk quintile. Overall, a larger proportion of male workers are in Q1 and Q2 combined, relative to female workers. The ethnic composition of each risk quintile is similar.

Workers who are under 25 are far more likely to be in the highest risk occupations (Q1) than any other age group. This is largely intuitive, given many occupations in Q1, such as elementary or retail work are typically entry level jobs or jobs that people may do alongside studying at university or college. Decline in these occupations may reduce the job opportunities open to young people that enter the labour market without higher level qualifications, as well as young people supporting themselves whilst studying. Older workers are also more likely to be in the riskiest occupations, especially beyond the age of 45.

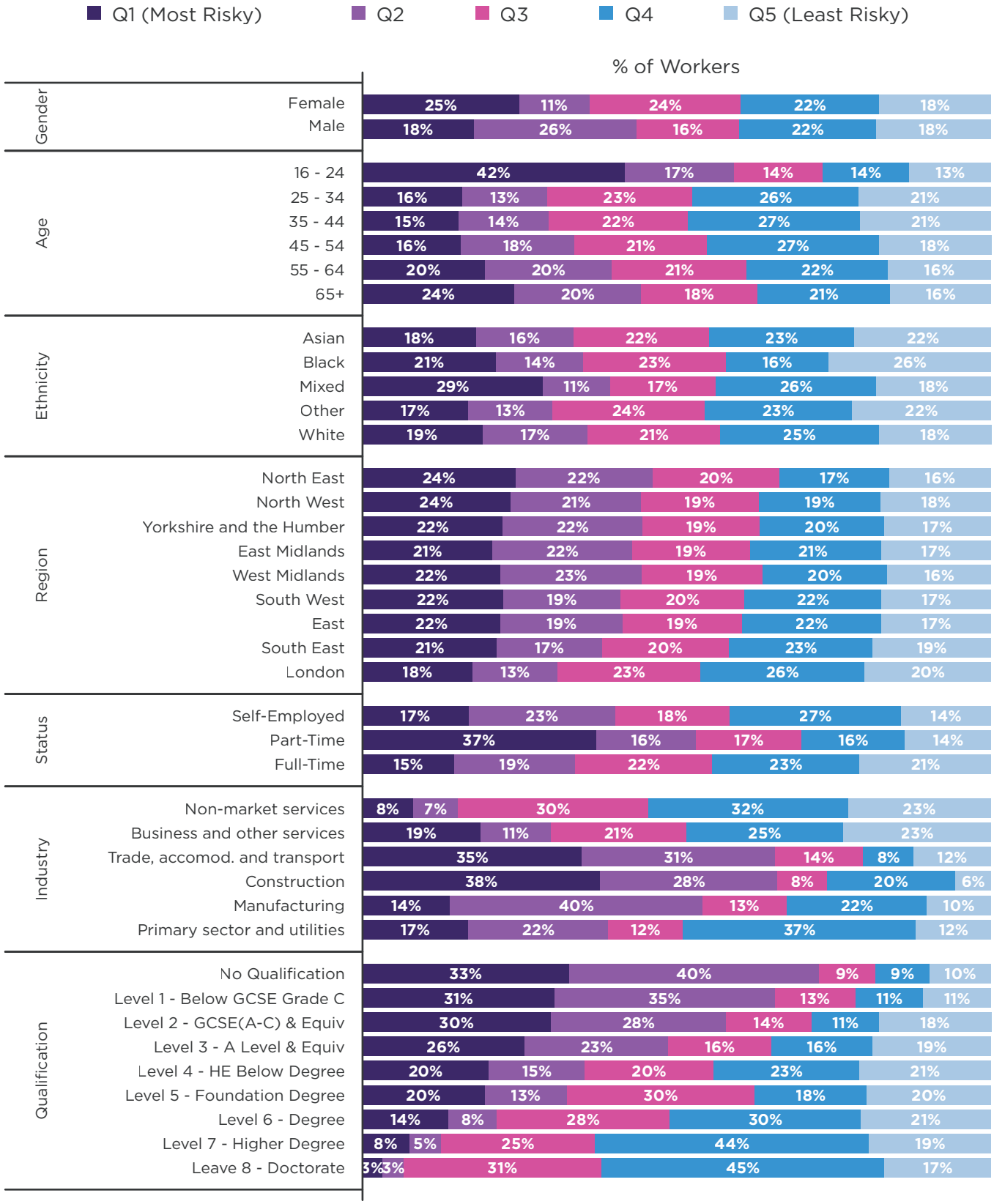
Geographically, the likelihood of working in the highest risk occupations falls as we go from north to south, with the North East and North West having the highest rate of workers in high-risk occupations, and London having the lowest, followed by the South East. This is largely unsurprising given that professional jobs are most highly concentrated in London and the South East.

Figure 8 also shows that workers in the 'Trade, Accommodation and Transport' and 'Construction' sectors are by far the most likely to be in high-risk occupations, with over 60 per cent of workers in both groups being in Q1 and Q2 occupations. This is unsurprising given that all operative occupations and most workers in skilled trades are in Q1 or Q2. Likewise, workers in 'Manufacturing' industries are much more likely to be in Q2. By contrast, only 15 per cent of workers in 'Non-market services' are in the highest risk occupations, reflecting the continued growth that is anticipated in health, education and social care. This suggests encouraging and preparing some workers in declining sectors to enter these roles is likely to be important if they are to stay in work.

Workers in the highest risk occupations are also more likely to work part-time[7]. Over half of all part-time workers are in Q1 and Q2 occupations, which tend to be lower paid. Low earners are four times as likely as high earners to experience volatility in their hours or pay, or to be working fewer hours than they would like. Additionally, half of shift workers in Britain receive less than a week's notice of their working schedules (Resolution Foundation, Centre for Economic Performance, and LSE, 2023).

7 *This report follows Skills Imperative 2035 employment projections in distinguishing between full-time and part-time people who work for an employer, and self-employed people.*

Figure 8 – Characteristics of Workers, by Risk Quintile of Occupation, (England, 2021)[8]



Source: Analysis using The Skills Imperative 2035 labour market projections (see Working Paper 2) for Gender, Region, Employment Status, Industry and Qualification. Analysis using APS 2021/22 for Age and Ethnicity.

8 *When reviewing Figure 11, readers should expect each quintile to contain approximately 20 per cent of the working population. However, each quintile does not contain exactly 20 per cent because we assign entire groups to one risk quintile and different datasets are used here, depending on the metric. As such, this analysis is primarily focused on the comparison of groups within the same category (e.g. male vs females).*

Workers in the highest risk occupations are least qualified and least likely to access training, and so consequently also least well positioned to move into growing occupations.

Given mismatches between the skills requirements of low-risk and high-risk occupations, successful job transitions are likely to be dependent on the opportunities that exist for workers in the highest risk occupations to retrain or develop their skills.

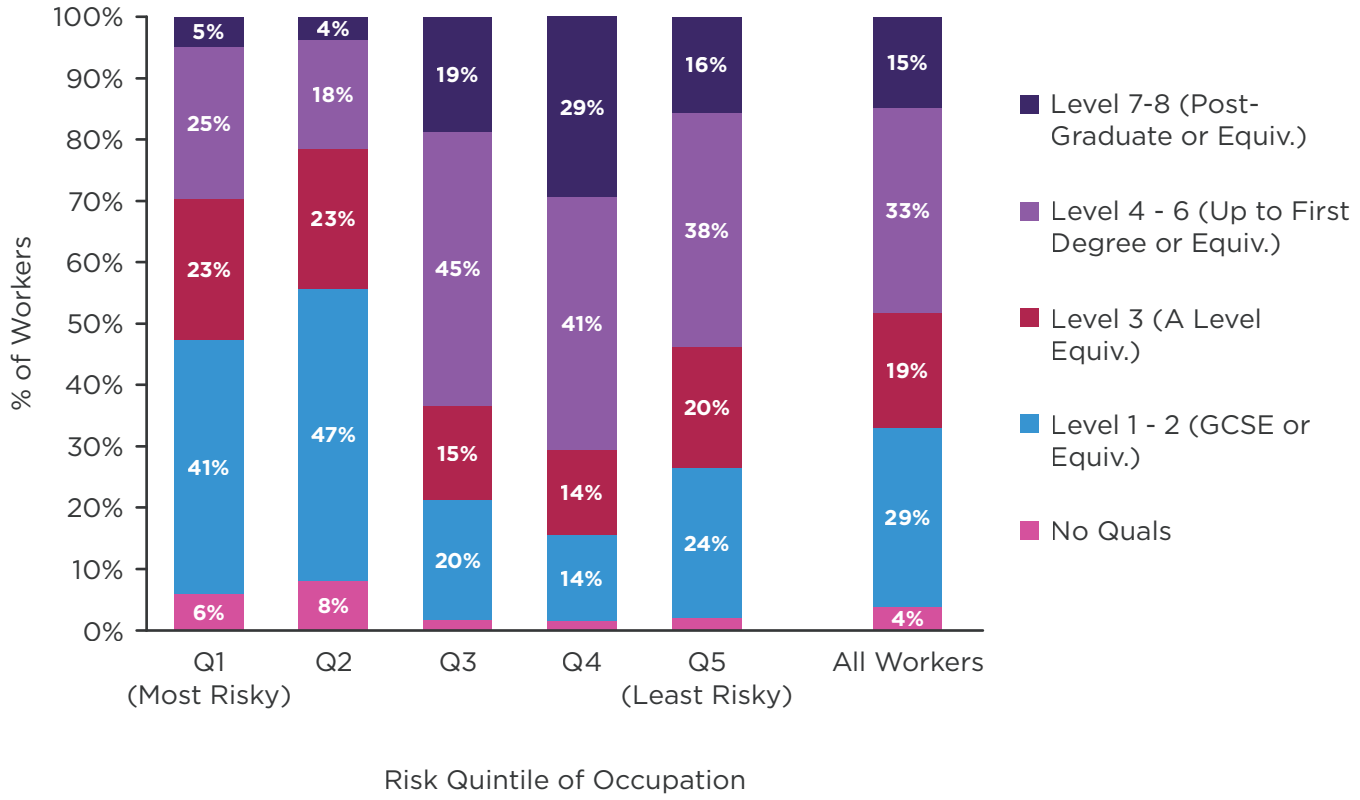
Our analysis suggests workers with higher levels of qualifications are far less likely to work in high-risk occupations, as shown in both Figure 8 and Figure 9. Over 70 per cent of workers with no qualifications and nearly 60 per cent of workers with Level 2 qualifications are in high-risk occupations (as in Figure 8). Interestingly, workers with no qualifications or Level 1 qualifications are more likely to be in Q2 occupations than Q1 occupations, whereas those with qualifications at Level 2 or above are more likely to be in Q1 occupations than Q2 occupations. This perhaps reflects the propensity of people with low-level qualifications (below level 3) to do manual jobs, working as Operators or in Construction, rather than jobs requiring routine cognitive skills such as administrative work. Workers' likelihood of being in a high-risk occupation decreases as their qualification levels increase. There are other reasons workers with Level 3 qualifications or higher may work in higher-risk occupations which tend to have relatively low levels of pay, which could be explored in future research.

Differences in the likelihood of being in a Q1-2 occupation between workers with no qualifications and workers with Level 3 qualifications are smaller than differences between workers with Level 3 qualifications and workers with a degree. This is shown in Figure 9; over half of all workers in low-risk (Q3-5) occupations have a Level 4 or above qualification (equivalent to at least the first year of a degree), compared to only 21 per cent of workers in Q2. This suggests that degrees are commonly a minimum requirement for entry to managerial, professional and associate professional work.

Workers in high-risk occupations are less likely to report having recently received training than those in other occupations, as shown by Figure 10[9]. Less than one in five workers in Q1 and Q2 report that they received training in the last three months (prior to when they were surveyed). This may be because their employers are less likely to offer them training, they are less likely to engage in the training, or because training they do receive is less formal and easily identified as 'training'. If they are receiving less training, this could be a barrier to workers in high-risk occupations making successful transitions into growing occupations.

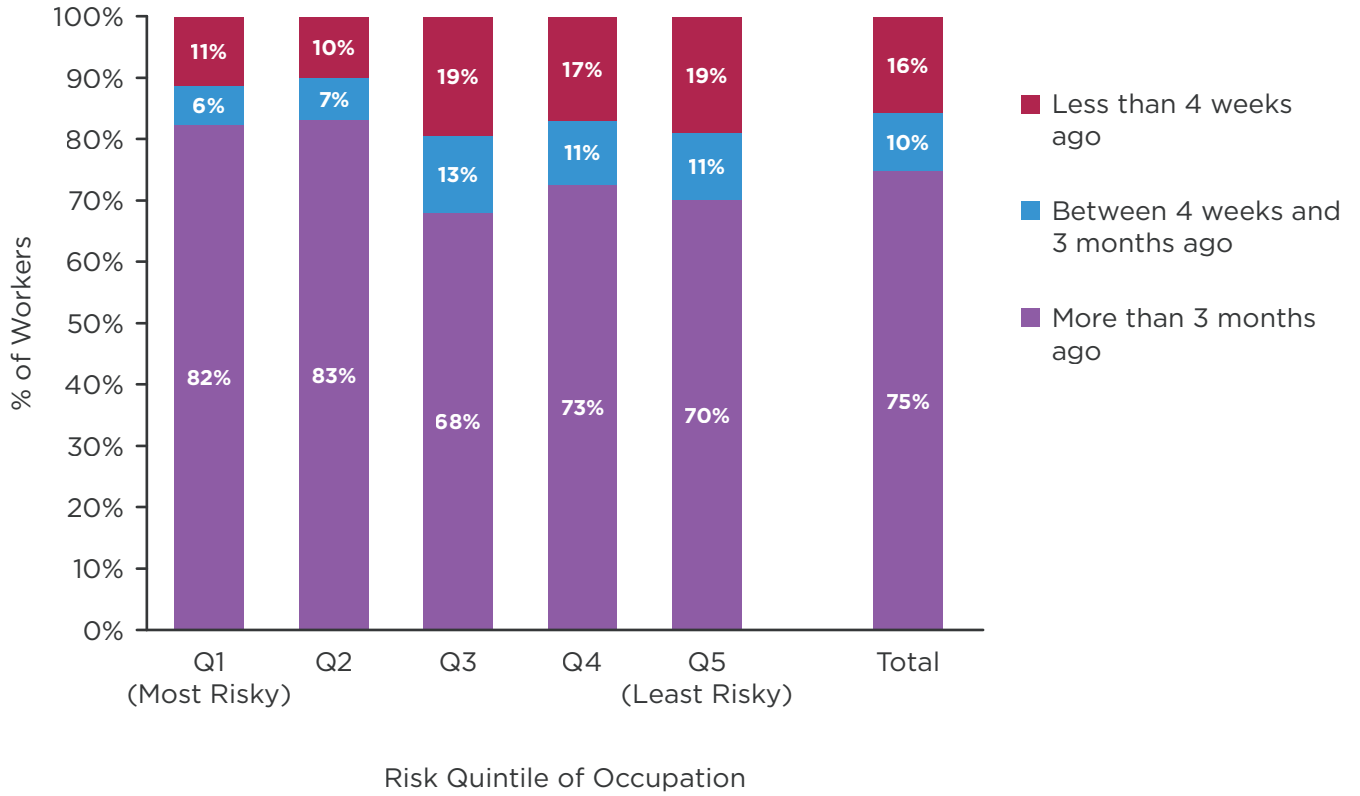
9 *The Annual Population Survey (APS) asks respondents about when they last received training and we report the data for those in work. Separately, the Employer Skills Surveys reports that only 17 per cent of the over 15 million adults who participated in employer-provided training in 2019 trained towards a qualification (Winterbotham et al., 2020).*

Figure 9 – Highest Qualification of Workers by Occupational Risk Category (England, 2021)



Source: Analysis using The Skills Imperative 2035 labour market projections (see Working Paper 2).

Figure 10 – Frequency of Training by Occupational Risk Category (England, 2021)

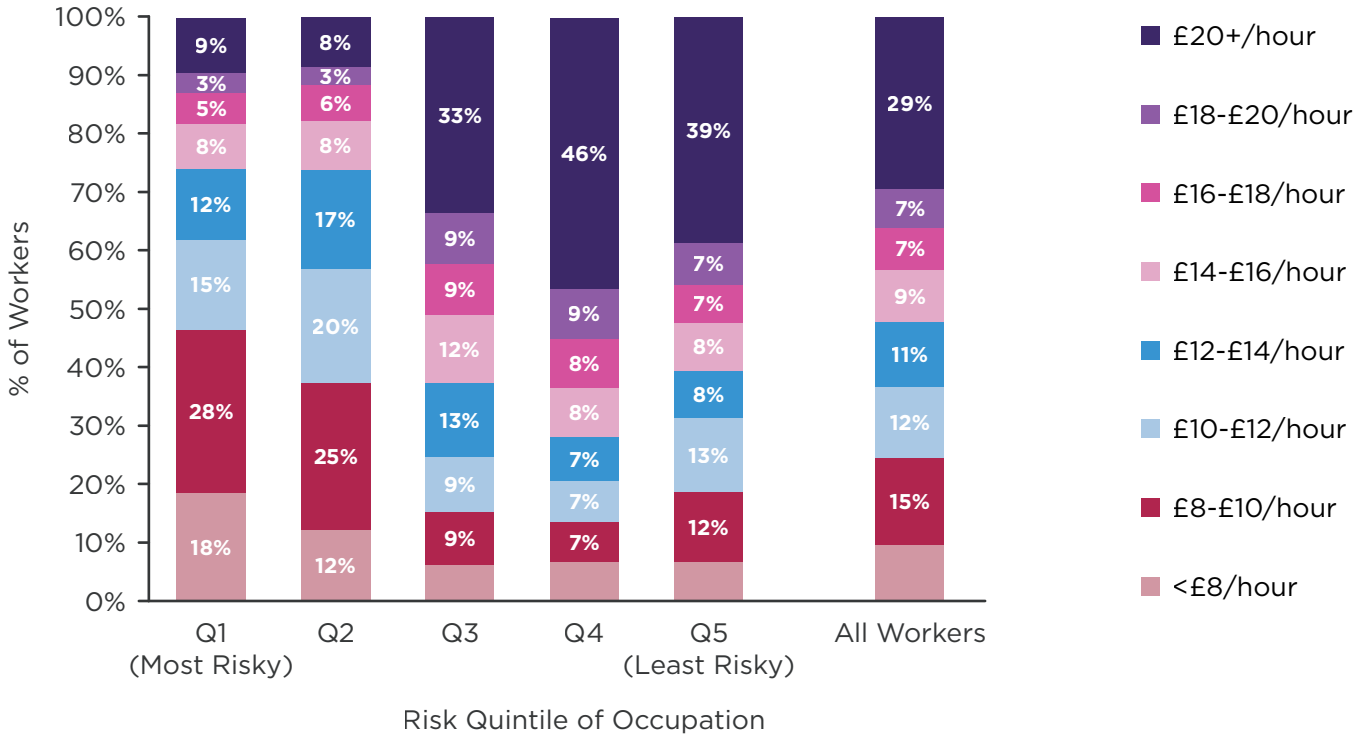


Source: Analysis using APS 2021/22.

Workers in high-risk occupations are paid less already, further limiting their ability to access the training and qualifications they might need to move into growing occupations.

Workers in high-risk occupations are, on average, the least likely to be able to afford to retrain or develop their skills, given the strong correlation between occupational risk and hourly wages indicated by Figure 11. The median hourly wage of workers in both the highest risk occupations (Q1) and the next highest risk group (Q2) is between £10 and £12.[10] By contrast, amongst workers in low-risk occupations (Q3-5), the median hourly wage is above £15/hour. A key contrast appears to be at the top of the distribution; less than 10 per cent of workers in Q1 and Q2 earn more than £20 per hour, whereas almost half of workers in Q4 occupations earn above this amount. Workers in high-risk occupations are therefore likely to face financial barriers to retraining or upskilling, particularly where this necessitates a reduction in working hours. Occupational decline may also exert a downward pressure on wages, magnifying the financial barriers to retraining and upskilling. Furthermore, existing research has tended to link low pay with other forms of insecurity, including pay volatility, low-paid self-employment, having a non-permanent job or being on a zero-hours contract, which all reinforce the financial barriers to retraining or upskilling for workers in high-risk occupations (Richardson, 2023).

Figure 11 – Wages by Occupational Risk Category (England, 2021)



Source: Analysis using APS 2021/22.

10 *This data covers the 2021 calendar year in the APS 2Y longitudinal samples. From April 2020 to March 2021 the national wage for those 25 and over was £8.91. From April 2021 to March 2022, the national wage for those 23 and over was £8.91. (GOV.UK, 2024)*

4. Examining the labour market transitions of workers in high-risk occupations

Key Findings

Workers in high-risk occupations are already more likely to fall out of work, either into unemployment or economic inactivity, between one year and the next. They are also more likely to change jobs.

When people change jobs, they tend to move to similar jobs. This means most people who change jobs stay in occupations in the same risk quintile. Moving from a high-risk occupation to a low-risk occupation is rare, in part because this typically requires retraining or upskilling.

However, around a quarter of job-to-job moves by workers in high-risk occupations are into low-risk occupations, which provides some cause for optimism. Supporting workers in high-risk occupations to move jobs and helping displaced workers in these occupations to get back into lower risk occupations is likely to play an important role in minimising the costs of disruption to the labour market and improving productivity across the economy.

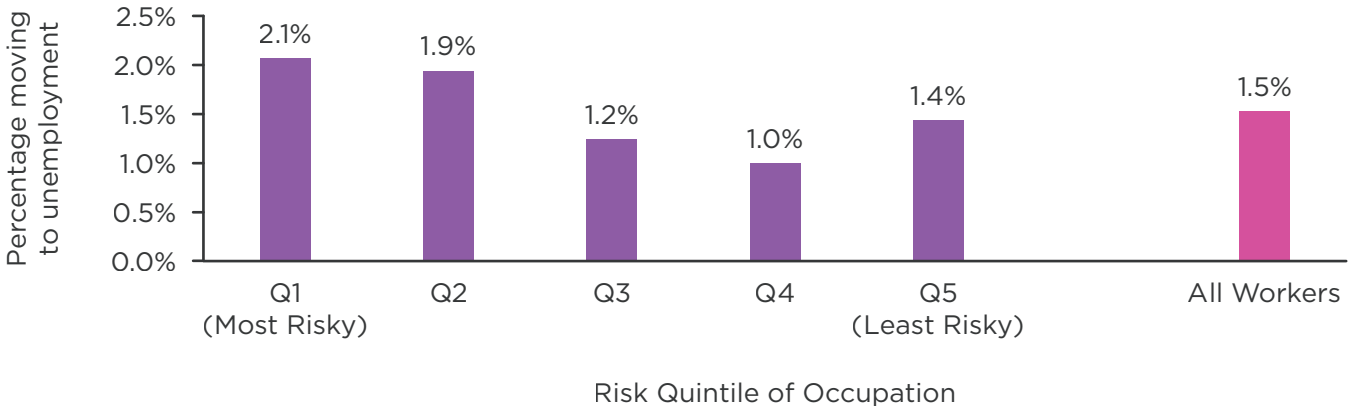
Changing jobs is also economically advantageous to workers, on average. Workers who change jobs tend to see larger wage increases than the average worker. Workers in the highest risk occupations experience the biggest wage premia of all workers when they change jobs, suggesting policies should tackle the barriers that prevent these moves from occurring.

Workers in high-risk occupations are already more likely to fall out of work, either into unemployment or economic inactivity.

So far, we have identified a set of occupations that are relatively high-risk because their employment share is projected to decline. In this section, we compare the labour market transitions of workers in high-risk occupations with those of workers in low-risk occupations. This sets the scene for us to identify barriers and enablers to supporting more workers in high-risk occupations to make successful transitions.

Whilst not all periods of unemployment are enforced, many are, and occupational groups from which people are more likely to fall out of work are likely to be more precarious. In a typical year, around 1.5 per cent of people move into unemployment. As shown in Figure 12, the proportion of workers in high-risk occupations (Q1 and Q2) who have moved into unemployment 12 months after being employed is almost double the rate for workers in growing, low-risk occupations (Q3-Q5).

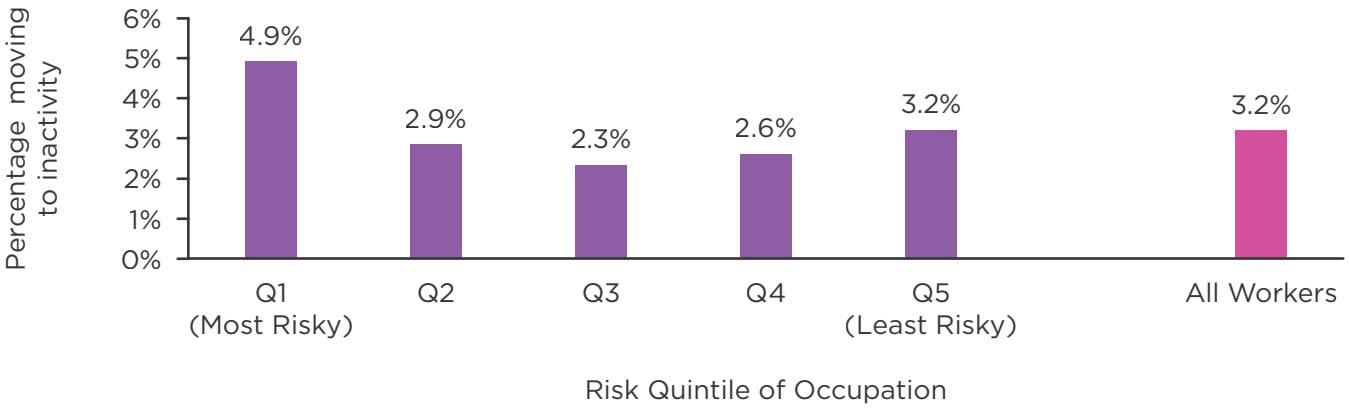
Figure 12 – Annual Rate of Workers Moving to Unemployment, split by the Risk Quintile they start in (England, 2012-2022)



Source: Analysis using APS 2012/13 to 2021/22.

As shown in Figure 13, workers in the highest risk quintile of occupations are also far more likely to transition into economic inactivity than other workers, reinforcing the conclusion that they are often in more precarious roles. In the previous section, we saw that workers in the highest risk occupations are disproportiuonately likely to be at either end of the age distrbution and to work part-time, which might also help explain why they are most likely to transition into either unemployment or inactivity[11]. Interestingly, workers in the second highest-risk quintile are less likely than the average worker to transition into inactivity, whereas they are more likely to move into unemployment. Transitioning into inactivity will sometimes be voluntary - for example, people may remove themselves from the labour market to care for family members or because they can afford to do so. However, many of these cases are likely to be people falling out of the labour market because they are unable to find work that they have the skills, qualifications and experience to do.

Figure 13 – Annual Rate of Workers Moving to Economic Inactivity, split by the Risk Quintile they start in (England, 2012-2022)



Source: Analysis using APS 2012/13 to 2021/22.

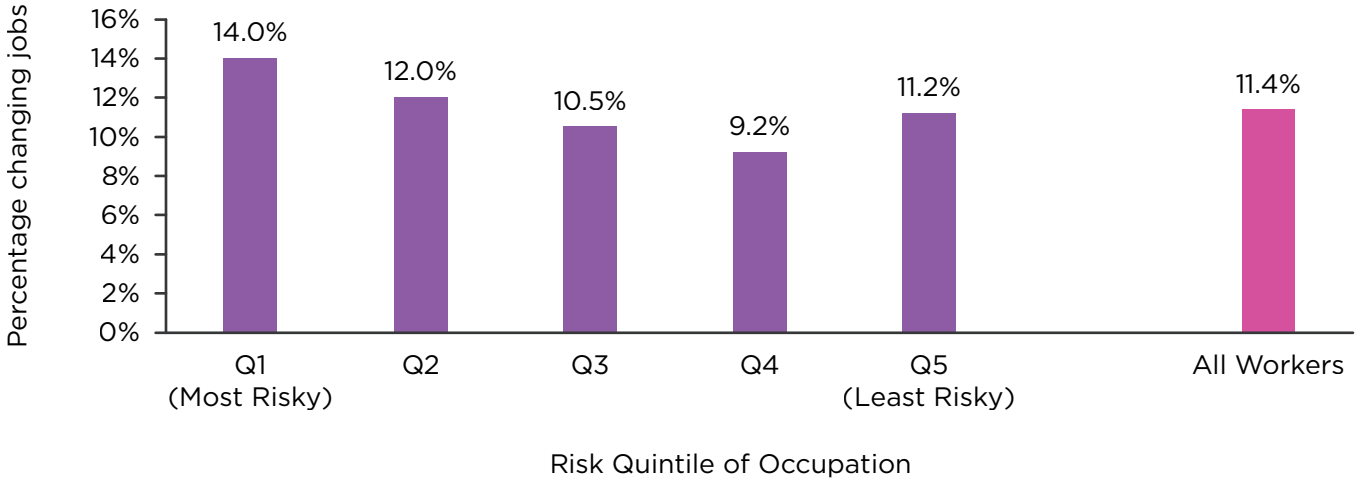
Workers in high-risk occupations are more likely to change jobs between one year and the next, at least partly out of necessity.

Workers in high-risk occupations tend to change jobs at a faster rate than workers in low-risk occupations, as can be seen in Figure 14.[12] This shows the rate of workers in England who changed jobs within an approximately 12-month period between 2012 and 2022, split by the risk quintile they were in before they transitioned. Existing research suggests many workers in high-risk occupations may be changing jobs out of necessity, for example because they are in non-permanent forms of work, perhaps due to the seasonal nature of work in some types of jobs, such as retail or hospitality work (Cominetti et al., 2021).

11 This analysis excludes workers who declare themselves formally retired by the second year, so these patterns are not explained simply by more people retiring from Q1 occupations.

12 It is important to note we look at people at two points in time, approximately 12 months apart. Some people may appear to change job but could have been out of work in the intervening period.

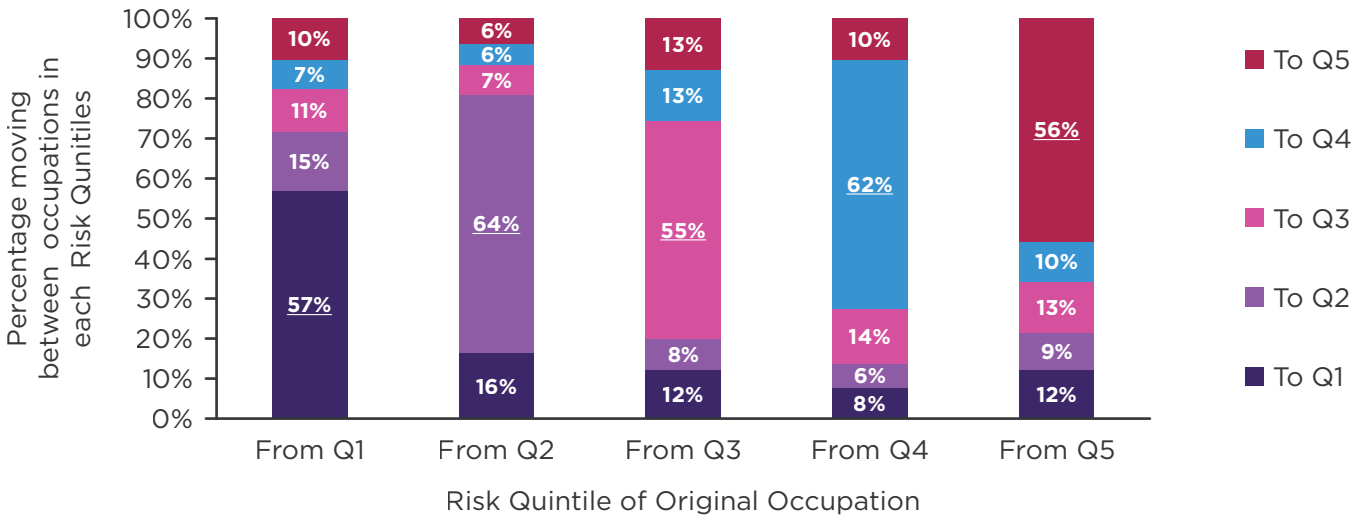
Figure 14 – Annual rate of Workers Changing Jobs, split by the Risk Quintile they start in (England, 2012-2022)



Source: Analysis using APS 2012/13 to 2021/22.

Sometimes, workers will be trying to move into low-risk occupations with better pay and progression. Figure 15 shows that, whilst most workers tend to stay in the same or similar occupations when they change jobs, about 30 percent of workers in Q1 occupations move into a low-risk occupation (Q3-Q5) when they change jobs. The proportion of workers in Q2 occupations who move into low-risk occupations when they change jobs is smaller (20 per cent), which may be because the attractiveness of these transitions is greater for workers in Q1 occupations compared to Q2 occupations. It may also reflect that workers in Q1 occupations tend to be younger and in the early stages of their careers or perhaps students working part time to supplement their incomes while they study, who then progress into higher-skilled roles. Workers in low-risk occupations are unlikely to move to high-risk occupations.

Figure 15 – Annual Rate of Workers Changing Jobs, by Risk Quintile of Original Occupation and Destination Occupation (England, 2012-2022)



Source: Analysis using APS 2012/13 to 2021/22.

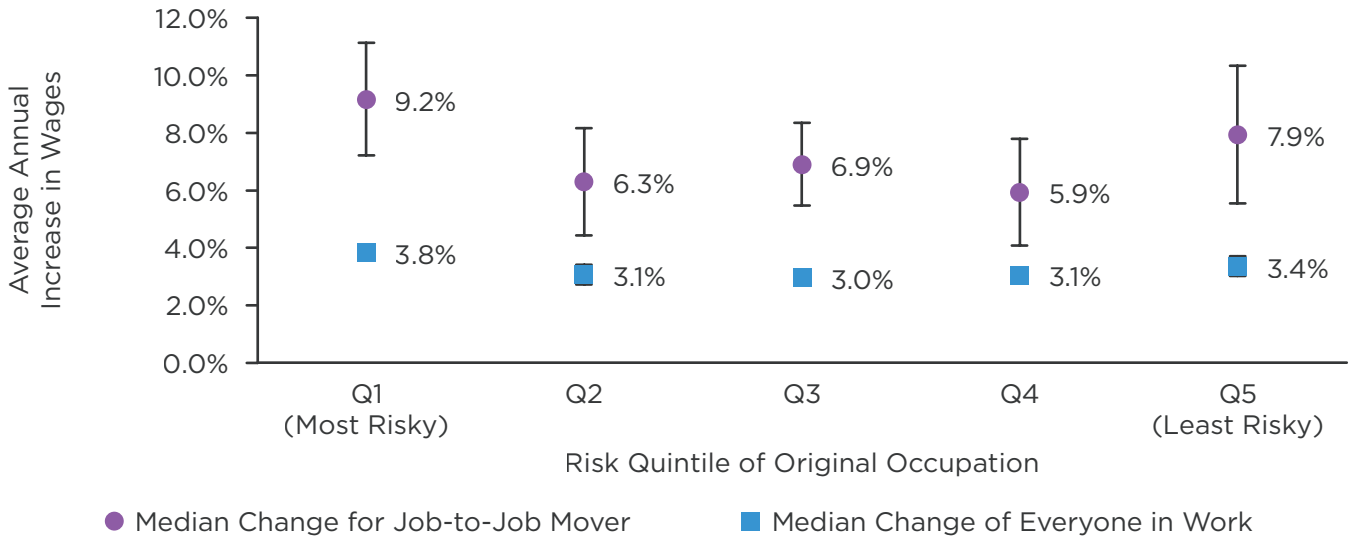
Moving from a high-risk occupation to a low-risk occupation is rare.

As shown in Figure 15, when workers change jobs from one year to the next, around 60 per cent move into other jobs in the same risk quintile that they started in (shown by the underlined data labels). Overall, between 72 per cent and 80 per cent of workers who change jobs from a high-risk occupation (Q1-2) move into another high-risk role. In other words, most workers in high-risk occupations remain at risk even after they change jobs.

Workers in high-risk occupations tend to change jobs more frequently than their counterparts in other occupations. However, the fact that so many Q1 workers move into other Q1 roles suggests they are predominantly making sideways moves, rather than upgrading into better paid occupations. These conclusions are reinforced by previous research. For example, the Office for National Statistics has found workers with higher wages tend to move less (Syed, 2019). Research for The Economy 2030 Inquiry has also shown younger workers (aged 16-24) are most likely to change jobs, and those on temporary contracts (which are common in some of the highest risk occupations such as retail and elementary occupations) are much more likely to change jobs than those on permanent contracts (Cominetti et al., 2021).

It is not suprising that most people tend to move into the same or similar occupations when they change jobs, given the skills and qualifications gaps between the occupations in each risk quintile (see Section 3). Whereas around 70 per cent of workers in Q1 and Q2 jobs do not have a qualification at Level 4, around 60 per cent to 70 per cent of workers in Q3-Q5 jobs do. Skills requirements, particularly Essential Employment Skills (EES), are also significantly higher in Q3-Q5 jobs relative to Q1 and Q2 occupations. This suggests that growing, better paid occupations are harder to access and, on average, may require workers in high-risk occupations to upskill or retrain first. The strength of the correlation between occupational risk and both skills and qualifications is striking. Skills and qualification gaps clearly pose significant barriers to successful transitions into low-risk occupations and that is likely to be the biggest single reason why workers in high-risk occupations struggle to move out of these occupations.

Figure 16 – Average Annual Change in Workers' Hourly Wage, by Risk Quintile of Original Occupation (England, 2012-2022)[13]



Source: Analysis using APS 2012/13 to 2021/22.

13 This does not include people who were made unemployed or inactive by the second year of the survey.

Moves from high-risk occupations to a low-risk occupation tend to be economically advantegous, on average.

Job-to-job transitions can also play an important role in increasing economic productivity by moving labour into more productive occupations and better paying jobs. Recent data suggests people tend to experience significantly larger wage increases when they change jobs compared to those who do not change jobs, regardless of their occupational risk profile, as shown in Figure 16. Moreover, the wage premium associated with changing jobs has been greatest (in percentage terms) for workers who start off in the highest-risk occupations (Q1).[14] This suggests there is an economic incentive for people to move from high-risk occupations to low-risk occupations, provided they can overcome skills and qualifications barriers and mismatches.

14 *One caveat to this finding is that the wage premium associated with moving from the highest risk occupations (Q1) to a growing occupation (Q3-5) may be partly driven by younger people stopping part-time, causal work jobs in high-risk occupations and moving into permanent, better paid positions upon completing their education.*

5. Identifying occupations that workers in high-risk occupations could move into and the likely barriers to these transitions

Key Findings

We categorise successful transitions out of high-risk occupations (Q1-2) into two types – 'lateral moves' into low-risk occupations with a median hourly wage of less than £15 and 'upgrades' into low-risk occupations with a median hourly wage of more than £15.

Our research suggests that mismatches between the skills and qualifications that workers in high-risk occupations typically possess and the job demands of low-risk occupations, may pose significant barriers to upgrades. Upgrades will typically require workers to utilise more skills and at a higher level, particularly Essential Employment Skills (EES), and to have higher level qualifications, which may require significant upskilling or retraining.

There is more scope for lateral moves that require similar overall levels of skills, EES requirements and qualification requirements. However, the evidence still suggests skills and qualifications mismatches pose substantial barriers even to lateral moves. This is because most lower-paid, low-risk occupations require higher levels of EES than high-risk (Q1-2) occupations and have median qualification levels at Level 3 (equivalent to A-levels) or higher, whereas over half of the workers in high-risk occupations are only qualified to Level 2 (equivalent to GCSEs) or lower.

Categorising successful transitions into lateral moves and upgrades.

As seen in previous sections, minimising the costs of disruption in the labour market is likely to require actions to support more workers in high-risk occupations or workers who have been displaced from these occupations to successfully transition into low-risk occupations. To examine the potential barriers to making successful transitions, we categorise successful transitions into two types:

'Lateral Moves'

These are moves to lower risk, growing (Q3-Q5) occupations with a median hourly wage of less than £15. Workers in these occupations tend to have Level 3 qualifications or less, and overall skills utilisation levels are lower on average too. These occupations are more varied than upgrades. The four occupations with the most workers in this group are: carers, teaching and childcare support workers, customer service agents, and HR and training associate professionals.[15]

'Upgrades'

These are moves to lower risk, growing (Q3-Q5) occupations with a median hourly wage of more than £15. Workers in these occupations tend to have Level 4+ qualifications, and the highest overall skills utilisation levels of any occupation. All occupations in this category are managerial, professional or associate professional occupations. The occupations with the most workers that could represent upgrades for workers in higher risk occupations are teaching professionals, functional managers, and IT professionals.

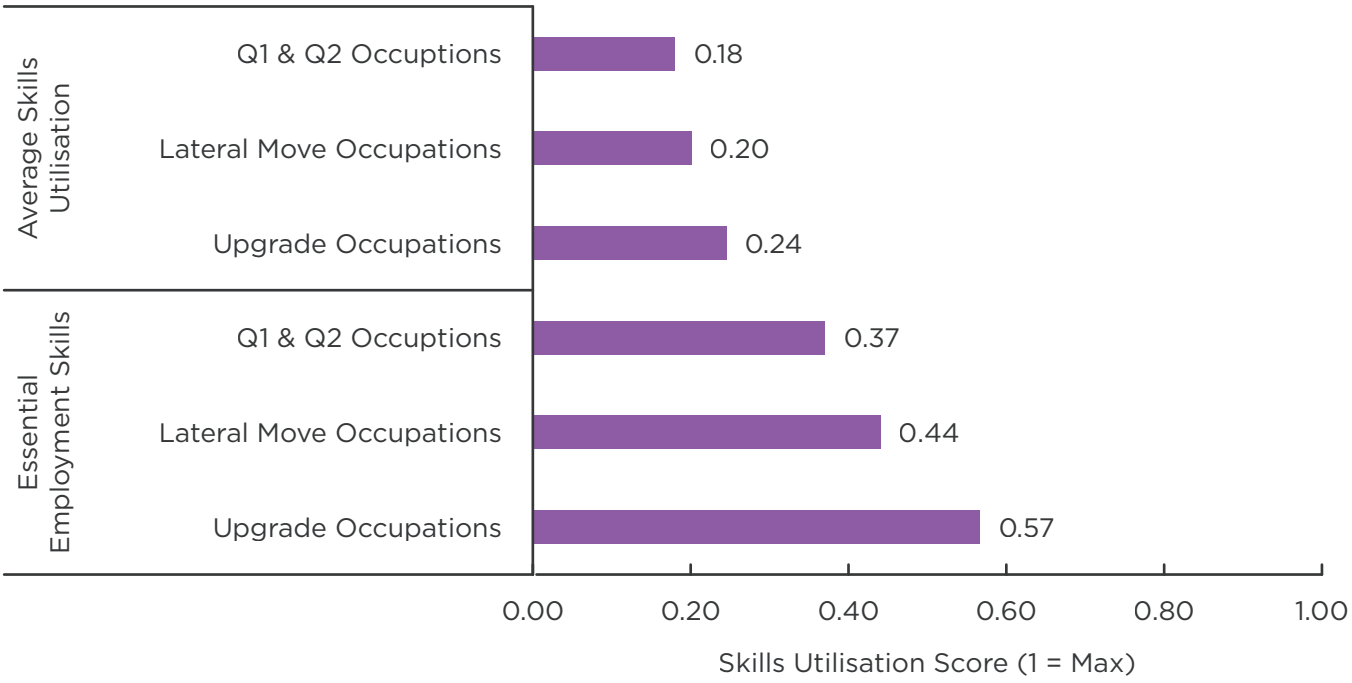
We explore potential barriers to both these two types of successful transition.

15 *'Occupations' here means SOC Minor Groups.*

Skills requirements, including Essential Employment Skills (EES), pose a clear barrier to both upgrades and lateral moves.

As shown in Section 3, workers in high-risk occupations tend to utilise lower skills in their jobs, except manual skills. This was true for both aggregate measures of skills and EES. Skills requirements are likely to pose a significant barrier both to upgrades and to lateral moves. Figure 17 illustrates that lateral moves into low-paid jobs with similar average skills requirements to high-risk occupations are likely to be more feasible, although occupations requiring the same overall skill level may still require a very different profile of skills (Dickerson et al., 2023). Upgrades generally require workers in the highest risk occupations to make a relatively large jump in terms of the aggregate skills they need to utilise.[16] Without considerable support, this jump in skills demands is likely to restrict the volume of upgrades that are possible.

Figure 17 – Average Skills Utilisation and Essential Employment Skills Utilisation across Q1/2 Occupations, Lateral Move Occupations and Upgrade Occupations (England, 2020)



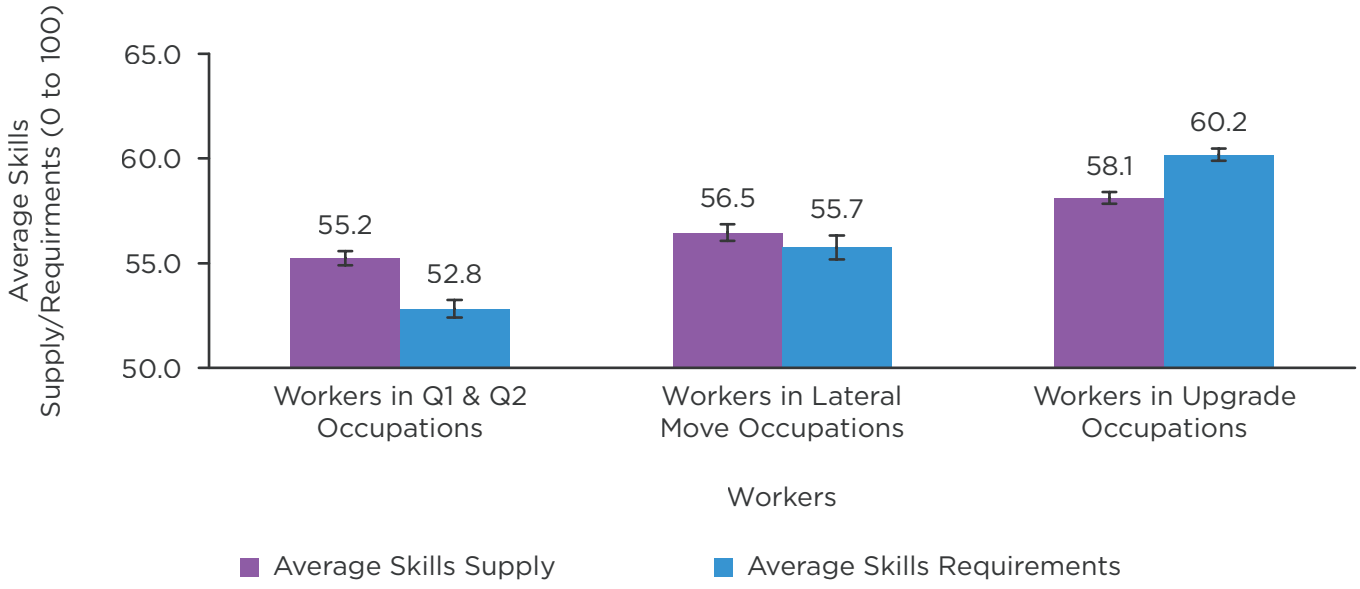
Source: Analysis using The Skills Imperative 2035 skills projections (see Working Paper 3).

As was also illustrated in Section 3, workers in high-risk occupations tend to utilise EES less intensively in their jobs than workers in low-risk occupations (Dickerson et al., 2023). As shown in Figure 17, both lateral moves and upgrades would typically require workers coming from high-risk occupations to utilise higher levels of EES than in their existing occupations. This suggests EES requirements of growing occupations are likely to be a considerable barrier to both lateral moves and upgrades.

16 *The jump from an average skills utilisation score of 0.18 to a score of 0.20 is equivalent to moving between an administrative role to a caring job, whilst teachers (classified as upgrades) have an average score at around 0.24.*

Data collected earlier in The Skills Imperative 2035 supports the conclusion that the average EES requirements of high-risk occupations are lower than those in occupations representing both lateral moves and upgrades (Bocock, Del Pozo Segura and Hillary, 2024).[17] This is shown in Figure 18, which also shows that workers in high-risk occupations report having lower levels of EES than workers in lateral move and upgrade occupations. Workers in high-risk occupations report having relatively high levels of skill under-utilisation and Figure 18 suggests the average EES these workers have is similar to (but still less than) the EES levels required in lateral move occupations. This may suggest that, at least for some high-risk workers, there may be some lateral move occupations they would already have the level of EES needed. Figure 18 shows that the EES supply and requirements in upgrade occupations are higher than all other jobs, reinforcing the conclusion that there are significant barriers to workers in high-risk occupations (or workers recently displaced from these occupations) moving into these occupations.

Figure 18 – Average Essential Employment Skills Supply and Requirements across Q1/2 Occupations, Lateral Move Occupations and Upgrade Occupations (England, 2023)



Source: Analysis using The Skills Imperative EES survey dataset (see Working Paper 4).

Qualifications also pose a significant barrier to both lateral moves and upgrades, especially the latter.

As previously illustrated in Section 3, workers in the highest risk quintiles tend to be less qualified than workers in lower risk quintiles.

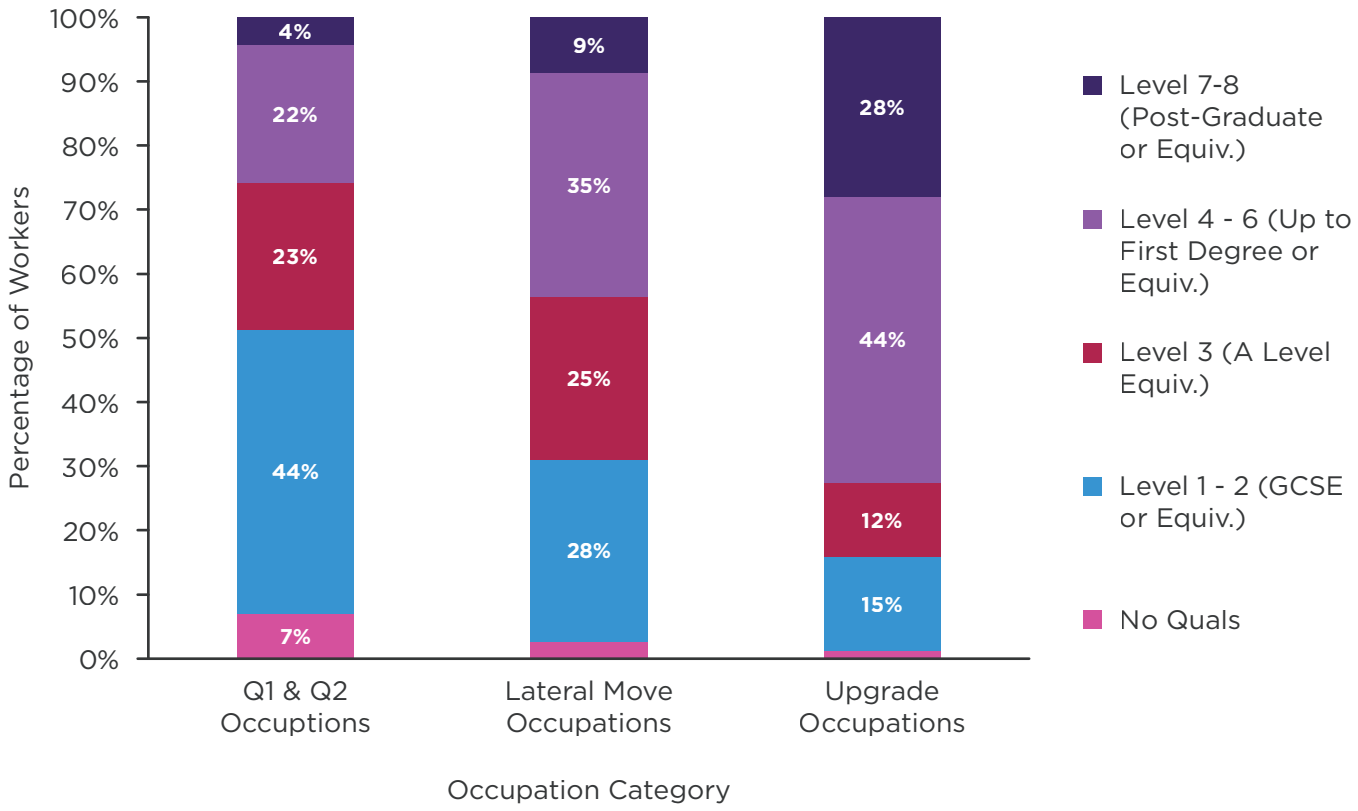
Qualifications appear to pose a barrier to lateral moves into low-risk occupations. Figure 19 shows just over half the workers in Q1/2 have Level 2 or lower qualifications, compared to around 30 per cent of workers in the low-risk occupations they could transition laterally into. Figure 18 also shows that just over a quarter of workers in Q1/2 occupations have Level 4+ qualifications, compared to 44 per cent of workers in lateral move occupations. Assuming there are no significant changes in employers' hiring and promotion practices, this suggests many workers displaced from high-risk occupations may need to acquire higher level qualifications to make lateral moves.

This qualifications barrier is even greater for workers in high-risk occupations who want to upgrade into higher-skilled, higher paid

17 *The numbers in Figure 17 and those in Figure 18 cannot be directly compared.*

occupations. Figure 19 shows that 72 per cent of workers in these upgrade occupations have a qualification at Level 4 or above compared with just 26 per cent of workers in high-risk occupations. Just under 30% of workers in upgrade occupations are qualified up to Level 3, which perhaps means a small minority of displaced workers may be able to upgrade using existing qualifications. However, this data largely suggests most of these workers would need to gain new qualifications to make big career changes like this. Alternatively, changes in recruitment practices could lead to larger proportions of workers with lower levels of qualifications being recruited into these upgrade occupations because of factors like their work experience or demonstrable skills.

Figure 19 – Highest Qualification Levels across Q1/2 Occupations, Lateral Move Occupations and Upgrade Occupations (England, 2021)



Source: Analysis using The Skills Imperative 2035 labour market projections (see Working Paper 4).

There are relatively few examples of upgrades (low-risk occupations where the average worker earns more than £15 per hour) where more than 50 per cent of incumbent workers in the occupation do not have qualifications above A Level or equivalent. Various managerial occupations, such as production managers and those working in logistics, warehousing or transport fit this description, as do protective service occupations, including military personnel, police officers, and fire fighters.

6. Factors that are associated with successful transitions into low-risk occupations

Key Findings

Over the last decade, workers in high-risk occupations have been significantly more likely to move into low-risk occupations when they have higher-level qualifications. Having a higher education qualification was very strongly associated with making upgrades.

Workers in high-risk occupations were also more likely to make upgrades and lateral moves when they had received training in the last three months, although the effects of training were far smaller than the effects of qualifications.

We cannot directly control for all factors that could affect individuals' labour market outcomes, so the impact of qualifications may be over-stated in our analysis. Other unobservable factors, such as a person's underlying skills or access to housing and transport, could also have an effect. However, our research provides suggestive evidence of the potential impact qualifications and training can have on people's likelihood of making upgrades or lateral moves.

Younger people (under 35) in higher risk occupations are more likely to make either a lateral move or an upgrade. Women are more likely to make lateral moves. Geographically, workers in London have a better chance of making upgrades.

Identifying factors that are associated with successful transitions

In this section, we identify the factors that are associated with workers in high-risk occupations moving into low-risk occupations, using APS data from 2012 and 2022. Specifically, we look at workers in high-risk occupations who make either a lateral move or an upgrade and compare them to all workers in high-risk occupations. This allows us to identify the individual characteristics associated with successful transitions, to inform future efforts to help displaced workers back into work.[18]

We can also look at the association between education and skills provision (specifically qualifications and training) and successful transitions out of high-risk occupations, after controlling for a broad range of other observable, individual characteristics. We call these associations 'estimated partial effects' but this is not meant to imply causality, as outlined below. We focus on the estimated partial effects of qualifications and training because these factors can be influenced directly by policy initiatives, whereas factors such as age, gender and region are harder to influence.

Of course, individual characteristics that are associated with successful transitions do not necessarily cause those transitions, even once other observable factors are accounted for. Nor are they necessarily conditions for these transitions to happen. Other non-observable factors may affect both an individual's observable characteristics and their likelihood of transitioning. For example, an individual's qualification level could be associated with their probability of transitioning jobs. However, both their qualification level and transitions could be causally determined by other factors, such as their ability, their aspirations, career choices and propensity to pursue qualifications in the first place.

Extensive evidence suggests many people do not achieve the qualifications they could be capable of, for a range of different reasons (for example, Farquharson, McNally and Tahir (2022) give a comprehensive overview of inequalities in UK education). These reasons may also determine the likelihood of people being able to move into lower risk occupations during their working lives. Furthermore, whilst skills and qualifications can be correlated, we do not observe individuals' skill levels in the data sets we are using for this part of the analysis. This means we cannot directly assess the effects of individuals' skill levels on the likelihood of workers making successful transitions. In a previous paper on this programme that used

18 *As in Section 4, it is important to note that individuals are only observed at two points in time. People could therefore appear to make lateral moves or upgrades within a 12-month period and had a spell out of work in between the jobs.*

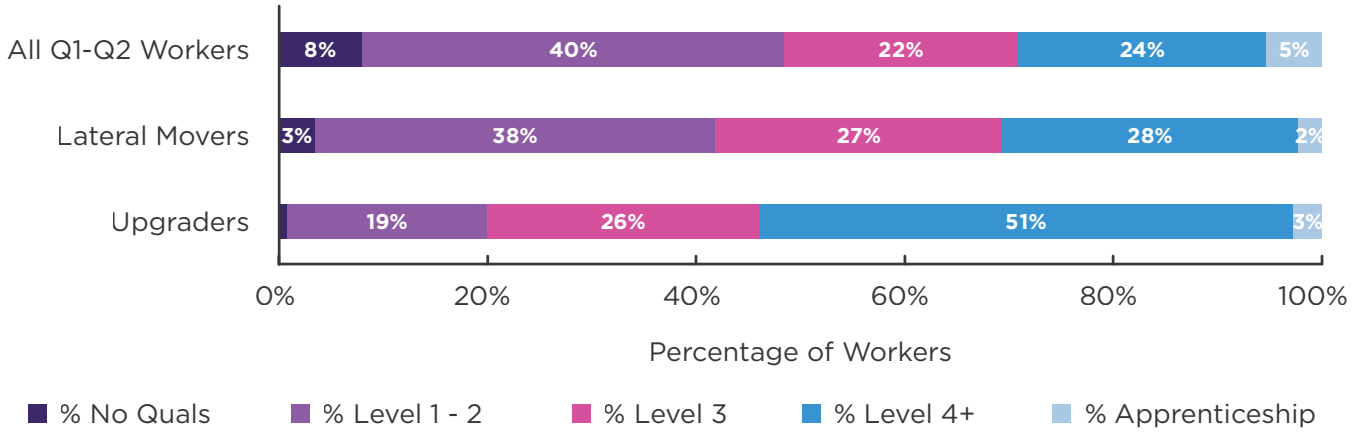
a different dataset, we found individuals with higher levels of EES earned higher salaries. We also found EES levels were higher in those with higher qualifications (Bocock, Del Pozo Segura and Hillary, 2024). This could suggest that a portion of the partial effect we ascribe here to qualifications may be more accurately ascribed to individuals' skills, or common factors which have influenced their ability to develop skills and pursue qualifications. Another set of factors that we can only partially control for are geographic factors. Whilst we control for region, more localised factors, such as transport and housing, may play a role in determining people's qualifications and job transitions.

In sum, whilst we control for differences in a broad range of individual characteristics in our regression models, we cannot control for all factors that could influence individuals' probability of successfully transitioning and/or pursuing qualifications and training. Nevertheless, our analysis provides valuable suggestive evidence as to the effect that each factor in our models may have on workers' likelihood of being able to make a successful transition, after netting out the effects of a broad range of other individual characteristics. It is also important to note that we estimate the effects of qualifications and training on transitions amongst workers who are starting off in the same occupational risk quintiles, and who may therefore be somewhat more similar to each other than if we looked at the entire population. Our analysis clearly highlights that workers in high-risk occupations typically struggle to make successful transitions . Earlier analysis in the paper shows that it is important that more is done to support these people so they can achieve progress in their careers and realise the combined influence of their abilities and, where possible, improve their qualifications. The estimated effects of qualifications and training are therefore valuable, if interpreted cautiously. They can help inform choices about responses required to support successful transitions into low-risk occupations.

Higher levels of qualifications (and to a lesser extent, training) are associated with successful transitions, and a reduced probability of moving into unemployment.

Workers who successfully transition into low-risk occupations are likely to have higher levels of qualifications than their counterparts who do not move away from high-risk occupations. Additionally, those workers with higher levels of qualifications are more likely to make upgrades. As shown in Figure 20, 51 per cent of workers who made upgrades between 2013 and 2022 did so with a Level 4+ qualification (equivalent to the first year of a degree, or more), whilst 28 per cent of those that made lateral moves had Level 4+, which compares with only 24 per cent of all Q1 and Q2 workers who have this level of qualification. Workers in high-risk occupations with a Level 3 qualification are also slightly more likely to make a successful transition than workers in high-risk occupations with lower levels of qualifications. Only 19 per cent of workers who made upgrades had a Level 2 qualification or less, compared to around half of all workers in Q1 and Q2 occupations. 38 per cent of workers who made lateral moves had Level 1 or Level 2 qualifications, which is similar to the proportion of workers in high-risk occupations with those qualifications. Not having any qualifications appears to make lateral moves and upgrades less likely.

Figure 20 – The proportion of workers in high-risk occupations, split by transition type, across qualifications (England, 2012-2022)[19]



Source: Analysis using APS 2012/13 to 2021/22.

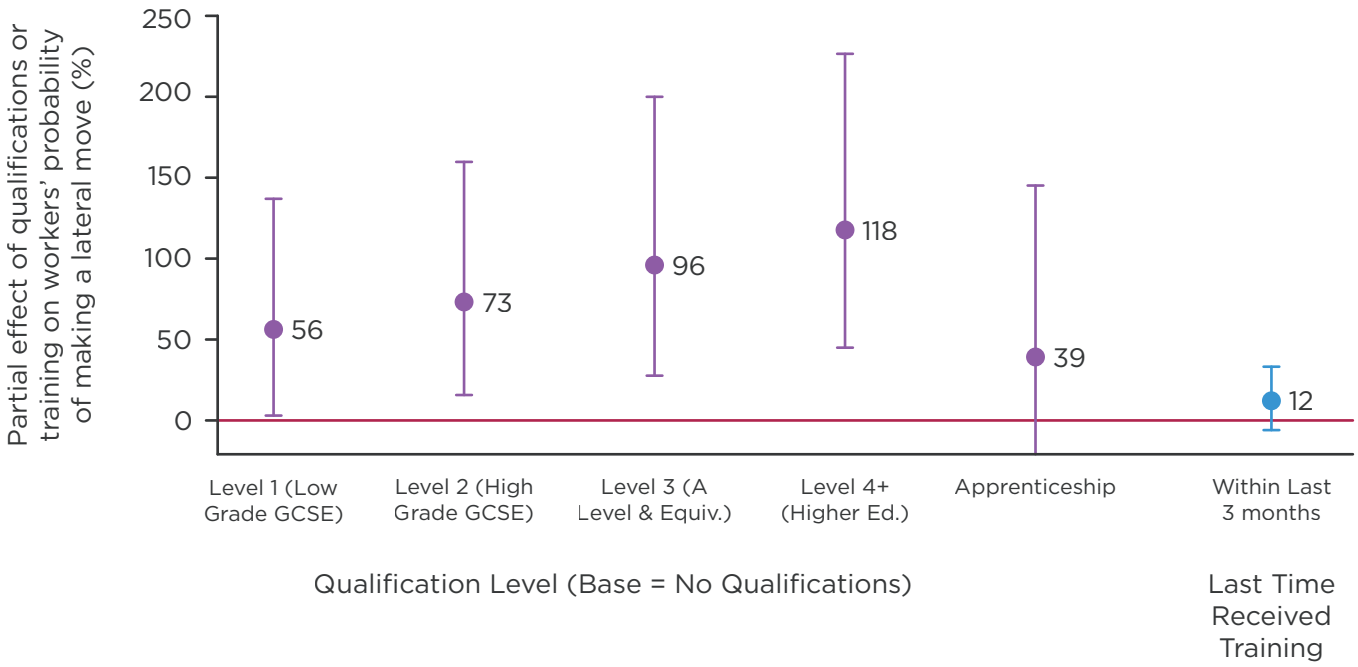
Workers in the highest risk occupations are also more likely to make successful transitions when they have received training in the last 3 months (as measured in their original job, before any potential job transition). 27 per cent of workers in high-risk occupations who made an upgrade had received training in the past 3 months and 25 per cent of those making lateral moves had too. Both figures are a little higher than the average amongst all workers in Q1 (20 per cent), suggesting that workers who have recently received training (the majority of which is non-qualifications bearing) are more likely to change jobs away from high-risk occupations. However, the association between training and successful transitions is clearly weaker than the association between qualifications and successful transitions.

The association between qualifications and successful transitions holds after controlling for differences in a broad range of other individual characteristics. Our first regression model clearly indicates that qualifications are strongly associated with people's ability to transition out of high-risk occupations (Q1 and Q2), either via a lateral move (as in Figure 21) or an upgrade (as in Figure 22). Both figures show that almost every additional level of qualifications up to Level 4+ aids a worker's ability to move into lower risk occupations. The effect sizes here (in the figures) are expressed in terms of elasticities; a figure of +100 per cent suggests workers with a given level of qualifications are twice as likely to experience the outcome than those with no qualifications[20].

19 *We include 'Apprenticeship' as a separate variable in line with the APS variable used here. The data suggests people in this category have reached a variety of levels of education. These statistics differ slightly to the those presented earlier in this report, which are based on the Skills Imperative 2035 employment projections data for 2021. These statistics are informed by the average of workers in Q1 and Q2 occupations in Wave 1 of the APS two-year longitudinal samples between 2012 and 2022.*

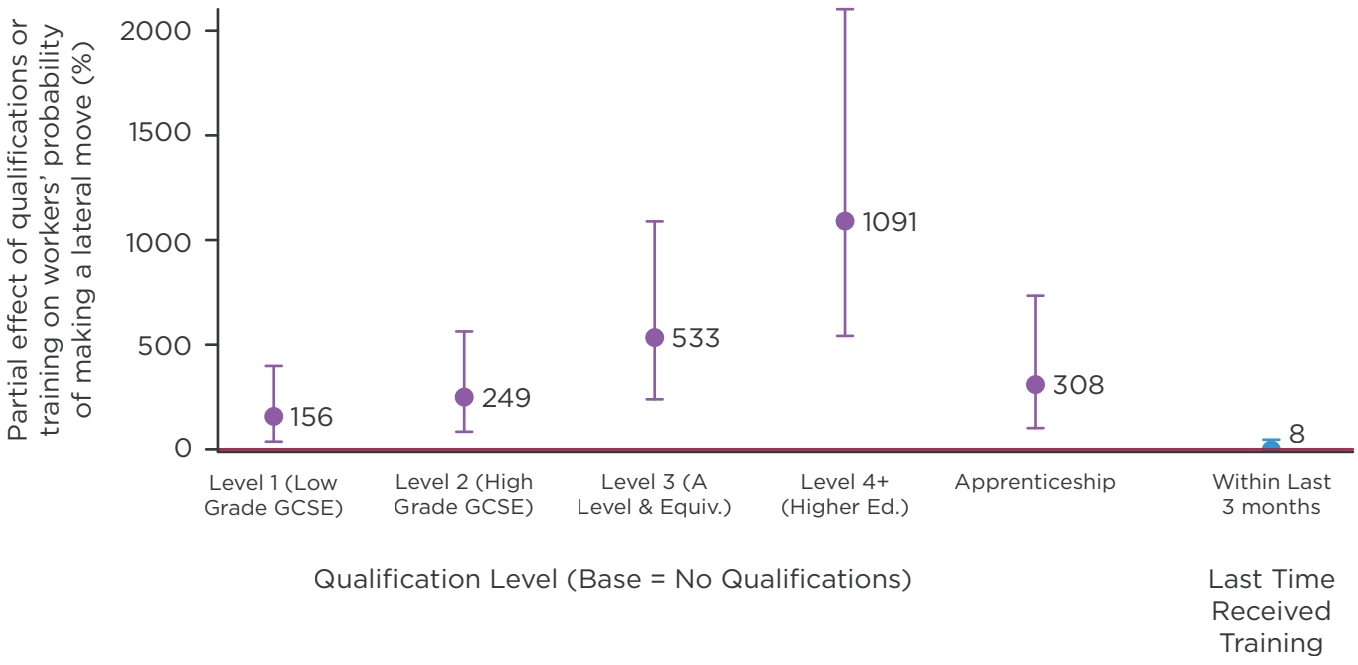
20 *The data records the highest level of qualification a given individual has. Estimated partial effects for different qualification levels should not be interpreted as including those that have those qualifications but higher ones as well.*

Figure 21 – Average Probability Effects of Qualifications and Training on Lateral Moves from Higher Risk (Q1/2) to Lower Risk (Q3-5) Occupations[21]



Source: Analysis using APS 2012/13 to 2021/22.

Figure 22 – Average Probability Effects of Qualifications and Training on Upgrades from Higher Risk (Q1/2) to Lower Risk (Q3-5) Occupations



Source: Analysis using APS 2012/13 to 2021/22.

21 The chart reports the partial effect of the characteristic on the x-axis, relative to a baseline group. For example, having Level 1 qualifications is estimated to increase the estimated probability of making a lateral move by 56 per cent (not percentage points), on average, compared to having no qualifications. Probabilities are estimated using the full set of control variables in the regression, listed in Section 2. For training, the average partial effect compares those who reported having received training within the three months before Wave 1 of the survey they completed (APS), compared to those who did not. In short, it compares those who receiving training more regularly, on average, with those who receive less.

Table 1 summarises these results. It compares the differences in the average estimated probability of a given transition at one level of qualifications to the next level of qualifications, whilst controlling for other observable characteristics.

Table 1 reports whether the differences between qualification levels are statistically significant or not.

Table 1 – Additional increases in the estimated, conditional probability of making each move type between one qualification level and the next, from a multinomial logistic regression model looking at transitions in the APS between 2012 and 2022.

Type of Move	Highest Qualifications[22]				Training
	Level 1, compared to Level 0	Level 2, compared to Level 1	Level 3, compared to Level 2	Level 4+, compared to Level 3	Receiving Training within Last 3 Months, Compared to Not
Lateral Moves	0.6x more likely*	0.1x more likely	0.1x more likely	0.1x more likely	0.1x more likely
Upgrades	1.6x more likely**	0.4x more likely	0.8x more likely**	0.9x more likely**	0.1x more likely

*Note: This table captures the additional likelihood of making a given transition that is associated with a higher level of qualification. For example, on average, someone in our sample is estimated to be 0.8x more likely (or a little under twice as likely) to make an upgrade within 12 months if they have Level 3 qualifications instead of Level 2 qualifications. These estimates control for differences in other observable characteristics. Estimates with * are statistically significant at the five percent significance level and those with ** are significant at the one percent significance level.*

Overall, our analysis suggests that higher qualifications are associated with successful transitions (both lateral moves and upgrades), even after other observables are controlled for. It is particularly notable that each step between qualification levels is associated with large, multiplicative increases in the estimated probability of upgrades, such that those who are qualified at Level 4+ (equivalent to at least the first year of a degree) are around twelve times more likely to upgrade into a growing occupation compared to otherwise similar workers with no qualifications. This is likely to be because a high proportion of managerial, professional and associate professional occupations that we have classed as upgrades require degree level qualifications. On the other hand, the results suggest there is limited difference between some qualification levels. For example, estimated differences between those with Level 1 and Level 2 qualifications tended to favour those with Level 2, but were not statistically significant, suggesting it is reasonably likely they occurred by chance.

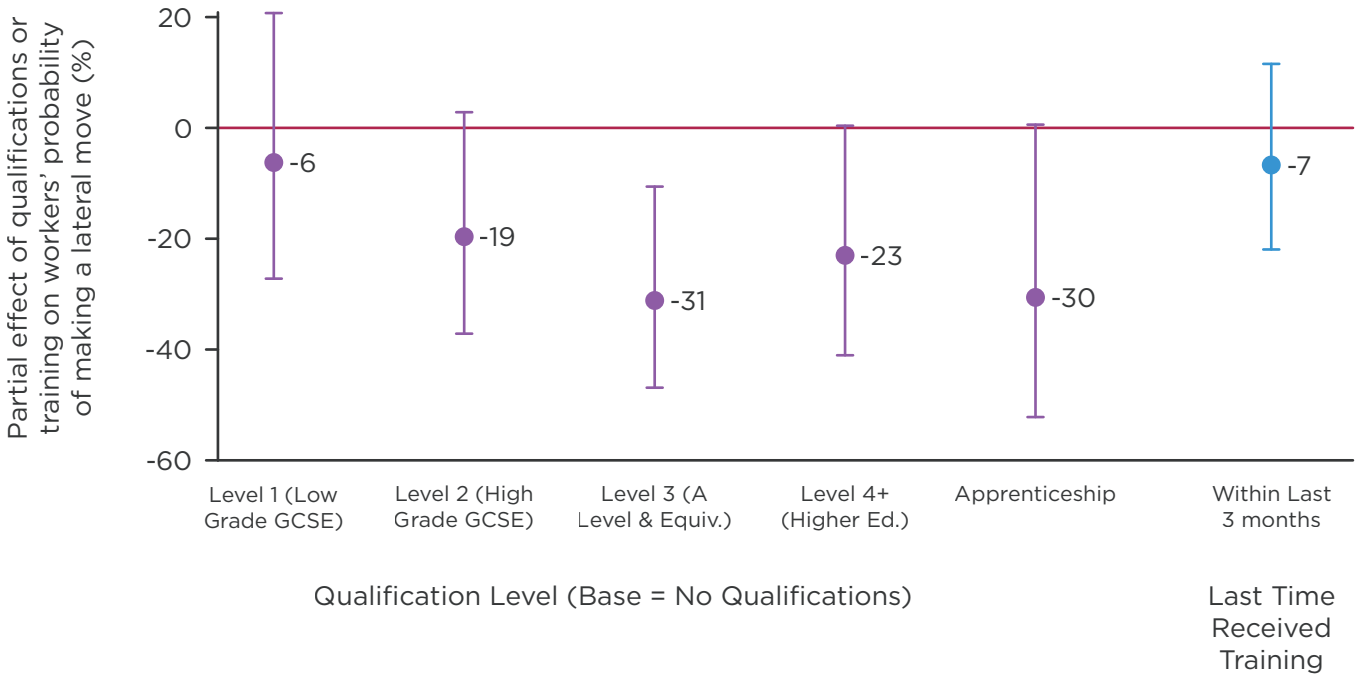
We also find workers who have participated in training more recently (whilst in a high-risk occupation and before a potential move) are more likely to make successful transitions, as shown in Figure 21 and Figure 22. These estimated partial effects are modest compared to those attributed to qualifications and it is relatively likely both results are simply due to chance. However, our sensitivity analyses (not shown) suggests that training is associated with successful transitions in a statistically significant way when we look at which factors are associated with either a lateral move or an upgrade, where both types of transition are aggregated together. There is, therefore, some evidence that training is associated with successful transitions, even when controlling for other variables. It is important to emphasise that individuals in this data were simply reporting whether they have received any training in the last three months. It is possible people will interpret this differently and have a range of

22 *As outlined above, those with the 'Apprenticeship' label in our data have teacher varying levels of qualifications. We have therefore not included them in this table. As shown in the charts, having an Apprenticeship qualification was predictive of upgrades but not lateral transitions, relative to those with no quals.*

thresholds for what constitutes training.[23] We do not have any further data on the type or intensity of the training. It is therefore possible that stronger, positive effects of intensive training are being diluted here by others reporting having received training in cases where that training was less intensive.

Further analysis provides evidence that workers in high-risk occupations with higher level qualifications are also less likely to move into unemployment within 12 months. Figure 23 shows that workers in high-risk occupations are less likely to move into unemployment when they have higher levels of qualifications (as shown by the negative correlation between qualification levels and effect sizes), although the partial effects of each qualification level are not all statistically significant, and workers with Level 4+ qualifications buck the trend in being marginally more likely to move into unemployment than workers with Level 3 qualifications.

Figure 23 – Average Probability Effects of Qualifications and Training on Transitions from Higher Risk (Q1/2) Occupations to Unemployment and Inactivity



Source: Analysis using APS 2012/13 to 2021/22.

Our findings suggest adult education can help people make successful transitions and point to other ways in which this can be achieved too.

Our research shows that qualification levels are strongly associated with an individual's likelihood of moving to a low-risk occupation, reinforcing the case for policy and other responses that support more workers in high-risk occupations to access adult education, as well as action to improve education earlier in people's lives. Although we cannot conclude that qualifications cause successful transitions, our analysis does build on the established evidence base, which has shown higher qualifications are associated with a range of benefits for individuals over the longer-term, including employment and earnings (Bibby et al., 2014; Social Mobility Commission, 2023). The returns to informal and non-formal training[24] are generally lower, and more variable (Fialho, Quintini and Vandeweyer, 2019), which is consistent with our finding that having received

23 *Separate estimates from other data suggest around 20 per cent of training counts towards a qualification (IFF Research, 2023).*

24 *The OECD identifies learning objectives and intentionality as the key characteristics of formal learning, whereas informal learning lacks these elements and non-formal learning may be organised but not designed or designated as learning.*

training in the last three months is not as strong a predictor of lateral moves and upgrades as having higher qualification levels.

Given the significance of qualifications and training for lateral moves and upgrades, the decline in employer-funded education and training over at least the past decade should be a cause for concern amongst policy makers and employers. Whilst the UK's training participation rate is fairly average compared to our European counterparts, the UK stands apart in having a relatively pronounced decline in training, measured both in terms of participation and investment (Tahir, 2023). Training in the UK also tends to be shorter and lower cost than in other European countries (e.g. Li, Valero and Ventura, 2020). Data from the Employer Skills Survey suggests employers' average training investment per employee fell by nearly 20 per cent (in real terms) between 2011 and 2022 (DfE, 2023). To encourage employers to provide more training, the new government has announced its intention to widen the existing Apprenticeships Levy into a 'Growth and Skills Levy', allowing employers to use up to 50 per cent of their total levy contributions on non-apprenticeships training.

The decline in employer-funded training has been accompanied by an even larger decline in the number of adults starting publicly funded classroom-based qualifications, which dropped from nearly 5.5 million qualifications in the early 2000s to 1.5 million by 2020 (Tahir, 2023). IFS analysis suggests that public funding for adult education has fallen by 31 per cent in real terms since 2003–04 (Tahir, 2023). The new government has announced the creation of a new body, Skills England, and has promised a future strategy for post-16 education, but it as yet unclear whether these changes will come with increased investment.

Declining private and public investment in adult education leaves employees with the option of either investing more of their own resources, or not pursuing education and training. Many adults choose the latter. This is understandable given the financial constraints of qualifications and training; both the direct costs of accessing training and the earnings penalty associated with a reduction in working hours (where this is necessary). These financial constraints make it difficult for individuals to invest in training, who can be reticent to take on debt when the returns to education are uncertain. They are unlikely to factor in the full societal benefits of adult education when making their choices. Both government and employers therefore play key roles in incentivising individuals to invest more of their own time and money in education and training. The Lifelong Learning Entitlement (LLE), which was announced by the previous government in 2020, will enable adults to access fee loans of up to £37,000 and extend access to maintenance loans, starting in 2025. However, previous analysis has suggested it will not significantly extend the loan entitlements for most post-18 education routes (Sibieta, Tahir and Waltmann, 2022). This means it may not reduce the current financial barriers to adult education and training.

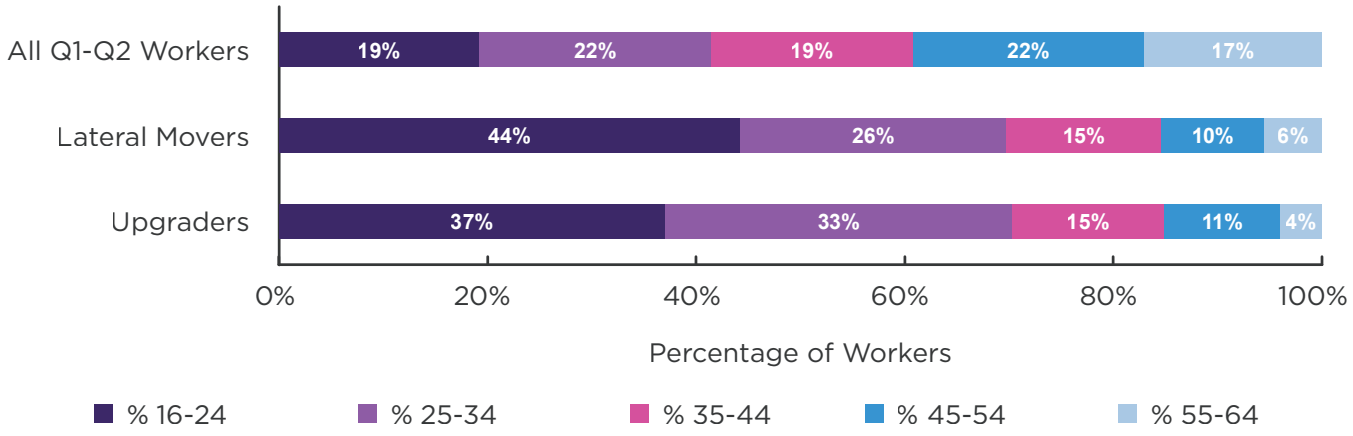
Finally, our results also suggest areas where qualifications may be less important in helping people make transitions to lower risk occupations. Beyond Level 1 qualifications, additional qualification levels only made a small difference to workers' propensity to make lateral moves. This tallies with our previous evidence (in Section 5) which showed that qualification and skills barriers for workers in high-risk occupations were lower for lateral moves than upgrades. Furthermore, our results may overplay the role of qualifications at the expense of factors we could not measure. These other factors may also affect workers' ability to successfully transition into lower risk occupations over the next decade and should therefore also be taken into account when shaping a response. They include:

- the skills the worker possesses, including skills assessed in recruitment processes;
- access to affordable transport or housing needed to pursue or take new job opportunities;
- a fear of risking a career change due to economic circumstances;
- the likelihood of having a good employer or manager who emphasises professional development and use of latent skills; and
- access to good careers advice.

Older workers may require greater support, and workers in the North and Midlands may require more opportunities.

Over the past decade, younger workers in high-risk occupations have found it easier to make successful transitions into low-risk occupations than their older counterparts, suggesting that older workers may require greater support, for example in terms of their access to qualifications and training. Figure 24 shows that around 70 per cent of those who were able to move into a low-risk occupation the following year were under 35, which is far higher than the proportion of all workers in high-risk occupations that were under 35 (44 per cent). Older workers making lateral moves or upgrades were scarce. On average, around 40 per cent of all workers in Q1 and Q2 are over 45, but only around 15 per cent of those making upgrades or lateral moves were over that age. This may suggest there is potential for more older people to switch occupations later in life, which could be realised if they are provided greater encouragement and support to do so. If they are able to make successful transitions to growing occupations, this would mean they face lower risk of losing their job in the future and have access to rewarding and fulfilling work for longer.

Figure 24 – The proportion of workers in high-risk occupations (Q1-2), split by transition type, by Age (England, 2012-2022)

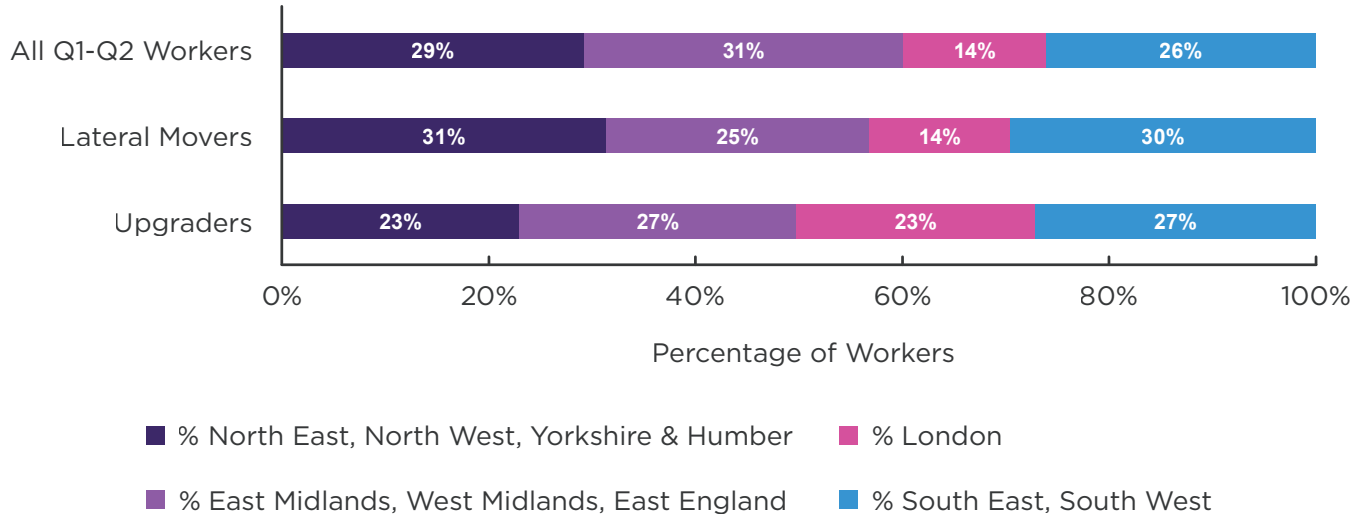


Source: Analysis using APS 2012/13 to 2021/22.

Workers outside of London, South East England or the South West England may also require greater support to make upgrades, which are most common amongst workers in high-risk occupations in London, compared to those in other regions, as shown in Figure 25[25]. Conversely, workers in the North, Midlands and East of England are less likely to upgrade. Those in the Midlands and East of England are also less likely to make lateral moves. This may reflect a lack of opportunities outside of southern England for people to make successful transitions, as well as lower levels of qualifications in these areas (ONS, 2023). If so, it suggests responses need to look beyond just helping workers improve their skills and places emphasis on ensuring growth is spread across the country so workers in high-risk occupations everywhere can move into low-risk occupations in the future.

25 *As with all characteristics presented in this section, the region of work recorded in the first wave of the survey is reported here. Some people may have move regions by the second wave, but this is not presented here. We were unable to explore the effects of geographical differences within regions.*

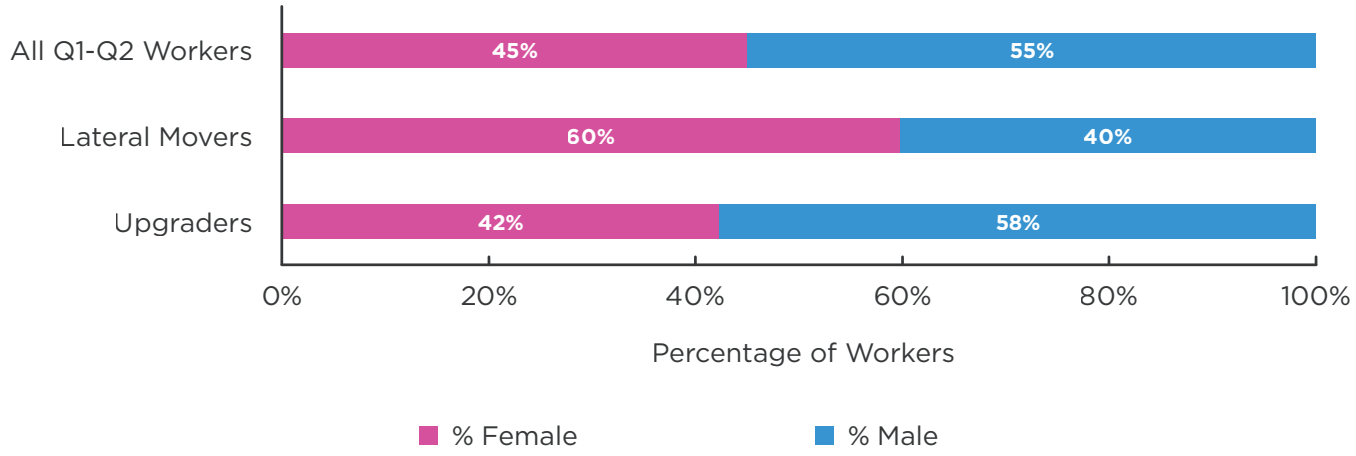
Figure 25 – The proportion of workers in high-risk occupations, split by transition type, by grouped Region (England, 2012-2022)



Source: Analysis using APS 2012/13 to 2021/22.

Women have tended to make lateral moves more often than men in the last ten years, as shown in Figure 26; whilst an average of 45 per cent of all Q1 and Q2 workers are women, 60 per cent of those making lateral moves were women. However, this is likely to be because some of the larger occupations that we have identified as 'lateral moves', such as caring or educational support roles, are typically done by women. Men are slightly more likely to make upgrades, but the difference here between the group that make upgrades and the wider group of Q1-Q2 workers is small.

Figure 26 – The proportion of workers in high-risk occupations (Q1-2), split by transition type, by Gender (England, 2012-2022)



Source: Analysis using APS 2012/13 to 2021/22.

7. Conclusions

Analysis for The Skills Imperative 2035 programme, including that for this paper, shows that job creation will be concentrated in professional occupations and many low- to mid-skilled occupations could see significant declines in their share of UK employment. Workers in administrative and secretarial roles, elementary occupations, sales and customer service roles are amongst those likely to be most adversely affected. In the worse-case scenario, over a million jobs in these occupations could disappear. Action is needed to mitigate the impact of anticipated changes on workers in those occupations identified as high-risk by helping workers make successful transitions to growing occupations. It is also needed to reduce the costs of upheaval by helping displaced workers rejoin the workforce quickly.

The analysis we report demonstrates there are two significant barriers to displaced workers finding jobs in growing occupations. Firstly, there are scarce examples of lower-skilled occupations that are projected to grow (the exceptions are caring services and customer service occupations). Instead, job creation is expected to be concentrated largely in high-skill occupations. Secondly, there are mismatches between the skills (including the essential employment skills) and the level of qualifications held by workers in high-risk occupations and those that are required for low-risk occupations. These mismatches are likely to pose significant barriers to both lateral job moves and job upgrades. We find that workers with higher qualification levels are more likely to make job transitions, even when we control for other observable characteristics. We also found that training has some effect.

This second barrier highlights the high importance of adult skill acquisition through training or studying for qualifications as a protective factor in mitigating the risk of future unemployment and helping displaced workers back into work. How this can best be achieved, and what would be the most effective financial, motivational and practical levers for increasing the uptake of qualifications and training, are important future research questions. We are hopeful that Skills England will address such questions, along with employers, educators and other actors in the skill system, as they look for ways to support adult workers in skill development.

However, whilst these findings highlight the importance of training and the acquisition of qualifications in particular, the picture is complex. Even with qualifications and training, some groups of workers are far more likely to make these high-risk to low-risk occupation transitions than others, with, for example, age, gender, location or access to housing and transport influencing their success.

Later this year, we will be holding a roundtable to bring together perspectives from stakeholders across the skills system to discuss the policy and other implications of our findings from across the research programme. During this we will identify actions to support workers in high-risk occupations to successfully transition into growing lower risk occupations or get back into the labour market. Following the roundtable, we will publish a report summarising key points and recommendations.

Annexes and Bibliography

Annex 1

This table contains composite measures of skills utilisation used to profile occupational groups.[26]

Composite Measure	ONET Items
Aggregate Skills Utilisation	Aggregate of 161 items included in Skills Imperative 2035 skills projections.
Essential Employment Skills	Communicating with Supervisors, Peers, or Subordinates Establishing and Maintaining Interpersonal Relationships Organizing, Planning, and Prioritizing Work Making Decisions and Solving Problems Getting Information Thinking Creatively
Non-Routine Cognitive: Analytical	Analysing Data or Information Thinking Creatively Interpreting the Meaning of Information for Others
Non-Routine Cognitive: Interpersonal	Establishing and Maintaining Interpersonal Relationships Guiding, Directing, and Motivating Subordinates Coaching and Developing Others
Non-Routine Manual Physical	Operating Vehicles, Mechanized Devices, or Equipment Spend Time Using Your Hands to Handle, Control, or Feel Objects, Tools, or Controls* Manual Dexterity Spatial Orientation
Routine Cognitive	Importance of Repeating Same Tasks* Importance of Being Exact or Accurate* Structured versus Unstructured Work*
Routine Manual	Pace Determined by Speed of Equipment* Controlling Machines and Processes Spend Time Making Repetitive Motions*

26 *Items marked with an asterisk are 'Work Context' measures that were not included in the Skills Imperative 2035 data. We have taken 2020 measures of these from ONET (O*NET resource Centre, 2023) and used a crosswalk (Day et al., 2023) to match these to UK SOC codes.*

Annex 2

This table contains the categorisation of occupational minor groups into risk quintiles, as outlined in Section 3. Minor groups are sorted by size within each risk quintile according to the estimate number of workers in 2021 in England in the Skills Imperative 2035 employment projections. The SOC codes are minor groups in the SOC 2020 classification.

Risk Quintile	SOC	Minor Group
Q1 (Most Risky)	711	Sales assistant and retail cashiers
	926	Other elementary services occupations
	412	Administrative occupations: finance
	421	Secretarial and related occupations
	922	Elementary cleaning occupations
	531	Construction and building trades
	415	Other administrative occupations
	413	Administrative occupations: records
	524	Electrical and electronic trades
Q2	821	Road transport drivers
	925	Elementary storage occupations
	543	Food preparation and hospitality trades
	411	Administrative occupations: government and related organisations
	713	Shopkeepers and sales supervisors
	414	Administrative occupations: office managers and supervisors
	811	Process operatives
	923	Elementary security occupations
	523	Vehicle trades
	522	Metal machining, fitting and instrument making trades
	814	Assemblers and routine operatives
	921	Elementary administration occupations
	532	Building finishing trades
	912	Elementary construction occupations
	913	Elementary process plant occupations
	822	Mobile machine drivers and operatives
	815	Construction operatives
	712	Sales related occupations
	544	Other skilled trades
	924	Elementary sales occupations
	813	Plant and machine operatives
	624	Cleaning and housekeeping managers and supervisors
	521	Metal forming, welding and related trades
	823	Other drivers and transport operatives
	533	Construction and building trades supervisors

Risk Quintile	SOC	Minor Group
	911	Elementary agricultural occupations
	541	Textiles and garments trades
	525	Skilled metal, electrical and electronic trades supervisors
	816	Production, factory and assembly supervisors
	812	Metal working machine operatives
	542	Printing trades
Q3	355	Sales, marketing and related associate professionals
	223	Nursing professionals
	357	HR, training and other vocational associate guidance professionals
	322	Welfare and housing associate professionals
	221	Medical practitioners
	354	Business associate professionals
	115	Managers and directors in retail and wholesale
	313	Information technology technicians
	222	Therapy professionals
	225	Other health professionals
	622	Hairdressers and related services
	353	Finance associate professionals
	232	Other educational professionals
	311	Science, engineering and production technicians
	621	Leisure and travel services
	111	Chief executives and senior officials
	321	Health associate professionals
	356	Public services associate professionals
	214	Web and multimedia design professionals
	623	Housekeeping and related services
	358	Regulatory associate professionals
	612	Animal care and control services
	323	Teaching and childcare associate professionals
	117	Health and social services managers and directors
	342	Design occupations
	312	Cad, drawing and architectural technicians
	116	Senior officers in protective services
	352	Legal associate professionals
	351	Transport associate professionals
	247	Librarians and related professionals
	631	Community and civil enforcement occupations
	114	Directors in logistics, warehousing and transport
	224	Veterinarians

Risk Quintile	SOC	Minor Group
	324	Veterinary nurses
	625	Bed and breakfast and guest house owners and proprietors
Q4	231	Teaching professionals
	113	Functional managers and directors
	611	Teaching and childcare support occupations
	341	Artistic, literary and media occupations
	112	Production managers and directors
	212	Engineering professionals
	245	Architects, chartered architectural technologists, planning officers, surveyors and construction professionals
	241	Legal professionals
	511	Agricultural and related trades
	244	Business and financial project management professionals
	246	Welfare professionals
	249	Media professionals
	211	Natural and social science professionals
	248	Quality and regulatory professionals
	343	Sports and fitness occupations
	216	Research and development (r&d) and other research professionals
	722	Customer service supervisors
	215	Conservation and environment professionals
	121	Managers and proprietors in agriculture related services
Q5 (Least Risky)	613	Caring personal services
	213	Information technology professionals
	721	Customer service occupations
	125	Managers and proprietors in other services
	242	Finance professionals
	243	Business, research and administrative professionals
	331	Protective service occupations
	122	Managers and proprietors in hospitality and leisure services
	124	Managers in logistics, warehousing and transport
	123	Managers and proprietors in health and care services

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