[D5.1 – Quantitative analysis report + data set: Understanding mismatches from the supply and demand side]

Skills2Capabilities Working Paper

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ABSTRACT

Skill mismatches have far-reaching consequences at various levels, including reduced wages, lower job satisfaction, diminished employability, higher turnover, and challenges in adapting to technological changes. These mismatches may also exacerbate social inequalities and hinder economic growth. This report uses data from the 2014 European Skills and Jobs Survey to explore the dynamics of skill mismatches over time and the factors influencing transitions between different mismatch statuses. The analysis examines individual job choices and external constraints in creating mismatches, as well as how these mismatches can be resolved through job mobility, changes in job tasks, and workplace characteristics.

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Skills2Capabilities, a Horizon Europe study, is about understanding how skills systems need to develop if they are to assist people to make labour market transitions – i.e. between jobs, employers or sectors – and thereby reduce the level of skill mismatch which might otherwise arise.

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1 Introduction

Although research on skill formation and education-to-job matching has a long history, the focus on skill matching and skill utilisation has emerged more recently (Buchanan et al., 2017; Fregin, 2019; Fregin et al. 2020; Green, 2013; Mavromaras and McGuiness, 2012; van der Velden and Bijlsma, 2018). This shift has been partly driven by the growing recognition that skills alone does not necessarily lead to the expected economic and social benefits (Buchanan et al., 2017; Smith, 2017). Rather, the effective utilisation of these skills is essential for achieving positive outcomes (van der Velden and Bijlsma, 2018; Quintini, 2014).

Skill mismatch has important implications at various levels. At the micro-level, mismatches between individuals' skills and the requirements of their jobs can have significant economic and non-monetary consequences. Evidence shows that skill mismatches can have negative effect on wages (see Allen and van der Velden, 2001; McGuinness and Sloane, 2011), on job satisfaction (Mavromaras et al., 2012; Sloane, 2014; Green and Zhu, 2010) and increases an individual's probability of future unemployment (Mavromaras et al., 2015). Also, overskilling is persistent in time and that those who have been overskilled in the past are also more likely to be overskilled in the future (Cedefop 2015; Mavromaras et al., 2013). At the meso-level, skills mismatches lowers productivity and leads to increased employee turnover (Quintini, 2011). From a macro-level perspective, mismatches can also hinder workforce's ability to adapt to technological advancements, potentially slowing down economic progress (Perry et al., 2014). Therefore, skill mismatches not only have impact on work-related outcomes but also extend to broader aspects of life, potentially exacerbating existing social inequalities and creating new ones (Fregin, 2019).

Previous research has shown that the mismatch between workers' skills and job requirements has increased over time (Verhaest and van der Velden, 2013). This trend may stem from imbalances between supply and demand, alongside rapid shifts in skill requirements due to technological advancements that outpace the ability of education and training systems to keep up with the changes (Allen & van der Velden, 2002). Variation across countries suggests that the alignment of workers' skills with job requirements is influenced also by institutional factors and labour market arrangements that shape the allocation of workers to jobs (Flisi et al., 2016; Fregin et al. 2020; Green, 2013; Levels, van der Velden, & Di Stasio, 2014; Levels, van der Velden, & Allen, 2014; van der Velden & Wolbers, 2003).

Several studies have explored job mobility, with much of the research focusing on educational mismatches and more specifically on overeducation. Sicherman (1991) found that overeducated individuals were more likely to experience mobility, either by changing firms or occupations, with occupational changes mostly involving upward movements. Similarly, Robst (1995) observed that overeducated workers were more likely to transition to jobs requiring higher skill levels. Other studies have also found evidence of higher job mobility rates (e.g. Alba-Ramirez, 1993; Alba-Ramirez and Blázquez, 2003; Sloane et al. 1999) and increased rates of within-firm promotion (Alba-Ramirez and Blázquez 2003; Dekker, de Grip, and Heijke 2002; Groeneveld and Hartog 2004) among overeducated workers.

This report utilises data from the 2014 European Skills and Jobs Survey (ESJS), which provides a unique opportunity to analyse how skill mismatches evolve over three points in time: during

respondents' previous job, at the start of their current job, and at the time of the survey (Cedefop, 2018; McGuiness & Pouliakas, 2016). The report[1] focuses on the factors driving skill mismatches and the transitions between mismatch statuses, both across jobs (inter-job mobility) and within a single job (intra-job mobility). While skill mismatches are often persistent, they can sometimes be resolved through job mobility, changes in workplace roles or tasks, or skill development. The ESJS data set is particularly valuable as it includes detailed insights into individuals' job selection motives and the constraints they face, which are analysed in the report using novel indices. This report aims to offer a new perspective on the factors influencing respondents' placement in mismatched positions and their resolution through job mobility, addressing research gaps in the literature and providing a solid foundation for both theoretical exploration and policy development. This report provides an overview of mismatches in the European labour force, incorporating both economic perspectives and the human capabilities approach. Although the ESJS data does not allow for the analysis of skills or education use across other life domains—a key aspect of the human capabilities approach—Deliverable 5.1 together with the data set establishes a solid foundation for synergy with other deliverables.

The structure of the report is as follows: Section 2 introduces the theoretical framework for understanding educational and skills mismatches, as well as job mobility. It begins with labour market theories, which explore mismatch dynamics from both supply- and demand-side perspectives, and then integrates the human capabilities approach and the concept of bounded agency. These frameworks expand the analysis beyond an economic lens, emphasising the interaction between personal choices, individual agency, and external constraints in shaping mismatches. Section 2 also reviews key findings from previous research on the micro-, meso-, and macro-level factors contributing to skills mismatches and job mobility.

Section 3 describes the data, variables, and research strategy used in the analysis. Section 4 presents the findings in two parts. The first part examines the micro- and meso-level factors influencing skills mismatches at the start of a job, as well as individual priorities in job selection and the barriers encountered during the job search. Additionally, it explores the impact of different macro-level factors, such as unemployment rates, employment protection legislation, and active labour market policies, on job allocation and the occurrence of mismatches at the start of the employment.

The second part of Section 4 focuses on inter- and intra-job mobility, particularly different skill mismatch transitions. For inter-job mobility, the analysis examines transitions from previous job – e.g. where individuals may have been overskilled or underskilled – to a new job, exploring whether the new position leads to better alignment between skills and job requirements or if mismatches persist. It also investigates the factors driving these transitions. For intra-job mobility, the focus shifts to changes in skill utilisation within the same job over time, considering factors such as shifts in job characteristics (e.g. task variety and difficulty), and workplace transformations, including advancements in the used technology and updates to working methods and practices.

[1] Based on Task 5.1 of the Grant Agreement.

Section 5 concludes the report, summarising the key findings and insights from the analysis and discussing their implications for understanding skill mismatches and job mobility.

2 Theoretical framework and findings from previous research

2.1 Economic perspective

Concerning educational or skills mismatch, various labour market theories have been used to explain this phenomenon. These theories primarily focus on the factors influencing the supply of workers with varying educational and skill levels, as well as employers' demand for different types of work. Human capital theory (Becker, 1964) suggests that worker's productivity is shaped by their previous investments in human capital, such as formal education and training. According to this theory these investments are rewarded in the labour market, with workers compensated in line with their marginal productivity. In this framework, wages reflect the value of an individual worker's marginal product, which is determined by the level of human capital they have previously accumulated. For instance, educational attainment and age (which reflects experience) are often seen as important indicators that signal accumulated human capital. As such, older workers or those with higher education are generally expected to be more productive than those who are less educated or younger when entering the labour market (Bills, 2004; Becker, 1962). When it comes to educational and skills mismatch, overeducated or overskilled workers are expected to possess skills that can enable them to transition into higher-level roles. Mismatches can arise as firms adjust their production processes to better utilise the human capital available within their workforce, however in this sense mismatches are considered a short-term problem that gradually resolves in time (Quintini, 2011). One limitation of human capital theory is its strong focus on the supply side, often overlooking the critical role of demand-side in the labour market.

Career mobility theory (Rosen, 1972; Sicherman and Galor, 1990), posits that mismatched roles may serve as stepping stones for career advancement and that individuals may strategically accept positions that do not fully utilise their skills to gain entry into their desired occupations, leveraging internal promotions or upward mobility across employers. This suggests that workers may intentionally accept positions for which they are overeducated or overskilled as a strategic step to gain experience and training that supports their career progression. From this theoretical perspective, educational or skill mismatches are also looked at as temporary, naturally resolving over time as workers advance in their careers. Some scholars have proposed that mismatch might arise when workers accept overeducation and lower pay in exchange for other job attributes they value more highly, such as job security (McGuinness and Sloane, 2011).

In contrast to the assumptions of perfectly competitive labour markets that are expected from the aforementioned theories, contemporary labour markets are far more complex. These markets are characterised by imperfections such as wage rigidities, imperfect information about applicants' skills, matching frictions and geographical mobility, which give rise to a variety of skill imbalances, ranging from skill shortages to qualification and skill mismatches and as a result mismatches are more persistent and multifaceted (Quintini, 2011).

Other theories emphasise the demand side of the labour market, providing additional insights into the dynamics of educational and skills mismatch. Job competition theory (Thurow, 1975) suggests that workers compete for specific jobs within various occupations, with their educational level serving as a signal of their future job performance and trainability. Job competition theory predicts that job characteristics, rather than individual qualifications, are the

primary determinant of earnings. Qualifications serve as a proxy for training costs, with more highly qualified individuals considered more capable and requiring less training by firms. According to this theory, as the number of graduates entering the labour market increases, overeducation occurs primarily due to a shortage of suitable job opportunities that match their qualifications. Meanwhile, individuals with lower education levels may face unemployment as they are pushed out from the labour market. Therefore, in a saturated labour market, individuals must invest in education to secure their place in the hiring queue, even if the jobs they obtain do not fully utilise their qualifications. Within this framework, qualification mismatch (or also skills mismatch) is considered a persistent phenomenon, with wages dependent on the qualifications required for the job, while surplus of it yield no additional returns. Thus, mismatches in this regard is rather a structural feature of a competitive labour market where education serves as a filtering mechanism for job allocation.

In a similar matter, the signalling (or screening) theory (Arrow, 1973; Spence, 1973; Stiglitz, 1975) posits individuals acquire certain qualifications or skills to signal their productivity to potential employers. When the supply of education (or skills) exceeds the demand, overeducation becomes more prevalent as workers with surplus qualifications signal their capability (Green, McIntosh, & Vignoles, 2002; Léné, 2011), but employers may not be willing to pay extra for these additional qualifications. However, it is also important to note that overeducated workers may lack the skills necessary to perform more demanding jobs and instead use their surplus formal education to compensate for deficiencies in other aspects of human capital (Green & McIntosh, 2007; Sloane, 2003).

Some theories take a more integrated approach, addressing both the supply and demand aspects of the labour market. The matching theory of job search (Jovanovic, 1979; Pries and Rogerson, 2005) suggests that both employers and employees have imperfect information about the exact location of one's optimal assignment. Following an initial assignment, new information may emerge over time, prompting reassignment to improve the match. This job-matching model explains turnover as a natural outcome of optimal reassignment, driven by the gradual accumulation of more accurate information over time. In labour markets characterised by uncertainty and costly information, both employers and employees invest time in searching for qualified workers or suitable job positions. However, due to the search costs, even highly educated workers may settle for positions below their qualifications or skills. Similarly, employers may hire overqualified candidates as a strategy to save on future training costs, as a result, overeducation (or also overskilling) may arise temporarily as a consequence of incomplete information in the labour market (Mortensen, 1986).

Assignment theory (Sattinger, 1993) suggests that allocation is optimal when workers are assigned to jobs in a hierarchical order based on their skill levels – more skilled workers are assigned to more complex roles, while less skilled workers are assigned to simpler jobs. According to the assignment theory, mismatches occur when the number of complex roles does not align with the supply of skilled workers, making perfect job matching unlikely. In this scenario, workers may find themselves in roles that do not fully utilise their skills and for which they are mismatched.

2.2 Human capabilities approach and bounded agency

While discussions of labour market mismatches often focus on economic perspective, the human capabilities approach, developed by economist Amartya Sen (1992, 1999), considers also other important aspects of individuals' lives. This approach goes beyond the economistic and instrumental perspectives, shedding light on the importance of personal choice and well-being and focuses on freedom and the creation of an environment that supports human flourishing. At its core are two main concepts: "functionings" and "capabilities." The first one refers to "the various things a person may value doing or being" (Sen, 1999, p. 75), while capabilities represent the range of achievable functionings from which individuals can choose meaningful combinations (Walker, 2005).

Rather than solely emphasising available resources, this approach highlights the importance of expanding opportunities for individuals to choose and pursue lives they find valuable (Sen, 2009). This approach evaluates not only what people are capable of (internally) but also the societal and institutional frameworks that influence whether they can translate those capabilities into real outcomes (Heckman and Corbin, 2009). In the context of skills mismatches in the labour market, this framework can be used to explain that mismatches arise from a broader set of opportunities—or the lack thereof. It emphasises the freedom to choose life that aligns with their personal values and meaningful pursuits. Furthermore, it acknowledges practical factors that people may value, such as work-life balance or choosing a job position, which could be helpful for career progression. Concerning that, different mismatches may present opportunities for personal development, skill enhancement, or the fulfilment of other non-economic goals. In some cases, it can be hypothesised from a theoretical viewpoint that some individuals may be willing to accept certain types of mismatches in the labour market if they believe such decisions will ultimately benefit them in the long term or provide greater freedom to pursue their preferred lifestyle.

However, it is crucial to acknowledge that while some groups of individuals have the freedom and a wider range of opportunities to make life decisions that align with their values and enhance their well-being, many others may lack these possibilities. Constraints such as limited job options or family responsibilities often push individuals into job positions that do not align with their skills or education. In such cases, these choices are not made willingly but are imposed by external circumstances.

We also draw on the concept of bounded agency, which offers a framework for understanding how structural, institutional, and cultural forces shape people's choices, expectations, and aspirations as they navigate further education and employment (Evans, 2017). Bounded agency emphasises that “agency is a socially situated process, shaped by past experiences, current opportunities, and perceived future possibilities” (Evans, 2002, p. 262).

In our analysis, bounded agency provides insight into how individuals' job selection decisions and experiences are shaped by the interplay between personal agency and external constraints. This perspective highlights that people’s aspirations, choices, and actions are influenced not only by their immediate circumstances, but also by broader structural factors, such as labour market conditions and situational barriers.

2.3 Findings from previous research

Education vs skills mismatch

Quintini (2011) states that the most commonly examined form of mismatch is the disparity between a worker's educational qualifications and their job requirements. This focus arises from the greater availability of data on educational attainment compared to skills. However, education may serve as an imprecise measure for overall human capital, as it fails to account for innate abilities or skills acquired through work experience (Mavromaras and McGuiness, 2012). Various approaches can be employed to assess each type of mismatch. While each method has its own strengths and limitations, they often highlight different dimensions of mismatches (see for an overview Fregin, 2019; McGuinness, Pouliakas, & Redmond, 2017). Skill mismatch addresses many of the limitations of educational mismatch by asking respondents to directly evaluate and compare their overall skills—including those developed through education, work experience, or innate abilities—with the requirements of their job. Nonetheless, Mavromaras and McGuiness (2012) caution that relying solely on subjective assessments to measure skill mismatches may introduce potential biases, such as individuals overestimating their true abilities. While both qualification and skill mismatches aim to identify gaps between workers' abilities and job demands, they represent distinct concepts (Quintini, 2011) and are weakly correlated (Flisi et al., 2014; Green and McIntosh, 2007). Therefore, it is crucial to specify clearly which type of mismatch is being measured in any analysis.

Micro-level effects

Krahn and Lowe (1998) highlight that certain groups are more likely to underutilise their skills, particularly literacy skills, including women, younger workers, individuals in non-supervisory roles, the self-employed, and those in part-time or temporary positions. Falter (2009), using Swiss data, finds that women are more likely to experience overskilling and less likely to experience underskilling compared to men. Similarly, Caroleo and Pastore (2018), analysing 2005 data of young Italian graduates, observe that women are more likely than men to perceive themselves as overskilled five years after graduation. Studies investigating the factors contributing to overskilling reveal that individuals who have experienced overskilling in the past are more likely to encounter it again (Mavromaras et al., 2013). Overskilling is more common among individuals with lower levels of education (Mavromaras & McGuinness, 2012; Mavromaras et al., 2013). Mavromaras et al. (2009), using HILDA data, found that while overskilling is rare, it is highly persistent among university graduates, relatively low but significant among school leavers with a general education, and absent among those with vocational education and training qualifications. Cross-national and country-specific studies show that younger workers are more prone to overskilling compared to older counterparts (Allen et al., 2013; OECD, 2013). This trend can largely be attributed to their concentration in temporary or entry-level positions, which often require lower skills and provide limited opportunities for skill utilisation. These positions frequently serve as stepping stones in the labour market. Additionally, younger workers may face challenges during the job search process due to the costs associated with searching and limited access to information, often leading to longer periods before securing a role that aligns with their skills. Evidence suggests job mismatch decreases over time as workers gain experience and improve their understanding of labour market opportunities (Alba-

Ramirez, 1993). While mismatch generally declines with experience (Desjardins & Rubenson, 2011), older workers may encounter other challenges, such as skill obsolescence due to technological changes and the effects of aging (Quintini, 2011).

McGuiness and Sloane (2012) used REFLEX data to examine labour market mismatches, particularly exploring whether overeducated workers trade higher earnings for other job attributes, such as career prospects, societal value, or opportunities for learning. Their findings revealed that overeducated workers prioritised job security, suggesting a possible trade-off between job satisfaction and lower earnings. In contrast, overskilled workers did not appear to exchange lower pay for other job attributes, though they were less inclined to choose jobs offering new challenges. Interestingly, opportunities to learn new skills or advance their careers were of minimal importance to mismatched workers.

Regarding job mobility, previous research on graduates has demonstrated that a substantial share of overeducated individuals in their initial jobs remained in the same situation even after several years, despite frequent job changes (Dolton & Vignoles, 2000; McGuinness, 2003b). McGuiness and Sloane (2012) found that 30% overeducated and 27% of overskilled workers in their first jobs were still mismatched five years after graduation, emphasising the persistence of these mismatches and the difficulty of overcoming them. In contrast, only 5% of initially matched workers became overeducated, and 8% became overskilled in their current roles. The study also revealed that overeducated men were more likely to prioritise work-life balance over high earnings, reflecting a compensating wage effect. Overskilled men, on the other hand, placed less emphasis on jobs offering societal value or career progression. For overeducated women, job security emerged as a key consideration, although the absence of a significant family balance effect from the findings was surprising. Meanwhile, no notable factors influencing overskilled women were observed.

Meso-level effects

The relationship between firm size and skill mismatch remains inconclusive. While Quintini (2011) finds no significant connection between the two, other cross-country studies suggest that overskilling tends to increase with firm size (Allen et al., 2013). This may be attributed to the greater complexity of larger companies, which can make it more difficult to align workers' skills precisely with job requirements. Additionally, as noted by Cedefop (2012), larger firms, typically which are less financially constrained, may adopt recruitment strategies aimed at maintaining a steady supply of highly skilled workers, including intentionally hiring overskilled individuals and investing in further training for their already highly skilled employees. On the other hand, the broader range of roles and more effective human resource policies in larger firms may facilitate the transfer of employees into positions that better align with their skill sets, potentially reducing mismatches.

Macro-level effects

Unemployment rate

Economic fluctuations also affect the composition of labour demand and how workers skills are utilised within firms. During periods of high unemployment and weak labour markets, employers may respond by raising recruitment standards to attract the most qualified candidates or by

intentionally hiring individuals with higher education levels as a strategy to navigate economic uncertainty (Bulmahn & Krakel, 2002). Similarly, Brunello and Wruuck (2019) suggest that business cycles influence skill mismatches, with fewer job openings during economic downturns often forcing jobseekers to accept positions below their education (or skill) level.

Employment protection legislation (EPL)

Employment protection levels have been shown to significantly influence individual labour market outcomes (Barbieri, Cutuli, & Passaretta, 2018). Strict dismissal regulations can hinder workforce restructuring, slowing the reallocation process of workers and making it more challenging to resolve skill mismatches (Di Pietro, 2002). Brunello et al. (2007) suggested that employment protection legislation could exacerbate skill mismatches by hindering individuals' ability to secure their first job and making it more challenging for firms to downsize due to restrictions on dismissals. While firing restrictions may result in mismatched workers staying in their positions longer, higher dismissal costs also encourage employers to prioritise better skill alignment during the recruitment (Noelke, 2011). In fact, the greater the dismissal costs, the more carefully employers should assess candidates to ensure a strong match between skills and job requirements. However, EPL can disadvantage young workers by making it harder for them to enter the labour market and secure jobs, as it primarily benefits established employees, a dynamic often highlighted in previous literature (Lindbeck & Snower, 1988; Ochsenfeld, 2018; De Vreyer et al., 2000). Fregin et al. (2020) explored how national-level institutional factors, including employment protection legislation (EPL), influence optimal skill matching. Their findings revealed that stricter EPL is associated with improved alignment between workers' skills and job requirements across both young and adult workers. They stated that this may be due to heightened employer awareness of the importance of skill alignment, leading to more deliberate matching processes and an increased emphasis on lifelong learning to maintain better skill alignment over time.

Active labour market policies (ALMP)

Mismatch is found to be more common in countries with lower investment in active labour market programs (Marsden et al., 2002). Fregin et al. (2020) found that strict implementation of active labour market policies (ALMPs) is linked with lower levels of optimal skill matching, and, consequently, higher levels of skill mismatch. Their analysis revealed that the implementation of more stringent ALMPs reduces the likelihood of workers being optimally matched to jobs according to their skill level.

While prior studies have primarily focused on educational mismatches due to the availability of data on qualifications, this approach overlooks the limitations of education as a proxy for human capital, failing to capture innate abilities and skills developed through work experience. Recent research has shifted attention to skill mismatches, which offer a more comprehensive measure by considering workers' self-assessments of their skills according to the job requirements. Moreover, the persistence of mismatches and their varied impacts at micro-, meso-, and macro-levels remain underexplored. There is limited understanding of how individual, organisational, and structural factors interact to influence skill mismatches and transitions within and between jobs. This gap highlights the need for a nuanced analysis that integrates these factors and examines the role of labour market institutions in shaping skill alignment across contexts.

The report will address the following **research questions (RQs)**:

RQ_1: What micro-, and meso-level factors contribute to workers entering skill-mismatched jobs?

RQ_2: How do labour market institutions and structural factors—such as employment protection legislation (EPL), active labour market policies (ALMP), and unemployment rates—influence cross-country variations in skill mismatches?

RQ_3: What micro- and meso-level factors drive changes in workers' skill mismatch status during job transitions (inter-job mobility) and within their current job (intra-job mobility)?

3 Data, variables and research strategy

3.1 Data and skill mismatch measures

The analysis is based on the data from the 2014 European Skills and Jobs Survey (ESJS), which surveyed approximately 49,000 adult employees across all EU27 Member States and the UK. It gathers data on how workers' skills align with the demands of their jobs. The survey was developed and funded by the European Centre for the Development of Vocational Training (Cedefop) in collaboration with a network of skills experts, the OECD, and Eurofound (McGuiness and Pouliakas, 2016).

The survey featured a series of questions designed to assess whether respondents' qualifications and skills aligned with the requirements necessary to secure and perform their jobs (McGuiness and Pouliakas, 2016). While the ESJS is not a panel dataset, it incorporates a longitudinal perspective to better understand changes and transitions in skill mismatch status among adult employees. Respondents were asked about the match of their skills to the skill demands of their job at three distinct points in time: during their previous job, at the start of their current job and in the current job role at the time of the survey (Cedefop, 2018). This approach facilitates a dynamic analysis of skill mismatches and offers comparable evidence of how skill mismatches evolve over time across the countries (McGuiness and Pouliakas, 2016). Since allocation processes and labour market participation may differ for part-time workers, we limit our sample in this report to full-time workers.

Different approaches can be used to assess each type of mismatch (van der Velden and Bijlsma, 2018; Flisi et al., 2016; Perry et al., 2014; Quintini, 2011). Regardless of the method employed, all concepts of skill mismatch depend on measures of both the skills workers possess and the skills required for their jobs. Since surveys focused on skill supply typically do not capture demand-side skill requirements, various proxy methods have been developed to address this gap. Typically, these methods include: having workers self-assess their skill match (subjective approach); comparing a worker's skills to the average skill level for their occupation within their country (statistical approach or realized matches); using the frequency of skill use at work as a proxy for required proficiency (job requirements approach); or evaluating skill levels through task descriptions based on systematically collected expert opinions (job analyst method). While each method has its own advantages and limitations, they often capture different aspects of mismatches (see an overview by Fregin, 2019 and McGuiness, Pouliakas and Redmond, 2017).

In this report, we use the self-assessment approach, where employees are asked whether their skills meet the job requirements, capturing their perception of how well their skills align with or fall short of the job's demands. The primary challenge with this method is the absence of an objective benchmark (see Allen and van der Velden, 2005; Allen et al., 2013), which makes it susceptible to measurement errors and social biases. Quintini (2011) states that while direct methods enable the examination of deficits and underutilisation of specific skills, they offer only a partial perspective on the overall prevalence of skill mismatch. In contrast, self-assessment methods are valuable for measuring the overall extent of skill mismatch, but they do not reveal which specific skills are most lacking or in surplus. Van der Velden and van Smoorenburg (1997) demonstrated that, in the case of the Netherlands, workers' self-assessments are significantly more accurate than the commonly used alternative of expert ratings based on job titles.

3.2 Variables

3.2.1 Dependent variables

The current analysis in this report focuses on the following dependent variables related to skills mismatches and job mobility:

1. Skills mismatch at the start of the job - this variable captures the alignment between individual's skills and the requirements of their job at the time of job entry[2]. The original variable has three values:

- Overskilled: Individuals skills are higher than required by their job;
- Well-matched: Individuals whose skills align with their job requirements;
- Underskilled: Individuals whose skills are lower than required and need to be further developed.

Based on these categories, we create two dependent variables**:** *overskilled* (with "well-matched" as the reference group) and *underskilled* (also using "well-matched" as the reference group).

2. Inter- and intra-job mobility - the second set of dependent variables examines mobility within and between jobs, focusing on the dynamics of skill mismatches over time:

- Inter-job mobility: Transitions from one job to another, analysing the skill alignment between those changes[3];
- Intra-job mobility: Changes within the same job, analysing shifts in skill utilisation over time[4].

Firstly, using the dependent variables of skills mismatch (*overskilling* and *underskilling*) we can explore the micro-, meso-, and macro-level factors influencing individuals' entry into mismatched job positions. Secondly, based on the variables of *inter-job* and *intra-job mobility* we can analyse further how skills mismatches evolve—whether individuals transition to better-matched positions, remain mismatched, or improve their skill alignment through intra-job changes. By combining these different aspects of the dependent variables, the report provides a comprehensive understanding of skills mismatches, their persistence, and the factors driving their resolution through job mobility.

3.2.2 New generated variables

We developed two indices to assess different aspects based on participants' responses to a series of survey items, which were rated according to their importance in job selection. The following items were used to construct the two indices:

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[2] The variable was derived from the following question: *"When you started your job with your current employer, overall, how would you best describe your skills in relation to what was required to do your job at that time?".*

[3] The variable is constructed to capture the dynamics of skill mismatches during job transitions, reflecting the perceived alignment between an individual's skills and job requirements in their previous job and at the start of their new job.

[4] The variable is designed to analyse changes in skill utilization within the same job over time, comparing the perceived alignment between an individual's skills and job requirements at the start of the job and at the time of the survey.

- *Career Alignment and Development Index (0 "not at all important", 10 "essential"):* This index captures factors related to the alignment of the job with the individual's career goals and professional growth. The following items were included:
  - The desire to gain work experience
  - Job offered opportunities for career progression or career development.
  - The company/organization was well-known/respected in its field
  - Interest in the nature of the work itself

- *Job Convenience and Compensation Index (0 "not at all important", 10 "essential"):* This index measures the practical and financial aspects of the job, including convenience and work-life balance. The following items were included:
  - The quality of the pay and benefits package (e.g., health insurance, bonuses, company car)
  - Proximity of the job to the participant's home
  - The job's support for a good work-life balance

In the analysis, we also included three additional variables to assess the barriers and constraints faced by individuals:

1. *Situational Barrier (0-2 scale[5])*: This variable measures the degree to which individuals experienced personal or family-related challenges:
   - The individual had considerable family obligations
   - The family experienced financial difficulties

2. *Dispositional barrier (0-3 scale[6]):* This variable measures the extent to which individuals faced difficulties in securing employment:

   - The individual sent many job applications but had few opportunities for interviews
   - The individual devoted significant time to job searching activities, such as preparing resumes, reviewing job ads, and visiting employment services
   - The individual did not decline any job offers they received

3. *Labour market constraint* (*0 = "No", 1 = "Yes"):* This variable indicates whether there were limited job opportunities available for individuals with the respondent's skills and qualifications.

[5] 0 – no barriers, 1 – individual experienced one mentioned barrier, 2 – two mentioned barriers.
[6] 0 – no barriers, 1 – individual experienced one mentioned barrier, 2 – two mentioned barriers, 3 – mentioned barriers

For intra-job mobility analysis we created three new variables. Firstly, *changes in job characteristics* variable, which captures the average change across three dimensions of job characteristics. Each of these dimensions was measured on a 0 to 10 scale, where 0 indicates "decreased a lot," 5 represents "stayed the same," and 10 signifies "increased a lot." The composite variable was calculated as the mean of the three scaled responses:

1. Changes in the variety of tasks
2. Changes in the difficulty of the tasks
3. Changes in the need to learn new things

To capture the frequency with which specific characteristics are present in respondents' jobs, a composite variable of *current job characteristics*, was generated. This variable represents an average measure of three key aspects of individuals' job characteristics. Each question was measured on a scale ranging from 1 ("always") to 4 ("never"). The composite variable was calculated as the mean of the three scaled responses:

1. Responding to non-routine situations during daily work
2. Learning new things
3. Choosing how to perform tasks

To quantify the extent of organisational changes experienced by respondents in the past five years, a composite variable, *level of workplace changes (scale 0-4[7])*, was created. This variable measures the cumulative number of specific changes that have occurred in the respondents' workplace or organisation across four dimensions. Each question was coded as 0 ("no") or 1 ("yes"). The composite variable was generated by summing the binary responses:

1. Changes to the technologies used (e.g., machinery, ICT systems)
2. Changes to working methods and practices (e.g., management styles or work processes)
3. Changes to the products or services produced
4. Changes to the amount of contact with clients or customers (e.g., handling customer/client queries or complaints)

3.2.3 Micro-, meso-, and macro-level factors used in the analysis

The variables used in the analysis of *skill mismatch at the start of a job*:

- **Micro-level factors**: gender, age group, highest level of education, occupational group, career alignment and development index, job convenience and compensation index, situational and dispositional barriers, and labour market constraint variable.
- **Meso-level factors**: firm size and sector.
- **Macro-level factors**: unemployment rate, employment protection legislation (EPL), and active labour market policies (ALMP), reflecting labour market institutions and structural conditions.

[7] 0 – no changes, 1 – individual experienced one change, 2 – two changes, 3 – three changes, 4 – four changes.

- Other control variables included in the analysis are listed in Appendices Table A1 and Table A2.

The variables used in the analysis of *inter-job mobility*:

- **Micro-level factors**: gender, age group, highest level of education, occupational group, career alignment and development index, job convenience and compensation index, situational and dispositional barriers, and labour market constraint variable.
- **Meso-level factors**: firm size and sector.
- Other control variables included in the analysis are listed in Appendices Table A3.

The variables used in the analysis of *intra-job mobility*:

- **Micro-level factors**: gender, age group, highest level of education, occupational group, current job characteristics, changes in job characteristics; workplace changes and different changes in job role[8].
- **Meso-level factors**: firm size and sector.
- Other control variables included in the analysis are listed in Appendices Table A4.

3.3 Research strategy

The analysis is divided into two parts:

In the first part, we start with presenting descriptive analysis to show the proportion of skill (mis)matches across various countries, highlighting the differences between skill mismatches at the start of a job and those observed during the survey period, after individuals had spent some time in their current roles. Subsequently, we use multilevel logistic regression analysis to examine skill mismatches at the start of a job by examining the influence of micro-level and meso-level factors on skill mismatches. Analysing also factors that shape individuals' job selection priorities and barriers, which may impact entering a skill-mismatched position. In addition, we investigate the role of macro-level factors—including unemployment rates, employment protection legislation (EPL), and active labour market policies (ALMP)—in shaping skill mismatches, reflecting different institutional and structural conditions.

The second part examines inter-job mobility (transitions between jobs) and intra-job mobility (progression within the same job) focusing on skill mismatch transitions. First, we present descriptive results of different skill mismatch transitions and showing their distributions. We then proceed with multilevel logistic regression analysis, focusing on the five most common transitions in inter-job and four most frequent transitions in intra-job mobility. Then we proceed to identify the micro- and meso-level factors influencing these transitions.

[8] If the person has been promoted; if their job tasks and responsibilities have changed; if the person has a lower level job position now; or if the individuals' role has remained the same.

4 Results

4.1 Skill mismatches

4.1.1 Skill mismatches at the start of the job vs current skill mismatches

In the following, we examine skill mismatch levels across European countries by comparing the skills employees possessed at the start of their employment with the variable, which observed skills alignment later during the survey period. This highlights variations in skill mismatches based on the different variables used to measure them in the survey. The descriptive analysis reveals notable variation in both overskilling and underskilling across countries during those two time points.

Figure 1 shows that at the start of their jobs, Austria, the UK, and Greece report the highest percentages of overskilled workers, ranging from 34% to 36%. In contrast, underskilling is most prevalent in Eastern Europe, particularly in Slovakia (36.9%), the Czech Republic (34.6%), Lithuania (38.1%), and Estonia (41.4%), where many workers initially stated that their skills are lower than required for their jobs. Luxembourg stands out with the lowest rates of both overskilling (15.3%) and underskilling (12.2%), suggesting a more well-matched labour market.

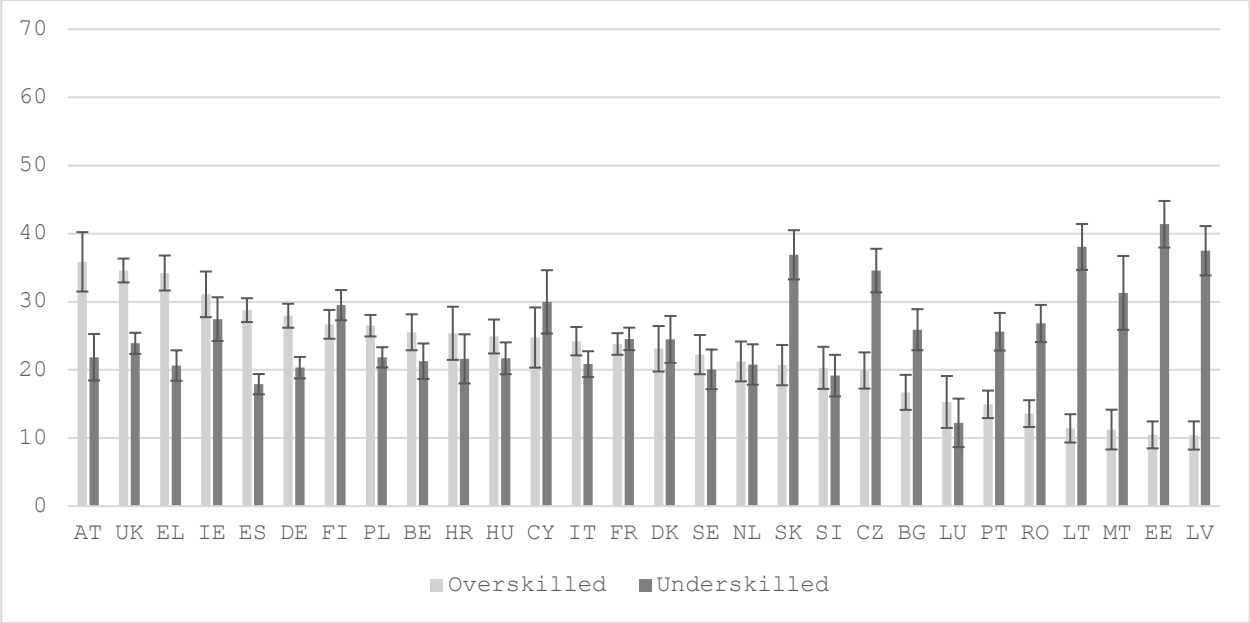

Figure 1 Skills mismatches (skills at the start of the job) across countries.
Source: Own calculations based on the *European Skills and Jobs Survey (2014), full-time workers*.

Figure 2 illustrates that current skill mismatches in jobs reveal high rates of overskilling across many European countries. Austria (54.1%), the UK (49.9%), and Greece (47.2%) lead in overskilled workers, with several Western and Northern European countries, including Ireland, Germany, Spain, and Finland, also reporting relatively high overskilling rates (around 40%). In contrast, underskilling is generally less common, with most countries showing rates below 10%. However, a few countries, such as Estonia (15.2%), Lithuania (11.5%), and Finland (10.6%), have slightly higher levels of underskilling compared to other countries. Luxembourg stands out

with one of the lowest underskilling rates (2.9%), while also reporting a below-average rate of overskilling.

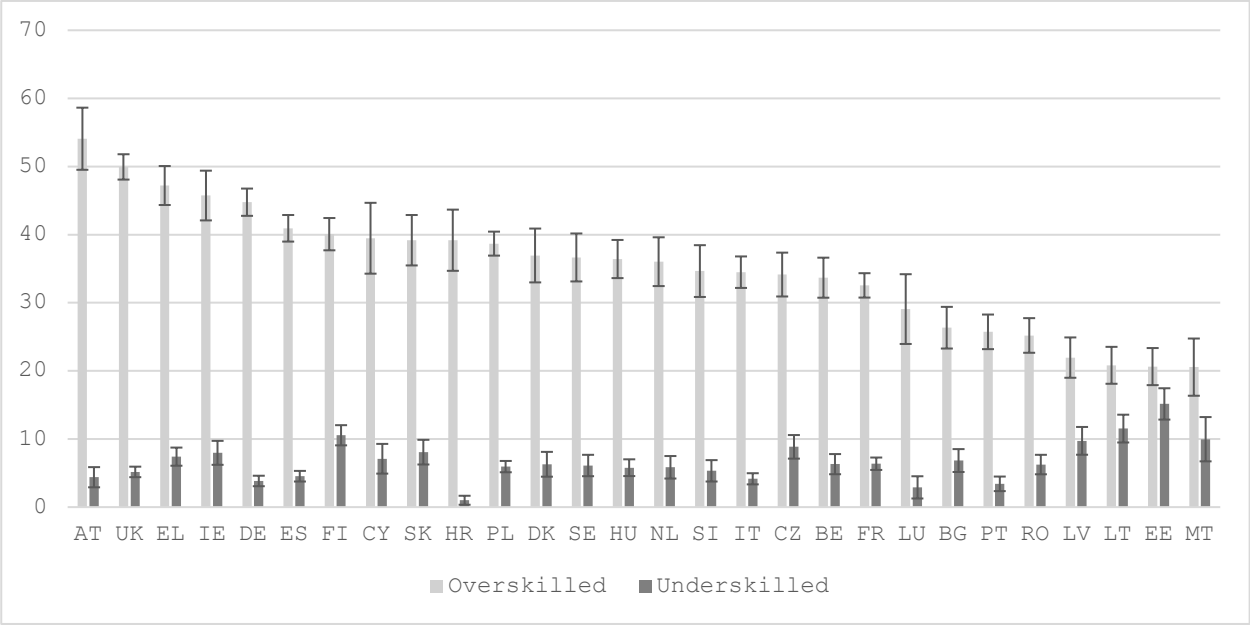

Figure 2 Skills mismatches (present skills at the time of the survey) across countries.
Source: Own calculations based on the *European Skills and Jobs Survey (2014), full-time workers*.

In summary, the analysis of skill mismatches across European countries reveals significant variation. When comparing skill mismatches at the start of employment to current levels, overskilling appears to have increased in most countries. This suggests that many workers who were initially well-matched to their roles have become overskilled over time, likely due to limited career progression opportunities and repetitive job tasks, resulting in skill development that surpasses the demands of their positions.

In contrast, underskilling follows a different trend. At the time of the survey, current skill levels indicate that underskilling is generally less prevalent than at the start of employment. This decline is likely due to workers gaining job experience and developing their skills over time.

4.1.2 Skills mismatches at the start of the job by different groups

This subsection presents the results of a multilevel logistic regression analysis examining the likelihood of experiencing overskilling or underskilling at the start of the job compared to being well-matched. The analysis first explores how factors such as gender, age group, educational level, occupational group, employment sector and firm size contribute to skills mismatches.

Table 1 Summarised results of mismatches at the start of the jobs.

	Overskilled (ref well-matched)	Underskilled (ref well-matched)
Gender (ref male)		
Female	–	↑***
Age (ref 24–39)		
40–54	↑***	↓**
55–65	↑***	↓***
Highest ed (ref tertiary)		
Lower secondary or below	↓***	↑***
Upper secondary	↓***	–
Post-secondary	↓***	–
Occupational group (ref high-skilled white collar)		
Low-skilled white-collar	↑***	↓***
High-skilled blue-collar	–	–
Low-skilled blue-collar	↑***	↓**
Sector (ref professional, scientific and technical activities, administrative and support service etc.)		
Agriculture, forestry and fishing, industry, construction and transport	–	–
Wholesale and retail trade, accommodation and food service	–	–
Firm size (ref 1-9)		
10–49	–	–
50–99	–	↓***
100–249	–	–
250–499	–	–
500 and over	–	–

Source: Own calculations based on the European Skills and Jobs Survey (2014) for full-time workers, using multilevel logistic regression modelling, based on separate models for overskilling and underskilling. Summarised models or overskilling and underskilling derived from Model 8 (see Tables A1 and A2 in the Appendices for full results). *** p ≤ .001; **p ≤ .01; * p ≤ .05.

The analysis reveals distinct patterns of skill mismatches across various demographic and occupational groups. Women are significantly more likely than men to experience underskilling, although no significant relationship is found between gender and overskilling.

Age also plays a significant role in skill mismatches. Workers aged 40–54 and 55–65 are more likely to report being overskilled at the start of a job compared to younger workers (24–39), while older workers are less likely to experience underskilling than their younger counterparts.

Education level emerges also as a significant predictor of skill mismatches. Workers with lower secondary education or below that level are less likely to report overskilling but are more prone to underskilling than those with tertiary education. Similarly, individuals with upper secondary or post-secondary education are less likely to be overskilled, though no significant differences are observed in their likelihood of underskilling compared to tertiary graduates.

The analysis also highlights the influence of occupational classification on skill mismatches. Low-skilled white-collar and low-skilled blue-collar workers are more likely to experience overskilling compared to high-skilled white-collar workers, though they are less likely to be underskilled. In contrast, no significant differences are found between high-skilled blue-collar workers and high-skilled white-collar employees in terms of overskilling or underskilling. This suggests that high-skilled workers across both white-collar and blue-collar occupations are more likely to find jobs that align with their skills or offer more complex tasks, reducing the likelihood of perceived skills underutilisation.

Sectoral analysis reveals no significant relationships between overskilling or underskilling.

Finally, the analysis also shows no significant effect of firm size on overskilling or underskilling, except for companies with 50–99 employees, where workers are less likely to experience underskilling compared to those in companies with 1–9 workers.

4.1.3 Skills mismatches at the start of the job by importance of different factors on job selection, situational barriers and constraints on the labour market

The analysis further examines the impact of additional factors—such as motivations for job acceptance, personal circumstances, and pre-employment labour market conditions—that may influence job choices, limit available opportunities, and contribute to the prevalence of overskilling and underskilling at the start of the employment. Predicted probabilities that illustrate these relationships are presented in the following figures.

To better understand these dynamics, two indices were developed: the *Career Alignment and Development Index*[9], which emphasises the importance of how well a job aligns with an individual's career goals and supports professional growth, and the *Job Convenience and Compensation Index*[10], which reflects practical and financial considerations. These indices capture the diverse factors that individuals prioritise when selecting their current job.

The results, shown in Figure 3, reveal that individuals who placed greater importance on career alignment and career progression prospects when considering to accept a job were less likely to experience overskilling at the start of employment. This finding suggests that individuals who prioritise factors like skill development potential and alignment with long-term career goals are more likely to secure roles that better match their skills. This highlights the role of strategic career

[9] This index includes factors such as the desire to gain work experience, opportunities for career progression, the reputation of the company or organisation, and personal interest in the nature of the work.

[10] This index includes the quality of pay and benefits, the job's proximity to the participant's home, and its support for achieving a good work-life balance.

planning in reducing the likelihood of overskilling and ensuring a better fit between individuals' capabilities and job requirements.

Additionally, the analysis uncovers a negative association between career alignment and underskilling, indicating that individuals who prioritise career alignment are also less likely to experience underskilling. While this effect is less pronounced than its impact on overskilling, it is somewhat surprising. One might have expected that prioritising career growth and advancement could increase the likelihood of underskilling, based on the assumption that individuals focused on career development might accept positions for which they are underskilled, with the expectation of future advancement. However, from an employer's perspective, such a mismatch might hinder performance or adaptation to the role in the short term. Consequently, individuals may struggle to access these roles and may instead opt for positions that better match their existing skill set while still offering opportunities for career growth.

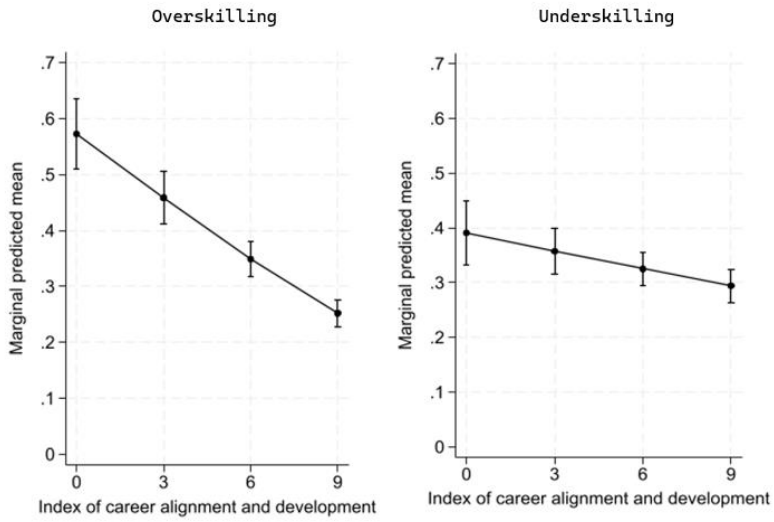

Figure 3 Skills mismatches by career alignment and development index.
Source: Calculations based on the European Skills and Jobs Survey (2014) for full-time workers. Multilevel logistic regression was applied, with predicted probabilities for overskilling and underskilling derived from Model 8 (see Tables A1 and A2 in the Appendices for full results).

The results in Figure 4, which analyse the Job Convenience and Compensation Index—encompassing factors such as pay quality, proximity to home, and work-life balance—show no statistically significant effect on the likelihood of being overskilled at the start of a job. This finding is somewhat unexpected, as it could have been anticipated that individuals to whom these practical aspects have higher importance might be willing to accept a trade-off, such as being overskilled, in exchange for other more highly valued job attributes.

Conversely, the index reveals a statistically significant negative effect on underskilling, suggesting that individuals who prioritise convenience and compensation in their job choices may actively seek roles that fulfil their immediate needs for adequate pay, manageable commute, and work-life balance, which could be found better in positions where their skills align with job requirements. By prioritising these practical considerations, individuals are likely to avoid job positions where they lack the necessary qualifications or skills, as underskilling could

hinder their ability to meet job expectations and affect the stability or benefits they seek. Additionally, employers may also prefer candidates whose skills match job demands to ensure productivity and performance, further reducing the likelihood of underskilled individuals being selected for such positions.

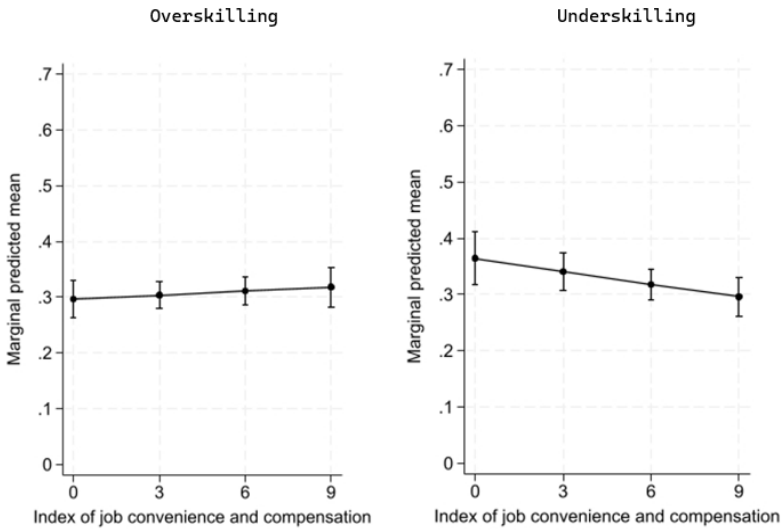

Figure 4 Skills mismatches by job convenience and compensation index.
Source: Calculations based on the European Skills and Jobs Survey (2014) for full-time workers. Multilevel logistic regression was applied, with predicted probabilities for overskilling and underskilling derived from Model 8 (see Tables A1 and A2 in the Appendices for full results).

The analysis indicates that the *Situational Barrier* variable, which captures the extent of personal or family-related challenges, has a positive and statistically significant effect on overskilling (see Figure 5). This suggests that individuals facing more situational barriers, such as substantial family obligations or financial difficulties, are more likely to be overskilled at the start of their job. These challenges may constrain their job search options, limiting their opportunities to seek for positions that fully utilise their skills. The results for underskilling are not statistically significant, indicating that situational barriers do not have a notable impact on the likelihood of being underskilled when starting a job.

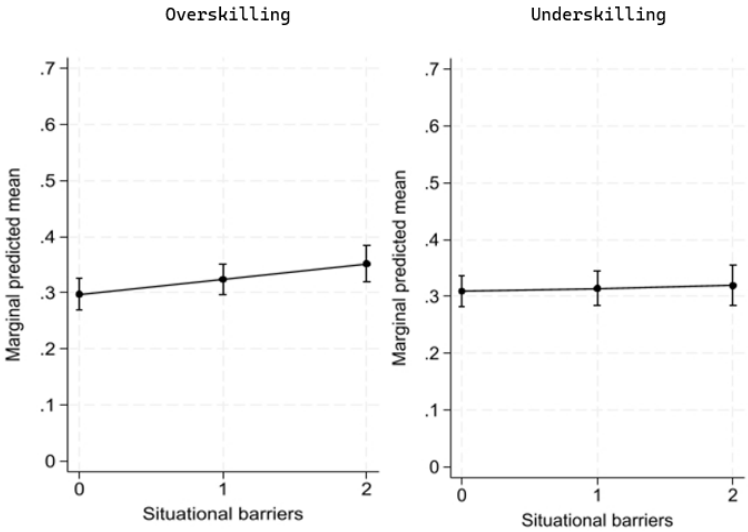

Figure 5 Skills mismatches by existence of situational barriers.
Source: Calculations based on the European Skills and Jobs Survey (2014) for full-time workers. Multilevel logistic regression was applied, with predicted probabilities for overskilling and underskilling derived from Model 8 (see Tables A1 and A2 in the Appendices for full results).

The results presented in Figure 6 reveal that the *Labour Market Constraint* variable, which reflects individuals' perceptions of limited job opportunities matching their skills and qualifications, has a positive and statistically significant effect on overskilling. This suggests that individuals who encountered scarcity of suitable positions were more likely to accept job positions where their skills were underutilised. Such constraints may have forced them to accept jobs below their skill level out of necessity rather than a preference. In contrast, the findings for underskilling are not statistically significant, implying that perceived labour market constraints do not have an impact on the likelihood of individuals entering jobs that require more skills than they possess at the start of employment.

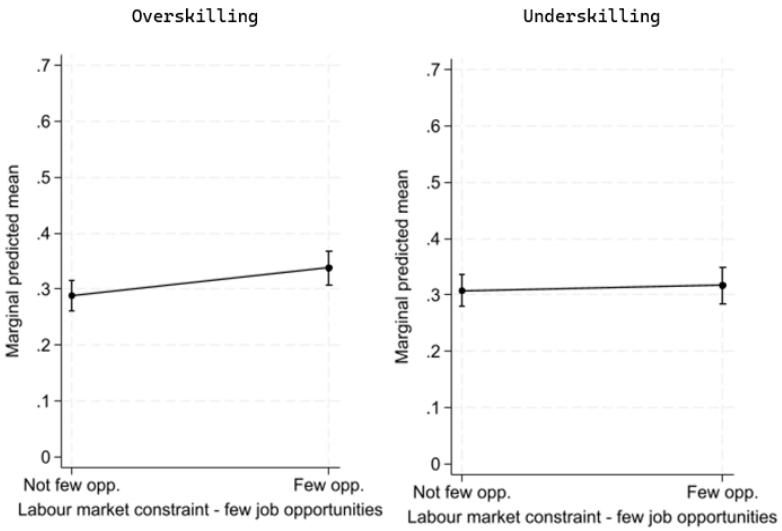

Figure 6 Skills mismatches by labour market constraint.
Source: Calculations based on the European Skills and Jobs Survey (2014) for full-time workers. Multilevel logistic regression was applied, with predicted probabilities for overskilling and underskilling derived from Model 8 (see Tables A1 and A2 in the Appendices for full results).

4.1.4 Macro-level effects on skills mismatch at the start of the job

The findings in Figure 7 reveal a positive and statistically significant relationship between the *unemployment rate* and the likelihood of overskilling. This supports the idea that during periods of high unemployment, workers are more likely to accept positions that do not fully utilise their skills due to a scarcity of job opportunities. In contrast, the absence of a statistically significant effect of the unemployment rate on underskilling suggest that weak labour markets primarily influence overskilling. This may be because employers, during economic uncertainty, tend to prioritise hiring overqualified candidates who can easily meet or exceed job demands, avoiding the perceived risks of employing candidates with insufficient skills. This selective hiring practice likely accounts for the strong association between higher unemployment rates and overskilling compared to underskilling.

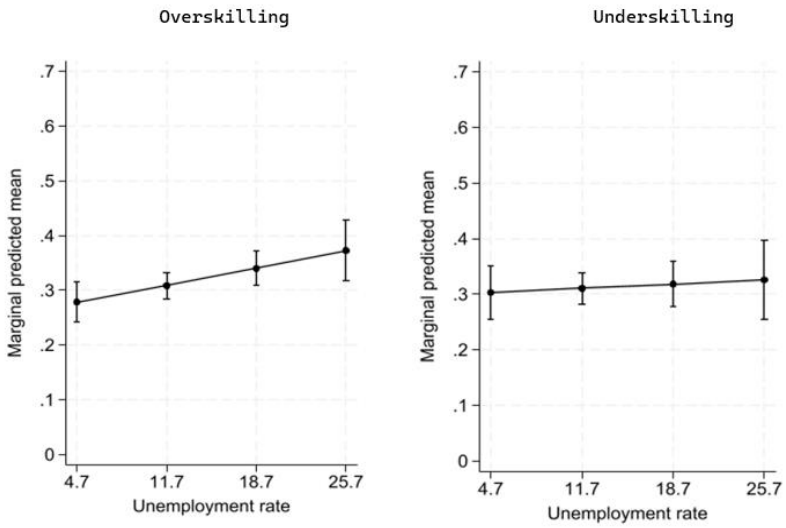

Figure 7 Skills mismatches at the start of the job by unemployment rate.
Source: Calculations based on the European Skills and Jobs Survey (2014) for full-time workers. Multilevel logistic regression was applied, with predicted probabilities for overskilling and underskilling derived from Model 9 (see the continuing Tables A1 and A2 in the Appendices for full results).

The multilevel logistic regression analysis found that *employment protection legislation* (EPL) had no significant effect on either overskilling or underskilling at the start of a job (see Tables A1 and A2, Model 10 in the Appendices for the detailed results). This finding contrasts with previous studies suggesting that EPL influences skill alignment. A possible explanation for this discrepancy is that the current analysis relies on workers' self-assessments of their skills, which may differ from objective measures used in other research such as Fregin et al. (2020).

The multilevel logistic regression analysis indicates that higher public spending on *active labour market policies* (ALMP) is associated with a reduced likelihood of underskilling at the start of a job. This finding suggests that increased investment in ALMP, as a percentage of GDP, helps align workers' skills more effectively with job requirements, reducing instances where employees lack the necessary skills for their roles. However, no statistically significant relationship was found between ALMP spending and overskilling, indicating that its impact may be more relevant for addressing skill shortages rather than skill surpluses. Interestingly, one might expect that participation in ALMPs, such as training programs, would raise individuals' skill levels, potentially leading to a higher likelihood of overskilling. Yet, these findings do not reflect such an effect. A possible explanation is that ALMP participants may transition into jobs that not only match their newly acquired skills but also align better with the labour market needs targeted by these policies. Alternatively, the impact of ALMPs on overskilling may become more apparent over a longer period, as workers adapt to their roles and employers refine job requirements to more effectively utilise employees' skills.

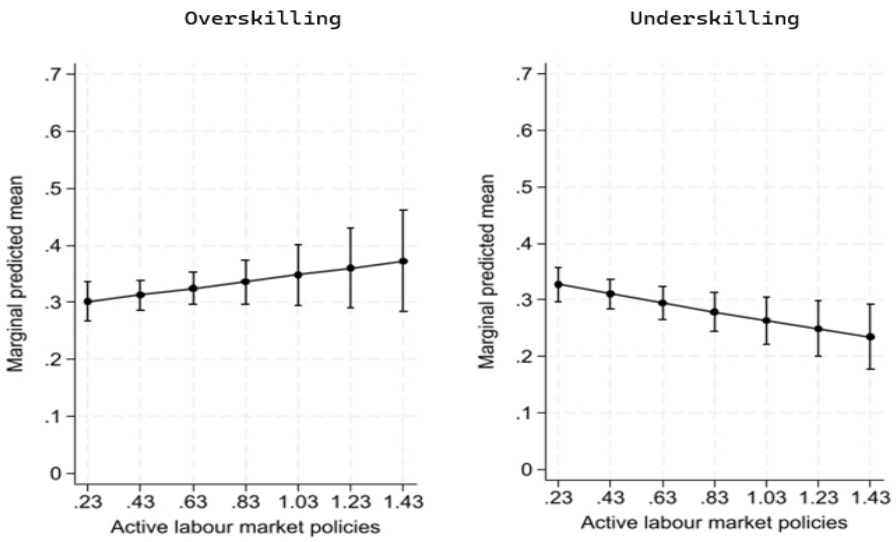

Figure 8 Skills mismatches by active labour market policies.

Notes. ALMP refers to expenditures on active labour market policy (ALMP) categories 2-7 as a percentage of GDP. Source: Calculations based on the European Skills and Jobs Survey (2014) for full-time workers. Multilevel logistic regression was applied, with predicted probabilities for overskilling and underskilling derived from Model 11 (see the continuing Tables A1 and A2 in the Appendices for full results).

4.2 Job mobility – skill mismatch transitions

Table 2 Distribution of skill mismatch transition status between and within jobs.

Skill mismatch transition	Skill mismatch transition at previous job to start of new job (inter-job mobility)	Skill mismatch transition at start of new job to present situation at the time of the survey (intra-job mobility)
Overskilled – Overskilled	**13%**	**19.2%**
Overskilled – Matched	**11.2%**	4.7%
Overskilled – Underskilled	5.8%	0.5%
Matched – Overskilled	**10.2%**	**12.9%**
Matched – Matched	**36.5%**	**36.4%**
Matched – Underskilled	**12%**	2%
Underskilled – Overskilled	1.6%	5%
Underskilled – Matched	4.1%	**15.7%**
Underskilled – Underskilled	5.6%	3.6%

Source: Own calculations based on the *European Skills and Jobs Survey (2014), full-time workers*.

The descriptive analysis reveals that the most common *inter-job* transition (36.5%) involves workers moving into new roles where they remain well-matched. The second most frequent transition is for workers who were overskilled in their previous jobs and continue to be overskilled in their new positions (13%). Other notable transitions include shifts from well-matched to underskilled (12%), overskilled to well-matched (11.2%), and well-matched to overskilled positions (10.2%). Transitions outside these categories occur less frequently, with rates around 5%.

For *intra-job* mobility, the data show that the most common outcome (36.4%) is workers maintaining a well-matched skill level within the same role over time. The next most frequent transition involves overskilled workers remaining overskilled (19.2%), indicating limited improvement in skill alignment for these workers. Other significant transitions include underskilled workers moving into well-matched roles (15.7%) and well-matched workers becoming overskilled (12.9%). All other transitions are relatively rare, each occurring at or below 5%.

4.2.1 Skill mismatch transitions between jobs (inter-job mobility)

Drawing on the inter-job skill mismatch transitions outlined in Table 2, the following multilevel analysis focuses on the five most frequent transitions: matched to matched**,** overskilled to overskilled**,** matched to underskilled**,** overskilled to matched, and matched to overskilled**.** This approach enables an in-depth examination of the factors driving these key transitions. A summary of the findings is provided in Table 3.

Table 3 Summarised results of inter-job mobility - previous job skill mismatch status vs skill mismatch status at the start of the current job.

	Matched to matched	Matched to underskilled	Overskilled to matched	Overskilled to overskilled	Matched to overskilled
Gender (ref male)					
Female	–	↑***	–	↓***	–
Age (ref 24–39)					
40–54	↑**	–	↑*	–	↑***
55–65	↑*	–	↑***	↑*	↑***
Highest ed (ref tertiary)					
Lower secondary or below	↑***	↑***	↓***	↓***	↓***
Upper secondary	↑***	↑***	–	↓***	↓**
Post-secondary	↑***	–	–	↓***	–
Occupational group (ref high-skilled white collar)					
Low-skilled white-collar	–	↑***	–	↑**	–
High-skilled blue-collar	↑**	–	–	–	–
Low-skilled blue-collar	↑*	↑***	↓***	↑***	–
Sector (ref professional, scientific and technical activities, administrative and support service etc.)					
Agriculture, forestry and fishing, industry, construction and transport	–	–	–	↑**	–
Wholesale and retail trade, accommodation and food service	–	–	–	–	–
Firm size (ref 1–9)					
10–49	–	–	–	–	–
50–99	–	–	↑*	–	–
100–249	–	–	–	–	–
250–499	↓*	–	–	↑**	–
500 and over	↓*	–	–	↑*	–

Source: Own calculations based on the European Skills and Jobs Survey (2014) for full-time workers, using multilevel logistic regression modelling. Summarised models of inter-job mobility (see Table A3 in the Appendices for full results). *** p ≤ .001; **p ≤ .01; * p ≤ .05.

The inter-job mobility analysis reveals distinct patterns of skill mismatch transitions influenced by various factors, including gender, age, education level, occupational group, sector and firm size.

Regarding gender, the findings indicate that women are more likely than men to transition from well-matched jobs to underskilled positions and less likely to remain overskilled when changing jobs.

Age also plays an important role in skill mismatch transitions. Workers aged 40–54 are more likely to remain in well-matched positions or transition from overskilled to well-matched jobs compared to their younger counterparts aged 24–39. However, this age group also shows a greater tendency to move from well-matched positions to overskilled ones. Similarly, workers aged 55–65 are more likely to remain in or transition into overskilled roles, reflecting potential challenges in skill alignment for older age groups, possibly due to reduced job opportunities.

Education has a notable effect on skill mismatch transitions. Workers with lower secondary education or below are more likely to remain in well-matched jobs or move to underskilled positions compared to those with tertiary graduates. Individuals with upper secondary education show similar patterns, but they are less likely to transition into overskilled roles. In contrast, post-secondary graduates have a higher likelihood of remaining in well-matched jobs and successfully transition from overskilled positions to roles better aligned with their skills.

Occupational group also influences skill mismatch transitions. Compared to high-skilled white-collar workers, low-skilled white-collar workers are more likely to transition into underskilled positions or remain overskilled, suggesting limited opportunities for improving skill alignment in these occupations. High skilled blue-collar workers tend to have a higher likelihood in remaining in well-matched positions when changing jobs, whereas low-skilled blue-collar workers experience a broader range of mismatches, including a higher likelihood of moving into overskilled job positions.

The effect of sector in which workers are employed was found to be significant only in the analysis of transitions where workers remained overskilled in the subsequent positions. The results showed that workers in agriculture, forestry and fishing sectors are more likely to remain overskilled compared to those in professional, scientific, technical, administrative, and support service activities. This suggests that industries with more manual or traditional skill demands may offer fewer opportunities for skill alignment, highlighting the influence of industry-specific characteristics on workers' skill trajectories.

Table 4 Summarised results of inter-job mobility - previous job skill mismatch status vs skill mismatch status at the start of the current job.

	Matched to matched	Matched to underskilled	Overskilled to matched	Overskilled to overskilled	Matched to overskilled
Career alignment and development	↑***	–	↑***	↓***	↓***
Job convenience and compensation	↑***	–	↓*	–	–
Situational barriers	–	–	–	↑***	↑*
Dispositional factors	–	–	–	↓*	–
Labour market constraint	↓***	–	–	↑***	↑***

Source: Own calculations based on the European Skills and Jobs Survey (2014) for full-time workers, using multilevel logistic regression modelling. Summarised models of inter-job mobility (see Table A3 in the Appendices for full results). *** p ≤ .001; **p ≤ .01; * p ≤ .05.

From the analysis of different indices and the effects of barriers (Table 4) on inter-job mobility, the results show that workers who place high priority on *career alignment and development* are

more likely to remain in well-matched roles or transition from being overskilled to well-matched positions. This indicates a proactive approach, where such workers actively seek work opportunities that align with their skills, prioritising positions that offer effective skill utilisation and career growth. Conversely, these workers are less likely to move from overskilled to overskilled or from well-matched to overskilled positions, indicating that they try to avoid transitions that would lead to or perpetuate skill mismatches. Interestingly, transitioning from a well-matched to an underskilled position did not show a significant relationship with the career alignment and development index. One might expect that underskilled roles, which offer potential for skill development and career advancement, would attract individuals focused on career growth. However, this may indicate that these workers prioritise immediate skill alignment over the potential for future development when making job transitions.

In contrast, placing greater emphasis on *job convenience and compensation* tends to increase the likelihood of workers remaining in well-matched roles, reflecting a preference for stability and practical considerations, such as manageable commute, work-life balance, or financial security, in their job choices. However, placing higher importance on these factors slightly reduces the probability of transitioning from overskilled to well-matched positions, potentially indicating a trade-off between prioritising job stability and seeking roles that better align with their skills. Workers who prioritise these practical aspects may accept some level of skill underutilisation as long as other desirable job attributes are met.

Situational barriers, such as family responsibilities or financial obligations, are, as expected, strongly associated with negative outcomes in skill-job alignment. Workers facing such constraints are more likely to remain overskilled in their new roles or transition from well-matched positions to overskilled ones. These barriers may limit job search flexibility, reducing the options available to workers.

Dispositional factors, such as experiencing difficulties in finding a job, reveal that although the effect is relatively weak, workers are less likely to remain overskilled in the subsequent job. This could reflect several dynamics. Since the respondents' skill mismatch is based on the self-assessment, individuals who have struggled to find a job might perceive their skills as less attractive to employers, which could influence their evaluation of skill-job alignment and downplay potential overskilling.

Labour market constraints, however, present a more mixed impact. These constraints reduce the likelihood of workers remaining in well-matched positions, but also increasing the probability of workers remaining overskilled or transitioning from well-matched to overskilled positions, reflecting limited opportunities for skill matching in constrained job markets. This suggests that, as would be expected, when job availability is restricted, workers may settle for positions that underutilise their skill set.

4.2.2 Skill mismatch transitions within jobs (intra-job mobility)

Building on the intra-job skill mismatch transitions detailed in Table 2, the subsequent multilevel analysis examines the four most common transitions: Matched to matched, overskilled to overskilled, underskilled to matched and matched to overskilled.

Table 5 Summarised results of intra-job mobility - skill mismatch status at the start of the job vs current skill mismatch status during the time of the survey.

	Matched to matched	Overskilled to overskilled	Underskilled to matched	Matched to overskilled
Gender (ref male)				
Female	↓*	↓***	↑***	–
Age (ref 24–39)				
40–54	↓***	↑***	↓***	↑*
55–65	↓***	↑***	↓***	↑*
Highest ed (ref tertiary)				
Lower secondary or below	↓***	↓***	↑***	↑***
Upper secondary	↓***	↓***	↑**	↑***
Post-secondary	↓*	↓***	–	↑***
Occupational group (ref high-skilled white collar)				
Low-skilled white-collar	–	↑***	↓***	↓***
High-skilled blue-collar	–	↑**	↓*	–
Low-skilled blue-collar	↑*	↑***	↓***	↓***
Sector (ref professional, scientific and technical activities, administrative and support service etc.)				
Agriculture, forestry and fishing, industry, construction and transport	↓***	–	–	–
Wholesale and retail trade, accommodation and food service	–	↑***	↓*	–
Firm size (ref 1–9)				
10–49	–	–	–	–
50–99	–	–	↓***	–
100–249	–	–	↓*	–
250–499	–	↑**	–	–
500 and over	↑*	↑*	–	–

Source: Own calculations based on the European Skills and Jobs Survey (2014) for full-time workers, using multilevel logistic regression modelling. Summarised models of intra-job mobility (see Table A4 in the Appendices for full results). *** p ≤ .001; **p ≤ .01; * p ≤ .05.

The results of the multilevel analysis reveal several significant relationships between individual and job characteristics and intra-job skill mismatch transitions. Gender plays a role, with women being significantly less likely than men to remain overskilled or stay in matched roles, while being more likely to transition from underskilled to matched jobs. Age also has a notable impact: workers aged 40–54 and 55–65 are significantly less likely than those aged 24–39 to remain in matched roles, but have a higher likelihood to stay overskilled or transition from matched to

overskilled roles. Both older age groups are also significantly less likely to transition from underskilled to matched roles.

Education level strongly influences skill mismatch transitions. Workers holding lower secondary education or below, as well as those with upper secondary education, exhibit similar patterns compared to tertiary graduates. These groups are significantly less likely to remain in matched or overskilled roles but are more likely to transition from underskilled to matched roles or from matched to overskilled positions. In contrast, post-secondary graduates are less likely to remain in matched or overskilled roles but are more likely to transition from matched to overskilled positions.

Occupational group is another key determinant. Compared to high-skilled white-collar employees, both low-skilled white-collar and low-skilled blue-collar workers are significantly more likely to remain overskilled but less likely to transition from underskilled to matched roles or move from matched to overskilled positions. The latter also indicates a higher likelihood of remaining in a matched job role. High-skilled blue-collar workers are more likely to stay overskilled and slightly less likely to transition from underskilled to matched roles compared to high-skilled white-collar workers.

Sectoral differences also emerge. Workers in the agriculture, forestry, and fishing sector are significantly less likely to remain in matched roles compared to those in professional, scientific, and technical activities, although no significant effects are observed for other transitions. In the wholesale and retail trade, accommodation, and food services, workers are more likely to remain overskilled and less likely to transition from underskilled to matched roles.

Firm size shows mixed effects. Employees in firms with 50–99 workers or 100–249 workers are less likely to transition from underskilled to matched roles compared to those in smaller firms (1–9 employees). In firms with 250–499 employees, workers are more likely to remain in overskilled roles. In companies with more than 500 employees, there is a higher likelihood of employees staying in matched or overskilled roles compared to those in firms with 1–9 employees, although the effect is not strong.

Table 6 Summarised results of intra-job mobility - skill mismatch status at the start of the job vs current skill mismatch status during the time of the survey.

	Matched to matched	Overskilled to overskilled	Underskilled to matched	Matched to overskilled
Job characteristics	–	↓***	↑***	–
Changes in job characteristics	↓*	↓***	↑***	↑***
Workplace changes	↑***	–	↑***	↓***
Changes in job role: have been promoted	–	–	–	↓***
Changes in job role: tasks and responsibilities have changed	–	↑***	–	↓***
Changes in job role: lower level job position	↑***	↑*	↓**	↓***
Changes in job role: role has remained the same	↓**	–	–	↑***

Source: Own calculations based on the European Skills and Jobs Survey (2014) for full-time workers, using multilevel logistic regression modelling. Summarised models of intra-job mobility (see Table A4 in the Appendices for full results). *** p ≤ .001; **p ≤ .01; * p ≤ .05.

The analysis of intra-job mobility highlights several significant relationships between various factors and transitions in skill mismatch status, from the start of employment to the current situation at the time of the survey. Workers whose jobs involve frequent learning opportunities and greater autonomy, are more likely to transition from being underskilled to well-matched and are significantly less likely to remain overskilled within the same job. These findings suggest that jobs offering continuous learning and greater autonomy provide workers with opportunities to develop their skills and better align them with job requirements. The increased likelihood of transitioning from underskilled to well-matched roles indicates that such work environments support skill development, enabling workers to close any skill gaps. Moreover, the reduced likelihood of remaining overskilled in such jobs suggests that these positions allow workers to leverage their existing skills more effectively, preventing situations where they are underutilised.

Changes in job characteristics, such as increased task variety, task difficulty, or the need to learn, also play a critical role. These increased changes are associated with a reduced likelihood of staying in overskilled positions and, to a lesser extent, in well-matched roles. However, they increase the probability of transitioning from underskilled to well-matched roles and from well-matched to overskilled positions, illustrating both positive and negative implications of task enrichment.

Workplace changes, including technological advancements and shifts in work practices, are strongly linked to intra-job mobility outcomes. Workers experiencing a higher level of workplace changes are more likely to remain in well-matched roles or transition from being underskilled to well-matched positions. Additionally, they are less likely to move from matched to overskilled positions. Workers exposed to such changes may find opportunities to better utilise their existing skills or develop new ones, leading to a reduction in skill mismatches.

Examining different changes in job roles, the findings indicate that promotions reduce the likelihood of transitioning from matched to overskilled skill status, suggesting that upward mobility mitigates skill surpluses. This result reflects the value of career advancement in preventing skill mismatches, as promotions often come with new responsibilities that better align with workers' skill sets. Workers whose tasks and responsibilities have evolved within the same role, but who have not been promoted or moved department, are more likely to remain overskilled but are less likely to transition from matched to overskilled roles. This suggests that while these workers may gain more experience and expertise within their current role, the lack of significant change in their job title or department may limit their career growth, leading to an overskilling situation without a corresponding increase in job relevance. In contrast, those moving to lower-level job roles are significantly more likely to remain well-matched or overskilled positions and less likely to transition from underskilled to matched or from matched to overskilled roles. Lastly, workers whose roles and responsibilities have remained unchanged are more likely to transition from well-matched to overskilled positions, likely due to stagnation in skill development relative to changing job demands, and are less likely to remain in a well-matched position. This implies that a lack of job evolution or skill development opportunities can lead to skill mismatches over time, as workers' skills may surpass the static requirements of their role, causing them to become overskilled.

5 Discussion and conclusions

This report examines the factors influencing skill mismatches and their evolution over time. It looks at micro-, meso-, and macro-level determinants of overskilling and underskilling, and assesses whether job mobility enables individuals to transition to better-matched jobs, remain mismatched, or achieve improved skill alignment within their current jobs. This report aims to provide a comprehensive analysis of skill mismatch dynamics and their implications for labour markets, serving as a foundation for policy recommendations to reduce mismatches among workers.

The analysis of skill mismatches across European countries reveals notable trends and variations. Specifically, when comparing the level of overskilling at the start of employment with the skill level reported at the time of the survey, the findings show that overskilling increases with job tenure. This suggest that many workers who were initially well-matched to their job tasks have outgrown their job requirements. This trend is likely driven by limited career progression and limited task variety, which result in skill development that surpasses job demands. In contrast, underskilling decreased over time, and by the time of the survey, it was less common than at the start of employment. This likely reflects workers' ability to develop their skills and gain experience as they advance in their roles.

The analysis of inter-job and intra-job mobility provides further insight into how skill mismatches evolve and resolve over time. These two forms of mobility highlight complementary but distinct patterns in how workers experience and address skill mismatches. The descriptive results reveal that the most common transition concerning both inter-job and intra-job mobility involves remaining in a well-matched role. This suggests a level of stability for many workers and maintaining skill alignment. However, the persistence of overskilling for 13% of workers in new jobs and 19.2% within the same job aligns with the findings of Mavromaras et al. (2013), which indicate that individuals who have experienced overskilling in the past are more likely to be overskilled in the future, highlighting the persistent nature of overskilling. This may indicate demand-side constraints in the labour market, such as a lack of higher-level opportunities or employer reluctance to invest in job redesign or promotions. However, transitions from overskilled to well-matched roles (11.2%) concerning inter-job mobility, indicate that overskilling can be also a temporary condition for some individuals. This finding aligns with career mobility theory, which suggests that overskilled workers may initially accept roles as stepping stones for future advancement, eventually moving into positions that better align with their skills. Similarly, the transition from previously well-matched job to new underskilled job (12%) reflects how career progression or new job responsibilities can occasionally lead to temporary underskilling, as workers adapt and acquire new skills during their tenure. With regard of intra-job mobility, transitions from underskilled to well-matched roles (15.7%) within the same job suggest that skill mismatches can resolve over time as workers gain experience and training, which is also consistent with the human capital theory. In contrast, well-matched workers becoming overskilled (12.9%) could reflect changes in job requirements or reduced opportunities for skill utilisation, or the possibility that due to search costs, workers may settle for positions below their qualifications or skills. This highlights the dynamic nature of mismatches, as suggested by matching theory.

The analysis highlights notable patterns in skill mismatches across demographic and job-related characteristics. Gender emerges as a significant factor, with women being more likely than men to experience underskilling at the start of the employment, though no significant relationship is found between gender and overskilling. Inter-job mobility analysis shows that women are more likely than men to transition from well-matched to underskilled positions and are less likely to remain overskilled when changing jobs. Intra-job mobility findings indicate that women are less likely than men to stay overskilled or remain in well-matched roles within the same job, but they are more likely to transition from underskilled to matched roles. These findings collectively highlight that while women often face challenges in maintaining skill alignment, they are proactive in achieving better alignment within their roles. These findings contrast with prior research. For example, Krahn and Lowe (1998) found that women were more likely to underutilise their skills, while Falter (2009) reported that Swiss women were more prone to overskilling and less likely to experience underskilling than men. Similarly, Caroleo and Pastore (2018) found that young Italian women were more likely than men to perceive themselves as overskilled five years post-graduation. These disparities may be explained by the broader context of the current analysis, which uses a pooled sample from the ESJS. The previously mentioned country-specific studies, might better capture the nuances of local labour markets, workforce participation rates, and typical gender-specific employment patterns, which could contribute to the observed differences in skill mismatch outcomes.

Age also plays a significant role in skill mismatches. The findings indicate that workers aged 40–54 and 55–65 are more likely than younger employees (24–39) to report being overskilled at the start of their jobs, while older workers are less likely to experience underskilling. Concerning inter-job mobility, workers aged 40–54 are more likely than their younger counterparts to remain in well-matched jobs or transition from overskilled to matched positions when changing jobs, but they also face an increased likelihood of moving from matched to overskilled roles. Older workers (aged 55–65) are particularly prone to remaining in or transitioning into overskilled positions, reflecting challenges in maintaining skill alignment later in their careers. In intra-job mobility, older workers are less likely to remain in matched roles and are more likely to stay overskilled or transition from matched to overskilled positions, with limited opportunities to improve skill alignment within their current roles. These results diverge from studies such as Allen et al. (2013) and OECD (2013), which suggest that younger workers are generally more prone to overskilling due to their concentration in temporary or entry-level positions that require lower skills and offer limited opportunities for skill utilisation, acting as stepping stones in the labour market. The results in this analysis may be explained with the reasoning that older workers may face higher levels of overskilling due to their accumulated experience and skills exceeding the requirements of their jobs, especially during job transitions later in their careers. Additionally, the reduced likelihood of underskilling among older workers aligns with their greater professional experience, which likely equips them to meet job requirements more effectively.

Education level is another significant predictor of skill mismatches. Workers with lower secondary education or below are less likely to report overskilling but are more likely to experience underskilling compared to tertiary graduates at the start of the employment. Similarly, individuals with upper secondary and post-secondary education are less likely to report overskilling, though no significant differences in underskilling were observed compared to

tertiary graduates. Education emerges as a stabilising factor in skill mismatch transitions. For inter-job mobility, individuals with lower secondary education or below are more likely to remain in well-matched jobs or transition to underskilled positions compared to tertiary graduates, who have higher chances of staying in well-matched roles or transitioning from overskilled to matched positions. Similarly, intra-job mobility findings show that lower-educated workers are less likely to remain in matched or overskilled roles but are more likely to move from underskilled to matched positions. Post-secondary graduates, while exhibiting greater stability in inter-job transitions, also show a higher likelihood of moving from matched to overskilled positions within the same job, reflecting both opportunities and challenges in skill alignment. These results contrast with Mavromaras et al. (2013), who found overskilling to be more prevalent among individuals with lower levels of education. This discrepancy could be due to an oversupply of tertiary-educated workers, leading to overskilling as individuals take on roles that underutilise their skills and qualifications. Furthermore, higher-educated individuals may be more inclined to perceive themselves as overskilled, given the self-assessment nature of the data and their higher expectations for jobs based on their educational level.

Overall, the findings indicate that skill mismatches, particularly overskilling at the start of the job, are more prominent among low-skilled workers, while high-skilled workers in both blue-collar and white-collar roles are more likely to experience better skill alignment. Inter-job mobility analysis reveals that low-skilled white-collar workers are more likely to transition from well-matched into underskilled roles or remain overskilled in the new job, while low-skilled blue-collar workers face broader mismatches, frequently moving into overskilled roles compared to the high-skilled white-collar groups. High-skilled blue-collar workers generally maintain stability in well-matched positions when changing jobs. Similarly, intra-job mobility indicates that low-skilled white- and blue-collar workers are more likely to remain overskilled, with fewer opportunities to transition from underskilled to matched roles or to move into overskilled positions. High-skilled blue-collar workers, while stable in inter-job transitions, are also more likely to remain overskilled in intra-job contexts compared to high-skilled white-collar workers.

However, sectoral analysis reveals no significant relationships between overskilling or underskilling at the start of the employment. Inter-job mobility findings show that only workers in agriculture, forestry, and fishing sectors are more likely to remain overskilled, while those in professional, scientific, and technical sectors exhibit better skill alignment. Intra-job mobility findings indicate that workers in agriculture and related sectors are less likely to remain in matched roles, and those in wholesale, retail, and accommodation sectors are more likely to remain overskilled and less likely to move from underskilled to matched roles. These patterns suggest that industries with traditional or manual skill demands often limit opportunities for skill alignment, whereas professional sectors offer better prospects.

Similarly, firm size showed limited impact on overskilling or underskilling, with the exception of companies with 50–99 employees, where workers were less likely to experience underskilling compared to those in firms with 1–9 workers at the start of the job. This aligns with Quintini's (2011) findings, which also showed no significant relationship between firm size and overskilling. In both inter- and intra-job mobility it showed that larger companies contribute to the persistence of overskilling, limiting dynamic skill transitions within the workplace. This confirms the findings of Allen et al. (2013) that overskilling tends to increase with larger firm sizes.

Using the detailed insights of individuals' job selection motives and the constraints they faced, we analysed these factors using novel indices on skills mismatch at the start of the employment and for inter-job mobility. For skill mismatches at the start of employment career progression and long-term goals, as captured by the career alignment and development index, significantly reduce the likelihood of both overskilling and underskilling, with a particularly strong effect on overskilling. Similarly, the findings demonstrate a negative relationship between career alignment and underskilling. While this effect is less pronounced than for overskilling, it challenges the expectation that career-focused individuals might accept roles requiring higher skills than they possess for potential future advancement. In terms of inter-job mobility, workers who prioritise career alignment and development actively pursue opportunities to better align their skills when changing jobs. These individuals are more likely to stay in well-matched positions, transition from overskilled to well-matched roles, and avoid falling into overskilled or mismatched positions. This highlights the importance of strategic career planning in achieving better matches between workers' skills and job requirements. The findings suggest that individuals who prioritise long-term career progression select roles that both match their current abilities and support their long-term growth.

Practical and financial priorities such as pay, proximity to home, and work-life balance, captured by the job convenience and compensation index, show a different pattern from the previous index. While these priorities have no significant impact on overskilling, they significantly reduce the likelihood of underskilling at the start of the job. In regard of inter-job mobility those who emphasise job convenience and compensation demonstrate a stronger preference for stability, as reflected in their likelihood of remaining in well-matched positions when they are changing their jobs. However, this focus on stability may slightly hinder their chances of moving from overskilled to well-matched roles, reflecting a trade-off between maintaining stability and achieving better skill alignment. Although McGuinness and Sloane (2011) previously identified a trade-off between overeducation and salary, the absence or only a weak effect of such a relationship between job convenience and compensation index and overskilling in this analysis suggests that individuals valuing these practical benefits are also selective, seeking roles that balance their desired conditions with an appropriate skills match. This finding reinforces the idea that prioritising practical considerations does not necessarily compromise skill alignment.

From a theoretical perspective, the human capabilities approach provides valuable insights into these dynamics. It posits that skill mismatches in the labour market arise from a broader set of opportunities, or the lack thereof, available to individuals. This framework emphasises the freedom to choose a career path aligned with personal values and meaningful pursuits, including long-term career goals. Furthermore, it recognises the importance of practical factors, such as work-life balance or career progression, which individuals may prioritise when navigating the labour market. By prioritising career alignment, individuals leverage these opportunities to move closer to their desired professional and personal objectives. However, the findings did not confirm that individuals trade-off overskilling for job convenience and compensation benefits.

Situational barriers, such as family obligations or financial pressures, increase the likelihood of overskilling, likely by limiting job search flexibility. However, these barriers do not significantly affect underskilling at the start of employment. They also significantly hinder skill alignment during inter-job transitions, with workers facing such barriers are more likely to remain

overskilled or transition from well-matched to overskilled positions. These challenges may restrict their job search options, reducing their ability to pursue positions that fully utilise their skills.

Labour market constraints, reflecting restricted job opportunities, are also positively associated with overskilling at the start of the job. Additionally, these constraints limit opportunities for skill alignment during inter-job mobility, increasing the likelihood of remaining overskilled or transitioning from well-matched to overskilled roles. These patterns highlight how external pressures and market conditions restrict workers' ability to improve skill alignment, suggesting that constrained job markets often force individuals to accept positions that underutilise their skills.

The findings from our analysis are closely linked to the theoretical framework of bounded agency, which emphasises the dynamic interaction between individuals' personal agency and the constraints imposed by their external environment. This perspective provides valuable insight into how individuals' job selection decisions and experiences are influenced by both their aspirations and the broader structural factors surrounding them. Specifically, the findings show that while individuals may prioritise career alignment and development, enabling them to make choices that better match their skills with job roles, their actions are not solely driven by personal agency. External constraints, such as situational barriers and labour market significantly shape individuals' ability to navigate the labour market effectively. These constraints limit their flexibility in job search, which can lead to skill mismatches, such as overskilling or underskilling, which in many cases are also not possible to resolve with changing jobs or progressing in the same job.

In our analysis we focused with intra-job mobility on job characteristics and workplace changes, reflecting skill adjustments within the same role. The findings indicated that workers in roles with frequent learning opportunities and autonomy are better positioned to transition from being underskilled to well-matched and are less likely to remain overskilled. Additionally, job enrichment through increased task variety or difficulty helps reduce overskilling and facilitates transitions from underskilled to matched roles. However, it can also lead to mismatches, as these changes may increase the chances of moving from well-matched to overskilled roles, highlighting both the benefits and challenges of task enrichment.

Workplace dynamics, such as technological advancements and organisational changes, support skill alignment. Workers in evolving workplaces are more likely to remain in well-matched roles or transition from underskilled to well-matched positions, while being less likely to become overskilled. Promotions within the same workplace also enhance skill alignment, as they reduce the likelihood of transitioning into overskilled positions. Conversely, workers whose roles and responsibilities do not change, or those who move into lower-level roles, are more likely to experience skill mismatches. A lack of task evolution often leads to a mismatch between workers' evolving skills and unchanging job demands, increasing the risk of transitioning from well-matched to overskilled positions.

Moving from individual and job-level determinants, the analysis examined also the role of macro-level factors in influencing skill mismatches at the start of employment. The findings reveal that higher unemployment rates increase the likelihood of overskilling. This suggests that limited job opportunities during periods of high unemployment may compel individuals to accept positions

that underutilise their skills. However, no significant effect of unemployment rates is observed on underskilling. These results align with Brunello and Wruuck's (2019) observation that economic downturns often force jobseekers into jobs below their skill level, and Bulmahn and Krakel's (2002) argument that employers may raise recruitment standards or prefer overqualified candidates during uncertain economic times. The findings suggest that weak labour markets primarily drive overqualification and overskilling.

Employment protection legislation (EPL) on the other hand, shows no significant effect on either overskilling or underskilling. This finding diverges from earlier studies, which suggested links between EPL and skill mismatches. In contrast, higher public spending on active labour market policies (ALMP) emerges as a significant factor in reducing underskilling. This suggests that ALMP's play an effective role in addressing skill shortages, although it appears to have no notable impact on overskilling. These findings differ from previous research. For instance, Marsden et al. (2002) found that lower investments in ALMPs was linked to higher skill mismatches, while Fregin et al. (2020) argued also that stricter ALMP implementation might increase mismatches. The variation in findings may reflect differences in measurement approaches – this report relies on self-assessed skill measures, whereas other earlier studies used objective metrics. It is also worth noting that this analysis focuses on skill mismatches at the start of employment, which may understate the long-term effects of macro-level factors like ALMPs. Over time, these policies may help individuals better align their skills with evolving labour market demands, potentially showing a stronger impact on skill alignment in longitudinal analyses.

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Appendix

Table A1. Overskilling at the start of the job.

	M1	M2	M3	M4	M5	M6	M7	M8
Gender (ref male)								
Female	-.111***	-.089*	-.048	-.055	-.057	-.071	-.073	-.076
Age (ref 24–39)								
40–54	-.009	.174***	.215***	.137***	.152***	.123***	.124***	.114***
55–65	.069	.451***	.532***	.429***	.434***	.399***	.399***	.400***
Highest ed (ref tertiary)								
Lower secondary or below	-.899***	-1.29***	-1.04***	-1.07***	-1.08***	-1.10***	-1.10***	-1.09***
Upper secondary	-.440***	-.394***	-.342***	-.329***	-.335***	-.348***	-.348***	-.358***
Post-secondary	-.270***	-.230***	-.185***	-.193***	-.192***	-.198***	-.198***	-.208***
Occupational group (ref high-skilled white collar)								
Low-skilled white-collar	.346***	.316***	.290***	.221***	.207***	.204***	.201***	.191***
High-skilled blue-collar	.167*	.143	.188	.110	.104	.092	.091	.089
Low-skilled blue-collar	.601***	.578***	.586***	.390***	.388***	.365***	.361***	.353***
Sector (ref professional, scientific and technical activities, administrative and support service etc.)								
Agriculture, forestry and fishing	.045	.029	.024	.018	.005	.006	.006	.022
Industry, construction and transport								
Whosesale and retail trade, accommodation and food service	.199***	.120**	.115**	.077	.081	.077	.077	.086
Tenure (years)		-.028***	-.028***	-.025***	-.025***	-.023***	-.023***	-.021***
Vocational qualification (ref non-vocational)								
Vocational		-.500***	-.180***	-.108**	-.103*	-.112*	-.112**	-.101*
Main activity before current job (employed in another job)								
Self-employed			.363***	.341***	.335***	.298***	.298***	.276***
In education and training			-.069	-.052	-.035	-.017	-.020	-.012
Unemployed			.199***	.108	.132*	.116	.104	.091

Inactive			.045	.067	.052	.001	-.001	-.011
Firm size (ref 1–9)								
10–49			-.011	.002	.008	.013	.013	.006
50–99			-.014	.012	.030	.030	.031	.011
100–249			.070	.116	.115	.113	.113	.077
250–499			.130	.201*	.197*	.197*	.197**	.167
500 and over			.083	.130	.129	.133	.133	.103
Skill (mis)match in previous job (ref overskilled)								
Well-matched			-1.28***	-1.30***	-1.30***	-1.30***	-1.30***	-1.29***
Underskilled			-1.00***	-1.03***	-1.03***	-1.02***	-1.02***	-.989***
Career alignment and development				-.170***	-.180***	-.179***	-.179***	-.176***
Job convenience and compensation					.016	.015	.015	.013
Situational barriers						.158***	.155***	.145***
Dispositional factors							.017	-.011
Labour market constraint								.268***
Constant	-.813***	-.500***	.148	1.34***	1.31***	1.25***	1.22***	1.12***
Number of countries	28	28	28	28	28	28	28	28
N	29 822	23 295	20 896	19 400	18 814	18 814	18 814	17 595

Source: Own calculations based on the European Skills and Jobs Survey (2014) for full-time workers, using multilevel logistic regression modelling. *** p ≤ .001; **p ≤ .01; * p ≤ .05.

Table A1 (Continued). Overskilling at the start of the job.

	M9	M10	M11
Gender (ref male)			
Female	-.079	-.048	-.076
Age (ref 24–39)			
40–54	.100**	.118***	.114***
55–65	.369***	.426***	.400***
Highest ed (ref tertiary)			
Lower secondary or below	-1.11***	-1.09***	-1.09***
Upper secondary	-.399***	-.358***	-.358***
Post-secondary	-.215***	-.189**	-.209***
Occupational group (ref high-skilled white collar)			
Low-skilled white-collar	.205***	.195***	.192***
High-skilled blue-collar	.116	.056	.091
Low-skilled blue-collar	.338***	.376***	.355***
Sector (ref professional, scientific and technical activities, administrative and support service etc.)			
Agriculture, forestry and fishing	.001	.039	.022
Industry, construction and transport			
Whosesale and retail trade, accommodation and food service	.063	.115*	.086
Tenure (years)	-.021***	-.021***	-.021***
Vocational qualification (ref non-vocational) Vocational	-.130***	-.108*	-.101*
Main activity before current job (employed in another job)			
Self-employed	.234**	.274***	.277***
In education and training	-.060	-.040	-.013
Unemployed	.060	.102	.090

Inactive	-.069	-.034	-.011
Firm size (ref 1–9)			
10–49	.024	-.003	.004
50–99	.021	.010	.009
100–249	.103	.061	.075
250–499	.122	.163	.165
500 and over	.166	.106	.100
Skill (mis)match in previous job (ref overskilled)			
Well-matched	-1.27***	-1.29***	-1.29***
Underskilled	-.984***	-.968***	-.989***
Career alignment and development	-.166***	-.176***	-.176***
Job convenience and compensation	.008	.014	.013
Situational barriers	.152***	.149***	.146***
Dispositional factors	-.016	-.018	-.011
Labour market constraint	.252***	.289***	.269***
Unemployment rate	.024*		
EPL		-.151	
ALMP			.311
Constant	.860***	1.49***	.987***
Number of countries	27	24	28
N	16 283	15 994	17 595

Source: Own calculations based on the European Skills and Jobs Survey (2014) for full-time workers, using multilevel logistic regression modelling. *** p ≤ .001; **p ≤ .01; * p ≤ .05.

Table A2. Underskilling at the start of the job.

	M1	M2	M3	M4	M5	M6	M7	M8
Gender (ref male)								
Female	.112***	.127***	.139***	.140***	.144***	.144***	.144***	.145***
Age (ref 24–39)								
40–54	-.136***	-.172***	-.103**	-.111**	-.095*	-.096*	-.096*	-.113**
55–65	-.304***	-.417***	-.311***	-.308***	-.284***	-.286***	-.286***	-.302***
Highest ed (ref tertiary)								
Lower secondary or below	-.039	.300***	.228***	.275***	.298***	.296***	.295***	.255***
Upper secondary	.018	-.005	.028	.014	.016	.015	.015	-.003
Post-secondary	-.003	-.008	.011	.005	.018	.017	.017	-.031
Occupational group (ref high-skilled white collar)								
Low-skilled white-collar	-.207***	-.224***	-.229***	-.235***	-.223***	-.223***	-.222***	-.227***
High-skilled blue-collar	-.138*	-.103	-.125	-.131	-.108	-.108	-.107	-.131
Low-skilled blue-collar	-.256***	-.160	-.162*	-.225**	-.199*	-.200*	-.199*	-.217**
Sector (ref professional, scientific and technical activities, administrative and support service etc.)								
Agriculture, forestry and fishing	.093*	.093*	.108	.097	.088	.088	.088	.100
Industry, construction and transport								
Whosesale and retail trade, accommodation and food service	-.023	.008	-.025	-.029	-.044	-.044	-.044	-.036
Tenure (years)		.013***	.011***	.011***	.011***	.011***	.011***	.012***
Vocational qualification (ref non-vocational)								
Vocational		-.137**	-.121*	-.076	-.063	-.063	-.063	-.060
Main activity before current job (employed in another job)								
Self-employed		-.013	-.038	-.129	-.126	-.127	-.127	-.156
In education and training		.227***	-.0003	.020	.026	.026	.027	.030
Unemployed		.320***	.251***	.214***	.216***	.215***	.219***	.208***
Inactive		.108	.044	.072	.077	.075	.075	.053
Firm size (ref 1–9)								
10–49			-.004	.021	.007	.007	.007	-.017
50–99			-.159***	-.119**	-.125**	-.125**	-.125**	-.159***
100–249			.009	.020	.003	.003	.003	-.006
250–499			.020	.072	.090	.090	.091	.065
500 and over			.031	.067	.053	.053	.053	.047
Skill (mis)match in previous job (ref overskilled)								
Well-matched			-.426***	-.425***	-.414***	-.414***	-.414***	-.398***
Underskilled			.926***	.926***	.916***	.916***	.916***	.921***
Career alignment and development				-.077***	-.050***	-.050***	-.050***	-.052***
Job convenience and compensation					-.044***	-.044***	-.044***	-.038*
Situational barriers						.006	.007	.024
Dispositional factors							-.006	-.017

Labour market constraint								.047
Constant	-.606***	-.723***	-.627***	-.119	-.045	-.047	-.039	-.070
Number of countries	28	28	28	28	28	28	28	28
N	29 420	22 857	20 119	18 681	18 079	18 079	18 079	16 865

Source: Own calculations based on the European Skills and Jobs Survey (2014) for full-time workers, using multilevel logistic regression modelling. *** p ≤ .001; **p ≤ .01; * p ≤ .05.

Table A2 (Continued). Underskilling at the start of the job.

	M9	M10	M11
Gender (ref male)			
Female	.121***	.161***	.144***
Age (ref 24–39)			
40–54	-.126****	-.106*	-.113**
55–65	-.329***	-.265***	-.300***
Highest ed (ref tertiary)			
Lower secondary or below	.249***	.222***	.261***
Upper secondary	-.007	-.013	-.003
Post-secondary	-.017	-.050	-.032
Occupational group (ref high-skilled white collar)			
Low-skilled white-collar	-.239***	-.229***	-.227***
High-skilled blue-collar	-.159*	-.119	-.134
Low-skilled blue-collar	-.237**	-.180*	-.218**
Sector (ref professional, scientific and technical activities, administrative and support service etc.)			
Agriculture, forestry and fishing	.123*	.110	.100
Industry, construction and transport			
Whosesale and retail trade, accommodation and food service	-.039	-.030	-.037
Tenure (years)	.012***	.011***	.012***
Vocational qualification (ref non-vocational)			
Vocational	-.055	-.096	-.060
Main activity before current job (employed in another job)			
Self-employed	-.132	-.176	-.157
In education and training	.017	.046	.031
Unemployed	.212***	.232***	.209***
Inactive	.028	.032	.053
Firm size (ref 1–9)			
10–49	-.015	-.040	-.016
50–99	-.166***	-.162**	-.157***
100–249	.016	-.050	-.005
250–499	.012	.032	.068
500 and over	.020	.032	.051
Skill (mis)match in previous job (ref overskilled)			
Well-matched	-.372***	-.396***	-.398***
Underskilled	.940***	.950***	.921***
Career alignment and development	-.053***	-.053***	-.053***
Job convenience and compensation	-.036*	-.038*	-.038*
Situational barriers	.029	.036	.024
Dispositional factors	-.020	-.033	-.018

Labour market constraint	.067	.057	.047
Unemployment rate	.005		
EPL		.066	
ALMP			-.416**
Constant	-.146	-.203	.109
Number of countries	27	24	28
N	15 789	15 078	16 865

Source: Own calculations based on the European Skills and Jobs Survey (2014) for full-time workers, using multilevel logistic regression modelling. *** p ≤ .001; **p ≤ .01; * p ≤ .05.

Table A3. Inter-job mobility, skill mismatch transitions.

	Matched to matched	Matched to underskilled	Overskilled to matched	Overskilled to overskilled	Matched to overskilled
Gender (ref male)					
Female	-.022	.273***	-.020	-.294***	.057
Age (ref 24–39)					
40–54	.122**	.082	-.132*	-.039	.273***
55–65	.197*	-.065	-.318***	.153*	.679***
Highest ed (ref tertiary)					
Lower secondary or below	.766***	.516***	-.865***	-1.40***	-1.02***
Upper secondary	.229***	.245***	-.001	-.478***	-.225**
Post-secondary	.133**	.156	.007	-.271***	-.057
Occupational group (ref high-skilled white collar)					
Low-skilled white-collar	.025	-.250***	.004	.344***	.086
High-skilled blue-collar	.142**	.003	-.207	.051	.072
Low-skilled blue-collar	.169*	-.256***	-.472***	.511***	.151
Sector (ref professional, scientific and technical activities, administrative and support service etc.)					
Agriculture, forestry and fishing	-.025	.095	-.058	.012	.014
Industry, construction and transport					
Wholesale and retail trade, accommodation and food service	-.050	-.008	-.084	.164**	.060
Previous occupation (ref different than now)					
Exactly the same	.843***	-.405***	-.484***	.188*	-.133
Similar	.562***	-.155**	-.264***	.045	.055
Tenure (years)	.007**	.016***	-.001	-.020***	-.027***
Vocational orientation	.070	.016	.034	-.116*	.038
Firm size (ref 1–9)					
10–49	-.005	-.021	.022	.077	-.065
50–99	-.049	-.266***	.194*	.103	.020
100–249	-.082	-.022	-.082	.143	.093
250–499	-.127*	-.100	-.020	.271**	-.045
500 and over	-.120*	-.042	.060	.229*	-.012
Career alignment and development	.054***	-.005	.101***	-.086***	-.147***
Job convenience and compensation	.035***	-.005	-.025*	.015	.014
Situational barriers	-.068	-.002	-.029	.163***	.089*
Dispositional barriers	.023	-.035	-.030	-.057*	.033
Labour market constraint	-.256***	-.109	.088	.288***	.178***
Constant	-1.75***	-2.054***	-2.235***	-1.48***	-1.43***
Number of Countries	28	28	28	28	28
N	20 921	20 921	20 921	20 921	20 921

Source: Own calculations based on the European Skills and Jobs Survey (2014) for full-time workers, using multilevel logistic regression modelling. *** p ≤ .001; **p ≤ .01; * p ≤ .05.

Table A4. Intra-job mobility, skill mismatch transitions

	Matched to matched	Overskilled to overskilled	Underskilled to matched	Matched to overskilled
Gender (ref male)				
Female	-.089*	-.149***	.229***	-.007
Age (ref 24–39)				
40–54	-.174***	.228***	-.181***	.065*
55–65	-.336***	.603***	-.373***	.132*
Highest ed (ref tertiary)				
Lower secondary or below	-.776***	-1.94***	.514***	.696***
Upper secondary	-.165***	-.410***	.178**	.271***
Post-secondary	-.125*	-.287***	.078	.174***
Occupational group (ref high-skilled white collar)				
Low-skilled white-collar	.073	.551***	-.320***	-.096***
High-skilled blue-collar	.047	.274**	-.146*	-.105
Low-skilled blue-collar	.164*	.854***	-.354***	-.309***
Sector (ref professional, scientific and technical activities, administrative and support service etc.)				
Agriculture, forestry and fishing	-.128***	-.049	.077	.005
Industry, construction and transport				
Wholesale and retail trade, accommodation and food service	-.012	.156***	-.112*	-.049
Tenure (years)	.014***	-.041***	.014***	.005*
Vocational orientation	.068	-.133***	-.018	.177***
Firm size (ref 1–9)				
10–49	.060	.059	-.058	.011
50–99	.100	.117	-.168*	.074
100–249	.057	.084	-.126*	-.016
250–499	.025	.224**	-.105	-.040
500 and over	.131*	.192*	-.095	-.069
Current job characteristics	-.054	-.103***	.161***	.015
Changes in job characteristics	-.032*	-.214***	.152***	.053***
Workplace changes	.060***	.012	.089***	-.160***
Changes in job role: have been promoted	-.067	.073	.063	-.116***
Changes in job role: tasks and responsibilities have changed	.001	.282***	-.070	-.132***
Changes in job role: lower level job position	.328***	.321*	-.448**	-.483***
Changes in job role: role has remained the same	-.172**	.001	-.087	.187***
Constant	-1.57***	.257	-3.29***	-1.038***
Number of Countries	29 729	29 729	29 729	29 729
N	28	28	28	28

Source: Own calculations based on the European Skills and Jobs Survey (2014) for full-time workers, using multilevel logistic regression modelling. *** p ≤ .001; **p ≤ .01; * p ≤ .05.

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This D5.1 working paper represents the views of the authors based on the available research. It is not intended to represent the views of all Skills2Capabilities affiliates.

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