D5.4. Synthesis report: unlocking capabilities, reframing skills mismatch

Skills2Capabilities Working Paper 5.4

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ABSTRACT

The report offers an extended interpretation of skills mismatch within the capability framework. It examines the multifaceted drivers and consequences of skills mismatch, prioritising the employee's perspective. The analysis investigates how vertical educational mismatch is related to inclusive economic growth, identifies key factors contributing to job-skill mismatches, explores the influence of mismatch on individuals' subjective well-being at work and perception of fairness, and analyses the relationship between mismatch and participation in job-related training. Challenging the dominant narrative that views mismatch solely as underutilised skills, this report argues for a broader understanding that incorporates societal implications, including influence on inclusive growth, well-being at work and perceptions of social justice. It demonstrates that skills attainment and utilisation extend beyond individual responsibility and labour market efficiency. This report synthesises findings from work package 5 of the Skills2Capabilities project.

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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.

This Working Paper is part of the Skills2Capabilitiy Work Package entitled 'Drivers and effects of skills mismatch'

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1. Introduction

The current policy debate on the future of work, unfolding amid economic, political, social, and ecological crises, significantly shapes how we understand problems and solutions to skills mismatch. The COVID-19 pandemic accelerated digital transformation in several sectors (Cedefop, 2023), increasing the demand for digital skills beyond the IT sector (Centeno et al., 2022). Consequently, skills shortages have been dominating the debates on skills mismatch (Bertoni et al., 2024). In these debates, public attention tends to focus on its implications for labour market efficiency, where mismatched workers are seen as underutilising their human capital (McGuinness, 2006; OECD, 2016). The solutions tend to be framed in terms of better alignment between education, training, and employer needs (Cedefop, 2020; ILO, 2021). This market-driven perspective, particularly dominant both among policymakers and practitioners, often assumes that the responsibility for closing the gap lies primarily with individuals adapting and adjusting their behaviour to the changes in labour market demands (Brown, Lauder, & Ashton, 2011; Keep, 2016). It often frames skills mismatch as an issue of underutilised skills, where individuals are seen as failing to meet the expectations of the labour market, resulting in suboptimal investments, either by the state or the employer, in their education and training. Such perspective often overlooks the broader ways in which skills and the opportunity to apply them are tied to citizenship, workplace satisfaction, and work-life balance—factors that ultimately benefit both employers and society at large.

By applying the capability approach (Sen, 1992; Nussbaum, 2000), this report responds to the recent calls to acknowledge the complex and multifaceted nature of discrepancies in skill supply and demand, to avoid focusing solely on employers' perspective on skill mismatch but a wider range of measures to improve worker adaptability to economic change (Cedefop, 2018). It proposes an alternative framework around skills and skills mismatch that moves beyond the neoliberal perspective, which treats education and qualifications primarily as instruments for enhancing individual employability and driving economic growth. Instead of focusing solely on people's resources, this approach situates individuals within their broader socio-economic contexts, examining how people from different social backgrounds engage with and benefit from their skills and education (Bozalek, 2013; Walker et al., 2003).

Both the drivers and consequences of mismatch are embedded within broader social and economic structures, shaping and being shaped by a network of interactions that goes beyond the workplace. A more nuanced understanding of skills mismatch recognises its implications not only for economic growth but also for social justice, individual well-being, and inclusive participation in society. Therefore, this report contributes to the ongoing discussions on skills mismatch by systematically analysing and interpreting skills mismatch in ways that also account for wider societal dimensions.

To achieve this, we synthesise and interpret findings from three separate but complementary working papers within the Skills2Capabilities project: Working Paper 5.1 (Martma, 2024), Working Paper 5.2 (Martma et al., 2025), and Working Paper 5.3 (Boyadjieva et al., 2024). Our analysis and interpretation

are anchored in the theoretical framework of the capability approach, originally developed by Amartya Sen and further expanded by scholars such as Nussbaum and Robeyns. Building upon these insights, this synthesis report seeks to advance the discussion beyond the traditional utilitarian interpretation of the labour market, emphasising the relationship between individuals' skills, whether present or lacking, and their broader capabilities. To this end, the present report is structured into six analytical sections. Each analytical section draws upon findings from the three above-mentioned working papers to address the following research questions:

- What is the nature and trends of skills mismatch in Europe?
- How does vertical educational mismatch relate to inclusive economic growth?
- What are the key factors that influence the mismatch between jobs and skills?
- How is skills mismatch related to participation in job-related training?
- How does the vertical educational mismatch relate to perceptions of justice, and how is this relationship embedded in different economic and political contexts?
- How does skills mismatch impact the individual's subjective well-being at work?

1.1 Capability Approach - capabilities as a window to well-being

Throughout the findings, we interpret capabilities to reflect a person's freedom and ability to lead a life that they value; a set of alternatives or opportunities available to them regarding what they are free to do and achieve (Sen, 1999: 75). A person's capabilities enable them to conceive of what a good life should entail and to engage in critical reflection while planning their life (Nussbaum, 2000). From the constrained capabilities available to individuals, they can achieve what Sen and Nussbaum call *functionings* — specific valued ways of being and doing in which a person actively chooses to engage. What constitutes a valuable functioning may vary depending on individual circumstances, cultural context, and societal norms (Nussbaum, 2000: 14), yet it encompasses all essential human qualities and rights (ibid.: 89). In this synthesis report, we have aimed to balance individual agency and a conscious decision-making process, in addition to considering external influences. There are structural constraints that limit the capabilities, such as economic opportunities, political liberties, basic education (Sen, 1999: 5), environmental diversities, variations in social climate, and differences in relational perspectives and distribution within the family (Sen, 1997: 386).

The capability approach acknowledges the embeddedness of skills in both the individual (internal capabilities) and the broader socio-economic context (external conditions) (Heckman and Corbin, 2016). Therefore, throughout this report, we aim to capture and explore some of these structural constraints grounded in economic and political contexts. Regarding the structural constraints, for example, we establish a connection between unjust inequality and disparities in the achieved functionings. More specifically, section 3 of this report explores the relationship between skills mismatch and inclusive economic growth, arguing that addressing skills mismatches can contribute to fairer societies by enabling individuals to lead fulfilling lives and participate more fully in the economy. It draws on the capability

approach to highlight how overcoming income disparities through addressing skills mismatches can lead to broader social well-being and inclusion. Moreover, section 5 emphasises the importance of fairness in opportunities, particularly in education and earnings, drawing on the capability approach to argue that unjust inequality stems from restricted freedoms rather than outcomes alone. It highlights that perceived unfairness in these areas negatively impacts active citizenship, well-being, and work effort, with social context playing a crucial role in mitigating these effects.

The individual socio-demographic characteristics and their relationship to skills mismatch are explored by mapping individual drivers of skills mismatch and well-being at work. According to the capability approach to skills mismatch, skills are not inherently valuable but rather serve to empower individuals to pursue lives aligned with their values and freedoms. For example, improving skills through job-related training participation relates to workers' "functionings", what they can achieve or experience (Sen, 1999: 55). Section 4 examines factors influencing skills mismatch, highlighting that individuals prioritising career alignment tend to have better job matches. The capability approach suggests that actively pursuing career development not only leads to better job alignment but also enhances one's capabilities by continuously seeking opportunities to utilise and refine skills, though exceptions exist based on factors like age and gender. Section 5 discusses job-related training, framing it within the capability approach by highlighting how access to training fosters skill development, enhances employability and prevents capability deprivation. The analysis underscores how workplace characteristics, economic factors, and employer support shape workers' training opportunities, ultimately influencing their broader human capabilities and workplace well-being.

Nussbaum proposes fundamental capabilities that are central to any human life, which can be viewed as an extensive list of opportunities for functionings, such as being healthy; safe, using one's senses, imagining, thinking, and reasoning (all informed by adequate education), planning one's life according to personal values (ibid.: 79-80), without listing economic wealth as a capability in its own right. Similarly, echoing the fundamental human capabilities, the subjective well-being at work, discussed in section 7 of this report, is considered to be more than just job satisfaction or salary (Nussbaum, 2000: 12) and explores how skills mismatch impacts this well-being. Well-being at work is a multidimensional phenomenon that, in addition to individuals' satisfaction with instrumental dimensions, includes their attitudes towards aspects that reflect intrinsic values, such as interest in their work, opportunities for continuous learning, acquiring digital skills, professional growth, and interpersonal relationships. Ultimately, this report underscores that fostering individual capabilities, addressing skills mismatches, and ensuring fairness in opportunities are not merely economic considerations. Instead, they are fundamental prerequisites for building inclusive and equitable societies where individuals can fully realise their potential and lead lives they value.

By combining insights from multiple working papers and grounding the analysis in the capability approach, the remainder of this report aims to provide a comprehensive understanding of skills mismatch that highlights its societal dimensions and emphasises the relationship between individuals' skills, their broader capabilities, and the opportunity to lead lives they have reason to value.

1.2 Conceptualising skills mismatch: typologies and measurement

Skills mismatch, as outlined by Cedefop (2010) and McGuinness et al. (2018), can take different forms, including overeducation and undereducation, overskilling and underskilling, horizontal mismatch, skill shortages, skill gaps, and skill obsolescence. Research based on data collection by the Program for the International Assessment of Adult Competencies (PIAAC) and the European Skills and Jobs Survey (ESJS) indicates that both overskilling and overeducation are among the most prevalent forms of mismatch (IME 2018). From the perspective of the aims set for this report, a key concern in the literature is the assumption that skills mismatches are inherently costly for individuals, enterprises, and societies (Cedefop, 2010; Quintini, 2011), leading to lower wages, reduced job satisfaction, decreased firm productivity, and broader economic inefficiencies. While some of these consequences are linked to more classic, and not unimportant, economic arguments, our synthesis aims to complement this with a broader humanistic approach to skill-related well-being at work and in society.

Within the capability approach (Sen, 1999), development is viewed as the expansion of persons' capabilities to lead the kind of lives they value and have reason to value. If this reasoning is applied to skills mismatch, it could be claimed that overcoming it is not desirable for its own sake; rather, it is a means to avoid the deprivation of people's capabilities and enable them to lead the kind of lives they have reason to value. The mismatches between education and work addressed in this report can broadly be divided into educational (or qualification) and skills mismatches. While both education (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). Accordingly, research on both education and skill mismatches has the potential to complement each other.

Educational mismatches arise when a person's education is different from that required by the job. Educational mismatches in terms of level, i.e. vertical educational mismatches are the focus of section 3 ('Skills mismatch and inclusive economic growth'), section 6 ('Skills mismatch, perceived fairness of educational opportunities and remuneration') and section 7 ('Skills mismatch and multidimensionality of well-being at work'). Importantly, in this report, the terminology is suggested to reflect the application of the capability approach. Usually, imbalances between level of education of worker and that required by job are characterised as 'overeducation' (i.e. a situation where a worker has educational qualifications over and above those required to either perform or get their current job, or 'undereducation' (i.e. situation where a worker has insufficient educational qualifications relative to those required to either perform or get their current job, see McGuinness et al., 2025 for both). In Working Paper No. 5.3, Boyadjieva et al. (2024) argue that the term 'overeducation' reduces the complexity of benefits from education to the labour market because, in fact, education can be used in diverse social spheres. Instead of 'overeducation' and 'undereducation', vertical educational mismatch above and vertical educational

mismatch below are used to explore the broader implications of vertical educational mismatch for individuals and societies.

Educational mismatches in terms of the field of study, i.e. horizontal educational mismatches, occur when 'workers are employed in jobs that are not relevant to the skills and knowledge accumulated by them in formal education' (McGuinness et al., 2018; Cedefop, 2022). Links between horizontal mismatch and subjective well-being at work are studied in section 7.

Skill mismatches, as the imbalances between workers' skills and job requirements, are explored in section 2 (Mismatch between employees' skills and jobs in Europe), section 4 (Drivers and barriers of skills mismatch) and section 7 (Skills mismatch and multidimensionality of well-being at work). In these sections, overskilling refers to a situation where a worker is deemed to have excess skills or competencies relative to what is required to competently do their current job. Accordingly, underskilling refers to a situation where a worker's skills or competences are deficient relative to what is required for their current job (McGuinness et al., 2025). Additionally, the perception of the extent of skills utilisation as characteristic of skill imbalances is used in section 4.

Approaches to measuring educational and skill mismatches can be categorised into objective and subjective methods (ILO, 2018); both of these are used in the different sections of this report. Among this distinction, the objective approaches include the normative method, which defines educational requirements for specific occupations or occupational groups, and the statistical method (applied in sections 3 and 6), which compares an individual's education or skills with the modal or mean level of education and skills of workers in the same occupational group. This statistical approach is also known as the "realised matches" method (Muñoz de Bustillo Llorente et al., 2018; Roosmaa, Saar, and Martma, 2023). In contrast to the normative and the statistical method, the subjective approach (applied in sections 2, 4, 5 and 7) relies on self-assessment, where individuals evaluate how well their education and skills align with the requirements of their job. Each of these approaches provides a distinct perspective on understanding and quantifying skills mismatch. The objective approaches—the normative and statistical methods—rely on externally defined standards: either by setting educational requirements for specific occupations (normative) or by comparing individuals' education and skills to the average levels within their occupational group (statistical). In contrast, the subjective approach captures individuals' own perceptions of whether their skills and education align with their job requirements, highlighting the more personal, self-assessed dimension of skills mismatch. Together, these methods offer complementary insights, highlighting the complexity of accurately measuring skills mismatch from both external and internal points of view. By combining insights from multiple working papers and grounding the analysis in the capability approach, the remainder of this report aims to provide a comprehensive understanding of skills mismatch that highlights its societal dimensions and emphasises the relationship between individuals' skills, their broader capabilities, and the opportunity to lead lives they have reason to value.

2. Mismatch between employees' skills and jobs in Europe

The synthesis of the results presented throughout this paper offers insight into the general trends of skills mismatch and capabilities seen across Europe, drawn from a wide range of data sources. However, the current section, in particular, illustrates the tenacious nature of skills mismatch across Europe, highlighting some notable country differences. The section highlights a general framing for this synthesis report: namely, that opportunities are not evenly distributed but are shaped by broader socio-economic and institutional contexts, often meaning that an individual's access to skill development or employment that matches their skills is often constrained by factors beyond their control, such as national investment in education, labour market flexibility, and social support systems. This guiding theme is rooted throughout the different sections of this report. Furthermore, beyond the immediate impact on productivity, skills mismatches can significantly affect workers' overall well-being and long-term career prospects.

The findings analysed in this section draw on Working Paper No 5.1 of the Skills2Capabilities project[1]. Working Paper No 5.1 applies multilevel logistic regression analysis to the data from the 2014 European Skills and Jobs Survey (ESJS), surveying approximately 49,000 adult full-time employees from all 27 EU Member States and the UK.

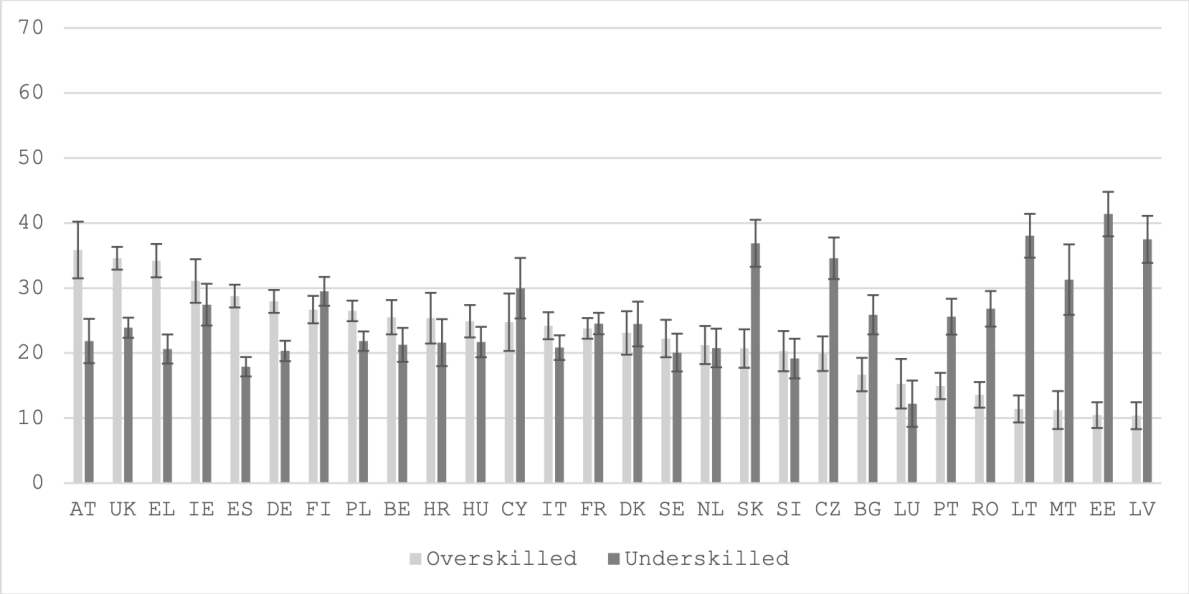

Figure 1. Skills mismatch at the start of the job as reported by the employees across countries
Source: Skills2Capabilities Working Paper No 5.1: 19.

[1] For more in-depth information on the data structure, variable operationalization's, analytical approaches and expanded and more detailed overview of the results, we highly recommend referring to Skills2Capabilities Working Paper No 5.1 on the Skills2Capabilities website.

The data provides a retrospective perspective on how employees' self-assessment of their skills evolves between two time points. First, they were asked to assess their skills retroactively at the time of starting their job and then compare that with their self-assessment at the time of the survey. Based on this data, we see that in 2014, skills mismatch varied significantly across Europe (Figures 1 and 2). When starting a job, employees in Western European countries such as the UK, Austria, and Greece were more likely to be overskilled, meaning their qualifications and abilities exceeded job requirements (Figure 1). In contrast, workers in East European countries like Slovakia, the Czech Republic, Lithuania, and Estonia were more likely to be underskilled compared to their Western European counterparts, starting jobs with skill levels below those required for their position. In Western Europe, overqualified individuals secure jobs and continue to enhance their skills while working. Meanwhile, in Eastern Europe, employees often begin jobs without sufficient skills but gradually acquire them over time. Factors such as economic conditions, labour market policies, and structural barriers could be some of the common explanations for their capability sets and influence how skills are utilised across different countries (Robeyns, 2017; Sen, 1997, 1999).

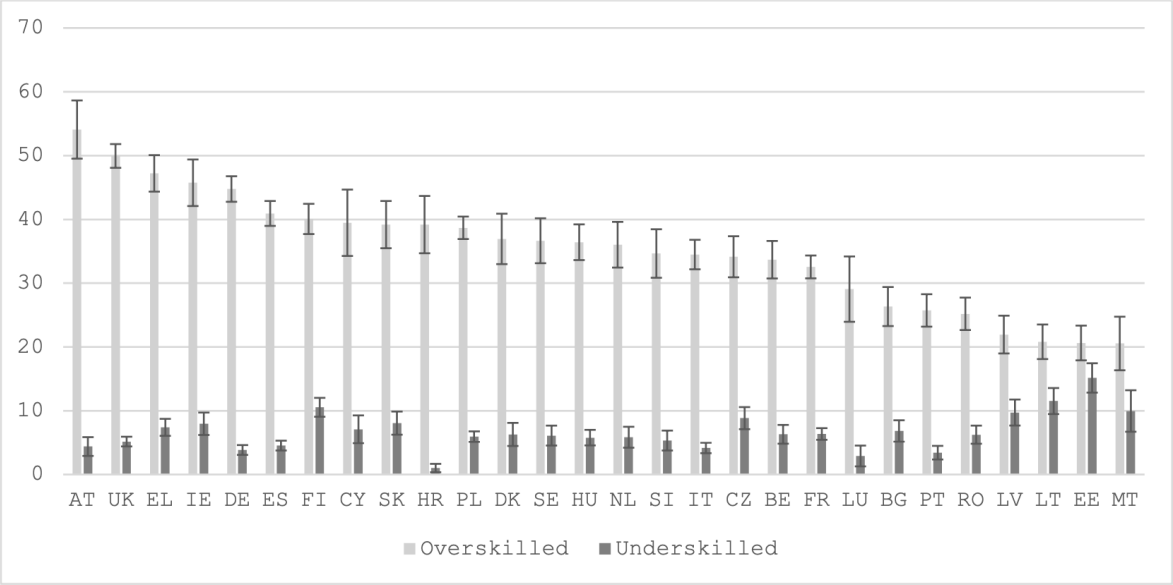

Figure 2. Skills mismatch at the time of the survey, as reported by the employees across countries
Source: Skills2Capabilities Working Paper No 5.1: 20.

Moreover, a pattern emerges across countries, as we see that the longer one's tenure at a job is, the more likely one is to be overskilled, while longer tenure at a job is associated with a lower likelihood of being underskilled (Figure 2). This trend illustrates that, as expected, employed individuals generally improve their skill levels. Several factors might explain this, including on-the-job learning and access to workplace or external training. The increasing prevalence of overskilling in European workplaces raises concerns about whether it represents real skill development or reflects limited career progression

opportunities and repetitive job tasks. The results of Working Paper No 5.1, unfortunately, do not allow for more detailed country-by-country comparisons, but the East-West disparity remains a relevant backdrop to keep in mind when contextualising the discussion of predictors of skill mismatches that we cover in the next sections of this report.

The trend could be explained through supply and demand dynamics, for example, with labour markets not absorbing skilled workers effectively, related to employees being overskilled in some countries and underskilled in others. The time of the survey, 2014, however, is also significant in providing further context to these trends; the lingering effects of the global financial crisis may have shaped employment structures, job availability, and access to training opportunities across Europe. These results show that opportunities are not evenly distributed but are shaped by broader socio-economic and institutional contexts. However, relying on the capability approach perspective, we could also argue that skills mismatches reflect capability deprivation[2] with wider consequences for the individual (such as his/her well-being, active citizenship, fairness of net pay or educational opportunities, etc.) than just income deficiency because even if workers are employed, they may not have opportunities to fully utilise or develop their skills. At the same time, there is evidence that participation in non-formal adult education (most of which is job-related) is associated with higher levels of individual subjective well-being (Boyadjieva and Ilieva-Trichkova, 2024).

Although employees become less underskilled over time as they gain experience in their roles, this does not necessarily mean they have opportunities to move into better-matched jobs or positions that allow them to fully realise their potential as it does not necessarily also mean that they have opportunities to transition into better-matched jobs or roles that enable them to reach their full potential.

3. Skills mismatch and inclusive economic growth

Within the EU, the importance of social cohesion is prioritised at the highest level. The European Commission (2020) highlights the connection between a high-employment economy and social cohesion, stressing that empowering individuals through high levels of employment, investing in skills, fighting poverty and modernising labour markets, training and social protection systems enables people to better anticipate and manage change, thereby strengthening social cohesion. This section explores and contextualises the relationships between educational mismatch and inclusive economic growth. Its guiding assumption stems from the well-established fact that although economic growth positively influences the average quality of life, there still remains wide income inequalities across countries and different levels of within-country poverty and in order to overcome this discrepancy, economic growth needs to be inclusive (Wilkinson and Pickett, 2009; Stiglitz, 2012).

[2] Capability deprivation can be seen as states in which capabilities are insufficient for a person to act and ensure good quality of life. Thus, Sen (1999) understands poverty as deprivation in the capability to live a good life.

Conceptually, the idea of inclusive growth highlights that growth with equity is possible and that growth, inequality and poverty reduction are interrelated (Ranieri and Ramos, 2013). Inclusive growth requires achieving sustainable growth that expands economic opportunities and ensures broader access to these opportunities for all members of society (McKinley, 2010). The definition of inclusive growth has three components. It is: 1) strong economic growth that is also 2) inclusive and 3) sustainable. In turn, inclusion refers to benefit-sharing, opportunity, participation, and empowerment (Cerra, 2022). The argument made in this section aligns with these ideas. It is based on the understanding of inclusive growth as a multidimensional phenomenon and its definition as strong and sustainable economic growth that is accompanied by shared improvements in well-being among all social groups.

The section draws on analyses in Working Paper No 5.3[3] and presents findings about the relationships between vertical educational match and vertical educational mismatch above and below as types of skills mismatches and inclusiveness of economic growth at the national level. Similar to the rest of this report, the interpretation of the results is grounded in the capability approach as it allows to extend beyond the economic and instrumental perspective towards skills formation and to consider other roles that skills/educational mismatch might have in society. Within the capability approach (Sen, 1999), this line of reasoning is viewed as the expansion of persons' capabilities to lead the kind of lives they value and have reason to value. When applied to skills and educational mismatch, it could be argued that overcoming income and wealth disparities is not desirable for its own sake; rather, it is a means to avoid the deprivation of people's capabilities and enable them to lead worthy and dignified lives and to build fair, inclusive and flourishing societies.

3.1 The importance of studying the connection between vertical educational mismatch and inclusive economic growth

At a theoretical level, human capital has been viewed as a main factor for economic growth. However, the empirical evidence for the effect of human capital on growth in some studies is weak and controversial (e.g. Sunde and Vischer, 2015). This has led researchers to focus more on the balance between the supply and demand of level and type of skills and to argue that the mismatch between the supply and demand of skills influences the growth–education relationship (e.g. Atiq-ur-Rehman and Khan, 2021). The existence of vertical educational mismatch – both above and below – signals that the acquired educational level is not a correct measure of human capital because it does not take into account whether the individuals' skills and knowledge associated with it are utilised in their jobs. Furthermore, the differences in the benefits and productivity between employees who are matched and those who experience vertical skills/educational mismatch (Brunello and Wruuck, 2021) represent a threat to equality of opportunities and just benefits-sharing and thus to inclusiveness of growth. This

[3]For more in-depth information on the data structure, variable operationalization's, analytical approaches and expanded and more detailed overview of the results, we highly recommend referring to Working Paper No 5.3 on the Skills2Capabilities website.

reasoning and the above short discussion on inclusive economic growth provide the ground for focusing the analyses on the relationship between vertical educational mismatch and inclusive economic growth.

3.2 Vertical educational mismatch and inclusive growth: empirical evidence

The results discussed in this section are based on correlation analyses utilising data from the European Social Survey for 2018. This particular survey wave was chosen because of its special rotating module devoted to justice and fairness, and the fact that it was the last wave before the COVID-19 pandemic. This dataset provided an opportunity to include 29 European countries in the analyses. The analytical sample was restricted to those respondents aged 25–64 years who reported having paid work in the past 7 days.

The analyses are based on the following operationalisation of the different types of vertical educational mismatch:

- vertical mismatch – a type of skills mismatch where an individual's level of education does not align with the level required for their job;
- vertical mismatch above – when an individual has a higher level of education than needed for the job;
- vertical mismatch below– when an individual has a lower level of education than required for the job.

In turn, vertical educational match refers to a situation in which the individual's level of education corresponds to the level of education required for the job.

The results uncovered several statistically significant associations between the levels of vertical educational match, vertical mismatch above and vertical mismatch below in a given country, on the one hand, and part of the measures of inclusive economic growth, on the other.

To capture the inclusiveness of economic growth, the following indicators were used: Inequality-adjusted HDI, the Gini coefficient of equivalised disposable income, the level of unemployment, the at-risk-of-poverty rate by poverty threshold, the persons at risk of poverty or social exclusion, and the in-work at-risk-of-poverty rate. Only the statistically significant correlations are discussed below.

Figures 3 and 4 illustrate the relationships between the proportion of vertical educational match among the people aged 25–64 who have paid work and the at-risk-of-poverty rate by threshold and in-work at-risk-of-poverty rate. More specifically, they show that a higher level of educational match among the people aged 25–64 who have paid work in a given country is associated with lower at-risk-of-poverty values and with a lower level of in-work poverty (Figures 3 and 4). Regarding different occupational groups, the results reveal that a higher level of vertical educational match for the occupational group of high-skilled blue-collar workers is associated with lower in-work at-risk-of-poverty rate, lower at-risk-of-

poverty values and lower economic inequalities. Working Paper No 5.3 provides evidence that the relationship between the in-work at-risk-of-poverty rate and the percentage of low-skilled blue-collar workers who are educationally matched in a given country. It shows that the higher the level of vertical educational match among the low-skilled blue-collar group in a given country, the lower the level of in-work poverty and vice versa.

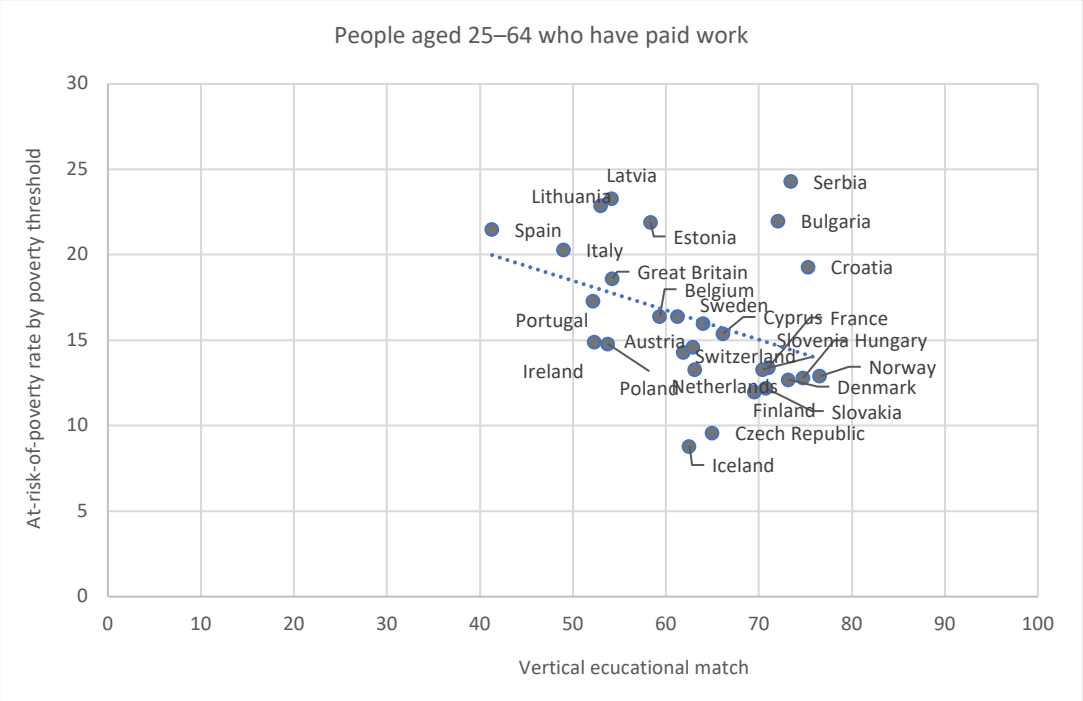

Figure 3. Scatterplot of proportion of vertical educational match against at-risk-of-poverty rate by threshold
Source: Adapted from Skills2Capabilities Working Paper No 5.3: 22.

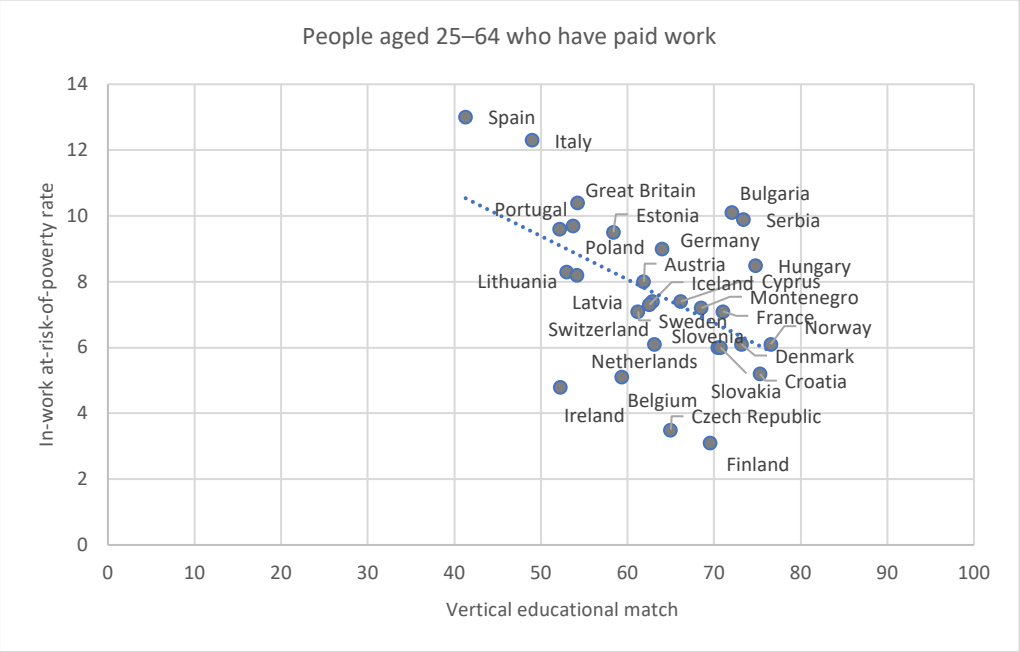

Figure 4. Scatterplot of proportion of vertical education match against in-work at-risk-of-poverty rate
Source: Adapted from Skills2Capabilities Working Paper No 5.3: 24.

As regards the vertical-above educational mismatch, the obtained results show that the higher the vertical-above educational mismatch among the population aged 25–64 who have paid work, the higher the at-risk-of-poverty rate by the poverty threshold. In relation to vertical-below educational mismatch, the findings reveal that the higher the level of vertical-below educational mismatch among the population 25–64 who have paid work in a given country, the higher the level of in-work poverty and vice versa. The analyses for different occupational groups show that the higher the level of vertical-below educational mismatch for low-skilled white-collar workers in a given country, the higher the level of in-work poverty and vice versa. A higher level of vertical-below educational mismatch among high-skilled blue-collar workers is associated with higher rates of in-work at-risk-of-poverty and unemployment. Additionally, in the analyses in Working Paper No 5.3 has revealed that a higher level of vertical-below educational mismatch among low-skilled blue-collar workers in a given country is associated with a higher level of in-work poverty.

3.3 Conclusion: encouraging vertical educational match to promote inclusive economic growth and to avoid capability deprivation

The findings show that for the population aged 25–64 and certain occupational groups, higher levels of educational matching are linked to lower at-risk-of-poverty and in-work poverty rates. Therefore, the extent of skills mismatch in a country can serve as a valuable indicator of the inclusiveness of its economic growth. The analyses also reveal that the associations between vertical educational mismatch and inclusive growth differ among occupational groups. This is in line with previous research, as Roosmaa et al. (2023) have shown that there are substantial differences in skills/educational mismatch between

occupational groups. The present section goes further by demonstrating that the relationship between skills/educational mismatch and inclusive growth at the societal level vary among different occupational groups. More concretely, the results suggest that the labour market situation of the high-skilled blue-collar occupational group plays a crucial role in the inclusive economic growth in a given country. Thus, higher levels of vertical educational match for this group are associated with lower values of income inequalities, at-risk-of-poverty rates, and in-work poverty rates in the countries where they work. In addition, the higher the vertical-below educational mismatch for this occupational group is, the higher the levels of unemployment. It can be suggested that these results reflect the fact that the existence of adequate and well-qualified high-skilled blue-collar workers is an important factor in the development of key economic sectors, such as energy, production, construction, agriculture, and manufacturing.

Stimulating vertical educational match is a way to promote inclusive economic growth. As already outlined (McKinley, 2010; Cerra, 2022), achieving inclusive economic growth means that all members of society should have the capabilities to participate in and benefit from economic activity. In essence, the research demonstrates that skills mismatch is not just an economic inefficiency but a barrier to people's fundamental capabilities, as it prevents people from developing their capability to have a decent job and high-quality work (see Stephens, 2023). By focusing on educational match, especially for vulnerable groups and key occupational groups, societies can create more equitable and inclusive opportunities for all. At the same time, besides the differences in country-level context of mismatches and freedoms, it is important to look at individual's capabilities to choose a well-matched job and thus to enhance their work-related well-being. The following section looks at the individual-level drivers and barriers that influence whether individuals find well-matched employment or accept mismatched jobs, and how these factors impact skills mismatch.

The year 2018 and data from the European Social Survey 2018 can serve as an important reference point for understanding both educational mismatches and inclusive growth in the European context. This wave of the European Social Survey was the last in which all countries followed the same mode of data collection: face-to-face interviews. In the following rounds, due to difficulties brought on by the COVID-19 pandemic, switching to a self-completion signifies a considerable drop in response rates in some countries. In turn, in 2018, European societies were characterised by a functioning democracy and an economy recovered after the 2008 crisis. This year can be used as a reliable basis for assessing the later effects of the COVID-19 crisis and the rapid development of artificial intelligence on the economy, education and labour market. Further studies based on data from the next waves of the European Social Survey could use the results obtained in Working Paper No 5.3 in a comparative perspective.

4. Key factors influencing the mismatch between jobs and skills

Understanding the factors that may drive individuals to seek either well-matched employment or, instead, to accept mismatched jobs is central to the discussions around skills mismatch. In our approach, we have aimed to balance individual agency and a conscious decision-making process, in addition to

external influences. Career motivation is not solely a personal trait but something that can be nurtured. Therefore, external factors, such as employer-provided training and professional development programs (explored in more detail in the next section), could play a crucial role in fostering a workforce that actively pursues career paths aligned with employees' skills.

4.1 Individual-level drivers and barriers of skills mismatch

To capture the employee perspective on the relationship between their skills and the skills expected at their job, various individual-level characteristics were considered in Working Paper No 5.1, grounded in the data of the 2014 European Skills and Jobs Survey (ESJS)[4]. ESJS is a cross-national survey conducted across 27 countries, targeting all adults (aged 25–64) in wage and salary employment (i.e. paid employees, excluding those who are self-employed or family workers). Analyses based on ESJS 2014 data are an invaluable empirical basis for making comparisons with the post-COVID-19 situation. The analytical sample for the models was 30,585 employed adults, while the sample for the job-related training analyses was 28,834 employed adults. In this section, in line with the overarching aim of this synthesis report, we are interpreting the results of these analytical models through the capability approach. To capture how well an individual's job aligns with their career goals and professional growth, the concept of career alignment and development was constructed and applied (Working Paper No 5.1, 22-23). The analytical models captured its impact on skills mismatch, revealing that workers who prioritise career alignment are less likely to be either overskilled or underskilled, indicating a better match between their skills and job roles (Figure 5). This finding suggests that individuals who actively seek roles aligned with their career aspirations are more likely to experience a harmonious fit between their competencies and job requirements, minimising inefficiencies associated with skill mismatches and enhancing overall job satisfaction and productivity. This finding is expected, as individuals who actively seek roles that align with their career aspirations are also more likely to secure well-matched positions. From the capability approach perspective, this suggests that employees who prioritise career development are engaging in a continuous cycle of skill enhancement. By strategically selecting job opportunities that align with their expertise and long-term aspirations, they are not only ensuring a strong match between their competencies and their roles but also fostering personal and professional growth. This process allows them to refine existing skills while acquiring new ones, thereby increasing their adaptability and employability over time. In essence, career-aligned job choices serve as a mechanism through which workers actively shape their professional trajectories, reinforcing their ability to meet evolving labour market demands and further strengthening their capabilities. However, as we see further in this section, there are some exceptions to this general pattern, for example, age and gender.

[4] For more in-depth information on the data structure, variable operationalization's, analytical approaches and expanded and more detailed overview of the results, we highly recommend referring to the Working Paper No 5.1 on the Skills2Capabilities website.

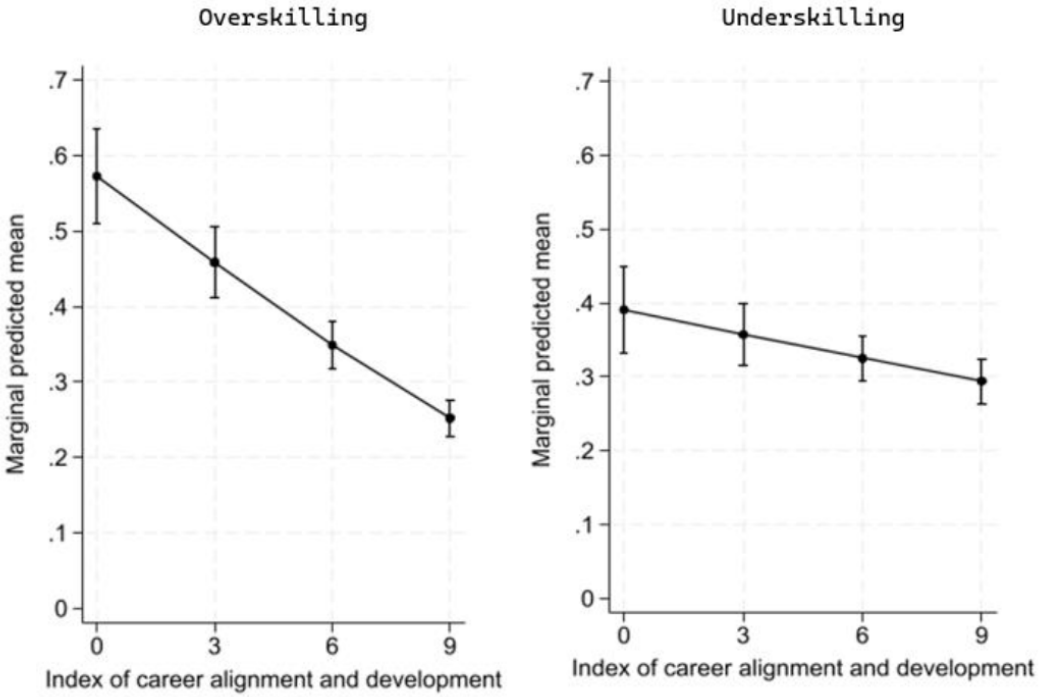

Figure 5. Employee's career alignment and development predicting skills mismatch
Source: Skills2Capabilities Working Paper No 5.1: 23.

Another key factor explored in the Working Paper No 5.1, which may influence an employee's decision to accept a job they are not well-matched for, is job convenience and compensation. At the start of employment, factors such as good pay and work-life balance do not necessarily increase the likelihood of being overskilled (Figure 6). However, job convenience and compensation primarily lower the risk of being underskilled when starting a job. This suggests that employers who offer better compensation and working conditions may also be more effective in ensuring that their workforce meets the minimum required skill levels, reducing the likelihood of employees being placed in roles where they lack the necessary competencies.

From a capability approach perspective, this has important implications: when workers have access to jobs that appropriately match their skill levels, they are better positioned to exercise their agency in shaping their professional development. A job that meets basic skill requirements provides individuals with the stability and foundational competencies needed to expand their capabilities over time. Adequate compensation and favourable working conditions contribute to employees' ability to make career decisions based on growth potential rather than financial necessity, allowing them to invest in skill development, further education, and long-term career planning. In this sense, ensuring that workers are not underskilled in their roles strengthens their ability to convert job opportunities into meaningful

career advancements, promoting the interplay between economic security, professional growth, and capability expansion.

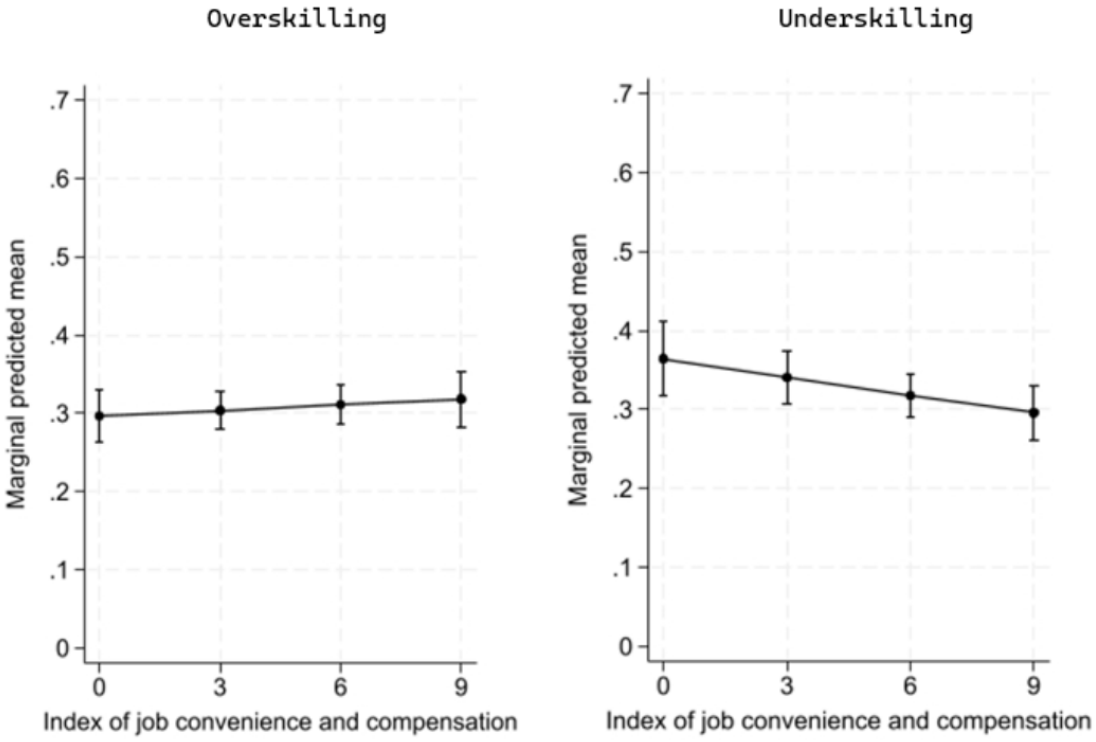

Figure 6. Employee's views on job convenience and compensation predicting skills mismatch
Source: Skills2Capabilities Working Paper No 5.1: 24.

From the capability approach perspective, if an individual accepts a role for which they are either over- or underqualified due to financial security or workplace benefits, their decision is shaped by practical necessity rather than career growth. This distinction raises further questions about the quality of employment choices available to workers, especially in economies with high labour market rigidity or limited job mobility. The findings also point to the interaction between internal and external conditions. Even if individuals have the intrinsic motivation and skills to seek better job matches, external conditions, such as employer hiring practices, industry demand for skills, and economic stability, may restrict their ability to convert those skills into better employment outcomes. This suggests that institutional interventions, such as career development support, targeted reskilling programs, and policies that promote better job-quality matching, could play a role in shifting workers from functional adaptation toward capability expansion. Alternatively, the capability approach emphasises the freedom to choose a life that aligns with their personal values and meaningful pursuits. These pursuits might not be income or career-progression or high-income-related, but be reflected in the person's functionings to live a healthy, creative, emotionally balanced and fulfilling life (Nussbaum, 2000: 89) outside the workplace. This interpretation shifts the focus from viewing work primarily as a means of financial gain to recognising

its role in fostering personal growth and well-being. It aligns with contemporary perspectives on the evolving nature of work, emphasising fulfilment, self-development, and the freedom to pursue a meaningful life beyond professional achievements. This broader understanding also resonates with recent discussions on universal income, which explore how economic security can enable individuals to engage in work that aligns more closely with their values and aspirations rather than being solely driven by financial necessity.

Individuals' opportunities are often shaped by and, in many cases, restricted by circumstances they have no control over, which can significantly impact their ability to secure employment that aligns with their professional skills. Factors such as gender and socioeconomic background can create systemic barriers that limit real choices. Certain demographic groups face distinct mismatches between their skills and employment opportunities. Three groups, in particular, stand out here: women are more likely to be underskilled, older workers (40–65) are more likely to be overskilled and less likely to be underskilled, and workers with lower education levels are also more likely to be underskilled (Working Paper 5.1, 22). Echoing the approach of the previous section, we reinterpret these findings through the lens of Nussbaum's extension of the capability approach, arguing that these mismatches represent a deprivation of human dignity for these groups. Nussbaum emphasises that access to meaningful and well-matched employment is not merely an economic concern but a fundamental capability that enables individuals to exercise agency and participate in society on equal terms (Nussbaum, 2000, 2011). When women face skill deficits that hinder their career prospects, older workers are placed in jobs that do not utilise their expertise, and individuals with lower education lack opportunities to develop their potential – in sum, their capabilities are restricted in a variety of ways. They are not only economically disadvantaged but also denied the ability to fully engage in work that reflects their skills and aspirations, an essential component of human flourishing according to the capability approach.

In addition, individual-level situational barriers, such as family responsibilities or financial constraints, are associated with a higher likelihood of workers being overskilled in their jobs (Working Paper No 5.1, 24-25). This suggests that many individuals accept jobs that do not match their skill levels due to external pressures that restrict their ability to make career choices that are truly free. From the capability perspective, these findings reinforce the idea that constraints, rather than individual preferences, shape employment outcomes. Situational barriers such as financial pressures force many workers into overskilled positions, meaning they accept jobs that underutilise their qualifications out of necessity rather than choice. For example, mothers with small children search for their skill-level employment in sectors with lower pay but better time flexibility. Situations like these illustrate how economic and social constraints embed inequality into labour market outcomes, limiting individuals' ability to pursue work that reflects their capabilities and aspirations (Sen, 1999).

However, while structural constraints undoubtedly shape employment outcomes, the capability approach remains relevant because it highlights the importance of expanding individuals' real freedoms to pursue work that aligns with their skills and aspirations. Recognising these limitations is not merely a theoretical exercise – it provides a basis for advocating policies and interventions aimed at reducing structural barriers. For example, improved access to childcare services, supportive employment

practices, and financial safety nets can help mitigate the effects of situational constraints, allowing workers greater flexibility in shaping their careers.

Meanwhile, for older workers, working in roles for which they are overskilled raises concerns about potential career stagnation. Their inability to move into more challenging or fulfilling positions suggests that their capabilities are being diminished over time, either due to a lack of opportunities for career progression or because structural barriers fail to recognise their expertise. The latter points toward patterns of ageism, where the labour market systematically undervalues older workers' contributions, reducing their access to meaningful work despite their experience and skills. Yet, from a capability perspective, addressing these barriers is central to ensuring that all individuals, regardless of age or socio-economic background, have the freedom to develop and apply their skills in ways that are meaningful to them. The capability approach does not dismiss structural limitations but rather emphasises the need to counteract them through interventions that expand individuals' opportunities. By shifting the focus from mere economic survival to enabling meaningful participation in the workforce, the capability framework serves as a guide for policies that foster a more equitable labour market.

4.2 Structural drivers and constraints of skills mismatch

To further examine the impact of structural drivers and constraints, the analysis results interpreted here also captured in their models how labour market constraints influence the mismatch between employees' skills and their job positions (Working Paper No 5.1, 25-26). Employees who perceive limited job opportunities are more likely to accept roles below their skill level at the start of their employment. However, this does not influence the likelihood of employees securing jobs that require more skills than they actually possess. A similar pattern emerges concerning high unemployment (ibid.: 27). When unemployment is high at the time of hiring, employees are more likely to be overqualified for their positions but not underqualified. Higher public spending on active labour market policies (ALMPs) appears to reduce the likelihood of employees being underskilled when starting a new position. However, it does not seem to impact the likelihood of employees entering roles for which they are overqualified (ibid.: 28). Public policies do seem to help with being underskilled for one's position, for example, by expanding training opportunities. Their failure to reduce situations where employees remain overskilled at their positions suggests that simply having more training is not enough to expand workers' real job choices. Moreover, if people accept mismatched jobs due to labour market constraints, their choices are not reflective of real freedom but of necessity.

Framing these findings within the capability approach (Sen, 1999; Nussbaum, 2000), labour market constraints can limit individuals' freedoms, namely, their ability to convert skills into meaningful employment opportunities that align with their capabilities and aspirations. The results deriving from Working Paper No 5.1 highlight that workers facing limited job opportunities often settle for positions below their skill level, while high unemployment further exacerbates skill mismatches by increasing the likelihood of being overskilled for one's position rather than improving situations where one is underskilled for their job. As expected, public investment in active labour market policies helps mitigating

underskilling by expanding access to training and development. However, its limited influence on being overskilled suggests that enhancing human capital alone does not necessarily translate directly into better job matches. This highlights a gap between formal qualifications and real opportunities, reinforcing the idea that mismatches are not merely a reflection of individual choices but of structural constraints. Moreover, from a capability perspective, if individuals are forced into mismatched jobs due to labour market conditions, their employment choices are shaped by necessity rather than genuine agency (Robeyns, 2005). To effectively address skill mismatches, it is essential not only to tackle structural barriers but also to invest in skill development and implement policies that enhance individuals' real freedoms to pursue work that aligns with their abilities and aspirations.

4.3 Job change as a solution to skills mismatch

The unique research design applied in Working Paper No 5.1 also allowed us to gauge the different factors that might become relevant regarding skills mismatch when an employee changes jobs, either by changing employers or moving from one position to another under the same employer. The data used in the original empirical analysis, 2014 European Skills and Jobs Survey (ESJS)[5], asked respondents to assess and compare their skill match 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). The central noteworthy takeaway from these findings is that many employees remained overskilled either after changing employers or after changing their job position with the same employer. In both cases, there is a relatively high chance of either becoming overskilled or remaining overskilled (ibid.: 29). When we look at the individual-level characteristics, we see that women and workers aged 40-65 are more likely to remain in mismatched positions (ibid.: 33, Table 5). The impact of these individual-level characteristics highlights how changing one's work role with the same employer has not so far been a straightforward solution to the problem of skills mismatch. If workers switch jobs but remain mismatched, it is evident that mobility alone does not expand capabilities — the availability of well-matched jobs is the real issue. Furthermore, the age factor needs to be considered, as more experienced, hence older employees have limited opportunities to fully utilise their skills and experience.

When we look at the same analysis results (ibid.) from the perspective of employers, we see that employers most likely to have mismatched employees are those in low-skilled white-collar and blue-collar sectors, as well as firms with larger workforces and limited job evolution opportunities. Compared to high-skilled white-collar workers, low-skilled employees in both white- and blue-collar roles are more likely to remain overskilled and struggle to transition into better-matched positions. This suggests that firms relying on lower-skilled labour may have a harder time optimising skill utilisation. Additionally, sectoral differences play a role, with industries such as agriculture, forestry, fishing, wholesale trade, and

[5] For more in-depth information on the data structure, variable operationalization's, analytical approaches and expanded and more detailed overview of the results, we highly recommend referring to the Working Paper No 5.1 on the Skills2Capabilities website.

food services experiencing higher rates of skill mismatches. These industries may lack structured career progression or skill development pathways, making it difficult for employees to align their skills with job demands over time. Moreover, the service sector seems to have much shorter job tenures and accept more job changes, in other words, job-hopping. Firm size also influences skill mismatches; mid-sized and large companies (50–499 employees) show lower mobility from underskilled to matched roles, while very large firms (500+ employees) are more likely to retain overskilled workers. This pattern indicates that in larger organisations, rigid job structures and slower career advancement may contribute to persistent skill mismatches. Furthermore, companies that fail to provide frequent learning opportunities, task variety, or role evolution tend to have higher mismatches (ibid.: 35, Table 6), as stagnant job roles lead to overskilled workers who are not adequately challenged or utilised. Overall, in the results we rely on here, we witness how employers in industries with low-skill demands, limited career mobility, and rigid job structures are most susceptible to skill mismatches among their workforce.

4.4 Conclusion: drivers of skills mismatch

The empirical findings synthesised and interpreted here highlight the idea that job-skill mismatches should not just be seen as market inefficiencies but also as a form of capability deprivation. While some workers accept mismatches strategically, many are forced into them due to constraints, which can be economic, demographic, or institutional. Policies as potential pathways to solutions, however, should focus on expanding real choices for workers, ensuring that skill development leads also to career opportunities rather than just training for training's sake.

There are three main takeaways from this section to highlight. First, being overskilled is not only a labour market inefficiency, but it also reflects a lack of real choices on the employee level. Second, career alignment is expected to also expand capabilities, while situational constraints reduce them. Lastly, job mobility does not automatically resolve mismatches unless workers have real opportunities for progression. Job-related education and training could be one way to overcome skill mismatch, but such opportunities are not available to all employees to the same extent. The next section takes a closer look at who gets to learn.

5. Participation in job-related education and training

Lifelong learning is vital for Europe's economic competitiveness, particularly in the backdrop of a rapidly ageing population and the impact of accelerated digital transformations in the labour market. Moreover, from the capability approach perspective, lifelong learning is as significant as job-related learning because it fosters the overall flourishing of individuals and provides workers with a sense of being full members of society. Not being able to upgrade one's skills might lead to capability deprivation and the inability to live a life where one's basic human needs are met, perhaps due to unemployment, lack of livelihood or opportunities to contribute to society meaningfully. Participating in education and training,

however, can lead to better skill match (Buchtemann and Soloff, 2003) and having full capabilities to participate in their workplace, the labour market and society. Acemoglu and Pischke (1999) argue that both firms and employees benefit from general and job-specific training, as new technologies make training essential.

5.1 Job-related training as an opportunity for better matching skills?

In this section, we zoom in on participation in job-related training and frame it as an essential element for achieving a fulfilling working life, which is a crucial component of a fulfilling life. This section is based on the analysis results from Working Paper No 5.2. It utilises individual-level data from the second wave of the Cedefop (2021) Second European Skills and Jobs Survey (ESJS)[6]. It is pertinent to note that the survey was conducted during the COVID-19 pandemic, which may have influenced both participation in job-related training.

It is well established that the characteristics of the workplace and the job, as well as the societal and economic context, influence the likelihood of participating in training and education (Rubenson and Desjardins, 2009; Nilsson and Rubenson, 2014). The skills that workers already have and what is required from them to do their work determine how much access to training they might have. Exploring the workers' self-assessment of their skill use, their sense of insecurity in the labour market, and the types of employers who are more likely to provide training to their employees allows to make some important generalisations about who gets to improve their work-related skills. Unfortunately, due to the characteristics of the ESJS dataset, it is not possible to distinguish if participating in workplace training is a mandatory requirement of the employer, and to what extent workers willingly participate in workplace training or to what extent employers are financially supporting or demanding workers' participation in job-related training. Nevertheless, the data helps to think about skill development as an aspect that might be significantly related to human capabilities and well-being at work. Following the capability approach, the capability to participate in adult education can be seen as a person's freedom to be involved in the type of job-related education or training that they have a reason to value, considering both constraining and enabling factors that might affect the freedom to participate in such education and training (Boyadjieva and Ilieva-Trichkova, 2021: 123-124). From the capability approach, participation in job-related training is influenced by the characteristics of the job and the workplace, but simultaneously functions as a reflection of what people value being or doing. With such an image of work in mind, we assume that workers might generally be interested in participating in work-related training, which allows them to develop their capability of making more creative and informed decisions at work and relating to their colleagues as fellow humans, as well as better positioning themselves in the labour market.

[6] For more in-depth information on the data structure, variable operationalization's, analytical approaches and expanded and more detailed overview of the results, we highly recommend referring to Working Paper No 5.2 on the Skills2Capabilities website.

5.2 Skills utilisation, job complexity, and workplace dynamics and their relationship to job-related education and training

Some types of jobs are much more likely to be linked with access, possibilities, enforcement or employee motivation to participate in job-related training. Workers' job characteristics, and thus learning opportunities, vary, and those who may need training the most often have the least access to it. For example, Schindler et al. (2011) state that jobs involving complex tasks that demand specific skills are scarce in the labour market. Consequently, employees hired for these roles often lack the necessary skills and must undergo additional training to bridge the gap. Conversely, routine jobs and those likely to be automated are associated with less training, potentially leading to unemployment (Working Paper No 5.2, Görlitz and Tamm, 2016; Kleinert and Wölfel, 2018; OECD, 2019). Results from Working Paper No 5.2 showed how skills utilisation at the main job, job complexity and the extent of changes in the workplace are all linked to employees' training participation. In terms of skills utilisation, understood as the extent to which workers hold skills needed to perform their job (Warhurst and Luchinskaya, 2018; Rafferty, 2020), the analysis found that workers who actively apply their knowledge and skills in their jobs are more likely to engage in job-related training than those who do not utilise their current knowledge and skills at all or utilise them only to a small extent, in their main job. However, no significant difference in participation rates was observed between workers who utilise their skills moderately and those who do so to a great extent. Higher skills utilisation suggests that individuals who use their skills at work may have the capability to participate more meaningfully in training. They may be more inclined to recognise the relevance of training to their existing skills and its potential to further enhance their capabilities. Meanwhile, workers with a lower likelihood of participation in workplace-related training could be viewed as having a diminished ability to utilise their existing skills. As a result, they were either not offered job-related training or did not require it due to the nature of their work. This can be linked to capability deprivation in terms of using their existing skills as well as acquiring new ones. Alternatively, they may have opted not to participate in the training because they did not value such opportunities in their working life (ibid.: 19).

When considering job complexity, the analysis showed that a more complex job meant a greater likelihood of participating in training, highlighting the strong connection between job complexity and training participation (Figure 7). Therefore, workers in complex roles are more likely to have participated in training, which, in turn, helps them develop the capabilities they value when performing their duties in the workplace. Complex jobs often pose challenges that require continuous skill development and adaptation, particularly in technology-driven fields where work environments are more prone to change (Bresnahan et al., 2002). Employees who demonstrate the ability to leverage their existing skill sets effectively are more likely to both desire and be afforded by their employers the opportunities for further development and advancement through training. The previous showed that companies that fail to provide frequent learning opportunities, task variety, or role evolution tend to have higher mismatches (ibid.: 35), as stagnant job roles lead to overskilled workers who are not adequately challenged or utilised. Both findings highlight the critical role of ongoing learning and development in preventing skills

mismatches: complex jobs drive worker participation in training, while companies that neglect learning opportunities create environments where workers become overskilled for their stagnant roles.

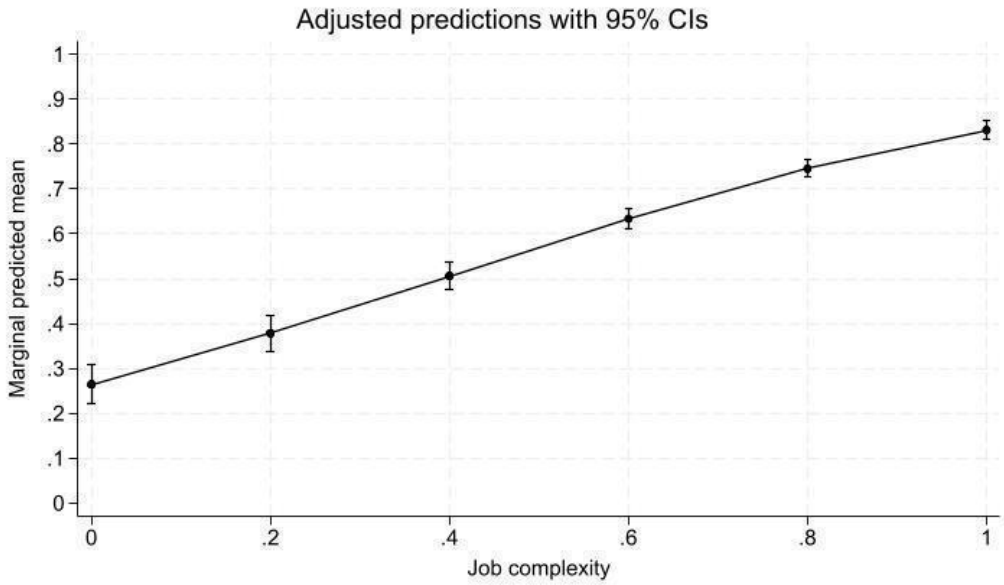

Figure 7. Predicted probabilities of job-related training participation at different levels of job complexity
Source: Working Paper 5.2: 20.

Working Paper No 5.2 also explored the impact of workplace changes on training participation. Workers in more dynamic environments — where management practices, working methods, digital technologies, products or services, or locations have changed in the past 12 months — participated in training more than those in workplaces with fewer changes (Figure 8). On the one hand, this indicates that dynamic workplace environments, characterised by change, might offer more training opportunities, allowing workers in such settings to develop skills and actively engage in training. Employees, on the other hand, might perceive such training as beneficial for their learning and growth. Relying on these data sources, however, it is challenging to determine the extent to which these workplace changes were due to the COVID-19 pandemic. The existing literature confirms that COVID-19 influenced working practices, locations, and technologies (Sahut and Lissillour, 2023; Kesküla, 2023). We can only note that employees in workplaces that underwent fast changes (possibly due to COVID-19) also had the opportunity to participate in more job-related training courses.

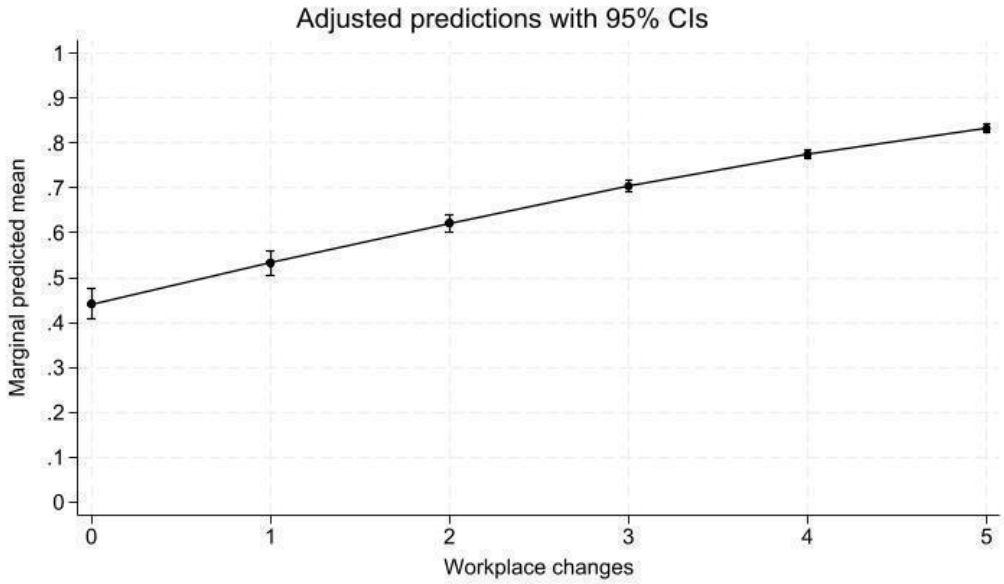

Figure 8. Predicted probabilities of job-related training participation at different levels of workplace changes
Source: Working Paper No 5.2: 21.

5.3 Employees' perceived skills obsolescence and job loss risk, and its connection to training participation

Besides the meso-level of the workplace and job characteristics, training participation is also related to the trends in larger global and national labour markets. In the context of rapid digitalisation and technological changes, Working Paper No. 5.2. also explored the relationship between employees' perceived skill obsolescence and its relationship to training participation. In general, skills obsolescence occurs when a worker's skills become obsolete due to ageing, which depreciates certain manual skills or through technological or economic change, which renders certain skills unnecessary, or through the underutilisation of skills (McGuinness et al., 2025: 318). Employees who believe new digital technologies in their company require them to acquire knowledge or skills they currently lack are more likely to engage in training (Figure 9). This could mean that they recognise that their old digital skill might become outdated. Conversely, workers who feel their existing skills are sufficient are the least likely to participate in job-related education (Working Paper 5.2:22). This may suggest that employees are concerned about their current skills becoming obsolete, which motivates their participation in training. Alternatively, it could indicate that employees recognise the fast technological changes occurring and believe they possess the capabilities to engage in training when necessary, making a conscious choice to exercise their capabilities and learn and develop in their workplace. Therefore, their participation in training may reflect both a proactive response to changing job requirements and a desire to broaden their competencies. The analysis of well-being at work presented below shows that subjective well-being at work is positively correlated with the need for new digital skills. This finding suggests that job-related training in digital skills will not negatively affect employees' well-being at work.

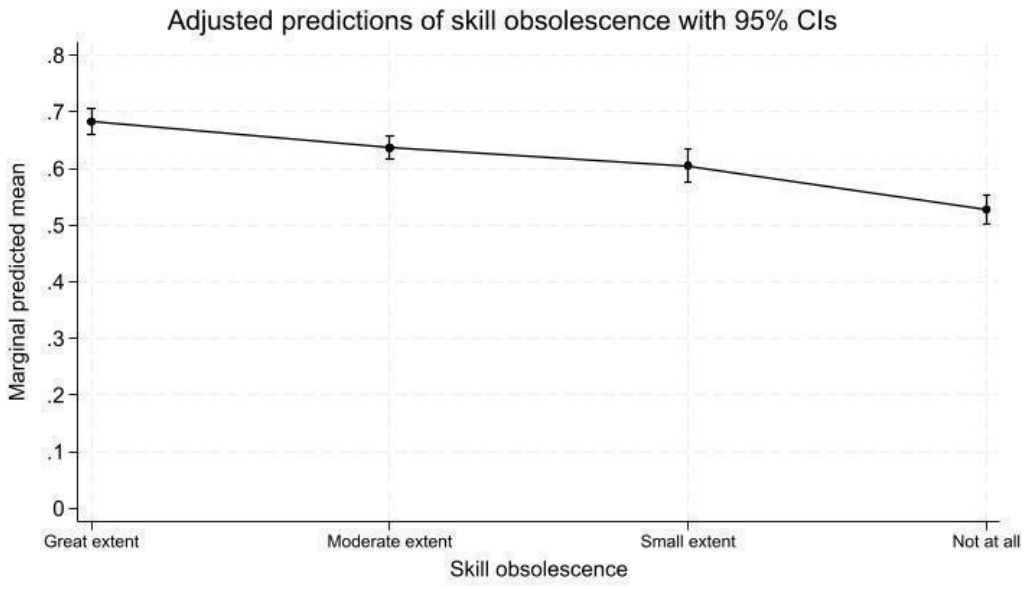

Figure 9. Predicted probabilities of job-related training participation at different levels of perceived skill obsolescence
Source: Working Paper 5.2: 20.

Job security concerns did not significantly impact employee training participation (ibid.: 23). Workers' perceptions about the risk of losing their jobs within the next twelve months did not result in different levels of training participation, suggesting that job insecurity may not be a significant motivator for training participation. When interpreting these findings, we must consider that 2021 was a period of heightened uncertainty and economic instability for many, regardless of their specific job circumstances. The pandemic intensified feelings of vulnerability and potential job loss, even in sectors that seemed stable (Wu, 2023; Blustein, 2020). Here, it is important to keep in mind that the analysis looked at training in the previous 12 months and people's fear of job loss in the next 12 months - participation in training during the preceding COVID-19 year, 2020, and fear of job loss were not significantly related. Because training happened before the assessment of job loss fear, we cannot definitively say that fear of job loss caused or prevented training participation. Broader economic trends and pandemic-related disruptions could have significantly influenced both past training decisions and future job loss fears independently of each other.

5.4 Workplace characteristics shaping opportunities for skills development

The capability approach aligns with the assumption that, in general, people seek jobs and workplaces where they can learn and grow. Keeping this in mind, differences in training participation based on employee characteristics were examined (ibid., p. 25). Employer characteristics can be seen as enabling certain capabilities or, conversely, leading to capability deprivation.

The main differences were based on firm size and the sector in which they were employed. Employees in small firms (1–10 employees) have a significantly lower likelihood of participating in job-related training compared to their counterparts in larger firms. For employees in larger firms (11–49, 50–249, and 250+ employees), the predicted probabilities of participation are higher and do not differ markedly from one another (ibid.: 25). These findings align with previous research indicating that larger firms typically provide more training opportunities due to their designated training budgets and more formalised training structures (OECD, 2012).

Employees of different sectors also exhibited differences in training participation. Employees in professional, scientific, and technical activities, administrative and support services, public administration, defence, education, human health and social work activities, and other service activities exhibit the highest likelihood of participating in training programmes**.** This sector has a significant number of complex jobs compared to other sectors. This finding aligns with previous research indicating that these sectors often benefit from well-developed training infrastructures and state-funded programmes (Roosmaa, 2021), as well as possible requirements to upgrade their skills regularly. While this sector stands out as having the highest likelihood of participation, the participation rates in other sectors do not differ significantly. The previous section (section 4) showed the highest skills mismatch in industries such as agriculture, forestry, fishing, wholesale trade, and food services. In that section, we suggested that industries may lack structured career progression or skill development pathways, making it difficult for employees to align their skills with job demands over time. Furthermore, employers in industries with low skill demands, limited career mobility, and rigid job structures are most susceptible to skill mismatches among their workforce. This is linked to the insights from this section, where we see that jobs with less complexity and change, and sectors with less well-developed training infrastructure, also have employees who are less likely to participate in training.

Employees in the non-profit sector exhibit the highest predicted likelihood of participating in training, closely followed by those in the public sector, which indicates that training opportunities are readily available and encouraged in these fields. Meanwhile, employees in the private sector show a lower likelihood of engaging in training, as there is typically a greater reliance on on-the-job learning. When considering employer type, these results suggest a potential capability deprivation for employees in smaller firms. They may have fewer opportunities to develop their skills and expand their capabilities through training. This disparity in training participation can influence the functionings employees are able to achieve, including career advancement, improved job performance, and increased employability. The capability approach underscores the importance of providing individuals with opportunities to develop their capabilities, and one option for this is job-related training. For policymakers, these findings emphasise the need to address the disparities in training opportunities across different firm sizes and sectors.

Overall, the results show that differences in training participation by employer type are rather modest compared to those associated with the nature of specific jobs. Simultaneously, the findings imply that differences in employee training participation across employers are only partially explained by differences in the nature of specific jobs within those employer types. Furthermore, we can suggest that,

in addition to the variation within employer types regarding the nature of specific jobs (especially their complexity), employers vary in the training they offer to employees performing particular job tasks. Consequently, the resulting rates of employee training participation reflect both job-specific training demands and employers' strategies to address those demands.

When examining the results, it is crucial to consider that the study took place in 2021 and that questions regarding training referred back to the previous year, 2020, when the pandemic created unusual circumstances across the world and potential in-person training cancellations. Nevertheless, it appears that individuals who were actively using their skills at work and who held more complex jobs participated in more training than those who did not self-assess their skill utilisation, job complexity, and dynamics as high. The capability approach helps us to identify inequalities in people's capability regarding workplace-based training, as those whose jobs did not necessitate these qualities were probably less likely to be offered training in the first place. Furthermore, perhaps they were also the first to have their work-related education and training cancelled when the pandemic struck.

5.5 Conclusion: learning as the achievement of one's capabilities

The capability approach allows us to frame job-related training as an important aspect of a fulfilling working life and interpret it as an individual's capacity to act and attain what they value. This, in turn, is linked to other aspects covered in this report, such as reduced skill mismatch and improved well-being at work. Workplace characteristics, such as job complexity, skill utilisation, and employer type, influence workers' likelihood of participating in training. Participation in job-related training could be seen as a "functioning" for the capability to participate in such training (see Boyadjieva and Ilieva-Trichkova, 2021; Ilieva-Trichkova and Boyadjieva, 2024). It reflects what people value and their agency, but also highlights good-quality employers who are able or willing to provide such conditions to employees. Several factors influence whether someone participates in training. Those who actively use their skills are more likely to participate, and more complex jobs are associated with a higher likelihood of receiving training. In a complex job, both the employer and employee are likely to be more focused on training: as the employer invests in the employee's skills and the employee can improve their capabilities as executing their complex job better or more efficiently, gaining the instrumental benefits such as a higher pay, but also perhaps leaving more time for creative endeavours outside the workplace. Workers in dynamic workplaces tend to participate in more job-related training. Employees who recognise a need for new digital skills are more likely to participate in training. Larger firms, certain sectors (such as professional and scientific, and public sectors), and not-for-profit organisations are more likely to provide training. Employees in smaller firms may experience "capability deprivation" due to fewer training opportunities, which can hinder their career advancement and well-being. This highlights the importance of equitable access to training and development opportunities, which directly leads us to a broader consideration of fairness within the capability approach framework, particularly as it relates to educational opportunities.

6. Skills mismatch, perceived fairness of educational opportunities and remuneration

In this section, we interpret the findings from Working Paper No. 5.3[7], which focuses on subjective perceptions of justice, particularly concerning one of the aspects of justice: the fairness one (Boyadjieva and Ilieva-Trichkova 2017). These findings allow us to highlight two key individual-level indicators of life achievement: educational attainment and net salary. It investigated whether individual-level differences exist in these assessments based on the degree of skills/educational mismatch. Furthermore, it also explored if the economic and political contexts can moderate the relationship between perceived justice in educational opportunities and net pay, and the skills/educational mismatch via multilevel regression analyses.

The results for this section were drawn from the analysis of data from the European Social Survey for 2018. This particular survey wave was chosen for the analysis because of its special rotating module devoted to justice and fairness, and covered 29 European countries. The analytical sample was restricted to the respondents aged 25–64 years who reported having paid work in the last 7 days. The questions about the fairness of earnings and subjective assessments of the fairness of educational opportunities served as dependent variables in the analyses. The main independent variable, which was used at the individual level, is vertical educational mismatch (which was calculated via the realised matches approach). In order to study the social embeddedness of the relationship between subjective assessments of the fairness of educational opportunities and fairness of earnings and vertical mismatch (above and below), two important indicators of economic and political contexts were selected as independent variables in the analyses at the country level: GDP per capita and Democracy index. Cross-level interaction terms between GDP per capita, democracy index, and vertical educational mismatch were also tested.

6.1 Fairness perceptions

The freedoms and opportunities that people have when choosing a life that they have reason to value are at the heart of the capability approach (Sen, 1992). However, as Sen (1992: 148) puts it: "[i]f the social arrangements are such that a responsible adult is given no less freedom (in terms of set comparisons) than others, but he still wastes the opportunities and ends worse off than others, it is possible to argue that no unjust inequality may be involved". Following this argumentation, social opportunities have a crucial role in expanding the realm of human agency and freedom, both as an end in itself and as a means of further expansion of freedom and those opportunities that are strongly

[7]For more in-depth information on the data structure, variable operationalization's, analytical approaches and expanded and more detailed overview of the results, we highly recommend referring to Working Paper No 5.3 on the Skills2Capabilities website.

influenced by social circumstances and public policy should be a matter of concern (Drèze and Sen, 2002). Moreover, any theory of justice has to be sensitive to both the fairness of the processes involved and to the equity and efficiency of the substantive opportunities that people can enjoy (Sen, 2009). The vital importance of the fairness of educational opportunities, in particular, reflects the fact that educational inequalities are among the most important determinants of economic disparities and differences in individual civic participation. There are two important characteristics of educational inequalities: they are strongly influenced by people's social background, and they are cumulative (e.g., Rubenson, 1998; Di Prete & Eirich, 2006). That is why the issue of the legitimacy of educational inequalities becomes indispensable for any study of education. However, the legitimacy of inequalities in education is not self-evident.

Higher perceived unfairness of educational opportunities is associated with lower levels of active citizenship, and the link between the perception of fairness of educational opportunities and active citizenship is socially embedded. However, the negative association between perceived unfairness of educational opportunities and active citizenship is mitigated when people are living in high-trust societies and in countries which are more economically and democratically developed (Boyadjieva, Ilieva-Trichkova & Todorov, 2024). Meanwhile, the significance of fair earnings distribution stems from the fact that income inequalities are among the most important determinants of disparities and differences in people's quality of life and unfair perceived earnings inequality is also associated with a lack of work effort and of active political participation (D'Ambrosio et al., 2018). Individuals' perceptions of the fairness of their pay have important implications for individuals and society as perceptions of injustice are linked to several negative outcomes, such as diminished well-being, poor health, increased stress, and depressive symptoms, as well as negative effects in the workplace domain (Moya and Adriaans, 2024).

6.2 Skills mismatch and perceived fairness of educational opportunities and remuneration

The results show that at the individual level, being vertically above or below educationally mismatched, compared to employees who believe their skills match their jobs, predicts lower levels of perceived fairness of educational opportunities and net pay. However, when the independent variables at the individual level were considered in the models, the influence of both types of mismatches (vertical-above and vertical-below) on the perceptions of fairness of educational opportunities disappeared. In the case of perceived fairness of net pay, the findings indicated that employees who are vertically-below mismatched compared to those whose skills match their job requirements, perceive their net pay to be fairer. For both perceptions of educational opportunities and net pay, findings provided evidence that a lower status of the occupational group predicts lower levels of both perceived fairness of net pay and educational opportunities. A higher level of attained education, however, predicts a higher perceived fairness of net pay and of educational opportunities. Moreover, having at least one parent who has higher education (used as a measure for high social background) also predicts higher levels of perceived fairness of net pay and educational opportunities. The analyses, however, did not find evidence of a

relationship between age and either of the two fairness perceptions; however, it did reveal that women, compared to men, have lower levels of perceived fairness for both net pay and educational opportunities. It is also very important to emphasise that the analyses revealed that the social environment does have a moderating role on the relationship between vertical educational mismatch and subjective assessments of educational opportunities, albeit not in the same direction for all cases of mismatch.

In the case of vertical-below educational mismatch, the country's level of economic development (measured with GDP per capita) has a positive moderating influence on the perceived fairness of educational opportunities. Higher levels of economic and democratic development in a country predict higher perceptions of the fairness of educational opportunities on the individual level. However, in the case of vertically-above mismatched employees, living in a country with higher values of the GDP and democracy index is associated with lower assessments on perceived fairness of educational opportunities. A plausible explanation for these results could be related to the fact that, as a rule, more democratic and economically developed countries favour the development of more critically-oriented individual attitudes, along with rewarding those individuals with higher expectations and aspirations (e.g. Heyne, 2016). At the same time, no evidence was found for the moderating influence of the levels of GDP and democracy index on the relationship between the fairness of net pay and the different types of educational mismatch.

6.3 Conclusion: skills mismatch and perceptions of fairness

Using data from the rotating module 'Justice and fairness' of the European Social Survey for 2018 via multilevel regression models, this section has analysed the relationships between vertical educational mismatch (in its two forms – above and below) and social justice measured with the individuals' perceptions about fairness of educational opportunities and earnings and if these relationships are moderated by different aspects of the context where people live. More specifically, two important aspects of the context, economic and political ones, were considered, and they were measured with GDP per capita and the Democracy Index.

It has highlighted the social embeddedness of the influence of the vertical educational mismatch in both of its types (above and below) on individual perceptions of social justice as captured by individual-level assessments of fairness perceptions of educational opportunities and earnings. It reiterated the moderating influence of economic and democratic context on the relationship between the fairness of educational opportunities and the type of vertical educational mismatch, but not in the case of the fairness of net pay.

7. Skills mismatch and multidimensionality of well-being at work

This section presents results from Working Paper No 5.2 where the relationship between skills mismatch has been explored using micro-data from the second wave of the Cedefop European Skills and Jobs Survey, carried out in 2021[8]. This survey was chosen because it contains the newest data on skills and jobs available and informs the ongoing policy debate about the impact of digitalisation on the future of jobs and the changing nature of work. Further, it informed the heightened concerns about the long-term effect of the COVID-19 crisis on EU digital skill needs and new forms of digital and distance learning. Last but not least, this survey allowed applying a more sophisticated understanding of subjective well-being at work and allowed the development of a composite index to better capture its multidimensionality. The analytical sample included employed adults aged 25-64 years nested within 27 European countries.

7.1 Subjective well-being at work

Well-being is one of the central concepts in the capability approach (Nussbaum, 2011; Sen, 1999). Sen (1999) argues that the understanding of well-being should focus on what people can be and can do, rather than simply on what they have. He also stresses the importance of the quality aspect of life in all its dimensions — family, health, employment, education, leisure, etc. According to Sen (1992), there are two aspects of well-being: freedom and achievement. Whereas well-being freedom is 'one's freedom to achieve those things that are constitutive of one's well-being' and 'is best reflected by a person's capability set' (Sen, 1992: 57), well-being achievements refer to the concept of functioning, i.e. what people are actually choosing to do within the range of their possible capabilities. In order to fully evaluate well-being from the capability approach perspective, it is important to acknowledge the full range of elements that people value, such as their sense of purpose or the fulfilment of their goals (Stiglitz, Sen, and Fitoussi, 2010) and take into consideration some objective information such as the real opportunities that people have.

The focus in this section is on the subjective well-being in one specific and very important domain of life – work. As a rule, subjective well-being at work is related to and measured with job satisfaction and job distress as simple dimensions (Mavromaras et al., 2012; McGuinness and Byrne, 2015; Urbanaviciute, Massoudi, and De Witte, 2024). Many studies show that overeducation results in lower job and life satisfaction (see, e.g., Verhaest and Omey, 2006; Peiró et al., 2010; Diem, 2015; Piper, 2015; Congregado et al., 2016). Some authors report more nuanced findings, arguing that this is only the case when overeducation is also accompanied by being overskilled (see, e.g., Green and Zhu, 2010; Sloane and Mavromaras, 2020). According to Mavromaras et al. (2012) and McGuinness and Byrne (2015),

[8] For more in-depth information on the data structure, variable operationalization's, analytical approaches and expanded and more detailed overview of the results, we highly recommend referring to Working Paper No 5.2 on the Skills2Capabilities website.

overeducation is only associated with lower job satisfaction for females. Fleming and Kler (2014) further specify that "this effect is particularly strong for females without children at home" (McGuinness et al., 2018: 12).

Basing our understanding of subjective well-being at work on the capability approach requires taking into account both its instrumental and intrinsic dimensions. Subjective well-being at work refers to the overall subjective state of an individual in relation to different aspects of the work environment. It is argued that from the capability perspective and having in mind the specificity of the contemporary highly dynamic and rapidly digitalised societies, subjective well-being at work should be defined as a multidimensional phenomenon, which – in addition to individuals' satisfaction with some instrumental dimensions, such as level of payment, working conditions, etc. – includes their attitudes to dimensions that capture intrinsic values: interest in the work, possibilities for continuous learning, acquiring of digital skills and professional growth, interpersonal relations.

Taking into account the previous literature on skills mismatch, as well as previous work on well-being and job satisfaction within the capability approach (e.g. Boyadjieva and Ilieva-Trichkova, 2024; Leßmann and Bonvin, 2011), the present study explored the link between skills mismatch and subjective well-being at work while adopting a more sophisticated understanding of the complexity of subjective well-being at work and by paying attention to the moderating influence of sociodemographic characteristics on this association. More specifically, 10 items were used from the ESJS 2021 questionnaire which allowed applying this more sophisticated understanding of subjective well-being at work and which allowed the development of a composite index which better capture its multidimensionality: digital or computer technologies you use, job security, promotion/career prospects, pay and benefits, working conditions, interest in the work itself, work-life balance, training provided, relations with supervisor or manager, and relations with colleagues.

7.2 Skills mismatch and its links with subjective well-being at work

To capture the variety of skills mismatches, five different forms of mismatch were included as independent variables in the analyses: level of education required for the job, education completed compared to education required by the job, horizontal mismatch, level of skills utilisation, and skills obsolescence.

Various individual socio-demographic characteristics were also controlled for gender, age, level of education, occupational group, and place of living. Individual-level interaction effects between gender, age, and occupational group and each of the five types of mismatch were also tested. Applying multilevel linear modelling, the analyses revealed that each of the types of skills mismatch studied – required education, vertical education mismatch, horizontal education mismatch, skills utilisation and skills obsolescence – matters for subjective well-being at work. More specifically, it was found that higher levels of required education for a job are associated with higher subjective well-being at work. Those employed in jobs requiring the same or lower level of education than they possess report significantly

higher subjective well-being at work than those in jobs demanding more education than they have. Having a job that requires skills and education different from what a person studied is associated with lower subjective well-being at work. People whose jobs did not require a specific field of study also had lower well-being at work compared to those whose jobs matched their field of study. The analyses also show that the fewer people use their skills at work, the lower their subjective well-being at work. Those who reported moderate use of their skills had lower well-being at work than those who used them extensively. The difference was even greater for those who reported little to no skill utilisation. Additionally, a lower perceived need for new digital or computer technology skills in the workplace was associated with lower subjective well-being at work.

Skills mismatch should always be studied as a multidimensional phenomenon, and its different types must be examined separately, both generally and specifically in relation to subjective well-being at work. The results indicate that when all types of skill mismatches are considered together, most still show a significant impact, albeit with smaller effects. Only two groups do not demonstrate a significant difference compared to the reference group: those with the same education level as their job requires, and those who do not anticipate needing new digital skills in their current role. This suggests that all types of mismatch contribute to undermining well-being at work. In other words, it is unrealistic to expect that diminishing the impact of one type of inequality will be sufficient to improve the overall situation regarding other aspects of well-being.

Considering the moderating effect of sociodemographic characteristics such as age, gender and occupational group, the study revealed that across sociodemographic groups, underutilisation of skills and education have different implications in terms of their work-related subjective well-being. Thus, older individuals experienced lower subjective well-being in jobs demanding higher education levels but reported higher subjective well-being when their education was lower than the job required. Additionally, older individuals who perceived a low need for new digital or computer technology skills reported higher subjective well-being.

The study provides evidence that, on average, women reported lower subjective well-being at work, but it was higher than that of men in cases where the job required skills from a different field or did not require a specific field at all. Additionally, women reported higher subjective well-being at work when they felt they were only moderately or minimally utilising their skills and when they perceived a low need for new digital or computer technology skills in their work.

When a job required a high level of education (ISCED 5-8), individuals in mid-level occupations (ISCO 4-6) reported higher subjective well-being than those in lower-skilled occupations (ISCO 7-9). Similarly, those in high-level occupations (ISCO 1-3) experienced higher well-being at work compared to those in lower-skilled occupations when the job required medium or high levels of education. The analysis further shows that although adults with ISCO 1–3 occupations have significantly higher levels of subjective well-being at work than that reported by adults who are employed in ISCO 7–9 occupations when they are employed in jobs which require the same or lower levels of education by their job the difference in subjective well-being at work between these two extreme occupational groups become smaller. It was

also observed that when employees in ISCO 1–3 categories use their skills at work to a small extent or not at all, their level of subjective well-being at work is significantly lower.

It is very important to underline that the findings show that various types/forms of mismatch influence subjective well-being at work differently. Thus, for example, horizontal mismatch (understood as a discrepancy between the field of an individual's education and that required in the job) and the lower level of reported skills utilisation at work are associated with lower levels of subjective well-being at work. In case of educational mismatch, adults employed in jobs where the same or lower level of education than what they completed is required for the job, reported significantly higher levels of subjective well-being at work than those who are employed in jobs where a higher level of education than theirs is required. Regarding skills obsolescence, the analysis shows that higher assessments that new digital technologies require new knowledge and skills positively influence subjective well-being at work. This creates an optimistic expectation that employees will be ready to participate in retraining, as this will not be at the price of lower subjective well-being at work. In turn, employers can motivate employees to be involved in training to acquire new skills, highlighting that this will also enhance their subjective well-being at work (economic benefits, but interest in the work and career opportunities as well). Based on these results, the present study argues that skills mismatch should always be studied as a multidimensional phenomenon and that its different types have to be examined in general but also specifically in relation to subjective well-being at work.

The findings also provide evidence that individual characteristics moderate the effect of skills mismatch on subjective well-being at work differently, which should be considered in both analyses and policymaking. Thus, for instance, the results demonstrate that horizontal mismatch matters less for females' subjective well-being at work, as they show a higher level of subjective well-being at work than males if they report a form of horizontal mismatch. A plausible explanation could be that, because of their greater family responsibilities, women might be more inclined to accept a job that does not correspond to their field of study if it met other criteria (e.g. close to home or a more convenient working time). The analysis also shows that higher education graduates are more sensitive when they experience a horizontal mismatch. If they report that their job does not require any specific field, their level of subjective well-being at work is lower in comparison to that of adults with secondary education and who report that their job does not require a specific field. A possible explanation is that because graduates invest more resources (not just economic) in obtaining their degrees than people with a lower level of education, they value the opportunity to work in line with their speciality more.

7.3 Conclusion: understanding the broader effects of skills mismatch

This section has drawn on the heuristic potential of the capability approach to find an understanding of skills mismatch, which goes beyond its focus on productivity and individual economic benefits. Thus, this section views skills/educational mismatch as imbalances between individuals' skills/education and the skills/education required in the labour market, leading to capability deprivation with wider consequences at the individual and societal level than reduced economic benefits alone.

More specifically, within this section, the subjective well-being at work has been considered as a multidimensional phenomenon which refers to different dimensions of work, both instrumental (income benefits, working conditions, security, work-life balance) and intrinsic (interest in the work, opportunities for personal growth, social relations). This understanding goes beyond the widespread focus on instrumental and economic effects of skills mismatch and affirms the importance of subjective well-being and values for their own sake for people's flourishing. It is also in line with Stiglitz, Sen, and Fitoussi's (2010: 65) thesis that 'the subjective dimensions of quality of life encompass several aspects.' Applying this understanding to the second wave of the Cedefop European Skills and Jobs Survey revealed that each type of skills mismatch studied – required education, vertical education mismatch, horizontal education mismatch, skills utilisation and skills obsolescence – matters for subjective well-being at work. Our findings demonstrate that various types/forms of mismatch, such as the five that we studied, influence subjective well-being at work in different ways. At the same time, individual characteristics moderate the effect of skills mismatch on subjective well-being at work differently, which should be considered in both analyses and policymaking.

8. Studying skills mismatch through the capability approach: limitations, discussion and conclusions

8.1 Limitations and further outlook

The work on WP5, "Drivers and effects of skills mismatch" within the Skills2Capabilities project, has come across several data-related limitations. These limitations have been acknowledged, and they are considered promising directions for future research.

Firstly, for some of the analyses, it was not possible to use the most recent data, due to: a) the lack of recent data which would allow applying the theoretical understanding of the main concepts (e.g. the questions of fairness of educational opportunities and net pay were only available in the rotating module on 'Justice and Fairness' in the ninth round of the European Social Survey carried in 2018); and b) the constraints related to using data from international surveys before spring 2025 (as in the case of the second wave of the Cedefop European Skills and Jobs Survey from 2021).

Secondly, there have been changes in the methodology of the international surveys. Although it was intended to use cross-national data from repeated large-scale surveys, implying they will be comparability over time, some of the questions have been changed over time: e.g. in the Cedefop European Skills and Jobs Survey questions of skills mismatches (including the one on skills obsolescence) have been changed between both waves (2014 and 2021).

Thirdly, in some of the analyses, objective measures of skills/educational mismatches were used, whereas in others, subjective ones. Although it has been acknowledged that measurement matters, there are some studies which show that despite the different measures used, the influence of the skills/educational mismatches on labour market outcomes seems to be quite consistent regardless of the

method employed (Muñoz de Bustillo Llorente et al., 2018). Given the multidimensional nature of the phenomena, it is also important in future studies to consider other types of mismatch, such as skills shortages, skills gap or skills obsolescence, and their effects on job-related training and inclusive economic growth and social justice.

Fourthly, the analyses presented allow for a discussion about the associations between variables, but they do not imply causality, as there was no longitudinal data available or data on skills/educational mismatch with experimental design. Nevertheless, although associations do not reveal causality, they indicate the existence of a relationship between the studied variables. Thus, some of the results were not sufficiently explained, and it is a matter for further research if there are more longitudinal datasets available which include questions on skill mismatch, its potential drivers and effects related not only to economic benefits but to all aspects of life/well-being.

Last but not least, it is worth emphasising that the analyses in Working Papers No's 5.1, 5.2 and 5.3. relied on secondary cross-national data. Although secondary data analysis has considerable advantages as a research strategy, the questionnaires have not been designed specifically using the framework of the capability approach. In this regard, there is a need to explore further efforts to improve the indicators used and to find additional ones in order to better operationalise the full analytical potential of the capability approach for studying skills mismatch, its drivers and effects.

8.2 Skills mismatch: economic factors and employment practices as external conditions

This report responds to the recent calls to acknowledge the complex and multifaceted nature of discrepancies in skill supply and demand, to avoid focusing solely on employer difficulties in finding the right skills and to focus on a wide range of measures to secure beneficial productivity outcomes and higher worker adaptability to economic change (Cedefop, 2018) by application of the capability approach.

Within the capability framework, people's well-being is becoming the central concern, and their capabilities are used as the yardstick for evaluating broader social prosperity, progress and the effectiveness of social arrangements as well as for assessing the well-being of a single individual at any point in time (Robeyns, 2017). Therefore, this report consistently applied a humanistic and capability-oriented theoretical framework (Sen, 1999) to summarise the key findings of the analyses presented in preceding working papers. It highlighted how the drivers and consequences of skills mismatch at both individual and societal levels could be understood and what the possible resulting implications are.

This report allows us to conclude that overall vertical educational match among adults who are in paid work in a given country does contribute to the inclusive economic growth and thus expands people's capabilities in the respective country. Moreover, lack of inclusive economic growth is also related to the educational mismatches of certain occupational groups, suggesting important political implications:

encouraging vertical educational match is one way to promote inclusive economic growth, and inclusive economic growth creates a supportive environment where capability deprivation is less likely.

In line with previous research, this report also showed that economic conditions (measured by the unemployment rate) and state policies (i.e. measures of active labour market policy - ALMP) tend to create conditions for skills mismatch to occur. The timing of the 1st ESJS survey, one of the sources of analysed data, had implications for the results, as the revealed high mismatch rates reflect the post-crisis situation, i.e., the stark decline in job availability (Cedefop, 2018). Regarding the start of the job, the findings revealed that high unemployment creates preconditions for being overskilled, while ALMP plays an effective role in addressing skill shortages. These results refer to the positive effect of the labour market policies, especially training courses for the unemployed (see also Cedefop, 2017).

Previous research has demonstrated that firms can significantly contribute to mitigating the skills mismatch by providing formal and informal training opportunities, by enabling career mobility (i.e. intra-job mobility) and by creating and designing jobs that can make the most of workers' skills (i.e. by increasing skills utilisation) (Cedefop, 2018). When translated to the language of the capability approach, it means that employers have a role in capability promotion. This report also reflects this issue. The analysis revealed the value of career advancement in preventing skills mismatches. Conversely, due to a lack of job tasks evolution, remaining in the same role confers the risk of transitioning from the matched to the overskilled category. Overall, the results imply that a lack of job evolution or skill development opportunities tends to lead to skills mismatches. Moreover, participation in formal training is also conditioned by the nature of specific jobs. The more complex the job, the more changes in job tasks are demanded and the higher the probability of participation in training. Importantly, the results also indicate that in addition to the specifics of the job, the characteristics of the employer (firm size, sector and sector type) matter as well, although to a lesser extent, suggesting their importance for developing capabilities.

This report centres on education and job-related training as one of the capabilities—an individual's potential for beings and doings, expressed broadly. To understand how this internal capability, encompassing physical and mental conditions, such as skills (Nussbaum, 2011), takes shape, the capability approach emphasises the need to examine external conditions. These include the wider socio-economic environment, such as economic conditions, such as welfare state policies, and social norms, as well as employers' practices, like job design and training provision. Nussbaum (2011) argues for such a combined approach to capability, asserting that the exercise of a functioning becomes possible only when internal capabilities are coupled with the necessary external conditions (see also section 1.4).

8.3 Capabilities, individual choice and skills mismatch

This report also highlighted the role of individual choice in skills mismatch, acknowledging that choice is one of the core concepts of the capability approach and that choices that people make, given their capability set, are always constrained by available opportunities: by people's past, their individual resources, as well as societal processes (including preference formation mechanisms) influence choices

driven (Robeyns, 2017). This highlights the comprehensive nature of the capability approach: "[w]e must ask which sets of capabilities are open to us, that is: can you simultaneously provide for your family and properly care for and supervise your children? Or are you rather forced to make some hard, perhaps even tragic, choices between two functionings which are both central and valuable?" (Robeyns, 2017: 52). We witnessed that individual resources and earlier experience of job search in interaction with societal influences (i.e. perception of labour market constraints) incline certain categories of potential workers towards the decision to take a job that does not match their skills. The concept of 'job convenience and compensation' paired with the concept of 'situational barriers' allowed to take into account how two functionings - 'family' and 'work'- might influence the decision. Work as the 'pull' factor and largely presenting 'employers' interest in the worker', i.e. in case of workers' strong bargaining power, while family as the 'push' factor towards taking a job that results in skills mismatch, i.e. when workers' weak bargaining power.

Individual resources of career alignment and development are associated with lower both the risk of being overskilled and underskilled, i.e. all in all, contributing to the search for a job to which a person's skills are well-matched. However, starting a job underskilled is coupled with the risk of complying with poor work compensation and a lack of work-life balance provisions. The perception of labour market constraints, coupled with the necessity to balance family and work obligations, contributed to being overskilled. Overall, we may conclude that not only individual resources and social influences (perception of labour market opportunities) but also choices made with regard to another (family) capability from the whole person's capability set all matter when choosing whether to enter a mismatched job.

The relationship between skills mismatch and subjective well-being at work was also unpacked in this report. Following the logic of the capability approach, subjective well-being at work was understood and measured as a multidimensional phenomenon. Empirical analysis of the association between different types of skills mismatch and subjective well-being at work revealed a consistent pattern across all these mismatch types: underutilisation of skills and knowledge contributes to lower subjective well-being at work. Importantly, the presented results indicated that all types of mismatch contribute to the perception of well-being at work, however, in different ways.

Given policy-makers' and researchers' concerns about reshaping work in a human-centric way, where people collaborate with (and are not replaced by) technology (European Commission, 2021; Lacity and Willcocks, 2018; Aleksander, 2017), these results have important policy implications. To achieve a more human-centric approach to work, all aspects of skills mismatch should be addressed, as diminishing the impact of one type hardly improves the overall situation in the inequality of in well-being. The results of this analysis also indicated that individual characteristics moderate the influence of skill mismatch on subjective well-being at work differently. In capability approach terminology, there are good reasons to suggest that both the conversion of resources available for individuals as well as the ways they make decisions (and perceived opportunities) vary across respective groups of populations. Accordingly, further evidence is needed to tailor policies that are effective for each respective group. This is a challenging task, particularly given the adaptive character of preferences: the capability approach requires research to focus not only on subjective well-being as connected to actual behaviour but also

consider objective conditions (real opportunities) for choices and the extent to which individuals' choices might be truly free.

This synthesis report also explored the connection between skills mismatch in the form of vertical educational mismatch and the legitimation of educational and economic inequalities. Based on assumptions driven by the capability approach, we would think of respective perceptions as a kind of feedback loop in generating the well-being of persons. Being internalised, these perceptions might shift public opinion in certain directions and, in turn, influence the perception of available options and interpretations of personal experiences. Perceptions of fairness of opportunities might influence the choice between options that are perceived as real (i.e. adaptation of preferences) and which might have real implications for a person's well-being. But the association between skills mismatch and legitimation of educational and economic inequalities is found to be rather weak, revealing itself only in a well-known pattern of legitimation of inequalities by already advantaged social groups. Moreover, the moderating influence of economic and democratic context on the examined associations is uneven – it is significant in the case of fairness of educational opportunities but not in the case of fairness of net pay. In sum, these results suggest a low risk of the abovementioned feedback loop effect occurring.

Overall, the central message conveyed by this report is in line with the suggestion of Cedefop's report (2018: 15): '[p]olicy-makers would benefit from adopting a different mindset in relation to mitigating discrepancies in skill supply and demand in their economies'. This report both complements Cedefop's messages (e.g., about the important role of employers in continuing skill development, about the dynamic character of skills mismatch, etc), but also serves as a warning that the issue of skill matching is still important and needs to be addressed in ways that would contribute to the goal of enabling people's well-being.

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