



Study on the Youth Guarantee in light of changes in the world of work

Part 2

Emerging challenges related to young people's
transition into the labour market



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The Youth Guarantee in light of changes in the world of work:
Emerging challenges related to young people's transition into the labour market

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Youth Guarantee in light of changes in the world of work:
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Part 2

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¹ DECISION No 573/2014/EU

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Executive summary

The Youth Guarantee was designed as a result of the high youth unemployment rates in many European labour countries after the economic recession. With the rate of youth unemployment generally declining since then, different challenges have evolved for young people in the labour market. Member States have experienced different paths in their economic recoveries, and the composition of groups of disadvantaged young people differs by country and by region, resulting in a combination of both Europe-wide challenges and specifically national challenges. In addition, it is expected that future technological developments will have significant impacts on European labour markets, particularly impacting on youth labour markets.

Since the end of the economic crisis, several key developments are worth noting. Firstly, as the overall economic outlook has improved, youth unemployment remains concentrated in specific Member States. In these Member States, jobless youth are also a key determinant in overall unemployment, a fact that is also reflected in a diverging trend in the youth unemployment gap between Member States. Secondly, at the aggregate level, trends are visible for specific groups of youth: among young men, for instance, inactivity rates remain higher now (2017) than they were before the crisis (2007) – for women, current inactivity rates are lower now than before the crisis, but they are overall at a higher level than for males. Thirdly, highly educated young people were affected more strongly by the economic shock, and their labour market position has recovered more slowly since then. At the same time, despite a less pronounced dynamic, NEET rates for low-educated young people remain higher in absolute terms. These general developments add to specific group heterogeneity at the Member State level: in particular, for instance, their capacity to reintegrate long-term unemployed youth varies markedly between countries.

In a parallel development, technological change through automation and digitalisation has advanced, and it is expected to re-shape the future world of work. Some predictions of the extent to which various jobs are likely to be automated represent an upper band of workers' redundancy and they may also underestimate the potential societal benefits of technological advances. In the meanwhile, certain accompanying labour market developments are becoming visible: one development, for instance, is the increasing prevalence of non-standard forms of work, and a higher degree of labour market volatility which is the result of less stable employment situations and more frequent job-to-job transitions.

Against this background, the report has discussed the implications of these challenges for youth employment and school-to-work (STW) transitions. First, it has provided a comprehensive overview of the current and future challenges for youth in the labour market and how these challenges will affect different groups of young people. Second, the report has reviewed the potential role of public policies and the current paradigms in view of these changes and discussed key policy levers to address these challenges. The first part makes clear that ongoing and anticipated technological developments are rightly expected to change the kinds of work experience that young people will have in the future as well as their actual jobs, with potentially important implications concerning the (in-)equality of opportunities and outcomes. The second part shows that these changes require responses in public policy in order to adapt economies to the upcoming challenges.

The main current challenges were identified as:

- Lack of basic skills, especially among disadvantaged youth

- Unmet labour market demand for high-skilled youth especially in STEM (Science, Technology, Engineering and Maths) skills and in ICT (Information and Communications Technologies) skills)
- Lack of work-related practical skills and a skills mismatch, especially among medium-skilled youth
- Labour market intermediation for youth

And the main future challenges were identified as:

- An increasing prevalence of non-standard forms of work
- Less stable employment situations and more frequent job-to-job transitions
- An increasingly precarious STW transition and growing path-dependence
- A changing relevance of specific skills and further uncertainty of skills requirements
- Lack of access to employment protection and social security.

One main response concerns the provision of skills. In fact, it is notable that skills provision and educational responses constitute the most prominent policy implication arising from this analysis. These skills responses have several aspects:

- Ensuring basic skills (including ICT) when people are entering the labour market
- Focusing on 'non-automatable' and ICT-related and STEM-related skills
- Identifying (transferable) skills in demand, providing targeted support services and ensuring flexible education and training systems
- Providing work-related skills matching labour market demand through an expansion of VET and work-based learning; improving collaboration between public and private stakeholders
- Providing labour market information, career guidance and job search assistance
- Targeting and tailoring Public Employment Services and Active Labour Market Programmes

In terms of policy levers for addressing future youth labour market challenges, these issues emerge as the most important:

- Maintaining and increasing the quality of work, and addressing challenges for the social security system
- Adapting labour market regulation and social protection, and supporting adaptability, self-management, and entrepreneurial skills
- Facilitating (non-formal) life-long learning, especially in non-cognitive and career-management skills

As far as the surge in non-standard forms of work is concerned, as well as needing to foster adaptability, it is important for policy to strengthen (self-)management among young people and also, to some degree, entrepreneurial skills, to prepare them for more autonomous daily work and more frequent labour market transitions. Public Employment Services (PES) and Active Labour Market Policies (ALMPs) may have an important role to play here, in an enhanced effort at providing fast and relevant labour market information, job search assistance, and placement interventions.

The concerns raised, relating to job quality and potential exclusion from social security systems require reforms of the labour market and business regulations. They also refer to the design of the social security system itself, which probably needs to be more flexible in its definition of what constitutes employment and the way workers can contribute to, and benefit from, the employment system. This is potentially out of the realm of youth policies *per se*, but it clearly is one factor shaping the labour market which future cohorts of European youth will enter into.

1. Introduction

The Youth Guarantee was designed and agreed upon in view **of high unemployment rates** in many European labour markets as a consequence of the economic recession, **which particularly affected Europe's youth**. Since the economic recovery, youth unemployment rates have now substantially decreased (although in some cases they remain at levels *above* those registered in the mid-2000s). With youth unemployment rates declining, the challenge seems to be not so much the severity of youth unemployment overall, but instead the continuing divergence between European Member States and – especially – between groups of youth within Member States. In addition, many actors expect that **future technological developments will have lasting and significant impacts on the European labour markets**, probably bringing about new challenges on the nature of youth employment.

Against the background of the differential economic recovery from the economic crisis and structural changes since the introduction of the Youth Guarantee across Member States, **this report discusses the implications of these challenges for youth employment and school-to-work (STW) transitions**. The goal of this report is twofold: *firstly*, to provide an overview of the current and upcoming challenges for youth in the labour market and **how these challenges will affect different groups of youth**. *Secondly*, to review the role of potential public policies and current paradigms in view of these changes, and to discuss key policy levers that experts, academics and relevant stakeholders **identify as potential instruments for addressing these challenges**.

Many of the challenges that youth face in the labour market are of a structural nature and have therefore persisted over time. The challenges that were relevant when the Youth Guarantee was implemented, the challenges that currently exist and the upcoming future challenges all to some extent overlap. The underlying economic factors develop continuously and some of these developments concern, in particular, long-term transformations that cannot be attributed to any specific time period, e.g. demographic change and globalisation. In order to establish a clear structure in this report and to avoid too much overlap across Sections, the study differentiates the factors underlying youth labour market challenges on a conceptual basis rather than by time periods. **This report discusses these challenges along the following structure:**

- (i) **Current challenges:** the second Section focuses on the **key challenges that have gained particular importance over the course of the recovery** from the economic crisis. To avoid overlap with challenges discussed in the first report (Caliendo et al, 2019), this report focuses on structural issues related to specific groups of youth (e.g. young people "Not in Education, Employment, or Training" - NEETs) and certain groups of Member States, rather than recession-related labour market weaknesses that affect young people in all Member States to a greater or lesser degree.
- (ii) **Future challenges:** to conceptually distinguish future challenges from current challenges, the third Section focuses on **anticipated economic development and challenges linked to ongoing and future technological advancements** (e.g. robotics, artificial intelligence, automation and the platform economy) and the consequences that these developments may have on youths' labour market careers (incl. job stability, the risk for precarious jobs, etc.).

Overall, the report not only draws on the extensive literature available on this topic, both from international organisations and academic publications, but it also ensures a **well-balanced involvement of relevant key stakeholders in the process**. The stake-

holder consultation includes an analysis of results from a stakeholder meeting that was held on 1st October 2018 in Brussels at the European Commission, an on-line survey that was launched in September 2018 amongst different groups of stakeholders, and follow-up interviews with a smaller group of representatives (see Annex A for details). The analysis will highlight stakeholders' perceptions of the most important current and emerging challenges for youth, as well as stakeholders' views on suitable and on the most adequate policy levers.

Predicting the future of labour market challenges for young people is clearly a complex task, but some key developments can be identified. In particular, these comprise the **fast-changing nature of the skills that are needed, and the increasing returns on transferable, interpersonal and ICT-related skills, as well as a prevalence of non-standard forms of employment (NFSE).**

These are some of the key developments on the labour market for youths that this report identifies and discusses in a systematic way. The challenges that these developments might bring will then be connected to possible policy responses. For instance, **one key policy lever is to adapt the education and training system to the changing nature of skills demanded on the labour market.** Another policy response concerns measures for youth to remain agile, adaptable and willing to continuously upgrade their skills. These and other policy responses will be systematically connected by the report to the relevant current and future challenges for young workers, and they will be discussed in additional detail.

The remainder of the report is structured as follows: the *second* Section provides an overview of the current state of the (youth) labour market in the EU – focusing on the most recent developments. The analysis of how the economic crisis and the subsequent recovery changed labour market environment for youth provides the basis for the ensuing discussion of current challenges that youth face on the labour market, and how these differ between specific groups of youth (especially disadvantaged youth). The *third* Section then provides an overview of *new* challenges that studies and stakeholders expect to emerge over the next 20 years in view of the changing World of Work. The *fourth* Section discusses potential implications of these emerging challenges for key policy responses. Section *five* concludes the analysis and thereby lays the foundation for the discussion of options for future development of the Youth Guarantee.

2. Current challenges

This Section provides an overview of **key challenges that youth in the EU currently face on the labour market**, and in particular in their school-to-work transition. To provide adequate background information, the Section starts in 2.1 by devoting some attention to the evolution of labour markets in the EU, stressing the differential speed of the economic recovery across Member States. Furthermore, it addresses **to what extent the economic crisis and the subsequent years of recovery transformed the way young people transition into the labour market.** Most importantly, this Section looks at the **specific challenges currently faced by certain groups and categories of young people – in particular the most disadvantaged** (e.g. the low skilled, young people living in poverty and social exclusion, people with disabilities, and those with migrant or ethnic minority background).

Having established the role of the crisis and the economic recovery for the youth labour market, this Section then continues to discuss current challenges across two lines which are clearly inter-connected but provide a useful conceptual separation for the analysis:

- *First*, Section 2.2 briefly **discusses challenges that youth who have first entered the labour market during the economic recession currently face on the labour market**. While the YG aimed to cushion the impact of the recession for these youth, it could not help all youth that suffered from the crisis to transition into the labour market. While the main part of this report focuses on the challenges that current and future labour market entrants (will) face, the current challenges of these youth are an important aspect to discuss policy levers that could address the ongoing NEET challenge in some Member States in the future.
- *Second*, Section 2.3 focuses on **challenges that current entrants to the labour market face; i.e. current challenges in their school-to-work (STW) transitions**. The report describes challenges that can be related to the lasting impacts of the economic recession in some Member States. We also touch upon some of the most important structural issues for STW transition that may have changed since the height of the 'great recession'.

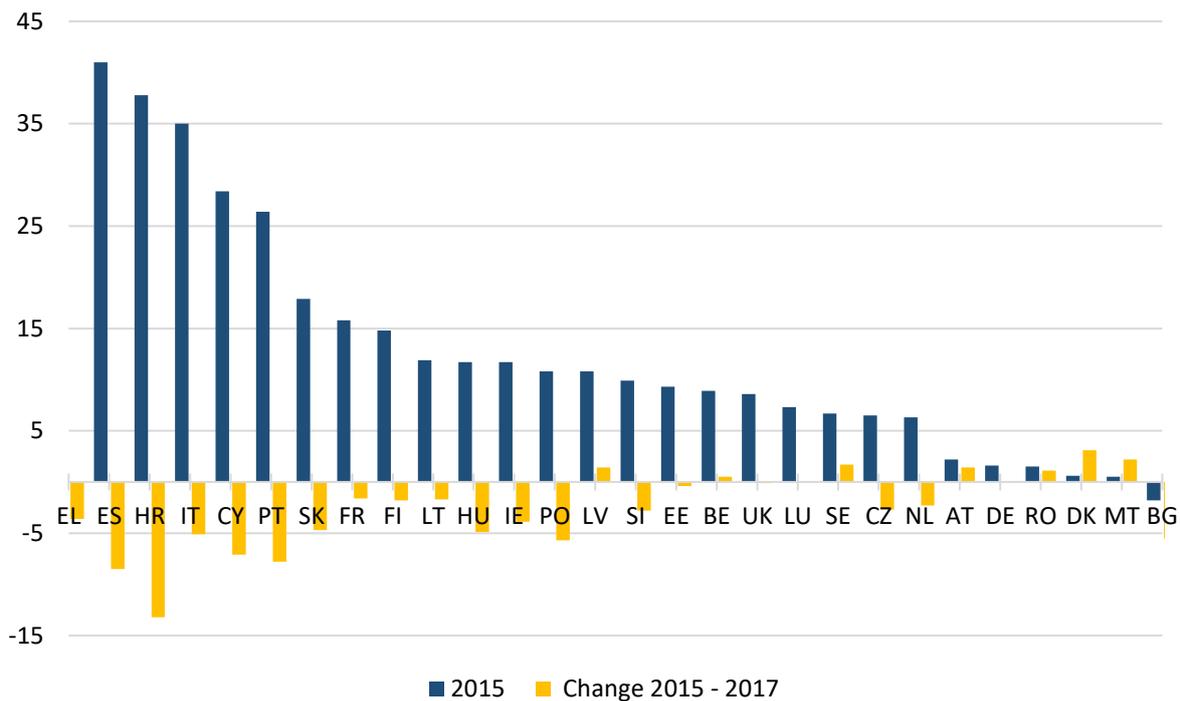
2.1. Economic crisis, recovery and the effects on youth labour markets

Youth labour markets in almost all Member States were strongly affected by the economic recession. Since then, EU youth unemployment rates have recovered overall. The EU-28 youth unemployment rate (15-24 years old) has gradually decreased in recent years and stood at 15.2% in the third quarter of 2018 (Eurostat) – slightly below the pre-crisis level of 15.6% in the second quarter of 2008. However, some Member States have seen stronger negative impacts during the economic recession than other and also less improvements since 2013.

This Section provides an overview of empirical facts that show how the economic crisis and the subsequent recovery have impacted the way youth transition into the labour market. It starts with an analysis of the development of European labour markets since the economic crisis, focusing in particular on the recent years since 2015. In order to discuss potential policy levers, it is important to understand which groups of Member States have yet to see a full recovery of their youth labour markets – and which factors explains these differences across Member States. Specifically, four key developments in EU (youth) labour markets will probably continue to play a significant role in the following discussion of future challenges.

A *first* key development is the **concentration of youth unemployment in specific Member States, which has increased even further since the crisis**. Whilst in the majority of European countries youth unemployment rates have recovered to pre-crisis levels, some countries (e.g. Greece, Spain, and Italy) are still facing substantial challenges, including youth unemployment rates that still exceed 30%. In fact, **youth unemployment is a key driver of differences in overall unemployment rates across Member States**: as Hernanz and Jimeno (2017) show, the concentration of unemployment among the younger population groups in some countries explains an important share of the increasing unemployment divergence across the EU. More importantly, however, not only do youth unemployment levels still differ strongly across Europe – youth unemployment trends differ as well. An increasing divergence across Member States within the EU is therefore observed (ibid).

Figure 1. Changes in the youth unemployment gap, 2015-2017



Note: the youth unemployment gap is defined as the absolute percentage difference between the youth unemployment rates and the adult unemployment rate. Source: Own calculations, based on Eurostat (une_rt_a).

A *second* key development is the **overall increasing divergence of the youth unemployment gap² between Member States**. To some extent, the divergence in youth unemployment levels discussed above can be related to the overall macroeconomic performance of Member States. While some Member States (e.g., Slovakia, Slovenia, Cyprus, and Latvia) have seen an improvement of their economic situation in recent years the recovery has stalled in others (e.g., Greece, Italy, and Portugal). But economic conditions can only partially explain differences in youth unemployment rates. Specifically, Member States differ not only in absolute levels but also in relative terms with respect to adult unemployment rates. The youth unemployment gap widened in most countries between 2007 and 2015.³ To some degree, this trend has been reversed since 2015, reflecting that youth are often 'first out-first in' (as will be discussed below). However, and most importantly, **the data show an increasing divergence across Member States also in the youth unemployment gap since the height of the crisis**. Figure 1 shows that Member States with a particularly stark youth unemployment gap in 2015 were not necessarily the ones that were able to revert this trend over the course of the economic recovery. Differences in the capacity of Member States to (re-)integrate youth throughout the economic crisis in the labour market are apparent by comparing the ini-

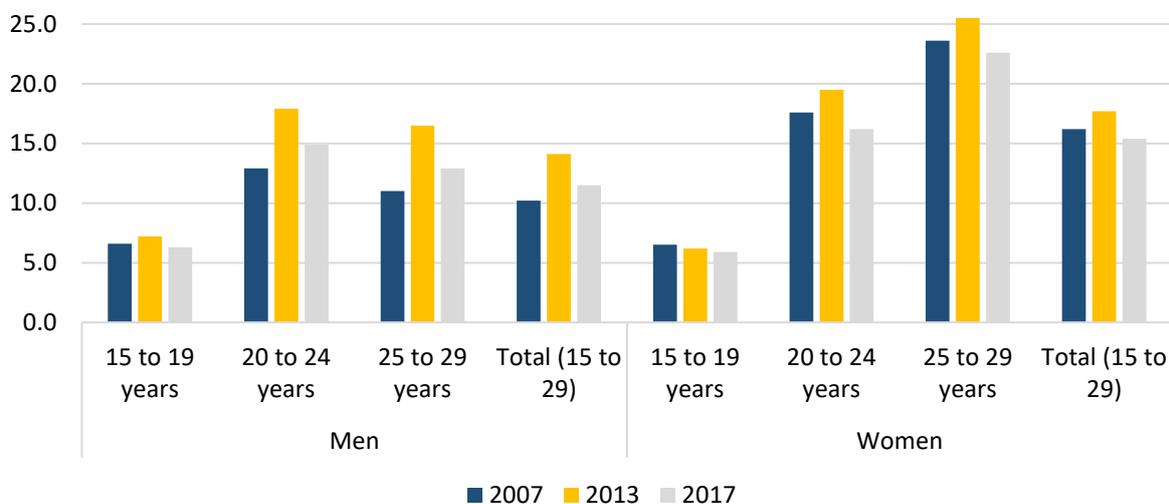
² As measured by the absolute difference between the unemployment rates of youth aged 16–24 and 25–29 with respect to that of the population over 30 years of age.

³ Hernanz and Jimeno (2017) show that over the course of the crisis the youth unemployment gap increased particularly strong in countries that had a high youth unemployment gap even before (mostly southern EU Member States).

tial gap levels to their change during the recovery.⁴ This is despite the large-scale intervention through the introduction of the YG, as shown by Caliendo et al (2019).

As a *third* key development, **there seem to be new trends regarding how unemployment and inactivity is distributed across specific groups in the EU – in particular by gender and education levels.** With regard to gender differences, Figure 2 shows that NEET rates for men have increased more strongly than for women in the context of the economic crisis. In addition, while overall NEET rates for men and women have recovered since the crisis, NEET rates for men are still above pre-crisis levels. As a result, it appears that men were particularly strongly affected by the crisis, and their subsequent labour market reintegration is lacking compared to women. Consequently, the gender differences in the NEET are less striking now, but women still have higher NEET rates today.

Figure 2. NEET rates in percent over time by gender and age cohort



Source: author's own calculations, based on Eurostat (yth_empl_160).

Higher educated youth are generally less likely to be NEETs.⁵ However, **in relative terms, young people with high levels of education were most strongly affected by the economic crisis** (see Figure 3).⁶ Most importantly, highly educated youth are also the ones whose NEET rates still stand high above pre-crisis levels, whereas the strongest recovery is observed among youth with low educational levels (in particular females).

Furthermore, heterogeneous developments can also be seen for different marginalised groups. A report by Bertelsmann Foundation (2017) finds that **youth with a migration background from non-EU countries generally saw the largest increase in unemployment in absolute terms over the crisis**, even though data are only available for

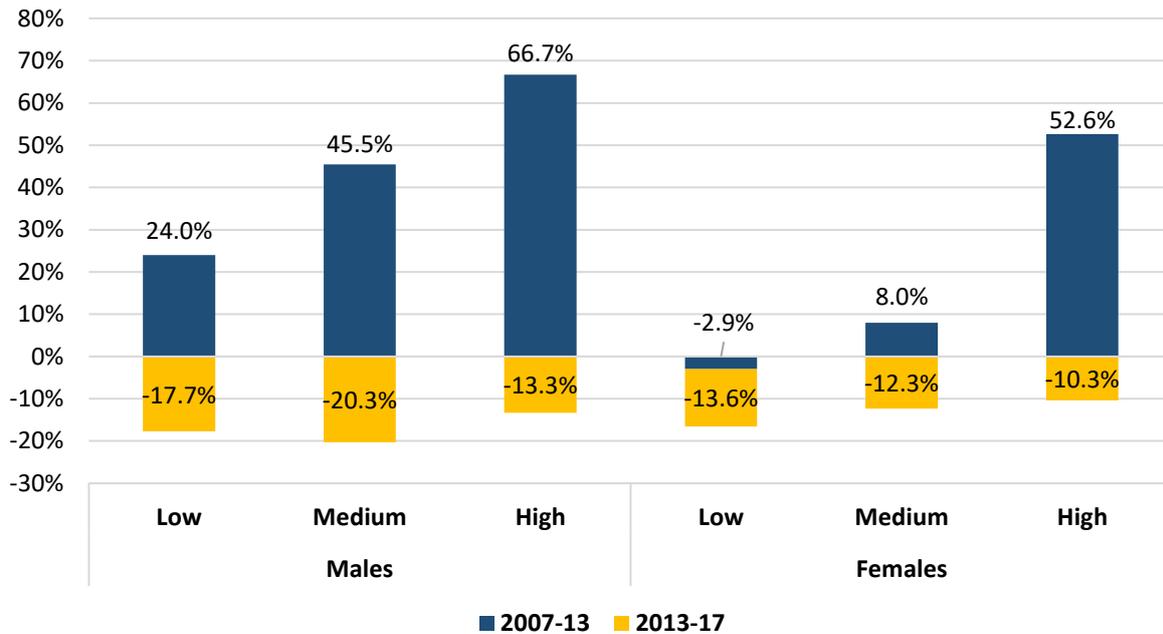
⁴ Compare, e.g., Belgium and Bulgaria – two countries with a similar youth-to-adult unemployment rate in 2015 – that have experienced very different recoveries of youth vs. adult labour markets since then.

⁵ For example, NEET rates among highly educated youth stood at 2 percent in 2013, but at almost 7 percent among low- and medium-educated young people. Note that both numbers are expressed in percent of the total youth population.

⁶ This phenomenon was also highlighted in previous research, e.g. Carcillo et al (2015) and O'Higgins (2014).

a limited set of countries. The report notes that it is 'safe to assume that marginalised groups [of youth] such as third-country migrants, ethnic minorities, refugees and people with disabilities are among those most affected by the crisis.' (ibid., p. 17). Similarly, Hadjivassiliou et al (2018) find that economic recession has particularly affected the speed, quality and sustainability of transitions of the most vulnerable and disadvantaged segments.

Figure 3. Relative change in NEET rates in percent by gender and education level

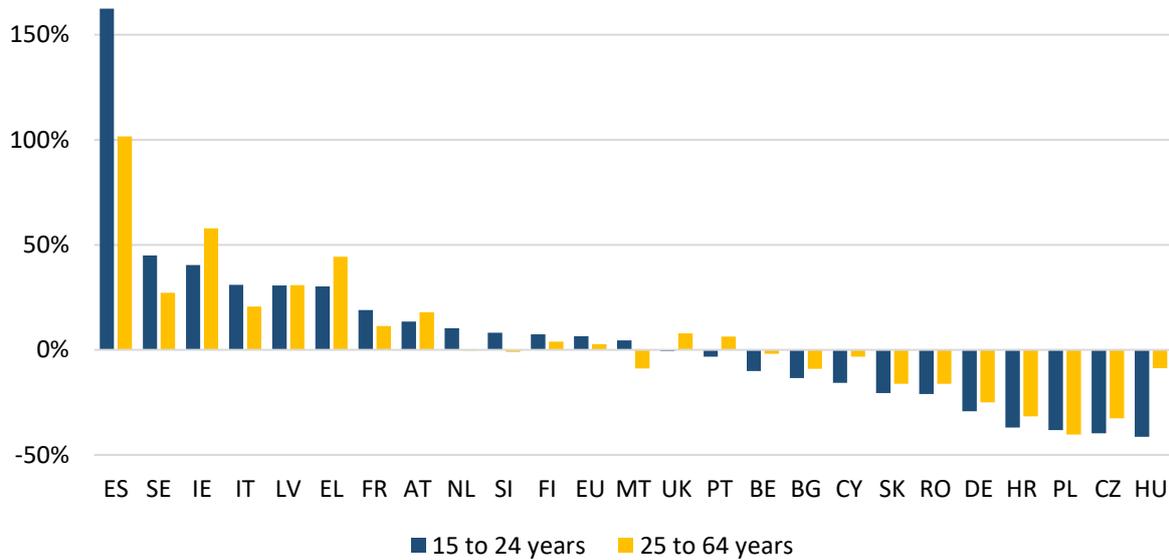


Notes: high education level corresponds to tertiary education (ISCED levels 5-8); medium education level to secondary and post-secondary non-tertiary education (ISCED levels 3 and 4); and low education level to no more than lower secondary education (ISCED levels 0-2).

Source: author's own calculations, based on Eurostat (yth_empl_160).

The *fourth* key development of concern **are differences in Member States' capacity to reintegrate youth and thereby prevent those young people from becoming long-term unemployed following the crisis.** Long-term unemployment among 15-24 year olds increased significantly in most EU Member States over the course of the crisis. But Figure 4 shows that Member States differ in their capacity to reduce the share of long-term unemployment back to pre-crisis levels or below. In several Member States (most notably Spain, Sweden and Ireland) the share of long-term unemployment among 15-24 year olds still stands above pre-crisis levels of 2017. On the other hand, some Member States have seen a substantial reduction in the share of long-term unemployed youth (and adults), e.g. Poland, Czech Republic and Hungary.

Figure 4. Relative change in share of long-term unemployment by age group 2007-2017



Source: author's calculations, based on Eurostat (Ifsa upgan), not for all MS available.

Taken together, these four empirical facts of current youth labour market trends show that the **economic recession does not necessarily imply continuing mass unemployment among young people**. But the facts likely reflect **shifts in demand between skills and occupational groups that affect the labour market position of groups of young people** within and between Member States in the long term. Recent studies argue that the mechanisms underlying these shifts are likely inequality-increasing (see e.g. EPRS (2018) for a review of the discussion), which may also be the case for youth employment outcomes.

2.2. Challenges for youth that entered the labour market during the economic recession

The first years after finishing education can be a very productive period – with young workers' wages growing rapidly and frequent transitions towards better paying jobs. At the same time, young workers are particularly vulnerable to adverse conditions in the labour market during this period (Schwandt and von Wachter, 2018). This Section discusses the long-term implications of the immediate recession-related impacts on youth unemployment.

Several immediate **negative impacts for young people entering the labour market during the economic recession** in the EU are typically discussed in the literature:

- **First, young people were generally less likely to find employment and less likely to keep their employment during the recession.** On the one hand, this is because hiring rates were cut at the onset of the crisis and therefore, newcomers were locked out of the labour market. On the other hand, young people were more quickly laid off, as they were lacking company-specific work experience, hence they meant a smaller loss to the employers. 'Young people are the ones last-in and first-out when the economy enters recession.' (Helbling et al, 2016, p. 2)

- *Second*, research has shown that, during recessions, **wages tend to fall most strongly for those workers entering new jobs**, which naturally particularly applies to young people during their STW transition (Elsby et al, 2016; Schwandt and von Wachter, 2018).
- *Third*, the prolonged jobs crisis may have **forced young people to be less selective about the type of jobs they were prepared to accept** (e.g. jobs that offer fewer returns and worse career prospects). Being new entrants with limited work experience, the young people were often employed through temporary and part-time contracts or pursued a traineeship. As they lack (full) job opportunities, young people entering the labour market also often resort to aligning several traineeships or internships before finding a full job.

Existing evidence clearly shows that **the pronounced negative effect of entering the labour market during a recession is not only of a temporary nature**, but it may lead to long-lasting adverse consequences for job prospects and labour market integration. Such persisting adverse consequences of negative early career experiences have come to be known in the literature as '**scarring effects**'. There is a comprehensive empirical literature demonstrating the negative long-term impacts of entering the labour market during a recession. For instance, several studies based on past recessions show that entering the labour market during a 'typical' recession lowers earnings for approximately ten years (Kahn 2010; Oreopoulos, Heisz, and von Wachter, 2012). In addition, a recent paper by Schwandt and von Wachter (2018) show that in the US the persistent negative effects are particularly bad for less advantaged groups in the labour market (especially non-whites and high school drop-outs). Within the EU, the long-term consequences of the recession are clearly reflected in NEET trends and long-term unemployment rates, which also differ across gender and educational groups (as discussed in Section 2.1).

Understanding the mechanisms of the scarring effects of the current challenges on young people has implications for key policy levers later on. While a full discussion of the mechanism is beyond the scope of this report, the following overview provides the main aspects of the diverse and inter-linked demand-side and supply-side mechanisms that may determine the magnitude of these scarring effects, and therefore the relevance to each Member State⁷:

- *First*, experiencing unemployment, especially long-term unemployment, at the beginning of one's career can have negative long-term consequences in terms of future earnings and employment prospects through demand-side challenges. **One important factor is employer discrimination based on the negative signalling effect of former unemployment periods.** Since the productivity of recent labour market entrants is less easily observable, negative signalling effects or stereotyping is usually considered more pronounced for young job-seekers (Oberholzer-Gee, 2008).
- *Second*, **supply-side challenges determine ongoing challenges for young people – most importantly a lack of human capital.** Firstly, because some young people did not have the possibility of accumulating as many job-specific skills as the other young entrants who experienced a smooth and stable STW transition (Helbling et al, 2016). Secondly, because for young people the depreciation of human capital during spells of unemployment takes place at higher rates

⁷ For a detailed overview see, e.g. Helbling et al (2016).

during the initial stages of the working career (Hernanz and Jimeno, 2017). Finally, an interesting aspect related to the accumulation of human capital for young people points in a different direction: in order to avoid entering the labour market at difficult times, young people may delay the STW transition by extending their education period. However, they often do not reap the expected positive results for later career prospects. For example, Sironi (2018) finds that the negative impact of the recession was especially pronounced for young people with tertiary education (as measured by the probability of being low-paid). The authors explain this by the large share of young men with tertiary education in the economic sectors most influenced by this crisis (ibid. p.110).

- *Third*, there is also a **psychological impact from negative early career job experiences**. Young people that enter the labour market bear a higher risk of discouragement and disengagement from the labour market (Ayllón, 2013) and they can become 'habituated' to their labour force status (Clark et al, 2001), as well as lower self-esteem. These psychological factors determine labour market outcomes through a variety of mechanisms, e.g. lower job-search intensity, and they particularly affect those who were already disadvantaged.⁸

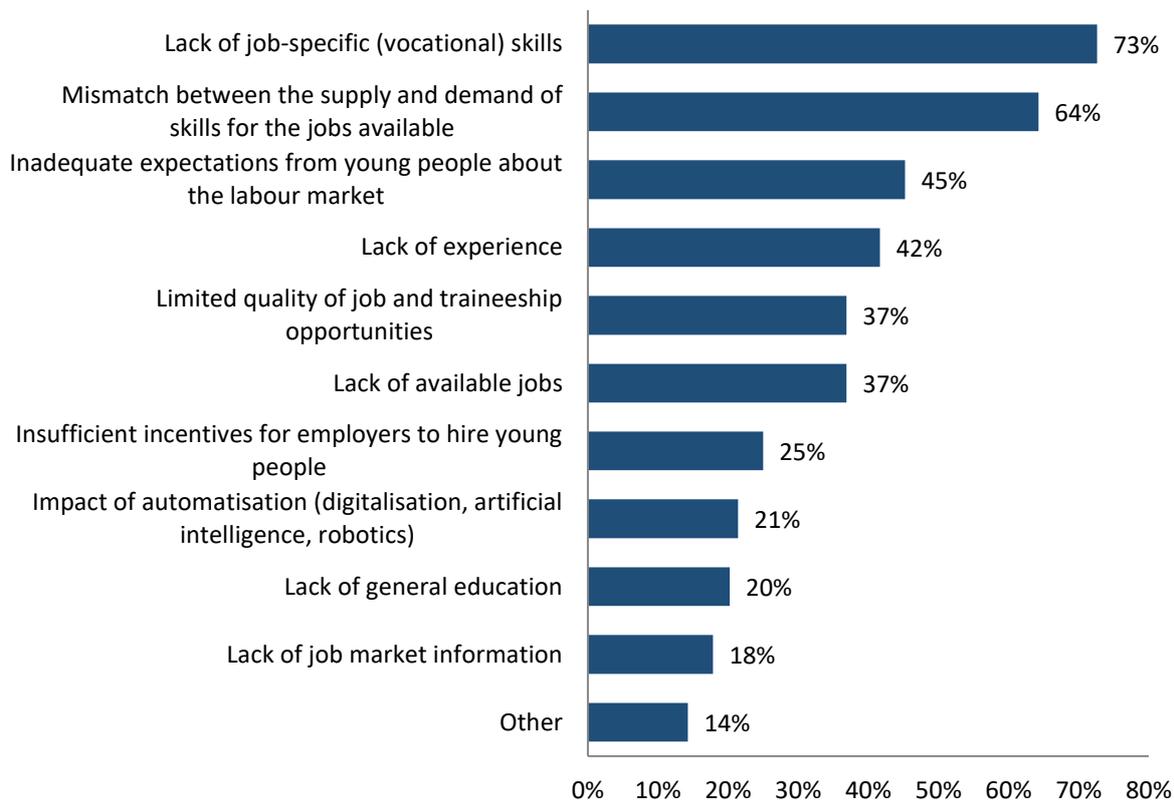
2.3. Challenges for current labour market entrants

Since the height of the economic crisis in 2013, labour markets have rebounded in many Member States, altering the challenges that young people face in their STW transitions. The previous sub-Section discussed the evidence on how the economic crisis has negatively affected young people that entered the labour market back then. This sub-Section discusses the challenges that current labour market entrants face, with a particular focus on challenges that differ from those predominant at the time when the YG was designed in light of the economic crisis. This study therefore relies not only on extensive desk research but also on the results of a stakeholder consultation (both an online survey and a stakeholder seminar, see Annex A for more details).

A key result of the stakeholder consultation is that labour supply-side related challenges are generally seen as being more relevant than the demand-side factors. Figure 5 shows that respondents to the online survey regard as most important challenges the **lack of job-specific (vocational) skills** (73%) and experience (42%). Additionally, a **mismatch between the supply and demand of skills for the available jobs** is identified as the second most important current challenge (64%). In regard to the demand-side, the key challenges mentioned were the limited quality of jobs and traineeships (37%) next to the lack of available jobs (37%), followed by insufficient incentives to offer them to young people (25%), or the negative impact of automatisisation (21%). Finally, the fact that information about the job market is not considered a key challenge (18%), suggests that most stakeholders believe that inadequate expectations about the labour market are due to a lack of experience (45%) rather than information available to young people.

⁸ Giuliano and Spilimbergo (2014) found that individuals who experienced a recession during their formative working years were more likely to believe that success in life depends more on luck than on effort, they are also more likely to support more government redistribution and to have decreased confidence in public institutions.

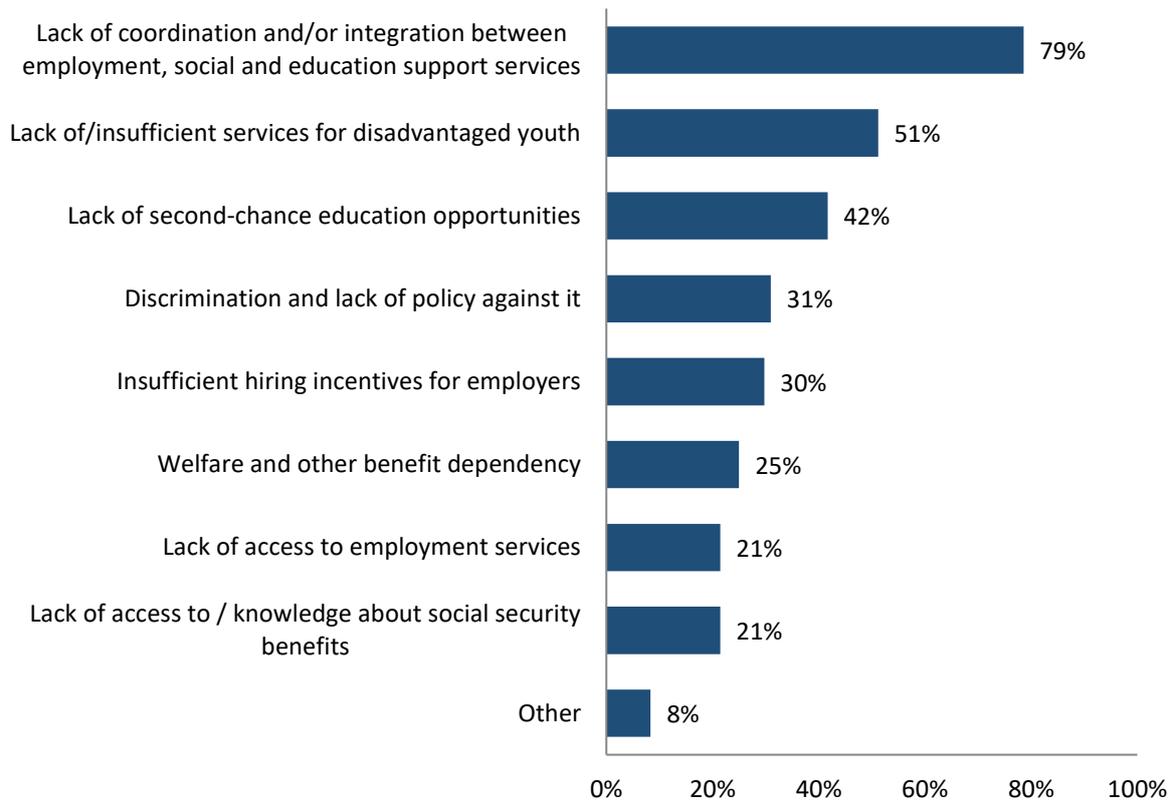
Figure 5. Stakeholder responses on current challenges



Note: N=84. Questions: What are the most pressing challenges currently faced by young people in the EU/in your country or region in their transition to the labour market?

Another important result of the stakeholder consultation was that **challenges for young people differ significantly by skill levels and/or other characteristics of being disadvantaged**. As part of the online survey, stakeholders were asked specifically about the most pressing challenges for disadvantaged young people (Figure 6). These were most prominently seen in a **lack of coordination and/or integration between employment, social and education support services** (79%), a lack of/insufficient services (51%) and a lack of second-chance education opportunities (42%). All these key challenges relate to policies in place for supporting disadvantaged young people, rather than the skills they bring to the labour market. In regard to the labour demand-side, key issues named were the lack of incentives (30%) or even discrimination against hiring disadvantaged young people (31%). Discussions in the seminar focused more on the heterogeneous challenges for young people with different skill levels. The main challenges identified were i) lack of basic skills, especially among the disadvantaged young people, ii) unmet labour market demand for highly-skilled young people and iii) the lack of work-related practical skills, and the skills mismatch mainly among middle-skilled young people.

Figure 6. Stakeholder responses on current challenges facing disadvantaged youth



Note: N=84. Questions: What are the most pressing challenges faced by particularly disadvantaged youth in their school-to-work transition in the EU/in your country or region?

The fact that skill-related challenges differ across Member States can be related to macroeconomic and structural factors that determine labour market demand and they therefore serve as an important moderator for youth labour market challenges related to the labour supply-side.

In regard to macro-economic factors, sub-Section 2.1 has shown an increasing divergence in overall labour markets between Member States since the height of the economic recession. While the economy has rebounded in most Member States, recession-related macroeconomic STW transition challenges persist in some Member States – in Greece, Italy and Spain, for example. In addition, in some countries the crisis hit earlier and its duration was shorter than in other countries, which meant that youth labour markets in these countries had more time to recover from its consequences (Bertelsmann Foundation 2017).⁹ In countries that were hit particularly hard, or that have experienced a sluggish recovery, STW transition challenges are at least partially still labour-demand related. In the context of the fragile or jobless economic recovery in many Member States, STW transition challenges may partially be explained by the shortage in demand for labour. The limited employer absorption capacity for providing training places (such as apprenticeships) and jobs for young people (Hadjivassiliou et al 2018) were also a factor.

⁹ For instance, Denmark and Ireland reached their highest youth unemployment levels in 2011, while most southern European Member States peaked in 2013/14.

In parallel to the macro-economic environment, recent structural developments have also gained importance in the EU's labour markets in recent years. **Key structural challenges that have been commonly cited in the literature include** (Autor et al, 2013; Dustmann et al, 2017; EPRS, 2018; European Commission, 2018a; UKCES, 2014)¹⁰:

- the integration of third-country and internal migrants in national labour markets;
- increasing competition from non-EU countries also outside of manufacturing sectors and blue-collar work;
- demographic change, in particular the change of the economic dependency ratio.

While these factors are not necessarily specific to youth labour markets, they are **key determinants for young people's STW transitions since they often imply increasing competition on labour markets**. For instance, within the population of third-country migrants, young men are overrepresented relative to the overall population. Furthermore, pension insurance systems place a heavier burden on young people in ageing societies, and they also affect countries in different way. In general, it is likely that these factors will alter the demand for specific skills and hence amplify the skills related challenges for young people (in particular low-skilled youth) that are discussed below.

Taken together, a key finding of this stakeholder consultation and the literature review is that **all Member States experience challenges related to the skills that youth bring to the labour market – but that the specific skills-related challenge varies across Member States due to macro-economic and structural factors**. This report takes these results as a starting point for a more in-depth analysis of the type of skills needed, and the associated challenges, for young people's STW transitions in the following paragraphs.

Challenge 1: Lack of basic skills, especially among disadvantaged youth

Overall, young workers nowadays are much better educated than the generations before them (European Commission, 2018a). Nonetheless, either **having no skills or inadequate skills appears to remain a challenge for young people's STW transition in some Member States even today**. The results of the latest (2015) PISA (Programme for International Student Assessment – the world's biggest international education study, involving schools and pupils in over 80 countries) tests show that one in five pupils is a low achiever in the key disciplines of mathematics, reading and science. Furthermore, despite all efforts, the trend has recently increased (European Commission, 2018a). The fact that a lack of basic skills is an important impediment for young people on the labour market was also a main outcome of the stakeholder consultation: Apart of the lack of job-specific (vocational) skills, one-fifth of respondents mentioned that 'lack of general education' is a key challenge. Shortages in these basic skills are a concern in almost all Member States. Based on the OECD Skills for Jobs database, the European Commission (2018a, p.94) found that 'literally all basic content skills are in short supply in almost all Member States [...] because almost all occupations require workers to make use of basic skills such as reading or writing'.

The lack of basic education is particularly relevant among disadvantaged young people: PISA scores can be explained to a significant extent by a person's social background (European Commission, 2018a). The issue can also be partially explained by the

¹⁰ To which extent each of these structural factors affect STW challenges of current labour market entrants is difficult to establish empirically, and the issues are too large to be discussed in this report in detail.

linked persistent relevance of **early school-leaving among disadvantaged youth**: specifically, more than one in ten young Europeans leave school early (European Commission, 2018a). While social background is strongly correlated with individual skills everywhere in Europe, the connection between parental educational achievements differs significantly across MS. This implies that the educational system in some countries is less good at ensuring equality of opportunity than in others (see European Commission, 2018a, p. 96 for more details). In this regard, the **key challenges identified by stakeholders during the seminar were the lack of interventions to identify and support those at risk of early school-leaving**. In addition, **a lack of second-chance education opportunities** for disadvantaged young people was commonly highlighted among stakeholders.

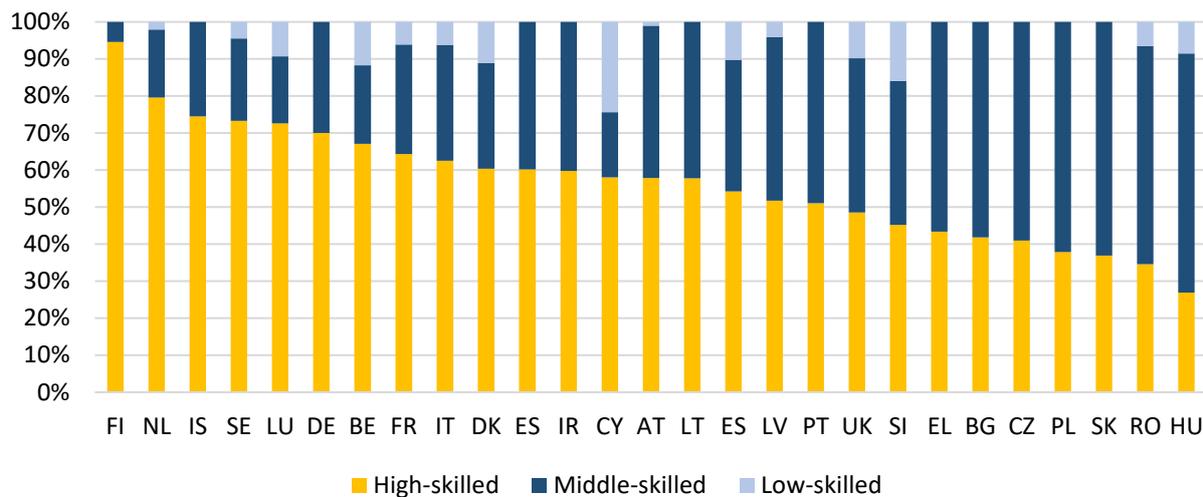
Challenge 2 – Unmet labour market demand for high-skilled youth (especially in STEM/ICT skills)

In some Member States, employers and business organisations say they suffer from an **increasing lack of adequately skilled youth, in particular in high-skilled occupations**. This is also confirmed in several studies – for example recent evidence from the OECD Skills for Jobs Database. The initial report of the database (OECD, 2017) and Verhagen (2018) provide a detailed analysis of the skills levels that are currently in shortage or surplus across EU Member States.¹¹ Figure 7 shows that, across the OECD and most EU Member States, **the majority of jobs that are hard-to-fill are found in high-skilled occupations**. This holds especially in northern and western European countries (e.g. Finland, Luxembourg and Germany). In these countries, the demand among job-seekers even for medium-skilled occupations is low. The data therefore further shows that few of the job vacancies that are hard to fill are found in low-skilled occupations – these low-skilled vacancies account for less than 1 in 10 of the jobs shortage across the OECD. While this is true across all EU Member States, the figure also displays large differences across EU Members States (compare, for example, Hungary and Finland) – which implies a distinct need for policy adjustments across Member States. Only in a very few Member States do low-skilled occupations represent a meaningful share of the jobs that are in demand (e.g. in Slovenia).

The further analysis of the data by Verhagen (2018) provides an indication of **specific types of skills that are in shortage across EU Member States**. These skills are mostly knowledge of computers and electronics, judgment and decision-making skills and verbal abilities. While these figures correspond to general labour market trends, they provide some information about the types of skills that young people may be lacking. Similarly, CEDEFOP (the European Centre for the Development of Vocational Training, 2016) notes that in several countries the supply of ICT and STEM graduates from upper-secondary and higher education is insufficient to meet demand, further stressing the importance of these types of skills.

¹¹ At the time of writing, no final report was launched. The data are from <https://oecdskillsandwork.wordpress.com/2018/10/22/the-oecd-skills-for-jobs-database-2018/>, accessed 23.10.2018.

Figure 7. Share of employment in high demand by skills level



Notes: high, medium and low skilled occupations are International Standard Classification of Occupations (ISCO - one of the main international classifications for which International Labour Organisation is responsible) occupational groups 1 to 3, 4 to 8, and 9, respectively. The shares of employment in each skill tier are computed as the corresponding employment in each group over the total number of workers in shortage in each country. The data refers to the latest year for which information is available.

Source: author's own calculations, based on the OECD Skills for Jobs database (2018).

Challenge 3: Lack of work-related practical skills and skills mismatch, especially among medium-skilled youth

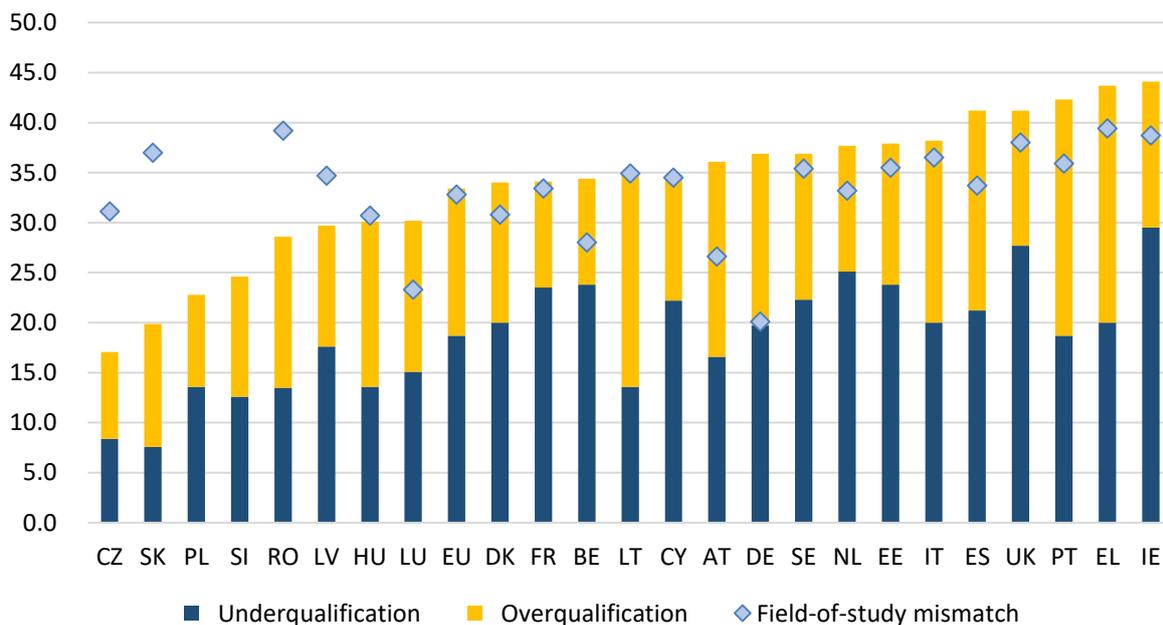
A final challenge identified from the literature and stakeholder consultation is the **lack of work-related skills, and the mismatch of skills**. Despite the fact that employment rates increase with educational level, recent analysis shows that **'education is a necessary but not sufficient condition'** (European Commission, 2018a, p. 15) for successful labour market integration and wages. The skills mismatch has two issues: firstly, a lack of work-related practical skills, and secondly, the development of skills that are not currently in demand on the labour market.

On the first issue, the fact that many youth lack work-related practical experience when entering the labour market is not new, and has been highlighted by stakeholders and business surveys for several years (McKinsey Center for Government, 2014). The **lack of job experience and job-specific (vocational) skills was also emphasised as a key current challenge by stakeholders** in the online and seminar consultation. While this concerns all skill levels, the literature review suggests that medium-skilled youth, in particular, are lacking vocational/work-related skills, or that such skills would be particularly relevant for this group for their STW-transition. A related concern highlighted in the stakeholder consultation – also with regard to lacking job experience – was **'inadequate expectations' among the young people about the labour market**.

On the second issue, a key factor appears to be that many young people are **not equipped with the right skills demanded by the labour market, despite their higher levels of education**. As the European Commission (2016) suggests, some Member States exhibit high discrepancies between both the employment and the unemployment rates of workers at different skills levels (for example in Belgium, Bulgaria, Hungary, Ireland, Lithuania, and Malta), indicating the presence of significant macroeconomic skills mismatches. In addition, there is growing concern about the fact that **higher education graduates experience considerable occupational skills mismatches by working in jobs typically requiring a lower level qualification** (European Commission, 2017a). Recent findings from the OECD Skills for Jobs Database shed light on

the fact that a challenge arises both from over-qualification and from 'field of study' mismatches.¹² For instance, Figure 8 indicates that field of study mismatches average around 30% across the EU. As Montt (2017) notes, field of study mismatches need not naturally be considered negative *per se*, as workers who find a job at their correct qualification level, but in another field, do not experience a statistically significant wage penalty in most countries. Underqualification may therefore be the more challenging issue: indeed, as Figure 8 shows, many Member States have significant rates of underqualification. This is particularly prevalent in Greece and Portugal, where the graduate earnings premium has declined markedly, which not only increases the likelihood of job dissatisfaction and disillusion with education, but also presents considerable economic costs (Green and Henseke, 2017).

Figure 8. Qualifications and field of study mismatch (2015)



Source: Own calculations, based on OECD Skills for Jobs database (2018)

A key aspect of skills mismatches and the **lack of work-related skills is the institutional set-up that determines the STW transition process for young people.** The fact that young people lack work-related skills when entering the labour market has frequently been acknowledged by many stakeholders and Member States. VET (Vocational Education and Training, including apprenticeships) was increasingly considered key to lowering youth unemployment and facilitating the STW transitions of young people across the EU (Eichhorst and Rinne, 2014; Quintini and Martin, 2014; Eichhorst, 2015; European Commission, 2017a).

As a result, there has been an effort to **improve VET offers and strengthen the role of VET apprenticeships in STW transitions** across all five clusters in Walter and Pohl's typology (European Commission, 2017b, 2018a and 2018b; Hadjivassiliou et al 2018). The goal is to show young people that VET can be an attractive alternative to general upper secondary and tertiary education. Since the onset of the crisis and the beginning of the YG, Member States have made varying efforts to reform their STW

¹² Field of study mismatch occurs when a worker, trained in a particular field, works in another field.

transition regimes. Education-related reforms have also focused on other areas, especially on addressing low educational attainment, since this is one of the key determinants for becoming a NEET as well as of being unemployed or inactive. Leaving school with at least an upper secondary education qualification has proved to be the minimum labour market entry requirement in the STW transition process (European Commission, 2015a).

When looking at the institutional change with respect to STW transition regimes across EU Member States, there are some signs of convergence across Member States in terms of the underlying logic of STW transition, but, at present, this 'institutional change remains limited in terms of impact and superficial in terms of actual implementation' (Hadjivassiliou et al 2017). Furthermore a 'worrying trend can be identified across [Pohl and Walther (2007)] country clusters, comprising a progressive deterioration of the quality of youth transitions across the board.' (ibid.)

Challenge 4: Labour market intermediation for young people

Besides the important challenges arising from the fact that young workers may not graduate from the educational system with a sufficient level, or an adequate mix, of skills (the various dimensions of which were discussed in the previous three challenges), **the process itself of searching and matching also requires an appropriate design.** For instance, information failures can arise in various shapes on both sides of the labour market (Kluve, 2018; Quintini and Martin, 2014): on the one hand, **young people may be insufficiently informed about the value of education, about the skills in demand when they are job-seeking** or in the future on the labour market and where to obtain those skills, and they may lack sufficient information on how and where to look for suitable employment. On the other hand, **employers may receive insufficient signals on youth productivity from the educational certificates that they are able to obtain.** Such patterns exacerbate the duration of the STW transition, and they may decrease the quality of the job match (ibid.)

These challenges of the STW transition processes **point to the importance of educational and post-educational support services**, e.g. by schools, by the social partners, and in particular by the PES (Public Employment Services). Specifically, whereas the better educated have been hit the most by the economic recession in relative terms (see Section 2.1) at the time, the less educated and migrant youth now entering the labour market are at a relative disadvantage, requiring further labour market intermediation support. In fact, one outcome of the stakeholder consultation was that **too few direct links and coordination mechanisms exist between the education system and labour market services and the PES programmes.** An improvement in these coordination services could potentially make an important contribution to an improved STW transition for young people.

3. Emerging future challenges

Against the backdrop of increasing global competition, a shrinking working-age population, and increased resource scarcity, technological innovations that increase productivity become ever more crucial. At the same time these innovations also significantly change the means and organisation of production and services, and with this, the world of work in the EU. This Section discusses the **most important trends in the labour market related to technological developments** that are likely to emerge over the next 20 years, with potentially fundamental consequences for the way and what people work. In the literature, **these changes are often associated with the 'New World of Work' or the 'Changing Nature of Work'.**

The Section aims to provide a **concise overview of a growing literature that has emerged in recent years about the future world of work, with a particular focus on youth labour market opportunities and challenges**. Methodologically, this Section is based on a thorough desk study on the existing literature on the future of work, with a particular focus on their relevance in EU labour markets and the expected trends therein. At the same time, the findings from the stakeholder consultations play a crucial role in shaping the content of this Section.

The anticipated economic and labour market developments are linked to ongoing and future technological changes, whose impact on the economies of the European Union are multi-fold and permeate every aspect of the markets. In particular, emergent technologies are blurring the boundaries of the firm, and changing production patterns and employment trajectories (World Bank, 2018). This has implications for two features of the future world of work.

- *Firstly, technological developments shape what people work*. This relates mainly to two factors: automation (the Fourth Industrial Revolution, computerisation, robotics, smart production systems, robots, artificial intelligence and genetics and digitalisation (the increasing importance of ICT in production and services)).
- *Secondly, technological developments shape how people work*. This relates to a digital transformation that has an impact on the future organisation of work within and across firms, such as for example, new business models, labour market mediation through online platforms and the gig-economy.

The Section characterises the future world of work, firstly by **defining the technological developments brought about by automation, digitalisation and digital transformation**. Secondly, it then **links this technological change to predictions about future employment in the EU**, and it also discusses developments in labour market polarisation and changing employment conditions. These key characteristics of the future world of work are then **translated into emerging challenges for young people in the labour market**.

3.1. The future world of work

3.1.1. Automation, digitalisation and digital transformation

Automation of production and services

The impact of emerging technologies on the production process has been discussed under multiple headlines. The seminal studies by Frey and Osborne (2013, 2017) refer to these developments as 'computerisation', while others refer to the 'Fourth Industrial Revolution' (Pouliakas, 2018, World Economic Forum 2016, UKCES 2014). This Section discusses the topic mainly as the **introduction of (potentially labour-saving) technologies, which is related to two intertwined developments**:

- First, an **increasing automation of the production process** related to, for example, robotics, smart production systems, and collaborate robots ('cobots').
- Second, **further digitalisation of production processes and service provision** through information and communication technologies (ICT).

The rationale of this distinction is that automation and digitalisation may have different implications for the future 'World of Work' and future policy levers that are related to the World of Work. The increasing automation of production processes is typically associated with a **shift between occupations and tasks that are performed by workers**, and

therefore increasingly routine- or skills-biased technological changes. Digitalisation, on the other hand, is associated with an **increase in the ICT content of tasks across all occupations**. In this light, researchers generally expect that automation will have a more immediate impact on low-skilled occupations and routine tasks, while further digitalisation will increase the premium paid on ICT-related skills – among other talents – in the future. As a consequence, policy levers to adapt to these developments can be specified.

Digital Transformation

Technological developments do not only affect labour markets through **changing the content of work (through automation and digitalisation), the 'digital transformation' also transforms how business and markets are organised** in a more fundamental way. This report considers the impact of digital transformation on the economy in a broad sense – as the increase in potential exchanges of low-cost value relative to transaction costs become economically viable through technological development, notably in ICT.

In the literature, this development is also attributed to the rise of so-called **Multi-sided platforms (MSPs, or 'matchmakers') which enable interactions between two or more parties** (recent examples are eBay and Uber) and 'reduce a transaction cost or economic friction and thereby facilitate value-creating interactions between two or more different types of economic agents'. (Evans and Schmalensee, 2017). Therefore, the digital transformation of the economy does not only relate to labour markets, due to lower transaction costs facilitating outsourcing and B2B (Business to Business) transactions will also be an important feature of the digital transformation.¹³

The commonly cited trends on how digital transformation will influence markets and economies can be grouped into three distinct developments. Firstly, the **digital transformation is likely to affect the organisation of firms and especially work within firms**: businesses will become increasingly flexible, increasingly able to create and disband corporate divisions, often defined as 'network orchestrators' that connect skills and resources. Secondly, the **organisation of markets and business relations is likely to be impacted through increasing the fragmentation of production processes**, more global value chains, and new forms of sourcing, such as crowd-funding. Thirdly, the digital transformation **enables new business models and new types of economic agents**, already apparent in the rise of the platform- or the gig-economy.¹⁴

With regard to labour markets, the most commonly cited aspect of this phenomenon is so-called **'platform work'**, – understood as 'the matching of the supply of and demand for paid work through an online platform' (Eurofound, 2018a: 1).¹⁵ The main features of

¹³ As Evans and Schmalensee (2017) discuss, MSPs 'play critical roles in many economically important industries including payments, communications, financial exchanges, advertising-supported media, operating systems, and various Internet-based industries such as online marketplaces and ride-sharing apps'.

¹⁴ Typical examples of the platform economy are Spotify, Amazon, Netflix and Alibaba (Parker et al, 2016).

¹⁵ At present there is a lack of shared understanding or terminology regarding platform work across the EU's Member States. The most common terms used across Europe to refer to this form of work include 'sharing economy', 'platform economy', 'gig economy', 'crowd employment', 'on-demand economy', 'crowd sourcing' and 'peer-to-peer work'. However, 'sharing economy' is often used to describe the genuine sharing of goods and labour without financial exchange. In 2018, Eurofound

platform work are that paid work is organised through online platforms, three parties are involved (the online platform, the worker and the client), work is being contracted out and may be broken down into specific tasks while services are provided on demand (Eurofound, 2018a). Hence, **platform workers are independent workers (freelancers) and not dependent employees**. Prominent examples of internet-based 'platform work' or 'crowd work' include services provided from home (e.g. 'Upwork' or 'Clickworker'), mobility services (e.g. Uber), or working in somebody else's home (e.g. 'Helping' or 'Taskrabbit') (European Commission, 2018e).

3.1.2. Automation, digital transformation and employment in EU Member States

Automation and employment in EU Member States

Research that aims to predict the extent of job loss due to automation is far from conclusive, with estimates varying greatly depending upon the choice of data and the methods applied. The study by Frey and Osborne (2013, 2017) estimated that 47% of U.S. jobs are at risk from automation. Since then, numerous studies have emerged, arriving at very different conclusions and wide-ranging estimates for the share of jobs that are potentially exposed to automation.¹⁶ There are various reasons for these divergent estimates, which are discussed in a recent article by Frey and Osborne (2018).

Since the future impact of automation and digitalisation on labour markets is difficult to predict, **several studies have established a variety of possible scenarios**. EPRS (2018), for example, develops three scenarios for how digitalisation may shape employment dynamics and income equality over the next 20 years. In the positive scenario, an **'industrial renaissance in Europe'** is depicted in which EU businesses and labour markets adjust quickly, and economic growth dampens the rising inequality. In a second scenario, which they call **'Europe's industrial misery'**, digitalisation and fierce global competition wipe out most employment in most sectors and Member States in Europe, resulting in little fiscal room for balancing social policies. In a third scenario, which they depict as **'Europe's growing double digital divide'**, digitalisation increases disparities both between Nordic/Western Member States and Southern/Eastern Member States; as well as between metropolitan and rural areas.

The fact that estimates vary significantly also makes it **difficult to predict the degree to which automation will affect labour markets differently across Member States**. Several studies have attempted to identify regional differences in the risk of automation. According to some studies jobs in Eastern and Southern Europe are at greater risk of automation than those in the United Kingdom, Ireland, the Netherlands and the Nordic countries (Nedelkoska and Quintini, 2018; Berger and Frey, 2016). Similarly, a recent EU-specific study estimates that the 'automatable jobs' vary greatly from country to country, if today's cutting-edge science and technology were applied in production processes (see Table 1).

adopted the term 'platform work' to encapsulate all online, platform-facilitated work in a bid to standardise understandings of this emerging form of labour across Europe (Eurofound, 2018a).

¹⁶ For example, it is estimated that between 40% and 70% of jobs are at 'high risk' of computerisation in relation to business, law, and transport services (Arntz et al, 2016). Likewise, other evidence suggests that more than 50% of European jobs are highly susceptible to automation (Berger and Frey, 2016). According to more recent estimates, 46% of jobs in 32 OECD countries have a probability of being automated of 50% or more (Nedelkoska and Quintini, 2018). For an overview of the recent empirical studies, see for example EPRS (2018) or the European Commission (2018a). It has to be emphasised that the predictions in the literature focus on the technological possibility of automation, and typically do not relate this to the potential costs involved.

Table 1. Shares of automatable jobs across EU Member States

	Recently Automatable	Fully Automatable	Polarised Automatable
Czech Republic	0.692	0.406	0.286
Germany	0.663	0.446	0.217
Cyprus	0.645	0.258	0.387
Portugal	0.644	0.419	0.225
Spain	0.613	0.316	0.296
Hungary	0.606	0.439	0.167
Italy	0.584	0.449	0.135
Lithuania	0.576	0.307	0.276
Slovakia	0.578	0.425	0.153
Austria	0.576	0.335	0.241
Estonia	0.575	0.293	0.282
France	0.575	0.328	0.247
Belgium	0.573	0.223	0.349
Luxembourg	0.568	0.269	0.299
Netherlands	0.567	0.376	0.191
Finland	0.546	0.288	0.258
Sweden	0.513	0.289	0.224
Greece	0.494	0.349	0.145
Croatia	0.480	0.247	0.233
Denmark	0.476	0.327	0.149
United Kingdom	0.433	0.286	0.147
Ireland	0.379	0.209	0.170

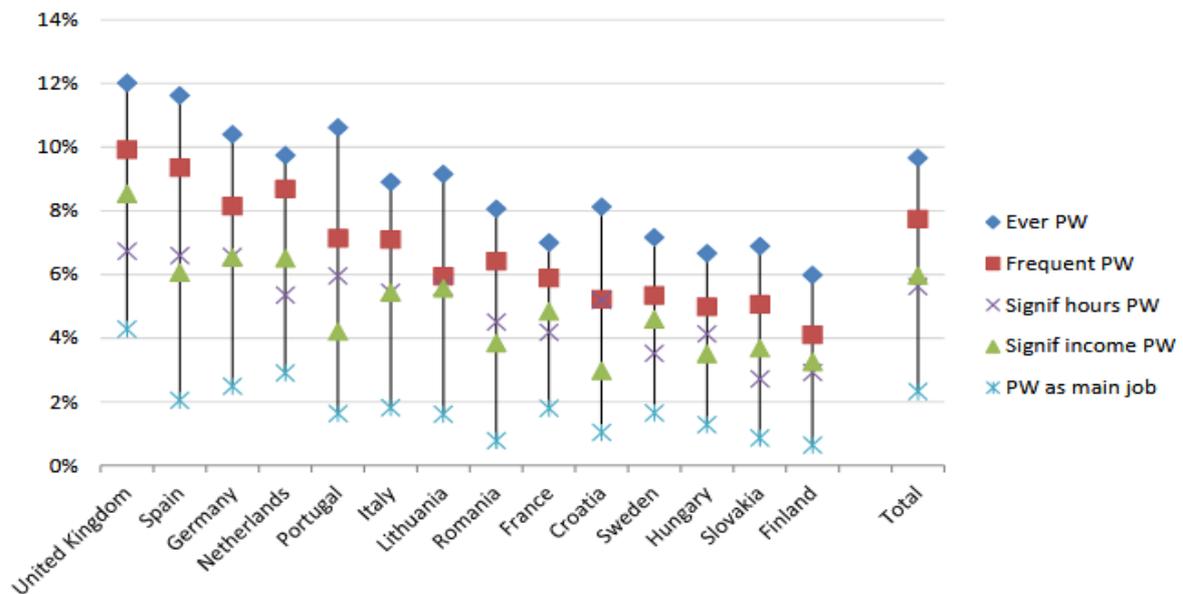
Note: In general terms, 'recently automatable jobs' are jobs that could be automatable, with the technologies that are currently available. 'Fully automatable jobs' are those where machines are able to easily replace people and where personal interaction does not play an important role. 'Polarised automatable jobs' are jobs where, although the technology is available, it will be able to take on some tasks but not others. The residual 'non-automatable jobs' that require interpersonal skills are unlikely to be automated. For more details, see Lordan (2018) based on Lordan, G. and Josten, C. (2017).

Digital transformation and employment in EU Member States

Robust data about the extent and economic relevance of the platform economy is lacking. The reasons for this are twofold: firstly, existing labour regulation categories are often applied in an ambiguous and indirect manner to employment platforms. Secondly, the amount of work carried out by individuals on various digital platforms is relatively opaque to everyone except those within the platform itself (European Commission, 2018b).

Overall, the **size and economic relevance of digital labour platforms is still small but growing.** The 2018 collaborative Economy and Employment (COLEEM) survey of 14 EU Member States provides the most robust data on platform workers in Europe to date (European Commission, 2018e). Figure 9 shows the most recent data on the relevance of platform work, indicating substantial heterogeneity across the 14 Member States surveyed.

Figure 9. Fraction of platform workers (PW) in the adult population (2018)



Note: This figure shows the prevalence of platform work across 14 EU countries. In particular, the figure provides information on the share of the adult population that has ever been employed as a platform worker (PW), frequently employed as PW and those mainly employed as PW and also the shares that spent a significant number of working hours as PW or gain significant income from platform work.

Source: European Commission (2018e).

Evidence suggests that **platform work has grown exponentially across Member States, even though it is still on a relatively small scale**. The survey indicates that 10% of the total adult population have used online platforms to facilitate employment at some point in their lives. The proportion of 'main platform workers' – those who derive the majority of their income from platform work – is estimated to be 2% of the adult population on average across the selected Member States (ibid). The COLLEEM survey also found significant variation in the extent of platform work between Member States. The UK has the highest incidence of platform work, followed by Germany, the Netherlands, Spain, Portugal and Italy. In contrast, Finland, Sweden, France, Hungary and Slovakia show very low values compared to the rest (ibid).

In relation to this report, an important finding of the 2018 COLEEM survey is that platform workers are on average 10 years younger than 'offline workers' (with a median age of 34 compared to 44) and more often male (Pesole et al, 2018). The fact that **young people are over-represented** has been attributed to the appeal of platform work's flexibility, yet also attributed to the difficulties faced by young people entering a labour market in which opportunities for permanent employment are in decline (Taylor, 2017; EPSC, 2016).

Another key aspect of the platform economy is the **increased irrelevance of physical location of labour input to the production process**. Some authors suggest that this offers opportunities for economic growth in rural areas, and presents new remote working opportunities outside of towns or cities (Eurofound, 2018b). Opponents reply that it is exactly the platform economy workers that typically prefer to live in urban centres, rendering this development unlikely (EPRS, 2018). This implies that the positive and negative impacts of digital transformation on the divide between metropolitan and rural

areas, depends, to some extent, on the ability of policy to make rural areas attractive for digital workers (EPRS, 2018).¹⁷

3.1.3. Polarisation of EU labour markets, and employment conditions

Polarisation of EU labour markets: skill- and task-biased technological change

Whereas the impact of automation and digitalisation on overall employment is difficult to predict, the literature agrees that **technological development will not be skills-neutral – i.e. technological innovations will strongly affect how employment prospects are distributed across different groups of workers**, especially in relation to low-skilled occupations and/or routine tasks (e.g. EPRS, 2018).

The literature discussing the risk and challenges of **future 'job-polarisation'** is very comprehensive and cannot be discussed in detail in this report. However, two main strands of literature should be noted: each one of them identifies different mechanisms of the distributional effect of technological change and they therefore give different predictions on the extent of the effects and the groups that are likely to be affected (ibid.).

An initial set of studies argued for a **'skill-biased technological change'** (Card and DiNardo, 2002; Haskel and Slaughter, 2002; Acemoglu and Autor, 2011): new technologies tend to favour certain skills while devaluing – or even making redundant – other skills. There is therefore less demand for these skills from firms that use such new technologies. This path of skills-biased technological change characterised much of the evolution of the US labour market in the 1990s and 2000s, and also the European labour markets over the last 20 years (EPRS, 2018).

More recent studies investigate yet another pattern, **'routine-biased technological change'** (Autor, 2013; Brynjolfsson and McAfee, 2014; Brynjolfsson and McAfee, 2017; Autor, 2015): that is, new process technologies can make those tasks¹⁸ redundant and that can be routinised and codified. At the same time, they increase the value and utility of other tasks through increasing their productivity. Therefore, occupations with a high routine-task content are particularly susceptible to automation – in fact, the main idea of the studies on the employment impact of automation cited in the previous Section (e.g. Frey and Osborne, 2013) is typically based on an assessment of the task composition of certain occupations, which determines their degree of automatability, and the respective size of the workforce in these occupations.

Evidently these two strands in the literature are closely related, and **both predict that low-skilled workers are especially at risk of displacement through automation**, as the number of available jobs that require only low qualification decreases. Furthermore, studies arguing for 'routine-biased technological change' also predict that **a high share of routine tasks not only in manual occupations, but also in white-collar and administrative ones, will be affected**. As a consequence, the demand for medium-skilled workers decreases, while the demand for both high-skilled and low-skilled (paid accordingly) ones increases. This development is called **'labour market polarisation'** (Autor et al, 2006) or **'job polarisation'** (EPRS, 2018).

¹⁷ In this regard, stakeholder seminar participants noted an increasing regional disparity within Member States as a key issue, and highlighted that policies will need to address both local economic development programmes, as well as programmes to support inter-/and intra-regional mobility.

¹⁸ In economic terms, a task is a unit of work activity that produces an output. Tasks can be performed by labour (people) or by capital (machines, or, in other words, automation). People apply their skills to deliver various tasks (EPRS 2018, p. 17).

The studies by Frey and Osborne (2017) and Ambrosetti Club (2017) have made an attempt at identifying professions, skills or tasks that are the least at risk of displacement. As an example, tasks identified less at risk by Ambrosetti Club (2017, p. 42) include: (i) non-repetitive tasks; (ii) tasks that require creativity and a spirit of innovation; (iii) tasks involving intellectual and operational complexity; and (iv) tasks that require relational and social capabilities, including empathy, persuasiveness and bargaining skills.

It is important to note that **the change in the composition of skills and tasks needed in the workplace is not only due to changes within industries, but also across industries**. Recent studies (European Commission, 2018a) argue that new technologies favour services over manufacturing, especially as Digitalisation supports growth in the ICT sector.

Irrespective of the exact distributional effects across occupational groups, specific skills or tasks, **there is evidence suggesting that the estimated risk of job-loss due to automation is highest amongst young people** (e.g. Nedelkoska and Quintini, 2018). The authors suggest this as the main reason that student jobs and entry-level positions have a higher risk of automation than jobs held by older workers. Though this can be attributed to an over-representation of youth in sectors at a high risk of automation, it was also found that the higher threat of job automation for young people remains even after these occupational sorting effects¹⁹ are accounted for (ibid.). This evidence therefore suggests that **automation may have more implications for youth unemployment policies than for policies targeted at other segments of working age population** (ibid.). Discussions of the potential '**digital skills gap**' threatening the future of the European labour market typically centre on older workers as being the most vulnerable. In all Member States, young people are better educated and higher skilled than their older counterparts (European Commission, 2018a), and more proficient in the digital technologies anticipated to be key to work in the future (Nedelkoska and Quintini, 2018).

Digital transformation and employment conditions

It has been argued that the most immediate and direct implications of labour market platforms do not necessarily concern overall job-loss, but rather the shift from full-time, typical employment contracts to short-term work contracted out in individual tasks.

Two **key concerns** are typically raised in regard to the proliferation of digital technologies, the platform economy and the associated increase in non-standard forms of employment. Firstly, there could possibly be a **deterioration of working conditions, job-quality and employment standards**. Secondly, there could be a **difficulty in integrating platform workers into social protection and welfare systems**.

Evidence suggests that the proliferation of digital technologies, and the associated growth of the platform economy, has led to 'an increase in non-standard work, affecting working conditions and job quality' (European Commission, 2018a). In fact, **a large number of platform economy jobs are considered precarious**. Recent surveys in the EU and the US show that only a minority of platform workers make a living from that work (Huws et al, 2017; European Commission, 2018a). These positions do not offer a guarantee for future work, stable and/or regular pay, and typically they come without the employment protection and the safeguards awarded under standard employment contracts. A key issue is that platform workers have little bargaining power, because, as

¹⁹ Occupational sorting effects occur if young people are more prone to go into occupations or sectors with a high risk of automation.

independent contractors, they are not entitled to collective bargaining in relation to their platforms or clients (Eurofound, 2018b).

Furthermore, **individualised platform work and online-freelancing offers little scope for on-the-job training, and incomes are often too low for people to be paying for their own upskilling.** Though data on the skills levels of existing platform workers are lacking, current research suggests that a worker's level of skill has a negative correlation with their reliance upon platform work for income (European Commission, 2018e).

Policy makers have warned that long term problems may arise because 'large numbers of younger workers enter [the labour market] in a career typified by forms of insecure employment, or by classifying themselves as 'self-employed', and as a result they **fail to make sufficient contributions to old age pensions or other social protection arrangements.**' (European Parliament, 2016: 55). A major difficulty is that platforms are a new form of economic organisation that does not fit neatly into the existing categories of dependent employment and self-employment. As a result, **many platform workers would not be covered by social protection systems as these systems are currently designed.** The current model of social protection in the EU is built on a payroll-based insurance system that assumes a traditional labour market of employers and employees. Since platform workers are often not regarded as employees, many are not covered by social protection systems (European Commission, 2018a). At the same time, **platform workers differ considerably from typical entrepreneurs and own-account workers.** Though platform workers do have control over the hours they work, their rates of pay and conditions of service are dictated by the relevant platforms. As such, online platforms facilitate work with flexibility only in regard to a platform worker's frequency of engagement with the platform. Where entrepreneurs are able to set the price of services, and therefore their own rates of pay, platform workers lack such autonomy (Wood et al, forthcoming).

As a result, **concern has been expressed that the situation of some platform workers could combine the worst of both worlds.** They will suffer from having more limited social and contractual protection experienced by self-employed workers, and they will also experience the dependence and lack of autonomy of employees. Whereas, the diverse nature of platforms can be associated with very different situations in terms of employment conditions (Eurofound, 2018b: 20), the general question of workers' employment conditions associated with a future increase in the platform economy remains worrying for policy makers.

Finally, in addition to the implications for individual income and social security, **digitally enabled employment has been shown to have a potentially negative effect on the wellbeing of individuals** (Wood et al, forthcoming). Though these jobs may offer autonomy and flexibility, research suggests that it often comes at the price of long, irregular and anti-social hours, in a socially isolating environment.²⁰ This isolation may be furthered by amplified direct competition with potential peers (Wood et al, forthcoming). Against this background, the role of the social dialogue is increasingly relevant but also under pressure as organising workers is particularly difficult in non-standard employment situations (European Commission, 2018a). In a detailed analysis of the role of social dialogue in a changing world of work, the authors come to the conclusion that 'the

²⁰ For example, as analysis of Eurofound's 6th European Working Conditions Survey (EWCS) (2015) has shown, the features of digital technologies such as dependence on machines and permanent exposure to electronic tools tend to reduce overall job satisfaction (European Commission (2018a).

changes brought by the changing world of work will require social partner organisations as well as public authorities to move out of the comfort zone of established routines' (ibid, p. 171).

3.2. The impact of technological developments on youth employment challenges

The previous sub-Sections have discussed various implications for labour market opportunities and work characteristics stemming from technological developments. This sub-Section condenses the discussion in regard to youth employment and the STW transition process. Five key youth labour market challenges will probably emerge as a consequence of the technology-driven changing world of work as described under Section 3.1.

Challenge 1: An increasing prevalence of non-standard forms of work

One of the key predictions of the impact of technological development on the future world of work is the **rise of non-standard forms of employment (NSFE)**. Already today, 'a-typical work' has become more prominent in EU labour markets (European Commission, 2018a). However, this development is multifaceted and encompasses several dimensions of work, and no precise definition of what exactly constitutes non-standard forms of employment has been forthcoming. Several reports (e.g. Eurofound, 2015) consider NSFE to be the opposite of standard work – defined as the open-ended, formal, full-time working relationship with a single employer. As a report by Eurofound (2017) shows, the long-term trend of standard employment contracts in the labour market is decreasing. But there is little evidence concerning how and which non-standard types of employment will be prevalent in the future world of work.

At the same time, several interlinked developments in this regard probably will affect young people's entry and position in the labour market of the future:

- the rise of own-account work, (dependent) self-employment, or micro-entrepreneurship²¹;
- increasingly common simultaneous multiple-job holding, or so-called 'portfolio-careers';
- rather than unemployment, the prevalence of under-employment and precarious self-employment.

These developments will probably have different (potentially both positive and negative) implications for various groups of young people. There is yet little hard evidence on which groups will be most affected, though most studies suggest that low-skilled workers will be most susceptible to these trends.

Challenge 2: Less stable employment situations and more frequent job-to-job transitions

Related to the previous point, many studies expect that technological developments will also change the permanency and stability of the employment contracts offered, and job matches available, to young people. Typically, **studies predict reduced employment stability and shorter within-job employment durations, as well as more frequent job-to-job transitions**, including transfers across industries: for instance, Berloff et al (2018) assert that labour markets are increasingly characterised by workers

²¹ As the multitude of terms already show, a related feature is that the boundaries between dependent employment and self-employment have become increasingly blurred (Eurofound 2017).

moving quite frequently between jobs, with possible unemployment spells in between. Flek et al (2018) note that young people have higher job-to-job transition rates generally, which can be interpreted as a typical feature of marginalised groups that have to 'churn' relatively more frequently through the (secondary, i.e. subsidised) labour market.

Challenge 3: An increasingly precarious STW transition and growing path-dependence

As discussed in Section 2.1, an increasing number of young workers already enter the labour market via low-quality job matches and instable employment contracts. This is specifically observable in an **increase in temporary employment contracts, an increase in part-time employment, and lower quality and precarious entry-level contracts among young labour market entrants**. Several studies predict that this development will become more and more prevalent with the rise of the platform economy, which in particular absorbs young workers and new labour market entrants.

In addition, the initial steps of young people's transition into the labour market is considered more complex and important than other transitions inside the labour market. For example, Lincaru et al (2008) argue that the STW transition represents a transition between two systems (school period vis-à-vis working period), defined by two different paradigms. Furthermore, the transition may cut off other trajectories of future development and hence show state- or path-dependence (ibid.). The threat that these initial steps are hence becoming more insecure with the crisis and subsequent (impartial) recovery, will likely reflect in long-term outcomes.

Again, this development will probably not affect all young labour market entrants equally. Recent studies note an increase in the gap in the STW transition process and subsequent labour market outcomes between low- and high- achievers in school. The divergent post-education STW transition brings also the risk to accentuate an increasing segmentation in the labour market and even a decline in inter-generational mobility across EU Member States.

Challenge 4: A changing relevance of specific skills and further uncertainty of skill requirements

Previous Sections of this report (e.g. Section 2.1 and Section 3.1) have quite clearly shown the **evidence for the changing nature of skills demanded by the labour market**. In the future, these trends are predicted to further gain in importance as skills-biased or task-biased technological change advances. One important lesson that the labour market developments induced by skills-biased and task-biased technological change have is that **a generally high skill level is the best preparation for the successful labour market career of the individual worker** (or, the best insurance against the potentially adverse effects of these changes). This has strong policy implications as it is the task, and the challenge, of policy makers to ensure that young people entering the labour market have high skill levels overall.

In addition to the challenge of shaping a high-skilled youth population overall, the composition of skills is also likely to change, or rather broaden. Specifically, **young people will be confronted with demand for digital knowledge, adaptability, creativity, and inter-personal skills**. Basic and technical skills will have to be accompanied by a comprehensive complementing skill set, which - as skills demands are likely to be changing more rapidly and on a continuous basis within and across occupations - particularly points to the need to have adaptability and flexibility skills.

Challenge 5: A lack of access to employment protection and social security

The lack of access to employment protection, adequate working conditions and possibilities for unionisation among workers in the platform economy will also affect young people entering the labour market. **Young people that enter (and stay) in non-standard forms of employment probably lack access to (the full) social safety net and the welfare system in the long-term**, since these are (currently) bound to standard employment contracts.

4. Implications for policy levers

Based on the understanding of what constitutes the changing world of work and the challenges it comes with, this Section **discusses the implications these changes will have on key policy levers and how education, youth and active labour market policies, labour law, and social policies will be affected**. Though technological advances offer many new positive opportunities for the European labour market, the Section will place emphasis on policy levers that intend to avoid their potentially negative consequences, in particular for disadvantaged youth. Nonetheless, it should be noted that the policies should also be combined with policies that reap the benefits of technological innovations (e.g. R&D and innovation policies).²²

Table 2 presents an overview of the challenges that were identified in Section 2 – the challenges for current labour market entrants – and Section 3 – future challenges arising in a changing world of work. The table connects each challenge with a corresponding policy lever and potential responses, each of which will be discussed in the remainder of this Section. Finally, the table also highlights the corresponding policy areas affected.

Table 2. Youth labour market challenges and key policy levers

Current Challenge	Key Policy Lever/Response	Policy area
Lack of basic skills, especially among disadvantaged youth	<ul style="list-style-type: none"> • Ensure (augmented) basic skills upon entering the labour market 	Education
Unmet labour market demand for high-skilled youth (esp. in STEM and ICT skills)	<ul style="list-style-type: none"> • Focus on non-automatable and ICT-related and STEM-related skills • Identify (transferable) skills in demand, provide targeted career guidance and ensure flexible education systems 	Education
Lack of work-related practical skills and skills mismatch, especially among medium-skilled youth	<ul style="list-style-type: none"> • Provide work-related skills matching labour market demand through an expansion of VET and apprenticeships, and providing quality traineeships; improve collaboration between public and private stakeholders 	Education

²² Some studies furthermore discuss whether typical 'standards' of youth policies are still adequate in the light of the changing world of work. As an example, in the light of more flexible labour markets and overall shorter employment durations, it may not be feasible or even conducive to try to get every young person into a long-term, formal job. This line of discussion will not be followed in this report.

Youth Guarantee in light of changes in the world of work:
Emerging challenges related to young people's transition into the labour market

Labour market intermediation for youth	<ul style="list-style-type: none"> • Provide labour market information, career guidance and job search assistance • Target and Tailor Employment Services and Active Labour Market Programmes to fasten and facilitate STW transitions further 	Education, Active Labour Market Policy
Future Challenges	Key Policy Lever/Response	Policy area
Increasing prevalence of non-standard forms of work	<ul style="list-style-type: none"> • Maintain and increase quality of work: • Address challenges for social security systems and labour market regulation due to changes in business and employment characteristics 	Social policy; labour market regulation; labour law
Less stable employment situations and more frequent job-to-job transitions	<ul style="list-style-type: none"> • Adapt labour market regulation and social protection 	Social policy; social benefit system; labour market regulation
An increasingly precarious STW transition and growing path-dependence	<ul style="list-style-type: none"> • Provide labour market information, career guidance and job search assistance • Tailor and Target Employment Services and Active Labour Market Programmes 	Education, Active Labour Market Policy
A changing relevance of specific skills and further uncertainty of skill requirements	<ul style="list-style-type: none"> • Support adaptability, self-management and entrepreneurial skills • Facilitate life-long learning, especially of non-cognitive and career-management skills 	Education, Active Labour Market Policy
Lack of access to employment protection and social security	<ul style="list-style-type: none"> • Address challenges for social security systems due to changes in business and employment characteristics 	Social policy; labour law

Table 2 highlights the fact that the **majority of challenges affect educational policies**. In fact, a large number of studies (e.g. Pesole et al, 2018; European Commission, 2018a; UKCES, 2014; Peters, 2016; Goldin and Katz, 2008) suggest that **providing the workforce with the right skills for the labour market is the one key policy lever to address the disruptions of technology on the economy and society**. These studies argue that through increasing the overall supply of skilled labour, policy can compensate the unwanted effects of skill-biased technological change on inequality (Goldin and Katz, 2008).

An important additional argument for the relevance of a skilled workforce is the **potential double dividend**. Skills not only secure individuals against skilled-biased technological change, in addition, a skilled workforce is an important driver of competitiveness and employment growth, at least in the long run (Peters, 2016). As a result, the 'social capabilities' that are accumulated in the societal learning process shape the extent to which society adapts to technological disruptions. This is firstly because individuals are more adaptable and resilient on the individual level; and secondly because economies and societies are more competitive when they work as a whole. This main finding that any adequate policy response to the challenges of the future world of work must entail corresponding educational policies is also reflected in the stakeholder opinions on policy options, as displayed in Figure 10.

Figure 10. Stakeholder responses on suitable policy options



Note: N=84. Question: What are, in your opinion, the most suitable policy responses to these upcoming challenges? Please indicate up to five most suitable policy responses.

4.1. Key policy levers to address the current youth labour market challenges

4.1.1. Ensure basic skills (including ICT) upon entering the labour market

A key policy lever is to **ensure that every young person is provided with (ideally: ICT-augmented) basic skills upon entering the labour market.** Equipping people with a wide base of different skills – and in particular with basic literacy and numeracy skills – is the essential aim of the education system. This requires policies that ensure that the teaching is of decent quality, the curriculum is appropriate, and that there are standardised ways of assessing the quality of the educational system. Many studies demonstrate the importance of early interventions, potentially starting with early childhood, focusing on this important period for shaping cognitive and non-cognitive skills and for forming the basis for learning and the acquisition of skills in later years (Heckman et al, 2013). Evidently, whereas early childhood interventions may form the starting point, the successful acquisition of skills needs to be assured at every level of the educational lifecycle. In addition, possibilities to also develop basic skills later in life need to be developed (see Section **Error! Reference source not found.**3).

Another important feature could be to **integrate and expand possibilities for non-formal learning and associated certification systems** (of non-technical, non-cognitive skills) – which are also relevant aspects for individual adaptability. At the same time, there is evidence that some institutional arrangements of certain education and training systems favour the development of non-cognitive skills (Brunello and Schlotter, 2011) and these may be further explored. As a result, in parallel to studies that identify non-cognitive skills in demand, studies analysing how non-cognitive skills can best be developed are required to improve policy design. Equally, it appears important to analyse which groups of youth currently lack these skills to adequately target policies towards them.

Besides basic literacy and numeracy skills, a certain level of ICT knowledge ('digital skills') are already part of the basic skill set required for successful STW transition. The acquisition of ICT-related skills requires an education system that invests in the necessary IT infrastructure to create the right IT environment as well as teachers that are at ease with using and teaching these skills. This also requires an adjustment in teacher training in the university system, at least for some of the teachers. Whereas basic digital skills are already required, the premium for professional ICT skills will probably increase in the future.

4.1.2. Focus on non-automatable and ICT-related and STEM-related skills

Studies that predict future job loss from technological disruptions typically argue that **one of the strongest protections against technological disruptions is the acquisition of 'non-routine' or 'non-automatable' skills** (Eurofound, 2018; EPRS, 2018). Skills that are typically mentioned in this regard typically include problem solving, critical thinking, teamwork, creativity and social and emotional intelligence. A major argument is that 'occupations requiring strong social, interpersonal skills and non-routine analytical skills have grown dynamically since 1980 with consistent wage growth' (EPSC, 2016).

This also holds for the relevance of ICT (and generally technological skills) as a professional field. Several studies project skills shortages in **scientific, technical, technological and mathematical (STEM) occupations**. For example, Berger and Frey (2016) forecast demand for STEM professionals in Europe to expand by some 8% until 2025 leading to an EU-wide shortfall of over 800,000 of digital professionals by 2020. Some studies go further by highlighting the importance of 'e-leadership' skills — the skills required of an individual to initiate and achieve digital transformation across companies and industries (Berger and Frey, 2016). Already today, **STEM graduates earn more than other graduates and are less likely to be overqualified** for the work they do (Arcidiacono et al, 2016; McGuinness, 2006).

At the same time, **it is difficult to predict the consequences of technological developments on the future of employment in specific industries and sectors**. This also holds for the future relevance of ICT-related skills. Digitalisation is moving fast, and there are some abilities that machines have that were far out of range in the opinion of most experts only a few years ago which makes it difficult to identify skills that are 'safe' from automation (EPRS, 2018). However, this may also be regarded as an argument in favour of soft- and inter-personal skills – they transverse specific occupations and they therefore allow individuals to respond more easily to unforeseen development.

4.1.3. Identify skills in demand and ensure flexible education and training

Given the predicted **importance of 'cross-cutting' and transferable skills** that permeate occupations and foster life-long learning and adaptability, government **policies need to urgently address the fact that these skills are rarely part of today's typical school-based curricula** (Brynjolfsson and McAfee, 2017). As it is likely that education and training providers will need to adapt their curricula to changing skill demands, it is essential that the education system is agile and adaptable to the emergent needs and trends on the labour market. An important policy lever therefore is to establish a conducive environment for dynamic adaptation of curricula: policies should help schools be flexible and responsive to labour market needs given the pace of change. Schools should be able to anticipate future needs and equip young people with the necessary 'dynamic' and evolving skillsets.

A more flexible education policy will make it possible to adapt more quickly to changing labour market needs and adapt the STW transition to the new working conditions (EC 2018a). A related approach would be to 'modulise' education (e.g. McKinsey Center for Government, 2014) to break up degree programmes into individual modules that focus on a particular set of skills, which would still count towards a degree. Such an approach too often contrasts with Member States' education systems which tend to be static and concentrated and frontloaded on focusing on an individual's youth-related educational trajectory, instead of promoting lifelong learning and continuous up-skilling and re-skilling (European Political Strategy Centre, 2016).

Given the technological advancements, institutions within and outside of the educational system should provide corresponding **career guidance and advice for students** that specifically encourage them to choose STEM related careers and opt for relevant educational trajectories. Ideally, in the long term, career guidance could be based on **skill anticipation systems** (Berger and Frey, 2016, see also section 4.1.5. on labour market information). In some Member States, an important policy lever may be to address the lack of high-skilled labour – in particular in STEM-related fields – through increased support for higher-level education institutions.

4.1.4. Provide work-related skills to match labour demand through an expansion of VET and work-based learning, and improve collaboration between public and private stakeholders

A first key policy lever in this respect is the **introduction of practical or work-based learning at all levels of the education and training system** to address the lack of work-related skills demanded by the private and public sector. The primary approach would be to **increase the share of VET and apprenticeships as part of secondary education systems** – in its most extreme form this would lead to the introduction of work-based learning in (specific tracks of) secondary education. Expanding the relevance of VET would be a part of this, but **curricula will need to be updated through broadening the qualification profiles and integrating the core work skills** (ILO, 2017). This also includes an improved alignment of skills provided by the curriculum with work-related skills demanded by the labour market.

Work-based schemes could also be a more common part in higher education and ALMP training programmes.²³ The expansion of work-related education should

²³ McGuinness, Bergin and Whelan (2018) show that a graduate's likelihood of experiencing either over-education or over-skilling on entering the labour market is lower the higher the number of practical learning elements within their degree programme. They also show that the pay-off from

not be confined to secondary education. Instead, a far reaching, comprehensive expansion of a work-based approach across all education levels would be a key policy lever for improving work-related skills among young people entering the labour market. This could also include the introduction of quality traineeship and apprenticeships into higher-education programs. At the very least, the formulation of workplace and practical skills, specifically through elements such as work placements, could be introduced into degree programmes, irrespective of the field of study (McGuinness et al, 2018). While this was acknowledged by stakeholders in the EU, the extent of implementation and success has so far been incomplete in several Member States, as shown in Section 2.3., so it may require increased efforts.

A second key policy lever **to ensure that the acquired skills match demand is supporting increased collaboration of all stakeholders**, such as education and training providers, public/private employment service providers, private sector stakeholders (for example regional business communities) and enterprises, so they can work together to develop skills ecosystems. This suggests that employers need to be engaged more actively in the design and provision of education and training. Policy can **actively support collaboration between employers and providers to work together to design curricula that fit business needs**. Similarly, employers should be more involved in designing and delivering training. Equally, governments can aim to align education and training policies with industrial, trade and innovation policies. Unambiguously, most stakeholders regard the lack of access to (and often even knowledge about) labour market services for disadvantaged young people (e.g. career guidance offered by PES) as one of the major challenges for young people's STW transition (see Figure 5). Related to this, many stakeholders see the missing coordination between these different services as a key issue for providing effective support to disadvantaged young people. **Strengthening the cooperation among different actors in the labour market and service providers is therefore a key policy response.**

4.1.5. Provide labour market information, career guidance and job search assistance

Given the concern about the changing world of work and the implications it has on the skill set of young people, **it is important to give young people every chance to make an informed decision about their educational and career choices**. This requires sustained efforts at career counselling, with built-in updating mechanisms (see also 4.1.2. above). Labour market information and career advice should therefore be given during the early stages of secondary education.

Careers advice need not be simply 'desk counselling'. It can also include an integrated system of providing students with occupational guidance and an expanded system of work-based learning periods which includes internships and 'tasters' while in school (as outlined in 4.1.4.). The practical experience and exposure to work life would be beneficial. This should, ideally, expose students to several distinct types of work environments.

In addition, **it is conceivable that the PES plays an increasingly active role in the STW transition**, for instance through increasing their interaction with students around the time of graduation. This might potentially be accompanied by high-intensity, short-term Active Labour Market Policy efforts – such as a job entrance employment subsidy or

practical learning tends to be highest within degree programmes that are traditionally considered to be academic in nature.

a get-ready for the job upskilling programme – although the specific incentive mechanisms for employers would have to be well-designed. Whereas more general employment incentives can take the form of wage subsidies, the payment of bonuses, exemption from social security contributions, or tax credits (European Commission, 2018i; see also next Section), the focus in this case would be specifically on an intensive and tightly time-limited intervention to specifically assist the STW transition.

To provide a clear career path, **educational institutions also need to continue combatting early school leaving**. They should identify and support, in particular, children from disadvantaged backgrounds, who may be at risk of staying behind in early years if they come from families that lack the social and economic resources to provide sufficient early developmental stimulation. In addition to a warning system regarding early school-leaving, this can also include starting career guidance earlier. It should be more systematically targeted towards at-risk young people, beginning potentially at the early teen age, and it should provide information on the value of a completed education.

4.1.6. Targeting and tailoring Public Employment Services and Active Labour Market Programs towards disadvantaged youth

Once outside the educational system, young people will need further support to remain employable and attached to the labour market, a role that can be provided by the PES and Active Labour Market Policies within three key policy levers:

1. The **identification and profiling of the most disadvantaged young people, and tailoring employment services and Active Labour Market Programs towards them**. Tailored support is especially important for disadvantaged groups since these groups often face multiple barriers to participation in employment, education and training. It is important as disadvantaged groups are those most affected by economic crises (see Section 1). Given the lasting impact of the economic recession in some Member States, identification and profiling are particularly important for older youth who still suffer from scarring effects of entering the labour market during the economic recession. **This also includes developing a clear terminology and statistical measurement that identifies distinct groups of NEETs, which would facilitate a more targeted policy response**. In fact, the insufficient profiling and lack of targeted and tailored support services for disadvantaged young people, the difficulties when addressing multi-dimensional challenges, and the lack of a 'holistic approach' were some of the key issues for young people that was raised during the stakeholder consultation.
2. **Design Active Labour Market Programs which target individuals that require support for up- and re-skilling on the job**. To address the need for continuous re-skilling of at-risk young people, active-labour market programmes will need to approach at-risk young people in the workplace to prevent them from becoming unemployed or from losing their 'transferable human capital'. However, employers often under-provide opportunities for up-skilling on the job, in particular of transferable skills. In so far as this can be considered a case of market failure, this implies a potential role for governments. Specifically, governments could consider to offer training programs and other support for on-the-job learning to those already employed but vulnerable to job loss. This particularly applies with the rise of the platform economy as many of digitally enabled forms of employment offer little opportunity for in-work training. However, having the skills to access current digital opportunities does not necessarily guarantee future employment if workers are 'left behind' by technological advancement. Young people could find themselves

effectively trapped at the bottom end of the digital labour market if avenues for upskilling are not created for them.

3. Policies and measures to **increase the uptake, quality and employment-relevance of non-formal and informal learning**. Non-formal learning typically refers to structured learning outside the formal education system. On this, public policy may address the possibilities of online learning that have been facilitated by technological developments. The same holds for other informal methods of learning, such as peer-to-peer learning and on-the-job work experience. However, the qualifications acquired through these avenues are not yet widely recognised. Measures to increase the availability of quality non-formal learning **need to be accompanied by systems to assess and certify the skills acquired in non-formal and informal contexts**. As the European Commission (2018h) highlighted, skills acquired through personal and/or work experiences are hardly ever documented and 'young people may not even be aware that they have them and that they can be of value' (p. 15). Making those skills visible through validation (identification, documentation, assessment and certification) means that young people can use them in their job searches, adapting their learning pathway while formulating a career pathway (ibid). For example, this could be achieved by developing skills-assessments (either a theoretical test, an interview, or even a work trial) provided by public institutions. In particular, validating informally acquired skills can also help to re-integrate early school leavers (European Commission, 2018h).

4.2. Key policy levers to address the future youth labour market challenges

4.2.1. Maintain and increase quality of work, and address challenges for the social security system

The lack of quality standards, social security and of training opportunities presents a challenge that may foster a two-tiered labour market. At the same time, the increasing prevalence of non-standard forms of employment (NSFE) stemming from the rise of the platform economy equally holds benefits for youth employment policy. In particular, **the flexibility and relatively low entry-requirements of the platform economy could provide a positive means of labour market inclusion and mobility for vulnerable groups** of job-seekers (Eurofound, 2018b). The profile of the platform economy in the COLLEEM (COLLaborative Economy and EMPloyment) survey does indeed reveal a high proportion of young people, male and immigrants being amongst its workforce (European Commission, 2018e). Platform work could therefore provide a means of gaining access to the employment market for low-skilled and disadvantaged youth, then they can move into more stable forms of employment form there.

Furthermore, the fact that many platform economy tasks can be carried out remotely indicates that it may offer **an effective means of labour market inclusion for young people in rural areas**, where more standard forms of employment can be scarce and engagement with public employment services has often been low (European Commission, 2018f). Finally, these new business models and entrepreneurship are considered an important factor to ensure global competitiveness and economic growth based on technological innovations in the future.

The overall goal for future changes to social-security and labour market regulations is **to ensure that platform work provides young people with adequate working conditions, sufficient income and the potential of a stepping-stone** to permanent employment, while at the same time not undermining the potentially positive implications of

the platform economy for innovation, growth and labour market integration of disadvantaged, low-skilled youth. Furthermore, it is important not to exclude young workers from government-provided insurance schemes such as unemployment insurance, as flexible working conditions make them more vulnerable to lay-offs than regularly employed people.

Given the predicted rise in NFSE, policy makers may **need to devise innovative ways of providing social protection** for this group. One general policy response to the threat of job automation that has been proposed is a basic income for everyone – an idea that is clearly very controversial. From an economic viewpoint, it is seen with pronounced scepticism due to the disincentives to work that would come with this form of regulation.²⁴ At the same time, governments could consider a tailored, specific version of the basic income scheme to provide social protection for young people. For example, if they became eligible for basic income once they complete their education that then faded out over a given time-frame. Again, the incentive structure of any such scheme would need to be closely scrutinised.

In addition, regulations regarding adequate working conditions that cover the various types of NFSE would need to be systematically devised.

4.2.2. Adapt labour market regulation and social protection, and support adaptability, self-management, and entrepreneurial skills

While not the focus of this report, the **importance of adapting labour market regulation and social protection systems** in light of the new world of work also needs to be highlighted when talking about the stability of employment and the frequency of transitions (in addition to the points discussed in the previous Section). Across Member States, social protection models continue to reflect and suit increasingly outdated models of full-time permanent employment (European Commission, 2018a; European Parliament, 2016). As a result, there is a need for a reconfiguration of social protection systems across the EU in view of the platform economy. A key step is to **rethink traditional distinctions of employment made by the social protection systems**, and to consider re-organising the way social security systems are funded so as not to exclude workers in flexible work arrangements from unemployment and retirement insurance schemes. This line of reasoning is supported by many stakeholders interviewed for this study. Over 30% of respondents advocate for widening the social-safety net by including non-standard forms of work into the system. One way to implement this may be the introduction of universal income taxes that do not discriminate between salary income and other types of income.

Some studies also suggest that a reduction in working time would either allow more people into work, or dampen the negative effects of technological developments on the labour market. At the same time, these studies also warn against the increase in labour costs, which may have negative consequences for the competitiveness of export-oriented firms if productivity does not increase in the same way (EPRS, 2018).

On the worker side, against the background of increasingly flexible work arrangements and non-standard forms of employment, it appears **essential to equip young people with skills such as career management and adaptability**. To some extent, this also

²⁴ In several countries basic income schemes are being piloted that intend to calibrate the (dis-)incentives to work such a scheme generates; the pilot in Finland has received particular attention and highlights the difficulties in both setting-up a pilot experiment and in calibrating basic income payments versus work incentives (e.g. De Wispelaere et al, 2018).

includes skills that make individuals more resilient to individual negative shocks on the labour market. This skill set may even include motivational skills and belief systems, and also attitudes and mind-sets that support openness, change and innovation. Encouraging the development of general skills would also address the negative impacts of field of study mismatch as young people who are not able to find work in their field of study do not have to downgrade to find work (Montt, 2017).

Along the same lines, the changing organisation of work within firms (for example, the outsourcing of tasks due to online platforms), may imply that young people will increasingly need skills relevant for own-account work or for being self-employed. This includes skills such as self-management, project organisation and so on. It would therefore be crucial **to equip a larger number of young people with entrepreneurial skills to help them shift into forms of self-employment**. This might then offer them more genuine autonomy and better working conditions than they experienced in the platform economy.

Entrepreneurship also engulfs some feature of a 'double-dividend' at the individual and societal level (as discussed for educational policies above), in the sense that entrepreneurs transform new scientific findings into growth and new employment (EPRS, 2018): A recent report by the OECD (2016) shows that a considerable amount of new jobs are created by small, newly-founded enterprises. The same report shows that Europe lags behind in the growth of young people's enterprises.

Supporting young people in entrepreneurship efforts could constitute a key policy lever for young people in the labour market. Besides training and consulting for people who want to start a business, this typically needs to include measures improving or providing access to finance. Furthermore, with the increase in project-based employment (c.f. UKCES, 2014), young people will more commonly require fundamental business skills (such as project management, contract negotiation and risk management). As these are rarely part of the school-based education curriculum, many young people may require post-education skills development in this regard. Supporting the development of entrepreneurship networks would be a further component of this policy lever (European Commission, 2018i).

4.2.3. Facilitate (non-formal) life-long learning, especially non-cognitive and career-management skills

Continuing on from the preceding Section, a related policy lever is **to provide young people with the skills that underlie individual adaptability, career management and the continuous need for up-skilling and re-skilling**. The complementing policy lever within the educational systems would be to provide students with **skills that facilitate future learning and adaption**. However, as is the case for many non-cognitive (e.g. inter-personal) skills, adaptability and self-management is typically not developed within the school-based education system (Brynjolfsson and McAfee, 2017). Against this background, alternative methods for developing these types of skills may need to be explored (e.g. peer-to-peer learning, work-based learning, etc.). To date there is little evidence on how to best develop career-management and adaptability skills.

A second policy lever would be to **facilitate life-long learning and continuous re-skilling for employed and unemployed young people alike**. This point was also among the issues particularly stressed by the stakeholders against the background of uncertainty regarding the exact types of skills necessary for future labour market success. Ample evidence demonstrates that training increases the employability of workers and shortens their unemployment periods if they become unemployed (Sanders and de Grip, 2004). **The support of life-long learning needs to go beyond the develop-**

ment of training programmes. It probably needs to include financial incentives for participating in education and training opportunities (Arntz et al, 2016). In addition, policies need to **ensure that acquired skills are part of official certification systems**, and that participation in such training programmes carry a positive signalling effect for future employers (c.f. validation of non-formal learning in **Error! Reference source not found.6**). Moreover, policy measures should be developed that identify and support employed young people in precarious occupations (or platform work) who would otherwise not participate in upskilling measures (Albert et al, 2004).

5. Conclusion

The Youth Guarantee was designed as a result of the high youth unemployment rate in many European labour markets after the economic recession. With the rate of youth unemployment generally declining since then, different challenges have evolved for young people in the labour market. Member States have experienced different paths in their economic recoveries, and the composition of groups of disadvantaged young people differs by country and by region, resulting in a combination of both Europe-wide and specific national challenges. In addition, it is expected that future technological developments will have significant impacts on European labour markets, also impacting on the youth labour markets.

Several **key developments** since the economic crisis are worth noting. Firstly, as the overall economic outlook has improved, **youth unemployment remains concentrated in specific Member States**. In these Member States, the number of jobless young people is also a key determinant of overall unemployment, a fact that is reflected in a **diverging trend in the youth unemployment gap between Member States**. Secondly, even at the aggregate level, trends for specific groups of youth are visible: young men, for instance, have been more likely than young women to remain discouraged and inactive since the crisis. Highly educated youth were affected more strongly by the economic shock, and their labour market outcomes have recovered more slowly since. These general developments **add to specific group heterogeneity at the Member State level**: in particular, for instance, the capacity for reintegrating long-term unemployed youth varies notably between countries.

In a parallel development, **technological change through automation and digitalisation has advanced, and it is expected to re-shape the future world of work**. Some predictions on the extent to which various jobs are likely to be automated represent an 'upper band' of workers' redundancy and these predictions may also underestimate the potential benefits of technological advances. Certain accompanying labour market developments are becoming visible: one development, for instance, is the **increasing prevalence of non-standard forms of work, and a higher degree of labour market volatility** determined by less stable employment situations and more frequent job-to-job transitions.

Against this background, the report has discussed the implications of these challenges for youth employment and school-to-work transitions. First, it has provided a **comprehensive overview of the current and future challenges for youth in the labour market and how these challenges will affect different groups of youth**. Second, the report has reviewed the **potential role of public policies and current paradigms in view of such changes and it has discussed key policy levers to address these challenges**. The first part makes clear that ongoing and anticipated technological developments are rightly expected to both change the kinds of jobs young people will have in the future as well as their content with potentially important implications concerning the

(in-)equality of opportunities and outcomes. In contrast, the second part shows that these changes require responses in public policies to adapt to the upcoming challenges.

One main response concerns the provision of skills. In fact, it is notable that skills provision and educational responses constitute the most prominent policy implication arising from this analysis. These skills responses have several aspects. A significant policy requirement is **ensuring that all young people, particularly the most disadvantaged young people, have basic skills, ideally augmented by (basic) ICT skills,** when they enter the labour market. Advanced ICT skills provision and an emphasis on STEM-related fields in the educational provision is also crucial for meeting the 'as yet unmet' labour demand for high-skilled youth.

In addition, a **lack of work-related skills and a skills mismatch, in particular for medium-skilled youth, needs to be addressed by strengthening VET and apprenticeships,** a key area across the European Union.

Finally, an overarching theme for the future world of work is that youth are expected to require – and therefore need to be educated in – **so-called 'adaptability skills' or '21st century skills'**. This is considered a key competence for youth in an increasingly automated and flexible labour environment. These challenges require **reforms of the educational and training system, as well as more focused career guidance, to help individuals identify the important skill sets** that need to be acquired before they enter the labour market, and in the long run through lifelong learning.

On the surge of non-standard forms of work, besides needing to foster adaptability, it is **important for policy to strengthen (self-)management among youth, and a certain amount of entrepreneurial skill,** to prepare them both for more autonomous daily work and more frequent labour market transitions. The Public Employment Services and Active Labour Market Policies may have an important role to play here in an enhanced effort to provide fast and relevant labour market information, job search assistance and job placement interventions.

The concerns raised related to **job quality and the potential exclusion from social security systems require reforms of labour market and business regulations.** They also include the structure of the social security system itself, which probably needs to be more flexible in its definition of what constitutes employment and the way workers can contribute to, and benefit from, the employment system. While this is possibly not in the realm of 'youth policies' as such, it is clearly one factor that will shape the labour market that future cohorts of European youth will enter into.

References

- Acemoglu, D. and Autor, D. (2011), *Skills, Tasks and Technologies: Implications for Employment and Earnings*, *Handbook of Labor Economics*, 4b, 1043-1171.
- Albert, C., García-Serrano, C. and Hernanz, V. (2010), *On-the-job training in Europe: Determinants and wage returns*, *International Labour Review*, 149(3), 315-341.
- Ambrosetti Club (2017), *Tecnologia e lavoro: governare il cambiamento*, The European House – Ambrosetti, Milan.
- Arcidiacono, P., Aucejo, E. M. and Hotz, V. J. (2016), 'University Differences in the Graduation of Minorities in STEM Fields: Evidence from California', *American Economic Review*, American Economic Association, vol. 106(3), pages 525-562, March.
- Arntz, M., Gregory, T. and Zierahn, U. (2016), 'The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis', *OECD Social, Employment and Migration Working Papers*, No. 189, OECD Publishing, Paris.
- Autor, D.H., Katz, L.F. and Kearney, M.S. (2006), 'The Polarization of the U.S. Labor Market.' *American Economic Review* 96, no. 2: 189-194.
- Autor, D. H., Dorn, D. and Hanson, G. H. (2013), 'The China Syndrome: Local Labor Market Effects of Import Competition in the United States.' *American Economic Review*, 103 (6): 2121-68.
- Autor, D. H. (2013), 'The 'task approach' to labor markets: an overview', *Journal for Labour Market Research* 46, no.: 185-199.
- Autor, D. H. (2015), 'Why Are There Still So Many Jobs? The History and Future of Workplace Automation', *Journal of Economic Perspectives* 29, no. 3: 3-30.
- Ayllón, S. (2013), 'Unemployment persistence: not only stigma but discouragement too.', *Applied Economics Letters*, 20(1), 67-71.
- Berger, T. and Frey, B. (2016), 'Digitalisation, Jobs, and Convergence in Europe: Strategies for Closing the Skills Gap.', Prepared for the European Commission DG Internal Market, Industry, Entrepreneurship and SMEs.
- Bertelsmann Foundation (2017), 'An Incomplete Recovery Youth Unemployment in Europe 2008 – 2016.', Bertelsmann Stiftung: Gütersloh, Germany.
- Berloffo, G., Matteazzi, E., Mazzolini, G., Sandor, A. and Villa, P. (2018), 'How can young people's employment quality be assessed dynamically?' in O'Reilly, J., Leschke, J., Ortlieb, R., Seeleib-Kaiser, M. and Villa, P. (eds.) (2018). *Youth Labor in Transition, Inequalities, Mobility, and Policies in Europe*, Oxford University Press.
- Brynjolfsson, E. and McAfee, A. (2014), *The Second Machine Age: Work, progress, and prosperity in a time of brilliant technologies.*, New York, London: Norton Publishers.
- Brynjolfsson, E. and McAfee, A. (2017), *Harnessing Our Digital Future: Machine, Platform, Crowd*. New York, London: Norton Publishers.
- Brunello, G. and Schlotter, M., (2011), 'Non-Cognitive Skills and Personality Traits: Labour Market Relevance and their Development in Education & Training Systems', *IZA Discussion Papers* 5743, Institute for the Study of Labor (IZA).
- Caliendo, M., Dheret, C., Hadjivassiliou, K., Kluge, J., Pastore, F., Stöterau, J. and Tübbicke, S. (2019), 'Study on the Youth Guarantee in light of changes in the world of work - Implementation of the Youth Guarantee: Intervention Models, Sustainability and Relevance.', Publications Office of the European Union, Luxembourg.
- Carcillo, S., Fernández, R., Königs, S., Minea, A. (2015), 'NEET Youth in the Aftermath of the Crisis: Challenges and Policies', *OECD Social, Employment and Migration Working Papers*, No. 164, OECD Publishing, Paris.

Card, D. and DiNardo, J.E. (2002), 'Skill Biased Technological Change and Rising Wage Inequality: Some Problems and Puzzles', NBER Working Papers 8769, National Bureau of Economic Research, Inc.

CEDEFOP (2016), 'Skill shortage and surplus occupations in Europe.', CEDEFOP Briefing note. Online: <http://www.cedefop.europa.eu/en/publications-and-resources/publications/9115>.

Clark, A.E., Y. Georgellis and P. Sanfey (2001), 'Scarring: The Psychological impact of past unemployment.' *Economica*, 68, 221–241.

Council of the European Union (2013), Council Recommendation of 22 April 2013 on establishing a Youth Guarantee - (013/C120/01. Brussels.

De Wispelaere, J., Halmetoja, A. and Pulkka, V.V. (2018), 'The Rise (and Fall) of the Basic Income Experiment in Finland', CESifo Forum, ISSN 2190-717X, ifo Institut – Leibniz-Institut für Wirtschaftsforschung an der Universität München, München, Vol. 19, Iss. 3, pp. 15-19

Dustmann, C., Schönberg, U. and Stuhler, J. (2017), 'Labor Supply Shocks, Native Wages, and the Adjustment of Local Employment', *The Quarterly Journal of Economics*, Volume 132, Issue 1, Pages 435–483.

Eichhorst, W. (2015), 'Does Vocational Training Help Young People Find a (Good) Job? - Systems Combining Structured Learning on the Job with Classroom Training Can Ease Youth Unemployment', IZA Paper, January

Eichhorst, W. and Rinne, U. (2014), 'Promoting Youth Employment through Activation Strategies', ILO, Employment Policy Department, Employment Working Paper No. 163

Elsby, M. W. L., Shin, D. and Solon, G. (2016), 'Wage adjustment in the Great Recession and other downturns: Evidence from the United States and Great Britain', *Journal of Labor Economics*, 34 (S1), S249-S291.

Eurofound (2017), 'Non-standard forms of employment: Recent trends and future prospects - a background paper for the Estonian Presidency', Ad-hoc Report *Produced at the request of the Estonian EU Presidency in the context of Conference on the 'Future of Work: Making IT e-Easy'*, 13-14 September 2017.

Eurofound (2018a), 'Employment and working conditions of selected types of platform work', Publications Office of the European Union, Luxembourg.

Eurofound (2018b), 'Automation, digitisation and platforms: Implications for work and employment', Publications Office of the European Union, Luxembourg.

European Commission (2016), 'Analytical Web Note 7/2015 – Measuring skills mismatch', Directorate-General for Employment, Social Affairs and Inclusion. Luxembourg: Publications Office of the European Union.

European Commission (2017a), 'European Semester Thematic Factsheet - Youth Employment', Online: https://ec.europa.eu/info/sites/info/files/file_import/european-semester-thematic-factsheet-youth-employment-en.pdf

European Commission. (2017b). *Education & Training Monitor 2017*, Comparative Report, 9/11/2017', Online: https://ec.europa.eu/education/sites/education/files/monitor2017_en.pdf

European Commission (2018a), 'Employment and Social Developments in Europe. Annual Review 2018', Directorate-General for Employment, Social Affairs and Inclusion. Luxembourg: Publications Office of the European Union.

European Commission (2018b), Digital Single Market - Digital Economy & Society – DESI by Components.

European Commission (2018c), Youth Guarantee country by country – Romania.

- European Commission (2018d), Youth Guarantee country by country – Bulgaria.
- European Commission (2018e), Platform Workers in Europe – Evidence from the COLLEEM Survey. Brussels.
- European Commission (2018f), Effective outreach to NEETs – Experience from the ground. Brussels.
- European Commission (2018g), Robots at work. A report on automatable and non-automatable employment shares in Europe. Directorate-General for Employment, Social Affairs and Inclusion. Luxembourg: Publications Office of the European Union.
- European Commission (2018h), Continued Education Offers under the Youth Guarantee Experience from the ground. Directorate-General for Employment, Social Affairs and Inclusion. Luxembourg: Publications Office of the European Union.
- European Commission (2018i), Employment and entrepreneurship under the Youth Guarantee – Experience from the ground. Directorate-General for Employment, Social Affairs and Inclusion. Luxembourg: Publications Office of the European Union.
- European Parliament (2016), The Situation of Worker in the Collaborative Economy. Brussels.
- EPRS (European Parliamentary Research Service) (2018), 'The impact of new technologies on the labour market and the social economy', Scientific Foresight Unit (STOA), Study IP/G/STOA/FWC/2013-001/LOT 8/C1. Brussels: European Union.
- EPSC (European Political Strategy Centre) (2016), 'The Future of Work - Skills and Resilience for a World of Change', EPSC Strategic Notes. Issue 13/2016, 10.6.2016. Available at: https://ec.europa.eu/epsc/publications/strategic-notes/future-work_en
- Evans D. S., Schmalensee R. (2017), *Multi-sided Platforms*. In: Palgrave Macmillan (eds) The New Palgrave Dictionary of Economics. Palgrave Macmillan, London
- Flek, V., Hála, M. and Mysíková, M. (2018), 'Youth Labor Flows Differ from Those of Older Workers?', in O'Reilly, J., Leschke, J., Ortlieb, R., Seeleib-Kaiser, M. and Villa, P. (eds.) (2018). Youth Labor in Transition, Inequalities, Mobility, and Policies in Europe, Oxford University Press.
- Frey, C. B. and Osborne, M. A. (2013), 'The Future of Employment: How Susceptible are Jobs to Computerisation?', Oxford Martin School Working Paper.
- Frey, C. B. and Osborne, M. A. (2017), 'The Future of Employment: How Susceptible are Jobs to Computerisation?', *Technological Forecasting and Social Change*, 114(C): 254-280.
- Frey, C. B. and M. A. Osborne (2018), Automation and the future of work – understanding the numbers', Online: <https://www.oxfordmartin.ox.ac.uk/opinion/view/404>, last accessed: 31.10.2018.
- Giuliano, P. and Spilimbergo, A. (2014), 'Growing up in a Recession', *Review of Economic Studies*. Number 81, issue 2, p. 787-817.
- Goldin, C. and Katz, L. F. (2008), *The Race between Education and Technology*. Harvard, Mass.: Harvard University Press.
- Green, F. and Henseke, G. (2017), 'Graduates and 'graduate jobs' in Europe: a picture of growth and diversification', Working paper no. 25. Centre for Global Higher Education. UCL Institute of Education, London.
- Hadjivassiliou, K., Tassinari, A., Eichhorst, W. and Wozny, F. (2016), 'Assessing the Performance of School-to-Work Transition Regimes in the EU', IZA Discussion Paper No. 10301.
- Hadjivassiliou, K. P., Tassinari, A., Eichhorst, W. and Wozny, F. (2018), 'How Does the Performance of School-To-Work Transition Regimes Vary in the European Union?', in

O'Reilly, J., Leschke, J., Ortlieb, R., Seeleib-Kaiser, M. and Villa, P. (eds.) (2018). *Youth Labor in Transition, Inequalities, Mobility, and Policies in Europe*, Oxford University Press.

Haskel, J. and Slaughter, M. J. (2002), 'Does the sector bias of skill-biased technical change explain changing skill premia?', *European Economic Review*, 46, issue 10, p. 1757-1783.

Heckman, J., Pinto, R. and Savelyev, P. (2013), 'Understanding the Mechanisms Through Which an Influential Early Childhood Program Boosted Adult Outcomes', *The American Economic Review* 103, no.6: 2052-2086.

Helbling, L. A., Imdorf, C., Ayllon, S. and Sacchi, S. (2016), 'Methodological challenges in the study of scarring effects of early job insecurity', NEGOTIATE working paper no. 6.1.

Hernanz, V. and Jimeno J.F. (2017), 'Youth Unemployment in the EU', *CESifo Forum* 18 (2), 2017, 03-10. Online: <https://www.cesifo-group.de/DocDL/CESifo-Forum-2017-2-hernanz-jimeno-youth-unemployment-june.pdf>

Huws, U., Spencer, N.H., Syrdal, D.S. and Holts, K. (2017), 'Work in the European Gig Economy', FEPS Working Paper.

ILO (International Labour Office) (2017), *Skills policies and systems for a future workforce*, Global Commission on the Future of Work Issue Brief No.8. Prepared for the 2nd Meeting of the Global Commission on the Future of Work. Geneva: International Labour Office.

Kahn, L. B. (2010), 'The long-term labor market consequences of graduating from college in a bad economy', *Labour Economics*, 17(2), 303-316.

Kluge, J. (2018), 'Bridging the 'last mile' from education to employment', KfW Development Research, KfW: Frankfurt, forthcoming.

Lincaru, C., Predosanu, G. and Brinza, R., (2008), 'Process of transition from school-to-work: generator for the initial stage of path dependence in career development', IRISS Working Paper Series 2008-13, CEPS/INSTEAD.

Lordan, G. (2018), 'Robots at work. A report on automatable and non-automatable employment shares in Europe', (<http://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=8104&furtherPubs=yes>)

Lordan, G. and Josten, C. (2017), 'Technology at Work: Occupations and Skills that may be replaced by technology in the next decade.'

McGuinness, S. (2006), 'Overeducation in the Labour Market', *Journal of Economic Surveys*, 20: 387-418.

McGuinness, S., Whelan, A. and Bergin, A. (2018), 'Is there a role for higher education institutions in improving the quality of first employment?', In: *Strategic Transitions for Youth Labour in Europe. Youth Employment: STYLE Handbook*. Jacqueline O'Reilly, Mark Smith, Tiziana Nazio, Clémentine Moyart.

McKinsey Center for Government (2014), 'Education to employment: Getting Europe's youth into work', McKinsey & Company.

Montt, G. (2017), 'Field of study mismatch and overqualification: labour market correlates and their wage penalty,' *IZA Journal of Labor Economics*, vol. 6(1), pages 1-20, December.

Nedelkoska, L. and G. Quintini (2018), 'Automation, skills use and training', *OECD Social, Employment and Migration Working Papers*, No. 202, OECD Publishing, Paris.

O'Higgins, N. (2014), 'Institutions and youth labour markets in Europe during the crisis', In P. Tridico & L. Mamica (Eds.), *Economic policy and the financial crisis* (pp. 90–114). Abingdon: Routledge.

Oberholzer-Gee, F. (2008), 'Nonemployment stigma as rational herding: A field experiment', *Journal of Economic Behavior and Organization*, 65, 30-40.

Oreopoulos, P., von Wachter, T., Heisz, A. (2012), 'The Short- and Long-Term Career Effects of Graduating in a Recession', *American Economic Journal: Applied Economics*, 4 (1): 1-29.

OECD (Organisation for Economic Co-operation and Development) (2016), 'Entrepreneurship at a Glance', Paris: Organisation for Economic Co-operation and Development.

OECD (Organisation for Economic Co-operation and Development) (2017), 'Getting Skills Right: Skills for Jobs Indicators, Getting Skills Right', Paris: Organisation for Economic Co-operation and Development.

Parker, G. G., van Alstyne, M. W. and Sangeet, P-C. (2016), 'Platform Revolution: How Networked Markets Are Transforming the Economy and How we Make them Work For You', W. W. Norton & Company.

Pesole, A., Urzì Brancati, M.C, Fernández-Macías, E., Biagi, F. and González Vázquez, I. (2018), 'Platform Workers in Europe', EUR 29275 EN, Publications Office of the European Union, Luxembourg.

Peters, B. (2016), 'Innovation, skills and job creation', In: *Science, Research and Innovation performance of the EU 2016. A contribution to the Open Innovation Open Science, Open to the World agenda*, ed. European Commission, 276-319. Brussels: European Commission, DG Research and Innovation.

Pohl, A. and Walther, A. (2007), 'Activating the Disadvantaged – Variations in Addressing Youth Transitions across Europe', *International Journal of Lifelong Education*, 26:5, pp.533-553.

Pouliakas, P. (2018), 'Determinants of Automation Risk in the EU Labour Market: A Skills-Needs Approach', IZA DP No. 11829. IZA Institute of Labor Economics.

Quintini, G. and Martin, S., (2014). 'Same Same but Different: School-to-Work Transitions in Emerging and Advanced Economies', *OECD Social, Employment and Migration Working Papers*, No. 154, OECD Publishing

Sanders, J. and de Grip, A. (2004), 'Training, task flexibility and the employability of low-skilled workers' *International Journal of Manpower*, vol. 25, no. 1, pp. 73-89.

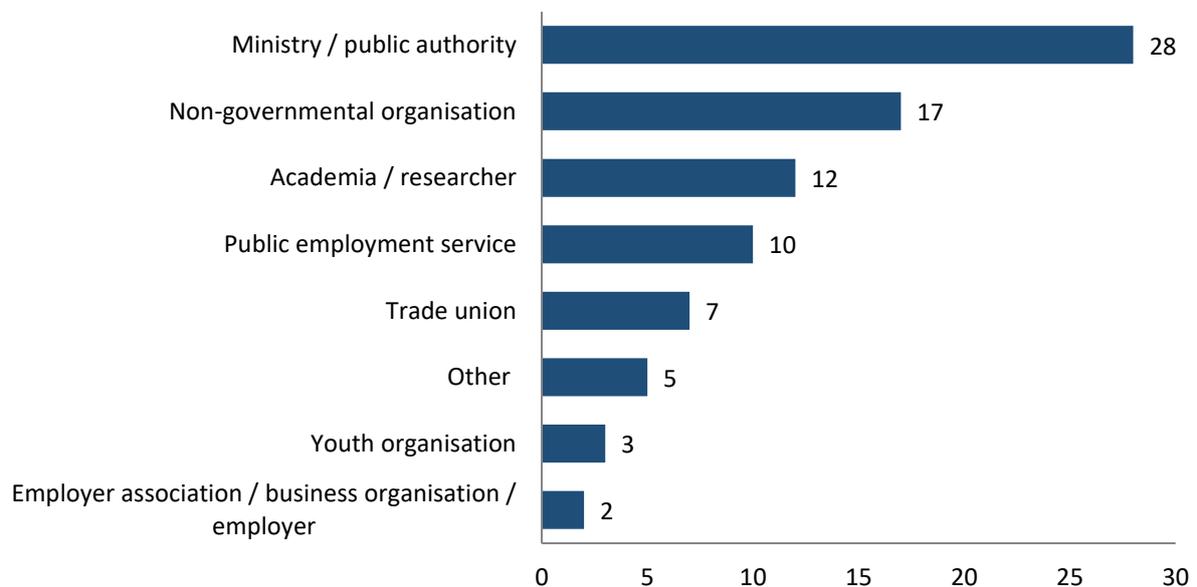
Annex A: Stakeholder Consultation

The aim of the stakeholder consultation was to gather key stakeholders' views and proposals on emerging challenges and policy responses related to youth employment and school-to-work transitions, with a particular focus on the 2013 Council Recommendation (Council of the European Union 2013) and the future development of the YG. The following groups of stakeholders were targeted in the consultation: YG coordinators, PES network representatives, social partners, stakeholders involved with skills and youth, youth organisations, civil society organisations, international organisations, business organisations, think tanks and academic representatives, and policy makers.

Part of this consultation was an online survey that was launched on 3rd September 2018 using the EU survey tool and ran until 4th October 2018. The survey was mainly disseminated through stakeholder channel groups by the European Commission and the study team. To increase the response rates, two reminders were sent to the groups of stakeholders identified above.

The online consultation received a total of 84 replies from stakeholders in 27 countries. Two thirds of the respondents (57) responded in their professional capacity on behalf of an organisation, while one third of the respondents (27) provided their responses as individuals in their personal capacity. More than half the respondents (63,1%) were active in the local, regional or national level, while 36,9% were working at the multi-national (or EU) level. The representatives of the ministries' public authorities (28), non-governmental organisations (17), and academia or research organisations (12), were the most active in replying to the consultation questionnaire. The distribution by type of organisation is presented in the figure below. A majority (70,2%) of the survey participants said that their work had been directly related to the Youth Guarantee and/or youth employment policies.

Figure 11. Distribution of respondents by type of organisation



Source: Author's own calculations from the online survey.

In addition to the online consultation, the study team held a brainstorming seminar with stakeholders from different European countries and institutions. The seminar was held on 1st October 2018 in Brussels at the European Commission. The day-long event aimed

at discussing issues related to current and future challenges for young people on the labour market as well as suitable policy responses to these challenges. After presenting some preliminary results from Caliendo et al (2019), the 45 participants were assigned to smaller discussion groups which were led by one of the members of the study team. Each one of those groups discussed topics independently from the others to gather more creative input from the brainstorming sessions. Other members from the study team documented key results from these sessions, providing valuable input for this report. Some participants of the brainstorming seminar were also contacted again by means of a telephone interview of about 40 minutes to discuss further policy options to combat current and future challenges for young people in the labour market. The subset of interview participants was chosen to include YG coordinators, the social partners, PES, European Social Fund (ESF) managing authorities, and international organisations.

Results: Current Challenges

The current challenges for young people in transitioning the labour market (Section 2.3) were initially identified through the desk study of recent literature. Most were backed by the evidence gathered from the stakeholder consultation. One slight exception is that the impact of new technologies is not currently seen to be a major issue for young people's STW transitions by key stakeholders. Another interesting observation is that stakeholders do not identify a lack of available jobs and, more specifically, a lack of quality job and traineeship offers as the most important challenges. The latter issue was more prominently raised in the seminar sessions.

Stakeholders stressed other challenges that are not necessarily at the forefront of the literature discussed, but they nonetheless represent important considerations. Most prominently, these include a lack of job experience and inadequate expectations among the youth about the labour market, the two issues are likely to be co-determined. A further aspect highlighted by stakeholders relates to increasingly precarious and lengthy STW transition of previous and current cohorts. Faced with dire job market prospects, young people defer entry into the labour market (e.g. by staying in education) and become independent later in life. In this regard, the 'Not Young, Not Adult' (NYNA) phenomenon was mentioned in the seminar, and a lack of support service for older youth, in particular for NEETs. Finally, stakeholders also mentioned the increasing regional disparity across and within Member States, and they highlighted the need for policies that address both local economic development programmes as well as programmes that support inter- and intra- regional mobility.

Regarding the most pressing challenges for *particularly disadvantaged youth* in their transition to the labour market, the results from the stakeholder consultations provided a somewhat different picture. Unambiguously, most stakeholders regard the lack of (access to and knowledge about) services and the missing coordination between different services for disadvantaged youth as one of the major challenges for their school-to-work transition (see Figure 6). Ranked by their relative importance as judged by the stakeholders, these issues are followed mostly by a lack of second-chance education opportunities for disadvantaged youth, discrimination in the labour market and a lack of policy against it, as well as other policy-related topics such as a lack of hiring incentives, information on and access to services and social security systems.

Other challenges for disadvantaged youth mentioned by the stakeholders relate to insufficient profiling and lack of targeted/tailored support services for disadvantaged youth, difficulties in addressing multi-dimensional challenges and a lack of 'holistic approaches', also regarding too few direct links and coordination mechanisms between the education system and labour market services and programmes by the PES. With regard to coordination and cooperation across labour market actors, stakeholders mentioned a lack of

skills recognition (also of informal skills) and human capital portability across occupations and Member States.

Results: Future challenges and policy response

The challenges discussed in Section 3 were identified through an extensive literature review of the growing body of evidence regarding emerging challenges for the youth and their STW transition. Compared to current challenges, future challenges received less weight in the online consultation of stakeholders by only including open questions on this subject. Instead, the online survey focused more on creative and suitable policy responses to match these upcoming challenges. Nonetheless, stakeholders' responses make clear that changes brought on by digitalisation and automation are the most important future challenges for young people in the labour market. Other future challenges mentioned were a brain-drain of young and well-qualified individuals and an increase in low-skilled immigration. While these issues go beyond the scope of this report, they represent relevant dimensions are thus at least mentioned in this Section.

During the stakeholder seminar, participants also stressed the importance of addressing the needs of the disadvantaged young people as they are likely to require a more holistic policy approach in order to tackle multiple entry barriers into the labour market. Regarding future policy responses, the stakeholder seminar suggested three main themes for responses: firstly, increasing the functionality of the educational system, for example through the inclusion of soft and entrepreneurial skills in the curricula, a stronger focus on ICT and STEM-related skills, better coordination of career guidance services and schools as well as a higher emphasis on the VET system, for example through apprenticeships. Secondly, stakeholders suggested improving the capacity of PES to increase the functionality of the labour market and the quality of employment. This would entail a stronger focus on profiling, especially regarding disadvantaged youth, higher monitoring efforts and more high quality opportunities for up-skilling to meet labour market demands. Thirdly, stakeholders suggested increasing policy coordination between different service providers such as health and social services to get closer to a 'holistic youth policy approach'. Policies should improve stakeholder involvement and harmonise social and unemployment benefit systems.

Respondents to the online consultation also mentioned many of these aspects. In fact, they view improved career guidance and closer cooperation between stakeholders as the most important policy responses to upcoming challenges. Furthermore, they stress the importance of the educational and training system to meet future labour market demands through, for example, enhancing lifelong learning, improving the validation of informal learning, securing access to second chance education systems, reducing early school-leaving and a stronger focus on ICT and digital skills. On the functionality of the labour market institutions, the online consultation suggested widening the social safety net by including what are, by today's standards, atypical forms of work (such as platform work) into eligibility conditions for benefit systems. In terms of financial resources, respondents also called for technical training expenditure among Member States. Issues that are seen as less relevant policy responses by stakeholders in the online consultation include increasing the capacity of the PES, modernising ALMPs, for example by providing stronger hiring incentives to employers as well as increasing the flexibility of labour markets.

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