

The future of work: Towards a progressive agenda for all

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List of abbreviations

AAL	ambient assisted living
AI	artificial intelligence
Cedefop	European Centre for the Development of Vocational Training
CESI	European Confederation of Independent Trade Unions
CJEU	Court of Justice of the European Union
COLLEEM	Collaborative Economy and Employment
EDA	European Defence Agency
EGF	European Globalisation Adjustment Fund
EHR	electronic health record
EPSCO	Employment, Social Policy, Health and Consumer Affairs Council
EPSR	European Pillar of Social Rights
ESF+	European Social Fund Plus
ETUI	European Trade Union Institute
Eurofound	European Foundation for the Improvement of Living and Working Conditions
EUROMIL	European Organisation of Military Associations and Trade Unions
EurWORK	European Observatory of Working Life
ICT	information and communication technology
ILO	International Labour Organization
IoT	Internet of things
JRC	European Commission's Joint Research Centre
LFS	Labour Force Survey
MISSOC	Mutual Information System on Social Protection
OECD	Organisation for Economic Co-operation and Development
PIAAC	Programme for the International Assessment of Adult Competencies (i.e. Survey of Adult Skills)
R&D	research and development
T/ICTM	telework and ICT-mobile work
WEF	World Economic Forum
WMU	World Maritime University

Executive summary

Europe's labour markets and the world of work in general are being transformed by the megatrends of globalisation, the fragmentation of the production and value chain, demographic ageing, new societal aspirations and the digitalisation of the economy. This Issue Paper presents the findings and policy recommendations of "The future of work – Towards a progressive agenda for all", a European Policy Centre research project. Its main objectives were to expand public knowledge about these profound changes and to reverse the negative narrative often associated with this topic. It aimed to show how human decisions and the right policies can mitigate upcoming disruptions and provide European and national policymakers with a comprehensive toolkit for a progressive agenda for the new world of work.

There have been numerous studies, much media attention and intense debate among policymakers, labour market players and experts about the future of work – and for good reason. The sensitivity of the topic is high, the challenges are tremendous and policy solutions are still at an experimental stage.

Building upon previous research, the following five chapters aim to take an in-depth look at labour market transformations, not least by examining the dual effects of the changing structure of the labour market, the growing importance of new forms of work and the implications of these changes for the workforce.

Chapter 1 analyses the shifts brought about by the fourth industrial revolution and the technologies that underpin it. It presents the findings of academic literature on the topic, takes a general look at the labour market and homes in on four industrial sectors: (health)care, media and publishing, transport and logistics, and security and defence.

The analysis identifies both common trends and sector-specific characteristics and variations. Among the common trends, research findings show that job displacement and labour market polarisation will intensify, whereas current evidence on job loss is ambivalent. Another trend is the increased mix and diversification of work arrangements. Atypical employment is not new; it pre-dated both the digitalisation of the economy and the 2008 economic crisis, and the resulting labour market deregulation provided fertile ground for its expansion. New forms of work are now further enabled by the fourth industrial revolution and its associated technologies. The combination of these two developments – labour market polarisation and the diversification of work arrangements – has major implications for Europe's economic and social models. They give rise to a new techno-economic paradigm and require systemic changes to how labour markets and welfare states are organised and interact with one another. At a time of fierce global competition, a number of challenges will arise or escalate, especially the need for technological leadership in Europe, new skillset requirements among workers and the question of how to train and organise an increasingly volatile workforce.

In a sectoral analysis, Chapter 1 shows that both the intensity of labour market polarisation and the diversification of work arrangements vary and thus have a differentiated impact across countries and industries. Such variations are driven by a complex set of factors, not least the regulatory environment of each given sector, the structure and age of its workforce, labour costs, public acceptance of new technologies and workers' involvement in strategic decisions. Examining how such factors interact with one another is vital to understanding potential future dynamics and technological impact facing each industrial sector. Chapter 1 therefore stresses the need for an overall strategy towards the future of work, a general understanding of the transformations at play and a set of sectoral approaches that should offer tailor-made solutions.

Chapter 2 studies the profiles of atypical workers, examines the implications of their arrangements for working conditions and access to social protection, and asks, crucially, whether they will form the new precariat of 21st century labour markets.

Drawing a profile of atypical workers is not easy, for several reasons. First, they comprise several sub-categories and their development responds to different logics. Second, while previously established trends still hold true today, new ones arise and make the identification of clear patterns difficult. For instance, while atypical employment is generally over-represented in certain economic sectors such as agriculture, the arts and entertainment, the sub-category of platform workers is mainly found in sectors that have been deeply impacted by digitalisation. Interestingly, the evidence also suggests that the population engaged in atypical employment is ageing and that the share of high skilled people has increased significantly. As regards gender, different patterns apply to different groups: while self-employed people are predominantly male, part-time workers are mainly female, and the gender distribution is roughly equal among temporary workers. The growing representation of high skilled women in each of these categories is noteworthy. All of this tends to contradict the popular view that atypical employment is largely the domain of young, inexperienced and low skilled workers. On the contrary, it appears that tertiary education no longer shields people from unstable jobs, which used to be the case in yesterday's labour market.

Generally speaking, atypical workers do face worse working conditions, have less social protection and bargaining power than standard workers, and this increases their risk of becoming the new precariat of the 21st century, as long as no proper actions are undertaken. Yet, given the great diversity of atypical workers and social welfare systems in Europe, treating them as a homogenous group would be misleading. Atypical employment is diverse and the situation differs significantly from one country to another. In fact, some countries have managed to narrow the social protection gap between atypical workers and standard employees, thus showing that public policies matter in that respect.

Chapter 3 stresses the lasting repercussions of a changing world of work and the decoupling of employment from social protection. Not only will this create new types of socioeconomic risk for individuals, it also adds pressure on the welfare state and tests the resilience of the social contract. Mental health disorders have become a more salient issue in the 21st century, and these disorders may impact atypical workers disproportionately, in particular the self-employed, due to fears and anxieties about job security, lack of predictability and income insecurity in old age as well as a higher risk of social exclusion. Mental (ill)health has huge societal costs, too. Furthermore, the decoupling of employment from social protection reduces the number of people who effectively contribute to the welfare system, thus aggravating the already unsustainable relationship between welfare beneficiaries and contributors. This further undermines the social contract and its redistributive principle at a time when technologies are accelerating the polarisation of the labour market and the erosion of the middle class.

Chapter 4 shows how the changing nature of work has crystallised public attention in recent years and fostered numerous initiatives undertaken at different policy levels and by various actors. It reveals the discrepancy between the established functioning of our welfare regimes, new socioeconomic realities and the transitory nature of the current phase, where numerous actors attempt to fill gaps, address workers' claims and/or provide their own solutions to systemic problems. While many measures might be useful in the short term to relieve some workers' grievances, without coordination, the multiplicity of initiatives and actors can raise the risk of piecemeal measures rather than foster a fully-fledged strategy on how to address the ever more complex realities of today's world of work. The question of how to define a social contract that is fit for the future should lie at the core of such strategy.

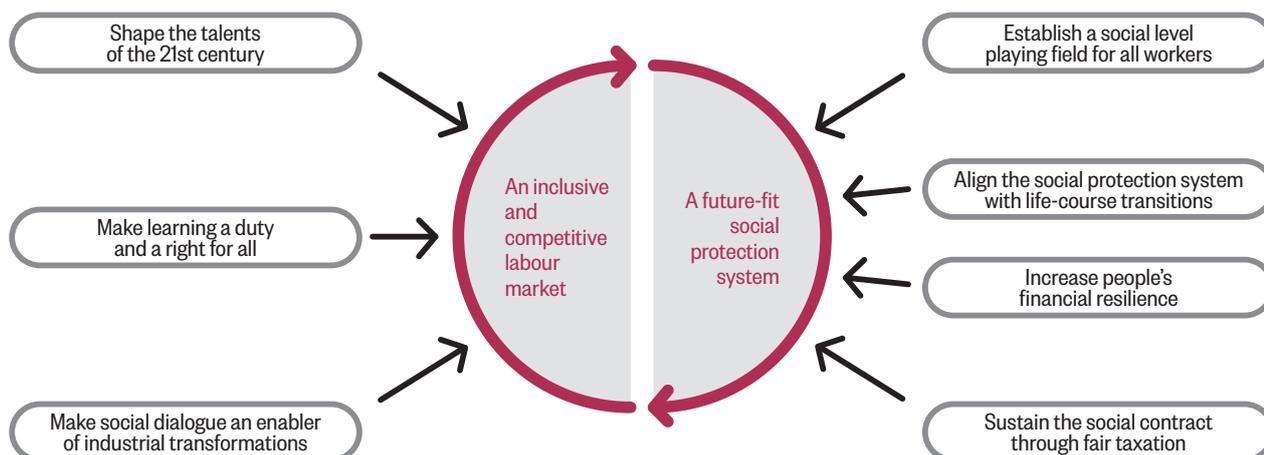
Chapter 4 also shows how the future of work is gradually making its mark on the reform agenda of public authorities. While inspiring reforms take place at the national level, the EU and international levels are also paying more attention to the effects of labour market transformations. As for

the European level, recent measures – in particular the increased focus on digital skills as well as the European Pillar of Social Rights and its mainstreaming into the European Semester and EU financing instruments – represent major policy developments. However, the success of the EU future of work agenda is highly dependent on the cooperation with and/or support of other players, such as national authorities, courts of justice, and social partners.

Based on the evidence and analysis provided in the paper, Chapter 5 offers policymakers a toolkit for a progressive agenda on the future of work. This agenda enables a new alignment between the functioning of the welfare state and the impact of technological progress, thus putting an end to the current phase that is gradually dismantling the social contract, in favour of a conscious, mature and controlled deployment of new technologies. This agenda will need to rest on an inclusive and competitive labour market and a social protection system acting in a virtuous relationship, as presented in the diagram below. To make such a virtuous circle possible, a number of concrete actions and systemic reforms will need to be carried out at different levels of decision-making.

Despite the limited scope of the EU's competences in this area, its role in steering a progressive agenda on the future of work, mobilising the forces of change and deploying cross-cutting instruments should not be underestimated. Both the current polarisation of the labour market and the decoupling of employment and social protection are likely to leave an indelible mark on European economies and societies. By meeting the challenges posed by the fourth industrial revolution, the EU would not only boost its economy, curb mounting divergences across European territories and people and preserve its core values of solidarity and equality. It would also act as a driving force for innovative and progressive changes, thus strengthening its normative power and influence at the global level and reinforcing citizens' trust in its ability to address their fears and anxieties.

ALIGNMENT OF TECHNOLOGICAL ADVANCES, WELFARE STATE REFORMS AND WORKING STRUCTURES



Introduction

European labour markets and society at large are going through profound transformations that are shaking the old foundations of European welfare states. These shifts are the outcome of a set of closely intertwined trends: globalisation and trade; the resulting fragmentation of the production chain; the disaggregation of tasks and the outsourcing of certain economic activities to other world regions; digitalisation and a rapid spread of new technologies; demographic ageing; as well as new societal aspirations and preferences, not least in regard to the purpose and meaning of work; workplace relationships and work-life balance.

This Issue Paper presents the main findings and policy recommendations of the European Policy Centre (EPC) research project entitled “The future of work – Towards a progressive agenda for all”. This research project started at the onset of 2018 when the public attention to the phenomena dubbed the ‘Uberisation’ of the economy was at its height and the concept of ‘future of work’ led to a multitude of studies attempting to describe, define and understand the different elements and aspects of it. Simultaneously, public authorities were under pressure to act and express their readiness to address the fears and concerns associated with the changing nature of work.

This EPC project, through its independent research as well as its numerous public debates and expert workshops, has contributed to an improved understanding of the complexity of ongoing labour market transformations and raised awareness on the resulting policy challenges.

The project’s objective was twofold. Firstly, it aimed to reverse the negative perception of the ‘future of work’ in the public debate through the identification of possible solutions. To this day, the notion still sparks anxiety and resistance and is often associated with job loss, increasing precarity, rising inequality and a polarised labour market. Secondly, it looked at labour market transformations comprehensively, thus avoiding the separation of closely interrelated issues and challenges that have large implications for the future of European societies.

Following this approach, “The future of work” project was structured around two pillars. It first analysed the impact of the so-called fourth industrial revolution on the overall structure of the labour market. It also adopted a sectoral approach by analysing its effects on specific industrial sectors: i.e. (health)care, media and publishing, transport and logistics, as well as security and defence. Priority was given to the human-related impact, namely the labour force working in these industries, by exploring how new technologies are transforming workers’ job prospects and working patterns.

The second pillar of the research was to analyse new forms of work, atypical workers’ access to social protection, and their implications for the future design

of the social protection system. Thus, linking the double effects of the fourth industrial revolution on the structure of the labour market and the emergence of new forms of work was a deliberate choice. In fact, both of them pose significant challenges to labour market institutions, the sustainability of our welfare states, the functioning of our societies and the ‘glue’ that is holding it together, often referred to as the social contract.

Extensive research has already been done on the fourth industrial revolution and the disruptive effects of its accompanying technologies on the labour market. The unfolding technological revolution builds on the outcomes of the foregoing third industrial revolution and its information and communication technologies (ICTs), with a new asset fuelling the unprecedented wave of innovation – data.

As precious metals and oil were once the engines of economy in the 19th and 20th centuries, digital data is propelling the present transformation and is probably the world’s most valuable resource today. Rooted in the widespread availability, storage and processing of data, the fourth industrial revolution is characterised by the emergence of new technologies that have the potential to bridge the digital, physical, and biological spheres and to steer the physical world through a virtual one created thanks to digitalisation. Thus, mastering data through digitalisation gives rise to new innovations such as the Internet of things (IoT),¹ artificial intelligence (AI)² and exponential increases in computing ability, enabling mankind to make major progress not only in human sciences (e.g. medicine, genomic research) but also in the optimisation of production tools, decision-making and services.

The changes triggered by this fourth industrial revolution are thought to be potentially unparalleled. Compared to the preceding third revolution and previous major industrial transformations, the present wave of innovation is evolving at an exponential pace, disrupting almost every industry and sector with both direct and indirect impacts on almost every aspect of today’s economic and societal life.

This Issue Paper is composed of five main chapters. The authors depict the impact of new technologies on the labour market and its workforce following both a general and sectoral-specific approach (Chapter 1) before examining its relation to new forms of work and their consequences as regards working conditions as well as the access to and coverage of social protection (Chapter 2). The numerous implications of such changes are discussed, with respect to the sustainability of European welfare states, our social contract and the new types of socioeconomic risks individuals might face (Chapter 3).

Subsequently, a number of policy responses that have been undertaken by various players over the last

years to address labour market transformations at the international, European and national levels are highlighted (Chapter 4). It also draws conclusions on what such a proliferation of initiatives and actors reveals regarding the welfare state's ability to address and adapt to such transformations. Finally, the authors focus on

possible solutions to align the functioning of the welfare state with the new world of work while discussing their implications for Europe's social contract and pointing out in which respective areas EU actions could become an enabler of a progressive agenda on the future of work. (Chapter 5).

Chapter 1: The impact of new technologies on jobs

The unfolding industrial revolution fuelled by data and digital technologies, together with changing demographics and an increasingly integrated world economy are the major forces at work currently shaping the labour market structure,³ and are undoubtedly having big effects on the way we live and work. This chapter concentrates on the impact of new technologies on the overall structure of the labour market, before taking a snapshot of four industrial sectors.

1.1 A CHANGING LABOUR MARKET STRUCTURE

Before taking into consideration the effects of new technologies on the labour market structure, it is useful to take a closer look at the developments of the last decade, when significant shifts occurred as a result of the 2008 financial and economic crisis. This analysis will provide a broader context in which technological advances operate today.

1.1.1 The scarring effect of the financial and economic crisis⁴

In the immediate aftermath of the 2008 crisis, the EU unemployment rate⁵ rose sharply from 9% in 2009 to 10.9% in 2013, with shocking figures in those countries affected the most (i.e. Greece, 27.5%; Spain, 26.1%; Portugal, 16.4%). European labour markets slowly started recovering from the prolonged recession following the 2008 crisis in late 2013. After reaching its post-crisis peak in 2013, unemployment started to decrease in most EU member states. Overall, in all EU countries (EU28), the unemployment rate fell from its 2013 peak of 10.9% to 6.8% in 2018. Despite this positive trend, unemployment remains high in a large number of EU countries. Three member states – Greece (19.3%), Spain (15.3%) and Italy (10.6%) – still had an unemployment level above 10% in 2018. A similar trend can be observed over the last decade with the youth unemployment rate, which after peaking in 2013 (23.7%) has decreased on average in the EU28. However, when taking a closer look at the disaggregated figures, it becomes clear that some countries have suffered more than others in this respect and experienced sharp increases in youth unemployment. Greece, Cyprus and Italy are the three member states where the 2018 youth unemployment rate still stands higher than what it was in 2009 (Greece, 39.9% against 25.7%; Cyprus, 20.2% against 13.8; Italy, 32.2% against 25.3%).⁶

In 2018, the EU28 employment rate for persons aged 15 to 64 was at 73.7%, reaching the highest average ever recorded in the last decade. Behind such a positive result, however, significant country variations remain, with the best performers (i.e. the Nordic countries, the Netherlands, Germany) reaching 77% and more, while other countries were still lagging with rates below 70% (i.e. Croatia at 66.3%, Romania at 67.8%, Greece at 68.2%, Belgium at 68.6%). Italy recorded the lowest rate among EU countries with 65.6%.

A ‘health check’ of the labour market also implies going beyond the question of the level of employment. In this respect, although the employment rate has now reached pre-crisis levels, the effects of the financial and economic crisis (combined with other major forces) on working patterns and contractual arrangements remain engraved in the labour market. These changes can be quantified by a dynamic increase of ‘atypical employment’ (see Infobox 1).

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From 2002 to 2018, the number of atypical workers grew by 23.4%.¹⁰ In 2015, these forms of work reached their peak with a share of 45.7% of the total employment in the EU28. They then started to decrease slowly (-2% of growth) and stood at 44.8% in 2018 (see Figure 1, page 10). When breaking down the change and looking in details at the three different categories of atypical employment, it appears that the increasing trend of atypical forms of work between 2002 and 2018 was mainly fuelled by part-time and temporary employment, which both experienced



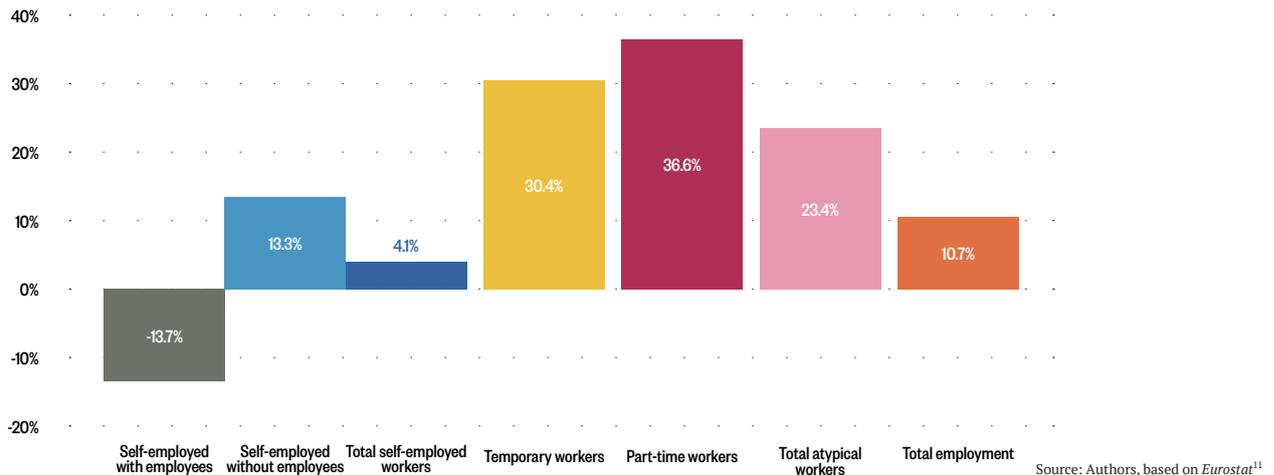
INFOBOX 1. What is atypical employment?

Atypical employment is defined by the European Observatory of Working Life (EurWORK) as “employment relationships that do not conform to the standard [...] model of full-time, regular, open-ended employment with a single employer over a long time span”.⁷ According to this definition, atypical employment includes part-time work, self-employment and temporary work. Self-employment, in turn, can be differentiated into two basic subcategories: self-employed workers without employees (i.e. own-account workers) and self-employed workers with employees.

It is also worth mentioning a particular category of atypical employment which comprises persons in the grey area between employment and self-employment, the so-called (economically) dependent self-employed. The International Labour Organization (ILO) defines dependent self-employed as those workers “who do not meet one or more of the following criteria: (1) they have more than one client; (2) they have the authority to hire staff, and/or (3) they have the authority to make important strategic decisions about how to run the business.”⁸ In its 2017 Labour Force Survey (LFS) ad hoc module on self-employment, Eurostat provided an operational definition of economically dependent self-employed “as the self-employed without employees who worked during the last 12 months for only one client or for a dominant client, and this client decided about their working hours.”⁹

Fig. 1

EMPLOYMENT GROWTH OF VARIOUS WORK ARRANGEMENTS (% , 2002-2018)



significant growth (i.e. +36.6% and +30.4% respectively). Similarly, the atypical work categories' share of the total employment increased substantially over the reference period (i.e. +23.3% and +17.8% respectively).

The increasing trend of atypical forms of work between 2002 and 2018 was mainly fuelled by part-time and temporary employment.

Meanwhile, the share of self-employment on the total labour force registered a 6% negative growth in the same reference period. Nonetheless, when studying the evolution of self-employment, the total number of self-employed workers has increased by 4.1% over the reference period. When breaking down this figure into the different categories of self-employment – namely, self-employed with employees and self-employed without employees (own-account workers) – it becomes clear that this rise was caused by the increase in the latter (+13.3%). In fact, over the same reference period, self-employment with employees fell by 13.7%.

As mentioned earlier, atypical employment reached its peak in 2015 after a prolonged period of economic recession. As unemployment increased in most European member states, active labour market policies pressured the unemployed to accept atypical forms of employment.¹² New forms of work were preferred due to their flexibility and ability to combat fluctuations in labour demand. This line of argumentation is also pursued by the European Trade Union Institute (ETUI),¹⁵ which demonstrated that in order to introduce greater flexibility and reduce unemployment, most national governments introduced reforms that downgraded labour law standards. As per example, in 2013, the Spanish government introduced so-called generational contracts which entailed a 100% cut in social security contribution for young entrepreneurs recruiting long-term jobseekers.¹⁴

1.1.2 The impact of new technologies on the labour market

Without any doubts, the fourth industrial revolution (see Infobox 2) – based on the deployment of digitalisation, the application of data to old and new technologies, and the combination of complex technological innovation – has the potential to create a significant number of disruptive changes going far beyond the product level. Instead, it is the entire process related to its production, how it is delivered to clients and how work and services are organised which are transforming. Our economies and societies are already witnessing some of



INFOBOX 2: The fourth industrial revolution

The fourth industrial revolution, firstly introduced in 2016 by Klaus Schwab, founder and executive chairman of the World Economic Forum (WEF), refers to a wave of innovation that is blurring the boundaries between the physical, digital and biological worlds.¹⁵ Based on different criteria, other researchers argue that this could even be considered the sixth revolution.¹⁶ Despite such academic disputes, the ongoing revolution will inevitably bring about changes and affect how people live and work.

It is worth listing some of the technologies which are shaping this process of innovation:

- ▶ *The cloud*: a global network of servers that is accessible to users over the Internet. Cloud storage refers to the large-scale storage of data in virtual locations, while cloud computing refers to the use of hardware infrastructures which may be remotely located.¹⁷
- ▶ *Big data*: enormous and diverse sets of digitised information created and collected at ever-increasing rates.
- ▶ *Mobile apps*: computer software applications designed to run on a mobile device (e.g. smartphones, tablets, watches).
- ▶ *Online platforms*: an umbrella term which describes a variety of services (e.g. marketplaces, social media, application stores). In its most basic form, an online platform is a virtual space which connects different parties, such as buyers and sellers.
- ▶ *IoT*: systems exchanging digitised data between objects (physical or virtual), which are connected to each other and the Internet.
- ▶ *AI*: the ability of a machine to perform tasks that normally requires human intelligence.

these transformations, but the magnitude of the changes is set to become even more large-scale when the level of maturity and scope of applicability of the technologies will be enhanced. This will further influence labour demand and supply, and the content of work; affect labour market relationships and institutions; and have an impact on social protection systems and ultimately on the job quality and wellbeing of workers. This thereby gives rise to a new techno-economic paradigm.¹⁸

Fears and concerns about new technologies' transformative potential are not new.

Fears and concerns about new technologies' transformative potential are not new. Already in 1931, economist John Maynard Keynes warned against the potentially disruptive effects that progress would have on employment in the short run. The discovery and application of new and innovative processes would inevitably lead to what he named 'technological unemployment', a temporary phase of disturbance in the labour markets which would affect workers negatively.¹⁹ The same fears and concerns characterise the debate over the future of work in a time when the speed, scope and impact of the fourth industrial revolution are predicted to be of an unprecedented scale.

It is difficult to assess whether job destruction and job creation, generated by technological advancements, will compensate one another. Surely, this wave of innovation will cause job displacement in the labour market that will alter its existing structure.

In recent years, a number of researchers have tried to assess the effects of the deployment of new technologies on the labour market, resulting in ambiguous outcomes. Frey and Osborne argued that up to 47% of existing jobs are at a high risk of being automated within the next two decades,²⁰ while a 2016 Organisation for Economic Co-operation and Development (OECD) study lessened such a negative prediction, indicating that between -6% and -12% of job loss could be expected.²¹ These wide discrepancies in outcomes are a result of differing research methodologies. While Frey and Osborne analysed the susceptibility of specific occupations to automation, the OECD study disaggregated occupations into tasks, thus analysing which tasks are more likely to be automated. It is also important to note that the study by Frey and Osborne refers to the US labour market, while the latter does a comparative analysis of 21 OECD

countries.²² Building on the two findings, a more recent OECD study – which also exploits the Survey of Adult Skills (PIAAC) to account for the variations in tasks – suggests that only 14% of existing jobs are at risk of complete automation.²³

While studies are pointing to the destructive effects of automation on jobs, it is also worth noting that others stress the potential of innovation when creating new jobs. Vermeulen *et al.*, for example, found that there is substantial job creation in sectors such as engineering, software and scientific services, as well as in sectors considered complementary like education, legal work and consulting services related to new technologies.²⁴ It is difficult to assess whether job destruction and job creation, generated by technological advancements, will compensate one another. Surely, this wave of innovation will cause job displacement in the labour market that will alter its existing structure.

New technologies influence how labour demand and supply meet and contribute to the diversification of work arrangements and organisational patterns.

In this context, it is also important to mention the relationship between new technologies and skills. It has been argued that "[t]echnology is not skill-neutral",²⁵ as it tends to favour certain skills while making others redundant, thus more likely substitutable. Researchers have also looked into individual tasks and how these could be better performed (i.e. by workers applying their skills, or machines). Based on these studies, findings show that demand for middle skilled jobs typically entailing routine tasks has decreased over the past decades while high and low skilled occupations have seen a simultaneous rise.²⁶ The eroding pattern of the middle, in terms of occupations and skills, also translates into an increasing polarisation of the labour market. In an attempt to document job polarisation in European countries, Goos, Manning and Salomons found that the polarisation caused by technological progress and digitalisation has affected middle-level workers the most (e.g. office clerks, metal and machinery-related work, machine operators and assemblers).²⁷

New technologies also influence how labour demand and supply meet and contribute to the diversification of work arrangements and organisational patterns (see Infobox 3). This is especially true of the recent surge of platform work, defined as "a form of employment that uses an online platform to enable organisations or individuals to access other organisations or individuals to solve problems or to provide services in exchange for payment."²⁹

Platform work transforms traditional employment relationships and the organisation of work as it introduces a new way of coordinating economic activity, namely



INFOBOX 3. New forms of employment

A research project conducted by the European Foundation for the Improvement of Living and Working Conditions (Eurofound) in 2015 identified nine (quasi-)new forms of employment.²⁸

- ▶ *employee sharing*: a group of employers jointly hires an individual worker;
- ▶ *job sharing*: an employer hires two or more workers to jointly perform a specific job;
- ▶ *interim management*: highly skilled experts temporarily hired for a specific project;
- ▶ *casual work*: a contractual arrangement allowing an employer to call employees on-demand;
- ▶ *ICT-based mobile work*: thanks to mobile technologies, workers perform from any place at any time without having to use the employers' premises;
- ▶ *voucher-based work*: an employment relationship based on a voucher-based model, in which the payment for services is done via a voucher that covers both pay and social security contributions;
- ▶ *portfolio work*: a self-employed worker provides services to a large number of clients, mostly carrying out small jobs for each of them;
- ▶ *crowd employment (i.e. platform work)*: labour broken down into small tasks and divided among different workers and services provided on-demand as a result of online platforms matching employers/clients to workers;
- ▶ *collaborative employment*: self-employed people or micro-enterprises establishing forms of cooperation (e.g. coworking spaces) to overcome limitations of size and prevent professional isolation.

These nine categories were established in 2015 and could continue to evolve depending on a number of factors, including technological development.

through digital platforms, which are defined as “digital networks that coordinate labour service transactions in an algorithmic way.”³⁰ According to recent literature, platform work can take multiple forms,³¹ such as on-location platform-determined work (e.g. Uber drivers), on-location worker-initiated labour (e.g. ListMinut users),³² or online contest work (e.g. 99designs).³³

Measuring the evolution of these new forms of work proves to be a difficult task due to the data restrictions of platform companies and the lack of agreement on an appropriate estimation methodology. However, the Collaborative Economy and Employment (COLLEEM) project survey conducted by the Joint Research Centre (JRC) of the European Commission in 2017 aims to solve these issues. According to the survey, around 9.7% of workers provided some form of labour service through digital platforms, while a more recent JRC study suggests that the number of workers who engaged in platform work has increased, from 9.7% in 2017 to 11% in 2018.³⁴ However, when studying the number of workers for whom platform work provided more than 50% of their income, they only account for about 2% of the adult population across the EU.³⁵

1.1.3 Europe's place in the global innovation race

When analysing the impact of new technologies on the labour market, it is also important to look at innovation leadership, given its key implications for competitiveness and job creation. It has become clear that in recent years

the EU has been losing ground at the global level with respect to technological advances and the adoption of digitally-driven business models. The US, East Asia and India outperform Europe when it comes to bringing new innovative products to the market and integrating advanced digital technologies into their business development. For instance, in 2016, Europe was only home to 6% of the world's 60 most valuable online platforms, while the US was home to 64% of them and Asian countries 31%.³⁶ The EU does not fare better in terms of the number of start-up companies that are valued over 1 billion dollars, or so-called unicorns. Disparities between the EU, the US and China remain stark here as well. In fact, in 2017, Europe only had 33 of these ‘unicorns’ while China could boast to have 83, and the US a staggering 151.³⁷

This gap can be partially explained by the growing divergence in terms of research and development (R&D) spending. From 2009 to 2017, investment in R&D, expressed as millions of euros, grew by 43% in EU28 countries, compared to 74% in the US and 302% in China. While Europe remains the number two investor in R&D in absolute terms, recent trends confirm the lost ground.³⁸ Furthermore, it is important to keep in mind the high geographic variation within Europe, where countries such as Sweden, Denmark and the Netherlands have innovative business sectors and countries like Romania and Bulgaria are lagging behind.³⁹

EU industry performance in attracting digital talents also faces hurdles. In 2018, 53% of companies had difficulties in filling vacancies for ICT specialists⁴⁰ and evidence shows that talents in AI, for instance, are concentrated in other regions of the world, not least the US and Asia. In that specific domain, we know that AI has not diffused yet across all industries and AI specialists are unevenly distributed across countries and industries. This unequal distribution will potentially become a new source of economic divergences in the near future.⁴¹

In-work skilling and upskilling are also points of concern, in particular when considering digital skills. Eurostat data indicates that older workers are those who most need digital training, with only 16% of them having above basic digital skills, compared to 57% of 16 to 24 years old. At the same time, a Zurich Insurance study⁴² points to the greater reluctance of older workers to undertake voluntary skills training. This highlights the difficulty of providing training and upskilling for those who need it most. Furthermore, when looking at fields such as AI, comparative studies⁴³ indicate that it is far more difficult to become an AI specialist after entering the labour market in the EU than in the US. This is mainly because the US labour market offers plenty of on-the-job training opportunities and online courses that are far more developed than in Europe, and does not deter its people from studying something completely different from their original field of study.

To conclude, European labour markets have been experiencing a slow recovery from the prolonged recession that followed the 2008 crisis, and despite such positive trend, several EU countries still suffer from high unemployment rates. While forms of atypical employment already existed before the crisis and the massive surge in the deployment of

digital technologies of recent years, they found the perfect ground to strive in relatively more deregulated labour markets, reaching a peak in 2015. Advances in technological innovation also influenced how labour demand and supply meet, thus contributing to the emergence of new forms of work and organisational patterns. The effects of the fourth industrial revolution and the signs of a new techno-economic paradigm are already visible, impacting how and when people work and the skills required for tomorrow's jobs. Rather than job loss, there is evidence of the effects of technologies on job displacement, resulting in a greater polarisation of the labour market. At the same time, in an age of globalisation and intense competition with the rest of the world, the old continent's chances to compete with other regions of the world will depend on its ability to keep up in the worldwide innovation race. The new techno-economic paradigm does therefore pose the question of how Europe can embrace new technologies and digitally-driven business models without undermining its attachment to core values like equality and solidarity. Before discussing this aspect (see Chapter 5), it is worth looking at whether ongoing transformations are impacting industrial sectors to the same extent.

1.2 A SECTORAL FOCUS – SNAPSHOTS OF INDUSTRIAL SECTORS

Moving beyond the general analysis of ongoing labour market transformations and their impact on the labour market structure, the following section takes a closer look at four industrial sectors: (health)care, media and publishing, transport and logistics, as well as security and defence. Although digitalisation has and will continue to exert cross-cutting effects on the overall economy, the impact on workers will vary depending on numerous factors, including the current structure of their respective sector and the nature of the work they perform. Adopting a sectoral approach is imperative to go beyond general considerations and ensure that policy measures are tailored to the specificities of each industry.

1.2.1 The (health)care sector⁴⁴

The healthcare and care workforce represents a significant segment of the European workforce. According to LFS data, in 2018, 224.4 million people were employed in the EU28 while some 24.6 million people were employed in human health and social work activities,⁴⁵ accounting for 11% of total employment in the EU28 (see Figure 2).

Employment in the healthcare and social care sector of the EU28 is on average increasing at a steady pace. In fact, this growing trend was not affected by the 2008 economic recession.

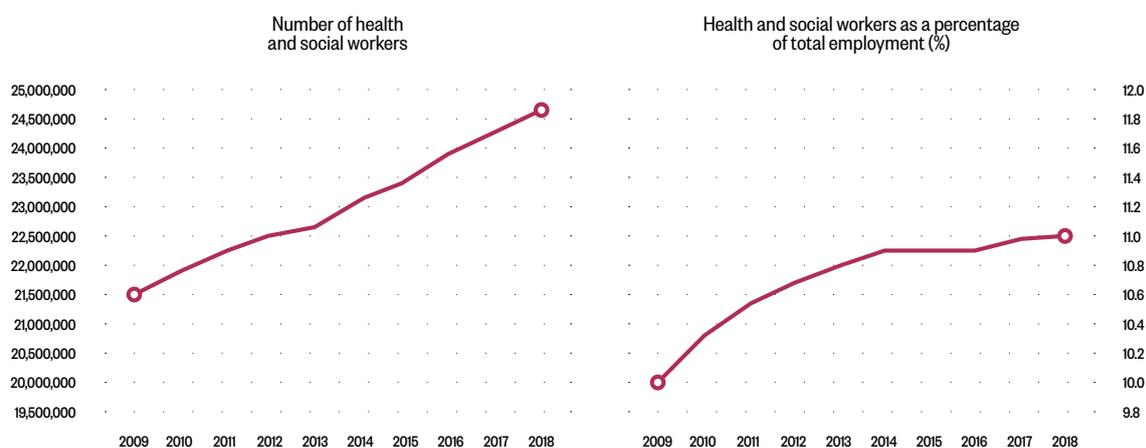
Employment in the healthcare and social care sector of the EU28 is on average increasing at a steady pace. In fact, this growing trend was not affected by the 2008 economic recession. Between 2009 and 2013, employment increased while total employment declined on average. Almost 4 million Europeans lost their jobs between 2009 and 2013, while the health and social care sector experienced an increase of around one million over that same period (see Figure 2).

Over the last decade (2009-2018), the health and social care workforce constantly increased in absolute terms, rising from 21.5 million people in 2009 to some 24.6 million people in 2018 (+14.4%). Its share in the total employment grew by almost 1 percentage point too, going from 10% in 2009 to 11% in 2018 (see Figure 2, page 13).

Interestingly, the health workforce is predominantly female. In 2018, more than 19 million out of 24.6 million employees in the health and social care industry were women (i.e. 78.7% of the total health workforce). By

Fig. 2

NUMBER OF WORKERS IN THE HEALTH AND SOCIAL CARE SECTOR AND THEIR SHARE OF TOTAL EMPLOYMENT (2009-2018)



Source: Authors, based on Eurostat⁴⁶

contrast, the share of female employment in the total economy was only 46.2%.

In 2018, over half of the care workforce was engaged in an atypical form of employment, whereas such non-standard work arrangements accounted for 44.8% of the total economy.

When considering contractual arrangements, it is worth noting that in 2018, over half of the care workforce was engaged in an atypical form of employment (54.3%), whereas such non-standard work arrangements accounted for 44.8% of the total economy. As regards the distribution of different forms of non-standard work within the care workforce in comparison to other sectors, it is worth noting several trends and divergences. Part-time employment is more widespread in the care sector (33.4% compared to 19.2% in the overall economy in 2018), and its share has experienced an increase over the last decade (+5.5%). This is in line with the increasing trend of part-time employment in the total economy (+6.6%). In 2018, the share of temporary employees remained static (12.1% in the total economy and 12.8% in the care sector), while self-employed people are less represented in the care sector (8.1% compared to 13.5% in the total economy). Interestingly, the changing patterns of self-employment and temporary employment in the care sector in the last decade are diverging from the general trend of the total economy, with self-employment experiencing a 3.3% growth (-6.1% in the total economy) and temporary employment decreasing by 0.4% over the decade (+6.1% in the total economy).⁴⁷

When looking at the growth dynamics of employment by professional status in the health and social care

sector over the last decade, we notice an increase in all categories of non-standard work (+20.6% for part-time workers, +13.9% for temporary workers, +18.1% for self-employed workers). Similarly to the patterns observed in the total economy, the growth of the self-employed workforce is to be attributed to increased numbers of self-employed workers without employees (+31.9%), while self-employed workers with employees decreased by 6% over the reference period (see Figure 3).

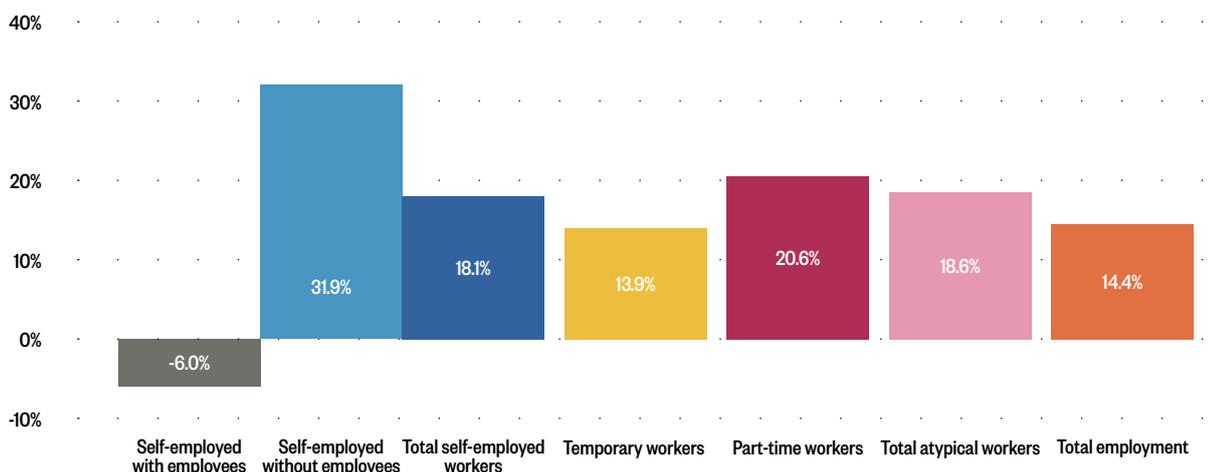
In terms of educational attainment, in 2018, the vast majority of health and social workers had medium or high education backgrounds.

In terms of educational attainment, in 2018, the vast majority of health and social workers had medium or high education backgrounds, with 44.3% having completed upper secondary and post-secondary education, and 44.8% having attained tertiary education. In 2018, only 10.9% of workers in the sector had primary and lower secondary education. From 2009 to 2018, we observe a noticeable divergence in the low and high education categories, with a 31.6% drop in the number of low skilled workers and a 13.6% increase in the number of high skilled workers. The figure of middle skilled workers remained stable over the decade, experiencing a minimal decline on 0.7%. If compared to figures in total economy, the educational attainment of workers in the health and social sector is higher than that of the average European worker (in 2018, 44.8% of health and social workers had a tertiary degree compared to only 35.1% of EU workers).⁴⁹

Lastly, the age structure of the workforce also deserves some attention, as it raises concerns about future shortages of health and social care professionals and the replacement

Fig. 3

EMPLOYMENT GROWTH IN THE HEALTH AND SOCIAL CARE SECTOR BY WORK ARRANGEMENT (% , 2009-2018)



Source: Authors, based on Eurostat⁴⁸

of the workforce. On average, the professionals of this sector are older than the total workforce. In 2018, workers aged 50 years or older accounted for more than 37% of the health and social care workforce, as opposed to 33.4% in the total economy. In other words, more than one in three workers will retire from the labour market over the next 15 years.⁵⁰ In addition, the snapshot of new graduates in medical and nursing disciplines varies across countries. The available data shows that between 2006 and 2016, the majority of EU countries experienced an increase in the number of new medical doctors, with Latvia, Slovenia and Ireland reporting the biggest growth per 100,000 inhabitants. On the opposite end of the spectrum, Austria and Greece reported a decrease, with less new graduates in 2016 than in 2006.

The age structure of the workforce also deserves some attention, as it raises concerns about future shortages of health and social care professionals and the replacement of the workforce.

The picture becomes more concerning when considering nursing professionals. The available data suggests that the number of new graduates increased in some member states (e.g. Croatia, Hungary, Malta), which also experienced very high growth rates overall between 2008 and 2016. By contrast, many EU countries faced decreasing rates for new graduates in nursing professions (e.g. Portugal, Romania, Lithuania) which also experienced negative growth rates in the same period (i.e. -29.2%, -50.9%, -21% respectively).⁵¹ Shortages of health professionals might also become exacerbated in the coming years as demographic ageing will increase the care needs of the European population. Against this background, there are growing concerns surrounding the workload of care professionals and the consequential pressure if the workforce is not replaced appropriately.

The digitalisation of the healthcare sector

Healthcare system digitalisation is a long and complex process which has, nevertheless, already started showing its concrete applications and the tremendous potential it holds for in the near future.

Health professionals are among those who are most likely to have experienced technological developments in their workplaces.⁵² By 2013, basic forms of electronic health record (EHR)⁵³ systems were available to an average of over 90% of general practitioners across EU countries, and 75% of acute care hospitals in Europe reported having some form of EHRs, despite significant country variations.⁵⁴

Health professionals are among those who are most likely to have

experienced technological developments in their workplaces.

Advanced functionalities are not yet widespread across European hospitals, but when available, they are quite popular and regularly used by health professionals in their clinical care routines. This is the case, for example, for the digital archiving of radiology images, which is only available in 53% of European hospitals but used fully in almost all of them (92%). Moreover, the electronic sharing of medical information between hospitals and external general practitioners and specialists is already occurring within the majority of hospital settings in Estonia, Denmark, Belgium and Austria.⁵⁵

Electronic prescribing (e-prescribing) is also increasingly developing. Most countries are transitioning from paper- to computer-based electronic generation and transmission of medical prescriptions. In 2018, over 90% of prescriptions were electronically transferred from prescribers to community pharmacies in Finland, Estonia, Sweden, Denmark, Portugal and Spain, while countries that have not yet implemented e-prescriptions systems (e.g. France, Germany, Ireland, Poland) all committed to starting this transition over the next few years.⁵⁶

Digital innovation in health is not confined to the generation of EHRs and prescriptions. Despite lower adoption levels, more advanced telemedicine functionalities, such as the remote domestic monitoring of patients homes and remote consultations with patients or other health practitioners, are also being implemented.

Furthermore, advanced technologies such as AI, IoT and big data analytics are expanding to the healthcare sector, bringing about opportunities to advance clinical practice, boost medical research and improve system management. For instance, the IoT enables smartphones, wearable technology and medical equipment to connect to the Internet and generate, exchange and analyse health-related information. AI and machine learning methods are increasingly applied in prognosis and outcome prediction. Surgical robots and precision medicine represent other examples of how technology can be applied to healthcare.

The impact of digitalisation on the healthcare workforce

The care sector is set to be among the industries less affected by the risk of job loss caused by automation. When analysing the susceptibility of jobs to computerisation – referred to as “job automation by means of computer-controlled equipment”⁵⁷ – it would seem that most occupations in care are less likely to be affected by job automation soon. This is the case for physicians and surgeons, nurses, social workers and other related jobs. The reason behind this prediction is that these occupations are intensive in generalist tasks that require social intelligence (e.g. assisting and caring for others, social perceptiveness), which are expected to be difficult to be substituted by computer capital over the next decade or two.⁵⁸

When analysing the susceptibility of jobs to computerisation – referred to as “job automation by means of computer-controlled equipment” – it would seem that most occupations in care are less likely to be affected by job automation soon.

Conversely, workers employed in health occupations are more likely to experience changing skills profiles. As already highlighted earlier, healthcare professionals are among the top occupational groups which experienced changes to the technologies being used in the workplace (e.g. machinery, ICT systems), and their skill sets are expected to become outdated in the near future.⁵⁹ For instance, the deployment of eHealth care technologies in homecare (e.g. remote telecare and ambient assisted living [AAL]) requires professionals to develop a set of composite skills and technology-specific competencies (e.g. basic skills to use new technology; specific skills to use the eHealth tool; the ability to interpret, analyse and communicate eHealth data).⁶⁰ Moreover, the 2018 European Centre for the Development of Vocational Training (Cedefop) survey on European skills and jobs finds that graduates from medicine- and health-related disciplines report the highest initial under-skilling rates in recruitment among different fields of study: over 25% of graduates in this field report initial under-skilling, while graduates in disciplines such as mathematics and statistics or economics and business report lower rates at under or around 20%.⁶¹

In addition to the transformative impact on specific tasks and the required skills as analysed above, new technologies also affect how health services are delivered. The implementation of technologically-enhanced health services would require adjustments in the organisation of healthcare delivery, thus having certain implications on the labour force and its working patterns. Research indicates that there are areas in which digital health services would optimise human resources and profit from efficiency gains (e.g. teleconsultation), therefore reducing the demand for more professionals. There are other areas (e.g. remote monitoring, AAL technologies, robotic surgery) which have the potential of enlarging the market by creating new health services and reaching to more patients, and therefore demand more workers or even create new professional roles.⁶² Moreover, new delivery models permitted by the deployment of new technologies in health would require professionals to adjust their working patterns. The development of digitally-enabled integrated care systems, for example, would require the engagement of multidisciplinary teams of health professionals. Also, the enhanced coproduction of healthcare – facilitated by a flurry of apps and personal mobile devices which enable citizens and patients to take on a more active role in managing their own health – would require adjustments to the daily work life of health professionals.

Lastly, it is important to reflect on some of the ethical implications of technological advances and digital

solutions in the healthcare sector. When considering the potential for an automated healthcare decision-making process, AI-driven developments in genome sequencing and gene-editing technologies, or the use of robots in care settings, a number of ethical and social concerns that require careful consideration arise. The use of AI and digital technologies poses issues of dehumanised care and decreased human contact, which could result in the isolation of the patient. Moreover, there is a potential lack of accountability for medical decisions if it is taken through an automated decision-making process which would translate into difficulties when seeking redress if harm occurs. These are some examples of specific concerns regarding the use of new technologies in the healthcare sector which might also have an impact on how health professionals, patients and citizens at large react to the digital transformation of the sector.

Healthcare professionals are among the top occupational groups which experienced changes to the technologies being used in the workplace, and their skill sets are expected to become outdated in the near future.

The digital transformation of care is unfolding at a steady pace, bearing the potential for enormous changes in the not-so-distant future. Such changes are already impacting the health workforce and pushing healthcare systems to adjust to the transformation. As seen above, the health and social care workforce is characterised by a high share of elderly employment, a prevalence of atypical forms of work and great exposure to changing skills profiles. Moreover, new healthcare graduates report the highest initial under-skilling rates at hiring and there are growing concerns related to shortages of health professionals, especially in comparison to the inevitable increase of care needs of the European population. These special characteristics will play a central role in how the workforce will be impacted by new technologies applied in the sector. An old workforce lacking digital skills might complicate the transformative process, for example. New graduates who are under-skilled when entering the labour market and in need of further in-work training might experience heavy workloads and pressures due to further adjustments to digital environments. The very high share of health workers engaged in atypical forms of employment also raises concerns in terms of access of these workers to training and adequate social protection.

The digital transformation of care is unfolding at a steady pace, bearing the potential for enormous changes in the not-so-distant future.

1.2.2 The media and publishing sector

Although the media and publishing workforce represents a small share of the European labour market, this sector is at the forefront of technological disruption. The early embrace of technologies and the adaptability of its business model reveal a tech-savvy industry which employs one of the most digitalised workforces.⁶³

The sector is best characterised as an amalgam of sub-sectors. It encompasses the production, publication and distribution of television, newspapers, magazines, books, film, radio, music as well as other forms of audio-visual content.⁶⁴ In the EU, more than 2 million people work in the industry, amounting to around 1% of the European workforce (see Figure 4).

Between 2009 and 2013, the media and publishing sector registered a significant decline of around 100,000 jobs, indicating the sharp effects of the economic recession on the industry. However, the sector expanded again from 2013 onwards to finally outgrow the 2009 number. As a percentage of the total workforce, the employment level has remained relatively stable around the 0.9% mark. However, when looking at specific sub-sectors, the illusion of stability fades away. For publishing activities, the number of workers remains under 2009 levels with a 14,800 decline. The same trend can be observed in programming and broadcasting activities, where there are 19,000 fewer employees compared to 2009. The only sector that registered growth is the video, motion picture and music production subsectors (see Figure 4).

The educational attainment of this sector is higher than that of the average European worker. In 2018, 62% of media and information workers had a tertiary degree compared to only 35.1% of all EU workers. In terms of gender differences, a significant disparity is visible. In 2017, 59.7% of all media professionals were men. More worryingly, from 2009 to 2018, a noticeable divergence is apparent, with a 2.5% drop in the number of women.

Lastly, the age structure of the workforce deserves some attention. Media workers are generally younger than the overall labour force, with a share of 15- to 39-year-olds representing 47.7% compared to 41.8% of the general workplace. However, it is worth noting that this difference might be readjusted in the future as the media labour force appears to be ageing faster. The percentage of the mentioned age group amounted to 55.2% in the media sector in 2009, compared to 46.4% in the total economy.

As regards atypical employment, the available Eurostat data does not provide reliable aggregates for the media and publishing industry. Thus, the evolution of atypical employment cannot be reliably measured for this sector. However, through the limited data available, it can be inferred that media workers have higher percentages of atypical contracts. In this respect, the audio-visual sector is a case in point. In 2010, self-employment accounted for 21.4% of total employment compared with 16.1% of total EU27 employment.⁶⁵ In 2012, 21% were working temporarily, compared to 12% of employees in all economic sectors.⁶⁶ Moreover, when studying the cultural employment – a broader category which includes arts and entertainment activities – it becomes apparent that self-employment among workers with a tertiary degree is much higher. In 2017, more than 55% of the highly-educated cultural workforce was self-employed.

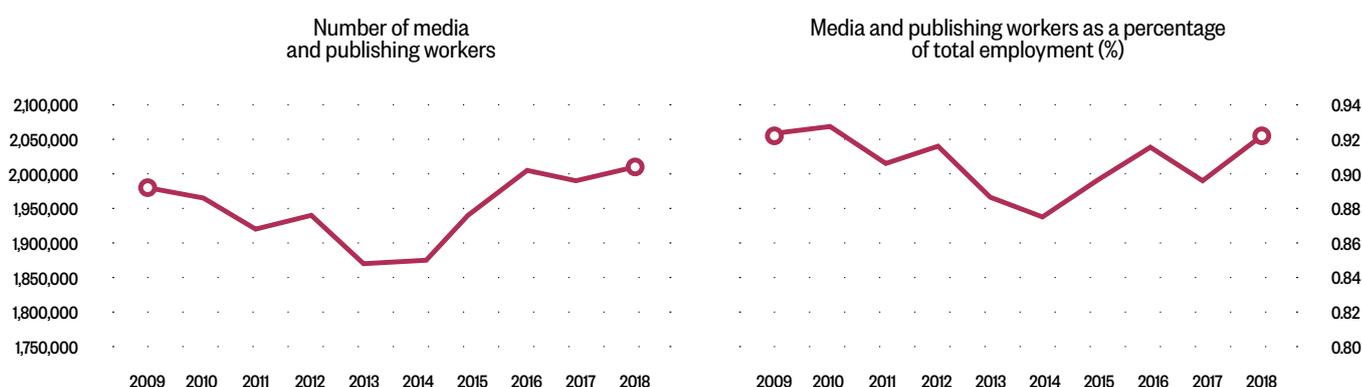
The digitalisation of the media sector

In recent history, technology and digitalisation have had important implications for the media and publishing sector. These developments influenced distribution channels and business model preferences and thereby resulted in new emerging challenges for the sector and its workforce.

The consumption of media patterns has changed significantly in recent years. According to Statista, the EU average daily media consumption time in 2017 reached a peak of 10 hours and 29 minutes, a 73-minute increase compared to 2012.⁶⁸ However, by studying the media

Fig. 4

NUMBER OF WORKERS IN THE MEDIA AND PUBLISHING SECTOR AND THEIR SHARE OF TOTAL EMPLOYMENT (2009-2018)



Source: Authors, based on Eurostat⁶⁷

source preferences closely, it becomes clear that not all channels of consumption enjoyed the same amount of growth. Taking the same timeframe as a reference, the use of the Internet and social media registered a respective 13% and 40% growth in usage. This came at the expense of more traditional sources (e.g. radio, written press). One exception is broadcasting: although it registered a small decrease, it is still the principal source of consumption, with 94% of EU citizens consuming it.⁶⁹

The digitalisation of media and the subsequent shift in consumer preferences casts a wide net of issues for the media and publishing sector, one of which is the decline of traditional media and its consequences for business models.

The digitalisation of media and the subsequent shift in consumer preferences casts a wide net of issues for the media and publishing sector, one of which is the decline of traditional media and its consequences for business models. Taking newspapers as an example, various economic performance indicators reveal declining revenues. Between 2009 and 2017, the percentage of household expenditure spent on newspapers and books registered a -8.3% decline.⁷⁰ Furthermore, when studying chain-linked volumes, defined as production volume of newspapers and books expressed in the prices of the preceding year, a drop of -11% for the same reference period is visible. In parallel, the digitalisation of news, coupled with the vast outreach of online platforms, enabled data-driven companies to attract more advertising revenue.⁷¹

This snapshot reveals that the media industry is affected by advances in technologies, digitalisation and globalisation in various ways. Some media formats thrive while others are being forced to downsize and rethink their business model. Regarding both employment levels and media consumption preferences, the publishing sub-sector faces the most radical structural changes, followed by the programming and broadcasting subsector. By contrast, the video, motion picture and music production subsectors are thriving.

The impact of digitalisation on the media and publishing workforce

The rapid and all-encompassing digitalisation of the media and publishing sector has had deep ramifications on the job market, the type of work performed and the profile of the media and publishing worker. In addition to the two main sectoral characteristics already highlighted earlier (i.e. a significant reduction in the number of workers in some sub-sectors of the media industry and increase in the employment of atypical workers), digital technologies have induced an increased demand for flexibility and a wider range of skills across all sub-sectors of the industry.⁷²

Due to the emergence of various media technologies (e.g. user-friendly video cameras and editing software), the demarcation lines between publishing, printing, broadcasting and entertainment have blurred in the process of multimedia convergence.⁷³ These technologies allowed businesses to reduce employment levels by combining tasks previously performed by a multitude of employees and assigning them to a single worker. This has resulted, however, in the work-life balance of media workers (barring those in the broadcasting subsector) to suffer. From 2008 to 2016, the average yearly working hours (expressed as average full-time equivalents) increased by 7 hours for workers in the publishing subsector and 14 hours for video and audio production workers. Digitalisation and the use of big data analytics to discover consumer preferences and behaviour has resulted in a competitive industry bent on delivering fast and unique news and content.⁷⁴ The pressure to accelerate content production may accentuate the trend of longer working hours for media workers.

In addition, media workers experience an increasing pressure of up- and reskilling. Traditional skills such as critical thinking and writing skills are still important and will dominate future developments in the industry. However, due to digitalisation and the previously mentioned multimedia convergence, modern media workers perform a wider set of tasks, and practical technological skills (e.g. video and audio editing) are becoming imperative.

Technological innovation is also shaping the future skillset of the media sector. AI is revolutionising how content is being generated, first by changing the way research is being conducted, with big data analytics and machine learning informing businesses and creators about consumer desires ; and second, in terms of content production. Many established news organisations such as *Forbes*, *The Washington Post*, and *Bloomberg* now use AI to generate at least some of their content.⁷⁵ As per example, Heliograf, *The Washington Post's* AI machine, is used to generate news articles about high school American football games automatically. According to their director of strategic initiatives, the print could only cover a handful of games before the arrival of the machine, while now they are able to cover its entirety.⁷⁶ This development means that routine tasks will become automated and that the media workforce will have to concentrate on highly-skilled tasks (e.g. creative writing).

Moreover, the demand for project management skills is rising due to a more international and diverse media landscape. Management skills are needed to cope with increasingly tight deadlines and coordinate work on multiple widespread and multicultural platforms. However, time pressures and reduced editorial resources that accompany the digitalisation of media prompt many academics to anticipate a deskilling in fact-checking, lateral reading⁷⁷ and independent research.⁷⁸

Despite limited data on atypical workers in the industry, studies point to significant challenges as regards the access to upskilling opportunities. For instance, businesses do

not feel incentivised to provide training for journalists who often work under a freelance status and for multiple companies. Thus, the pressure to upskill and remain competitive in the global economy falls predominantly on the shoulders of individual workers.⁷⁹ There are, however, good practices of some media companies providing training to journalists, especially in France and the UK,⁸⁰ and cases in which trade unions and public initiatives are taking over the role of businesses in upskilling the media workforce. In the Netherlands,⁸¹ for instance, public broadcasting organisations are organising courses for self-employed and freelance workers at their own costs; while in Italy, unions negotiated company-based agreements, which included training.

The media and publishing sector is one of the industries where globalisation, digitalisation and advanced technologies have revolutionised consumer practices and businesses, thus forcing them to change their financial models and find new ways to generate revenue.

As seen above, the media and publishing sector is one of the industries where globalisation, digitalisation and advanced technologies have revolutionised consumer practices and businesses, thus forcing them to change their financial models and find new ways to generate revenue. The workforce is dominated by young, educated workers whose capacity to adapt to these technologies is likely to be stronger than the average worker. In the same vein, there is some evidence that points to higher shares of atypical work arrangements (in particular self-employment) compared to other industries. This confirms the hypothesis that this workforce has a high degree of flexibility. The changes induced by new technologies in the media and publishing sector are set to continue changing the job content of its workforce, including raising a number of challenges. Although technology has

the potential to reduce routine tasks and increase creative work, fast-paced media delivery may accentuate the need for extremely rapid reactivity and longer working hours, thus having repercussions on the workforce's stress level. In addition, while multimedia convergence is increasing the need for upskilling, training opportunities remain limited for atypical workers.

1.2.3 The transport and logistics sector

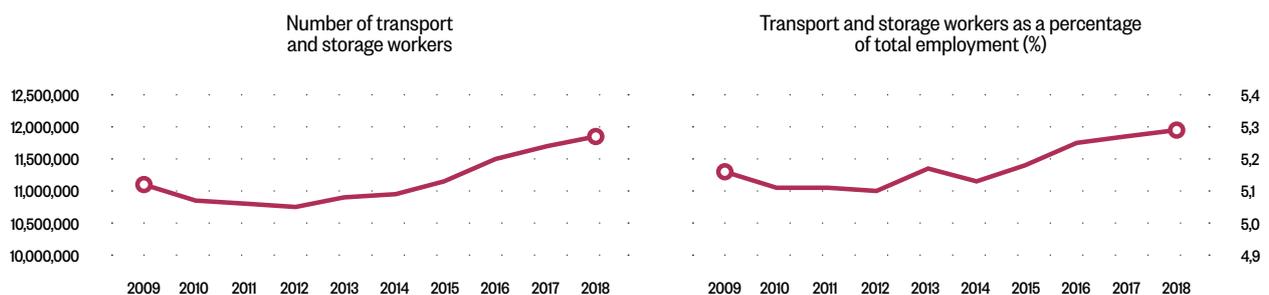
Transport and logistics are crucial parts of the European economy with significant externalities in other sectors. In addition to its strategic importance for the overall economy in general and the EU internal market in particular,⁸² this sector is home to a significant share of the labour force. Almost 12 million people are working in the sector, accounting for 5.3% of all EU workers.⁸³ The sheer size of the labour force, combined with the low educational attainment of its worker, highlight the importance of transport and logistics as a central sector for analysing the impact of technological innovation on the future of work (see Figure 5).

Taking a long-term view of transport and logistics employment, it is clear that the number of workers has expanded in the past decade by exceeding the 2009 level with around 790,000 workers. On the other hand, the growth level of employment as a percentage of total employment has remained modest.

As regards to the geographical distribution of the workforce, a considerable gap between Eastern and Western Europe is worth noting. In countries such as Estonia, Croatia, Hungary and Lithuania, the proportion of transport and logistics workers out of total workers exceeded 6.5% in 2018 (and even reached 8.9% in Latvia). By contrast, Western and Southern European countries register lower proportions of workers, with only 4.4% in Portugal and 3.8% in Luxembourg. From 2009 to 2018, the level of employment has mainly risen in countries where the sector was already important. For instance, in the case of Lithuania, the sector grew by 11.8%. In comparison, Western European countries have registered negative trends, with Luxembourg having the highest negative growth (-18.3%).

Fig. 5

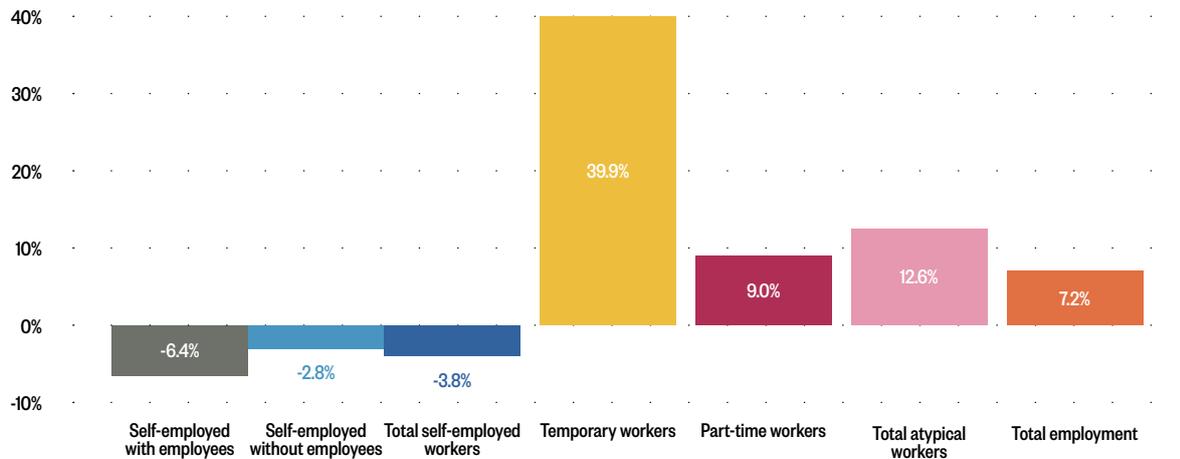
NUMBER OF WORKERS IN THE TRANSPORTATION AND STORAGE SECTOR AND THEIR SHARE OF TOTAL EMPLOYMENT (2009-2018)



Source: Authors, based on Eurostat⁸⁴

Fig. 6

EMPLOYMENT GROWTH IN THE TRANSPORT AND LOGISTICS SECTOR BY WORK ARRANGEMENT (% , 2009-2018)



Source: Authors, based on Eurostat⁸⁵

Concerning atypical work, the sector is below the European average, with only 31.1% of its workforce falling under non-standard contracts. In the same vein, the levels of both temporary and self-employed workers in 2018 were below their share in overall workforce (i.e. 10.6% and 9.9% respectively compared to 12.1% and 13.5%). The size of these two categories has evolved differently over time. While the absolute number of temporary workers has seen a sharp increase between 2009 and 2018 (+39.9%), the number of self-employed workers decreased (-3.8%). In the case of part-time workers, employment levels are almost twice as low as in the general economy (10.6% in comparison to 19.2%), though it did grow by 9% within the same referential timeframe (see Figure 6).

Another major development in the transport and logistics industry with implications for its workforce is the emergence of platform work, which is particularly present in the transportation of persons and goods. Although there are no official numbers of platform workers within the sector, other indicators (e.g. vehicle numbers) can illustrate the growth of the phenomenon. From 2006 to 2014, the number of shared personal vehicles operating on platforms (e.g. Uber, Lyft) in Europe expanded more than sevenfold, from 7,491 to 57,947.⁸⁶ More recent data suggests that their numbers further increased and that in 2018, the number of personal vehicles reached 370,000.⁸⁷ It is important to acknowledge that the growing number of vehicles does not correlate with an equal growth in the size of the transport and logistics workforce. Most platform workers provide services on a casual basis, while maintaining other full- or part-time jobs, and not necessarily in the same sector.⁸⁸

In terms of educational background, in 2018, the majority of transport and logistics workers had completed secondary or post-secondary education (59.2%). Meanwhile, 22.5% had a low educational background, with only 18.3% holding a tertiary degree. This data illustrates the prevalence of middle skilled workers in the sector.

Concerning the gender makeup, we observe a considerable disparity with 77.9% of the workforce in 2018 being men. This gap has increased (+0.4%) over the last decade. Lastly, the age structure shows that transport and logistics workers are on average older than the rest of the labour force. In 2018, the proportion of workers over the age of 50 represented 36% for transport and logistics workers and only 33% of workers for the general economy.

The digitalisation of the transport and logistics sector

Historically, this sector has been at the forefront of globalisation and technological development. Today, many companies like Amazon⁸⁹ and Uber⁹⁰ are spearheading innovation by revolutionising the business structure and developing new technologies (e.g. autonomous vehicles). However, when studying the whole sector, most companies are visibly slow at embracing current technological innovation. A series of indicators such as the use of cloud computing services (14% of transport and logistics companies compared to 18% of general companies in 2018), use of robots (3% compared to 7%) and employment of ICT specialists (13% compared to 20%)⁹¹ paints a picture of a lagging sector.

The reasons for which transport and logistics are behind the curve in relation to overall technological development are varied. Some observers point to the combination of low labour costs and the high costs of investing in and rolling out new technologies. According to their argument, the development costs of new technologies are high and often has repercussions on the price the consumer will pay. Since the transportation and logistics sector operates on low margins, the low cost of transport labour means that workers are a cheap alternative to investing in innovation. Moreover, the lack of a regulatory framework for advanced technologies slowed down the adoption of said technologies, given its high risks, particularly in the realm of human safety in transportation activities. The absence of an adapted

regulatory framework is also evident in self-driving cars. The question of liability in the event of an accident has not been solved yet and would necessitate tremendous changes in how insurance companies operate.⁹²

Despite such braking factors, the sector might be on the cusp of a technological revolution. According to a Deloitte study from 2017,⁹³ automation, digitalisation and the use of big data are trends that will shape the future of transport and logistics. Starting with digitalisation, a new abundance of real-time data can put a dent in inefficient transport chains. The development of real-time logistics and the use of digital technologies (e.g. cloud analytics) would allow to better monitor transport vehicles and create more predictable outcomes.⁹⁴ Similarly, AI can facilitate the use of logistics planners and improve the performance of logistics operations. Companies such as DHL already employ machine learning algorithms to predict delays in air transit time and are using this data to enable proactive mitigation.⁹⁵ Furthermore, automation is poised to disrupt the world of transport significantly. The development of self-driving vehicles has the potential of reducing the need for human labour and thus increase transport efficiency. Besides reduced labour costs, automated cars increase efficiency by circumventing labour regulations (e.g. 8-hour driving shifts). However, this technology is still far from becoming widespread, both from a technological perspective (e.g. perfecting driverless software for crowded urban situations)⁹⁶ and in terms of regulatory barriers, as mentioned earlier.

Lastly, the structure of the industry – operating on tight deadlines, high volume and low margins – is well suited to benefit from the increased efficiency associated with digitalisation.⁹⁷ In the same vein, some argue that the sector's current increase in labour costs can pressure the industry to adopt new technologies to increase efficiency and compensate for lost revenue.⁹⁸

The impact of digitalisation on the transport and logistics workforce

There is great concern surrounding the magnitude of the effects that advanced technologies, especially those related to automation, could have on the transport and logistics workforce, not least concerning the risks of technological unemployment. However, instead of job loss, current evidence points to significant job displacement and polarisation of the sector instead.

According to a World Maritime University (WMU) study,⁹⁹ the potential of automation in the transport sector is significant. For low-skilled workers, the potential is lower compared to the rest of the economy (68% probability of automation compared to over 80%). This might be explained by the importance of the regulatory framework and lack of cultural acceptance in certain cases as already mentioned. In others, emerging business structures, in particular in the area of passenger transportation and mobility, still rely on the labour of low skilled workers, such as deposit workers.

When studying middle skilled workers, which make up the majority of transport and logistics workers, the same study indicates that the risk of automation is around 77%. While up-and reskilling could provide new job prospects for these workers, their age also needs to be kept in mind. As the transport and logistics worker is generally older than the rest of the workforce, there is a risk that working with advanced technologies will prove difficult and time-intensive.

The adoption of new technologies in this sector could, therefore, accelerate tremendously if braking factors such as labour cost, regulation and a lack of high-tech specialists were to be addressed.

In parallel, studies highlight the increased need for high skilled jobs. With a higher degree of technological complexity and a low risk of automation (ranging from 23% to 30%, depending on the transport sub-sector),¹⁰⁰ there will be a higher demand for high skilled jobs (e.g. trip planners, transportation coordinators, mobility system developers). While increased demand is positive, the risk of more acute skills shortage is high. According to the WMU as well as a 2017 European Commission study,¹⁰¹ low levels of highly skilled workers in the transport and logistics sector has already created skills shortages in the area of management and logistical planning. Furthermore, the lack of people who can develop and manage technological innovation is one of the factors hampering the further automation of the sector.

The analysis provided in this section indicates that transport and logistics represents a large sector, with significant economic externalities. Regarding its interaction with technologies, the sector is home to some of the most innovative companies which are currently testing labour market institutions while forcing them to adjust. The rise in temporary workers and platform work is one of their direct effects. However, this surge of innovation is not distributed equally across the sector. Evidence shows that in general, the sector is slow in adopting technological innovation, due to a variety of reasons. The adoption of new technologies in this sector could, therefore, accelerate tremendously if braking factors such as labour cost, regulation and a lack of high-tech specialists were to be addressed. This might, however, also lead to increasing polarisation of the sector, thus raising a number of challenges, such as the training middle skilled workers.

1.2.4 The security and defence sector¹⁰²

More than any other sector, the security and defence sector has long been particularly concerned with technological changes due to its historically pioneering role in numerous innovations and its importance for the safety of the workforce, in particular, the armed forces.

The following analysis on the security and defence sector is based on the structure and developments of the European armed forces, which in 2017 was numbered at 1.54 million people,¹⁰⁵ thus amounting to 0.7% of the overall labour force. These workers are composed of military (80% of the total armed forces) and civilian personnel.¹⁰⁴ The distribution of military and civilian personnel has been rather stable in the last decade, although there has been a modest increase in the proportion of military personnel in more recent years (see Figure 7).

Adopting a long-term view of defence and security employment as a percentage of total employment, a stark decrease is visible between 2005 and 2017 (-0.4%). In absolute terms, over 779,000 jobs have been lost since 2005 (see Figure 7).

Analysing the characteristics of the structure and composition of the European armed forces is a difficult exercise due to data scarcity and lack of comparative data. Thus, it is important to note that the forthcoming identification of the major characteristics of the European armed forces presented in this section faces some caveats. Many of the official statistics (i.e. Eurostat, Cedefop) do not differentiate between the armed forces and public sector. Furthermore, it is unclear if their methodology of data collection allows for comparability. For example, it is unknown if the previously mentioned data sources include civil personnel in their pool, or only military staff.

Eurostat data indicates that in 2017, most people working in the armed forces (15 years of age and older) had completed secondary or post-secondary education (48%). 34% obtained a degree in tertiary education, whereas 18% had only completed their primary education. This highlights a medium skilled workforce, with only low percentages of low skilled workers. Variations might exist across the member states, however.

The gender makeup also reveals severe disparities: the proportion of women in the armed forces varies drastically from one country to another. In 2015, women made up 15.5% of the French military workforce and

37.7% of the civilian personnel.¹⁰⁵ In 2018, women made up 12.1% of the German armed forces, a drastic increase from 1.4% in 2000.¹⁰⁶ The gender disparity is similar among military tertiary students. In the majority of EU countries, women represented less than 20% of the graduates of 2016. The highest share of female graduates was registered in Poland (42%).

As regards the age structure of the defence and security workforce, a prevailing young demographic is worth noting. Based on data provided by the European Organisation of Military Associations and Trade Unions (EUROMIL),¹⁰⁷ the largest age group in countries such as the Netherlands or Denmark are workers between 20 and 30. Furthermore, many countries impose age limits for active service, thus limiting the age distribution of military personnel.¹⁰⁸ However, in the case of civilian personnel, there is evidence that the majority of the workforce belongs to the 40 and older age group: 61.9% of the UK's workforce apply, while in 2018 the average age of French civilian personnel was just 47.¹⁰⁹

There is no publicly available data detailing the spread of atypical working arrangements in the defence and security sector. However, questionnaire data provided by EUROMIL, which surveyed a quarter of their 32 members, reveals that for two out of eight surveyed member organisations (i.e. Hungary, Greece), short-term contracts are the only available contract arrangement for enlisted personnel. In five member organisations (i.e. Italy, Belgium, Denmark, Slovakia, Cyprus), both short- and long-term contracts are available, and only in one (i.e. Ireland) is long-term contracts the norm.

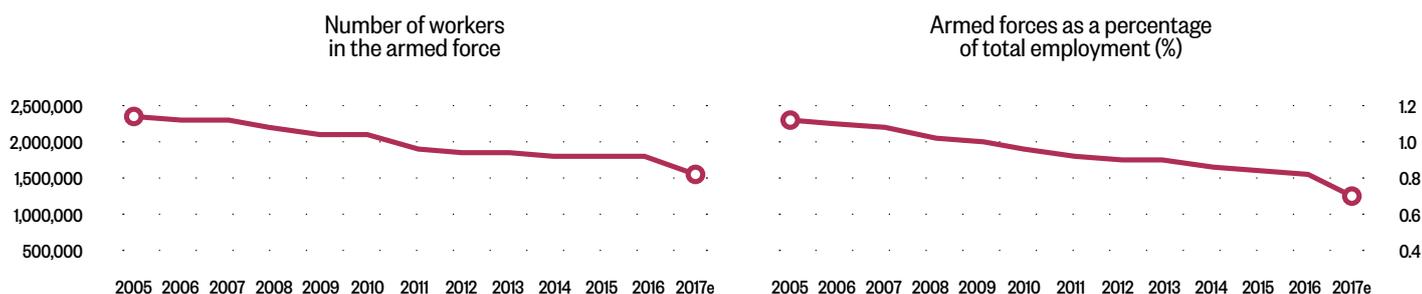
Finally, it is important to highlight other peculiarities faced by the armed forces. Military personnel is governed by different employment laws across the EU and not all workers' rights are guaranteed everywhere (e.g. Italian defence workers do not have the right to unionise).¹¹¹

The digitalisation of the security and defence sector

Technology and digitalisation have a rooted history in the defence sector. In fact, many civilian technologies, such as the Global Positioning System (GPS) and

Fig. 7

NUMBER OF WORKERS IN THE ARMED FORCES AND THEIR SHARE OF TOTAL EMPLOYMENT (2005-2017)



Source: Authors, based on European Defence Agency¹¹⁰

the Internet, were first developed for military use.¹¹² Nowadays, many of the technologies which will revolutionise the industry are coming from the private sector. Their impact will be concentrated in three important areas: enhancing connectivity, enhancing understanding and enhancing equipment.¹¹³

Several important technological developments such as blockchain, IoT and virtual reality will innovate defence connectivity. As per example, the IoT, which interconnects non-smart machines by enabling them to send and receive data, has the potential to reduce the information dissonance between troops on the ground and the control centre. This new abundance of data coupled with the graphical display power of virtual reality can reduce the need for logistical coordination and thereby reduce costs. In tandem, this increases the accuracy of decision-making and the safety of people on the ground.¹¹⁴

Another important development is the use of AI-related technologies. Understanding risks and opportunities is vital in the military environment. Recent developments in technology and data analysis have the potential to increase the predictability of decision-making and the overall security of operations. Accordingly, these new technologies will require an increase in civilian personnel, who can detect patterns and provide real-time analysis to military staff who take decisions on the ground.

In terms of equipment, automation and robots can replace humans in performing dangerous tasks, augment human capability through sensors or help with manual tasks. Drones are already being deployed in situations where the risk is deemed too high for airplane pilots. These can be used to deliver equipment, surveil enemy bases¹¹⁵ or even provide targeted strikes. Robots and machines that enhance human physical potential can also be deployed to assist the armed forces. Finally, equipment would benefit from the development of 3D printing which could reduce the costs associated with the production of tools and parts, enhance their design and streamline the time it takes to reach the end-user.¹¹⁶

The impact of digitalisation of the security and defence workforce

The previous section had shown how advanced technologies can bring in more efficiency, reduce costs, and improve decision-making as well as the understanding of risks. At the same time, they will alter the nature of armed forces' jobs, thus raising a number of new opportunities and challenges.

Among the positive effects of technological adoption, it is worth noting how the introduction of robotics could create new opportunities for female workers in the armed forces, thus reducing the gender gap. The physical burden of military work could diminish thanks to new equipment, such as robotic exoskeleton which transfer the physical burden from muscles to the machine.¹¹⁷ Another positive effect is the increase in military workers' safety that new technologies could bring about. Take the example of

operators flying out military drones into high-risk combat areas from a safe distance.

On a more pessimistic note, advanced technologies might also create new sources of tension for the armed forces, which might become subject to new types of risks. The increase in the amount of data used to aid decision making will only add a new layer of complexity to which humans will have to adapt. New ethical implications with respect to decision-making and diffusion of responsibility will emerge as a result of technological progress. Furthermore, there are fears regarding the overreliance on technologies and the risk it poses on human lives. Since armed forces operate in hostile and unpredictable scenarios, technological failure could lead to irreversible consequence. In such situations, the personnel needs to be able to operate without the aid of machines and big data.

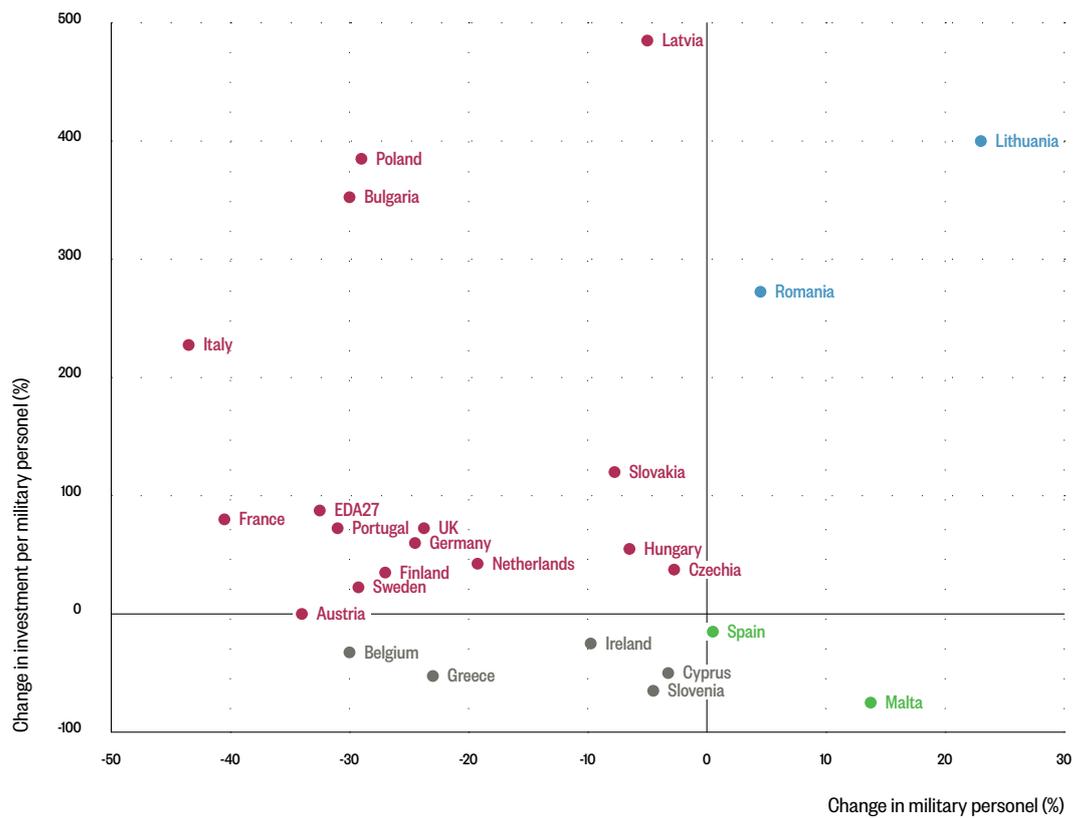
In addition, as in the other sectors, technological changes are likely to greatly disrupt the workforce. When looking at defence investment expenditure (i.e. R&D and equipment procurement), one can see that the level of expenditure per military personnel increases due to the combine effect of higher investment and a reduced number of employees. As seen in Figure 8, this trend was present in 15 (marked in red in Figure 8) out of 24 countries. Concerning the remaining countries, there is a variety of scenarios. Two countries (blue) combine rising investment per military personnel and an increase in staff; five countries (black) witness a decrease in both investment and the number of military personnel; and two other countries (green) see a growing number of military personnel despite lower investment per staff.¹¹⁸ Interestingly, these figures could suggest that while technological changes reduce the demand for certain jobs, higher investment per personnel reflect more costly and sophisticated equipment and therefore a need for highly skilled workers.

The previous argument is also highlighted by data on educational attainment: since 2011 to 2017, the percentage of tertiary educated workers in the armed forces increased from 30% to 34%, while the percentage of low skilled workers decreased from 21% to 18%. Given the increased complexity associated with new technologies, this trend will most probably be accelerated.

Even with rising personnel investment, several research studies¹²⁰ raised the issue of existing skill mismatches in the sector. At the moment, as well as in the immediate future, technical skills make up the majority of the skills deficit (e.g. electrical engineering, software engineer, AI specialist). However, in the not-so-distant future, studies suggest a growing gap between the demand and supply of cognitive skills, such as management and leadership. Such skill shortage is particularly worrying in the case of the security and defence sector where the need to embrace advanced technologies goes beyond the question of economic competitiveness and can have a direct impact on human lives. Thus, gaining in technological autonomy and protecting the lives of our soldiers do require having a sufficient level of high-tech specialists which can develop, update and maintain new technologies. In addition, this skill mismatch projection

Fig. 8

INVESTMENT PER MILITARY PERSONNEL AND NUMBER OF MILITARY PERSONNEL OVER TIME (% , 2005-2017)



Source: Authors, based on *European Defence Agency*¹⁹

is illustrative of the dual impact new technologies will have on the labour market. Although technological innovation increases the demand for technical know-how, technologies also change how people work and interact with machines, which in turn increases the demand for social and cognitive skills.

Re-establishing a certain form of technological autonomy is essential for the sector. It demands stronger efforts to recruit and retain high-tech specialists, implying the need for attractive and competitive contractual arrangements.

As seen above, the size of the European armed forces is greatly declining, while the investment per personnel is generally expanding suggesting a growing need for more skilled workers. While the ongoing job displacement appears to be one of the consequences of technological development, the sector has lost ground in its capacity to instigate technological breakthroughs. This could have serious consequences, especially as regards the human lives of its armed forces, which operate on the battle field. Re-establishing a certain form of technological autonomy is therefore essential

for the sector. It demands stronger efforts to recruit and retain high-tech specialists, implying the need for attractive and competitive contractual arrangements. In parallel, the adoption of new technologies could lead to additional benefits such as a greater gender balance. It could also, however, raise new needs and risks that will require enhanced levels of coordination across the armed forces, training oriented towards new technologies, and stress-related programmes.

1.3 INTERIM CONCLUSIONS

The analysis provided in the first chapter of this paper indicates that labour market transformations feature some mega-trends and sectoral specificities at the same time. While new technologies will instigate some job loss in certain industries, job displacement and labour market polarisation (i.e. shifting jobs towards the high and low ends of the skill spectrum and away from the middle), are set to be some of the main characteristics of tomorrow's labour market. The intensity of this polarisation for each industry already varies – and will continue doing so – according to a number of factors, such as the regulatory environment, labour cost, the structure of the workforce within each industry, workers' involvement, the degree of globalisation and tasks fragmentation within the sector, public acceptance of machines and robots, as well as their implications.

The uptake of new technologies across sectors indicates that some industries were faster in interacting with digital innovations than others. For instance, the media and publishing industry embraced digitalisation at an early stage – which was made possible thanks to a young, educated and flexible workforce – and which had major consequences on the development of new business models. The pace of the transformations and the corresponding challenges will therefore vary across sectors, thus requiring different solutions.

While new technologies will instigate some job loss in certain industries, job displacement and labour market polarisation (i.e. shifting jobs towards the high and low ends of the skill spectrum and away from the middle), are set to be some of the main characteristics of tomorrow's labour market.

Furthermore, this chapter has shown that European labour markets witness an increased diversification and mix of work arrangements following different patterns across countries, between and within sectors and having serious implications for the workforce. Atypical work

arrangements already pre-existed the recent and massive spread of the digitalisation of the economy and increased in the context of the economic crisis. Their development (sometimes fostered by new technologies but not always) is now intensifying, thus creating ever more complex labour markets and career trajectories.

The combination of these two developments – labour market polarisation and the diversification of work arrangements – give rise to a new techno-economic paradigm.

Therefore, the mega-trends at work as well as the sectoral specificities highlighted in this chapter point to both the need for an overall strategy towards the future of work and a general understanding of its resulting transformations, as well as a set of sectoral approaches that should offer tailor-made answers to specific challenges.

Finally, and despite industrial characteristics, some considerations hold true for all sectors. First and foremost, at a time of fierce global competition, one of the key drivers of technological development and competitiveness will be the ability of each industry to attract and retain high-tech specialists while ensuring a high degree of digital literacy across the workforce. In addition, the diversification of work arrangements raises fundamental questions as regards working structures and organisational patterns that have, for instance, direct implications on how training is organised and delivered to workers.

Chapter 2: Atypical workers – A new precariat?

As previously mentioned, the world of work is being transformed by a number of major forces leading to a mix and diversification of work arrangements. While permanent full-time contracts remain the norm, part-time and temporary forms of employment have increased and new forms of work such as platform work have emerged. This chapter aims to identify the central characteristics of atypical workers by paying particular attention to the consequences of their work arrangements for their rights, not least those falling under the realm of working conditions and access to social protection. It raises the heated question of whether atypical workers represent the new precariat of 21st century labour markets. Divided into two sections, it attempts to answer this question by (2.1) understanding the profiles of atypical workers by studying the sectors they work in, their age, level of education and gender; and (2.2) examining atypical workers' working conditions and social protection coverage.

2.1 ATYPICAL WORKERS – WHO ARE THEY?

To analyse the impact of digitalisation on working patterns and build an appropriate public policy response for atypical workers, it is imperative to go beyond aggregate figures and better understand what their main characteristics are.

2.1.1 Where do they work?

As shown through the sectoral approach applied in Chapter 1, the prevalence of new working arrangements and the distribution of workers across the different categories of atypical employment vary across industries. This section complements the findings of Chapter 1 by providing a comparative overview of the general distribution of employment in the overall economy and the size of atypical work in the main sectors shaping the European economy.

Figure 9 shows the sectoral composition of the economy and the corresponding distribution of employment.

Nearly half of all employment is concentrated in public services and in the wholesale and retail economy (49.5%), while the rest is dispersed mainly in industry, construction, professional and scientific activities as well as the arts, entertainment and activities of household.

Atypical work is more prevalent in some sectors of the economy than others. By means of comparison, Figure 10 shows the distribution of economic sectors by working arrangements. For temporary employment, we observe similar trends to the ones shaping the overall economy. The majority of temporary workers are concentrated in public services and in the wholesale and retail economy (53.4%).

For part-time employment, too, these sectors hire the majority of part-time workers (60.4%). However, there are some discrepancies. On one hand, 9.8% of part-time workers are employed in the arts, entertainment and activities of household, while the sector only makes up 5.3% of overall employment. On the other hand, we observe that there is a much lower presence of part-time workers in industry (i.e. 6.3% compared to 17.4%).

When considering self-employment, we note a higher presence in agriculture (13.7% compared to 3.7%), professional and scientific activities (16.2% compared to 9.8%) and construction (13.1% compared to 6.8%). The public services and the wholesale and retail economy make up only 33.8% of the self-employed workforce. This is mainly due to the low presence of such contractual arrangements in public services (i.e. 9.6% compared to 25.5% in the general economy).

Taken together, this data provides interesting findings about the employment composition of certain sectors. Some of them are mainly composed of atypical employment. This is the case in the areas of agriculture, the arts, entertainment and activities of household, where over 70% of the workforce falls under atypical employment. To a lesser extent, but still deviating from the norm, professional and scientific occupations are also dominated by atypical contracts (56%). By contrast, the sectors which

Fig. 9

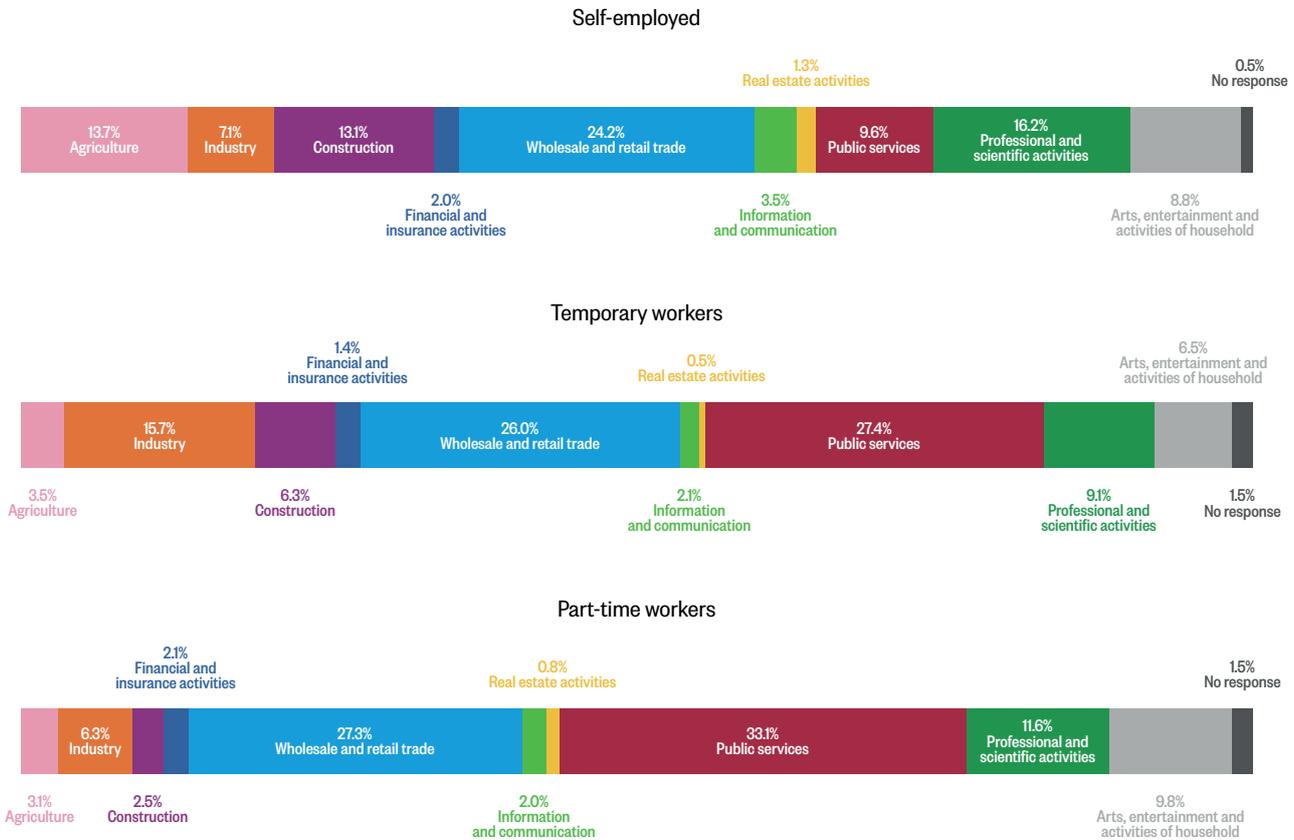
DISTRIBUTION OF TOTAL EMPLOYMENT BY ECONOMIC SECTOR (% , 16-64 YRS, 2018)



Source: Authors, based on Eurostat²²¹

Fig. 10

DISTRIBUTION OF ECONOMIC SECTORS BY WORKING ARRANGEMENTS (% , 16-64 YRS, 2018)



Source: Authors, based on Eurostat¹²²

are the least affected by atypical work are industry (23%), financial and insurance activities (29%) and ICT (35%).

Turning our attention to platform work, the findings of the COLLEEM survey indicate that the most common type of work provided through platforms is online clerical and data entry (43%), followed by professional and creative tasks (both above 30%) with a sizeable minority providing transport and on-location handy work (around 15%). Based on these tasks, we can infer that platform workers are most active in wholesale and retail, ICT, as well as the arts, entertainment and activities of household.

Platform work, by definition, is mediated through digital technologies, and as a result we observe higher percentages in sectors that were already deeply impacted by digitalisation and new technologies.

A closer look at the sectors in which atypical and platform workers operate reveals important differences between

the two phenomena. Platform work, by definition, is mediated through digital technologies, and as a result we observe higher percentages in sectors that were already deeply impacted by digitalisation and new technologies (e.g. ICT), and a minority of workers in sectors with lower levels of digitalisation (e.g. transportation). In comparison, the distribution of other forms of atypical work is more diverse and influenced by a multitude of factors, including but not limited to digitalisation. An example is the percentage of atypical workers in the ICT sector. Even though the sector is at the forefront of digitalisation and technological change, the number of atypical workers has actually been decreasing.

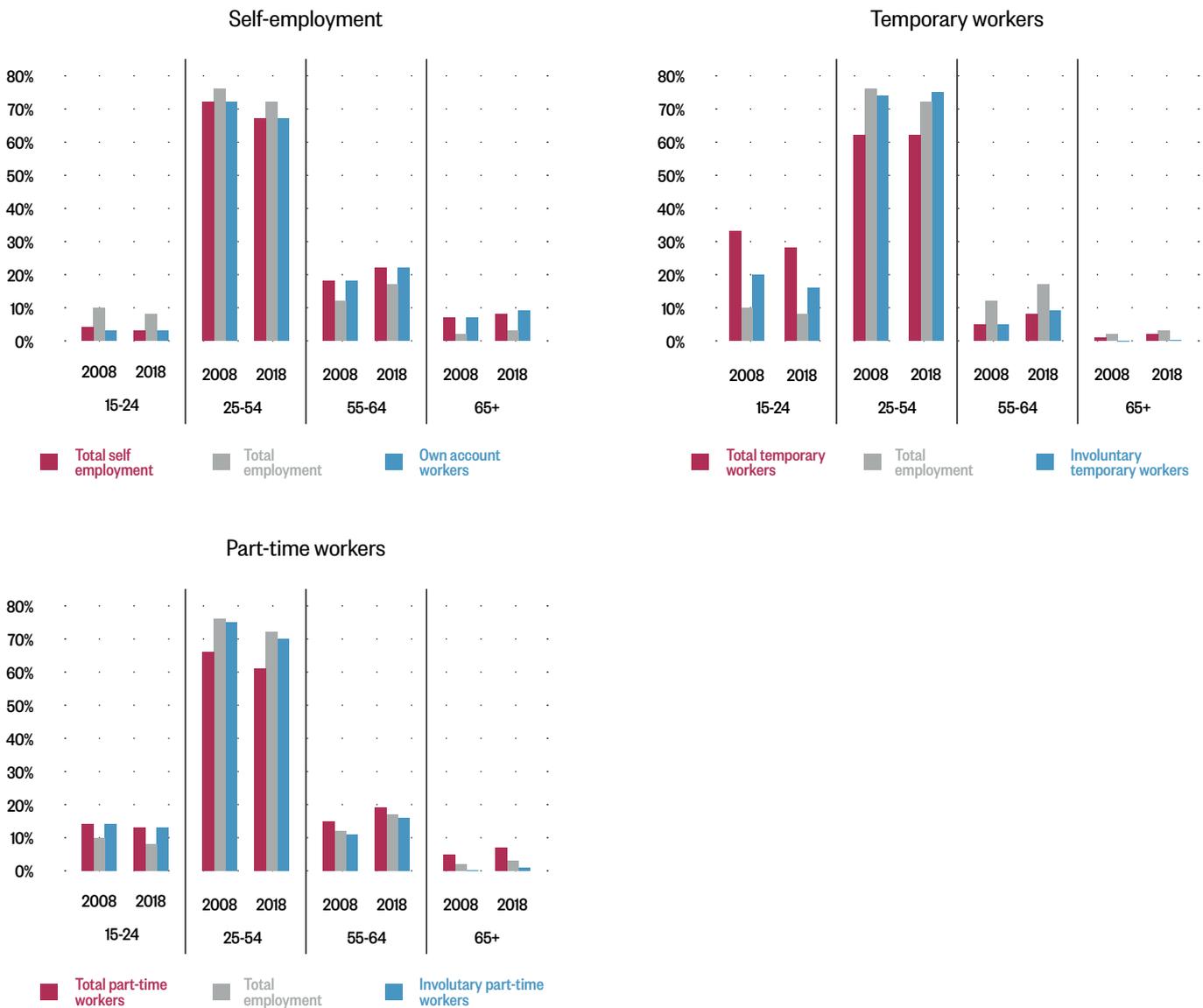
2.1.2 What is their age?

In terms of age structure, data reveals important differences between atypical workers and the rest of the active population. As seen in Figure 11 (page 28), the majority of the labour force is composed of the 25-54 age group, which is experiencing a decline to the benefit of the 55-64 group. The latter has grown from 12% to 17% between 2008 and 2018.

On average, self-employed workers are older. While they are primarily made up of the 25-54 age group, the percentage of 55 to 64-year-old workers is higher

Fig. 11

EMPLOYMENT BY TYPE OF WORK ARRANGEMENT AND AGE GROUP (% , 2008-2018)



Source: Authors, based on Eurostat¹²³

(22% compared to 17%), as well as the 65+ age group (8% compared to 3%). There is little variation between the total self-employed population and own-account workers, with the latter being slightly older. Over the last decade, both categories have experienced demographic ageing.

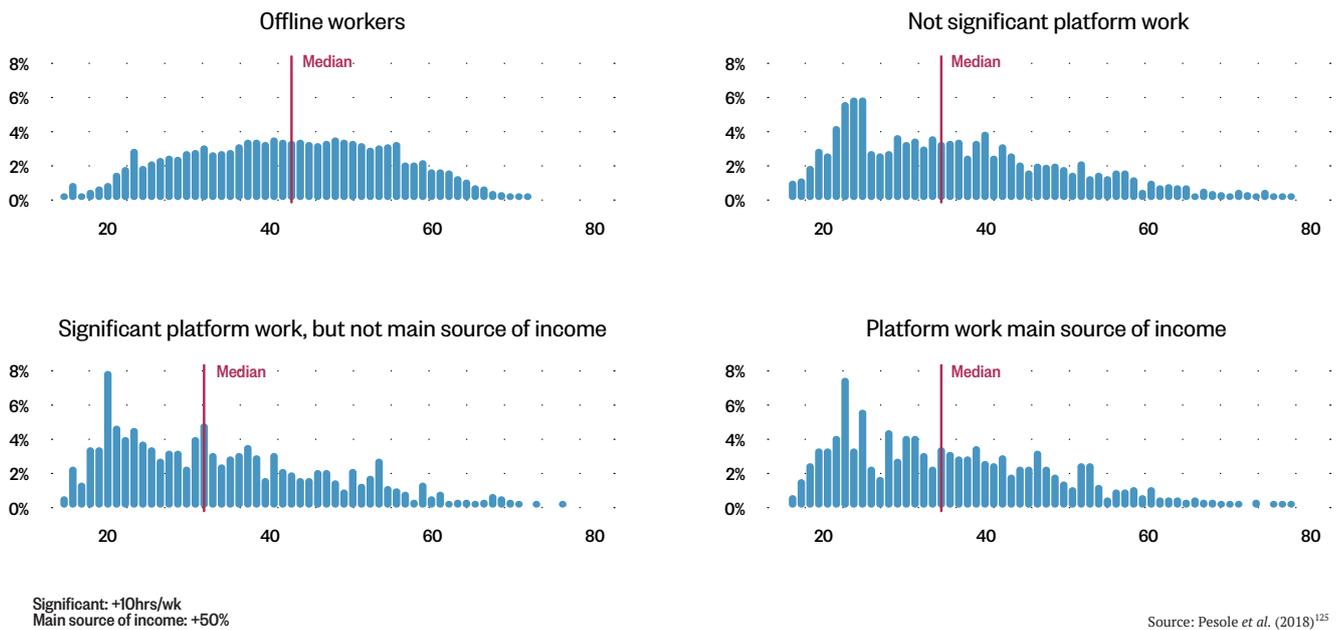
Temporary workers are much younger. In 2018, 15 to 24-year-old workers made up 28% of temporary employment compared to 8% of total employment. They have, however, declined by five percentage points between 2008 and 2018, to the benefit of the 55-64 age group. Here, we observe a stark contrast between total temporary workers and involuntary ones, with the latter being older. This is mainly caused by the number of young workers voluntarily seeking short-term employment during their studies.

Part-time workers are mostly made up of the 25-54 age group, though it is witnessing a declining trend to the benefit of the 55-64 group. The latter group grew from 15% to 19% between 2008 and 2018. Compared to the total part-time workers, involuntary part-timers are younger. In 2018, the percentage of 25 to 54-year-old workers is higher by nine points, while the percentage of 15 to 24-year olds is unchanged.

Finally, and with respect to platform workers, the COLLEEM survey shows that platform workers are on average 10 years younger than the average employee (34 compared to 44).¹²⁴ Figure 12 shows the age distribution of offline workers (total employment) as well as the distribution of platform workers by intensity of platform work. The first category represents workers who do not spend a significant amount of time on platforms (10

Fig. 12

AGE DISTRIBUTION OF PLATFORM WORKERS BY INTENSITY OF WORK (% , 2017)



hours per week), the second represents workers who spend a significant time on platforms but for whom platform work does not represent their main source of income, with the last representing workers who earn more than 50% of their income through platform work. A careful comparison reveals that with the increase in platform work intensity, the age distribution is being skewed towards the younger age groups.

Based on the data presented earlier, we conclude that the 25-54 age group is the most numerous for all types of work. However, their percentage varies significantly between different forms of atypical work, ranging from 61% for part-time workers to 75% for involuntary temporary workers. Younger workers were most widespread in temporary employment and in platform work, while the percentage of 65+ year old workers was highest among the self-employed. For all employment types, however, the demographic distribution shifted towards older workers between 2008 and 2018.

2.1.3 What is their educational attainment?¹²⁶

The European labour force is dominated by medium skilled workers, as seen in Figure 13 (page 30). However, when looking at the past 10 years from 2008 to 2018, we observe a gradual decrease in the numbers of medium skilled workers from 49.3% to 47.4%, to the benefit of high skilled ones, who increased by eight percentage points in the same reference period.

Similarly, self-employed workers are primarily medium skilled (43.6% in 2018). However, we observe over the last decade a drastic change in the share of high skilled self-employed people, who increased from 24.5% to 34.2%,

mainly at the expense of the low skilled ones. There is little variation between total self-employed and own-account workers.

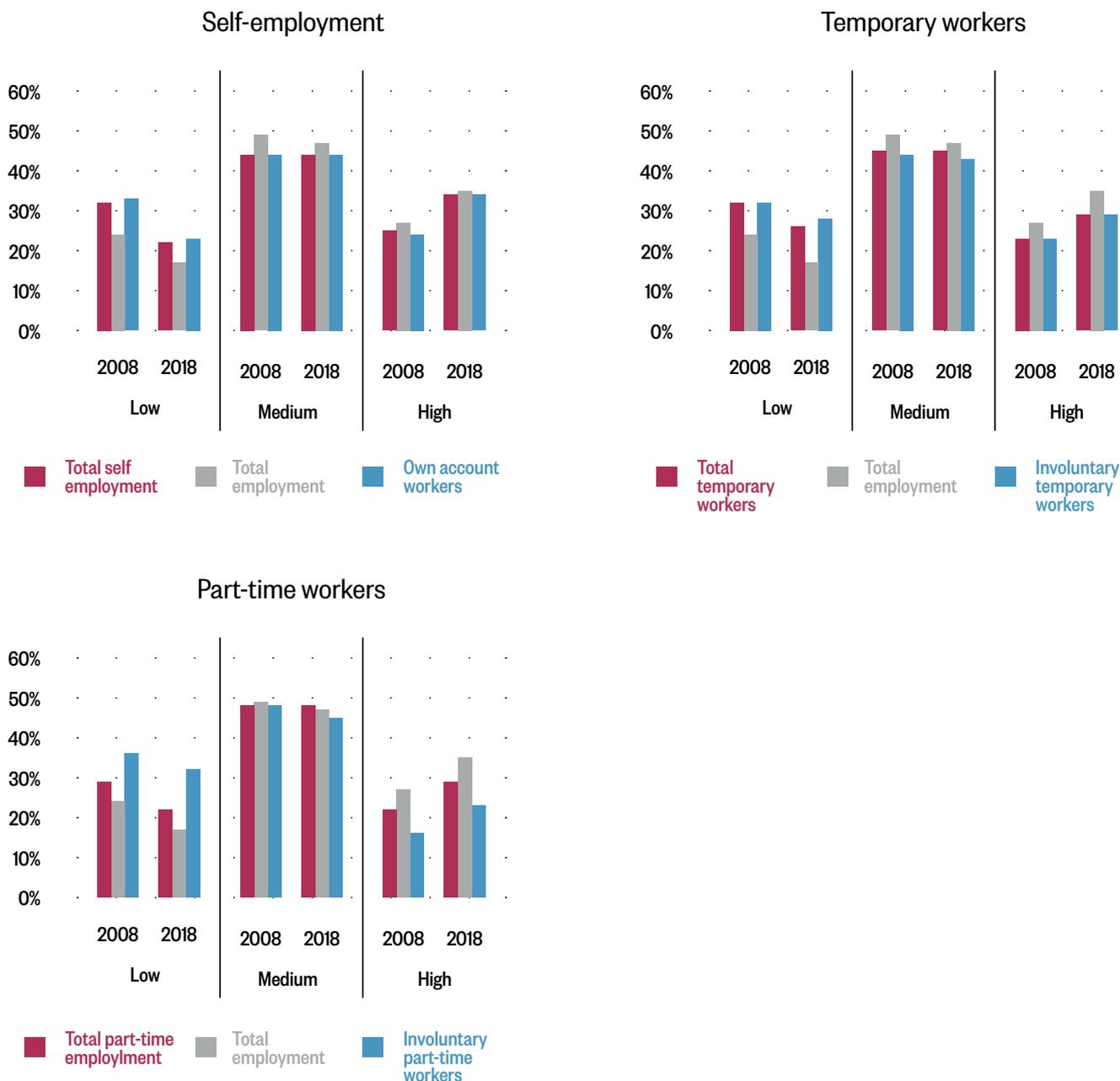
In the case of temporary workers, the distribution of skills is also skewed towards medium skills, with a higher percentage of low skilled workers. Uniquely among different types of employment, we observe the percentages of low skilled and high skilled workers to be roughly equal (26% compared to 28.8%). From 2008 to 2018, the number of low skilled workers declined, mostly in favour of high skilled ones, while the number of medium skilled workers changed marginally. However, from 2014, we observe a slightly increasing trend in favour of low skilled workers. For involuntary temporary workers, the increase was even higher, accentuated by the more drastic decline in medium skilled workers.

Part-time employment is also mostly composed of medium skilled workers. Moreover, in a similar trend, the percentage of high skilled workers increased from 22.3% to 29.6% between 2008 and 2018, at the expense of the low and medium skilled labour force. However, unlike other types of atypical employment, there are stark differences between total part-time workers and involuntary ones. Uniquely, the number of low skilled involuntary part timers is higher than that of high skilled workers; 31.9% compared to 22.7% in 2018.

Lastly, according to the COLLEEM survey,¹²⁸ platform workers tend to be more educated than the general workforce. The survey estimated that in 2017, around 55% of workers who earn more than 50% of their income from platform work had a tertiary degree. As shown previously, although there are some platform workers who perform

Fig. 13

EMPLOYMENT BY TYPE OF WORK ARRANGEMENT AND EDUCATIONAL ATTAINMENT (% , 2008-2018)



Source: Authors, based on Eurostat¹²⁷

low skilled tasks, the majority of them work in digital- and numerical-intensive fields, which require higher levels of educational attainment. Interestingly, Figure 14 indicates that the educational attainment is positively correlated with the intensity of platform work. However, as shown in Annex 1, the majority of platforms require low to medium skills, meaning that the platform workforce is overqualified for the jobs.

As shown above, the majority of workers, with the notable exception of platform workers, have medium skills. For the past decade, for all categories, there has been a drastic increase in the number of high skilled workers, who have

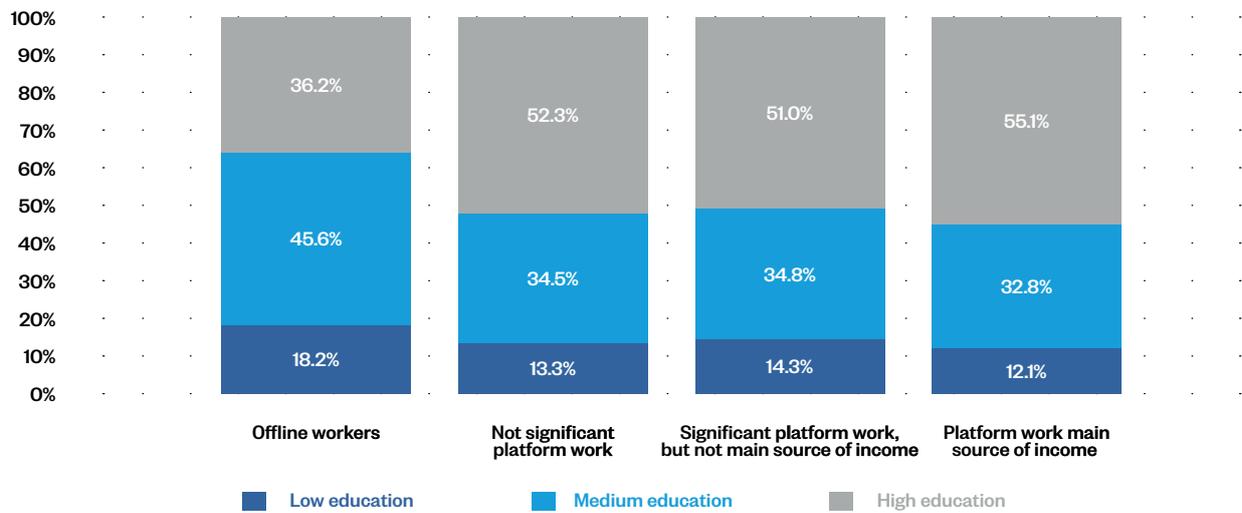
replaced, in almost all cases, low skilled workers as the second-most numerous in the workforce. In the case of platform workers, we observe a high share of high skilled workers, due to the knowledge-intensive industries in which they operate.

2.1.4 What is their gender?

In terms of gender differences, the total workforce consists of 54% males and 46% females, with these numbers staying relatively constant over the last decade, despite a trend of slight convergence. Moving beyond aggregate figures, it is worth noting that women are

Fig. 14

DISTRIBUTION OF PLATFORM WORKERS BY INTENSITY OF WORK AND EDUCATION (% , 2017)



Significant: +10hrs/wk
Main source of income: +50%

Source: Pesole et al. (2018)¹²⁹

more educated, with 39.2% of them having completed a tertiary education, compared to 31.5% of men. Moreover, while the share of high skilled workers increased for both categories from 2008 to 2018, it increased more for women (9.7 percentage points compared to 7).

From a gender perspective, there are signs of convergence for all categories of work. However, when looking at education, women make up a higher proportion of high skilled workers, with an accelerating trend between 2008 and 2018.

When considering self-employment, the gender gap is more pronounced; 66% of workers are men and 34% women. Since 2008, there has been little to no convergence on this front. When studying skill levels, in line with the trend displayed at the total workforce level, self-employed women are more educated with 39.4% having completed tertiary education, compared to 31.4% of men. The difference is even higher when looking at own-account workers, where 42.9% of women have tertiary degrees compared to 29.4% of men. Here too, data from 2008 to 2018 shows the increase in high skilled workers, with a more rapid increase of female workers (+14.1 percentage points for women and +7.4 for men), and own-account workers (+14.5 percentage points and +7.9 for men).

For temporary workers, both voluntary and involuntary, the gender distribution is roughly equal and has been stable over the last decade. When considering educational background, the differences are considerable. Women tend to have higher education: 34.1% and 36.2% for involuntary temporary workers, with +11.4 and +14.7 percentage points difference compared to men. When looking at the evolution from 2008 to 2018 for both voluntary and involuntary temporary workers, the share of high skilled workers increased for both genders (+6.5 and +7.6 percentage points for women, compared to +4.2 and 3.8 percentage points for men).

A substantial gender divide appears in the case of part-time workers. In 2018, 73.5% of all part-time workers were women while only 26.5% were men. In the case of involuntary part time, the gender divide is slightly lower, with 67.6% of involuntary part-time workers being women and 32.4% being men. In both cases, there has been a slight gender convergence over the past decade, with the percentage of women workers dropping by 2.8 and 4.4 percentage points respectively. The gender difference in the share of highly educated part-time workers is less pronounced than in other types of atypical work. When considering skill composition, 30% of women have tertiary education compared to 28.6% of men working part time voluntarily, and 23.7% of women compared to 20.7% of men working in involuntary part-time employment.

When looking at the gender distribution of platform work, the COLLEEM survey reveals that the representation of women progressively decreases as the intensity of



INFOBOX 4. From precarious employment to decent work

According to the ILO, some common characteristics of 'precarious employment' can be identified despite the multifaceted and often context-specific aspects of the phenomenon. The concept of precariousness entails elements such as instability, lack of protection, and vulnerability. Thus, 'precarious employment' is "typically understood as work that is low paid, especially if associated with earnings that are at or below the poverty level and variable; insecure, meaning that there is uncertainty regarding the continuity of employment and the risk of job loss is high; with minimal worker control, such that the worker, either individually or collectively, has no say about their working conditions, wages or the pace of work; and unprotected, meaning that the work is not protected by law or collective agreements with respect to occupational safety and health, social protection, discrimination or other rights normally provided to workers in an employment relationship."¹³²

As regards the concept of decent work, it entails major elements (e.g. dignity, equality, fair income, safe working conditions). It has been recognised as a universal objective to be achieved in the UN's 2030 Agenda for Sustainable Development. According to the ILO, decent work "involves opportunities for work that is productive and delivers a fair income, security in the workplace and social protection for families, better prospects for personal development and social integration, freedom for people to express their concerns, organize and participate in the decisions that affect their lives and equality of opportunity and treatment for all women and men."¹³³ To pursue these objectives, the ILO has developed the Decent Work Agenda, an approach for the community of work based on four strategic pillars: 1) rights at work; 2) full and productive employment; 3) enhanced social protection; and 4) improved social dialogue.

platform work increases. More specifically, in comparison to the wider economy, women represent 40% of workers who perform non-significant platform work, and 31% of those who perform significant work on platforms without this being their main form of income. Conversely, women account for only 26% of workers whose primary form of employment is platform work.¹³⁰

Therefore, from a gender perspective, there are signs of convergence for all categories of work. However, when looking at education, women make up a higher proportion of high skilled workers, with an accelerating trend between 2008 and 2018.

2.2 ATYPICAL WORKERS' WORKING CONDITIONS AND SOCIAL PROTECTION

Atypical employment, not least platform work, is often associated in the public debate with precariousness, although it is important to recall that the two phenomena are not necessarily synonymous. To avoid simplifying the complex realities of the world of work, international organisations do therefore prefer to call for an agenda on 'decent work for all', regardless of the type of work arrangements, standard or non-standard, a person is taking part in. As highlighted in Infobox 4 (page 32), precarious employment and decent work have varying definitions. In an attempt to answer the question whether atypical workers represent the new precariat of the 21st century, this section will investigate atypical workers' remuneration, working hours, access to social protection and trade union representation, taking into account the different nuances and complexities mentioned above.

2.2.1 The remuneration of atypical workers

There are little comparable data about the remuneration of atypical workers. Alternatively, it is interesting to examine the extent of in-work at risk of poverty,¹³¹ which is a growing phenomenon within the entire workforce. Between 2010 and 2018, the percentage of workers at risk of poverty increased by 0.6 percentage points from 5.2% to 5.8%. Despite the general increase of the issue, considerable differences appear between those working under atypical contracts and those engaged in traditional employment. Data indicates that atypical workers were more likely to be below the poverty line in 2017 than those in traditional employment. In fact, 16.2% of temporary workers and 15.6% of part-time workers were at risk of poverty.

Additionally, a long-term analysis of in-work poverty highlights that the number of working poor among atypical workers has increased more rapidly than among people being in a traditional employment relationship. In the case of temporary workers, the percentage of workers who experience poverty grew from 13.3% to 16.2% between 2010 and 2017. In the case of part-time workers, between 2010 and 2017, in-work poverty grew from 12.9% to 15.6%.

A long-term analysis of in-work poverty highlights that the number of working poor among atypical workers has increased more rapidly than among people being in a traditional employment relationship.

Relevant cross-country variations exist, with Eastern Europe having more working poor, in both typical and atypical contracts, and Northern Europe having fewer. When looking at the differences between typical and atypical contracts, some interesting trends emerge, in particular in Eastern and Southern Europe. For example, in Latvia, there is a difference of 17 percentage points between full- and part-time employment (7.4% and 24.4% respectively), and almost 23 points between temporary and permanent employment (6.7% and 29.5%). Some exceptions, however, are worth noting. The Czech Republic, for instance, has a difference of only 4.8 percentage points for part-time/full-time work and 4.6 for temporary/permanent employment. Northern Europe registers the lowest differences. For example, Finland has a 5.2 points difference between part-time/full-time work and a 4.1 points difference for temporary/permanent employment.

In-work poverty appears to be a more widespread phenomenon among atypical workers, although important variations exist across countries.

Due to the complexity of the phenomenon, it is harder to report on the income of platform workers.¹³⁴ Most of them (68.1%) report having employee status, 7.6% are self-employed, while the rest are either unemployed, in training, retired or 'homemakers'. As previously mentioned, only a small percentage relies on platform work for most of their income.

However, interviews with platform workers reveal that platform-based earnings are insufficient to make a decent living.¹³⁵ This may vary depending on numerous factors: status, type of task (with on-location activities bringing more income), and country (with on-location platform workers in Austria, for example, earning more than the average national wage for low skilled work). Their pay is also influenced by working time. In some countries, platforms offer significantly more money for weekend work. In France, a platform worker may have an incentive of €4 per hour incentive to work on weekends, depending on the type of contract. However, this raises concerns about working time and work intensity.

Based on the data presented above, in-work poverty appears to be a more widespread phenomenon among atypical workers, although important variations exist across countries. In addition, some countries have managed to maintain low differences between standard and non-standard workers, thus showing that public policies matter to create a level playing field among the diverse types of employment statuses.

2.2.2 Working hours

In 2018, full-time employees worked on average 41.2 hours per week across the EU. Compared to 2008,

this figure denotes a slight reduction of 0.6 hour. This trend does not display strong country variations.

The trend is, however, reversed when it comes to part-time work. The EU average was 20.5 hours in 2018, showing an increase since 2008 when the average time was 19.9 hours. Looking at the geographical patterns, both Central and Eastern European countries as well as Nordic states saw a decrease in part-time working hours, while the biggest increase was registered in Western and Southern states, with Belgium registering the biggest increase from 23.6 hours to 25.3.

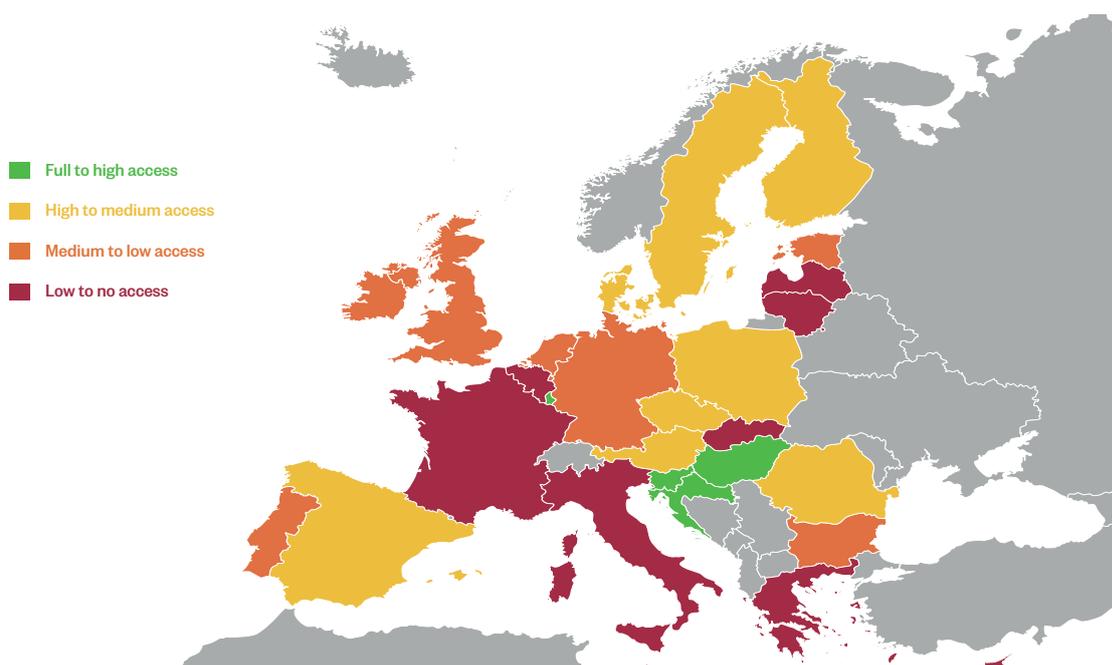
For the self-employed, working time is slightly higher than for typical workers. On average, they work 42.1 hours (i.e. 0.9 hours more than full-time employed persons). However, when looking at own-account workers, their working-hours are lower than those of typical employees, reaching an average of 39.6 hours. Furthermore, it is worth mentioning that the decrease in working hours between 2008 and 2018 is more pronounced than for full-time employees. In fact, the decrease was by 2.2 hours for all self-employed and 2.3 hours in the case of own-account workers.

Temporary workers, on average, work less than typical workers. In 2018, they worked 32.6 hours, i.e. 9.2 hours less than standard employees. Moreover, as in the case of the self-employed, there has been a decrease in working time, 0.9 hours less since 2010.

For platform workers, the diversity of the phenomenon renders any generalisation difficult. However, data shows that 50% of all platform workers work less than 10 hours a week.¹³⁶

Fig. 15

ACCESS OF SELF-EMPLOYED WORKERS TO SOCIAL PROTECTION BY COUNTRY (2017)



Source: Authors, based on Spasova et al. (2017)¹⁴⁰

The evidence provided above and other data presented in the Issue Paper point to significant trends in the structure of the labour market. There has been a structural shift towards part-time work, which increased in both the number of workers and the number of hours worked. However, when considering both working time and income, it is worrying to see that although part-time workers spend more time working, more of them are at risk of poverty. For other types of atypical work, the picture is less clear. In the case of self-employment, both the number of workers (except for own-account workers) and their working hours declined, while there was an increase in temporary workers but a decline in their working time.

2.2.3 Social protection legislation and statutory gaps

The growing decoupling of employment from social protection and the resulting low coverage of a growing number of workers lie at the core of the negative public perception of certain new forms of contractual arrangements.¹⁵⁷ Before looking at the social protection associated with different types of job status, however, it is important to highlight a few caveats. Achieving a comprehensive and comparative overview in this field is difficult due to the high heterogeneity of social protection systems across member states. Furthermore, the distinction between statutory (i.e. permitted or required by law) and effective coverage (i.e. the social protection provisions that workers benefit from in reality) adds another layer of complexity to the equation. While dealing with these caveats, it appears that the most comprehensive study is a 2017 Commission paper that analyses national policies with data from the [Mutual Information System on Social Protection](#) (MISSOC) database, and builds a taxonomy of statutory social protection access.¹⁵⁸ The section below sheds light on existing social protection legislation and statutory gaps for the different categories of non-standard forms of employment.

As regards self-employed workers, a great degree of heterogeneity becomes apparent. The previously mentioned Commission study establishes four clusters in relation to access to social protection.¹⁵⁹ Cluster 1 is classified as ‘full to high access’ and includes countries where the self-employed are required to be covered by all insurance-based schemes. Cluster 2 comprises countries offering high to medium access, meaning that the self-employed are not required to be insured under all schemes but have the option to opt in. The third cluster includes countries offering medium to low access, where the self-employed are not required to be insured under one or more insurance scheme. They do, however, have the possibility to opt into some of the schemes, while being excluded from others. Finally, cluster 4 corresponds to the ‘low to no access’. It comprises countries in which the self-employed are prohibited from opting into one or more insurance-based scheme. For example, the self-employed cannot opt into unemployment insurance schemes in Belgium or Cyprus. Moreover, in France and Slovakia, the self-employed do not have access to occupational diseases and work-injury schemes. The distribution of countries by social protection cluster can be seen in Figure 15 (page 33).

As regards the specific case of platform workers, their situation and employment status vary widely from one platform, and country, to another, depending on their legal status. This factor adds to the complexity of mapping their social protection coverage. On this point, a 2018 Eurofound¹⁴¹ study conducted interviews with platform workers and found that their vast majority are able to identify their employment status. As previously explained, only a small percentage of platform workers primarily earn income through this type of work. As such, many already fall under existing employment statuses, such as employee, self-employed or occasional worker. In fact, of the total 41 interviewees, only 5 of them declared that they had no status. All of them took part in the online-contest type of platform work. Furthermore, the interviews highlighted that workers from three studied categories (i.e. online contest work, on-location platform-determined work, on-location worker-initiated work) had access to social security through their main activity. However, as previously mentioned, this varies according to employment status. Platform-determined workers declared themselves to be either employees or self-employed. In the case of on-location worker-initiated platforms, workers reported being either self-employed or ‘in-between-ers’, such as occasional workers. Finally, online contestants reported being self-employed or without employment status.

While pension systems seem to take the diversification of work arrangements into consideration in most EU countries, the picture is more diverse when looking at unemployment, sickness and maternity benefits.

However, most issues for workers taking part in several and new forms of work stem from effective rather than statutory coverage. Although temporary and part-time workers are both salaried employees who should qualify for social protection schemes, those legal rights are not always translated into effective coverage due to the difficulty in reaching minimum eligibility requirements like working hours or contribution period.

Given the issue with reaching requirement thresholds, there is a need to quantify the effective coverage of atypical workers. This can be done by analysing coverage criteria of social protection legislation and determining what types of workers are at risk of being excluded.¹⁴² Based on this methodology, researchers indicate that the EU average risk of not receiving benefits was 12.9% for unemployment benefits in 2014, 7.7% for sickness benefits and 7.6% for maternity leave (see Figure 16).

Pension coverage deserves special attention. Unlike other types of insurance-based protection, there is little risk of a total lack of coverage. However, temporary and part-time workers – who are more likely to have a career interruption, lower life-time earnings and a shorter

Fig. 16

SHARE OF THE LABOUR FORCE AT RISK OF NOT BEING ENTITLED TO BENEFITS (% , 15-64 YRS, 2014)



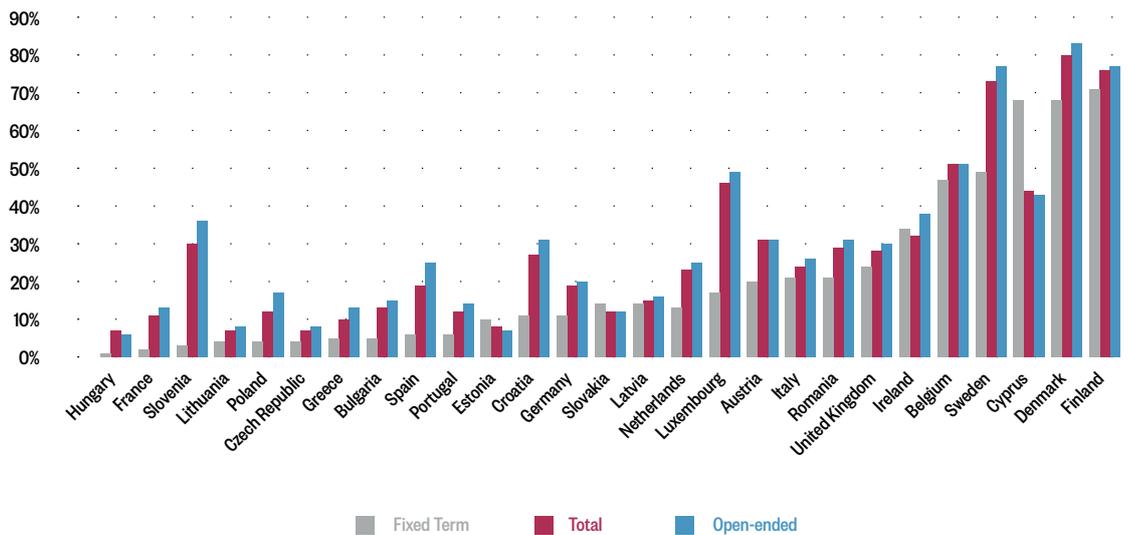
Source: Matsaganis et al. (2016)¹⁴⁸

employment record – are likely to receive lower pension benefits than standard employees. For self-employed workers, the picture is more complex. In most member states, pensions are compulsory, with 13 countries¹⁴³ having compulsory insurance and 3¹⁴⁴ having first-tier basic pensions. There are 4 countries where the self-employed can opt out from pensions (UK, Ireland, Hungary, and Malta) and lose their rights. For the rest of the countries,¹⁴⁵ pension law may have special conditions or separate schemes for the self-employed but they do not present substantial differences from the schemes for employees.¹⁴⁶

This snapshot of social protection legislation highlights some of the still persisting social protection gaps that exist among different types of workers. Diverse national legislations create considerable differences between countries. While pension systems seem to take the diversification of work arrangements into consideration in most EU countries, the picture is more diverse when looking at unemployment, sickness and maternity benefits. In such cases, there is a great amount of heterogeneity regarding the access of self-employed workers as well as notable gaps for part-time and temporary workers.

Fig. 17

TRADE UNION MEMBERSHIP BY TYPE OF CONTRACT (% , 2016)



Source: European Commission (2018b)¹⁵⁰

2.2.4 Worker representation

Data on working preferences highlights that some atypical workers prefer non-standard working patterns because of the associated flexibility. For example, in 2018, only 23.4% of part-time workers¹⁴⁷ were engaged in atypical work because they could not find traditional forms of employment. By contrast, 20.8% preferred part-time work because of their caring responsibilities, 14.5% opted for part-time work for family reasons and 10.7% worked part-time due to ongoing school education or training. Similarly, although more than 50% of temporary workers chose this type of contract because they could not find a permanent job, we observe an increase in preference for temporary work, with the share of workers who did not seek a permanent contract growing from 10.9% in 2009 to 13.5% in 2018. Furthermore, data collected by a Zurich Insurance survey¹⁴⁹ reveals that younger workers are more mobile and do not always aspire to the permanent, full-time job scenario, with 41% of workers in their 20s reporting the intention to leave their job voluntarily.

Given the preference of some workers for new work arrangements, it is of central importance to solve the issues of working conditions and poor social protection without stifling the associated advantages of flexibility. One tool that could reconcile workers preferences, social protection coverage and working conditions without imposing too much rigidity is social dialogue. However, trade unions' efforts to reach out to atypical workers have intensified only recently and, as shown in Figure 17, they are still hampered by low union density among this type of workers.

For a long time, accepting atypical workers has been a controversial issue for trade unions. Due to their development under Fordism, trade unions grew accustomed to a homogeneous group of members: "white, male, working in full-time with relatively

secure occupations".¹⁵¹ Subsequently, their interests were geared towards the needs and characteristics of these groups of workers.¹⁵²

That being said, Gumbrell-McCormick¹⁵³ describes several developments that pressured worker organisations to accept atypical employment as a viable membership pool. First of all, an ageing working population contributed to the reduction of possible trade union recruits and a subsequent reduction in bargaining power. Secondly, atypical work became a staple of the modern economy that trade unions could no longer ignore. As a result, unions gradually acknowledged the new environment they were operating in and decided to integrate these workers into their ranks as a means of maintaining their capacity to act and negotiate.

As seen in Figure 17, despite trade union interest to enlarge their membership pool with atypical workers, they have had limited success so far. There are a few notable exceptions (e.g. Cyprus, Estonia, Slovakia) where union membership is higher among fixed-term contracts than open-ended ones. Looking at these numbers and the percentage of temporary employment out of the total, it can be observed that there is no relation between the number of temporary workers and their degree of unionisation. For example, France has low levels of unionised workers with fixed-term contracts (2%), while temporary workers make up a high share of its total employment (14.3% in 2016). By contrast, in Estonia, temporary workers make up a low share of total employment (3.4% in 2016) but have higher degrees of union membership compared to typical employees (10%).¹⁵⁴ This relation shows that the issue is not necessarily linked to the potential added value in bargaining power that temporary workers would bring, but is more complex and includes a mix of economic, social and cultural factors.

As such, the legal background becomes important in understanding trade union membership among atypical workers. When it comes to self-employment, there are numerous barriers that limit the right of representation. According to an ILO convention,¹⁵⁵ trade unions have the right to recruit and organise self-employed workers. However, some European countries (e.g. Bulgaria, Hungary, Poland, Romania) have adopted legislation that prevents most self-employed workers from being members of trade unions, or at least provides no clear right for them to become members.¹⁵⁶ In other countries, legislation limits the right of trade union membership to specific types of self-employed workers. As an example, in Austria, collective agreements can only be signed by bodies whose decision-making is independent from the other party. This means that self-employed workers with employees cannot be involved in union decision-making.

Even in countries that have not passed legislation to specifically prohibit self-employed workers from joining unions, the application of competition law may prohibit it. In this vein, EU competition law was used to question the legality of minimum-fee arrangements that were unilaterally set by liberal profession workers' organisations. Several cases in Italy and Bulgaria have established that these minimum-fee arrangements will be prohibited unless they can be justified on the grounds of being necessary for the implementation of the legitimate objective of providing guarantees to customers or ensuring the implementation of legitimate objectives.¹⁵⁷

Apart from legal barriers in countries where self-employed workers are allowed to join trade unions, some authors report discouraging attitudes which limit real/effective access, particularly in the case of self-employed workers with employees.¹⁵⁸ In spite of these barriers, there are countries in which social dialogue is taking root. In Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden and the UK, collective bargaining has been used successfully to set the terms and conditions of self-employed workers.

There is on average low trade union membership among atypical workers. The associated geographic variation is not tied to the prevalence of atypical work but rather to something less tangible, such as trade union attitudes.

Two strategies have been developed in order for platform workers to be represented in social dialogue: the expansion of existing unions to include platform workers as new members, or the creation of new organisations (i.e. work councils) by platform workers.

It remains unknown which of the two strategies yield better results as this is a recent phenomenon. However, both have advantages and disadvantages. New trade unions face challenges in accessing experts, funds and

networks. These are often prerequisites for effective sector-wide collective agreements. On the other hand, established trade unions tend to operate in a way that favours the majority of their members which, as shown earlier, are full-time employees. Some characteristics of atypical workers makes them hard to integrate, such as the blurred distinction between worker and employer.¹⁵⁹

To sum up the findings, there is on average low trade union membership among atypical workers. The associated geographic variation is not tied to the prevalence of atypical work but rather to something less tangible, such as trade union attitudes. Apart from those countries where self-employed workers are prohibited from unionising, and barring the added barriers imposed by competition law, cultural barriers have been identified as a major deterrent. In recent years, there have been several successful good practices of atypical workers being unionised, but more efforts and research are needed to analyse the impact and effectiveness of various recruitment strategies.

2.3 INTERIM CONCLUSIONS

This chapter aimed to better understand the profile of atypical workers and the linkages between digital transformations, diversification of work arrangements, working conditions and access to social protection. The analysis confirms that the distribution across sectors is uneven. Furthermore, it indicates a mix of previously established and upcoming trends. For instance, while atypical employment is over-represented in certain economic sectors (e.g. agriculture, arts and entertainment activities) where it is traditionally prevalent, the share of high skilled people taking part in atypical work arrangements has significantly increased. In the same vein, evidence suggests that the population taking part in atypical employment is ageing. This picture contradicts the popular belief that atypical employment is dominated by young, inexperienced and low skilled workers, which are often perceived as the new precariat of the 21st century.

The overall picture is in fact much more complex and simplistic conclusions would be a mistake for several reasons. Firstly, it appears that tertiary education is no longer a shield against unstable jobs, and though it represented an asset in yesterday's labour market, it does not necessarily hold true today. Secondly, although atypical workers suffer disproportionately from in-work poverty, lower social protection coverage and less bargaining power due to a low representation among trade unions, treating atypical workers as homogenous would be false. Atypical employment is diverse and the situation differs significantly from one country to another. In fact, some countries have managed to narrow the gap between atypical workers and standard employees, thus showing that public policies matter in that respect.

Chapter 3: The broader implications of labour market transformations

The deep and far-reaching labour market transformations, which have been described in the previous chapters of this Issue Paper, have a number of lasting repercussions. They create new types of socioeconomic risks for individuals, put additional pressure on the welfare state and test the resilience of our social contract. If these implications are not well-anticipated and properly managed, they will be detrimental to both individuals and society at large.

3.1 RISKS FOR INDIVIDUALS

While Chapter 2 focused on the impact of new forms of work on a number of individuals' rights, such as access to social protection and collective representation, this section explores the consequences of the changing nature of work for a broader range of issues. In particular, it looks at the nature of atypical workers' fears and anxieties, the impact of technologies on work-life balance and the rapid increase in mental health issues. It is important to note that the emergence of new socioeconomic risks does not only concern atypical workers, but can be seen across the whole of society. However, given the multiple insecurities and specific realities atypical workers face as indicated earlier in this Paper, such risks are likely to be even more acute among this particular group.

Mounting fears and anxieties

Several surveys have been carried out to better understand the impact that new forms of work have on workers' well-being. Survey outcomes indicate that three major aspects cause serious concerns among atypical workers: job insecurity, lack of predictability, and income insecurity in old age.

Three major aspects cause serious concerns among atypical workers: job insecurity, lack of predictability, and income insecurity in old age.

Evidence shows the relationship between atypical employment and concerns about job security. In fact, a 2010 Eurofound study¹⁶⁰ indicates that atypical workers are disproportionately affected, compared to standard employees: they are three times more likely to be worried about losing their job (34% compared to 11%). Similarly, a 2017 study¹⁶¹ reports that around a third (33.3%) of platform workers fear losing their job, compared to only 16% of standard employees.

With respect to predictability, the picture is more complex. While atypical workers appear to have strong

preferences for flexible working time,¹⁶² this flexibility can create unpredictable working environments. Interviews with atypical workers reveal that in some instances, the flexibility is all one-sided. For example, some zero-hours workers expressed concerns about the predictability of their workload as they had no genuine option to turn down offers of work.¹⁶³ Furthermore, research also shows that in the case of platform workers, securing as much work as they would like is not easy. In fact, a 2016 ILO paper¹⁶⁴ indicates that 85% of surveyed workers in the US would have liked to do more platform work. The main reason preventing them was the insufficient number of tasks available on the platforms.

Another issue which concerns platform workers is the predictability of pay. According to a study conducted for the European Parliament,¹⁶⁵ more than 50% of platform workers report payment delays and over 75% report having to put in more time than agreed. As a result, fear over predictability of hours and predictability of pay is a recurrent issue for people engaged in new forms of employment.

Furthermore, the fear of insufficient/inadequate income protection in old age was investigated in a Zurich Insurance and Oxford University survey, which assessed the ownership of income protection or term life insurance, be it a private, individual purchase or as a group-plan membership. Interesting findings emerge from the survey, such as the relatively low level of ownership and major differences by gender, age, primary wage earner, and the task type of the worker.¹⁶⁶ The survey covers seven EU countries (Finland, the UK, Romania, Germany, Spain, Ireland and Italy) and points to a general societal failure to address this concern.¹⁶⁷

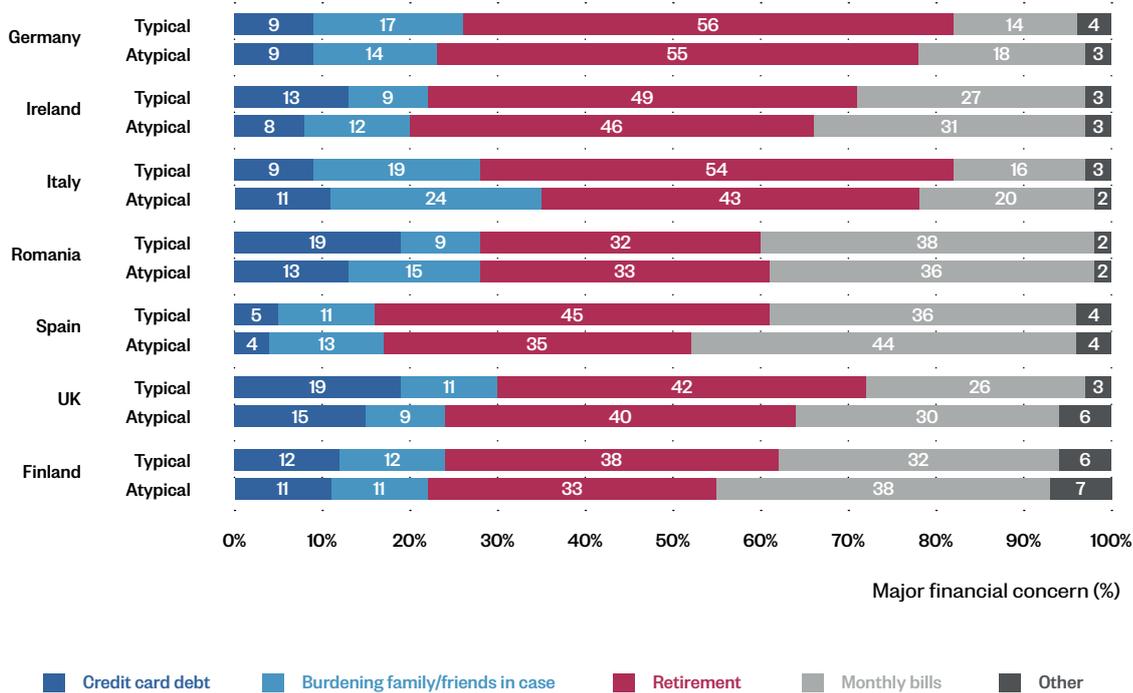
As seen in Figure 18, in four out of the seven surveyed EU countries (i.e. Germany, Ireland, Italy, and the UK), the biggest financial concern for all types of workers is retirement. Interestingly, we can observe that typical workers do also feel even more concerned about old age income than atypical workers in certain countries. By contrast, the latter are generally more worried about monthly bills than typical workers.

For Spain and Finland, retirement is still the main concern for typical workers whereas atypical workers are more concerned with paying their monthly bills. In Romania however, paying monthly bills represents the main concern for both typical and atypical workers.

Given the high levels of concern, it is important to look at old age protection legislation for atypical workers. As previously shown, pension contributions are usually mandatory for most types of atypical workers (e.g. temporary and part-time workers). However, due to the low pay, career breaks and shorter contribution time, these workers have lower old age protection. Furthermore, in

Fig. 18

FINANCIAL CONCERNS BY COUNTRY AND CONTRACT TYPE (2018)



Source: Zurich Insurance (2019)¹⁶⁸

some countries, pension schemes are not mandatory for self-employed workers and require voluntary enrolment. In addition, some countries do not allow self-employed workers to join general pension funds, but rather create separate schemes. These might be problematic due to their lower scale and associated loss of efficiency (see Infobox 5). As argued in De Nederlandsche Bank’s paper from 2006, scale influences both administrative and investment costs with industry-wide pension funds being more efficient than smaller ones, such as company funds.¹⁶⁹ Lastly, in the case of platform workers, more than 56% of them lack old age income protection of any sort.¹⁷⁰

Evidence of the fears and concerns of atypical workers is also underpinned by additional data on work-life balance and the pressure that new forms of work can create for mental and physical health.



INFOBOX 5. Efficiency of pension funds

The efficiency of pension funds is measured as the return to investment minus the operating costs of the fund. While more people bring more money to the pension funds, two operating costs remain quite similar: administrative costs and investment costs. Administrative costs range from file management to communication with members, while investment costs relate more to activities such as risk management and performance evaluation.¹⁷¹

Work-life balance

ICTs have profoundly transformed the way people work. With the advent of mobile technology, portable computing and the means to communicate anytime and anywhere, the line between work and personal life has blurred. Research shows that the impacts of telework and ICT-mobile work (T/ICTM)¹⁷² on work-life balance are highly ambiguous, if not contradictory. On the one hand, entering the digital world has allowed certain workers to perform T/ICTM anytime and outside of the traditional office environment, thus enabling them to combine personal engagements and family life with a professional career. Furthermore, workers using these technologies report an improved work-life balance due to reduced commuting time and greater working-time flexibility and autonomy.

On the other hand, it has been found that these individuals tend to work longer hours than average employees and often in the evening and over weekends (e.g. checking emails or making phone calls while commuting to/from the office, performing ICT-based work outside office hours). T/ICTM can therefore not only be a substitute to traditional office-based work but also add to normal working hours, which are often informal and unpaid. This creates a blurred boundary between paid work and personal life, with more interferences between the two spheres and a direct impact on workers’ health.

Mental health in the workplace and its economic impact

The changes that digitalisation has brought to the labour market also have implications for workers' mental health. Moreover, as seen in Chapter 1, new technologies are modifying job content and tasks by, for instance, reducing the time for decision-making, creating a constant need to react quickly to events or reducing the number of interpersonal relations in favour of more time spent at a computer. All of these changes put pressure on individuals that can impact mental and physical health, which add to the existing challenges regarding safety and health at work.

New technologies are modifying job content and tasks by, for instance, reducing the time for decision-making, creating a constant need to react quickly to events or reducing the number of interpersonal relations in favour of more time spent at a computer.

When studying the workplace, psychosocial risks and work-related stress are already among the most challenging concerns in terms of occupational safety and health. One in two European workers report that work-related stress is common in their workplace.¹⁷³ Moreover, workers across Europe consider exposure to stress to be the primary occupational risk, followed by ergonomic risks due to repetitive movements or tiring positions.¹⁷⁴ Work-related stress has a negative impact on productivity, reduces worker performance and causes absenteeism.

Health and safety risks have also been associated with new forms of work enabled by ICTs, such as crowdsourcing.¹⁷⁵ Particularly concerning are the psychosocial risks that might arise from the peculiar working conditions in such new forms of jobs. Crowdsourcing work is often characterised by a high level of precariousness and flexibility, as the workers are often required to work at very short notice and there is no certainty that they will have work from one day to the next. Many people in these new forms of work experience barriers to social protection, from health services to unemployment benefits. With the addition of risk factors like isolation and lack of social support, it becomes clear that these new forms of work have the potential to negatively impact workers' mental and physical (good) health.

Mental health-related costs are likely to be further aggravated if the working and living conditions of atypical workers are not improved.

The impact of mental health problems on EU societies and economies is already huge. Tens of millions of



INFOBOX 6. The heavy burden of poor mental health across Europe

It has been estimated that in 2016, mental illness affected about 84 million citizens, with the most common disorders being anxiety and depression (46 million people). In 2015, this number was thought to represent more than €600 billion, or more than 4% of the GDP across EU countries. The direct costs for healthcare and social security systems (e.g. medical visits, pharmaceutical and hospitalisation costs, paid sick leave, disability benefits) amounted to €360 billion, while indirect costs caused by lower employment rates, greater absenteeism and lower productivity accounted for the remaining €240 billion. In fact, these figures are an underestimate, as other additional costs (e.g. social assistance, work-injury benefits, lost working hours for informal caregivers) are not accounted.¹⁷⁷

Europeans suffer from a mental health problem every year. The direct costs of mental illness on healthcare and social security systems and indirect costs on the economies are estimated to be enormous (see Infobox 6). Furthermore, mental health-related costs are likely to be further aggravated if the working and living conditions of atypical workers are not improved.

3.2 THE SUSTAINABILITY OF THE WELFARE STATE

Broadly speaking, the main challenge for current social protection systems is the growing imbalance between the number of welfare beneficiaries and welfare contributors. This imbalance is influenced by several factors, not least demographic ageing and unemployment.

One way to assess the sustainability of our welfare state is to look at the so-called economic dependency ratio (see Infobox 7). Figure 19 indicates the recent evolution of the economic dependency ratio from 2008 to 2016. While the reduction in unemployment in recent years has led to a slight decrease in the economic dependency ratio, there has been an overall increase from 61.6% in 2008 to 64.1% in 2016. This correlates with the ageing of the European population and the growing number of people drawing their pension.

Looking at the evolution of the economic dependency ratio can help explain how this relation will change over time and the magnitude of the efforts needed to curb the imbalance. By doing so, Figure 20 presents two scenarios for the future economic dependency rate. For the number of employed and unemployed, the projections were developed using Eurostat population projection data by age group and hypothetical employment and unemployment rates. With respect to the number of



INFOBOX 7. Economic dependency ratio

Economic dependency ratio is an indicator which describes the relationship between those who are economically dependent (e.g. unemployed persons of working age, pensioners) and economically active (15-64 age group). This indicator is helpful when analysing how much pressure an economy bears in terms of its non-productive population and how this is compensated by the population in employment.

Fig. 19

ECONOMIC DEPENDENCY RATIO OF EU28 COUNTRIES

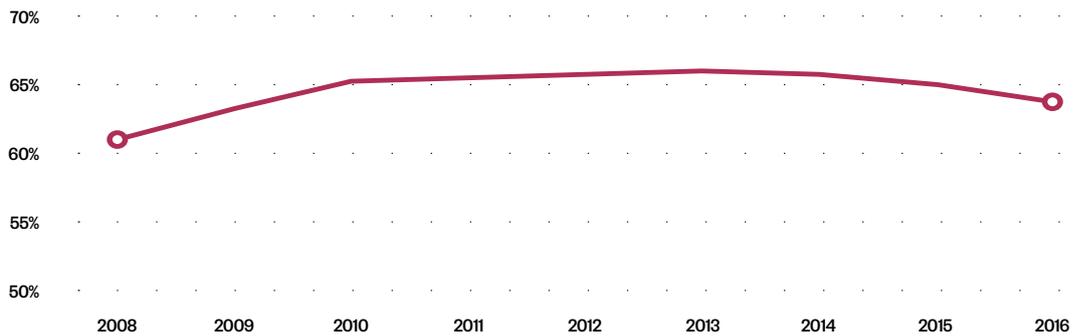
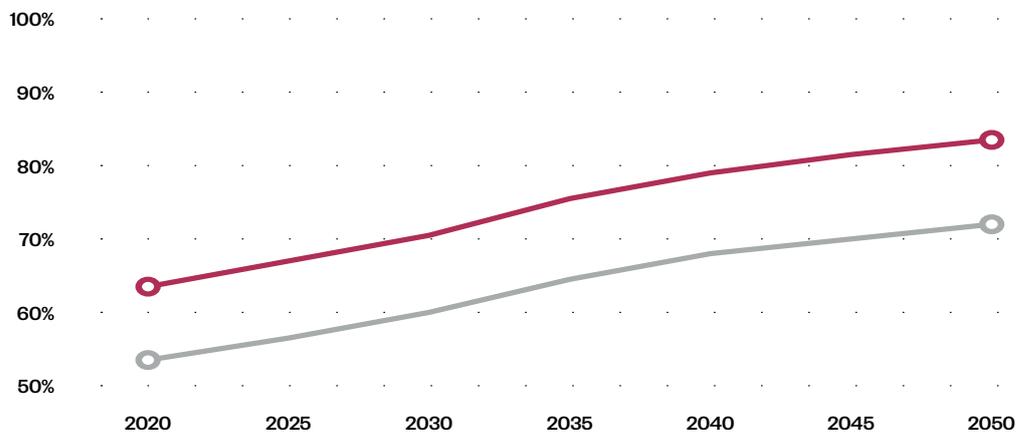
Source: Authors, based on Eurostat¹⁷⁸ and the European Commission 50 the 2018 Ageing Report

Fig. 20

ECONOMIC DEPENDENCY RATE PROJECTIONS

Source: Authors, based on Eurostat¹⁷⁹ and the European Commission 50 the 2018 Ageing Report

pension beneficiaries, Figure 20 uses the projections in the European Commission's 2018 Ageing Report.¹⁸⁰

Many atypical workers will not be able to access decent pensions. Therefore, there is a risk of them becoming the new 'retired poor', dependent on additional welfare provisions and creating additional burdens for the welfare state.

The first scenario presented in Figure 20 (red curve) assumes a constant level of employment and unemployment based on 2018 rates (i.e. 73.7% employment rate and 7% unemployment rate). According to this scenario, the dependency rate will reach 83.5% by 2050. In absolute numbers, this would mean that 220 million workers will support 184 pension and unemployment provision beneficiaries.

The second projection (grey) makes more generous assumptions about future employment and unemployment rates (80% employment rate and 3% unemployment rate). According to this projection, dependency falls to 71.9% by 2050. The difference with the first scenario shows how the employment rate can influence the equilibrium between welfare beneficiaries and contributors, and in the end, the sustainability of the welfare state.

While the projections made above point to the importance of maintaining high levels of employment, they do not take into consideration the growing number of people engaged in new forms of work. Given their limited social protection coverage and lower old age protection (as discussed in Chapters 2 and 3), many atypical workers will not be able to access decent pensions. Therefore, there is a risk of them becoming the new 'retired poor', dependent on additional welfare provisions and creating additional burdens for the welfare state. As a result, the already gloomy projections are likely to look worse. Furthermore, it is fair to say that the employers and employees engaging in typical work

arrangements will be subsidising our welfare system by supporting people who have not been able to put aside financial savings to cope with socioeconomic risks, such as sickness, parental leave or old age.

Due to this issue, many point to the need for workers to access private insurance. However, as shown by the Zurich Insurance and Oxford University study,¹⁸¹ there is an unequal distribution of insurance products across workers. In each country women own fewer insurance products (ranging from 13% to 33%) than men (14% to 39%). In addition, workers involved in knowledge-intensive jobs tend to own such products more than manual workers. In a nutshell, the study points out that more vulnerable workers appear to have less protection. In view of this, it is clear that more needs to be done to ensure a more equal distribution of insurance products across workers and guarantee the long-term sustainability of the welfare state.

3.3 PERSPECTIVES FOR OUR FUTURE SOCIAL CONTRACT

The erosion of the contributory tax base and the emergence of financing gaps jeopardises the viability of our social contract and the main principles underpinning it. Our social contract is based on solidarity between generations and socioeconomic groups. This contract strives to give working people a just share of economic progress and wealth, and, together with the former structure of the labour market where labour had high return, it has helped contain the rise in inequality and establish a strong middle class. The major tools in turning such a contract into reality include social protection, redistributive mechanisms and social dialogue. At the same time, our social contract has largely contributed to social justice, socioeconomic cohesion and peace, which have convinced most people that an economy underpinned by such a social contract can hold societies together and deliver progress for most.

The new income distribution between labour and capital has put additional strain on social dialogue.

Social dialogue is fundamental in accompanying transitioning workers by coupling them with employers to identify joint solutions together and reach agreements through collective bargaining. Historically, social dialogue has played an important role in improving the wages and working conditions of millions of European workers. Nevertheless, social dialogue is not always as constructive in some sectors and countries as it should be, firstly because the unionisation of workers is on the decline in almost all EU countries. This is now amplified by the growing number of atypical workers who are potentially not covered by any collective agreement. Secondly, because social partners often operate defensively, they undermine the capacity to work together and define a joint agenda.

Furthermore, the new income distribution between labour and capital has put additional strain on social dialogue. This distribution has increasingly benefited capital to the detriment of labour, thus diminishing the bargaining power of workers and weakening the link between productivity gains and wages. In fact, wages as a share of GDP have fallen in the most advanced economies since the late 1970s while the profit share has risen (see Figure 21).¹⁸²

Europe's ability to reinvigorate a constructive and efficient social dialogue will determine how inclusive tomorrow's world of work will be.

Additional existing trends foreshadow the dismantling of our social contract, raising central questions about its future. The coverage gaps in our social protection system and the emergence of new groups of workers falling through the cracks of labour regulation, as described earlier, is but one signal. Another is the increased polarisation of the labour market, which appears set to continue, with the rapid spread of digitalisation and automation and the corresponding challenges for the middle class. Numerous EU countries witness growing inequalities, with middle incomes growing more slowly than those at the top (see Figure 22) and an increased level of vulnerability and insecurity among the middle class. Besides changes in income distribution, however, the question of the composition of the middle class appears to endanger our social contract. In fact, according to an OECD study,¹⁸³ the relationship between occupational skill level and household income is changing. Whereas previously middle skilled jobs were largely held by the middle class, this is no longer true today. In other words, the probability that middle skilled workers are in the lower-income class has increased significantly.

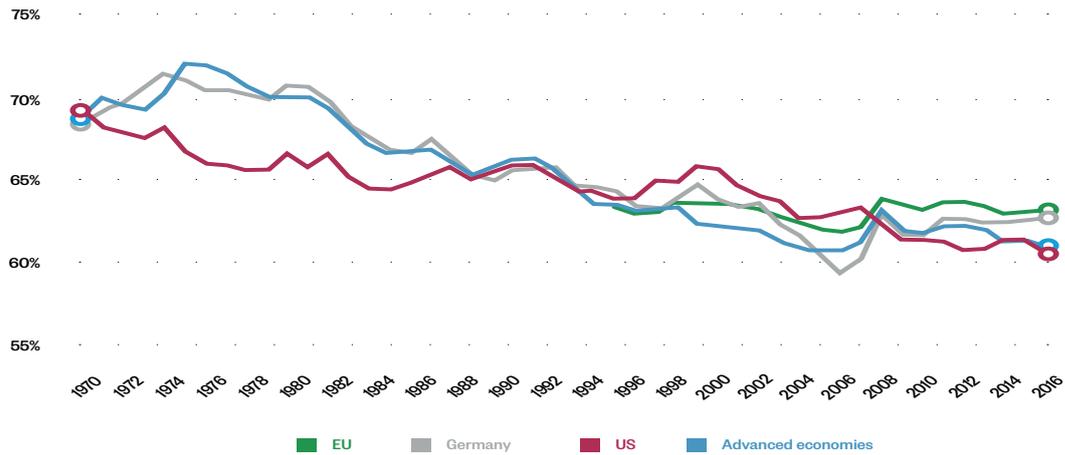
Despite its weakening, social dialogue remains a crucial instrument to address these growing challenges. Its role in framing the world of work and ensuring that all workers are represented equally with a strong bargaining position regardless of the sector and company they work in and/or their employment status will be fundamental. In short, Europe's ability to reinvigorate a constructive and efficient social dialogue will determine how inclusive tomorrow's world of work will be.

3.4 INTERIM CONCLUSIONS

While it is true that atypical workers have less social protection coverage and less bargaining power, as described in Chapter 2, the new realities of people's working lives have, in general, less visible but equally insidious consequences. People's working environments (as a general trend, i.e. regardless of their employment status) appear to be more stressful than in the past and technologies often blur the line between private and

Fig. 21

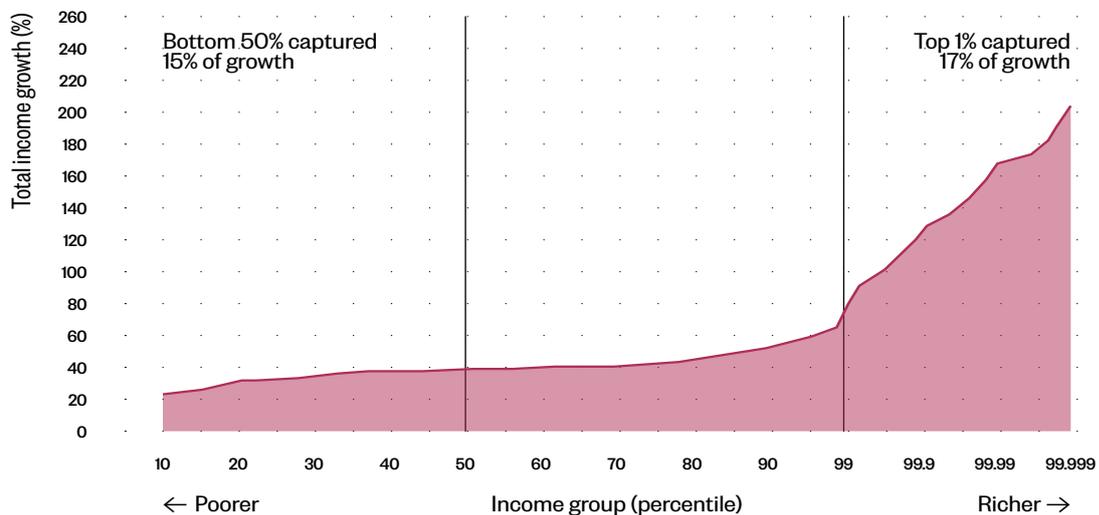
ADJUSTED WAGE SHARE OF GDP (% , 1970-2017)



Source: Carlén (2019)¹⁸⁴

Fig. 22

INCOME INEQUALITY AND GROWTH IN EUROPE (% , 1980-2017)



Source: Blanchet, Chancel and Gethin (2019)¹⁸⁵

professional lives. In addition, atypical workers face a number of fears and anxieties, such as job insecurity, lack of predictability and income insecurity in old age. All of this has made mental health problems a salient issue of the 21st century.

Moreover, the effects are also at the society level. The diversification of work arrangements reduces the number of people who effectively contribute to

our welfare system, thus aggravating the already unsustainable relationship between welfare beneficiaries and contributors. This also undermines our social contract and its redistributive principle at a time when technologies are accelerating the polarisation of the labour market and the erosion of the middle class.

Chapter 4: Addressing labour market transformations – A proliferation of initiatives and actors

The pressing question of whether Europe's welfare states can withstand the much-publicised labour market transformations has pushed member states, their governments as well as a number of labour market players to act. The measures undertaken so far are various and deal with different aspects of the changing nature of work and its consequences, leading to a proliferation of initiatives and actors. This chapter reviews some of these initiatives by distinguishing them by type of actors: public authorities at the national level (4.1), private sector (4.2), and the European and international governance levels (4.3). It also considers the consequences this proliferation of initiatives and actors might have for the future design of Europe's welfare states, especially for the delivery of certain welfare provisions.

4.1 PUBLIC POLICIES AT THE NATIONAL LEVEL

Given the broad implications that the future of work has for the entire economy, European countries are trying to formulate policy responses to prepare societies and equip people for upcoming changes. The policy measures span a broad spectrum of aspects, from enhancing social protection provisions, addressing grey areas in labour regulations, ensuring effective social protection coverage (including previously excluded groups) and providing equal rights to training. The policy priorities vary from one country to another, as do their target groups. For instance, while some countries focus on issues associated with part-time work, others prioritise their actions towards temporary workers and/or the self-employed. The reform agenda followed by each country and its concrete outcomes therefore depend on a number of factors, such as the current provisions in national labour laws, the efficiency and constructivism of social partners, the scope of existing coverage gaps, welfare traditions and the intensity of public pressure on certain aspects.

The reform agenda followed by each country and its concrete outcomes depend on a number of factors, such as the current provisions in national labour laws, the efficiency and constructivism of social partners, the scope of existing coverage gaps, welfare traditions and the intensity of public pressure on certain aspects.

This section presents a set of inspiring initiatives that showcase how the welfare state can adapt to labour

market transformations by adjusting and modernising its policy and regulatory framework. The measures highlighted below have been selected according to their relevance to the main challenges raised in Chapters 1 and 2, not least the unequal access to training opportunities, the misclassification of workers, the absence of labour market intermediaries and collective bargaining power for self-employed workers, in-work poverty as well as the social protection coverage gaps between standard employees and atypical workers. Most of them have also been discussed throughout the activities of the EPC project, "The future of work – Towards a progressive agenda for all".

Starting with unequal access to training opportunities, several countries are trying to address the cost differential associated with training programmes for different categories of workers. In fact, access to upskilling programmes supported by public subsidies might be denied to some categories of workers, such as the self-employed. The solution developed in Austria was to put in place regional funding schemes which can be accessed by paying social contributions. As an example, the so-called waff training account developed in Vienna provides training grants to a specific group of self-employed workers, the *Neue Selbständige*, including artists and journalists, which represents a hybrid category between employees and self-employed workers.¹⁸⁶

France is also currently putting in place a major reform of its training system, the *Compte personnel de formation*, overhauling the landscape of vocational training. Among the novel elements of the reform is the creation of individual rights to vocational training for all active people that can be accessed, updated and managed directly by individuals on a digital platform. Through their individual accounts, workers can have access to certain certified training programmes corresponding to their professional path and possible desire for up- or reskilling. Each training programme is converted into a certain amount of euros and individuals' accounts are credited on a yearly basis, depending on the number of hours worked.¹⁸⁷

On the issue of worker classification, there are a great number of policy responses. One approach pursued by Slovenia and the Netherlands is to reduce the tax differences between different contracts to reduce the incentive for misclassification. Another measure is to enforce existing regulations for workers' classification by simplifying enforcement procedures or by creating targeted inspections. In its attempt to implement this kind of policy, Ireland issued inspections based on consultations with trade unions.¹⁸⁸ Another solution comes in the form of extending rights to workers in the



CASE STUDY 1: The extension of employment protection in Italy

On 11 January 2019, the Court of Appeal of Turin ruled that compensation to home delivery platform workers should be based on the compensation paid to employees of the same sector. This ruling builds on Article 2 of Legislative Decree 81/2015 which established the extension of employment protection to autonomous (i.e. self-employed) workers who continuously collaborate with a main client who organises their activity in terms of workplace and working time.¹⁸⁹

grey area. In this respect, in January 2019, an Italian court ruled that the compensation for home-delivery platform workers should be based on the compensation paid to employees in the same sector (see Case Study 1).

As regards social dialogue and self-employed workers' rights to collective bargaining, experiences vary greatly across countries, and some member states have implemented inspiring practices. For instance, some existing unions in Germany opened their membership to platform workers (i.e. IG Metall and ver.di, which are the two largest unions in Germany).¹⁹⁰ In France, besides existing unions integrating platform workers, there is also the example of drivers of a large platform creating their own union.¹⁹¹ Moreover, in 2018, the first collective agreement between a social partner and a platform was signed in Denmark.¹⁹²

Closing social protection gaps for workers has already been subject to intense policy efforts across the EU, even if the issue is far from being resolved. The policy responses implemented so far tackle different problems and therefore take various forms, such as lower legal minimum thresholds on working time, duration of employment or earned income to become eligible for social protection schemes; harmonised social protection schemes across types of workers; or the possibility for self-employed workers to accumulate entitlements in individual accounts. As regards the first aspect, the Netherlands has made sure that every hour worked by part-time workers counts towards social insurance contributions, thus removing legal minimum thresholds. A similar approach has been implemented in Denmark whereby a new unemployment benefit scheme treats all income sources equally (see Case Study 2). In addition to creating a level playing field, it also encourages the transition between salaried employment with other forms of work such as self-employment or platform work.



CASE STUDY 2: The new unemployment insurance scheme in Denmark

In May 2017, Denmark adopted a new unemployment insurance scheme for workers in non-standard jobs. The reform seeks to provide better unemployment insurance coverage to the growing number of workers in new or combined forms of employment (e.g. self-employed workers, persons with multiple jobs, persons combining employment and self-employment). Under this new scheme, eligibility rules are based on the total (work-related) income, which also comprises earnings from salaried employment, non-standard and self-employment.¹⁹³

With respect to entitlements for self-employed workers, some countries have integrated them into existing social security schemes, while others such as Italy,¹⁹⁴ Spain¹⁹⁵ and France have created separate schemes which allow certain categories of workers to have access to unemployment benefits. This is the case for 'dependent self-employed workers', which constitute a distinct category in Spain and Italy, and for artists in France.

4.2 PRIVATE INITIATIVES

The private sector has not been exempt from pressure to change and has used its creative power to address the growing public attention that new forms of work have sparked over the recent years.

The most well-known example is Uber, the transportation company which organises its services around digital applications. Uber started a decade ago as a provider of ride-hailing services through a smartphone app. It is active today in more than 600 cities worldwide, with some 3 million drivers and delivery partners globally, of which more than 150,000 are in the EU.¹⁹⁶ Uber's business model is based on connecting passengers to drivers who use their own cars to provide the service. Such a business model entails no exclusivity, minimum commitment nor shifts, meaning that drivers are not bound to working schedules and can choose when and for how long they will provide the service. The profits from the ride are then divided between Uber and the drivers. While it started as a company offering car rides on demand, it has expanded today to provide services ranging from sharing on-demand electric bikes to delivering food.

The private sector has not been exempt from pressure to change and has used its creative power to address the growing public attention that new forms of work have sparked over the recent years.

The degree of flexibility that characterises Uber's business model is also a reason for harsh public criticism, as flexibility comes at risk of precariousness for the workers. For a long time, Uber has been seen as the symbol of labour market deregulation and new forms of precarious work, to the extent that the 'Uberisation of work' is now a term referring to the gig economy and its implications for new models of work. The criticisms are mostly related to concerns that such new forms of work are insecure and fragmented, with poor, if any, access to social protection. Work on demand, such as that on the app-driven labour market, is temporary and irregular by nature, and does not offer job security or income stability.

Uber is attempting to address public criticism of its business model and workers' complaints by reconciling independent work, flexibility and decent working conditions. In 2018, it launched the Partner Protection Insurance,¹⁹⁷ an EU-wide

insurance package at no extra cost to the drivers. The central feature of this scheme is that it offers both on- and off-trip coverage, providing the drivers with protection in case of accidents while driving, but also coverage in case of events while off-trip, such as one-off maternity and paternity payments or compensation for severe sickness and injury (see Infobox 8).



INFOBOX 8. The Uber insurance package¹⁹⁸

Uber's insurance scheme offers both on- and off-trip coverage. All independent/self-employed Uber partners are eligible for the benefits of on-trip coverage. Off-trip benefits are accessible to 'Active Uber Partners', or workers who completed 150 (drivers) or 30 trips (delivery partners) in the 8 preceding weeks. Off-trip coverage comprises benefits such as one-off maternity and paternity leave of €1,000, and compensation for sickness or injuries amounting to a daily payment of €40 which start from day 8 up to a further 15 days.

Other innovative initiatives aiming to either enhance the social protection provisions of atypical workers or address the wider implications their employment status has on their life can be found among private employment agencies. In that respect, the World Employment Confederation, which represents the recruitment and employment industry at the global level, has launched a database collecting the best practices of the sector. One of the examples provided in their Social Innovation Stories database¹⁹⁹ is in the Netherlands where agency workers were unable to apply for a mortgage loan, thus representing a major hindrance for such workers to create personal safety nets. Together with banks, the Dutch association for employment agencies set up an accredited method allowing for the big data assessment of a person's future employability and earning capacity. This assessment is then presented in a 'prospect statement' that banks can use in their decision to provide the loan. Another example can be found in France, where the French association of private employment agencies, *Prism'emploi*, offers a supplementary health insurance scheme to agency workers. This scheme complements the one provided by the French state and covers medical costs and hospitalisation for workers and their family members.²⁰⁰

Finally, the current shifts reshaping the world of work have led to the emergence of new intermediary bodies. For instance, SMART²⁰¹ is a Europe-wide cooperative of freelancers founded in Belgium in 1998, with offices in other eight European countries. It is a not-for-profit organisation that acts as a labour market intermediary between workers and firms and provides a wide range of services to its members, from administration to accounting and financial services. By joining this organisation, self-employed workers become 'formally employed' and benefit from mechanisms that are in place for standard forms of work, such as income predictability.

More specifically, SMART invoices contractors on behalf of its members and pays the salaries directly to the latter, after deducting taxes, contributions and a fee. Income predictability is ensured by means of SMART advancing the payment of the salary, even if the contractor has not yet paid the invoice. This intermediary role extends to other

services such as legal assistance, training, provision of insurance against client bankruptcy and co-working spaces.

4.3 INTERNATIONAL RESPONSES AND EU POLICIES

Addressing the ongoing labour market transformations and seizing the opportunities presented by such changes to strengthen the welfare state and make it fit for the future are also priorities identified at the supranational level. Policy recommendations and frameworks of principles have been designed to support national governments in their actions.

The future of work is shaping the international agenda by becoming, for instance, a major topic discussed in the G20 forum. In 2018, the heads of state met to discuss policy options for issues associated with the future of work,²⁰² to disseminate ideas and spearhead proposals to make the economy more productive, redistribute the wealth created by automation and implement fair taxation for new forms of work. Apart from the policy examples, the meeting stressed the importance of improving international coordination, increasing knowledge-sharing and finding room for common efforts on how to accompany the future of work.

Additionally, and as part of its Future of Work Centenary Initiative, the ILO set up the Global Commission on the Future of Work, an independent and diverse group of experts, in August 2017 to examine the changes occurring in the world of work and provide recommendations to address the challenges posed by such changes. In its landmark report, published in January 2019, the Global Commission outlines a vision for a "human-centred agenda for the future of work"²⁰³ that places people and their work at the centre of social and economic policies. The report puts forward a set of recommendations to promote people's capabilities, ensure that the institutions of work are fit for the future, and provide decent and sustainable work opportunities for all.

In particular, the Global Commission calls on national governments to invest in people's capabilities through a universal entitlement to lifelong learning. An effective lifelong learning ecosystem would enable people to receive the necessary formal and informal learning, from basic education to adult and in-work training, thus supporting them through future of work transitions, including changes triggered by new technologies. The report also calls for guaranteed universal social protection, from birth to old age, to support workers and their families and help them participate in the labour market. Governments must design social protection systems that afford a basic level of protection to all in need and extend adequate protection to all types of workers.

The Global Commission also calls on governments to strengthen the institutions governing work, as an important step to reducing inequality, enhancing security and ensuring social justice. In particular, it suggests the establishment of a Universal Labour Guarantee, including workers' fundamental rights and a set of basic working

conditions, such as limits on hours of work, an adequate living wage and safe and healthy workplaces. Moreover, the Global Commission emphasises the need for governments and employers' and workers' organisations to closely monitor and steer the impact of new technologies on work. In particular, the report suggests adopting a "human-in-command" approach towards the deployment of AI solutions to make sure that final decisions impacting work are always taken by humans. When considering the diversification of work arrangements, especially platform work, it also recommends the development of an international governance system that establishes a set of minimum rights and protection to be guaranteed to platform workers and clients.

The Pillar is the most comprehensive EU initiative relevant to the challenges raised by the future of work since it addresses the areas of equal opportunities and access to the labour market, fair working conditions, as well as social protection and inclusion.

When moving from the international to the European context, it is important to consider EU institutional action in pushing for greater social progress and cohesion between and within EU member states.

This ambition is well reflected in the European Pillar of Social Rights (EPSR),²⁰⁴ an interinstitutional proclamation by the European Commission, the Council and the Parliament that was adopted and launched in November 2017 at the Social Summit of Gothenburg. The Pillar is designed as a set of 20 principles and rights aiming to serve as a compass for a renewed process of upward convergence towards better working and living conditions. It is the most comprehensive EU initiative relevant to the challenges raised by the future of work since it addresses the areas of equal opportunities and access to the labour market, fair working conditions, as well as social protection and inclusion.

As part of the rollout of the Pillar, a set of legislative measures have been put in place, including:

- ▶ a Regulation establishing a European Labour Authority 2019/1149;
- ▶ a Directive on work-life balance for parents and carers;
- ▶ a Directive on Transparent and Predictable Working Conditions 2019/1152; and
- ▶ a Council Recommendation on access to social protection 2019/C 387/01.

In June 2019, the Parliament and the Council adopted the Regulation establishing a European Labour Authority²⁰⁵ to ensure the effective application and enforcement of

EU law related to labour mobility. The Authority, which will have an annual budget of approximately €50 million, will assist member states and the Commission with the coordination of social security systems across countries.

Along with the establishment of the Authority, the Directive on work-life balance for parents and carers was adopted in June 2019 with the main objective being to reconcile parents' and carers' professional and private lives while also increasing the participation of women in the labour market. To that end, the Directive introduces measures such as the individual right to four months' parental leave, a carers' leave for workers caring for relatives and the right for these workers to request flexible arrangements.

The Directive on transparent and predictable working conditions in the European Union was adopted in June 2019. This revised Directive, repealing Directive 91/553, aims to guarantee that all workers, regardless of previous specific working arrangements, should be provided with more in-depth and complete information regarding essential aspects of their work (e.g. place of work, description of the work, remuneration), which are to be received by the worker, in writing, either by the seventh calendar day starting on the first working day or within one month of the first working day (the timing depends on the type of information to be provided), instead of up to two months afterwards, as it is now. The Directive stipulates that the text will apply to "every worker in the Union who has an employment contract or employment relationship as defined by the law, collective agreements or practice in force in each Member State with consideration to the case-law of the Court of Justice".²⁰⁶ Thus, all workers who match the criteria established by the Court of Justice of the European Union (CJEU) will be covered by this Directive (including those working on a zero-hours contract), except those whose predetermined and actual working time is equal to or less than an average of three hours per week in a reference period of four consecutive weeks. In addition, it is important to note that self-employed persons do not fall within the scope of the Directive.

In March 2018 the Commission tabled a proposal for a Council Recommendation on access to social protection of workers and the self-employed to support workers in non-standard forms of employment and self-employment who have limited access to social protection and are thus exposed to higher economic insecurity. The ministers for employment and social affairs adopted the Recommendation during the Employment, Social Policy, Health and Consumer Affairs Council (EPSCO) in November 2019.²⁰⁷ This Recommendation calls on member states to provide access to adequate social protection to all workers and self-employed persons and to establish minimum standards in this field.

In addition, the Commission commits to support member states in achieving the objectives of the Recommendation by promoting mutual learning activities, improving statistics on social protection, and establishing a monitoring framework to assess the national implementation of the Recommendations. In return, member states are asked to provide reliable and detailed

data on access to the various forms of social protection and submit a plan setting out the corresponding national measures of the Recommendation.

Besides legislative measures, the Commission also made real efforts to mainstream the EPSR across the EU's main strategic instruments. For instance, the documents issued as part of the European Semester,²⁰⁸ not least the country reports, refer to the Pillar and consider aspects such as poverty and social exclusion, labour market segmentation, in-work poverty as well as social protection. Furthermore, these reports also assess the performance of each country against a set of employment and social indicators called the Social Scoreboard,²⁰⁹ which is designed to support the monitoring of the Pillar.

The methodology²¹⁰ applied to the Social Scoreboard is well thought out as it provides a comparative analysis over time and across countries, thus encouraging progress and peer pressure. In addition, the Commission has often referred to how the EU budget could be used to support the implementation of the Pillar and its accompanying measures. The Commission has advanced different proposals to strengthen the Union's social dimension through EU funds for the next EU budget 2021-2027. In particular, the European Social Fund Plus (ESF+), the EU's main instrument to implement the principles of the Pillar, should count on a budget allocation of €101 billion for the next financial period, while a budget of €1.6 billion should be allocated to the European Globalisation Adjustment Fund (EGF) to continue supporting workers adjusting to major structural changes caused by globalisation.

The proposed InvestEU Programme is also a good tool to finance projects in social innovation, skills and education, healthcare and integration of vulnerable groups, thus contributing to the implementation of the Pillar. Lastly, in its Recommendation on access to social protection, the Council also invited the Commission to support member states' efforts to promote access to social protection by mobilising funds from the relevant Union programmes.

Lastly, the European Commission has been active in the field of education and training. In 2010, it launched the Digital Agenda for Europe²¹¹ as part of its Europe 2020 Strategy to maximise the social and economic potential of ICTs. Building on this background, Commission President Juncker announced the creation of a connected Digital Single Market (DSM)²¹² in 2014, aiming to pursue three major objectives: (1) providing better access to online goods and services across Europe; (2) creating the right environment for digital networks to flourish; and (3) maximising the growth potential of the European digital economy.

Within the DSM Strategy, the Commission also recognised the need to promote and increase digital skills and expertise to meet the ever-increasing demand for digitally skilled workers. In this vein, the digital and skills agendas seem to go hand in hand. In fact, digital competences form part of initiatives that the Commission

has taken to strengthen human capital and enhance skills. In 2016, the Commission launched its New Skills Agenda for Europe,²¹³ which has a specific focus on digital skills and the need for member states to invest more in digital skills formation across the entire spectrum of education and training.

The EU's original ambition has tended to be scaled down throughout the negotiation process with member states.

Despite significant progress, it is important to highlight the limitations of the ongoing measures. First and foremost, one can notice that some of the solutions brought up so far, in particular the Directive on Transparent and Predictable Working Conditions, fail to address the entire problem at stake. In fact, while it provides considerable improvements for workers fulfilling the criteria of an employment relationship defined by the CJEU, it excludes self-employed persons, not least the 'bogus self-employed' who are among the most vulnerable. In addition, legal experts have highlighted that while the employment relationship of platform workers could be easily recognised for some, this is not the case for a crowd-worker who falls outside the scope of the Directive.

Another noteworthy point is that the EU's original ambition has tended to be scaled down throughout the negotiation process with member states. For instance, when considering the Council Recommendation on access to social protection for workers and the self-employed, the initial ambition of the European Commission was to propose a Directive. In the same vein, the initial ambit of the Directive on Transparent and Predictable Working Conditions was to provide a codified definition of a worker derived from the CJEU's case-law.²¹⁴ In addition, it is important to bear in mind that the Pillar remains a non-binding document. Its implementation depends therefore on member states' good will and interpretation.

4.4 INTERIM CONCLUSIONS

This chapter indicates how the changing nature of work has crystallised public attention in recent years and provided fertile ground for the proliferation of initiatives undertaken at different policy levels and by various actors. This has made public authorities particularly sensitive to the possible consequences for our welfare system, our social contract and societies in general.

In one sense, it reveals the discrepancy between the established functioning of our welfare regime and new economic and social realities it has to cope with. Another aspect is the transitional nature of the phase Europe finds itself in, where a multitude of actors attempt to fill in existing gaps, address workers' claims, and/or provide their own solutions to a tremendous challenge.

While these initiatives are very positive in the short run and must be warmly welcomed as they respond to the immediate needs of certain workers, the welfare state should also identify how all of these new measures can coexist in order to create a level playing field for workers. Thus, the coordination of ongoing initiatives is highly needed to achieve comprehensive solutions that can fit the ever more complex realities of today's world of work. In the absence of such coordination, there is a risk of ending up with a patchwork of piecemeal measures rather than a fully-fledged strategy on how to address the diversification of work arrangements. The question of how to define a social contract that is fit for the future should lie at the core of such strategy.

Finally, this chapter has shown how the future of work is gradually making its mark on public authorities' reform agendas. While inspiring reforms take place at the national level, the EU and international levels are also becoming increasingly attentive to the effects of labour market transformations. As regards the European level, recent measures, in particular the EPSR

and its mainstreaming into the European Semester and EU financing instruments, represent major policy developments, which should be warmly welcomed. However, there are important limitations to existing EU initiatives that make the success of its future of work agenda highly dependent on cooperation with and the support of other players, such as national authorities courts of justice, and social partners.

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Chapter 5: Solutions for a progressive agenda on the Future of Work

The previous chapters of this study highlighted the transformations that are currently shaping European labour markets, the difficulties they pose for workers, society and our welfare system, and the plethora of initiatives to develop new solutions to emerging challenges. Despite the importance of such initiatives in stressing the dichotomy between new labour market realities and the current social protection system, and their relevance to testing new solutions, this study has also shown that preserving our social contract requires more than a patchwork of measures.

Europe is currently in a transition period where labour market changes are testing the resilience of the established institutional and regulatory framework, and gradually dismantling it. This transition gives rise to a number of phenomena described earlier in this Issue Paper. They include the emergence of various economic actors trying to either take advantage of existing loopholes or weave their way into the new realities, mounting frictions between economic actors and the state, new forms of inequality, and the development of social innovation which is vehemently trying to offer new solutions to economic, social and societal challenges.

In the midst of this transition period, the EU and its member states are faced with two options: to either allow this period to take its course and give free rein to market forces, thus accepting the gradual dismantling of our welfare state, or unleash systemic changes that can live up to the enormity of current challenges.

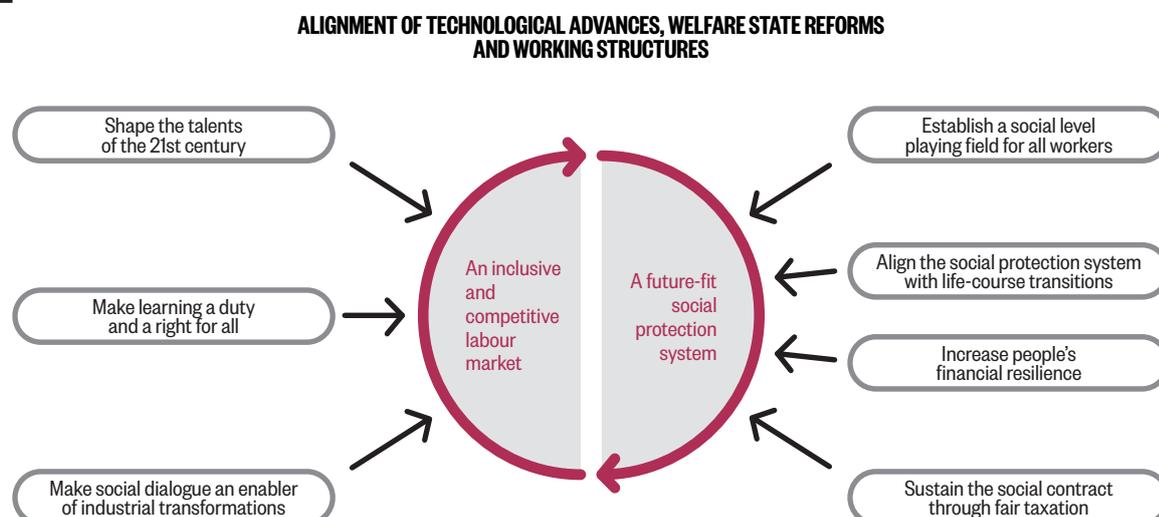
This chapter will present a number of policy recommendations that have the potential to unleash

systemic changes and allow for a redefined alignment of technological advances, the functioning of welfare states and working structures. Each of these recommendations is underpinned by concrete actions requiring the support and involvement of specific stakeholders. Particular focus is given to the role of the EU. The objectives of such actions are both to guarantee an inclusive and competitive labour market while shaping a social protection system that is future-fit. In fact, it would be wrong to address these two areas separately, as the future of the labour market and the social protection system are in reality closely interlinked.

Europe is currently in a transition period where labour market changes are testing the resilience of the established institutional and regulatory framework, and gradually dismantling it.

While the functioning of the social protection system should take new employment realities into account, the performance and inclusiveness of the labour market contribute to the sustainability of the social protection system. Therefore, the reforms undertaken in each of these two areas must become mutually reinforcing. Figure 23 below summarises the systemic changes that are necessary for the so-called redefined alignment. They are presented in depth in the following sections.

Fig. 23



5.1 TOWARDS AN INCLUSIVE AND COMPETITIVE LABOUR MARKET

► Shape the talents of the 21st century

Chapter 1 shows that the EU is losing ground to other regions of the world when it comes to innovation and technological leadership at the global level. Therefore, strengthening the EU's know-how in new technologies and fostering their faster and broader application in European businesses are imperative for Europe's future competitiveness, the health of its economy and job creation. To do so, three specific actions need to take high priority.

Strengthening the EU's know-how in new technologies and fostering their faster and broader application in European businesses are key to Europe's future competitiveness, the health of its economy and job creation.

First and foremost, there is an urgent need to spread digital literacy across all groups of the labour force and democratise access to digital skills, which is far from being the reality today. Digital skills remain unevenly distributed across age groups, educational levels, genders and household income. Given that almost all jobs require at least basic digital skills, the EU cannot afford to ignore a large part of its labour force by not investing in digital literacy. Digital skills should be taught from an early age and integrated into school curricula. More efforts must also be put into the training of teachers so that they feel comfortable using digital devices in their classrooms and into the adequate equipment of schools. Programmes aiming at the labour market integration of vulnerable young people should also entail strong digital elements.

In that respect, inspiring programmes exist across Europe (sometimes supported by the EU itself) and their visibility needs to be reinforced, not least through an even better outreach of already existing initiatives, such as the [All Digital Week](#) or the [Europe Code Week](#). However, it is important to recall that it is not young people who are most affected by digital illiteracy. Senior workers struggle disproportionately to cope with the fast-paced digitalisation of our economy. Intensifying the support measures towards this target group is therefore crucial. It needs to be done through programmes delivered by employment agencies, but also through the deployment of lifelong learning opportunities when people are still in employment (see following section).

While basic digital skills are a necessity, they will not suffice to make the EU a world champion in new technologies. To this end, the EU should train tech-savvy specialists and increase its capacity to attract digital talent. Chapter 1 indicates that the EU is lagging behind in that respect, as compared to other regions of the world

(i.e. US, Asia). To reverse this worrying trend, the EU must develop and finance research and training programmes in advanced digital technologies at the university level and ensure that Europe is home to some of the top universities in this area. Pooling research centres and creating a benchmark of European universities in the field of digital technologies are examples of concrete initiatives the EU could take. However, good universities are not the only determinant for retaining talent in Europe. They must be part of an ecosystem with research centres and industries, where fundamental and applied research can nurture one another. Such ecosystems of advanced digital technologies need to be given top priority in existing and future EU policies, not least in the context of the smart specialisation strategy and cohesion policy.

Lastly, mastering technologies and having at least a moderate level of digital skills will need to be combined with other assets, in particular cognitive and non-cognitive skills. Businesses that are most likely to succeed in tomorrow's labour market are those which will bring together a high and optimal integration of new technologies, strong capacity to understand and anticipate market needs/gaps, as well as robust management and financial capacities. In fact, while machines will mostly replace human labour in the case of discrete, repetitive and predictable tasks²¹⁵ in the future, they will still rely on workers to develop, maintain and upgrade technologies as well as integrate them into business models. Thus, business development and management are examples of cognitive skills that will be in high demand.

At the same time, advanced technologies will create new needs to interpret, tailor and explain data inputs. Understanding customers' expectations, working in teams and being able to deal with unforeseen scenarios that are not anticipated by machines in a short time frame will require non-cognitive skills such as emotional control, openness to learn and adapt, problem-solving, sociability and creativity. This complex mix of skills needs to be carefully reflected in school curricula and further supported by European initiatives. Thus, EU programmes aiming at the education and training of the (future) workforce, such as the ones financed through the ESF+, should give proper consideration to such new realities and integrate this association of skills as one of their major end objectives.

► Make learning a duty and a right for all

All research and information reported by businesses point to a profound skills mismatch and shortages on the labour market, which are likely to be further aggravated without important reforms of how knowledge, in a broad sense, is delivered. While the need to increase investment in digital and technological skills has already been addressed, the delivery of knowledge, skills and competences deserves equal attention.

This Paper has highlighted (mainly in Chapter 1) the tremendous unmet demand for up- and reskilling, thus revealing the limited access to training, the lack of offers on the market and the insufficient investment by private

and public entities. The continuous and rapid pace of technological innovation calls for a complete overhaul of how learning is perceived in society and how it is delivered to people. Too often, the education system prepares students for one specific occupation with a precise set of tasks, whereas people are increasingly likely to change jobs numerous times throughout their career. And even if they hold the same occupation throughout their professional life, their job content will alter due to the introduction of new technologies.

Once people are in employment, they struggle to learn new skills and develop competences in areas they have not received formal training. Europe appears to be particularly bad at providing bridges across occupations and skills. As indicated in Chapter 1, the case of AI is a good example, with evidence showing that becoming an AI specialist once employed is far more difficult in the EU than in the US.

Another characteristic of training programmes is that they tend to benefit higher skilled segments of the workforce more than lower skilled workers, i.e. those who need it most. The root causes of this phenomenon are likely to be linked to the following factors: training programmes are under-represented in industries or sectors where low skilled workers are over-represented; such workers might be less proactive than high skilled people to seek and ask for training opportunities; and, in a context of labour market polarisation and over-supply of low skilled workers, companies might be more interested in investing in high skilled labour, as the return on investment is likely to be higher. Thus, training opportunities become a competitive advantage in a 'war for talent', even though the logic mainly applies to the high skill market. This is a worrying trend as such a phenomenon will keep reinforcing the already unfolding labour market polarisation.

The continuous and rapid pace of technological innovation calls for a complete overhaul of how learning is perceived in society and how it is delivered to people.

Implementing a complete overhaul of how learning opportunities are delivered to workers will require three elements: flexibility, adaptation and cooperation. Flexibility will be required to integrate fast-changing technologies and evolving labour market needs. Adapting to territorial circumstances will also be vital to ensure a better match between labour supply and demand on local labour markets. Finally, cooperation between governments, the education system and businesses will contribute to the success of up- and reskilling programmes.

Together with this complete overhaul, two distinct priorities need to be set simultaneously. The first, which is in line with Principle 1 of the EPSR,²¹⁶ is to make lifelong learning a right for everyone by changing how it is delivered to people. Workers should have equal rights

regardless of their employment status, industry and the company they work in. Several reforms could support this priority. Individual learning accounts, such as the one recently established in France, is an interesting tool to guarantee equal rights and facilitate a better match between demand and supply. The offer of online courses for up- and reskilling then needs to grow exponentially through public support and incentives for universities to develop such tools. Lastly, there should be obligations for companies to invest in their human capital, which should be supported by tax incentives.²¹⁷

Workers should have equal rights regardless of their employment status, industry and the company they work in.

The second priority is to concentrate efforts on those workers who need it most. The current focus of certain EU instruments, such as the EGF, is placed on workers who are directly affected by structural changes in world-trade patterns or shifts in the labour market that are induced by globalisation or digitalisation. While this support is relevant and necessary, there is also a need to assist low skilled workers who are not at immediate risk of dismissal but are trapped in a low skilled and low wage job which offers little to no chance of climbing the skill ladder. This requires a more anticipatory approach in the support programmes developed at the EU and national levels and a strong cooperation with respective industries that are best placed to inform how the market, and the consequent skills requirements, are evolving. Pre-consultations with the industries and a sound understanding of market needs must therefore become a standard feature of the territorial implementation of EU programmes dedicated to education and training.

► Make social dialogue an enabler of industrial transformations

In line with the human-centred agenda proposed by the ILO, the authors of this Issue Paper believe that technological developments need to be steered and controlled by humans. The impact of the fourth industrial revolution and its level of disruption of jobs is indeed not predetermined and will largely depend on human decisions. Thus, advanced technologies can become a great enabler of economic and social progress, not least by replacing workers by machines on dangerous tasks, but they can also have irreversible effects – not only in terms of job disruption but also as regards their ethical implications – in the absence of any control. Therefore, the impact of technologies will be determined by the regulatory framework that humans will be able to put in place.

Against this background, it is essential to involve workers in the design of such a regulatory framework, and social dialogue remains – despite its current flaws – the best instrument to do it. In short, in view of the profound

shifts labour markets are currently undergoing, an efficient and constructive social dialogue where workers, employers and working structures can co-design the solutions of tomorrow is imperative. Thus, it is key to guarantee a well-functioning social dialogue in all industrial sectors, including the ones where work is mediated through digital platforms, and to extend the coverage of collective agreements. Social dialogue will be particularly helpful in two respects. Firstly, it can contribute to anticipating and monitoring the effects of new technologies on job displacement, work content, working conditions and the overall structure of the labour market. Secondly, it can help curb the polarisation of the labour market by setting the pace for technological developments and ensuring that solutions are found for the workers most at risk before the disruption takes effect.

In view of the profound shifts labour markets are currently undergoing, an efficient and constructive social dialogue where workers, employers and working structures can co-design the solutions of tomorrow is imperative.

While the inputs of social partners on these two aspects should be organised according to member state traditions and labour market institutions, they need to span all industrial branches. This also implies that businesses need to report on their plans whenever they decide to make a major investment in technologies that might have detrimental implications for their workers.

The objective of business reporting would not be to hamper technological advances but to promote a culture of dialogue within companies, better manage the impact of technological transformations and introduce a human factor in the cost-benefit analysis of businesses whenever new technologies are introduced. Following such a bottom-up process, social partners should inform national roadmaps on the future of work. The objective of the roadmaps will be to address the numerous aspects of labour market transformations highlighted in this Paper comprehensively and proactively.

Such roadmaps should become an integral part of broader national strategies on social investment, setting out governments' plan to invest in human capital and equip people with the necessary toolkits to cope with ongoing changes. The European Semester needs to play a strategic role in that respect (e.g. by asking member states to develop a social investment strategy based on an analysis of labour market transformations in the country reports). While complementing the rights-based approach of the EPSR, this strategy should then be put into action at the national level, while its implementation should be considered during the formulation of country-specific recommendations.

5.2 TOWARDS A FUTURE-FIT SOCIAL PROTECTION SYSTEM

► Establish a social level playing field for all workers

As stipulated in Principle 12 of the EPSR²¹⁸ and the recent Council Recommendation on access to social protection, the latter should be guaranteed regardless of a person's employment status, thus creating a social level playing field for all workers. Fulfilling such an objective requires a set of complementary actions spanning the areas of fiscal policies, legislation and regulation.

As indicated earlier in this Issue Paper, atypical workers often suffer from social protection gaps and lower effective coverage compared to people in standard forms of employment. To address such unequal treatment, member states have embarked upon a series of policy experiments differing in scope and level of provided provisions (see Chapter 4). Such experiments often follow a path-dependency approach based on the existing nature of the regulatory environment, welfare traditions and preferences, revealing that policy priorities are highly dependent on national context.

The persisting cracks in social protection, inconsistencies and unequal treatment reveal that welfare states are struggling to adapt to the new world of work. Efforts to turn the still prevailing piecemeal approach into a fully-fledged framework that embraces the new labour market complexities and anticipates new ones need to be intensified. Current initiatives prove that it is possible to align the functioning of the welfare state and its protection system with upcoming labour market realities and bridge the gap between the rights and effective coverage of people taking part in diverse forms of work. While designing such a framework falls mainly within the responsibility of national governments, the EU could play a significant role in supporting the transition.

Five specific actions will need to take top priority when designing such a fully fledged framework.²¹⁹ These priorities focus on providing policy solutions to ensure that all workers get equal access and coverage of social protection. They include the following elements: (1) an 'equality check' of social protection systems with a minimum social protection floor for all workers, (2) a 'fiscal check' of employment and labour laws, (3) the fight against workers' misclassification, (4) an assessment of labour law reforms and new concepts, and (5) the regulation of digital platforms.

(1) An 'equality check' of social protection systems with a minimum social protection floor for all workers

First, establishing a social level playing field for all workers necessitates the effective implementation of a minimum social protection floor for all. This minimum floor must entail universal access to the four main components of social protection, which are mostly financed through contributory schemes and thereby constitute the main areas of inequality among workers. They include parental leave, sickness (including occupational injuries and work accidents), unemployment and old age/pension. The access

and minimum level of benefits needs to be equal regardless of employment status, thus implying that the duration of benefits as well as of the contributory period required to access them need to be harmonised.

Enlarging the scope of social protection beneficiaries and ensuring universality demand a broadening of the contributory base. In other words, mandatory contributions will have to be paid by all types of workers (see the forthcoming recommendation on sustainability of social protection systems). An efficient collaboration between member states and the EU would help the creation of such a genuine minimum social protection floor for all European workers tremendously. While member states would need to conduct an ‘equality check’ of their social protection system to identify current gaps and solutions, the EU could provide intellectual and financial support. As regards the former, the European Semester is the ideal instrument to monitor national developments and help member states move towards an inclusive social protection system which provides equal and universal rights. The monitoring of the implementation of the Council Recommendation on access to social protection should become a central part of the European Semester and its country-specific recommendations as well as the social investment strategy of each individual member state mentioned earlier.

Establishing a social level playing field for all workers necessitates the effective implementation of a minimum social protection floor for all.

Furthermore, data on social protection is still very patchy across the EU, making the identification of gaps and people who are mostly at risk of falling between the cracks difficult. The implementation of the Council recommendations therefore needs to be accompanied by strong EU guidance on data collection at the national level. Concerning the latter, the EU needs to identify the financing instruments that could support member states in the implementation of such a ‘quality check’. In this respect, the Structural Reform Support Programme²²⁰ could be a useful instrument, providing administrative, policy and financial support to national administrations.

(2) A ‘fiscal check’ of employment and labour laws

The growth of new types of work arrangements sometimes reflects a purely financial logic that goes beyond economic arguments. In fact, the argument often advanced by employers when using atypical workers, that a flexible labour force is needed to adjust labour to demand fluctuation, does not always hold true. In reality, there is often a significant corporate cost differential between an employment relationship with a standard employee and with an atypical worker. For instance, employers may have to pay lower contributions when they employ workers on a part-time basis rather than full-time. This is the case in the UK, where employers do

not pay social contributions for employees earning below a certain threshold. This is therefore a simple way for employers to reduce labour costs. The same logic applies to self-employed workers. In this case, the absence of an employer means that all social contributions are covered by the worker him/herself, thus shifting the financial burden to the individual. This might happen even when the nature of the work performed by the self-employed person has the same features as that performed by a standard employee.

Against this background, it is imperative for member states to carry out a ‘fiscal check’ of their employment and labour laws, thus ensuring that fiscal rules do not disadvantage certain workers and/or employers over others. In a nutshell, the diversification of work arrangements should be a decision based on genuinely economic factors and how new forms of contractual arrangement might best respond to certain economic imperatives. In other words, it should in no way be based on fiscal aspects and labour cost differential. As with the ‘equality check’ of national social protection systems, the ‘fiscal check’ of employment and labour laws needs to be fully integrated into both the European Semester and national social investment strategies.

(3) The fight against abuse and workers’ misclassification

The presence of fiscal incentives described above can lead to abuse and the misclassification of workers. In some cases for instance, differential in labour costs also leads to a deliberate misclassification of self-employment, or in the case of crowd-work and zero-hours contracts, people’s working time might become highly unpredictable. All of these forms of abuse have two common features: the ‘real employer’ profits from the cracks and grey areas in employment and labour laws to limit taxes and the payment of social contributions, while taking advantage of workers’ vulnerability and lack of bargaining power.

Corrective measures must be tailored to each type of abuse. For instance, in the case of temporary workers, employment law needs to limit the use of successive short-term appointments and ensure that temporary work is a stepping stone towards more permanent jobs. When it comes to zero-hours contracts, implementing a set of rules, such as those defined in the Directive on Transparent and Predictable Working Conditions, would be helpful. As regards the misclassification of self-employed workers, public authorities must strengthen the controls against misclassification of workers, and national courts have an extremely important role to play in providing a robust and coherent jurisdiction. For better or worse, no codified definition of ‘worker’ is provided in EU legislation, only an autonomous definition based on the numerous decisions of the CJEU.²²¹ It therefore falls within the responsibility of national labour laws and domestic courts to decide upon the key parameters of an employment relationship and how they define an employee, a worker and a self-employed person. In this respect, it is worth noting the increased number of judgments on workers’ misclassification that national courts have recently dealt with. Interestingly, the

conclusion of many of these judgments has pointed to a disguised form of employment relationship, thus forcing corporates to reclassify the status of their workers.²²²

(4) An assessment of labour law reforms and new concepts – The case of the self-employed

Labour market transformations have rendered the traditional binary distinction between employees and self-employed inadequate. In fact, the economic freedom enjoyed by an increased number of self-employed workers is severely restricted. In other words, and as highlighted by Risak and Dullinger, “these new ‘solo-entrepreneurs’ and freelancers are very different from those of the past, where ‘liberal professions’ such as lawyers, architects and other high-skilled professionals had the power to bargain for high remuneration and controlled their own working conditions”.²²³ This new reality has already led numerous countries – including Spain, Italy, France (for some sectoral-specific cases), Germany and Austria – to recognise that there is an intermediary category of workers falling in between employment and self-employment. They are called the ‘dependent’ or ‘vulnerable self-employed’. In these countries, legislative measures have been undertaken to safeguard the legal status of these workers and guarantee their access to and coverage by social protection. The key criterion to determine their status is often their economic dependency (i.e. the fact that their income depends on a limited number of contractual partners).

Labour market transformations have rendered the traditional binary distinction between employees and self-employed inadequate.

Such practices should be debated more among member states and at the European level. In particular, some work and research must be invested into analysing the social protection coverage of these ‘dependent self-employed’, while trying to draw conclusions on whether such a new category might be a suitable solution. With the creation of such an intermediary category, legal provisions protecting dependent self-employed workers against a race to the bottom, enhancing their contributory capacity, and enabling them to contribute to the social welfare system need to be examined. In the same vein, existing competition law, whereby self-employed workers are prohibited from fixing their tariffs, needs to be revisited so that dependent self-employed workers can charge a minimum fee for their services. Interestingly, this is the approach followed by the current Dutch government, which is trying to protect this category of workers against poverty. The idea is that a minimum rate would not only enable the self-employed to pay their social contributions, but would also provide them with a wage premium that would compensate for their flexibility. Furthermore, persons belonging to this category should be covered by collective agreements and have access to

unemployment benefits. Exploring possible solutions and analysing the impact of these legal provisions should be the European Commission’s top priority when monitoring the implementation of the Council Recommendation with regards to access to social protection. At the same time, this topic should become the subject of mutual learning and exchange of best practices across member states.

The notion of economic dependency needs to also become a central piece of EU law. Until now, the identification of an employment relationship has been mostly judged in the light of a relationship of personal subordination in the case law of the CJEU. As claimed by Risak and Dullinger, it is now time for the CJEU to move beyond this narrow concept of ‘worker’ and integrate economic arguments that better reflect the vulnerability of the dependent self-employed.²²⁴ By doing so, the scope of protection of existing and upcoming EU labour regulations could be enlarged to this group of people without leaving it to the discretion of member states and national courts.

(5) The regulation of digital platforms

The specific and complex case of platform workers has already been highlighted in this Issue Paper. The diversity of platforms, their specificities and the various roles they play in a worker’s income makes any regulation particularly challenging. However, and despite the so far limited phenomenon of platform work across the EU28, variations across countries – 2.7% of the Dutch labour force working on platforms as their main job compared to 0.6% in Finland – points to the role regulation plays in curbing or facilitating this form of work.

The distinction made earlier between app-based work delivered locally and crowd-based work provided in a global environment needs to be reflected in the regulation. While the policy framework required for workers taking part in the first category of platforms falls within the solutions already suggested above – given that such platform workers are generally working under the self-employed status –, the second category is more complex. In fact, as their services are provided online through platforms which are generally located outside national and sometimes even European borders, it is extremely challenging to track them, identify the party responsible for contributing to social insurance and ensure the payment of all due taxes.

In addition to the cross-border dimension, the novelty of the phenomenon adds another layer of complexity. Notwithstanding, a number of new measures could be particularly helpful to regulate the sector, including the obligation for digital platforms to take part in social dialogue and enter into collective agreements; dedicated efforts by trade unions, which would be supported and coordinated by public authorities to reach out to and represent platform workers (or alternatively to organise worker councils); as well as the obligation for digital platforms to report on the number of service providers in each country and their corresponding number of hours worked as a means to assess the revenue they generate in each country. All of these measures could be facilitated by digital technologies. Evidently, designing comprehensive

regulations on issues of a global nature is not an easy task. Nonetheless, governments should start somewhere and not concede defeat. They should bring their efforts and strengths together to identify the best solutions and work jointly towards concrete achievements. In this respect, the EU should act as a driving force by, in the first stage, launching a comprehensive roadmap dealing with all the consequences of platform work and assessing the feasibility and adequacy of different policy solutions. In the second stage, it should lead on shaping solutions at the international level.

► **Align the social protection system with life-course transitions**

As already mentioned, professional lives are becoming increasingly complex and often involve several employers and jobs. Working for different employers and in different environments can be a great asset to one's professional life as well as to the economy. In fact, people with diverse professional experiences might be more agile and able to deal with complex situations and draw lessons from previous working environments. However, such potential is not properly exploited in the current labour market. In reality, workers are often not incentivised to transit between jobs or move from one professional status to another as they fear losing the accumulated benefits that are often attached to their most recent employer. This issue is a major hindrance to labour market mobility, entrepreneurship and the health and dynamism of our economy in general.

To reverse this, public authorities should ensure that multiple and diverse work experiences do not equal less financial security and reduced social provisions. To do so, guaranteeing the portability of rights across employers and employment statuses is imperative. Adequate coordination mechanisms must therefore be established to allow workers to keep and transfer the benefits they have accumulated throughout their professional life. Such mechanisms also need to allow people to combine different work arrangements and multiple employers. Beside flexibility, transparency is equally important and needs to be one of the main features of such coordination instruments. Thus, the principles of coordination and transferability of rights need to be turned into concrete instruments, such as a smart card and/or individual accounts where people can easily access a full overview of their rights and benefits. Such accounts should centralise all the contributions of the corresponding rights and benefits made throughout an individual's career path.

Efforts and actions at both the national and European levels are necessary to align the social protection system with life-course transitions. The proliferation of actors and initiatives delivering social protection provisions explained in Chapter 4 makes the creation of a uniform and centralised system of information particularly challenging. This proliferation therefore needs to be adequately managed by public authorities, which must guarantee the reliability of new emerging actors. As for the EU level, initiatives in the realm of the exchange of best practices would be particularly helpful in assessing the impact of such smart card and/or individual accounts and maximising mutual learning among member states.

► **Increase people's financial resilience**

Chapter 2 has shown that atypical workers share a certain number of concerns and insecurities. Addressing them requires important changes in the social protection system, as indicated earlier. However, given the growing complexity of individuals' professional careers, which have become less linear, it is essential to increase people's awareness about how they can cope with expected long-term changes, such as old age, or unexpected short-term socioeconomic risks, such as sickness or job loss. Obtaining sufficient and transparent information and feeling adequately protected against such life events can play a major role in mitigating people's fears and anxieties. This would also be a determinant factor in encouraging people to become more entrepreneurial and take risks.

Three concrete measures would be particularly useful in this respect:

1. **People need to better understand the functioning of their social protection system** (including pensions) and the constraints most welfare regimes face in terms of sustainability. In this respect, it is striking to note that graduates have little to no knowledge of how socioeconomic models function and that workers are often unaware of the provisions they are entitled to. Integrating basic knowledge into school curricula is therefore key.
2. Public authorities need to **strengthen awareness-raising campaigns** towards atypical workers **about the importance and relevance of certain insurance products**. This is even more important when public welfare provisions are not generous enough to cover certain risks. Such guidance could, for instance, be provided during information meetings when people register as self-employed.
3. **Self-employed people need to become better protected against possible risks, including unemployment**. In this respect, mandatory enrolment into a 'pooled' income insurance provided by either the state or a private company is necessary. Such mandatory contributions should of course be coupled with other regulatory provisions (such as those described in the above sections), allowing self-employed people to afford the payment of such contributions.

► **Sustain the social contract through fair taxation**

The question of how to finance the social protection system plays a central role in its long-term sustainability and the viability of our welfare system. This aspect is too often neglected by most studies dealing with the future of social protection. Moreover, preserving the main principles of our welfare system, based on solidarity and redistributive mechanisms and therefore our social contract, will require an effective and increased mobilisation of revenue.

Two main sources of revenue contribute to the financing of social protection today: social contributions paid by both employers and workers, and general taxation. By

highlighting the diversification of work arrangements and the growing tendency to decouple social protection from employment, adding to other factors such as demographic ageing and unemployment, this Issue Paper has shown how the erosion of the contributory base for social insurance is set to deteriorate, and in so doing, puts our entire welfare system at risk. This decoupling process therefore poses a fundamental question for European welfare states: are we ready to abandon and unravel the foundations of previous decades and accept that employment will no longer be the lynchpin of our social protection system?

By doing so, and if the objective is to maintain the core principles of our social contract, new solutions will have to be found, not least to enable millions of Europeans to obtain effective minimum social provisions. Theoretically, a system financed only through general taxation could be an alternative. However, it raises the question of whether it would lead to a fair balance of responsibilities between workers and employers. The former will still have to pay social contributions, while it will become extremely difficult to ensure that the latter will contribute their fair share to the public good in exchange for their use of labour. Another proposal, also suggested as a supplementary measure to the previous one, is to broaden the existing fiscal space by finding new financial resources (e.g. by raising taxes on gas emissions, financial transactions or robots).

The suitability of each of these new sources of revenue merits special attention and detailed analysis, which go beyond the scope of this Paper. However, a number of caveats can already be raised at this point. Firstly, it is doubtful that any of these new sources of revenue would be able to compensate for the loss of employers' contributions and respond to the coverage needs of our future social protection system. Secondly, many of them would still leave the question of the responsibility of employers towards their workers and their contribution to the public good unanswered. Thirdly, removing the traditional link between employment and social protection might introduce another challenge. Workers could choose to take care of their own social provisions, thus forcing the state to replace mandatory contributions by voluntary ones. As experiences have shown, many people who have the possibility to opt into certain schemes do not do so for a variety of reasons. This leads to increased risk of poverty, social exclusion and greater inequality.

It is certain that no robust solution ensuring an equilibrium between the greater needs for social protection and the efficiency and adequacy of financial resources has yet been found. Until this fundamental question has been resolved, unravelling the foundations of past decades is a risky endeavour with serious consequences for individuals and society at large.

5.3 INTERIM CONCLUSIONS

This chapter presents the main actions that should underpin a progressive agenda on the future of work in Europe, while keeping the bigger question of the sustainability of European welfare states and the viability of the social contract in mind. Turning such ambition into a reality

would require both a virtuous relationship between the labour market and the social protection system as well as a redefined alignment of technological advances, welfare state reforms and working structures. This alignment must be based on a number of systemic changes stemming from both a recalibration of past achievements as well as new approaches and instruments.

On the one hand, competitive and inclusive labour markets call for the ability to shape the talents of the 21st century, who will have to reflect the need for a complex set of skills combining technological know-how as well as cognitive and non-cognitive skills. In addition, our societies must undergo a complete overhaul of how continuous learning is delivered to people, thus making it a duty and a right for all. Lastly, the profound shifts labour market are undergoing require employers, workers and working structures to co-design the solutions of tomorrow. Social dialogue remains the best channel to achieve this and could become, if more efficient and constructive, a great enabler of industrial transformations.

On the other hand, a future-fit social protection system needs to be based on a social level playing field for all workers establishing a minimum social protection for all. This would require an 'equality' check of social protection systems, a 'fiscal check' of employment and labour laws, the fight against abuse and workers' misclassification, an assessment of labour law reforms and the regulation of digital platforms. In parallel, social protection systems will need to be aligned with life-course transitions, not least through the effective portability of workers' rights; and people's financial resilience, including atypical workers', will have to be increased to cope with the growing complexities of the labour market and the emergence of new socioeconomic risks. Lastly, the fundamental question of how to finance the social protection system in view of the growing decoupling of employment and social protection will have to be answered and put at the centre of the public debate on how to sustain the social contract through fair taxation.

To achieve this objective, such changes need to be supported by a wide range of actors, including employers, trade unions, the CJEU and national courts. The role of national authorities and EU institutions will be central in this joint endeavour, and finding the right ways to complement one another's actions will be fundamental. In this respect, the authors suggest to make the best use of existing EU instruments, such as the European Semester, funds, digital initiatives and mutual learning, and mainstream the recommendations highlighted in Chapter 5 through these various channels. Moreover, at the core of the interaction between the EU and its member states should be the development of national social investment strategies based on national roadmaps on the future of work. Such strategies should set out how member states intend to address the various challenges raised by the new world of work and complement the rights-based approach provided by the EPSR. They must form a central part of the European Semester's country reports and the formulation of its country-specific recommendations.

Conclusions

European labour markets are undergoing profound transformations triggered by the current challenges and mega-trends, thereby giving rise to a new techno-economic paradigm. This new paradigm calls for a redefined alignment of technological advances, welfare state reforms and working structures. This Issue Paper has highlighted the complexity and frictions generated by such transformations, shown their deep and long-lasting repercussions for individuals and society at large and identified how the creation of a virtuous relationship between inclusive and competitive labour markets on the one hand, and future-fit social protection systems on the other, should lie at the core of a progressive agenda on the future of work. This virtuous relationship needs to be underpinned by a series of systemic changes that are presented in this Issue Paper.

The role of the EU in steering such a progressive agenda and supporting the development of more agile welfare states in the age of increased labour market complexities will be decisive for its future.

Such systemic changes in no way mean a rupture with past achievements. Labour markets and welfare states are the result of a complex history of successive developments with constant, although often painful, adaptation. This historical legacy, including welfare provisions, labour market institutions and social dialogue, should help Europe create solutions for tomorrow. Thus, systemic changes will consist of a recalibration of past achievements which should be complemented with new instruments, such as national social investment strategies, and adapted to the increased complexity of today's realities. The conscious, mature and controlled deployment of advanced technologies should be used towards this redefined alignment.

Besides the fact that systemic changes are necessary to make our welfare system sustainable in the long run, they will also have a number of significant overall benefits. Firstly, they will allow the deployment of new technologies while tapping into their full potential to bring about innovative solutions to our societies and harness their economic benefits. Secondly, they will inject new life into our social contract by clearly defining the responsibility of each part of society to contribute to the public good, offering new prospects for all, curbing new forms of inequality and addressing the concerns and fears of people who perceive themselves to be the losers of ongoing transformations.

The role of the EU in steering such a progressive agenda and supporting the development of more agile welfare states in the age of increased labour market complexities will be decisive for its future. This will, however, not be an easy task. At a time when there is a clear preference for nationalistic solutions and a strong resistance from certain member states to cooperate on employment and social matters, the EU's ambition will undoubtedly face vehement opposition. Therefore, besides the level of ambition and quality of the EU's policy agenda, its political leadership will be central in mobilising the forces of change. Moreover, the long-term benefits would also be significant. By meeting the challenges posed by the fourth industrial revolution, the EU would not only boost its economy, curb mounting divergences across European territories and people, and preserve its core values of solidarity and equality. It would also act as a driving force for innovative and progressive change, thus strengthening its normative power and influence at the global level and reinforcing people's trust in its ability to address their fears and anxieties.

This Paper aims to contribute to the fundamental debate surrounding the future of work concept. Although it might not provide an answer to all questions, it will hopefully inspire policymakers to tackle emerging challenges and provide a solid toolkit for the next generation of EU leaders.

Annex 1: List of platform work categories

Label	Service classification			Platform classification		Share of platforms in total number of platforms	Share of workers in total number of workers	Examples
	Skills level	Format of service provision	Scale of tasks	Selector	Form of matching			
On-location client-determined routine work	Low	On-location	Larger	Client	Offer	13.7%	1.3%	GoMore
On-location platform-determined routine work	Low	On-location	Larger	Platform	Offer	31.5%	31.2%	Uber
On-location client-determined moderately skilled work	Low to Medium	On-location	Larger	Client	Offer	11.3%	10.9%	Oferia
On-location worker-initiated moderately skilled work	Low to Medium	On-location	Larger	Worker	Offer	4.2%	5.5%	ListMinut
Online moderately skilled click-work	Medium	Online	Micro	Platform	Offer	0.6%	5.3%	CrowdFlower
On-location client-determined higher-skilled work	Medium	On-location	Larger	Client	Offer	2.4%	3.3%	appJobber
On-location platform-determined higher-skilled work	Medium	On-location	Larger	Platform	Offer	1.2%	4.2%	Be My Eyes
Online platform-determined higher-skilled work	Medium to high	Online	Larger	Platform	Offer	0.6%	1.9%	Clickworker
Online client-determined specialist work	Medium to High	Online	Larger	Client	Offer	5.4%	30.3%	Freelancer
Online contestant specialist work	High	Online	Larger	Client	Contest	5.4%	4.6%	99designs

Source: European Foundation for the Improvement of Living and Working Conditions (2018), [Digital age: Employment and working conditions of selected types of platform work](#), Luxembourg: European Union.

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- ¹¹⁷ Hussein, Talal, “[US Army trials exoskeletons for military use](#)”, *Army Technology*, 15 May 2019.
- ¹¹⁸ Changes in military personnel are calculated by the authors based on the actual number of personnel (without civilian staff) in 2005 and 2017. Due to a lack of data, Croatia is not included. The same goes for Luxembourg and Estonia that were outliers. Where specific data was not available for certain years, the closest years possible have been used (Belgium: 2008; Bulgaria: 2006; Germany: 2016; Romania: 2006).
- ¹¹⁹ See *European Defence Agency*, “[Info Hub > Defence Data Portal](#)” (accessed 05 May 2019). Luxembourg was excluded as an outlier. For some countries, the figure describes the latest available data. See endnote 118; Belgium: 2008; Bulgaria: 2006; Germany: 2016; Romania: 2006.
- ¹²⁰ *Ibid.*
- ¹²¹ See *Eurostat*, “[European Union Labour Force Survey \(EU LFS\)](#)” (accessed 17 July 2019). The official names of some categories were shortened. The official 11 Eurostat sectors are “Agriculture, forestry and fishing”; “Industry (without Construction)”; “Construction”; “Wholesale and retail trade, transport, accommodation and food service activities”; “Information and communication”; “Financial and insurance activities”; “Real estate activities”; “Professional, scientific and technical activities; administrative and support service activities”; “Public administration, defence, education, human health and social work activities”; “Arts, entertainment and recreation; other service activities; activities of household (e.g. preparing meals or doing housework), and extra-territorial organizations and bodies” and “No Response (individual did not indicate the sector of activity)”. See [methodological notes for NACE classification](#).
- ¹²² *Ibid.*
- ¹²³ *Ibid.*
- ¹²⁴ Pesole *et al.* (2018), *op.cit.*
- ¹²⁵ *Ibid.*, p.22.
- ¹²⁶ The authors use educational attainment as an indicator for the overall level of skills. Eurostat describes this approach as one of the most common methods of measuring skills. Its assumption is that the duration of education is positively associated with the level of skills. Based on that assumption, those who only finished their primary education have low skills, those who only finished their secondary education have medium skills and those who finished a tertiary degree have high skills. See Eurostat (2016), [Statistical approaches to the measurement of skills: 2016 edition](#), Luxembourg.
- ¹²⁷ See *Eurostat*, “[European Union Labour Force Survey \(EU LFS\)](#)” (accessed 17 July 2019).
- ¹²⁸ Pesole *et al.* (2018), *op.cit.*
- ¹²⁹ *Ibid.*, p.26.
- ¹³⁰ *Ibid.*
- ¹³¹ Eurostat defines the at-risk-of-poverty rate as the share of people with a disposable income (post-social transfer) below the at-risk-of-poverty threshold, which is set at 60% of the national median of disposable income after social transfers. They note that this indicator does not measure wealth or poverty but does represent an income comparison for member state countries. As such, it is particularly relevant to our analysis. See *Eurostat*, “[Glossary: At-risk-of-poverty rate](#)” (accessed 27 November 2019).
- ¹³² International Labour Organization (2016), “[Non-standard employment around the world: Understanding challenges, shaping prospects](#)”, Geneva, p.18.
- ¹³³ *International Labour Organization*, “[Decent work](#)” (accessed 27 November 2019).
- ¹³⁴ Pesole *et al.* (2018), *op.cit.*
- ¹³⁵ European Foundation for the Improvement of Living and Working Conditions (2018), *op.cit.*
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- ¹³⁷ Organisation for Economic Co-operation and Development (2018), “[The Future of Social Protection: What Works for Non-standard Workers?](#)”, Paris; European Commission (2018b), [Employment and Social Developments in Europe: Annual Review 2018](#), Luxembourg; European Foundation for the Improvement of Living and Working Conditions (2018), *op.cit.*
- ¹³⁸ Spasova, Slavina; Denis Bouget; Dalila Ghailani and Bart Venhercke (2017), [Access to social protection for people working on non-standard contracts and as self-employed in Europe: A study of national policies](#), Brussels: European Social Policy Network.
- ¹³⁹ *Ibid.*
- ¹⁴⁰ See *ibid.*
- ¹⁴¹ European Foundation for the Improvement of Living and Working Conditions (2018), *op.cit.*
- ¹⁴² Matsaganis, Manos; Erhan Özdemir; Terry Ward and Alkistis Zvakou (2016) [Non-standard employment and access to social security benefits: Research note 8/2015](#), Brussels: European Commission.
- ¹⁴³ Austria, Bulgaria, Czech Republic, Croatia, Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Portugal, Romania, Slovakia and Slovenia.
- ¹⁴⁴ The Netherlands, Denmark and Sweden.
- ¹⁴⁵ Germany, France, Belgium, Italy, Finland, Greece and Poland.
- ¹⁴⁶ Matsaganis, *et al.* (2016), *op.cit.*
- ¹⁴⁷ Authors’ calculations based on Eurostat, “[European Union Labour Force Survey \(EU LFS\)](#)” (accessed 10 July 2019).
- ¹⁴⁸ Matsaganis, *et al.* (2016), *op.cit.*
- ¹⁴⁹ Zurich Insurance Group (2019), *op.cit.*
- ¹⁵⁰ European Commission (2018b), *op.cit.*, p.164. 2016 data except for Luxembourg where 2004 data was used; Romania and Latvia where 2008 data was used; Bulgaria, Cyprus, Slovakia, Italy where 2010 data was used; and Croatia and Greece where 2012 data was used. Data for Malta was not available.
- ¹⁵¹ Hyman, R. (1994), “Changing Trade Union Identities and Strategies”, *New Frontiers in European Industrial Relations* (Oxford, Blackwell), pp. 56, as cited in Gumbrell-McCormick, Rebecca (2011), “[European trade unions and atypical workers](#)”, *Industrial Relations Journal*, Volume 42, Number 3, pp. 297.
- ¹⁵² Gumbrell-McCormick, Rebecca (2011), “[European trade unions and atypical workers](#)”, *Industrial Relations Journal*, Volume 42, Number 3, pp. 293–310.
- ¹⁵³ *Ibid.*
- ¹⁵⁴ See *Eurostat*, “[European Union Labour Force Survey \(EU LFS\)](#)” (accessed 14 August 2019).
- ¹⁵⁵ International Labour Organization (1948), “[Freedom of Association and Protection of the Right to Organise](#)”, Convention 87.
- ¹⁵⁶ Countouris, Nicola and Valerio De Stefano (2019), “[New trade union strategies for new forms of employment](#)”, Brussels: European Trade Union Confederation.
- ¹⁵⁷ *Ibid.*
- ¹⁵⁸ *Ibid.*
- ¹⁵⁹ Akgüç, Mehtap; Miroslav Beblavy and Zachary Kilhoffer, (2018), “[Industrial relations and social dialogue in the age of collaborative economy](#)”, Brussels: Centre for European Policy Studies.

- ¹⁶⁰ Riso, Sara (2010), "[Very atypical work: Exploratory analysis of fourth European Working Conditions Survey – Background Paper](#)", Dublin: European Foundation for the Improvement of Living and Working Conditions.
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- ¹⁶⁹ Jacob A. Bikker and Jan de Dreu (2006), "[Pension fund efficiency: the impact of scale, governance and plan design](#)"; Amsterdam: De Nederlandsche Bank.
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- ¹⁷³ European Commission (2017), "[Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Safe and healthier work for all - Modernisation of the EU occupational safety and health legislation and policy](#)", COM(2017) 12 final, Brussels.
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- ¹⁸⁵ Blanchet, Thomas; Lucas Chancel and Amory Gethin (2019), "[Forty years of inequality in Europe: Evidence from distributional national accounts](#)", *Vox*, 22 April 2019.
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- ¹⁹¹ E.g. *Syndicat des chauffeurs privés et VTC (SCP-VTC)*, created in 2015.
- ¹⁹² The collective agreement was signed by the Danish cleaning services platform Hilfr and 3F, the United Federation of Danish workers. See *FH – Danish Trade Union Confederation*, "[Historic agreement: Digital platform concludes collective agreement](#)", 10 April 2018.
- ¹⁹³ European Commission (2018d), "[Access to social protection for workers and the self-employed: Best practice examples from EU Member States](#)", Luxembourg.
- ¹⁹⁴ In 2015, the [Italian legislative decree n.22/2015](#) established on a trial basis the unemployment benefit for *lavoratori con rapporto di collaborazione coordinata e continuativa*, a category of 'semi-subordinate' workers which falls into the grey zone between self-employed and dependent employee. The unemployment benefit was then stabilised with [law n.81/2017](#), which also introduced new protections (for both *collaboratori* and freelance professionals) in case of maternity, illness or accident.
- ¹⁹⁵ In 2007, the [Spanish law n.20/2007](#) introduced the category of *trabajador autónomo económicamente dependiente*, the economically dependent self-employed, and ensured this category access to social protection, from health insurance, pension and unemployment benefits to rights in terms of work-life balance and representation.
- ¹⁹⁶ See *Uber*, "[Company info](#)" (accessed 28 November 2019); Gore-Coty, Pierre-Dimitri, "[Ensuring independent drivers are not on their own](#)", *Uber Newsroom*, 23 May 2018.
- ¹⁹⁷ See *Uber*, "[Partner Protection Insurance with AXA](#)" (accessed 30 October 2019).
- ¹⁹⁸ For policy details, see AXA (2018), "[Santé & Prévoyance: Notice d'information. Offre UBER](#)", Nanterre.
- ¹⁹⁹ See World Employment Confederation, "[Social Innovation Stories](#)" (accessed 30 October 2019).
- ²⁰⁰ See *World Employment Confederation*, "[Social Innovation Stories > Prism'Emploi: Intérimaires Santé](#)" (accessed 30 October 2019).
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- ²⁰³ Global Commission on the Future of Work (2019), "[Work for a brighter future](#)"; Geneva: International Labour Organization.
- ²⁰⁴ For more information about the Pillar, see *European Commission*, "[The European Pillar of Social Rights in 20 principles](#)" (accessed 28 November 2019).
- ²⁰⁵ European Parliament and the Council of the European Union (2019a), "[Regulation \(EU\) 2019/1149 of the European Parliament and of the Council of 20 June 2019 establishing a European Labour Authority, amending Regulations \(EC\) No 883/2004, \(EU\) No 492/2011, and \(EU\) 2016/589 and repealing Decision \(EU\) 2016/344](#)".
- ²⁰⁶ European Parliament and the Council of the European Union (2019b), "[Directive \(EU\) 2019/1152 of the European Parliament and of the Council of 20 June 2019 on transparent and predictable working conditions in the European Union](#), Art.1(2), p.112.
- ²⁰⁷ Council of the European Union (2019), "[Council Recommendation on access to social protection for workers and the self-employed](#), 2019/C 387/01, Brussels.
- ²⁰⁸ See *European Commission*, "[The European Semester](#)" (accessed 28 November 2019).
- ²⁰⁹ See *European Commission*, "[European Pillar of Social Rights > Social Scoreboard](#)" (accessed 28 November 2019).
- ²¹⁰ The methodology looks jointly at levels and changes of indicators in comparison to EU averages and classifies member states into seven categories, ranging from "best performers" to "critical situation".
- ²¹¹ European Commission (2010), "[Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Digital Agenda for](#)

Europe, COM(2010)245 final, Brussels.

²¹² European Commission (2015), [Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Digital Single Market Strategy for Europe](#), COM(2015) 192 final, Brussels.

²¹³ European Commission (2016b), [Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A New Skills Agenda for Europe. Working together to strengthen human capital, employability and competitiveness](#), COM(2016) 381 final, Brussels.

²¹⁴ Bednarowicz, Bartłomiej, “[Workers’ rights in the gig economy: is the new EU Directive on transparent and predictable working conditions in the EU really a boost?](#)”, *EU Law Analysis*, 24 April 2019.

²¹⁵ González Vázquez *et al.* (2019), *op.cit.*

²¹⁶ According to Principle 1 of the European Pillar of Social Rights, “[e]veryone has the right to quality and inclusive education, training and life-long learning in order to maintain and acquire skills that enable them to participate fully in society and manage successfully transitions in the labour market.” See *European Commission*, “[European Pillar of Social Rights > Social Scoreboard](#)” (accessed 28 November 2019).

²¹⁷ This recommendation is similar to the findings of a Zurich Insurance Group study, which points to the importance of the employers’ role in delivering training. See Zurich Insurance Group (2019), *op.cit.*

²¹⁸ Principle 12 of the European Pillar of Social Rights stipulates that “regardless of the type and duration of their employment relationship, workers, and, under comparable working conditions, the self-employed, have the right to adequate social protection.” See *European Commission*,

“[European Pillar of Social Rights > Social Scoreboard](#)” (accessed 28 November 2019).

²¹⁹ Please note that this list of priorities could be extended to e.g. aspects related to administrative barriers and how to make contribution collection more transparent. However, due to spatial constraints, the authors chose to concentrate on the ones they considered the most likely to facilitate the delivery of the systemic changes called for in this Issue Paper.

²²⁰ The Structural Reform Support Programme is a programme that provides technical and financial support to EU countries for the implementation of structural reforms, mainly in the context of the European Semester. The Programme assists member states with reforms in different areas, such as governance and public administration, growth, labour market and health services, and the financial sector. In May 2018, the Commission put forward its proposal for the Reform Support Programme post-2020, increasing the allocated budget from €222.8 million (period 2017-2020) to €25 billion for the period 2021-2027. See *European Commission*, “[Structural Reform Support Programme \(SRSP\)](#)” (accessed 28 November 2019).

²²¹ Risak, Martin and Thomas Dullinger (2018), “[The concept of ‘worker’ in EU law: status quo and potential for change](#)”, Brussels: European Trade Union Institute, p.12.

²²² Aranguiz, Ane, “[Spain à l’avant-garde on social protection for platform work?](#)”, *Social Europe*, 04 September 2019. See Beltran de Heredia Ruiz, Ignasi, “[Employment status of platform workers \(national courts decisions overview – Argentina, Australia, Belgium, Brazil, Chile, France, Italy, Nederland, Panama, Spain, Switzerland, United Kingdom, United States & Uruguay\)](#)”, *Una mirada crítica a las relaciones laborales*, 09 December 2018.

²²³ Risak and Dullinger (2018), *op.cit.*, p.12.

²²⁴ *Ibid.*

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