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Working conditions

Working conditions in sectors

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Research carried out prior to the UK's withdrawal from the European Union on 31 January 2020, and published subsequently, may include data relating to the 28 EU Member States. Following this date, research only takes into account the 27 EU Member States (EU28 minus the UK), unless specified otherwise.

This report presents the results of research conducted largely prior to the outbreak of COVID-19 in Europe in February 2020. For this reason, the results do not fully take account of the outbreak.

The European Foundation for the Improvement of Living and Working Conditions (Eurofound) is a tripartite European Union Agency established in 1975. Its role is to provide knowledge in the area of social, employment and work-related policies according to Regulation (EU) 2019/127.

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Abbreviations used in the report

ECB	European Central Bank
EU-LFS	European Union Labour Force Survey
EU-OSHA	European Agency for Safety and Health at Work
EWCS	European Working Conditions Survey
ICT	Information and communication technologies
ILO	International Labour Organization
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
NACE	Nomenclature générale des activités économiques dans les Communautés européennes (General industrial classification of economic activities within the European Communities)
OECD	Organisation for Economic Co-operation and Development
OSH	Occupational health and safety
TFEU	Treaty on the Functioning of the European Union
TICTM	Telework and ICT-based mobile work

Executive summary

Introduction

Megatrends, such as digitalisation, globalisation, demographic change and climate change, not only impact on labour demand and supply, but also affect working conditions and the quality and sustainability of jobs. Technological change has transformed the organisation of work and the task content of many jobs, along with the skills required for them. Combined with globalisation, it has changed business models, leading to new forms of employment that differ from the dominant, standard employment models. Some of these changes have a positive impact: one example is the automation of dangerous tasks, which reduces the risk of injury. However, new risks are also emerging, while others are exacerbated, with negative consequences for workers' health and well-being. In this context, social dialogue has been identified as a key element for finding solutions.

Using the European Working Conditions Survey (EWCS 2015), this report aims to describe and analyse trends in job quality across 10 economic sectors, under four thematic areas:

- changing tasks and skills, training and employability
- non-standard employment and employment security
- health and well-being and flexible work organisation
- employee representation and voice

Policy context

Improving working conditions and workers' rights is a longstanding ambition of the European Union, enshrined in the Treaty on the Functioning of the European Union (TFEU) and affirmed in the Lisbon Strategy and the Europe 2020 Strategy. The European Pillar of Social Rights is based on 20 key principles, structured around three categories: equal opportunities and access to the labour market; social protection and inclusion; and fair working conditions. With the endorsement of the Pillar in 2017, ensuring fair and high-quality jobs for all workers has become a policy priority.

In recent years, the European Commission has launched several initiatives aimed at ensuring fair working conditions. Chief among these have been the establishment of the European Labour Authority and the implementation of EU directives on transparent and predictable working conditions and on work–life balance. Social partners have a major role to play in shaping labour and social policy and in supporting the implementation of the European Pillar of Social Rights through interprofessional and sectoral social dialogue within the Member States and at EU level. Research on job quality and working conditions is key to informing policy and social partner initiatives, and to helping workers adapt to the changing world of work.

Key findings

Differences in job quality are found both between and within sectors. Agriculture, industry, construction, commerce and hospitality, and transport report fewer career prospects, lower levels of skills and discretion, poorer working time quality, and a less safe physical environment. In financial services, the physical environment is better, as are prospects, skills and discretion, but this is often at the expense of higher work intensity. Within sectors, managers, professionals and technicians and highly educated workers generally enjoy enhanced job quality compared to other occupations.

Changes in task and skill requirements have had a significant impact on employment and working conditions. Between 2010 and 2015, the tasks that workers were required to perform changed significantly. There was an escalation in the use of ICT, an increase in cognitive tasks and a decline in repetitive and physical tasks. In this context, training is a crucial element to ensure workers' employability. However, workers carrying out physical routine tasks with a high risk of being automated have less access to training and lower perceived employability than others.

Non-standard employment, in contrast to full-time, permanent employment with a single employer, is characterised by lower job quality and poorer working conditions – particularly for workers with short-term, temporary contracts. Non-standard employment is also associated with job insecurity. In all country clusters and sectors considered in this report, job insecurity scores high and employment security low for this group of workers.

While employee health and well-being in most sectors is close to the EU average, some sectors are characterised by relatively poorer health at work, mainly due to unfavourable working conditions. With a few exceptions, high cognitive demands at work, even when balanced with decision latitude (the ability to make work-related decisions independently), are negatively associated with work–life balance. Similarly, when compared to standard work organisation, some work

organisation practices characterised by the use of teleworking and digital technology are linked to poorer results for work–life balance and certain health indicators. One example of this development is in the financial services sector.

The presence of employee representation is an important factor in the move to improve these issues. The research shows that some sectors have low levels of trade union representation – for example, agriculture, construction, and commerce and hospitality – and these are sectors where a large proportion of workers experience job insecurity and lack of access to training. The absence of forms of employee representation or voice is associated with poorer job quality in most sectors, as well as with higher work intensity, a less attractive social environment and more limited prospects.

Policy pointers

- Transport, construction, and commerce and hospitality are sectors with particular needs in terms of training as task requirements have changed significantly in these sectors in recent years. Compared to the EU average, workers in these sectors report higher job insecurity and lower employability. At the same time, employees receive less training. A substantial policy effort is needed to incorporate workers from these sectors into lifelong learning schemes or company training to allow them to adapt to new tasks or move to other jobs.
- Given that the construction and health sectors score the lowest for health-related indicators, future occupational health and safety (OSH) strategies at national and EU levels should take this into account. Efforts to prevent physical risks and address the level of job demands in these sectors should be accelerated. The poor social environment experienced by many workers in health-related services must also be tackled.
- Improving the situation of those in non-standard employment – especially in agriculture, construction, commerce and hospitality, financial services and other services – is a priority. Policymakers and social partners should develop measures to address relevant issues such as skills development, job security and work intensity. Compared to standard employment relationships, training and job security have remained comparatively low in this type of employment. The recent Directive on Transparent and Predictable Working Conditions is designed to assist workers in non-standard employment to move into more secure jobs by providing cost-free mandatory training.
- Policymakers and social partners should focus on improving the working and employment conditions in sectors more affected by changes in work organisation, teleworking and digitalisation, such as financial services, other services and public administration. Emerging digital work practices present advantages and drawbacks that need to be tackled. Changes to regulations or measures that help to enforce existing working time limits and health and safety preventative measures might be necessary.
- Social partners and governments should pay special attention to workers in workplaces without any form of employee representation, notably in agriculture, commerce and hospitality, and construction. Social partners should reflect on and implement strategies to foster the participation of these workers through direct or representative channels, or both.
- Social partners have pointed to the particular challenges for working conditions resulting from the COVID-19 health crisis. The role of social partners and of social dialogue will continue to be essential in all sectors. Issues such as work intensity and adverse social behaviour have become more prevalent, but to varying extents across different sectors.

Introduction

The purpose of this study is to identify disparities in working conditions and job quality from a sectoral perspective and highlight working conditions that need to be improved in specific sectors. To this end, it describes job quality in different economic sectors and focuses on working conditions associated with ongoing changes in the world of work – changes to tasks and the associated skills requirements, non-standard employment and employment security, health and well-being, flexible work organisation and employee representation. It also examines how solutions can be found through social dialogue. These changes are being shaped by four megatrends: digitalisation, globalisation, demographic change and climate change.

Technological progress is replacing low-skill routine tasks and raising the skill threshold of employability. While there is no definite conclusion regarding the possible extent of technology's impact on jobs, studies show that repetitive routine tasks are the most prone to full or partial automation. These changes will affect sectors differently as regards skills requirements, job content and structure, employment and working conditions (Eurofound, 2018c, 2018e). Education, training and lifelong learning all have an important role to play in helping workers to adapt to new skills demands and address skills deficits. The analysis of 'changing tasks and skills' in this report describes how tasks are changing over time and the implications for skills development. Given its importance from a policy perspective, the analysis also covers workers' employability and access to training.

New technologies, globalisation and the resulting increase in competition have contributed to changes in forms of employment (Eurofound, 2015a; Vereycken and Lamberts, 2019). New forms of employment are emerging, changing the nature of employment and the jobs affected. There is evidence (Eurofound, 2015a) of a growing incidence of some specific forms that are linked with poorer working conditions (income volatility and lower employment security and social protection, for example). This is particularly the case for some forms of platform work. To explore how these trends affect different sectors, this report will look at differences between sectors in relation to 'non-standard employment and employment insecurity'.

The way work is organised has also been impacted by megatrends, especially technological developments. This has been shown to affect the working conditions and health and well-being of workers (Eurofound, 2015a, 2020b). Changes in work organisation include a move towards more flexible work, including more flexible working time arrangements, which impacts autonomy, but also work intensity. A link between work–life balance and the health and well-being of workers has been established. This report will address sectoral differences in the 'health and well-being' reported by workers and will include insights on the 'flexible organisation of working time' as an example of a form of work organisation that is becoming increasingly important.

Finally, given the important role of social partners in improving working conditions and addressing the challenges listed above, the report will map employee representation at workplace level and the existence of a health and safety committee in the different sectors. This will be used as an indication of the potential for engaging in social dialogue.

Detecting sectoral disparities in job quality and working conditions and highlighting the main axes of difference within and between sectors will allow better monitoring of areas and trends that emerge as problematic and a tailoring of policy measures to be implemented. This is of specific relevance to sectoral social partners. Knowledge about disparities related to the conditions of work within and between sectors can inform their policy agenda and help to identify what groups of workers are affected and are facing the most problematic conditions.

Policy context

The improvement of working conditions is a longstanding ambition of the EU, enshrined in Articles 151 and 153 of the TFEU and elaborated on in several directives and initiatives. This ambition was also made explicit in the Lisbon Strategy, launched in 2000, which aimed to create more and better jobs and was later echoed in the Europe 2020 Strategy. The ambition to improve working conditions, however, was somewhat overshadowed in the past decade due to the 2007–2008 global financial crisis. As many Member States experienced dramatic increases in unemployment (ECB, 2012), the focus of attention was on job numbers. In the first years of economic recovery after the crisis, 'having a job' was deemed more important than 'what [the] job' actually was (Hoque et al, 2017).

As employment rates surpassed their pre-financial crisis levels (prior to the COVID-19 outbreak in 2020), and in light of the deterioration in working conditions during the crisis (Eurofound, 2013) and the impact of the megatrends, job quality has resurfaced on the policy agenda of the EU and its Member States. In recent years, several new initiatives have been launched with a view to improving working and employment conditions.

The European Pillar of Social Rights, proclaimed in November 2017, aims to foster convergence towards better working and living conditions in the EU.

The Pillar consists of 20 principles that are structured around three categories:

- equal opportunities and access to the labour market
- fair working conditions
- social protection and inclusion

The principles relevant to this study address:

- education, training and lifelong learning (principle 1)
- gender equality (principle 2)
- secure and adaptable employment (principle 5)
- social dialogue and involvement of workers (principle 8)
- work–life balance (principle 9)
- healthy, safe and well-adapted work environment and data protection (principle 10)

The Pillar addresses aspects of working conditions that might require different levels of attention in different sectors.

Several proposals linked to the European Pillar of Social Rights were initiated by the Juncker Commission, of which the creation of the European Labour Authority, the Directive on Transparent and Predictable Working Conditions and the Work–life Balance Directive are key examples. The von der Leyen Commission, similarly, has highlighted the topic of working conditions. Improving working and employment conditions is a central objective of European agencies and bodies, notably Eurofound, and the social partners. Moreover, the European Green Deal and the Commission's digitalisation initiatives will have an impact on jobs, employment and working conditions.

The EU's industrial policy considers the megatrends and their implications for the number and quality of jobs. For example, in her political guidelines, Commission President Ursula von der Leyen highlighted that the industrial policy would have to be adapted to move towards a climate-neutral Europe. Prior to that, the renewed EU industrial policy strategy, launched in 2017, emphasised that investment in clean and digital technologies needed to be encouraged as a critical component in the competitiveness of the European economy. Sectors and social partners play a key role in this process. EU industrial policy is supported by the Investment Plan for Europe, the Single Market and the Digital Single Market strategies and the New Skills Agenda.

From a broader perspective, international organisations have endeavoured to achieve better employment and working conditions for workers around the globe, and their initiatives date back several decades (Eurofound and ILO, 2019). For example, the International Labour Organization (ILO) launched its influential Decent Work Agenda in 1999. A joint report by Eurofound and the ILO (2019) includes data on working conditions in the EU, US, China and a number of other countries. The report identifies not only major inequalities and structural differences in working conditions between countries within sectors, but also many similarities in relation to risks. As expected, the latter can be explained by similarities in occupations and sectors. On the other hand, this is also an indication that megatrends, such as digitalisation and the emergence of new non-standard forms of work and employment, affect workers and companies on a global scale.

Megatrends affecting the world of work

This section briefly elaborates on four megatrends – digitalisation, globalisation, demographic change and climate change – and their impact on sectors and working conditions, as identified in the literature. Some of the working conditions particularly affected by megatrends will be analysed later in Chapters 3–6 of this report.

Digitalisation

The introduction of technological innovations is a key driver of the digital economy and the changing world of work (Mäkiö et al, 2018). Eurofound (2018c) identified three vectors of change in the digital age: the automation of work, the digitisation of processes and the emergence of digital platforms. Automation of work refers to the replacement of workers, as their tasks can be performed by machines. The digitisation of processes relates to the use of sensors and rendering devices to translate parts of the physical production process into digital information, and vice versa. Digital platforms are virtual networks that coordinate economic transactions through algorithms.

These technological transformations lead to job creation, job destruction and job transformation and hence have an impact on the number and quality of available jobs (Autor et al, 2003; Eurofound, 2018e, 2018f). Some sectors are more affected by these developments than others – they may be further along in the adoption of new technologies or have higher shares of occupations that can be automated, for example (Arntz et al, 2016; Degryse, 2016; Eurofound, 2018e, 2018f). The ICT sector was a frontrunner in the adoption of new digital technologies. Degryse (2016) provides examples of occupations at the highest risk of automation and digitalisation, such as office work, commerce and sales, transport and logistics and manufacturing jobs. Some of these jobs exist in all sectors, whereas others are concentrated in specific sectors.

The replacement of routine tasks by technologies changes the skills required for these tasks. Industry 4.0,[1] however, does not only affect routine tasks – more complex tasks are increasingly subject to automation and are being substituted by machine learning. Although it is estimated that 70% of activities in the OECD could be impacted, only 9% of jobs can be fully automated (Arntz et al, 2016). In most cases, digitalisation affects working conditions, job content and skills demand, but does not eliminate jobs entirely (Autor et al, 2003). Digital technologies enable work that is independent of place and time, and also allow platforms to adjust the demand for and supply of work in real time (Eurofound, 2018c; ILO and Eurofound, 2017). Digital facilitators, online communication and information-sharing tools, for example, allow workers to work anywhere, anytime and even in virtual teams, which has implications for work organisation.

The flexibility and autonomy allowed by these digital technologies come with advantages and limitations for both employers and workers. New technologies allow workers to work more autonomously and independently and organise their work as they see fit (Eurofound, 2018c, 2018d). However, this increased flexibility may also make work schedules less predictable and stable, and blur the boundaries between work and private life, impacting workers' work–life balance and increasing the probability of mental health issues for workers (Cottini and Lucifora, 2010; Eurofound, 2018c). Digitalisation also enables new forms of work that are mediated through online platforms (Eurofound, 2015a, 2018d). Depending on the sector, occupation and type of platform, these new ways of working also come with new or increased occupational risks, as discussed below. They are also associated with non-standard forms of employment including 'bogus self-employment' (platform work, for example, see Eurofound, 2019c).

Globalisation

Since the 1970s, globalisation of the world economy has accelerated, as evidenced by sharp increases in trade in goods and services, foreign direct investment and migration (Cantwell and Cantwell, 1989). In a globalised economy, knowledge, communication and information systems gain in importance, and value chains become longer and more complex (Cadestin et al, 2018). Globalisation has resulted in increased competition between companies, putting downward pressure on prices and wages and pushing companies to outsource (a part of) their production, or to opt for a more flexible labour force (Vereycken and Lamberts, 2019). Global flexibility allows companies to relocate (Manning, 2014), and their location decisions typically depend on the availability of a skilled local workforce and local labour costs (World Economic Forum, 2018).

In the consumer industry, in infrastructure, in the mining and metals industry and in professional services, labour costs matter (World Economic Forum, 2018). In many industries, the location choices made by companies depend primarily on the availability of local talent. Such industries include:

- automotive
- transport
- travel and tourism
- chemical
- energy utilities and technologies
- financial services
- health
- oil and gas
- information and communication technologies

In Europe, this is reflected in the decline of the primary and secondary sectors and the growing importance of services (Eurofound and ILO, 2019). While this trend is broader than the EU, it is visible within and between its Member States in the outsourcing of tasks to other regions or countries, and in the varying importance of each economic sector.

Globalisation has an important impact on working conditions and job quality (Gomez, 2010; Berliner et al, 2015). First, the increased competition between companies and the changes in the economy's sectoral composition could put more workers in risky work environments. The growth of the services sector, for example, may increase the number of workers employed as cleaners, who must cope with the risks of this activity. At the same time, however, the global relocation of high-risk industries could lead to a reduction in work hazards related to the countries of origin. Increased competition between companies and workers may lead to longer working hours, higher work intensity and speed pressure. Second, the complexity of value chains hampers the monitoring and measurement of the job quality of all workers involved in the production of a good or service (Berliner et al, 2015). Labour migration due to globalisation can put workers in vulnerable labour market positions (Wu and Sheehan, 2011) or result in precarious working conditions (Ronda-Pérez et al, 2014; Nieuwenhuijsen et al, 2015).

1 Industry 4.0 is the ongoing automation of traditional manufacturing and industrial practices using modern smart technology.

Demographic change

The ageing of the workforce has received considerable attention. Two main trends can be discerned: ageing and dejuvenation (Guillot et al, 2001; Han, 2006). While ageing refers to the rapid pace at which the European population is getting older, dejuvenation is linked to the decline in birth rates. These two trends are ongoing simultaneously and affect labour supply. Many EU Member States have raised the statutory retirement age, have closed pathways for early retirement and are now actively promoting the continued labour market participation of workers over the age of 55 to ensure the sustainability of their social security schemes. Despite these initiatives, individual and work-related factors could impede the extension of working lives (Kroon et al, 2016; Eurofound, 2017; OECD, 2019a). For example, workers with chronic illnesses or care responsibilities may have shorter careers or work fewer hours (Eurofound, 2017). Eurofound (2019a) shows that, while 25% of the European workforce has a chronic illness, most of these workers cannot enjoy workplace adaptations, despite the positive impacts such adaptations have on the quality and sustainability of their employment. In addition, research shows that poor working conditions undermine the sustainability of work for all age groups, but that the incidence of such poor conditions varies across groups (Eurofound, 2017). Older workers, for example, are less exposed to physical risks, work fewer hours and have more autonomy, but receive less training and have fewer prospects. In order to retain these workers in the labour market, positive working conditions, such as a good work–life balance, access to training and adaptations related to health issues, are essential.

Population ageing also affects labour demand. The healthcare and long-term care sectors, for example, have experienced an increase in demand (Schultz and Geyer, 2015). However, the demand for labour already exceeds labour supply in many Member States. This gap is likely to grow as the average age of the current workforce in these sectors rises.

Another noticeable change is the increased labour market participation of women. Although women have entered the labour market in large numbers, men still spend more hours in their main paid job than women do (Eurofound and ILO, 2019). On the other hand, women are overrepresented in unpaid work, including care and household tasks (Eurofound and ILO, 2019). To be able to combine work with care tasks, workers need autonomy to decide when and where to work (Vereycken and Lamberts, 2019). Gender segregation is also noticeable at sector and occupation level, which implies different working conditions and health effects for women and men (Eurofound, 2012b, 2016b, 2020c).

As men dominate the construction sector, for example, and women form a large majority of workers in education and health services, their job quality outcomes will differ. Facilitating a work–life balance and working and employment conditions that are conducive to career development are key issues for fostering gender equality.

Climate change

Climate change has both direct and indirect impacts on labour markets. First, climate change gives rise to new green industries and green jobs. Green jobs are ‘all jobs that depend on the environment or are created, substituted or redefined (in terms of skills sets, work methods, profiles greened, etc.) in the transition process towards a greener economy’ (EU-OSHA, 2013). Climate change can foster job creation in some (new) sectors and occupations, and lead to job destruction or transformation in other cases (ILO, 2012; EU-OSHA, 2013). Emerging sectors focusing on recycling or waste management, for example, develop further, while the traditional reclaiming of raw materials, such as the recovery of raw materials from mining waste, is in decline.

Second, climate change affects working conditions in some occupations and sectors. Schulte and Chun (2009) and Andrews et al (2018) identify several environmental factors that may influence the daily execution of tasks – for example, higher ambient temperatures, air pollution, ultraviolet exposure and extreme weather conditions. These factors are likely to have an impact, especially on workers whose occupations involve physical tasks that must be performed outdoors (e.g. the construction and agriculture sectors). Traditional occupational risks are expected to intensify in terms of their prevalence, diffusion and severity (Schulte et al, 2016). For example, increased sweating, reduced brain function or dizziness due to exposure to extreme heat can lead to illnesses and injuries. This is particularly problematic for workers with limited autonomy regarding their place, time and pace of work (Eurofound and ILO, 2019).

Methodology

To assess differences in working conditions and job quality from a sectoral perspective, a series of statistical analyses have been carried out using data from the sixth wave of the European Working Conditions Survey (EWCS 2015), complemented by data from other EWCS waves, where possible and relevant. These statistical analyses are supplemented with a mapping of sectoral characteristics based on data from the European Union Labour Force Survey (EU-LFS), and a literature review, which aims mainly to provide a deeper understanding

of the megatrends and their impacts and support an interpretation of the study's findings. More details on the methodological approach are provided in the following sections and in the annexes (Eurofound, 2020a).[2]

This research was conducted before the UK left the EU on 31 January 2020. Where relevant, findings are reported for the EU Member States and the UK (EU27 and the UK).

Scope of the analysis

This study examines differences in working conditions and job quality from a sectoral perspective. To this end, the study considers 10 sectors and 9 subsectors (Table 1).[3] Within these sectors, workers are differentiated according to their age, gender, education level, occupation and employment status. By default, the analyses only cover employees, with the exception of the section on non-standard employment, where the self-employed are compared with those in other statuses.

Table 1: Sectoral coverage

Sector	Corresponding NACE Rev. 2 sectors (subsectors in italics)	Sample size per sector*
Agriculture	Agriculture, forestry and fishing (A; 01–03)	553 observations
Industry	Mining and quarrying (B; 05–09)	5,065 observations
	Manufacturing (C; 10–33) *NACE 11–12 Food products; NACE 13–15 Textiles; NACE 16–23 Non-metallic materials; NACE 24–30 Metals*	
	Electricity, gas, steam and air conditioning supply (D; 35)	
	Water supply; sewerage, waste management and remediation activities (E; 36–39)	
Construction	Construction (F; 41–43) *NACE 41 Construction of buildings; NACE 43 Specialised construction activities*	1,760 observations
Commerce and hospitality	Wholesale and retail trade; repair of motor vehicles and motorcycles (G; 45–47)	5,842 observations
	Accommodation and food service activities (I; 55-56)	
Transport	Transportation and storage (H; 49–53) *NACE 49–51 Transport*	1,795 observations
Financial services	Financial and insurance activities (K; 64–66) *NACE 64 Financial service activities*	1,052 observations
	Real estate activities (L; 68)	
Public administration	Public administration and defence; compulsory social security (O; 84)	1,971 observations
Education	Education (P; 85)	2,962 observations
Health	Human health and social work activities (Q; 86–88) *NACE 86 Human health activities*	3,351 observations
Other services	Information and communication (J; 58–63)	5,230 observations
	Professional, scientific and technical activities (M; 69–75)	
	Administrative and support service activities (N; 77–82)	
	Arts, entertainment and recreation (R; 90–93)	
	Other service activities (S; 94–96)	
	Activities of households (T; 97–98)	
	Activities of extraterritorial organisations and bodies (U; 99)	

Note: ** More specifically, the sample sizes available when all countries and workers are considered are: 84 observations for NACE 11–12 (food products), 423 observations for NACE 13–15 (textiles), 1,082 observations for NACE 16–23 (non-metallic materials), 1,589 observations for NACE 24–30 (metals), 717 observations for NACE 41 (construction of buildings), 796 observations for NACE 43 (specialised construction activities), 1,181 observations for NACE 49–51 (transport), 591 observations for NACE 64 (financial service activities) and 1,832 observations for NACE 86 (human health activities).*
Source: *EWCS 2015*

2 The annexes to this report are unpublished but are available on request from Eurofound.

3 Subsectors are discussed only when results for the subsector differ significantly from those of the main sector, in part because the sample sizes available for the different subsectors are (very) small and often do not allow reliable detailed statistical analyses.

The statistical analyses consider five country clusters, covering the EU27 and the UK (Table 2).[4] Using country clusters is important, as direct aggregation at EU level may conceal potentially relevant institutional variation. Such variation matters for policy recommendations. Clustering of countries is also required for statistical reasons to ensure sufficiently large samples for each case, so that breakdowns for the indicators of interest are possible and reliable.

Data sources

The main data source for the statistical analyses conducted in this study is the EWCS 2015. The EWCS is a unique data source that allows the monitoring, assessment and quantification of working conditions and broader aspects of quality of work and employment in all EU Member States, the UK, Norway, Switzerland, Albania, North Macedonia, Montenegro, Serbia and Turkey. The EWCS gathered data on approximately 44,000 workers in 2015. The first wave of the survey dates back to 1990, covered the 12 countries of the European Community and included 19 questions; this compares to 106 questions in the EWCS 2015. The seventh EWCS wave is currently in progress. The survey sets out to provide a complete picture of the world of work as experienced by workers, covering topics such as health and well-being, work organisation, training and skills, and employee voice. Both objective and subjective measures of job quality can be constructed with EWCS data.

In addition to the data from the 2015 wave, data from previous EWCS waves are used, when possible, to allow for trend analyses. However, caution is required with trend variables, as the questionnaire is updated in every wave based on scientific recommendations, and questions are added or removed according to policy relevance. Opting for a longitudinal perspective, therefore, implies a reduction in the scope of the research (Eurofound, 2015b; Holman and Rafferty, 2018). Past analyses have shown that working conditions at the EU aggregated level do not change significantly between two EWCS waves for most indicators and, therefore, the general picture from 2015 should be valid for current policy-related decisions, apart from those relating to the COVID-19 crisis.

Data from the EU-LFS are used to map the characteristics of the 10 sectors of interest in terms of workforce demographics, occupational structure, employment situation and company size. The EU-LFS is an EU-wide quarterly household sample survey on the labour force participation of individuals aged 15 and over, including individuals who are outside of the labour force (Eurostat, 2019). The EU-LFS covers all sectors and occupations.

Table 2: Country coverage

Cluster	Countries (and number of observations)	Sample size per cluster
Continental	Austria (859), Belgium (2,169), France (1,391), Germany (1,833), Luxembourg (895), Netherlands (863)	8,010 observations
Eastern	Bulgaria (880), Croatia (817), Czechia (834), Estonia (895), Hungary (837), Latvia (837), Lithuania (857), Poland (983), Romania (848), Slovakia (870), Slovenia (1,325)	9,983 observations
Ireland and the UK (IE & UK)[5]	Ireland (828), United Kingdom (1,364)	2,192 observations
Scandinavian	Denmark (938), Finland (790), Sweden (925)	2,653 observations
Southern	Cyprus (819), Greece (637), Italy (935), Malta (880), Portugal (724), Spain (2,748)	6,743 observations

Note: *The sample size (number of cases available) is indicated in the third column. These country clusters were created on the basis of data from the ICTWSS database (the Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts in 34 countries between 1960 and 2014) and previous Eurofound research, which mapped industrial relations in the EU Member States.*
Source: *EWCS 2015*

4 At the time of the data collection, in 2015, the UK was still an EU Member State.

5 It should be noted that this cluster has fewer observations and countries than the others, which could influence results (1,364 observations for the UK and 828 observations for Ireland). The Scandinavian cluster has a slightly higher number of observations overall, which are more equally distributed across the three countries – 938 observations for Denmark, 790 for Finland and 925 for Sweden.

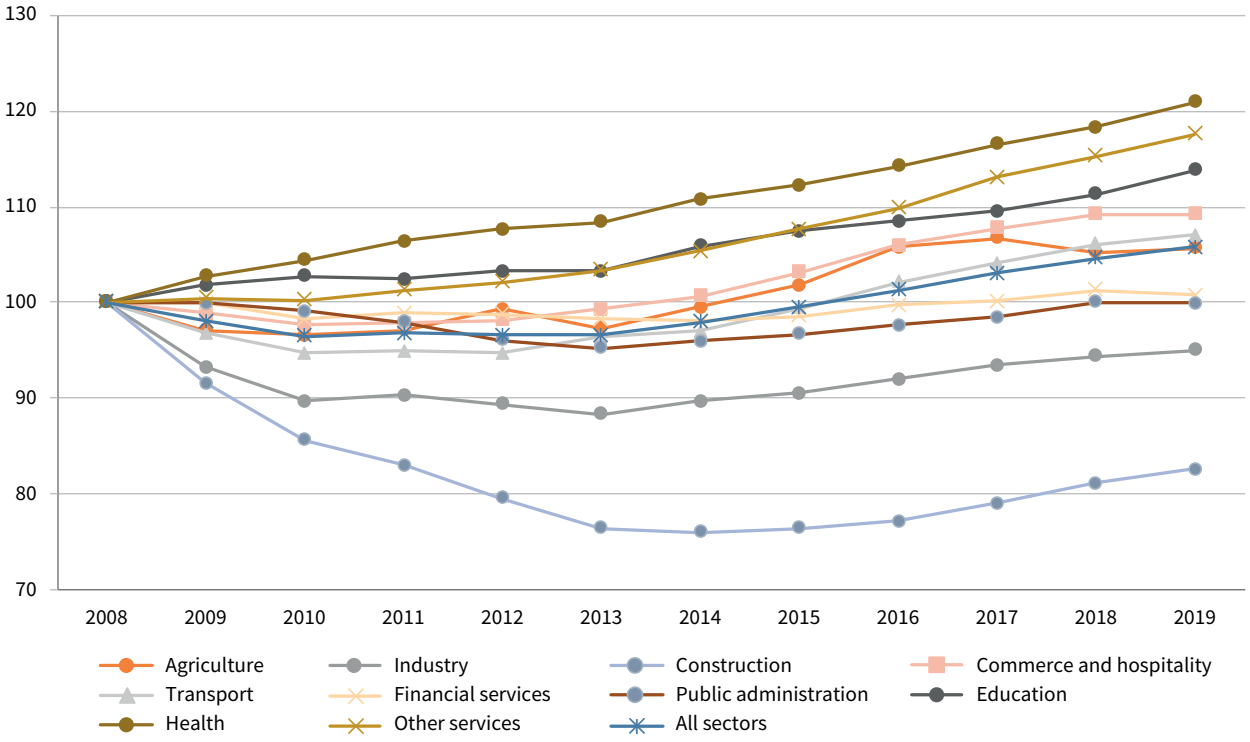
1 Mapping the sectoral characteristics of employment

This chapter maps sectoral characteristics, in terms of employment development, using data from the EU-LFS to set the scene for the sectoral analyses in the subsequent chapters.[6] The first section summarises the evolution of employment by sector and country cluster. The remaining sections deal with the distribution of demographic characteristics, occupational and educational structures, as well as employment conditions across sectors.

Evolution of employment across economic sectors from 2008

In 2019, almost all sectors of the European economy had recovered to pre-financial crisis employment levels. As shown in Figure 1, with the exception of construction and industry, where employment had dropped critically in the aftermath of the financial crisis and has barely recovered since, employment in all sectors started recovering from 2013 onwards, showing a sustainable increasing trend in the subsequent years. It is worth noting that employment in some sectors, such as education, health and other services, saw consistently rising employment over the period 2008–2019. Overall, the financial crisis of 2007–2008 exacerbated the structural transformations of the economy by increasing the share of employees working in services at the expense of more labour-intensive sectors like manufacturing and construction. At the time of finalising this report, the impact of the COVID-19 health crisis on employment could not be considered due to a lack of data at EU level by sector.

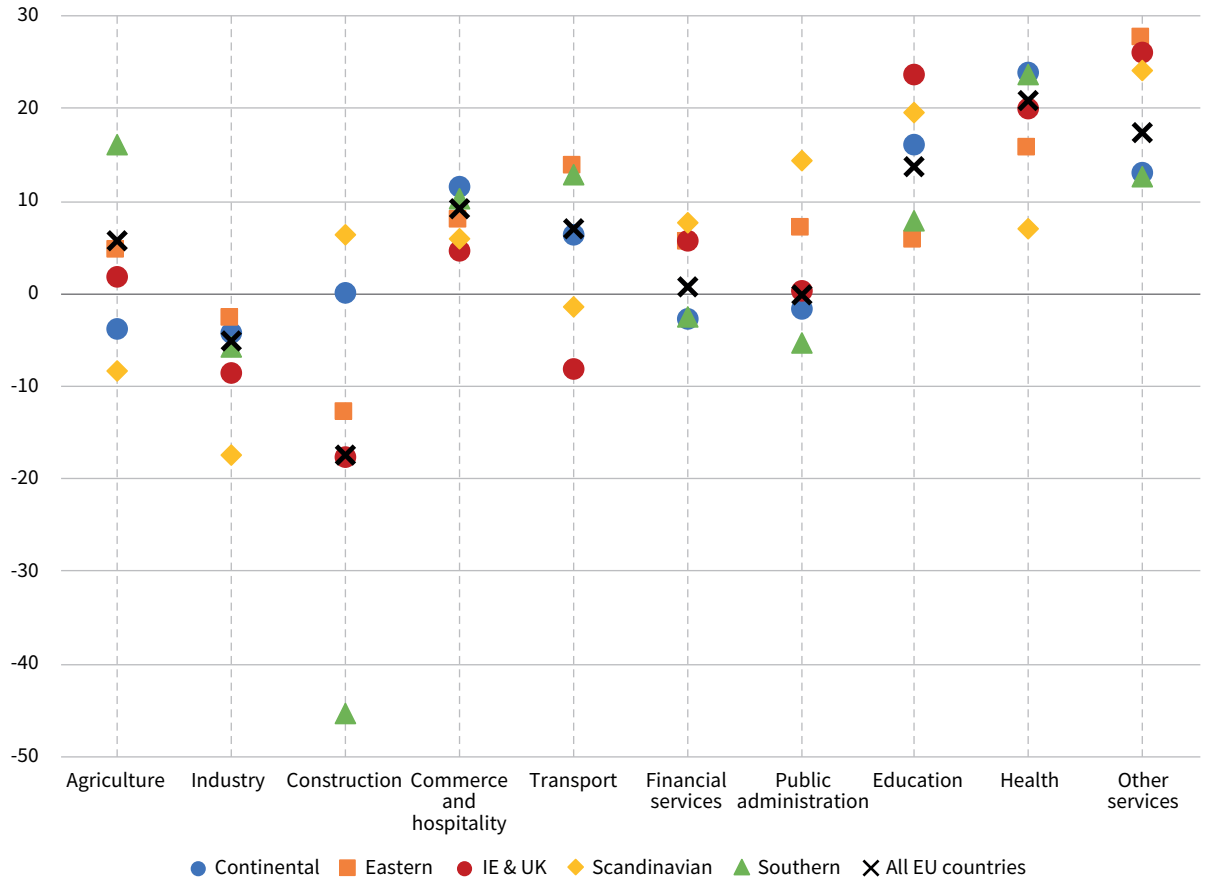
Figure 1: Change in employment by sector, 2008–2019 (100 = 2008)



Source: *EU-LFS 2008–2019*

6 Throughout this chapter, employment is measured by the number of employed persons.

Figure 2: Change in sectoral employment by country cluster, 2008–2019 (%)



Note: *For each country cluster, the figure shows the percentage change in employment by sector between 2008 and 2019.*
Source: *EU-LFS 2008–2019*

Looking at employment changes within country clusters in Figure 2, different patterns are found for sectoral trends, although they are convergent with the reported trend at EU level in Figure 1. The highest decline in employment shares is recorded for the construction sector in Southern countries. For example, construction employment declined by almost two-thirds in the aftermath of the 2007–2008 financial crisis in Spain. To a lesser extent, similar patterns are found for Ireland and the UK and Eastern countries. Employment in the services sector has expanded in all country clusters except Continental and Southern countries, where employment has slightly declined in financial services and public administration.

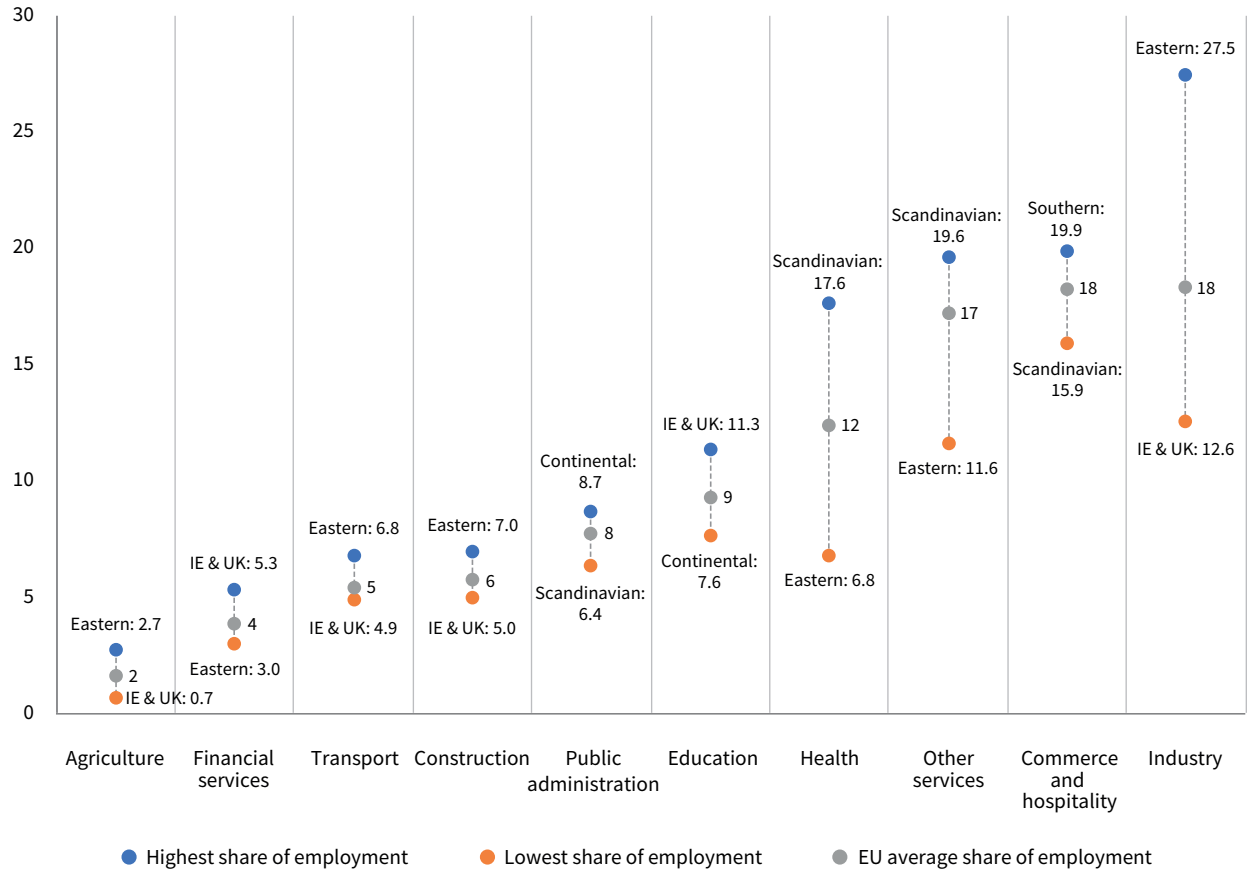
Structural characteristics of economic sectors in 2015

To put the results from the following chapters based on the EWCS 2015 in perspective, the structural characteristics of economic sectors, based on the EU-LFS 2015, are described in the following sections.

Economic structure

Despite ongoing deindustrialisation, manufacturing still represents a large share of employment in European economies, though large differences are observed between country clusters, as illustrated in Figure 3. The industrial sector represents 18% of total European employment, with Eastern countries recording the highest share (27.5%) and Ireland and the UK recording the lowest share (12.6%). In comparison, commerce and hospitality, though accounting for the same proportion of European employment as industry (18%), shows less heterogeneity across country clusters. Significant differences are also reported in the health sector and in other services. Health employees represent more than 17% of total employment in Scandinavian countries, while this share falls to around 7% in Eastern countries. In the remaining sectors, sectoral employment shares by country cluster are closer to the European average, denoting similar economic structures.

Figure 3: Proportion of total EU employment by sector and country cluster, 2015 (%)



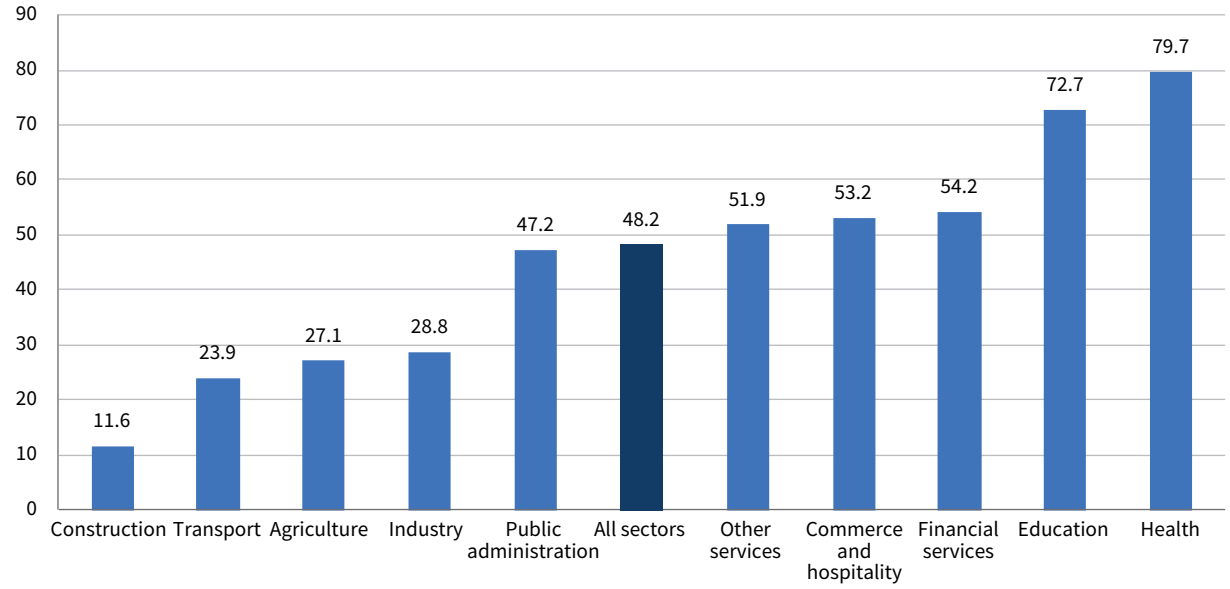
Note: *This figure reports the EU average share of employment as well as the highest and lowest shares by country cluster for each sector.*
Source: *EU-LFS 2015*

Differences are also found within each country cluster. The industry sector records a high dispersion of employment shares within three country clusters: Continental, Southern and Eastern. Within the Continental cluster, the employment shares range from 22.5% in Germany to 6.5% in Luxembourg, while these shares range from 34% in Czechia to 17% in Latvia within the Eastern cluster and from around 24% in Italy to 10% in Cyprus within the Southern cluster. Considerable heterogeneity in employment shares is also reported for the commerce and hospitality sector, especially within the Southern and Continental clusters. For example, the employment share in Cyprus is 28% compared to 17% in Italy in the Southern cluster, and ranges from 21% in the Netherlands to 15% in Belgium in the Continental cluster. Health and financial services are other sectors that show large differences within the Continental cluster. Employment shares range from 18% in the Netherlands to 11% in Austria for the health sector and from 12% in Luxembourg to 3% in Germany for financial services.

Demographic characteristics

Despite the ongoing and sustainable rise in female labour market participation since the 2007–2008 financial crisis, the gender distribution of employees is far from being balanced across sectors, as illustrated in Figure 4. Health and education are the sectors with the highest proportion of women among total employees (79.7% and 72.7%, respectively). Sectors such as finance, commerce and hospitality and other services show a well-balanced proportion of men and women. Industry, agriculture, transport and construction are still overwhelmingly male dominated (less than 30% of employees are female).

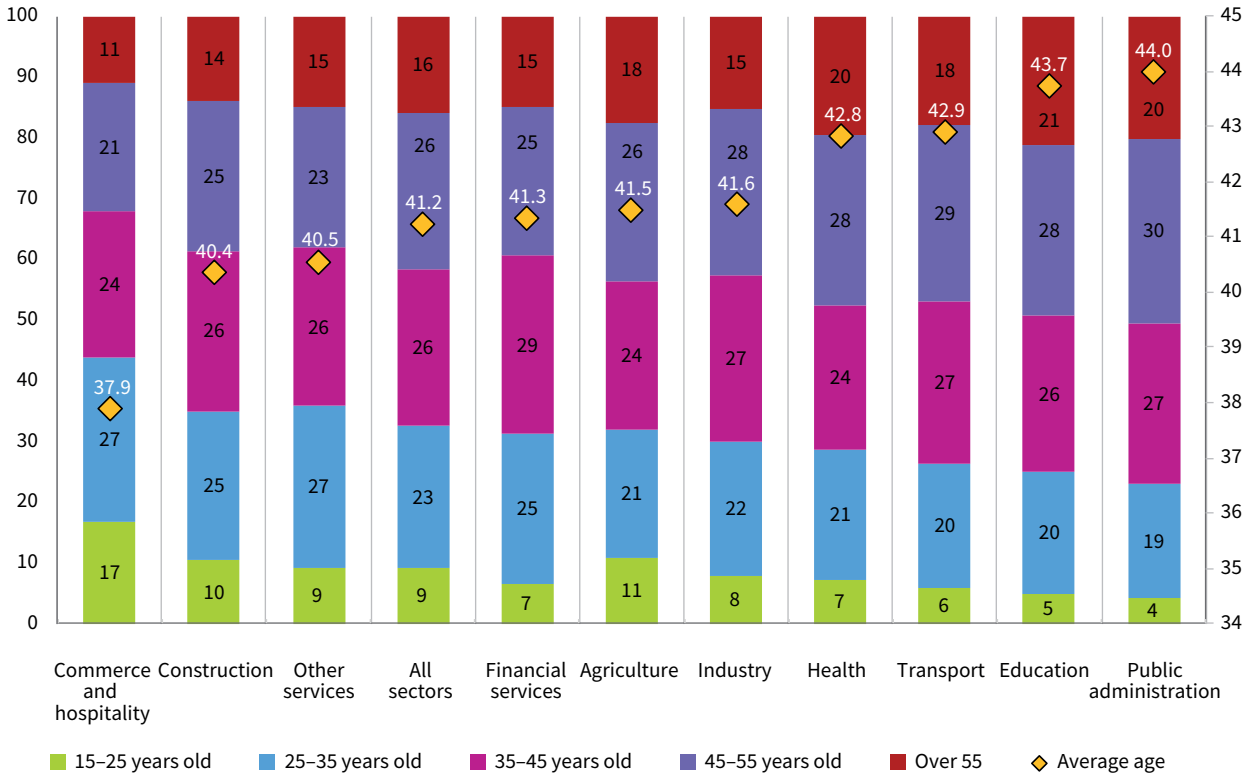
Figure 4: Female share of employment by sector, 2015 (%)



Source: *EU-LFS 2008–2019*

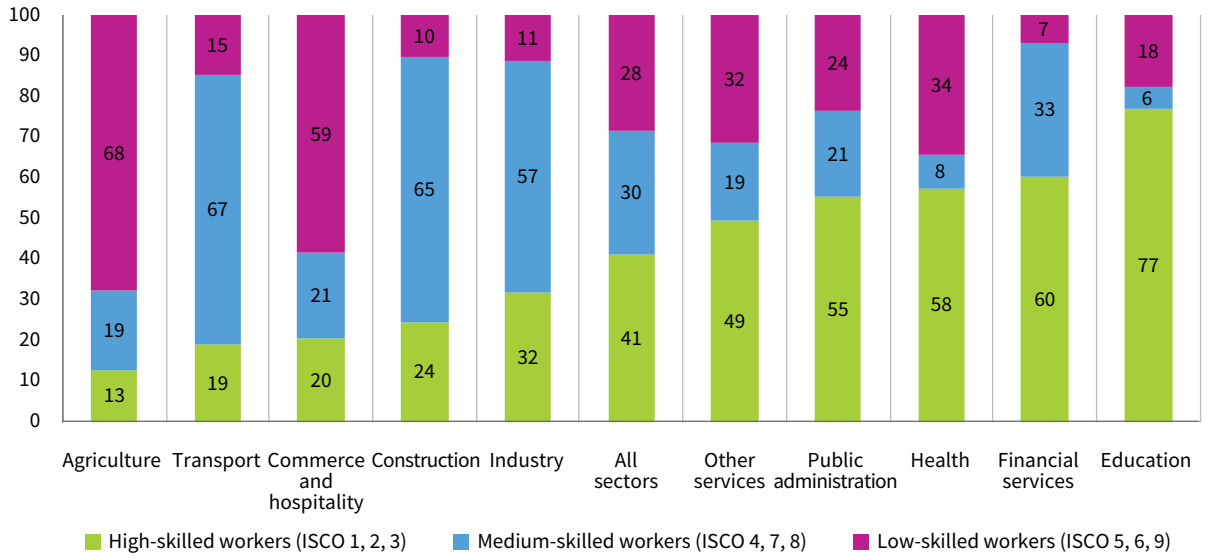
Figure 5 displays the employees' age structure across sectors. The youngest workforces are found in commerce and hospitality, construction and other services. Conversely, employees over 55 years of age are overrepresented in public administration, education and health, where the proportion of employees in this age group exceeds 20% of total employees. These three sectors and transport have a workforce which is ageing more than the workforces in the other sectors examined in this report. This is because they also have a high share of workers in the 45–55 age cohort.

Figure 5: Age structure of the workforce by sector, 2015 (%)



Note: *The age structure of the employee workforce is measured by the percentage of employees in each age category for each sector in 2015. The average employee age is shown in yellow (scale on right).*
Source: *EU-LFS 2015*

Figure 6: Occupational structure by sector, 2015 (%)



Source: *EU-LFS 2015*

Occupational structure and education

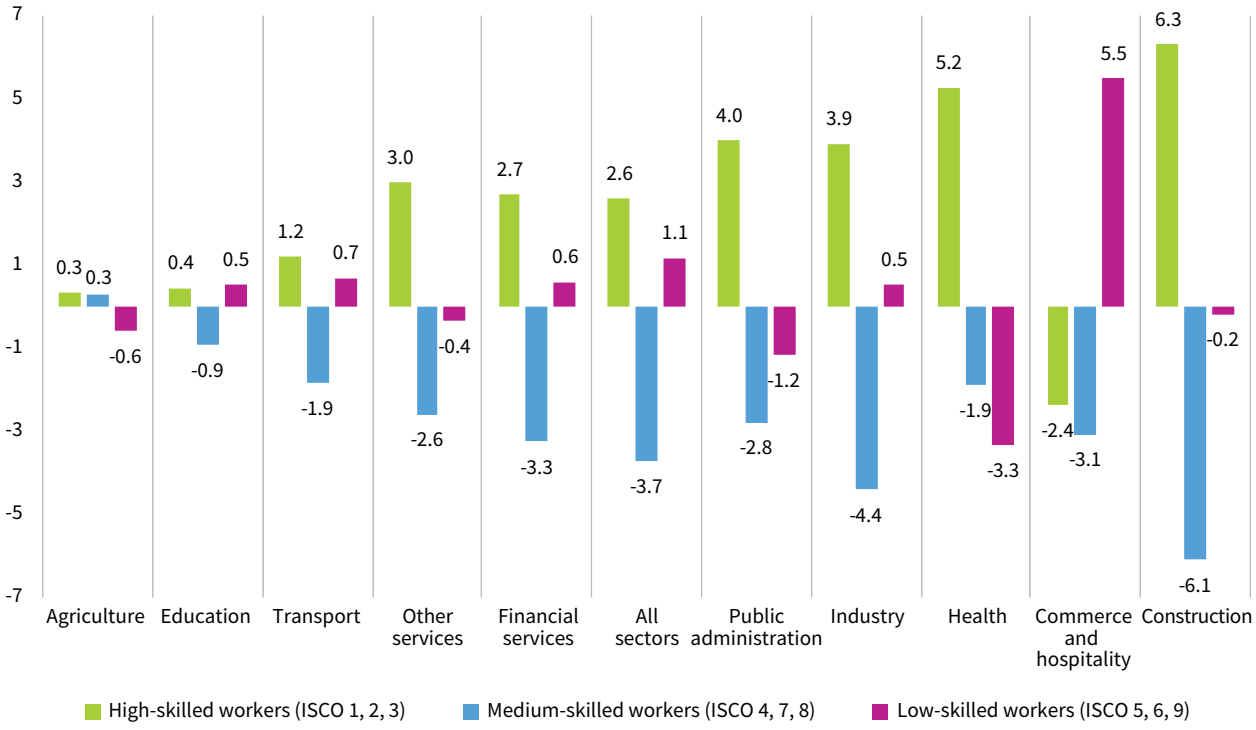
Figure 6 reports the distribution of employees by occupation, grouped into three categories in each sector: high-skilled, medium-skilled and low-skilled employees.[7] High-skilled employees are overrepresented in education (77%), financial services (60%) and health (58%), and in public administration and other services, where about 50% of employees are high-skilled. Medium-skilled employees account for over 50% of total employment in transport, construction and industry, while the lowest share is found in education (6%). Commerce and hospitality and agriculture record the highest proportions of low-skilled employees.

Figure 7 depicts the changes in occupational structures within each sector between 2010 and 2015 comparatively.[8] At first glance, the share of high-skilled employees increased in nine sectors out of 10, while the share of medium-skilled employees decreased in all sectors but agriculture, confirming polarisation trends within EU sectors. However, some sector-specific trends are worth noting. First, in construction, health and public administration, the share of high-skilled employees increased at the expense of medium- and low-skilled categories. Second, some sectors, such as industry, financial services, transport and education, are marked by high job polarisation. These sectors record a positive change in both high-skilled and low-skilled occupations, while the proportion of medium-skilled occupations has declined, thus converging with the average changes observed at EU level. Finally, commerce and hospitality is the only sector where the rise in low-skilled employees is offset by the decline in medium- and high-skilled employees. Agriculture is the only sector where the rise in high- and medium-skilled employees is balanced with the decline in low-skilled employees.

7 The breakdown criteria are based on the seminal analyses of Autor et al (2003), Acemoglu and Autor (2011) and Autor and Dorn (2013), which rely on a combination of skills level and wage level to define the categories. This method is used as a reference for analysing upskilling and polarisation of the workforce (OECD, 2017a). The three categories from ISCO-08, 1 digit are high-skilled workers (ISCO 1, 2, 3), medium-skilled workers (ISCO 4, 7, 8) and low-skilled workers (ISCO 5, 6, 9).

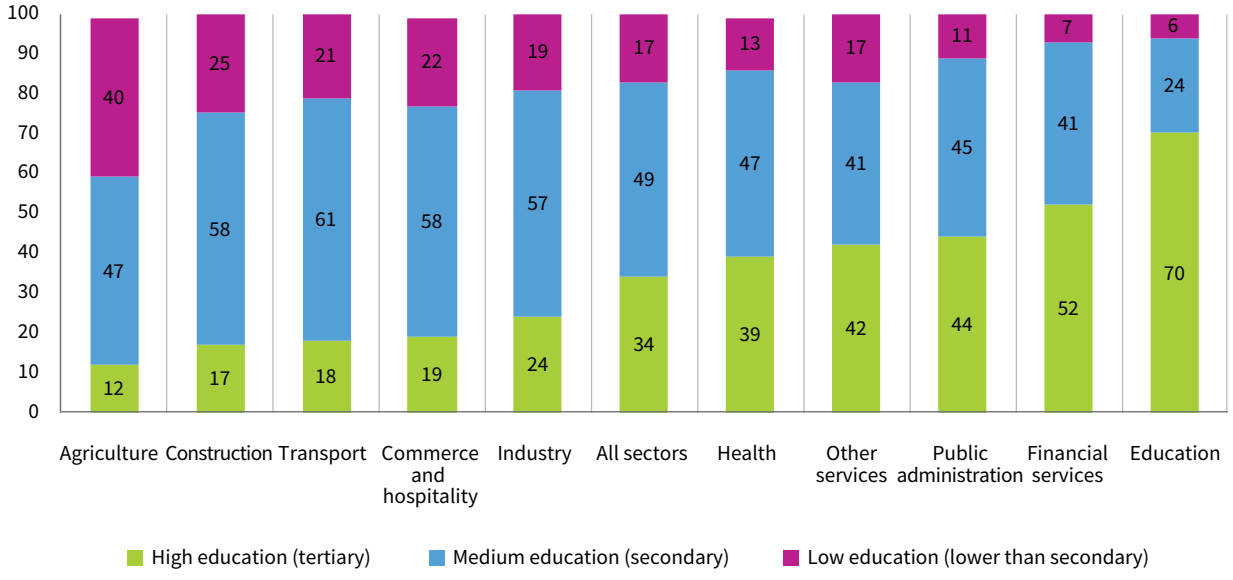
8 In the following chapters, and more precisely in the chapter on changing tasks, both the fifth (2010) and the sixth (2015) waves of the EWCS are used. Looking at occupational changes over the period 2010–2015 will help to contextualise the results in the following chapters.

Figure 7: Shifts in occupational structures by sector, 2010–2015



Note: *This figure reports the percentage points change by occupational category for each sector.*
Source: *EU-LFS 2010–2015*

Figure 8: Distribution of educational attainment by sector, 2015 (%)



Note: *The percentages represent the proportion of each educational category with respect to total employment in the sector.*
Source: *EU-LFS 2015*

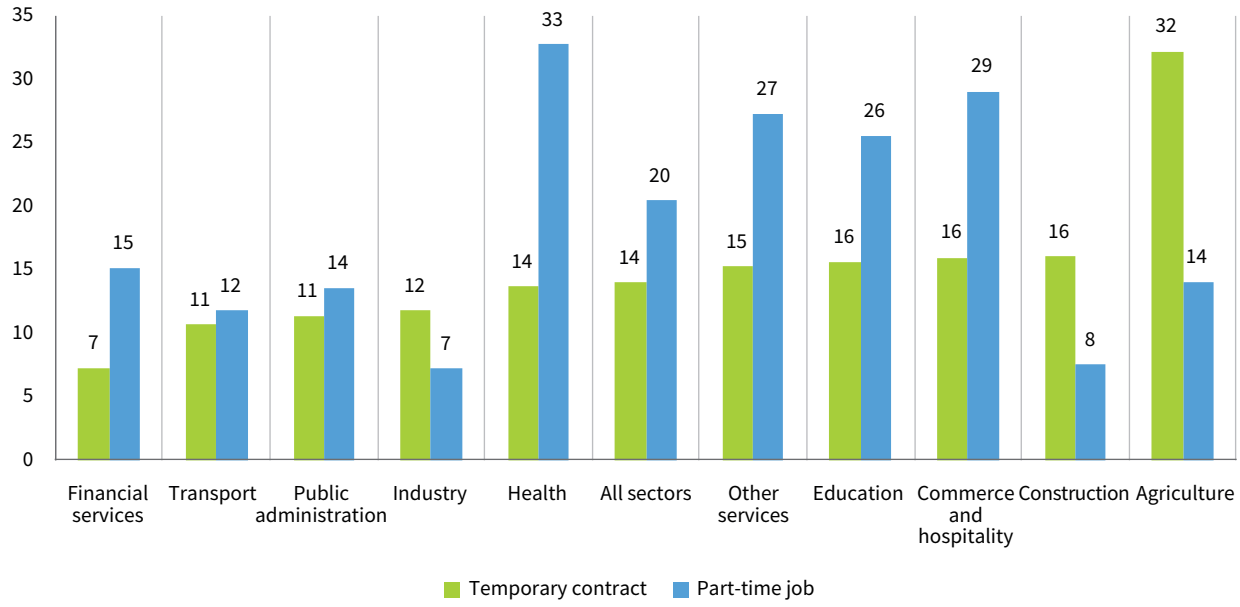
In terms of the educational attainment of employees, over half of the workforce in education and financial services is highly educated, as illustrated in Figure 8.[9] This share, however, is less than 20% in commerce and hospitality, transport, construction and agriculture, which record – along with industry and health – the highest shares of employees with secondary education. Agriculture is the main hiring sector of employees with lower than secondary education, where this category represents about 40% of total employment in the sector.

Employment conditions

Some conditions of employment, like employment status, will be looked at in more depth in other chapters of this report. However, in order to have a complete mapping of the characteristics of the sectors before looking at job quality issues, it is necessary to frame the sectoral differences at the beginning of this study. In this way, it will be easier to understand some of the working conditions results and outcomes presented in the following chapters.

The standard employment contract with a permanent and full-time job is still the predominant employment status in almost all the sectors examined. Figure 9 shows different employment statuses, with a focus on temporary and part-time employment. Agriculture is the sector that is the most reliant on temporary jobs, with almost 32% of employees on temporary contracts. This is mostly linked to the seasonality of activity in this sector. In the remaining sectors, the share of temporary contracts ranges from 16% in construction, commerce and hospitality and education to 7% in financial services. Regarding the distribution of part-time work arrangements across sectors, four sectors rely more extensively on part-time employment: health (33%), commerce and hospitality (29%), other services (27%) and education (26%). Transport, public administration and industry had the lowest shares of atypical contracts in 2015.[10]

Figure 9: Proportion of part-time and temporary employment by sector, 2015 (%)

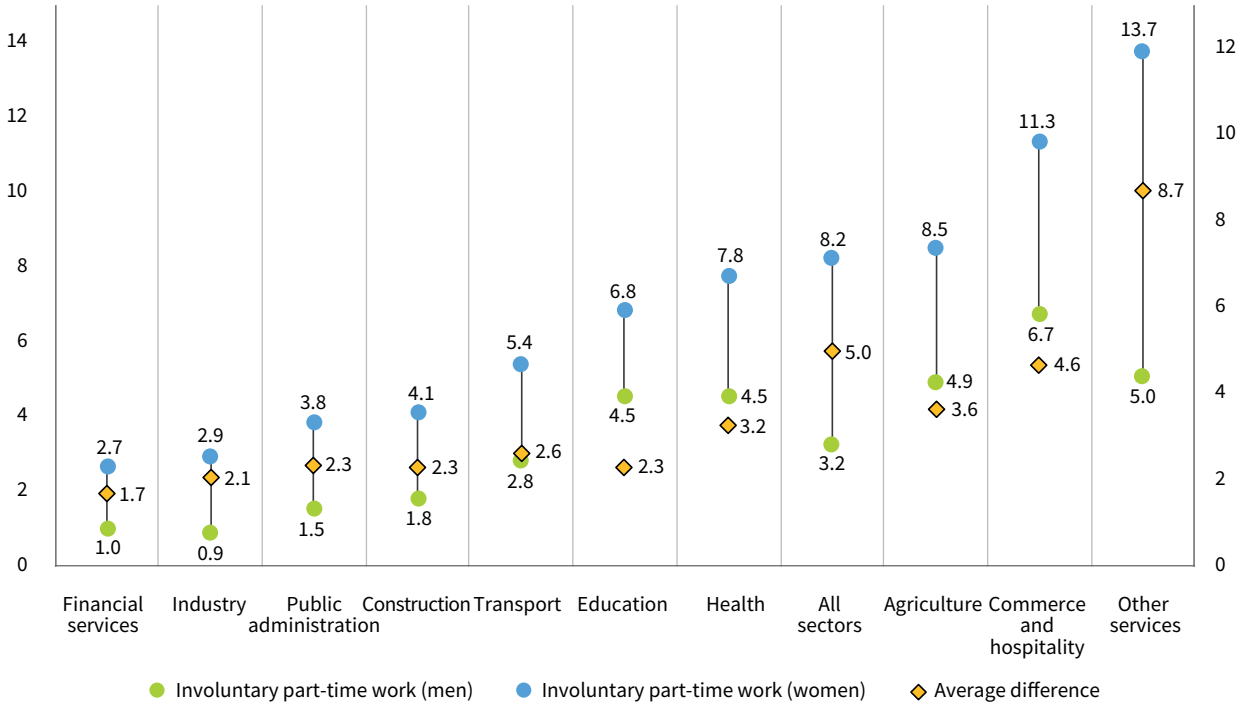


Note: *This figure displays the share of non-standard forms of contract entered into by employees by sector.*
Source: *EU-LFS 2015*

9 The three categories are the aggregated levels of ISCED classification, following the Eurostat classification. High education represents tertiary education (ISCED 5–8), medium education is secondary education (ISCED 3–4) and low education is less than secondary education (ISCED 0–2).

10 Atypical contracts are generally defined as employment contracts that do not conform to a standard, open-ended and full-time contract. This can encompass many types of contract, including part-time, fixed-term, temporary, casual and seasonal (Eurofound Industrial Relations Dictionary).

Figure 10: Involuntary part-time work by gender and sector, 2015 (%)



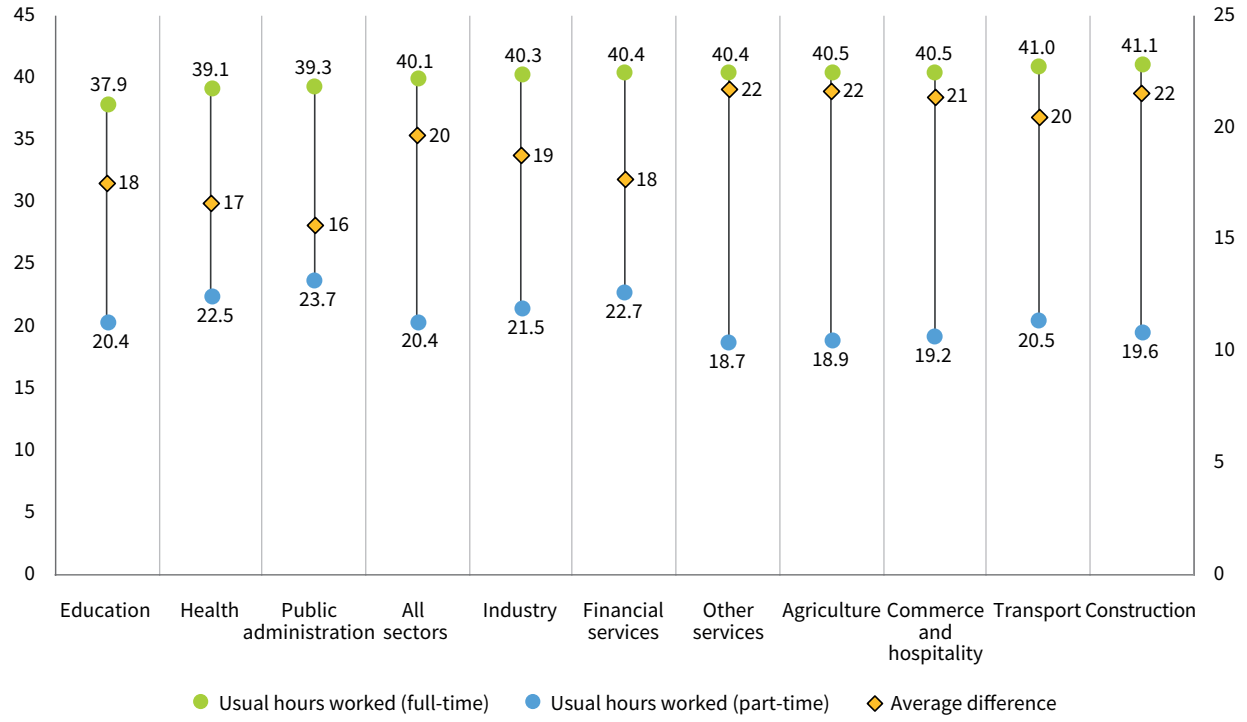
Note: *This figure shows involuntary part-time work for male and female workers in each sector in 2015. The rounded difference between the two is shown in yellow (scale on right).*
Source: *EU-LFS 2015*

Involuntary part-time workers, defined as those who cannot find a full-time job, are mostly women, as reported in Figure 10. Around 14% of women in other services and 11% in commerce and hospitality report involuntary part-time work, while this share falls to 5% and 6.7% for men, respectively. The gender gap is also pronounced in agriculture and health, where there is more than three percentage points difference between men and women.

Furthermore, sectors recording the highest shares of part-time work are, to some extent, those with the highest shares of involuntary part-time work. This is the case, for example, in other services, commerce and hospitality and health. The commerce and hospitality sector, with 29% of part-time work, registers 9% of involuntary work. Yet, there are some exceptions to this relationship – namely public administration and financial services, where the share of part-time employees is relatively high (14% and 15%, respectively), but the share of involuntary part-time employees is quite low (2.3% and 2.7%, respectively).

Figure 11 shows the usual hours worked by full-time employees compared to part-time employees, as well as the average difference in hours worked between the two types. Education, health and public administration have the lowest number of usual hours worked for full-time work, and relatively high numbers for part-time work. This reflects the particularity of public sectors, which have rather good quality standards in terms of working time. Conversely, other sectors – such as commerce and hospitality, other services, agriculture and construction – have the opposite profile: a high number of worked hours for full-time employees and a low number for part-time employees.

Figure 11: Usual hours worked by contract duration and sector, 2015



Note: *This figure shows the hours usually worked for part-time and full-time work in each sector in 2015. The rounded difference between the two is shown in yellow (scale on right).*
Source: *EU-LFS 2015*

In brief

- Employment in all sectors in the EU recovered to pre-financial crisis levels, except in industry and construction. Despite this common trend, disparities in sectoral structures are visible between and within country clusters. Industry, for example, is still an important sector of employment in Europe, albeit driven by the prominence of this sector in Eastern countries in comparison with Scandinavian and Continental countries. In the last 10 years, the health sector has shown the highest increase in employment, while the construction sector has shown the strongest decrease.
- Sectoral employment is marked by important demographic differences. Women are overrepresented in health and education, while construction, transport, agriculture and industry are male dominated. The age structure within each sector shows that the youngest employees are mainly present in commerce and hospitality and construction, whilst the proportion of employees over the age of 55 is 20% or above in public administration, education and health. The other age categories are more evenly distributed across sectors.
- The occupational structure of sectors changed over the period 2010–2015, with a rise in high-skilled occupations in all sectors except commerce and hospitality and a decline in medium-skilled occupations in all sectors except agriculture. The share of low-skilled employees declined in only five sectors – health, public administration, other services, agriculture and construction.
- Over half of the workforce in education and financial services is highly educated. However, this share is lower than 20% in commerce and hospitality, transport, construction and agriculture. Industry and agriculture record the highest shares of employees with secondary education and agriculture is the main hiring sector of employees with lower than secondary education.
- With respect to employment conditions, agriculture, commerce and hospitality, education, other services and health rely more heavily on non-standard employment contracts (high level of part-time and temporary contracts) in comparison with the European average.[11] Involuntary part-time work is predominant among female employees, with overall higher shares in commerce and hospitality and other services.

11 'Non-standard employment is an umbrella term for different employment arrangements that deviate from standard employment. They include temporary employment; part-time and on-call work; temporary agency work and other multiparty employment relationships; as well as disguised employment and dependent self-employment' (see https://www.eurofound.europa.eu/topic/non-standard-employment#s-01).

2 Measuring job quality across different dimensions

The megatrends and changes in the world of work described above affect the working conditions and job quality of workers, as new jobs emerge and existing jobs are transformed (European Commission, 2018). It is not always easy to predict whether such changes will lead to an improvement or deterioration in job quality, and for which workers. Technological progress, for example, can improve the quality and sustainability of jobs through the automation of dangerous, dirty, repetitive or demanding jobs. It has, however, also led to new flexible forms of work that come with high work intensity, a poor social environment and a more problematic work–life balance, including some types of platform work and ICT-based mobile work (Eurofound, 2020b). Trends and changes in the world of work are often more likely to affect some groups of workers, and some sectors, than others. For this reason, it is necessary to monitor job quality across sectors.

This chapter explores the broad trends in job quality across sectors on the basis of six indices derived from the European Working Conditions Survey 2015, shown in Table 3 (Eurofound, 2016b):

- physical environment
- social environment
- working time quality
- work intensity
- skills and discretion
- prospects

The job quality indices aim to capture how workers experience the conditions under which they perform their work. Table 3 shows the variables that are included in each index.

Job quality indices as captured in the EWCS 2015

Physical environment: This index captures physical risks in the workplace in three areas – ambient (e.g. exposure to noise, high temperatures), posture-related (e.g. painful positions, repetitive movements) and biological and chemical risks (e.g. handling or being in contact with dangerous substances and hazardous biological agents such as bacteria or viruses). A higher score on the index should be interpreted as a safer – or less risky – physical environment.

Social environment: This index measures the adverse social behaviour and discrimination that workers are exposed to and the social support they receive at work. A higher score index corresponds to more supportive and respectful professional relationships.

Working time quality: This index captures the duration of work and atypical working times, and thus provides insights into issues such as work–life balance and working time flexibility. Duration is assessed on the basis of the number of hours worked per week and per day. Atypical working time refers to night work, weekend work and shift work. A higher score on this index implies a better working time quality.

Work intensity: This index considers the quantitative and pace demands in a job. Quantitative demands are assessed on the basis of having to work to tight deadlines, at high speed, or doing short repetitive tasks. Pace determinants and interdependency assess whether the work pace depends upon factors such as work done by a colleague or supervisor, a numerical target or the speed of a machine. A higher score on this index signifies that the job is more demanding in terms of speed pressure and deadlines.

Skills and discretion: This index provides an indication of learning and training possibilities offered and paid for by the employer. Learning is assessed on the basis of the cognitive dimension of the tasks performed (e.g. task complexity, requirement to learn new things) and decision latitude (e.g. being able to choose the order and pace of work). The latter also gives an indication of the task autonomy a worker has. A higher score on this index means that a worker has more opportunities for learning and training and greater autonomy.

Prospects: This index captures four dimensions that are all related to workers' employability and prospects for the future – employment status, career prospects, job security and downsizing. Some of these dimensions are determined by the organisation in which the employee works, while others are specific to the occupation. A higher score on this index signals that workers have better prospects.

Source: *Eurofound, 2016b*

Table 3: Job quality indices

Index	Dimension	Variables from EWCS (2015)
Physical environment	Ambient	Exposure to vibrations from hand tools, machinery (Q29a) Exposure to noise so loud that you would have to raise your voice to talk to people (Q29b) Exposure to high temperatures that make you perspire even when not working (Q29c) Exposure to low temperatures whether indoors or outdoors (Q29d) Exposure to breathing in smoke, fumes, powder or dust (Q29e)
	Posture related	Painful or tiring positions (Q30a) Carrying or moving heavy loads (Q30c) Repetitive hand or arm movements (Q30e)
	Biological and chemical	Handling or being in direct contact with dangerous substances such as chemicals or infectious materials (Q29i)
Social environment	Adverse social behaviour	Exposure to discrimination on the basis of sex (Q72d) Exposure to unwanted sexual attention (Q80b)
	Discrimination	Age discrimination (Q72a) Ethnic discrimination (Q72b) Disability discrimination (Q72f) Nationality discrimination (Q72c)
Working time quality	Duration	Number of working hours per week (Q24) Long working days (10 hours or more a day) (Q37d)
	Atypical working time	Night work (Q37a) Saturday work (Q37b) Sunday work (Q37c) Shift work (Q39e)
Work intensity	Quantitative demands	Short repetitive tasks of less than 1 minute (Q48a) Short repetitive tasks of less than 10 minutes (Q48b) Working at very high speed (Q49a) Working to tight deadlines (Q49b)
	Pace determinants and interdependency	Work pace dependent on the work done by colleagues (Q50a) Work pace dependent on direct demands from people such as customers, passengers, pupils or patients (Q50b) Work pace dependent on numerical production target (Q50c) Work pace dependent on automatic speed of machine or movement of a product (Q50d) Work pace dependent on the direct control of your boss (Q50e)
Skills and discretion	Cognitive dimension	Meeting precise quality standards (Q53a) Assessing yourself the quality of your own work (Q53b) Solving unforeseen problems (Q53d) Complex tasks (Q53e) Rotating tasks between you and your colleagues (Q55) Learning new things (Q53f)
	Decision latitude	Choosing the order of tasks (Q54a) Choosing the methods of work (Q54b) Choosing the speed or rate of work (Q54c)
	Training	Training paid for or provided by the employer (Q65a)
Prospects	Employment status	Kind of employment contract in main job (Q11)
	Career prospects	Job offers good prospects for career advancement (Q89b)
	Job security	Might lose job in the next six months (Q89g)
	Downsizing	Has the number of employees at your workplace increased, stayed the same or decreased? (Q19)

Source: *EWCS 2015*

Previous research, including Eurofound research based on the EWCS (Eurofound, 2012b, 2016b), has shown that the sectoral perspective is particularly relevant for some of these indices, for example the physical environment index, while the link is less notable for other indices. The physical environment depends on the production processes, materials and equipment typically used in a sector, as well as the activities performed and the occupations found within it. A clear example is the construction sector, where builders may be performing heavy manual labour, working at heights or using toxic substances. It follows that the construction sector reports the highest physical risks (Eurofound, 2016b). Some branches of industry face high work intensity or low working time quality, for example, because the production process is organised in an assembly line, with workers doing shift work. Moreover, of all the occupations covered in the EWCS 2015, plant and machine operators have the least positive views on the performance of their managers (Eurofound, 2016b).[12] For other indices, the link with sectors may be less clear, or the link with other dimensions, such as occupation or employment status, may be stronger. This is investigated in the following sections.

Another important point, however, is that megatrends influence the economic sectors themselves (the composition of the workforce, the types of companies present and the importance of specific occupations, for example), as well as the sectoral composition of the economy. Population ageing leads to increased demand within the health sector; digitalisation may make these jobs less risky and more sustainable. In this chapter, a description of job quality characteristics across sectors is presented. When studying job quality, an attempt is made to separate structural effects from the composition of the workforce and changes within jobs.

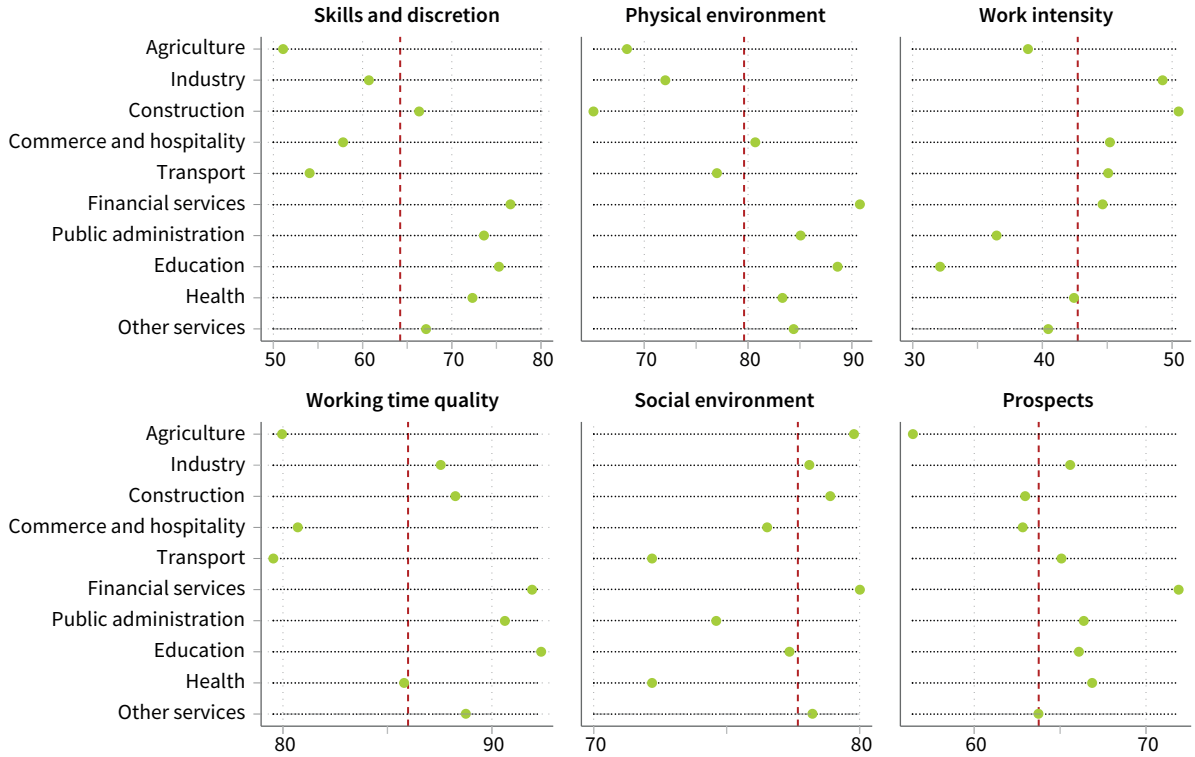
Job quality by sector and subsector in 2015

The analysis of differences in job quality between and within sectors starts by mapping the six job quality indices for each of the 10 sectors (Figure 12, Figure 13) and nine subsectors (Figure 14) of interest based on EWCS 2015 data. These figures document the state of play and may reveal issues that require further examination. It is often insightful to divide the sectors under examination on the basis of labour input, rather than output (primary/secondary/tertiary/quaternary). This leads to a group of sectors dominated by blue-collar or manual labour (agriculture, industry, construction, commerce and hospitality, transport) and a group of sectors dominated by white-collar or non-manual labour (financial services, education, public administration, health, other services). Together with skills levels, the manual/non-manual divide connects to theoretical research on job polarisation and the impact of technological change (automation and digitalisation) on the workforce (see Autor et al, 2006; Goos et al, 2009).

Starting with Figure 12, an initial observation is that some sectors perform poorly in relation to almost all indices, whereas for other sectors the opposite applies. Agriculture emerges as the sector with the worst job quality of all sectors for prospects and skills and discretion, and also scores low on the physical environment and working time quality indices. For work intensity, the sector scores below the EU average. The social environment is more favourable, however, with the second highest score after the financial services sector. Sectors dominated by manual, blue-collar occupations, such as construction, agriculture, industry and transport, have less safe physical environments and worse skills and discretion, particularly when compared to the EU average. In contrast, sectors dominated by white-collar occupations, such as financial services, education and public administration, record high scores for physical environment. These sectors also score well for prospects and skills and discretion (financial services, health, public administration and education, in particular). However, large differences exist between sectors for work intensity, which is particularly low in education and public administration, and for working time quality, for which the health sector scores much lower than financial services, public administration and education. In industry and construction, work intensity is high. However, these sectors have a favourable social environment and above-average working time quality. In relation to this index, agriculture, commerce and hospitality and transport have the lowest scores.

12 According to Eurofound (2016b), 58% of plant and machine operators report that their supervisor gives them recognition for doing a good job and 53% report that their supervisor encourages their development. In both cases, these percentages are significantly lower than for some other occupations, notably professionals.

Figure 12: Job quality indices by sector, 2015

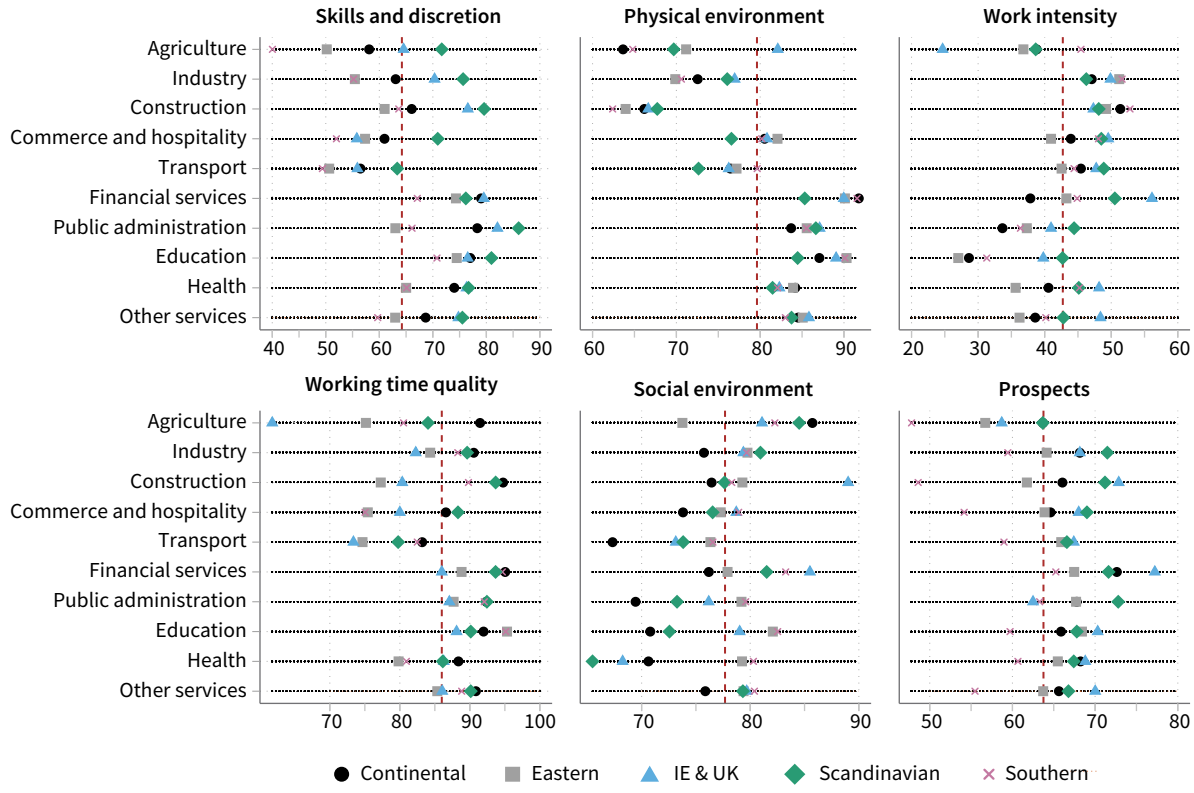


Note: *The dashed line represents the EU27 and the UK average over all sectors. Scales are different because individual scores are shown adjusted to the same graph size for each job quality indicator.*
Source: *EWCS 2015*

Figure 13 replicates the graphs in Figure 12 to show the variation across the country clusters. This analysis is relevant, considering the differences in the sectoral employment shares found between and within country clusters using the EU-LFS data. Overall, job quality is lower in the Southern and Eastern countries, and higher in the Scandinavian cluster. For all sectors, the Southern and Eastern clusters report the lowest scores for skills and discretion and prospects (except for Ireland and the UK in relation to prospects in public administration). Ireland and the UK do not consistently rank the same over the country clusters for the six job quality indices. Work intensity in this cluster is higher, working time quality is lower, but physical environment, prospects and skills and discretion are on a par with Scandinavian countries. The Continental cluster occupies a middling position for most indices, though work intensity is lower overall and the social environment is notably worse than in the Scandinavian cluster.

For some job quality indices, the differences between the sectors seem larger than those between the country clusters. More specifically, for physical environment, work intensity and working time quality, all country clusters record scores below the average for a number of sectors and above it for other sectors. Above-average scores for physical environment and working time quality are recorded for financial services, public administration, education, health and other services for almost all country clusters. Ireland and the UK and the Eastern countries perform particularly poorly when it comes to working time quality in the agriculture, industry, construction, commerce and hospitality and transport sectors – for the other country clusters, the scores are noticeably better. This is an important observation, bearing in mind that the Eastern country cluster reports that their highest employment shares are in transport, construction and industry. Work intensity is above the average level in the industry, construction, commerce and hospitality and transport sectors in almost all clusters. Work intensity is particularly high in the financial, health and other services sectors in Ireland and the UK and the Scandinavian cluster, but less so in the other country clusters. This is important because, according to the EU-LFS data, Scandinavian countries have the highest employment shares in the health and other services sectors, and Ireland and the UK report the highest employment shares in financial services and education. Education, agriculture and financial services are the sectors with the largest differences in work intensity between the country clusters. For skills and discretion and social environment, the picture is more blurred and larger differences arise between the clusters.

Figure 13: Job quality indices by sector and country cluster, 2015



Note: *The dashed line represents the EU27 and the UK average over all sectors. Scales are different because individual scores are shown adjusted to the same graph size for each job quality indicator.*
Source: *EWCS 2015*

A further analysis of what is driving differences in job quality suggests that all levels matter: the national level, the sector level, the company level and the worker level.[13] The results show that the company level (workplace) – in its interaction with the situation of the individual worker, such as their occupation, education level and household situation – has the largest impact on working conditions. This is because the company level is where measures are implemented. Nevertheless, the national and sector levels have a very important role as well, as these set the conditions and the institutional framework in which companies and workers operate. The sector level appears particularly relevant for the physical environment, prospects and skills and discretion indices.

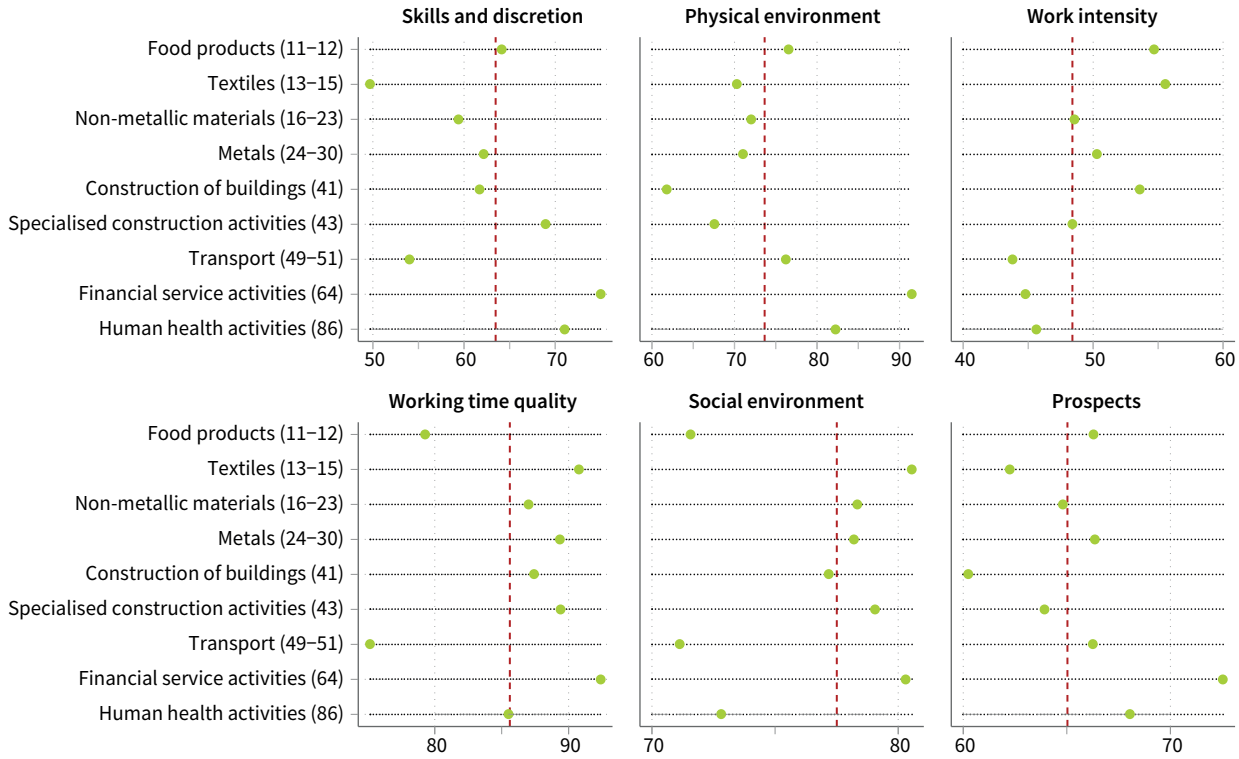
To find variations within sectors that stand out in terms of their scores on these job quality indices, a further analysis of nine subsectors is conducted. These subsectors are selected from industry and construction (both have a poor physical environment and high work intensity), transport (low level of skills and discretion and low working time quality), financial services (good performance for all indices except work intensity) and health (relatively good performance for all indices except social environment). The subsectors are:

- food products
- textiles
- non-metallic materials
- metals
- construction of buildings
- specialised construction activities
- transport
- financial service activities
- human health activities

Turning to these nine subsectors in Figure 14, the job quality scores can be compared with those of the main economic sector to which they belong (shown in Figure 12). These comparisons must be made with great caution, as some of these subsectors only count a very low number of observations. For example, the food products subsector counts 84 observations and textiles counts 423 (both are part of industry, which is a main sector and counts 5,065 observations). In other cases,

13 The results of this analysis are presented in detail in the annexes (Eurofound, 2020a).

Figure 14: Job quality indices by subsector (NACE Rev. 2), 2015



Note: *The food products, textiles, non-metallic materials and metals subsectors are part of the industry sector; the construction of buildings and specialised construction activities subsectors are part of the construction sector; the transport subsector is part of the transport sector; the financial service activities subsector is part of the financial services sector; the human health activities subsector is part of the health sector. The dashed line represents the EU27 and the UK average over all sectors. Scales are different because individual scores are shown adjusted to the same graph size for each job quality indicator.*
Source: *EWCS 2015*

the selected subsector makes up a large part of the main sector. For example, out of the 1,795 observations available for the full transport sector, 1,181 come from the transport subsector (66%). In such cases, it is likely that the findings for the subsector do not deviate much from those of the main sector.

For a number of subsectors – construction of buildings, specialised construction activities, transport, financial service activities and human health activities – no major deviations in job quality are observed in comparison with their main economic sector.

At first glance, the graphs suggest differences between the construction of buildings and specialised construction activities subsectors. The construction of buildings subsector performs worse than the specialised construction activities subsector on all job quality indices. The construction of buildings subsector reports higher work intensity and a poorer social environment than the construction sector overall. The specialised construction activities subsector appears to have a better physical environment than the average for the whole construction sector. These differences could be driven by differences in the occupational composition and type of activities. Nevertheless, both subsectors have job quality scores that are similar to those of the overall construction sector, and a closer look at the scales on the graphs reveals that the actual differences are not very large.

Stronger deviations between subsectors within the main sector are visible for industry (food products, textiles, non-metallic materials and metals). More specifically, the textiles subsector has lower skills and discretion, fewer prospects and higher work intensity than the other subsectors. The food products subsector has a poorer social environment and poorer working time quality compared to the other three subsectors and the main sector, but does have a somewhat better physical environment. The largest differences between these four subsectors can be seen in: skills and discretion (poorer in textiles), working time quality (lower in food products) and social environment (poorer in food products). Smaller, but noticeable, differences between the subsectors arise for work intensity (higher in food products, textiles) and prospects (lower in textiles). The subsectors that report the largest deviations, food products and textiles, are characterised by different occupations, activities and production and distribution processes compared to the other two subsectors, which are more similar.

Figure 15 presents the six job quality indices for 2015 by sector and occupational category in the EU27 and the UK. Blue-collar occupations are especially prevalent in agriculture, industry, construction, commerce and hospitality and transport. White-collar occupations are commonly found in the financial services, public administration, education, health and other services sectors.

The variation in job quality across sectors is substantially wider for some indices (such as physical environment, skills and discretion) than others (social environment, prospects). Almost universally, workers in managerial, professional and technical occupations have better job quality compared to those in other occupations (such as clerical, service, trade and craft workers). This divide is especially visible for the prospects and skills and discretion indices. For these indices, the differences between managerial, professional and technical occupations are particularly large in the agriculture, industry, construction and other services sectors (prospects and skills and discretion), and also in commerce and hospitality, transport and education (skills and discretion). Looking at the sectoral spread in the EU27 and the UK, the divide between sectors dominated by blue-collar, manual occupations and white-collar, non-manual occupations discussed above is noticeable for the physical environment, working time quality and work intensity indices.

Nevertheless, when looking at the six job quality indices, different sectors record specific job quality outcomes depending on the index. There is, however, a caveat for agriculture, which is a small sector with quite specific conditions and often appears as an outlier compared to other sectors. Moreover, its dominant occupational category is agricultural workers (ISCO 6) and its job quality is poorer across the board. This does not affect the weighting of the EU27 and the UK average due to underreporting (there are many missing values for this occupational category).

Industry shows substantial differences between managerial, professional and technical occupations and the other occupational categories with regard to physical environment, prospects and skills and discretion – less so with respect to working time quality, work intensity and social environment.[14] It is striking that work intensity is lower among managerial, professional and technical occupations than among those in other occupations. This also occurs in construction, commerce and hospitality and transport.

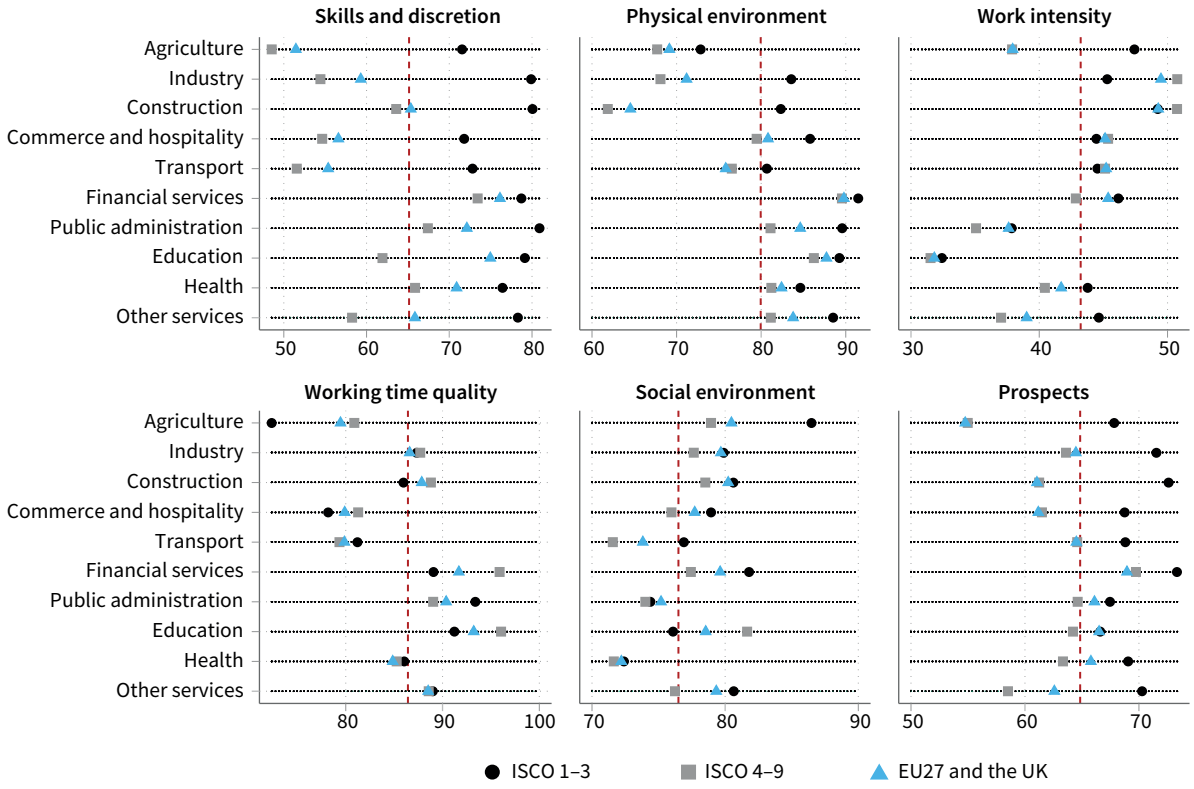
Construction, commerce and hospitality and transport show patterns that are broadly similar to those seen in industry. However, while the physical environment is poorer for medium- and low-skilled occupations in construction, this is not the case in commerce and hospitality. Job quality is generally favourable in financial services, even though the higher-ranked occupational categories (such as managers, scientists, programmers and experts) have a comparatively higher work intensity and poorer working time quality. In public administration, job quality is average overall, aside from the low work intensity and limited prospects for most occupations at all levels. In terms of skills and discretion and physical environment, there is more inequality. Managers, professionals and technicians have much higher skills and discretion and a better physical environment than workers in other occupations. Education largely follows this pattern, though generally the physical environment is safer and the social environment is better. In health and other services, the same pattern emerges as in the public sector, but with higher work intensity and more prospects.

With respect to skills and discretion, the higher occupational group scores 10% to 30% higher than the lower group in all sectors except financial services (Table 4). In the case of the physical environment, the differences are still around 10% to 20% in industry, construction, commerce and hospitality, public administration and other services. Work intensity is lower for the higher ISCO categories in industry (-15%), but higher in health (+9%) and other services (+14%). Working time quality is noticeably worse in financial services (-8%) and education (-7%), but slightly better in other services (+3%). Furthermore, the social environment for highly educated workers is better in agriculture (+15%), industry (+6%), commerce and hospitality (+7%), transport (+13%) and other services (+9%), but somewhat worse in education (-8%). Finally, prospects are between 9% and 20% more favourable in agriculture, industry, construction, commerce and hospitality, health and other services.

Job quality and analysis of indices in terms of three levels of educational attainment largely overlap with what has been discussed above. In terms of skills and discretion, physical environment and prospects, workers with primary education fare worst and workers with tertiary education fare best. In contrast, workers with tertiary education have middling levels of working time quality and social environment within most sectors, but report more intense work compared to workers with lower educational attainment.

14 Note, however, that skills and discretion are implicitly captured in the occupational classification.

Figure 15: Job quality indices by sector and occupational category, 2015



Note: *ISCO codes 1, 2 and 3 represent managers, professionals and technicians; ISCO codes 4, 5 and 6 represent clerical support workers, service and sales workers and skilled agricultural, forestry and fishery workers; ISCO codes 7, 8 and 9 represent craft and related trades workers, plant and machine operators and assemblers, and elementary occupations. The dashed line represents the EU27 and the UK average over all sectors. Scales are different because individual scores are shown adjusted to the same graph size for each job quality indicator.*
Source: *EWCS 2015*

Table 4: Occupation and job quality by sector, 2015 (percentage difference for higher ISCO categories (1–3) relative to lower ISCO categories (4–9))

Sector	Skills and discretion		Physical environment		Work intensity		Working time quality		Social environment		Prospects	
Agriculture	24	**	2	NS	-9	NS	-16	NS	15	**	20	**
Industry	32	***	22	***	-15	***	0	NS	6	**	9	***
Construction	20	***	29	***	-11	NS	-4	NS	7	**	18	***
Commerce and hospitality	25	***	8	***	-3	NS	-4	NS	7	**	10	***
Transport	31	***	3	NS	2	NS	1	NS	13	**	4	NS
Financial services	1	NS	2	NS	7	NS	-8	**	9	NS	2	NS
Public administration	11	***	8	***	4	NS	7	**	0	NS	-1	NS
Education	18	***	0	NS	1	NS	-7	***	-8	**	1	NS
Health	12	***	0	NS	9	**	1	NS	3	NS	9	***
Other services	19	***	8	***	14	***	3	**	9	**	16	***
F-test (p-value)	0.001	***	0.001	***	0.001	***	0.001	***	0.001	***	0.001	***

Note: *NS = not significant. Figures are marginal effects at the means, with logged dependent variables (semi-elasticity), controlling for age (squared), gender, education (ISCED – 3 categories) and country. F-test for the joint significance of the interaction effects, assuming no difference between sectors as the null hypothesis. The significance levels are represented as follows: <0.05 (*), <0.01 (**) and <0.001 (***).*
Source: *EWCS 2015*

Evolution of job quality over time and the effects of a changing economic structure

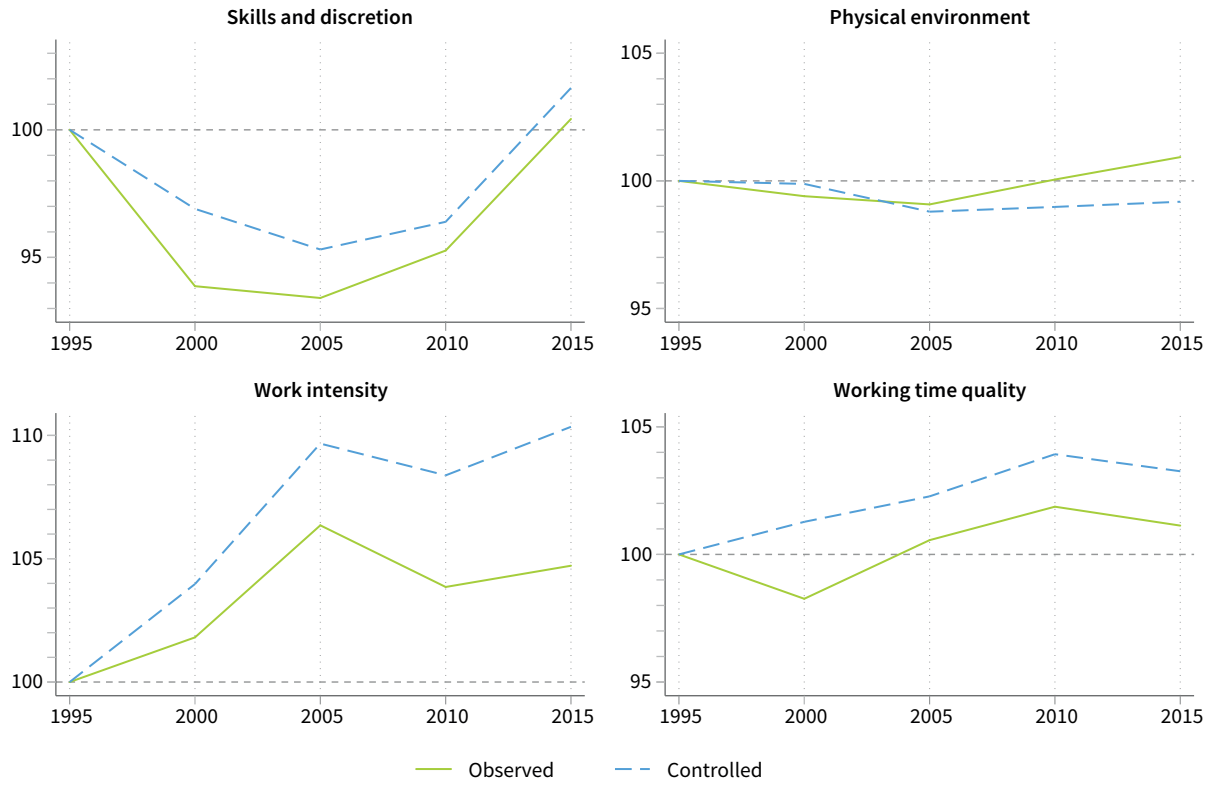
Sectors operate in a broader context of changing economies and work patterns, driven somewhat by the megatrends described above. This leads to spillover effects – even sectors such as education, health and public administration, which are shielded from international competition or operate in competitive markets to a lesser extent, may show patterns such as work intensification, increasing job complexity and blurring boundaries between work and private life, for example in relation to the rise of non-standard employment and work. However, these megatrends also lead to changes in the economic structure, with particular sectors taking up a larger share of the economy, as documented in the EU-LFS data in the previous chapter. The main trends in this respect are deindustrialisation, tertiarisation (growth in the services sector) and cuts in the public sector. This too affects overall job quality in Europe and across sectors.

To disentangle changes in job quality from changes in the economic structure, an analysis is done in which the actual changes in job quality over the period 1995–2015 are compared to what would have happened if the structure of the economy and workforce had not changed. Looking first at how the indices for skills and discretion, physical environment, working time quality and work intensity have changed over time in the five country clusters and the EU27 and the UK, overall job quality has improved. The skills and discretion index has improved in all clusters, except Ireland and the UK. The pattern is not continuous in this cluster, although there has been a rise over the last 10 years. Working time quality shows a clear increase in most country clusters, while it appears to have reached a ceiling in the Scandinavian cluster. For the other indices, a pattern is less clear across the different clusters.

The second step involves a simulation of how job quality would have evolved if the composition of the workforce and the economy had remained the same over time in terms of gender, age, occupation, sector and country ('counterfactual' analysis). In other words – are the changes in the job quality indices discussed above due to actual changes in the quality of the jobs or to changes in the available jobs and the workforce? This exercise takes into account a longer time span, from 1995 to 2015, using the NACE Rev. 1.1 classification.

Figure 16 compares this analysis with the evolution that is observed (note that the graphs have different scales). For the skills and discretion index, there was a decline

Figure 16: Job quality indices over time, 1995–2015



Note: *Controls for country, gender, age (quadratic), occupation (ISCO-88, 1 digit) and sector (NACE Rev. 1.1). Job quality in 1995 is set to 100 to reflect percentage changes in the indices.*
Source: *EWCS 1995–2015*

between 1995 and 2005, while (the composition of the workforce and the economy being constant) there was a return to the 1995 base in the later period (2015). Work intensity increased more noticeably, and it would have increased even more if the composition of the workforce and economy had remained the same throughout the period studied. The same pattern appears in the case of working time quality, but to a lesser degree. With respect to the physical environment, very minor differences are observed.

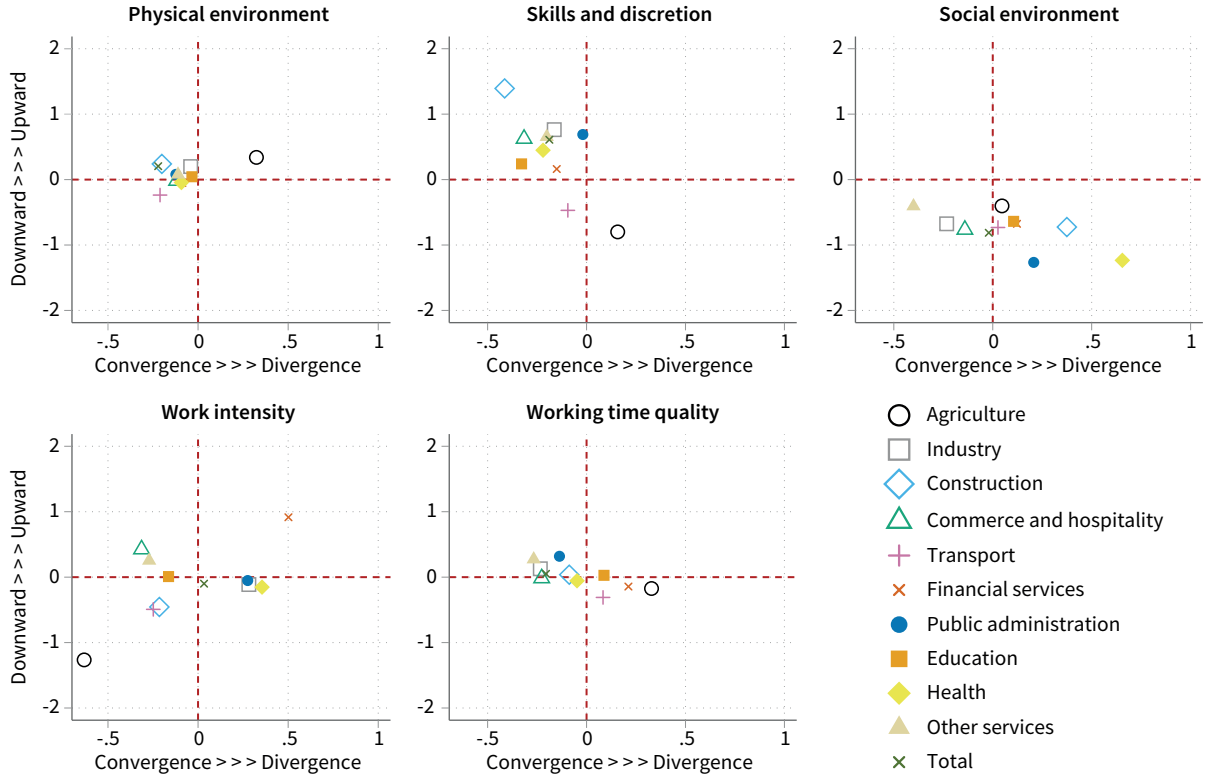
Convergence and divergence

Besides the general trends in job quality, an important question is whether the job quality of sectors is converging between EU Member States towards equal levels. This will help to determine whether upward and downward convergence or divergence is occurring, as shown in Figure 17.

The main finding from Figure 17 is that each job quality index follows a specific pattern. With respect to the physical environment, the sectors are concentrated around a slight upward convergence, with the exception of agriculture, which is characterised by upward divergence, and the transport sector, where slightly downward convergence is apparent. However, the majority of sectors are improving in relation to their physical environment.

Similarly, the skills and discretion index shows improvement – stronger upward convergence, in fact – notably in construction and commerce and hospitality, while there is no improvement in agriculture or transport. More variation is found with respect to the social environment, which is deteriorating over time in all sectors, especially in public administration and health. While downward convergence is recorded for industry, commerce and hospitality, and other services, other sectors also have a deteriorating social environment and differences between countries in Europe are growing. For work intensity, the trends are very different across sectors, with a deterioration and convergence in commerce and hospitality and other services, while work intensity is increasing unequally in financial services. On the other hand, in transport, construction and agriculture, work intensity is generally easing. Finally, working time quality shows slight upward convergence in industry, public administration and other services, and a slight downward divergence in transport, financial services and agriculture.

Figure 17: Convergence and divergence of sectoral job quality over time, 2005–2015



Source: *EWCS 2005–2015*

Differences in job quality between groups of workers within sectors

The demographic structure of the workforce is undergoing profound change as a result of greater participation of women in the workforce, ageing and migration. Job quality may differ between sociodemographic groups, and the differences may be more notable within particular sectors. In this section, each background variable is singled out to identify potential differences in job quality between sociodemographic groups within sectors. The results – summarised in Table 5 – show that job quality differs between sociodemographic groups. This can be due to subtle unmeasured differences between the groups or differences in preferences when one dimension of job quality is exchanged for another (for example, poorer prospects for less intense work). It can also signal situations of differential treatment.

Table 5: Summary of sociodemographic characteristics and job quality by sector, 2015

Sector	Skills and discretion	Physical environment	Work intensity	Working time quality	Social environment	Prospects
Agriculture	Women: NS Young: NS Old: NS Foreign: NS	Women: ↑ *** Young: NS Old: ↑** Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS	Women: ↑ ** Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: ↓** Foreign: NS
Industry	Women: ↓ *** Young: NS Old: NS Foreign: ↓**	Women: ↑ *** Young: NS Old: NS Foreign: NS	Women: NS Young: ↓** Old: ↓** Foreign: NS	Women: ↑ *** Young: ↓** Old: NS Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS	Women: ↓ ** Young: ↓** Old: NS Foreign: NS
Construction	Women: NS Young: NS Old: NS Foreign: NS	Women: ↑ *** Young: NS Old: NS Foreign: ↓**	Women: NS Young: ↓** Old: ↓** Foreign: NS	Women: ↑ ** Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: NS Foreign: ↓**	Women: NS Young: NS Old: ↓** Foreign: ↓**
Commerce and hospitality	Women: ↓ *** Young: ↑*** Old: ↑** Foreign: ↓**	Women: ↑ ** Young: NS Old: NS Foreign: NS	Women: ↓ ** Young: ↓** Old: ↓*** Foreign: NS	Women: ↑ *** Young: ↑** Old: ↑** Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: NS Foreign: ↓**
Transport	Women: NS Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS	Women: NS Young: ↓** Old: ↓** Foreign: ↑**	Women: ↑ *** Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: ↑** Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS
Financial services	Women: NS Young: NS Old: NS Foreign: NS	Women: NS Young: ↓** Old: NS Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS	Women: ↑ *** Young: NS Old: NS Foreign: NS	Women: NS Young: ↓** Old: NS Foreign: NS	Women: NS Young: NS Old: ↓** Foreign: NS
Public administration	Women: NS Young: NS Old: NS Foreign: NS	Women: ↑ *** Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: ↓** Foreign: NS	Women: ↑ *** Young: NS Old: ↑** Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS	Women: ↓ *** Young: NS Old: NS Foreign: NS
Education	Women: NS Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS	Women: NS Young: ↑*** Old: NS Foreign: ↓**
Health	Women: NS Young: NS Old: ↑** Foreign: NS	Women: NS Young: NS Old: ↑*** Foreign: NS	Women: ↑ ** Young: NS Old: ↓** Foreign: NS	Women: ↑ ** Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: NS Foreign: NS	Women: NS Young: NS Old: ↓** Foreign: NS
Other services	Women: NS Young: NS Old: NS Foreign: NS	Women: ↑ *** Young: NS Old: ↑*** Foreign: ↑**	Women: NS Young: NS Old: ↓*** Foreign: NS	Women: ↑ *** Young: NS Old: NS Foreign: NS	Women: NS Young: ↓** Old: NS Foreign: NS	Women: ↓ ** Young: NS Old: ↓** Foreign: NS

Note: *NS = not significant. The asterisks indicate the level of statistical significance; when the likelihood that a result occurred by chance alone is below a certain level, one or more asterisks are displayed. Popular significance levels are <0.05 (*), <0.01 (**) and <0.001 (***). The arrows indicate whether the index is higher or lower for the sociodemographic group under consideration; the green text suggests better conditions for the indicator of interest; the red text suggests worse conditions. Further details are presented in the annexes (Eurofound, 2020a).*
Source: *EWCS 2015*

For seven of the 10 sectors examined (all except agriculture, transport and education), differences between sociodemographic groups emerge for at least four of the six job quality indices. Industry, construction, commerce and hospitality, health and other services are sectors of particular note in that differences between sociodemographic groups arise for five indices and significant effects are often visible for multiple sociodemographic groups per index. In industry, women report lower skills and discretion levels and fewer prospects, but a better physical environment and working time quality. Young workers report both poorer prospects and poorer working time quality. In the construction sector, women experience a better physical environment and higher working time quality; old workers report a lower work intensity and poorer prospects; and foreign workers report a worse physical and social environment and poorer prospects. This is a striking result, as construction is the sector where foreign workers experience a significantly lower job quality on three of the six indices. With the exception of commerce and hospitality, where they report poorer prospects and lower skills and discretion levels, foreign workers generally do not stand out in comparison with other sociodemographic groups in the other sectors. In commerce and hospitality, women have lower skills and discretion levels, a better physical environment, higher working time quality and lower work intensity. Both young and old workers in this sector report lower work intensity, higher working time quality and higher skills and discretion levels. In the health sector, the most striking results emerge for old workers, who have higher skills and discretion levels, a better physical environment, lower work intensity, but poorer prospects. Finally, in the other services sector, women, old and foreign workers experience a better physical environment, whereas young workers have a worse social environment. Overall, relatively few differences between sociodemographic groups are noted for the skills and discretion and social environment indices.

In brief

- Job quality differs between the 10 sectors examined. Agriculture, construction, industry and transport have less safe physical environments and lower levels of skills and discretion; agriculture additionally records poor job quality in terms of working time quality and work intensity. The industry and commerce and hospitality sectors are also characterised by high work intensity. In contrast, the physical environment is safer in financial services, education and public administration – sectors that also offer good prospects and skills and discretion for workers. These results point to a divide between the sectors dominated by manual, blue-collar labour and those dominated by non-manual, white-collar labour, though this pattern is less clear for working time quality and social environment. Job quality is generally lower in the Southern and Eastern countries and higher in the Scandinavian countries. Nevertheless, for physical environment, work intensity and working time quality, differences between sectors are more pronounced than between country clusters.
- Within sectors, job quality varies across occupations. Those in managerial, professional and technical occupations generally experience better job quality than those in other occupational categories (e.g. clerical workers, service workers). This is especially the case for skills and discretion and prospects in agriculture, industry, construction and other services, and to a lesser extent in commerce and hospitality, transport and education. Work intensity in industry, construction, commerce and hospitality and transport is lower for the managerial, professional and technical occupations than for other occupations, while the reverse is true in other sectors. In public administration, particularly, there are striking differences between, on the one hand, managers, professionals and technicians and, on the other hand, other occupations with regard to skills and discretion and physical environment.
- Job quality differs between sociodemographic groups within sectors, especially in the industry, construction, commerce and hospitality, health and other services sectors. In these five sectors, women tend to report higher working time quality, a better physical environment, lower work intensity (commerce and hospitality) and lower skills and discretion levels (industry and commerce and hospitality) compared to the EU average. Foreign workers, in particular, experience lower job quality in construction in terms of their physical and social environment and prospects. Compared with younger workers in their sectors, older workers report a better physical environment (health, other services), higher skills and discretion levels (health), lower work intensity (health, commerce and hospitality), better working time quality (commerce and hospitality) and poorer prospects (health).

- In relation to some indices, there are common trends towards an improvement and convergence of conditions in all sectors, for example physical environment, skills and discretion and working time quality. However, there are some exceptions. There is a general downward trend in job quality (except in work intensity) in the transport sector, while the social environment is deteriorating, especially in public administration and health. Work intensity is on the rise in commerce and hospitality and in financial services. It is also worth mentioning that the traditional manual sectors are experiencing some relevant improvements: the physical and social environments are improving in agriculture, and skills and discretion and work intensity are improving in construction.
- Finally, the analysis has identified some aspects of job quality where specific improvements are needed in sectors in certain country clusters. Examples include working time quality in agriculture in Ireland and the UK, and skills and discretion, prospects and physical environment in Southern countries and in the Continental cluster. The analysis also highlights a need for improvement in skills and discretion in the transport sector in the Southern and Eastern clusters, working time quality in Ireland and the UK, and social environment in Continental countries. The situation is worrying as regards work intensity in the financial services sector in Ireland and the UK, and to some extent in the Scandinavian countries. In public administration and education, the social environment is problematic, especially in the Continental countries. This aspect of job quality was shown to be in need of improvement in the health sector, particularly in Ireland and the UK and Continental and Scandinavian countries.

3 Exploring changing tasks, training and employability

The trends described in Chapter 1 contribute to important changes in the world of work, ranging from new jobs to job displacement and transformations, and from productivity increases to skills gaps and imbalances (McAfee and Brynjolfsson, 2017; Haskel and Westlake, 2017). These changes may foster improvements in job quality by securing or replacing risky jobs, automating repetitive jobs or offering more flexibility in work organisation. Some of these trends are presented in Chapter 2. These inherent opportunities depend, however, on stakeholders' ability to instigate reforms in labour markets and education and training systems to allow for a smooth transition for all. This chapter tackles the issue of task changes between 2010 and 2015 by first reviewing the conceptual frameworks within which tasks can be analysed. Second, task changes are broken down between and within sectors. The chapter ends with training and employability as crucial issues in the face of changing tasks and workers' adaptation.

European task framework

The main hypotheses put forward to explain the observed changes in tasks and skills demands are technological transformation and globalisation (Goos et al, 2014; Berger and Frey, 2016; OECD, 2017b). New technologies are changing the nature of tasks performed at work and, by extension, the skills demand (Acemoglu and Autor, 2011; Eurofound, 2018c; OECD, 2018; Grundke et al, 2018), while the intensification of globalisation is increasing competition between workers on a worldwide scale (Thoenig and Verdier, 2003; OECD, 2018; Rodrik, 2018).

The literature offers two main frameworks to understand how these changes are reflected in labour markets – skills-biased technological change and task-biased technological change. The former helps to explain the increasing skills premium and the demand for highly skilled labour, but does not explain the employment shifts from medium-skilled occupations to high- and low-skilled occupations, or the job polarisation documented in the EU-LFS data. As shown before, it appears that in most economic sectors, the share of high-skilled occupations increased between 2010 and 2015, while the share of medium-skilled occupations declined. Routine-biased technological change provides a more convenient theoretical model to explain these developments (Goos et al, 2014; Autor, 2015; Marcolin et al, 2016; Verdugo and Allègre, 2017; Cirillo, 2018) – digital technology substitutes workers performing routine tasks and complements workers performing cognitive tasks, but also interactive and non-routine manual tasks (Autor and Dorn, 2013; Acemoglu and Restrepo, 2019).

This model thus assumes different changes in the demand for labour and skills, depending on the tasks performed at work. The model, however, relies on a very narrow classification of tasks, limited mainly to cognitive and routine dimensions. To overcome this shortcoming, Eurofound (2016a) proposed a framework to analyse the distribution of task contents in Europe using a more exhaustive task taxonomy, which differentiates between task contents and the methods and tools used at work. Accordingly, task contents are separated into three types – physical tasks, intellectual tasks and social tasks. The methods and tools used at work are differentiated into work organisation (autonomy, repetitiveness and standardisation of tasks) and technology use (machines and ICT use).[15] Whereas most of the previous studies have documented the change in labour structure and the polarisation effect, fewer analyses have focused on the change in skills and task content at sectoral level.

Based on the European task framework developed by Eurofound (2016a), three types of tasks, which summarise the task content and methods of European workers, are analysed in this chapter.[16]

- **Physical routine tasks** are characterised by high levels of physical tasks, repetitiveness and standardisation of work, predominant use of machines, relatively frequent teamwork and low levels of autonomy and ICT use.
- **Cognitive tasks** include intellectual tasks, teamwork, problem solving and setting quality standards and norms, as well as ICT use. This indicator also includes digital tasks.

15 For more details, see the methodology in the annexes (Eurofound, 2020a).

16 These three tasks are obtained by using a principal component analysis on the set of tasks and methods used at work and identified in the European task framework (Eurofound, 2016a). For more details, see the corresponding methodological section for this chapter in the annexes.

- **Interactional tasks** are mainly defined by social tasks (dealing directly with people who are not employees in the workplace, such as customers, passengers, pupils or patients) and, to a lesser extent, by physical tasks. Interactional tasks are negatively related to work standardisation, highlighting the permanent adaptation effort required by social interaction.

These three types of tasks are analysed at the sector level in the following sections, with a special emphasis on the changes between and within occupations, and also across country clusters.

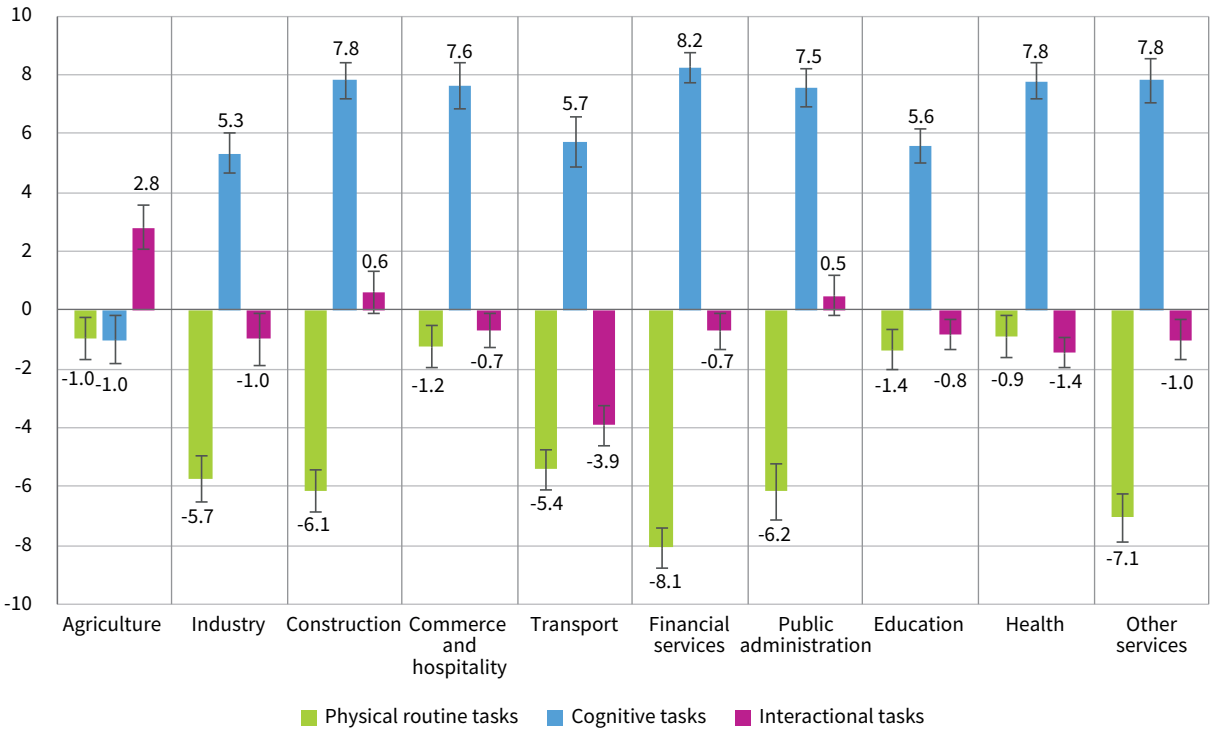
Breakdown of task changes by occupation and sector

Disentangling the drivers of these developments requires, as a first step, the disentanglement of the structural changes attributed to changes between occupations' shares within sectors (for example, the relative decline/increase in occupations that perform a given task) from the changes in the tasks performed within occupations.

Task distribution across sectors

From a comparative perspective, Figure 18 reports task changes between 2010 and 2015 by sector.[17] At first glance, the majority of sectors (except agriculture) show an upward trend in cognitive tasks and a decline in physical routine tasks. The main increase in cognitive tasks is observed in the financial services sector (+8.2%), which also records the most significant decline in physical routine tasks (around -8%). Other sectors with similar patterns are industry, construction, transport, public administration and other services, where the rise in cognitive tasks is nearly balanced by the decline in physical routine tasks. When compared to other sectors, agriculture emerges as an outlier in terms of task development over the period, with a decline in both cognitive and physical routine tasks, but a rise in interactional tasks. This sector shows the highest change in interactional tasks (+2.8%) compared to the other sectors, which display negative changes ranging from -3.9% in transport to -0.7% in the commerce and hospitality and financial services sectors. These changes are nonetheless convergent with the findings from the chapter on job quality – a rise in cognitive tasks translating into more skills and discretion, and a decline in physical routine tasks illustrated by the improvement in the physical environment of workers.

Figure 18: Changes in task indicators by sector, 2010–2015 (%)



Note: *Variations are shown as percentages. Confidence intervals of 95% for variations are displayed tor each sector (the interval is shown in black).*
Source: *EWCS 2010 and EWCS 2015*

17 The 2015 scores for the three tasks by sector are presented in the annexes.

However, the magnitude – and sometimes the direction – of these changes varies from one country cluster to another.[18] Despite a general decline in physical routine tasks at EU level, some sectors in specific country clusters exhibit a positive change – commerce and hospitality, financial services and health show a rise in physical routine tasks in Scandinavian countries of 1.6%, 8.6% and 3.4%, respectively. Similarly, the average change in physical tasks in Eastern countries is positive (+0.5%), driven by an increase in numerous sectors such as industry (+1.3%), construction (+2.1%), financial services (+4.1%), public administration (+1.3%), health (+1.6%) and other services (+2.8%). This increase in physical routine tasks in industry in Eastern countries is linked to a reorganisation of the value chain within Europe, in which routine tasks were reallocated from western European countries (Huws et al, 2009). Regarding the changes in cognitive tasks, the positive upward trend observed in sectors at EU level is also found at the level of country clusters, except for some sectors in Eastern countries, such as transport (-0.6%) and other services (-2.3%). Interactional tasks also vary considerably across country clusters. Almost all sectors (except transport) in Scandinavian countries show an increasing trend, while in Continental countries, interactional tasks are declining in all sectors. Financial services record the highest divergence across country clusters, with a decline in interactive tasks of 12.3% in the Southern countries, and an increase of 6.9% and 4.7% in Eastern and Scandinavian countries, respectively.

The intersectoral differences, in terms of tasks performed, are directly linked to the occupational structure of each sector. Based on the breakdown of occupations previously used in this study (high-skilled, medium-skilled and low-skilled occupations), the highest and lowest score by sector are reported for each task indicator in Table 6.[19] The average score for physical routine tasks is higher in medium- and low-skilled occupations (42) compared to high-skilled occupations (30.7), which instead record the highest average score (65.7) in cognitive tasks. Low-skilled occupations and high-skilled occupations have an

Table 6: Task indicator scores by occupation category within sectors

	Average	Sector score		
High-skilled				
Physical routine tasks	30.7	Highest	Health	36.8
		Lowest	Public administration	25.7
Cognitive tasks	65.7	Highest	Financial services	68.4
		Lowest	Education	60.5
Interactional tasks	49.0	Highest	Health	62.8
		Lowest	Industry	40.7
Medium-skilled				
Physical routine tasks	42.0	Highest	Industry	47.6
		Lowest	Education	37.5
Cognitive tasks	52.4	Highest	Financial services	57.7
		Lowest	Transport	45.2
Interactional tasks	43.9	Highest	Transport	49.8
		Lowest	Industry	32.2
Low-skilled				
Physical routine tasks	42.2	Highest	Construction	51.6
		Lowest	Education	35.8
Cognitive tasks	44.9	Highest	Financial services	49.5
		Lowest	Other services	41.2
Interactional tasks	51.8	Highest	Health	58.5
		Lowest	Industry	45.4

Note: *This table displays the highest and lowest score by sector for the three task components for each occupation category, once controlled by other characteristics.*
Source: *EWCS 2010 and EWCS 2015*

18 Details on task changes by sector within country clusters are provided in the annexes to this report.

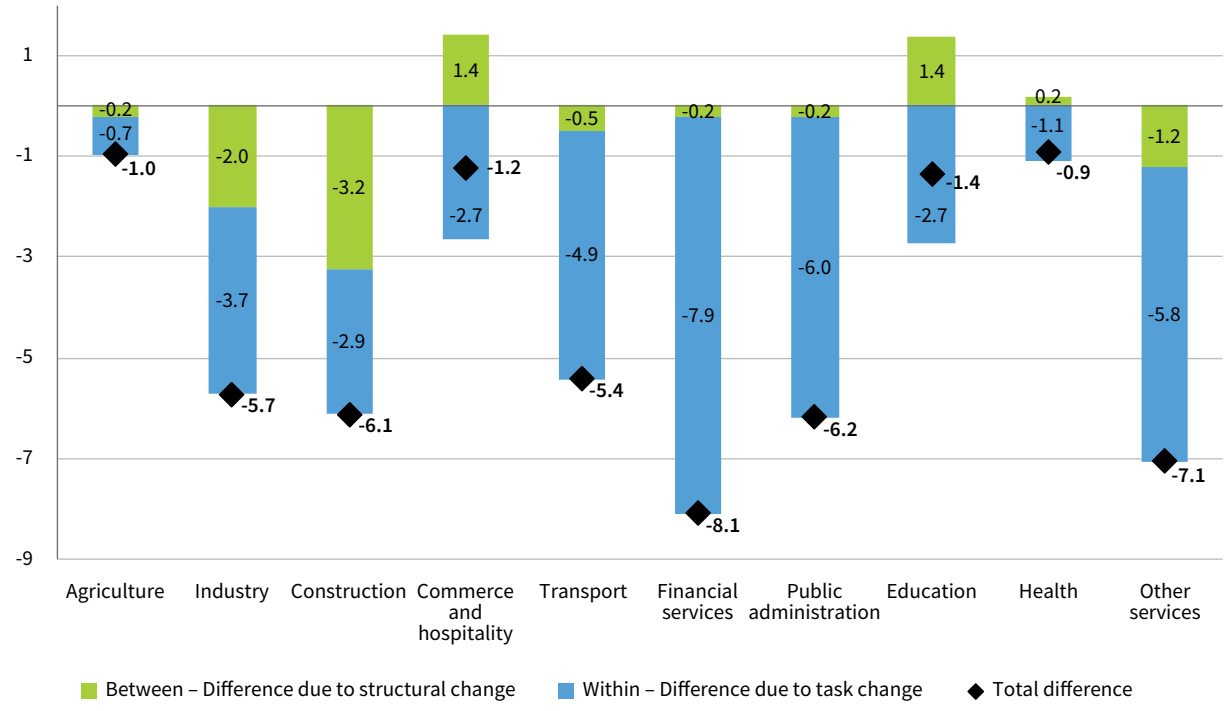
19 These scores are obtained from regression analyses carried out on individual data from EWCS 2010 and EWCS 2015 and control for other influencing variables, such as demographic characteristics (age, gender, education), country and sector dummies.

average interactional task score of 51.8 and 49, respectively, compared to a score of 43.9 in medium-skilled occupations. Noticeable differences are also found by sector. Medium-skilled and low-skilled occupations within industry and construction, respectively, as well as high-skilled occupations in health, have the highest scores for physical routine tasks. The latter is related to the physical efforts required by carers and nurses who are looking after old and sick persons in this sector. Financial services have the highest score for cognitive tasks in all occupation categories (68.4, 57.7 and 49.5 for high-skilled, medium-skilled and low-skilled occupations, respectively). Finally, high-skilled and low-skilled occupations display the highest scores for interactional tasks within the health sector, and the lowest scores in industry.

Breakdown of task changes between and within sectors

As highlighted above, task indicators changed considerably over the period 2010–2015, with significant differences between sectors and occupations. Indeed, 14% of the variation in physical task scores over the period 2010–2015 is explained by occupations, and this rises to 20% for cognitive tasks. Sectors account for 11% of all variations in interactional tasks over the period.[20] As sectors differ in their occupational structure, the overall task change should be analysed with respect to changes in the occupational structure of sectors ('between change') and to changes in the tasks performed within occupations ('within change'). The between change can be illustrated by the relative decline/increase in occupations performing a given task in the sector, while the within change is indicated by the decline/rise in the performance of a given task in a given occupation.[21] This decomposition analysis is performed hereafter and the results for each task indicator are reported in Figures 19, 20 and 21.

Figure 19: Breakdown of changes in physical routine tasks by sector, 2010–2015 (%)



Note: *The sum of the between components (green) and the within components (blue) gives the overall task variation, presented in bold.*
Source: *EWCS 2010 and EWCS 2015*

20 The variations in shares reported above are obtained from an ANOVA analysis of each task indicator while including country clusters, occupations and sectors.

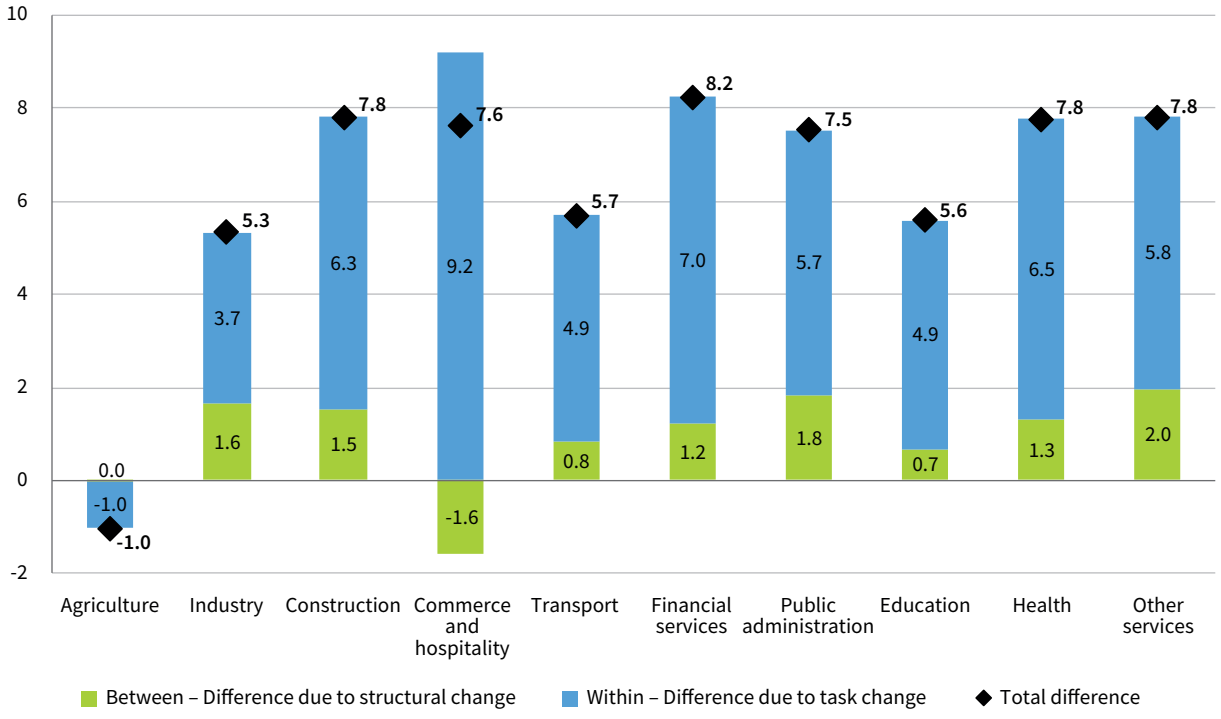
21 This methodology of decomposition analysis is widely used in the literature (Autor et al, 2003; Bisello et al, 2019). Further details on the method are provided in the annexes.

Most of the decline in physical routine tasks between 2010 and 2015 comes from changes in the task content within occupations. In this respect, transport, financial services and public administration are sectors where compositional change in the workforce did not affect the average level of physical routine tasks. In contrast, industry, construction and – to a lesser extent – other services experienced a fall in the share of occupations' relatively higher levels of physical routine tasks, especially blue-collar occupations. Commerce and hospitality and education present a different dynamic – the within components (content of tasks) display a reduction, while the between components clearly offset a part of this reduction. Stated differently, there is a simultaneous increase in occupations with a high number of physical routine tasks in these sectors, but a decline in physical routine tasks within these occupations. As previously reported (see the mapping of sectoral characteristics), these two sectors experienced the highest relative growth in the share of low-skilled workers during the period.

Similarly, most of the changes in cognitive tasks (Figure 20) are driven by task changes within occupations in each sector, which almost account for the full increase by sector. For example, the rise in cognitive tasks within occupations in transport and construction is 4.9% and 6.3%, respectively, and covers almost the total change in the sectors (5.7% and 7.9%, respectively). Commerce and hospitality is the only sector where the between and within changes go in the opposite direction. This implies that, in this sector, there is a relative decline in the number of occupations with cognitive tasks, along with a significant increase in the amount of these tasks within occupations. Again, this is consistent with the analysis of the variation in occupational categories (see the mapping of sectoral characteristics), since commerce and hospitality saw a sharp increase in the share of sales and personal services workers (low-skilled workers) at the expense of other occupations.

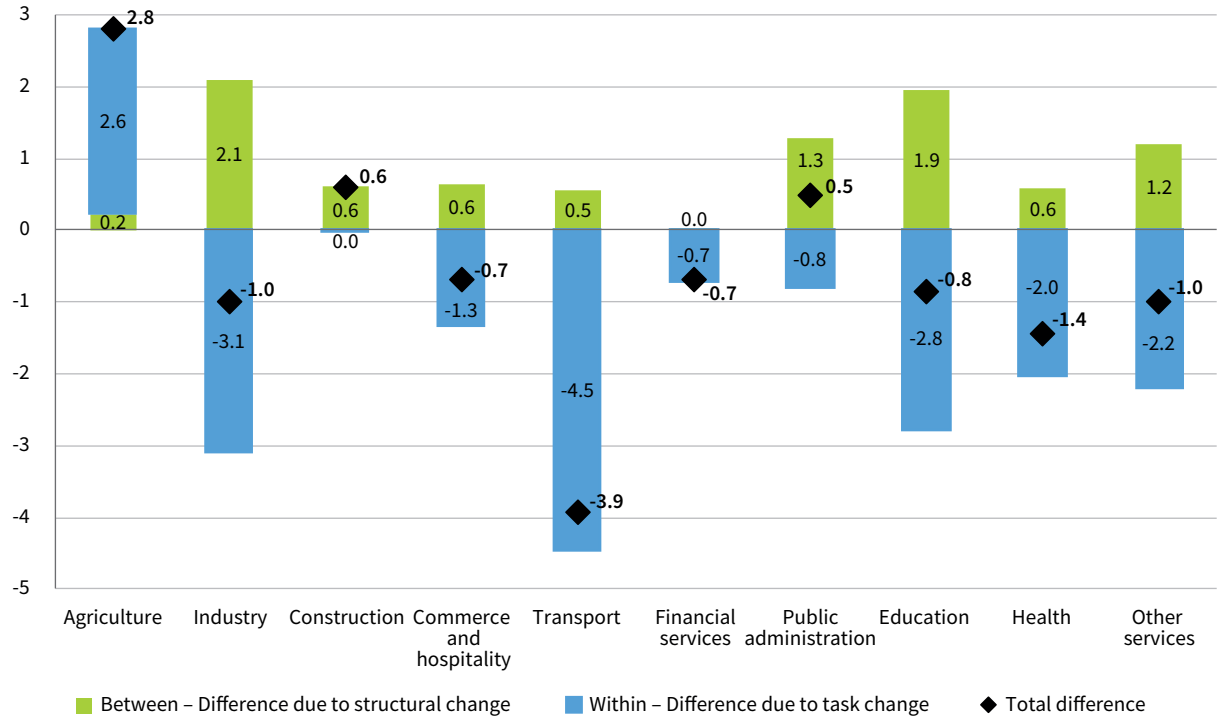
The decomposition analysis of interactional tasks in Figure 21 provides the most interesting results of these three figures and illustrates the crucial role of this analysis in understanding the drivers of task development within occupations. The overall change in interactional tasks is negative for almost all sectors, as previously highlighted. However, it can be seen from the decomposition analysis that the occupations performing interactional tasks have expanded relatively in all sectors except financial services. This positive change is counterbalanced by a general decline in interactional task performance within occupations.

Figure 20: Breakdown of changes in cognitive tasks by sector, 2010–2015 (%)



Note: *The sum of the between components (green) and the within components (blue) gives the overall task variation, presented in bold.*
Source: *EWCS 2010 and EWCS 2015*

Figure 21: Breakdown of changes in interactional tasks by sector, 2010–2015 (%)



Note: *The sum of the between components (green) and the within components (blue) gives the overall task variation, presented in bold.*
Source: *EWCS 2010 and EWCS 2015*

This decline accounts for almost all the total change recorded for this task in sectors such as transport (-4.0% out of -4.5% total change), education (-2.0% out of -2.8%) or industry (-2.1% out of -3.1%). The only sector with both changes going in the same direction is agriculture, indicating a concomitant rise in occupations with interactional tasks (+0.2%) and in interactional task intensity across occupations (+2.6%). The general trend outlined for interactional tasks is convergent with previous findings in the literature, especially with the decomposition analysis performed by Bisello et al (2019) using the same data sources, but over a longer period (1995–2015). These authors report significant growth in jobs performing social tasks, along with a decline in the reported levels of social tasks at work.

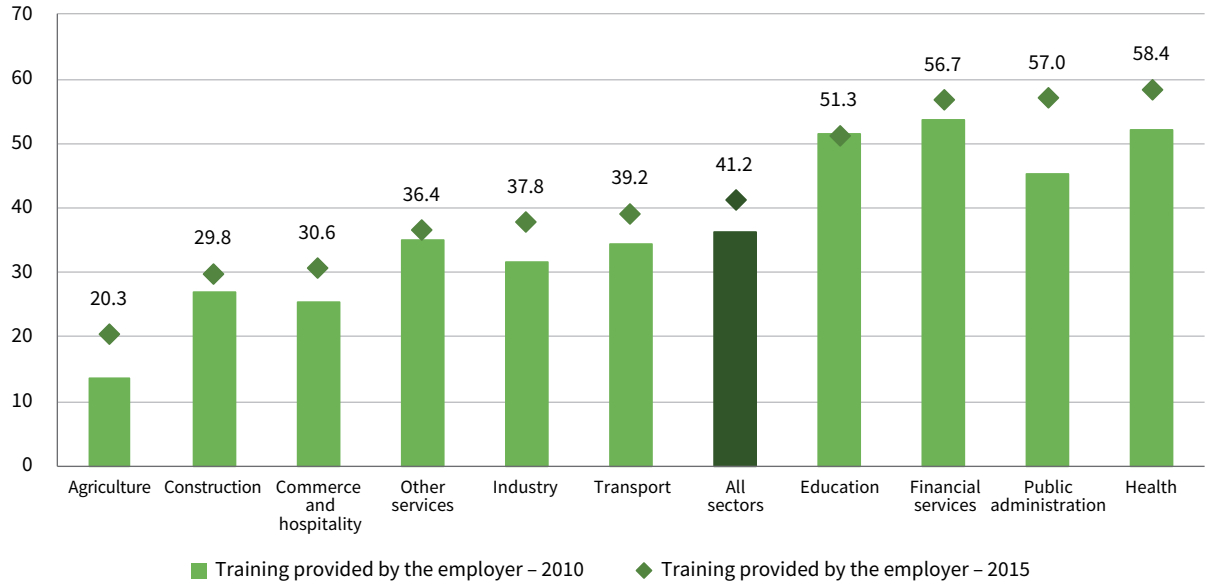
In summary, the decomposition analysis emphasises the major role of task changes within occupations as the main driver of total changes observed for each task between 2010 and 2015. Overall, compositional changes prompted by relative changes in the number of occupations performing the three types of task account for a small amount of the total change in each sector. In this context and for that period of time, training measures should have been put in place to adapt to the new skills associated with changing tasks and to enhance the employability of the workforce.

Training and employability

In the context of the changing nature of work, a transformation is also taking place in the demand for tasks and skills. However, different actions – involving stakeholders such as policymakers, companies, employees and social partners – can be taken to ensure the continued employability of the workforce in the face of these changes. The effectiveness of both education and training policies, as well as skills assessment and anticipation systems, ensures that workers are well equipped to meet the skills needs of companies. This section sheds light on whether training solutions have been undertaken by employers and employees, or more generally by government policy, to overcome task changes. It also shows how the perceived employability of workers is changing with training and the tasks that are performed. Performing specific tasks may have either a positive or negative impact on perceived employability, depending on the overall demand for these tasks in the labour market.[22]

22 In cases where perceived employability represents a good proxy of employability (labour demand), task models support a direct correlation between changes in tasks and employability of workers performing those tasks (Autor, 2015; OECD, 2018; Grundke et al, 2018).

Figure 22: Share of employees who had received training provided by the employer (during the previous 12 months) by sector, 2010 and 2015 (%)

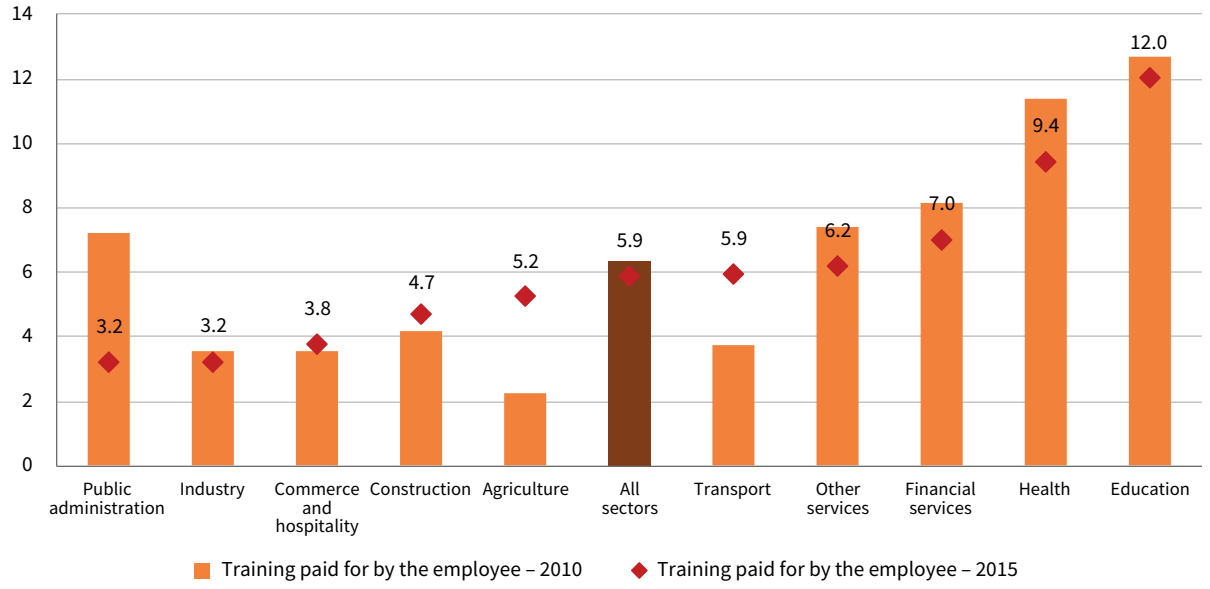


Source: *EWCS 2010 and EWCS 2015*

Training provides workers with the opportunity to acquire skills to meet the new requirements of the changing nature of work and to adjust their competencies accordingly. Figure 22 shows that the share of employees who received training paid for by their employer increased between 2010 and 2015 in all sectors.

In contrast, for most sectors, the share of employees who participated in training paid for by themselves declined (Figure 23). This could reflect a shift of investment in training to the company. However, transport, construction and agriculture are sectors which experienced an increase in training paid for by the employee. These are also three sectors with rather low levels of employer-paid training. This could indicate that training needs are not sufficiently addressed by employers in these sectors.

Figure 23: Share of employees who had received training paid for by the employee (during the previous 12 months) by sector, 2010 and 2015 (%)



Source: *EWCS 2010 and EWCS 2015*

Differences between sectors are, however, worth pointing out. Training provided by the employer is more frequent within white-collar sectors such as health, public administration and financial services, which are also the sectors that have relatively high levels of cognitive tasks, and have faced a deep digital transformation (OECD, 2019c). Moreover, they are sectors with higher levels of education among employees, and normally those employees with higher educational levels tend to participate more in lifelong learning activities. In contrast, sectors dominated by blue-collar workers, with higher levels of physical routine tasks, provide less training for their workforce. These observations are further confirmed when the relationship between task indicators and training is studied.[23] There is a negative association between physical routine tasks and training in all sectors. This relationship, however, turns positive with cognitive tasks. In the case of interactional tasks, the association with training is negative only in commerce and hospitality and transport, but is positive in the remaining sectors. These results are convergent with the literature linking task changes, education and training, which highlights that workers performing many routine tasks receive less training (Görlitz and Tamm, 2016a; OECD, 2018). This is explained to some extent by the high risk of automation of these tasks, which reduces employers' incentives to train employees performing such tasks (OECD, 2019c). The main consequences for such workers are either to be trapped within their jobs with fewer career prospects, or to lose their jobs once their tasks are fully automated. The tasks performed within jobs therefore have an impact on the employability of workers.

To further investigate this point, the perceived employability[24] of employees is analysed in relation to training and tasks performed within jobs.[25] Training is positively and significantly related to perceived employability in all the sectors under consideration (see Table 7). Training may increase the productivity of employees and help them to adapt to task changes or restructuring, which enhances their perceived employability. Moreover, if employees anticipate that the tasks they are currently performing are going to be automated or that the task demand is likely to decrease, their perceived employability will deteriorate. As an illustration, physical routine tasks entail lower levels of perceived employability in all the sectors, though the magnitude is higher in financial services, agriculture, construction, industry and transport. Employees performing such tasks are then less confident about their career prospects and development. Conversely, performing cognitive tasks enhances perceived employability in all sectors, particularly in construction and industry. In these sectors, the low prevalence of cognitive tasks compared to other tasks fosters the employability of employees performing such tasks. Again, interactional tasks present mixed results, depending on the sector under consideration, though the average effect on employability for all sectors is positive. Sectors where interactional tasks foster perceived employability are financial services, health, other services and industry. In the remaining sectors, the relationship is negative. It is worth noting that between 2010 and 2015, physical routine tasks declined in almost all sectors, and an analysis of the relationship between these tasks and employability emphasises a negative association between these tasks and perceived employability. In contrast, the increase in cognitive tasks over the period must be considered from the perspective of the positive impact of performing such tasks on perceived employability.

In fact, the type of tasks demanded in the labour market is an indication of the evolution of the economy towards a more service- and knowledge-based economy. Moreover, the recent financial crisis (2007–2008) has shown that sectors like construction and industry are very sensitive to such crises, and others, like agriculture, have high levels of temporary employment (see Chapter 1), adding to the perceived level of employment security.[26] This association between types of task and employability, therefore, is also related to the fact that, generally, there is growing demand and levels of employment in occupations that are characterised mainly by cognitive tasks. Another factor that contributes to the greater employability of workers in the financial services, health and education sectors is a higher level of education, which is an important factor in the employability of workers.

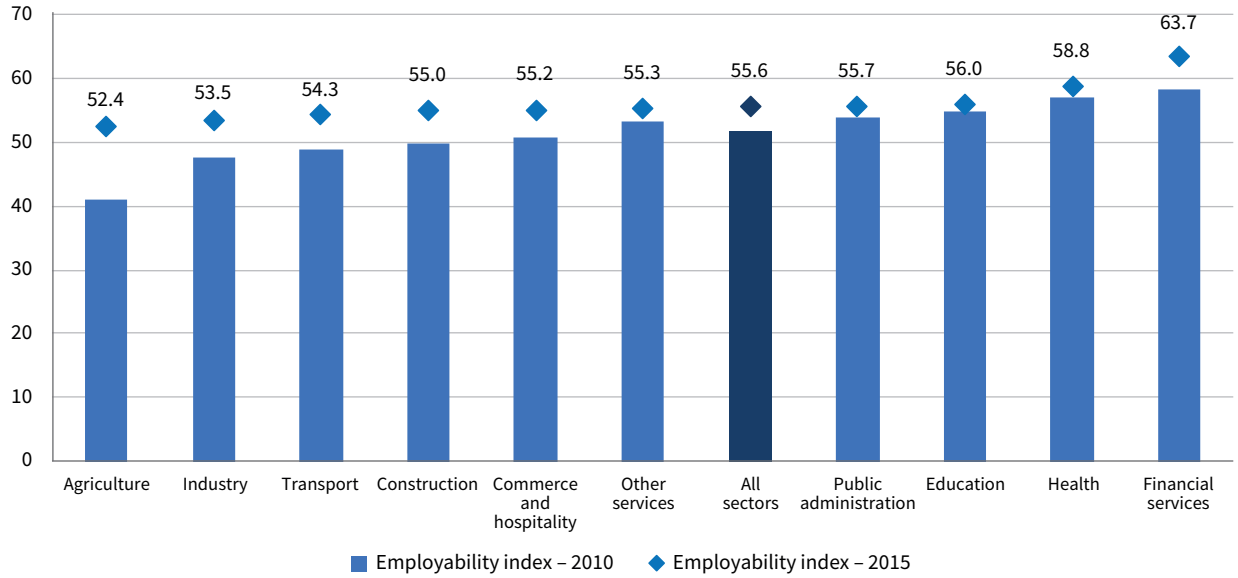
23 Correlations between training and task indicators are reported in the annexes.

24 The perceived employability index (normalised to a 0–100 range) is the aggregation of three questions from the EWCS 2010 and EWCS 2015: my job offers good prospects for career advancement; I might lose my job in the next 6 months; if I were to lose or quit my current job, it would be easy for me to find a job of similar salary. Higher values of the index denote greater employability.

25 Regression analyses are carried out based on data from the EWCS 2010 and EWCS 2015, with employability as the dependent variable and training and task indicators as the main explanatory variables. Control variables included are gender, age, education, workplace size, sectors and countries.

26 Related to the seasonal aspect of this activity.

Figure 24: Average score for the level of employability by sector, 2010 and 2015



Note: *The scores for employability are normalised to an index from 0 to 100.*
Source: *EWCS 2010 and EWCS 2015*

Table 7: Regression between task indicators and perceived employability by sector, 2010 and 2015

Regression table	Physical routine tasks		Cognitive tasks		Interactional tasks		Training	
All sectors	**-0.18**	***	**0.22**	***	**-0.05**	***	**0.05**	***
Agriculture	-0.37	***	0.20	***	-0.03	***	0.07	***
Industry	-0.24	***	0.25	***	0.01	NS	0.03	***
Construction	-0.23	***	0.28	***	-0.05	***	0.03	***
Commerce and hospitality	-0.18	***	0.22	***	-0.05	***	0.05	***
Transport	-0.24	***	0.19	***	-0.04	***	0.03	***
Financial services	-0.41	***	0.09	***	0.15	***	0.03	***
Public administration	-0.12	***	0.15	***	-0.02	***	0.00	***
Education	-0.17	***	0.11	***	-0.02	***	0.04	***
Health	-0.07	***	0.11	***	0.08	***	0.05	***
Other services	-0.24	***	0.21	***	0.02	***	0.03	***

Note: *NS = not significant. The coefficients reported show the relationship between employability level and task indicator score, once all an employee's characteristics are controlled; the asterisks display the confidence level of the coefficients (*** = 99%).*
Source: *EWCS 2010 and EWCS 2015*

In brief

- All sectors except agriculture show an upward trend in cognitive tasks and a decline in physical routine tasks between 2010 and 2015. Interactional tasks increased in only three sectors: agriculture, construction and public administration.
- The magnitude – and sometimes the direction – of these sectoral changes varies from one country cluster to another. An increase in physical routine tasks in a few sectors, and a decline in cognitive tasks in the other services sector can be observed in Eastern countries. These changes are partly linked to a reorganisation of the value chain within Europe, which saw a reallocation of routine tasks from western European countries.
- Medium-skilled and low-skilled occupations within industry and construction, respectively, and high-skilled occupations in health have the highest scores for physical routine tasks. Financial services score the highest for cognitive tasks for all occupation categories. High-skilled and low-skilled occupations display the highest scores for interactional tasks within the health sector, and the lowest in industry.

- Task changes within occupations are the main drivers of the total task changes observed for each type of task between 2010 and 2015. Overall, compositional changes prompted by relative changes in the number of occupations performing the three types of tasks account for a small amount of the total change in each sector.
- Between 2010 and 2015, training opportunities provided by employers increased in all sectors, but to a lesser extent in education and other services even though these two sectors faced substantial task changes. There are, however, persistent differences in access to training. Financial services, education, health and public administration stand out with high levels of participation, whereas agriculture, construction and commerce and hospitality report comparatively low levels of participation in training.
- In all the sectors under consideration, employers are more likely to train employees performing cognitive tasks than those performing physical tasks. Commerce and hospitality and transport are the only sectors where training opportunities are lower if workers perform interactional tasks. In the remaining sectors, interactional tasks within occupations open up more training opportunities. Other factors should not be forgotten – educational level and employability also play a role in participation in training, both from the employee's and the employer's perspective.
- Training plays a positive role in enhancing the perceived employability of workers in all the sectors under consideration. Similarly, workers who perform cognitive tasks anticipate better career development and prospects, and thus have higher perceived employability. In contrast, employees performing physical routine tasks are less confident in their career development and thus have lower perceived employability. This association is also related to levels of education, types of contract and the evolution of the labour market.
- Finally, the commerce and hospitality sector experienced an increase in cognitive tasks and – at the same time – an increase in low-skilled occupations. This seems to be an exceptional case in that increased performance of cognitive tasks (including greater use of ICT) at work is not being clearly translated into the upskilling of the workforce, at least at aggregate level.

4 Non-standard employment and employment security

The megatrends affecting the world of work challenge traditional employment relationships and give rise to non-standard forms of employment. Non-standard employment refers to all employment arrangements that deviate from standard employment. Standard employment is defined as employment that is full time, permanent and part of a subordinate relationship between a single employer and an employee (Eurofound, 2015a; ILO, 2016). Examples of non-standard employment are part-time work, temporary agency work and self-employment (Eurofound, 2015a). Non-standard forms of employment are often associated with non-standard or atypical work arrangements, or patterns like working shifts, nights or working in non-fixed workplaces (Eurofound, 2015a; Vereycken and Lamberts, 2019). The characteristics and use of non-standard employment are changing in the context of the future of work and digitalisation. One example of this is the ample use of self-employment and temporary employment in platform work. This is attributable to the challenge that platform work presents to traditional concepts like employer and employee, employment regulation and labour market institutions.

This analysis focuses on contractual relations only. However, the issue of non-standard employment connects with the wider discussion on precariousness and precarious work. Precarious work is work that is uncertain, unstable and insecure, in which employees bear the risks associated with the work (as opposed to businesses or the government) and receive only limited social benefits and statutory protections (Kalleberg and Vallas, 2017). Although the employment relationship is clearly a core dimension of precarious work, other aspects, such as income, voice and say, have also been associated with precariousness (Eurofound, 2018g; Julià et al, 2017). Following the argument made by Standing (2011) on the precariat as a new class, insecurity is not only related to current unfavourable conditions or an increased probability of tumbling into such conditions, but to the unavoidable possibility of slipping through the safety net. Welfare regimes and guaranteed income provision from the state, therefore, together with the narrower concept of labour markets, cause cross-national differences in precariousness. Hence, feelings of job insecurity or employment security are not perfectly matched to the workers' job statuses. Some workers may be optimistic about their future labour market position despite having more insecure contracts, while others may be more insecure despite having permanent contracts. The EWCS shows that the type of contract plays a role in levels of job insecurity. Workers on temporary contracts are more likely to report job insecurity than employees on permanent contracts. However, the type of contract does not determine the level of employment security. As is demonstrated in Chapter 3, aspects like the type of task, educational level and labour market situation also play an important role in the perception of employment security.

The standard employment contract is still the predominant employment status in almost all sectors. However, as shown above using EU-LFS data, there are large differences between sectors in the use of part-time and temporary work and self-employment, with part-time work being especially prevalent in the health, commerce and hospitality, other services and education sectors. Women, in particular, participate in involuntary part-time work. According to Eurofound (2018b) research, non-standard forms of employment are on the rise, affecting 33% of the European workforce in 2015. This increase is driven by the demand for more flexibility and autonomy for employers and employees, and the flexibilisation of labour markets (Eurofound, 2015a; Valenduc and Vendramin, 2016). Other studies, however, warn that non-standard employment is largely taken up by workers due to a lack of alternatives (Degryse, 2016; ILO, 2016; ETUI, 2019). In relation to this, the observation (based on the EU-LFS data) that involuntary part-time work increased in all sectors is highly relevant. This would explain why these forms of employment have proliferated, especially during and after the global financial crisis of 2007–2008.

Several studies have shown that those in non-standard forms of employment tend to report poorer working conditions and lower job quality (Eurofound, 2015a, 2018b; ETUI, 2019). Eurofound (2018b) showed that employees with a permanent contract experience the highest levels of job quality, while those with short-term contracts report the lowest levels of job quality. Eurofound (2015a, 2018d) also studied nine new forms of employment, of which most combine aspects of non-standard work with aspects of non-standard employment (employee sharing, job sharing, interim management, casual work, ICT-based mobile work, voucher-based work, portfolio work, platform work and collaborative employment). Some of these forms are found in most sectors, while others are concentrated in a few sectors only (casual work in hospitality and homecare, for example). Portfolio work, platform work, collaborative self-employment, voucher-based work and casual work present the greatest challenges with

regard to working conditions – in terms of access to training and skills development, for example. Casual work is most problematic when it comes to work–life balance. All nine types face job insecurity and social and professional isolation, which may increase work intensity, cause stress and lower workers' engagement and overall health and well-being (Eurofound, 2018d).

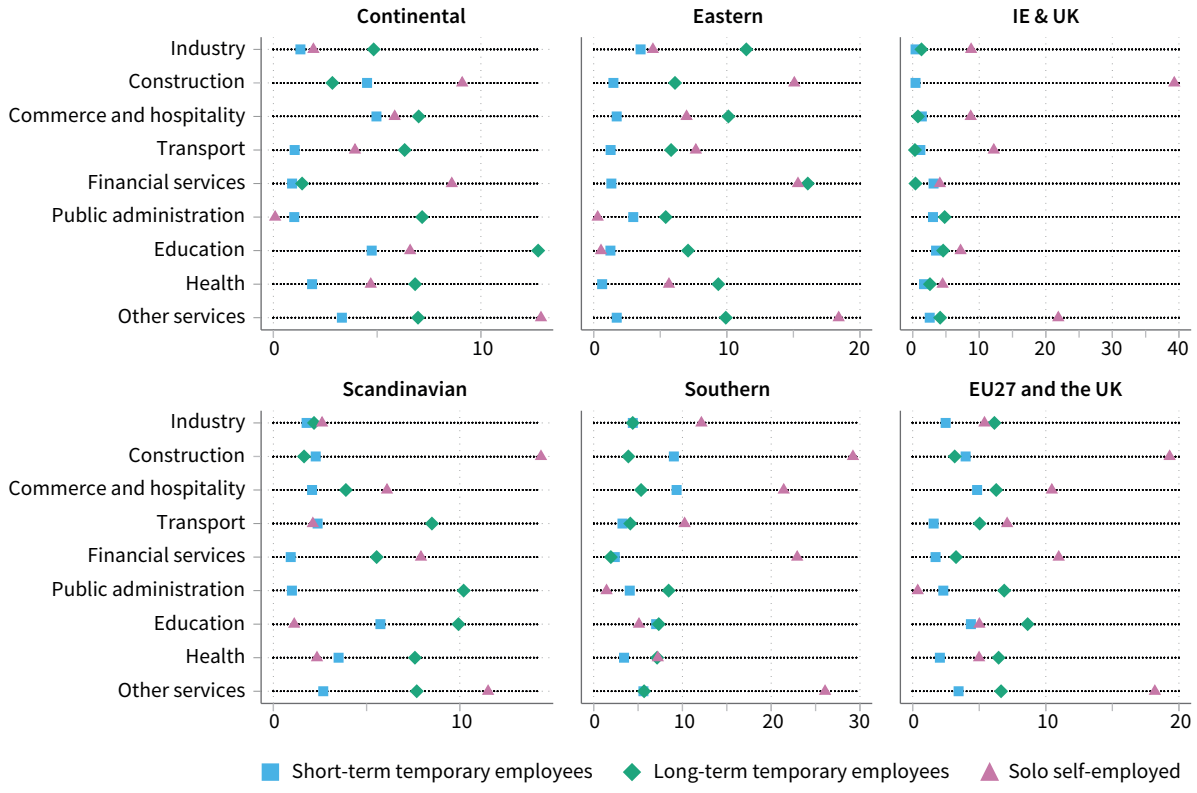
In this context, non-standard employment has recently been high on the radar of EU policymakers. With the European Pillar of Social Rights and the directives derived from it – notably the Directive on Predictable and Transparent Working Conditions – the EU strives to achieve equal opportunities and access to the labour market, fair working conditions and adequate social protection and inclusion for all, regardless of the type or duration of the employment relationship. The Social Pillar also refers to the eradication of economic and social insecurity and the prevention of precarious conditions.

Non-standard employment and employment and job insecurity

Using data from the EWCS 2015, this section explores the presence of non-standard employment across the sectors, using the same approach as previous studies (see Eurofound, 2019b), which distinguished between permanent employment, long-term temporary employment (more than one year), short-term temporary employment (less than one year) and solo self-employment. Agency work and work without a contract are not included here, as it is difficult to relate the working conditions to a precise and representative job.

Figure 25 shows the prevalence of non-standard employment in 9 of the 10 sectors across the EU27 and the UK and in the five country clusters. Non-standard employment remains the exception in all sectors, except agriculture (not shown).[27] Nevertheless, non-standard employment occurs fairly frequently in

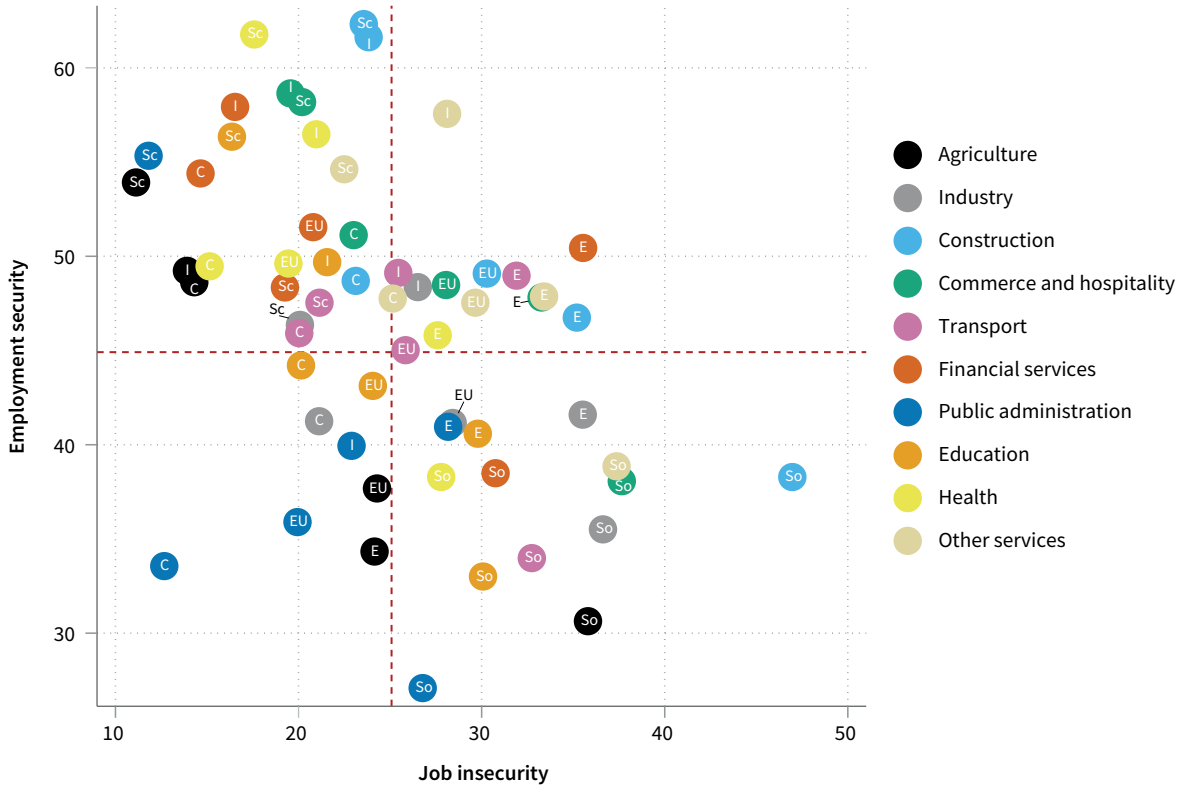
Figure 25: Share of non-standard forms of employment by sector, 2015 (%)



Note: *The scales refer to the share of each of the categories in the sector and country cluster.*
Source: *EWCS 2015*

27 As it is the dominant form of employment in agriculture, it does not fit the scale. The share of solo self-employed workers in agriculture stands at 52% in the EU27 and the UK, and ranges from 19% in the Continental cluster to 61% in the Southern cluster. The share of short-term temporary employees in agriculture stands at 5% in the EU27 and the UK, and ranges from 2% in the Eastern cluster to 10% in the Southern cluster. The share of long-term temporary employees in agriculture stands at 3% in the EU27 and the UK, and ranges from 3% in the Southern cluster to 4% in the Continental cluster.

Figure 26: Perception of employment security and job insecurity in the EU27 and the UK by sector and country cluster, 2015



Note: *Cluster abbreviations: C = Continental, E = Eastern I = IE & UK, Sc = Scandinavian, So = Southern, EU = EU27 and the UK.*
Source: *EWCS 2015*

some sectors, such as construction, other services, commerce and hospitality and financial services, mainly because solo self-employment stands out. As a rule, neither short-term nor long-term temporary employees account for more than 10% of employment in any sector. With a few exceptions, mostly in construction, there is also more long-term temporary work than short-term temporary work in the Southern cluster and in Ireland and the UK – both forms of temporary work are more or less equally represented, however.

Figure 26 shows the sectoral and national variation in the feelings of employment security and job insecurity. As can be expected, we find an inverse correlation across sectors and country clusters. The health sector is an example of this across countries: if job insecurity is low, employment security will be high. This may be due to the (perceived) difficulty that employees have when changing to other firms, organisations or areas in the health sector. In contrast, with the exception of the Scandinavian countries, we find that employees in public administration have lower levels of job insecurity, but below average employment security, and there doesn't appear to be a trade-off across countries. In general, Scandinavian countries signal more employment security and less job insecurity, while Southern and Eastern countries find the opposite across almost all sectors. Both sector and occupation, but also country, therefore play a role in determining levels of both employment security and job insecurity. In Eastern countries, workers are more likely to report job insecurity, but an above-average degree of employment security, whereas in Southern countries employees are more likely to report low employment security as well, notably in public administration.

These results confirm the role of a country's institutional characteristics, the functioning of the labour market and the level of protection, but also the seasonality of some economic activities in some countries.

Non-standard employment and job quality

Non-standard forms of employment imply different contractual relations, but they can also involve other aspects of job quality. In contrast to the analyses above, the prospects index is no longer considered in the following sections, as it includes the contract type and its analysis is therefore tautological. Instead 'employment security' is added, which is a subjective measure based on a five-point Likert scale (strongly agree – strongly disagree) answer to the question: 'If I were to lose or quit my current job, it would be easy for me to find a job of similar salary.' This has been recoded to 0–100, with a higher score indicating higher employment security.

On the whole, solo self-employed and short-term temporary employees fare worst, and permanent employees (in standard employment) have the best job quality outcomes (as was also discussed in Eurofound, 2019b). However, each employment status has a particular dimension or dimensions on which its score stands out. Permanent employees and long-term temporary employees register largely comparable scores for most indices and in almost all sectors. Larger differences are visible between these two groups, compared to the solo self-employed, on the one hand, and short-term temporary employees, on the other. The latter perform worse on the skills and discretion index (especially in agriculture and in public administration) and the physical environment index (across the board). The solo self-employed report a lower work intensity in all sectors except public administration, which is positive, but also reduced working time quality (especially in agriculture, commerce and hospitality, transport and public administration) and a worse social environment (especially in industry, transport and other services).

Moreover, it seems that employment status correlates with job quality over sectors. For each individual job quality index, the ranking by employment status is fairly stable across all sectors, even if the averages vary by sector. An exception is the employment security indicator, for which the rankings are inconsistent. For example, the solo self-employed in financial services, public administration and construction are more optimistic, while those in agriculture, industry, commerce and hospitality, transport and other services are more pessimistic about employment security. The next section explores these findings in detail, in order to assess whether differences between the types are statistically significant for each sector.

Figure 27: Non-standard employment and job quality indices by sector, 2015

Note: *Scales are different because individual scores are shown adjusted to the same graph size for each job quality indicator.*
Source: *EWCS 2015*

The above analysis refers to observed differences between the different employment status groups. These differences can in part be explained by the demographic composition (in terms of age, gender and educational attainment) of each sector, by occupation and by country differences.

Table 8 presents the results of this analysis for workers in non-standard employment. Being in non-standard employment reduces workers' skills and discretion by around 10% in commerce and hospitality and in public administration. For physical environment, a negative effect is noted in construction; minor positive effects are found in commerce and hospitality and education, which means that non-standard employment is more associated with physical risks than permanent employment. For work intensity, the sectoral interactions are significant and slightly over -10% in commerce and hospitality and construction, and twice as large in education, health and other services. In these sectors, therefore, work intensity increases (to some extent) if the workers are in non-standard employment. On the other hand, the results for working time quality are negative for non-standard employment in sectors dominated by blue-collar workers, and to a lesser extent in other services. The social environment is worse for non-standard workers in agriculture, construction and financial services, but better in education. Finally, employment security is not significant in any sector except financial services, where it appears to have a very positive effect. On the whole, however, it seems that, despite having objectively less job security (by virtue of their type of contract), people's perception of employability – which varies according to the descriptive figures above – has more to do with their occupation, human capital, sociodemographic background or institutional characteristics than with the contract as such. Note, however, that no matter what form of non-standard employment or employment relationship exists, job quality can always be improved.

Table 8: Job quality and non-standard forms of employment by sector, 2015 (percentage difference in the case of non-standard employment)

Sector	Skills and discretion		Physical environment		Work intensity		Working time quality		Social environment		Employment security	
Agriculture	8	NS	2	NS	8	NS	-23	***	-17	**	3	NS
Industry	-3	NS	-1	NS	-6	NS	-6	**	-5	NS	-3	NS
Construction	-1	NS	-7	**	-11	**	-7	**	-9	**	1	NS
Commerce and hospitality	-9	**	2	**	-13	***	-11	***	-3	NS	2	NS
Transport	-3	NS	2	NS	0	NS	-14	**	0	NS	4	NS
Financial services	-2	NS	1	NS	-18	**	-7	NS	-9	NS	18	**
Public administration	-10	**	2	NS	0	NS	4	NS	-7	NS	6	NS
Education	-8	**	3	**	-19	**	0	NS	7	**	3	NS
Health	-5	NS	2	NS	-26	***	-3	NS	1	NS	-1	NS
Other services	-2	NS	1	NS	-19	***	-4	**	-5	**	3	NS
F-test (p-value)	0.116	NS	0.046	**	0.000	**	0.000	***	0.001	**	0.271	NS

Note: *NS = not significant. Figures are marginal effects at the means, with logged dependent variables (semi-elasticity), controlling for age (squared), gender, occupation (ISCO-88, 1 digit), education (ISCED – 3 categories) and country. F-test for the joint significance of the interaction effects, assuming no difference between sectors as the null hypothesis. The asterisks indicate level of statistical significance: ** = <0.01 *** = <0.001.*
Source: *EWCS 2015*

In brief

- Non-standard employment is found in all sectors, but is especially prevalent in agriculture, construction, health, commerce and hospitality, education and financial services. Non-standard employment is connected to precarious work more generally, with the employment relationship being one dimension of precarious work.
- The health sector reports low levels of job insecurity and a greater perception of employment security. In other sectors, for example in industry, workers report high levels of job insecurity and low employment security. However, agriculture and public administration have low levels of job insecurity and average levels of employment security. In general, both the sector and country cluster play a role in determining employment security and job insecurity.
- Non-standard forms of employment are associated with poorer job quality. EWCS 2015 data show that individuals with short-term temporary contracts are worse off than those with long-term or permanent contracts in all sectors. For each job quality index, the ranking by employment status is relatively stable across sectors. For example, work intensity is highest for long-term temporary employees, followed by short-term temporary employees, permanent employees and the solo self-employed. This suggests that the same group of workers always has the lowest scores for an indicator, regardless of the sector in which they work.
- Further analyses show that being in non-standard employment is associated with low job quality, especially for workers in commerce and hospitality (low skills and discretion, high work intensity) and construction (poor physical and social environment, high work intensity).

5 Health, well-being and flexible work organisation

Technological and societal transformations are shaping the contours of a new world of work. New organisational models are emerging, in particular through the adoption and dissemination of new digital technologies. These new forms of work organisation rely on digital technology to reallocate work and promote a more horizontal work organisation, giving workers more autonomy and flexibility in the organisation of their work (Eurofound, 2015a, 2020b, 2020d; Eurofound and ILO, 2017). These new forms of work organisation appear to offer increased job resources through more autonomy and more decision latitude. However, several studies have shown that these forms of work organisation, as well as the use of teleworking and digital technology, also increase job demands. This includes work intensification and an increase in psychological and emotional demands (Chen and McDonald, 2015; Valenduc and Vendramin, 2017; Eurofound, 2020d), which are associated with an increase in reported mental health problems. At the same time, more traditional forms of work, characterised by physical tasks or interactional tasks, are still present in large parts of the workforce. This means that both physical demands and demands related to dealing with third parties, like customers, clients or pupils, are important in the EU's economy (Eurofound, 2017).

Indeed, work organisation and the physical and social work environment have a considerable impact on workers' health and well-being.

In this chapter, a comparative analysis of health and well-being in sectors is carried out using several indicators. Following this, an insight into the effects of job quality on these outcomes is outlined. Finally, given the importance of (newer) work organisation, which is characterised by flexibility and the use of ICT, its distribution across sectors is mapped and its linkages to health and well-being are analysed.

Health and well-being within sectors

Using EWCS 2015 data, this section presents an overview of the distribution of five indicators, which cover aspects of workers' health and well-being, across sectors and within country clusters.[28] The five indicators are: (i) health quality,[29] which encompasses several aspects related to declared health problems; (ii) health at work,[30] which covers the effects of work on both physical and mental health; (iii) work–life balance,[31] which measures the extent to which workers are able to achieve a good fit between work and private life; (iv) subjective assessment of work sustainability, which reflects the self-declared ability of workers to do their current job until the age of 60; and (v) subjective well-being, which is a subjective measure of emotional and psychological well-being based on self-assessment.[32] Figure 28 reports the score deviation of each indicator from the European average by sector while Table 9 presents the highest and lowest score by sector and country cluster.

With respect to the European average, financial services and other services stand out as the only sectors where all health and well-being indicators are above the European average. Conversely, the health sector underperforms the European average on all the health and well-being dimensions. This sector is indeed characterised by high social and emotional demands as well as high work intensity, with negative impacts on workers' health and well-being (Eurofound, 2019b). Different patterns emerge for the remaining sectors depending on the indicator in question. Construction is the sector where workers show by far the largest difference in relation to the European average, denoting the negative side-effects of work on their health and by extension low work sustainability.

28 For each indicator, the corresponding items are normalised to a 0–1 range, before grouping the items in a summative index. Once constructed, each index was transformed to range from 0 to 100, with 100 corresponding to the most favourable situation. Further details on the indicators' construction are provided in the annexes.

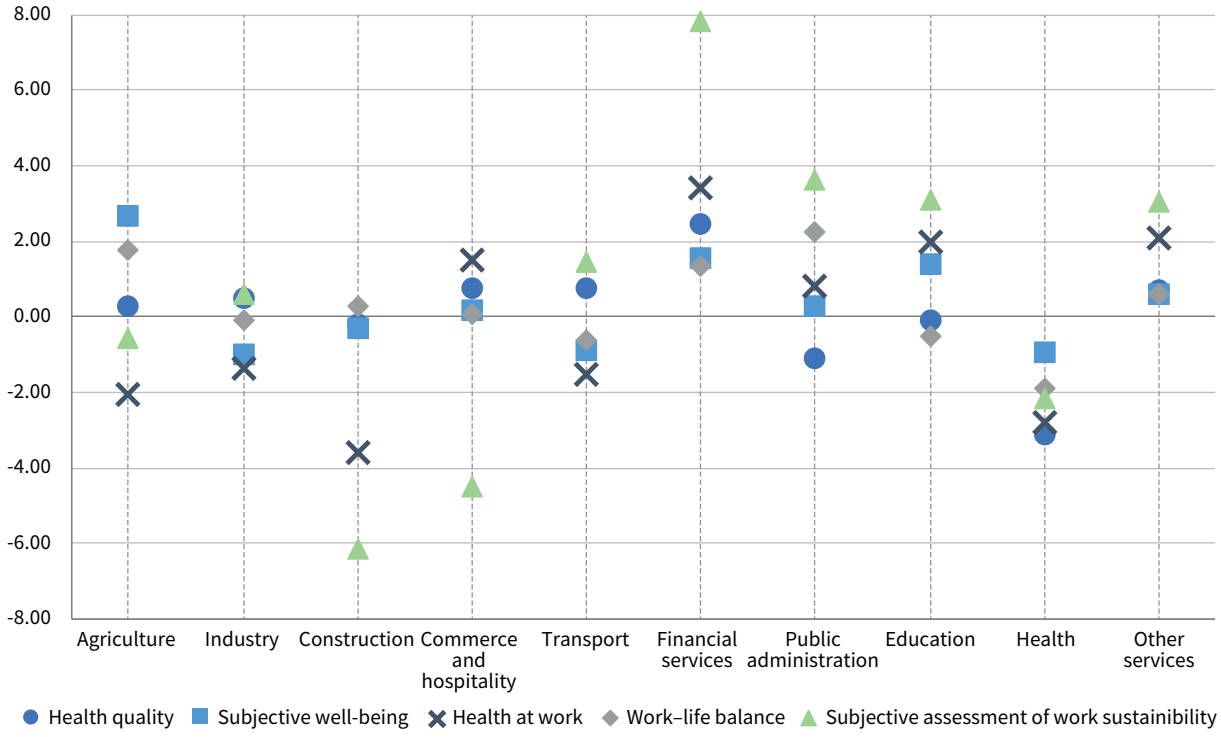
29 This indicator covers the following dimensions: hearing problems, skin problems, backache, upper limb pain, lower limb pain, headaches, injuries, anxiety, overall fatigue, difficulty falling asleep, waking up repeatedly during sleep, waking up with a feeling of exhaustion and fatigue.

30 This indicator covers the following dimensions: sickness absence due to work, presenteeism, absenteeism due to health risks from work, feeling full of energy at work, being enthusiastic about work, time flying when working, exhaustion at the end of the working day.

31 This indicator covers the following dimensions: worrying about work when not working, feeling too tired after work to do housework, difficulty managing work and family time, difficulty focusing on work because of family responsibilities, fitting working hours in around family and social commitments.

32 This indicator is a based on the World Health Organization's scale of well-being (the WHO-5 Well-Being Index) and covers the following aspects: feeling cheerful and in good spirits, feeling calm and relaxed, feeling active and vigorous, waking up fresh and rested, feeling that daily life is filled with interesting things.

Figure 28: Health and well-being indicators by sector – deviation from the EU average, 2015



Note: *This figure reports the difference between the sectoral average of each indicator and the European average, which is represented by the black line.*
Source: *EWCS 2015*

Health at work is an interesting indicator because it links directly to the work-related experience. The construction and health sectors have the lowest scores for health at work, followed by agriculture, transport and industry. All of them are below the EU average.

Looking at how sectors perform within country clusters, workers in financial services within the Scandinavian cluster have the highest score for subjective well-being (74.7), health at work (79.1) and work sustainability (84.8) (Table 9). However, the lowest levels of health

Table 9: Well-being and health indicators, 2015 by sector and country cluster, 2015

		Highest score	Sector and country cluster	Lowest score	Sector and country cluster
Health quality	First	82.5	Southern – Financial services	70.3	Scandinavian – Health
	Second	81.8	Southern – Transport	70.6	Scandinavian – Transport
Subjective well-being	First	74.7	Scandinavian – Financial services	62.6	Ireland & UK – Health
	Second	72.3	Scandinavian – Construction	62.9	Ireland & UK – Public administration
Health at work	First	79.1	Scandinavian – Financial services	67.8	Scandinavian – Transport
	Second	78.4	Southern – Education	69.4	Ireland & UK – Health
Work–life balance	First	77.7	Continental –Construction	68.1	Southern – Commerce and hospitality
	Second	77.2	Continental – Public administration	68.1	Ireland & UK – Health
Subjective assessment of work sustainability	First	84.8	Scandinavian – Financial services	59.3	Eastern – Commerce and hospitality
	Second	84.7	Ireland & UK – Industry	60.4	Eastern – Industry

Note: *For each indicator, the table displays the two highest and lowest scores by sector and country cluster. Indicator scores range from 0 to 100, with 100 corresponding to the best situation. Agriculture scores are not reported because the number of observations by sector within country clusters is too small.*
Source: *EWCS 2015*

quality and health at work are recorded within this cluster for the health and transport sectors, respectively. These results illustrate high cross-sectoral heterogeneity within the Scandinavian cluster with respect to health and well-being. The construction sector in Continental countries and the financial services sector in the Southern cluster record the highest score for work–life balance (77.7) and health quality (82.5), respectively. For workers in commerce and hospitality, those within the Southern cluster report the worst balance between work and private life (68.1) and those within the Eastern cluster report the lowest subjective assessment of work sustainability (59.3).

Singling out again the results for the health at work indicator, the analysis shows that the best performers are the financial services sector in the Scandinavian cluster and the education sector in Southern Europe. The transport sector in Scandinavian countries and the health sector in Ireland and the UK fare worst.

This raises the question of the extent to which these results are due to various aspects of job quality.

Overall and on average, sectoral scores for health and well-being indicators are very close to the European average, suggesting few disparities among workers. Nonetheless, the subjective assessment of work sustainability shows some noteworthy divergences: employees in financial services enjoy relatively high levels of work sustainability, whilst employees in both construction and commerce and hospitality report relatively poor work sustainability. Furthermore, the financial services sector is the only one where employees report relatively high levels of health and well-being, while the opposite is observed for the health sector. Considering the performances of sectors by country cluster, the financial services sector in Scandinavian countries ranks first for all health and well-being indicators except work–life balance and health quality. However, there is a clear heterogeneity across sectors within this country cluster as employees in health and transport have the worst score in health quality and health at work, respectively.

Insight into job quality and health and well-being

Beyond the observed divergences between sectors within country clusters, working conditions are well-established determinants of health and well-being at work. Numerous studies have outlined the negative associations between adverse working conditions and employees' health and well-being. Cottini and Lucifora (2013) show that working conditions, defined in terms of job demands and job hazards, have a significant negative impact on European workers' mental health. Similarly, Green et al (2016) find that high work intensity is associated with low job-related well-being. There is, however, some evidence of the beneficial effects of work on health and well-being, as work can help to achieve self-affirmation and self-esteem (Kieselbach et al, 2006).

Using the six job quality indices previously introduced, this section analyses how each dimension is related to health and well-being indicators for each sector while taking into account employees' characteristics, such as gender, age, size of the workplace and occupation, as well as country differences.[33] All health and well-being indicators exhibit a strong negative association with work intensity and this is true for all the sectors under consideration. This corroborates the detrimental effect of quantitative demands, such as working at very high speed or to tight deadlines, on employees' health and overall well-being. In terms of the other job quality dimensions, the regression analyses show that improving the physical environment, social environment and career prospects is positively related to health and well-being in all sectors.

The skills and discretion index is an aggregation of aspects related to the cognitive dimension of work, decision latitude and training. Its impact in terms of health and well-being can be mixed, depending on which aspect is considered. For instance, skills and discretion is positively related to subjective well-being and health at work, but negatively associated with work–life balance. Indeed, the cognitive dimension, combined with decision latitude and training opportunities, can contribute to self-development at work, and can lead to a balance between work demands (cognitive) and resources (decision latitude and training). Therefore, improving this equilibrium will have a positive effect on health and well-being. Nonetheless, when it comes to work–life balance, the effect is rather negative in all sectors except public administration, where it is positive. The rationale behind this negative association lies in the fact that jobs characterised by a high level of skills and discretion involve greater work engagement and more autonomy for work organisation, leading to difficulties in efficiently reconciling work with other parts of life.

Working time quality presents some mixed results with regard to health and well-being. There is a positive and strong association in all sectors between working time quality and work–life balance, on the one hand, and health at work, on the other. This relationship, however, turns negative in public administration, construction

33 The results from this section are further elaborated upon in the annexes.

and agriculture with respect to health quality and subjective well-being. As working time quality takes into account work duration, shorter working time may not be the preferred schedule for all employees, suggesting lower earnings and job insecurity for employees working in public administration, construction and agriculture and thus explaining the negative association.

Flexible work organisation, health and well-being

This section extends the analysis of job quality, health and well-being by focusing on work organisation. As emphasised at the start of this chapter, technological and societal transformations are changing the way people work, with benefits and risks for workers' health and well-being. Teleworking and ICT-based mobile work is an obvious illustration of an expansion of working time arrangements, with the advantage of more flexibility in arranging working schedules and the high risk of vanishing boundaries between private and working life. In a recent report, Eurofound (2020d) analysed the employment and working conditions in telework and ICT-based mobile work (TICTM). Its main findings were that these work arrangements are characterised by great autonomy and higher productivity but higher work intensity and longer working hours.

Taking stock of the framework developed by Eurofound (2017, 2020d), this section focuses on analysing flexible digital work organisation practices. To this end, workers are grouped into three categories[34] based on their use of ICT and work mobility. There is a strong association between the use of ICT and mobility and working time flexibility (Eurofound, 2020d). The first group of workers, labelled digital workers with a high level of flexibility, is characterised by both a high use of ICT and high work mobility.[35] The second group, labelled digital workers with a medium level of flexibility, is different from the first group in that employees rarely work in locations other than their employer's premises. Low-digital workers represent the third group, which uses fewer digital devices.[36] With respect to working conditions, digital workers with a high level of flexibility enjoy relatively higher levels of autonomy and working time flexibility compared to digital workers with a medium level of flexibility; the difference is even more pronounced when compared to low-digital workers, as reported in Table 10.

Table 10: Average scores for autonomy and working time flexibility by digital worker category, 2015

Digital worker category	Autonomy score	Working time flexibility score
High level of flexibility	68.9	54.6
Medium level of flexibility	63.8	43.4
Low-digital worker	55.3	34.5
Average	58.7	38.8

Source: *EWCS 2015*

As seen in Table 11, digital workers with a high level of flexibility are predominant in financial services and other services, with more than 20% of total employees having highly flexible forms of digital work organisation in these sectors. Public administration, education and transport rank just behind, with more than 10% of employees having a highly flexible form of digital work organisation. Digital forms of work organisation with medium levels of flexibility are, to some extent, more represented across sectors, with almost all recording a proportion above 10% of staff, except in construction and agriculture, where these proportions fall to 7.5% and 5.2% of total employees, respectively. It is worth pointing out that the financial services sector is the only sector where digital workers with a medium level of flexibility (56.3%) are predominant instead of low-digital workers (19.2%). Table 12 reports the share of each group of workers by occupation. Digital workers with a high level of flexibility are mainly managers, professionals, technicians or clerical support workers, as the share of this group within these occupations exceeds 10% of total employees. This distribution across occupations holds for digital workers with a medium level of flexibility. Low-skilled occupations, such as elementary occupations, and plant and machine operators, account for a small proportion of flexible digital work, whilst low-digital workers are predominant within these occupations. Nevertheless, this table shows that each occupation can experience the three types of work organisation, supporting the view that diverse organisational forms can exist within a given occupation (Eurofound, 2015a, 2017; Lorenz, 2015).

34 Further details on the methodology of group formation are provided in the annexes.

35 More precisely, this group of workers corresponds to those who work always or almost all of the time with computers, laptops, smartphones and similar technology and who work at least several times a month in another location (one other location) other than their employer's premises.

36 Less than almost all of the time.

Table 11: Distribution of digital worker categories (with high, medium and low levels of flexibility) by sector, 2015 (%)

Sector	High level of flexibility	Medium level of flexibility	Low-digital workers
Agriculture	4.0	5.2	90.8
Industry	8.3	20.1	71.6
Construction	8.3	7.5	84.1
Commerce and hospitality	7.1	18.6	74.4
Transport	10.5	16.0	73.5
Financial services	24.4	56.3	19.2
Public administration	19.2	35.3	45.6
Education	14.6	13.9	71.5
Health	7.9	18.9	73.2
Other services	20.3	27.3	52.4
All sectors	**11.8**	**21.0**	**67.1**

Source: *EWCS 2015*

Table 12: Distribution of digital worker categories (with high, medium and low levels of flexibility) by occupation, 2015 (%)

Occupation	High level of flexibility	Medium level of flexibility	Low-digital workers
Managers	34.0	25.5	40.5
Professionals	24.1	24.2	51.7
Technicians and associate professionals	19.1	32.2	48.7
Clerical support workers	10.9	60.6	28.5
Service and sales workers	4.2	12.1	83.7
Skilled agricultural, forestry and fishery workers	2.3	1.0	96.6
Craft and related trades workers	3.4	3.8	92.8
Plant and machine operators and assemblers	3.5	4.6	91.9
Elementary occupations	1.5	2.4	96.1
All employees	**11.8**	**21.0**	**67.1**

Source: *EWCS 2015*

As stated earlier, different forms of work organisation may have mixed effects on health and well-being. Table 13 shows the results of this relationship analysis by reporting the regression coefficient score for each health and well-being indicator by category of worker within each sector. On average, employees with highly flexible forms of digital work organisation have relatively lower levels of health quality in almost all sectors except construction and health.[37] Similarly, and on average, subjective well-being is lower for digital workers with a high level of flexibility than for low-digital workers in all sectors except agriculture, construction and commerce and hospitality. In the majority of sectors, digital work with a high level of flexibility leads to relatively lower scores of health at work than low-digital workers, except in agriculture, industry and construction. The analysis of work–life balance confirms the high level of work intensity that goes with digital work organisation where there is a high level of flexibility. Indeed, employees have the worst fit between their work and private life with this organisational form in all sectors, compared to the

37 The negative association between health quality and digital work with a high level of flexibility for most sectors could come from the reverse relation – a low level of health quality may increase work flexibility through teleworking.

Table 13: Difference in average level of health and well-being indicators for each category of worker (with high and medium levels of flexibility) by sector, 2015

Regression table	Health quality		Subjective well-being		Health at work		Work–life balance		Subjective assessment of work sustainability	
Reference: Low-digital workers	Medium level of flexibility	High level of flexibility	Medium level of flexibility	High level of flexibility	Medium level of flexibility	High level of flexibility	Medium level of flexibility	High level of flexibility	Medium level of flexibility	High level of flexibility
Agriculture	NS	-2.1**	NS	4.9***	7.2***	2.5***	7.5***	-4.0***	11.1***	2.1*
Industry	1.5***	-1.2*	1.1*	NS	3.0***	3.0***	1.5**	-3.4***	8.4***	7.0***
Construction	1.9***	3.5***	NS	4.2***	4.2***	5.8***	9.1***	-1.2*	16.4***	19.2***
Commerce and hospitality	NS	-1.3***	0.7***	0.5**	1.1***	NS	-0.6*	-4.0***	8.1***	NS
Transport	NS	-6.0***	1.5**	-3.5***	2.7***	-1.6***	4.1***	-5.2***	NS	NS
Financial services	0.8**	-3.6***	-0.6**	-3.8***	NS	-3.4***	2.6***	-4.2***	-2.7***	NS
Public administration	0.7**	-3.6***	NS	-1.0***	3.7***	NS	2.1***	-5.3***	12.3***	-2.3**
Education	NS	-5.1***	-1.9***	-4.1***	-0.6**	-4.6***	-1.3***	-9.7***	NS	-8.5***
Health	NS	0.7*	-1.6***	-1.0***	-0.7***	NS	-0.7***	-3.0***	7.9***	7.2***
Other services	NS	-2.1***	-1.5***	-2.9***	1.4**	-1.5**	1.2*	-4.7***	8.8***	6.5***

Note: *This table displays the average difference score for each health and well-being indicator in low-digital workers (other workers) by sector (controlled by country, workplace size, education, gender, age and occupation). Asterisks display the confidence level of the difference (* = 95%, ** = 97.5% and *** = 99%). NS = not significant.*
Source: *EWCS 2015*

reference group of low-digital workers. This result supports the view of increased work demands induced by TICTM, leading to irregular work schedules and long working hours, which are detrimental to private life. On the other hand, digital workers with a high level of flexibility outperform low-digital workers when it comes to work sustainability in all sectors except public administration and education. Moreover, it is worth pointing out that, compared to high flexibility, low flexibility leads to better performance in terms of health and well-being. For instance, in almost all sectors, work–life balance is relatively higher for digital workers with a medium level of flexibility than for digital workers with a high level of flexibility. This result shows that the high level of flexibility offered by working from different premises (allowed by digital tools) has relatively negative consequences in terms of health and well-being. An illustration of this result is provided in transport and public administration, where digital work organisation with a medium level of flexibility leads to a relative increase in health quality and well-being, while a high level of flexibility leads to a relative decrease in health and well-being. Nevertheless, this negative association is mainly concentrated within services sectors, where the share of highly flexible workers is high, whilst in physical work-based sectors (such as agriculture, industry and construction) highly flexible digital work (less common) has a positive impact on health and well-being.

In brief

- Financial services and other services stand out as the only sectors where all the indicators for health and well-being are above the European average. In contrast, the health sector underperforms the European average on all the health and well-being dimensions. For the remaining sectors, workers' health and well-being is very close to the European average, denoting few disparities among European workers, except in construction. Overall, construction and health are the sectors with the worst health results directly related to work.
- Considering the sectors by country cluster, the financial services sector in Scandinavian countries ranks first in all the health and well-being indicators except for work–life balance and health quality. However, there is clear heterogeneity across sectors within this country cluster, as employees in health and transport score the worst in health quality and health at work, respectively, compared to other country clusters. Education in Southern Europe scores high in relation to health at work compared to other country clusters and other regions. In contrast, transport in Scandinavian countries and health in Ireland and the UK have the lowest scores in this indicator compared to the rest of the geographical regions.

- Improving working conditions – and job quality more generally – has positive effects on employees' health and well-being. This is especially the case for work intensity, but also for physical environment, social environment and prospects. However, some general job quality indices can have negative side-effects. For example, a high level of skills and discretion is negatively related to work–life balance, except in public administration, and to health quality, except in financial services, public administration and education. In general, there is a positive and strong association in all the sectors under consideration between working time quality and work–life balance, on the one hand, and with health at work on the other.
- Highly flexible digital work organisation is only prevalent in services sectors such as financial services, public administration and other services, and within high-skilled occupations, such as managers and professionals. A high level of flexibility in relation to work is relatively detrimental to work–life balance in all sectors. However, this form of work organisation leads to higher work sustainability in all the sectors under consideration, except in public administration and education.

6 Role of employee representation and voice

In the European social model, social partners and collective bargaining play a key role in creating more and better jobs throughout the EU (Eurofound, 2011). As social dialogue covers topics directly related to working and employment conditions, the social partners are very well placed to help tackle job quality challenges facing workers. Nevertheless, employee representation has been under pressure in the EU in recent decades (Visser et al, 2017). Trade union membership has been in decline since the 1980s, which may affect the membership composition, lower the presence of trade union members on-site and reduce trade unions' bargaining power (Crouch, 2017; Hoque et al, 2017). This decline has been linked to the megatrends shaping the world of work (OECD, 2019b) and to institutional reforms and decentralisation tendencies, which have diversified the landscape of collective bargaining in Europe. Work has been fragmented as a result of the globalisation of value chains and 'fissured' employment within countries; jobs that used to be connected are now dispersed over different firms and branches, and sometimes executed in isolation by self-employed or platform workers (Weil, 2014). This has reduced the mobilisation capacity of workers and lowered unionisation rates. At the same time, Eurofound (2018a) finds that centralised collective bargaining is associated with higher levels of job quality, social justice, industrial democracy and industrial competitiveness.

This chapter first maps employee representation at workplace level, the existence of a health and safety delegate or committee in the different sectors and the existence of meetings to discuss organisational affairs (voice). It also explores the relationship between employee representation and voice and working conditions. Eurofound's online European Industrial Relations Dictionary defines employee representation as 'an employee's right to seek a union or individual to represent them for the purpose of negotiating with management on issues such as wages, hours, benefits and working conditions'. The company level is the main level of collective bargaining in the Eastern and Ireland and the UK clusters, whereas the sector level (or a combination of the two) appears dominant in the remaining country clusters. Social dialogue at national, sectoral and company level affects working conditions and job quality, and disentangling its impacts is not so straightforward (Bryson and Forth, 2017).

Several studies provide evidence of a positive relationship between employee representation and job quality. The OECD (2019b), for example, finds that job quality tends to be higher in organisations with a recognised form of employee representation in the workplace. Employee representation can affect job quality in multiple ways by negotiating fair and good working conditions, enforcing occupational health and safety (OSH) regulations, reinforcing labour market security (through training, for example), monitoring management practices or fighting intimidation and discrimination. The positive effect on training provision by employers is particularly well documented (Cooney and Stuart, 2012).

Employee representation and voice within sectors

The EWCS 2015 poses two questions that probe for formal employee representation in the employee's company or organisation (existence of a trade union, works council or similar committee, or existence of a health and safety delegate or committee), and one question that captures employee voice more generally (existence of a regular meeting at which employees can express their views about what is happening in the organisation). This section examines these three questions in more depth. Note, however, that these questions do not provide any details on the nature, extent, impact or efficiency of the representation (Eurofound, 2017). Even though the EWCS centres on representation and voice at company level, in the context of this study it must be highlighted that the sectoral context is critical, as it affects the issues faced by workers, as well as the mechanisms available to address them (Eurofound, 2011).

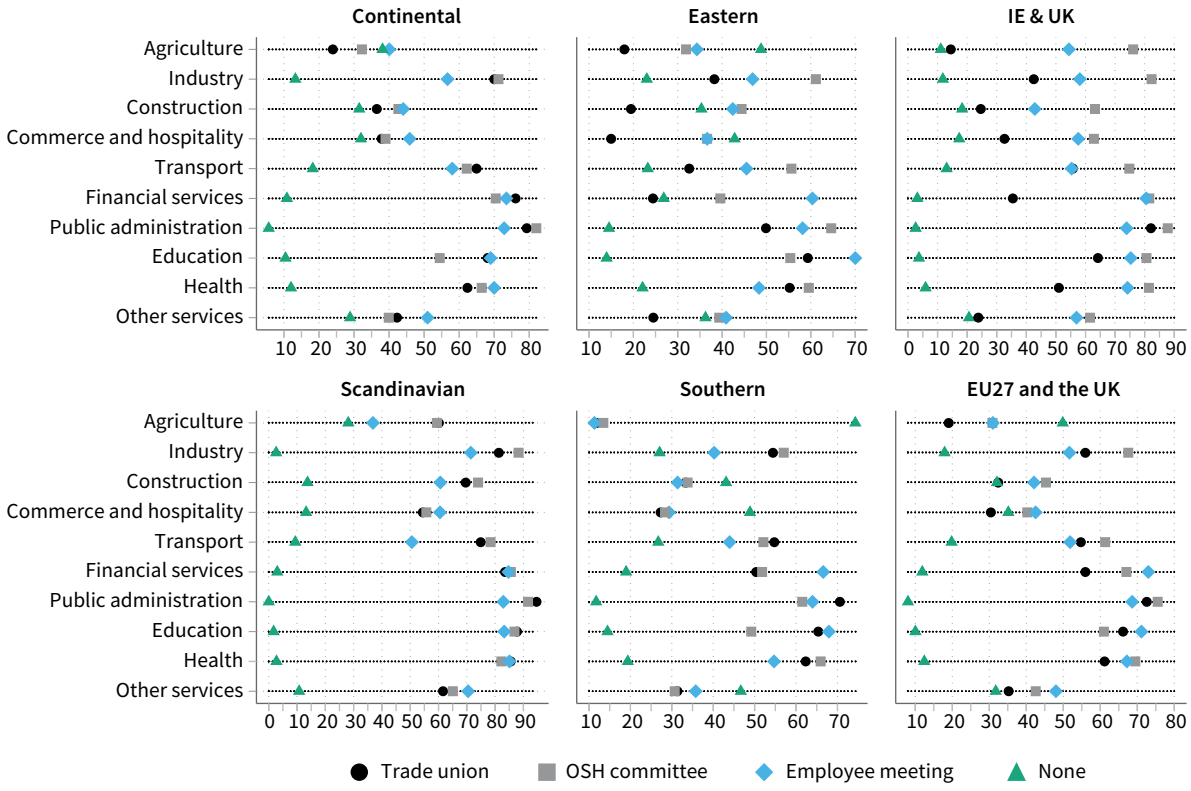
Figure 29 shows the presence of representative bodies or voice in the 10 sectors across the EU27 and the UK and in the five country clusters. In the EU27 and the UK, over 90% of workers report the presence of at least one type of representative body (including OSH representation) or voice at meetings. However, there are differences between the three types of representation: 50% of workers report having employee representation in the company; 58% report having an in-company health and safety delegate or committee; and 55% report having a regular meeting in which employees can express their views about what is happening in the organisation.

In public administration, education and health, the presence of employee representation is the strongest, followed by industry, transport and financial services. Workers in agriculture, construction, commerce and hospitality and other services, in particular, report less representation than workers in other sectors that have an OSH committee or a union delegation to represent them. The Continental and Scandinavian clusters have sectoral patterns similar to the EU pattern; larger differences emerge in the other clusters. Compared to the EU27 and the UK, agriculture, commerce and hospitality and other services in the Southern cluster appear to stand out as sectors where an OSH committee is present in only a few workplaces. In the Eastern cluster, the presence of an OSH committee is more comparable to the EU27 and the UK, but fewer workplaces have trade union representation or similar, especially in industry, construction, commerce and hospitality, transport and financial services.

Overall, the different types of employee representation and voice distinguished in the EWCS (trade union, OSH committee, employee meeting) show fairly similar patterns by country cluster and sector. In Scandinavia, this correlation is almost perfect. Yet there are exceptions. For example, there is a lower rate of union presence in Ireland and the UK (whereas the presence of an OSH committee is on a par with the EU27 and the UK) and a higher prevalence of formal bodies in industry and public administration in general. The absence of any representative body is more common in particular sectors, including agriculture, construction, commerce and hospitality, transport and other services. For some of these sectors, the smaller size of the companies plays a role in the lower likelihood of having a representative body. Moreover, these sectors report high shares of low-paid workers (agriculture, commerce and hospitality) and medium-paid workers (construction, transport), workers with lower than secondary education (>20% of workers in agriculture, construction, transport and commerce and hospitality have a low level of education), young workers (commerce and hospitality, construction and agriculture) and non-standard employment (agriculture, commerce and hospitality) in the EU-LFS data, and comprise many small and medium-sized enterprises. Some of these sectors additionally represent a large part of total employment in some country clusters (such as commerce and hospitality in Southern Europe, or transport and construction in Eastern Europe). This suggests that some of the most vulnerable workers are in those sectors where the absence of any representative body is more common.

Trade unions have the role of negotiating collective agreements, which form part of the regulation of working conditions. For this reason, the conditions included in those agreements are enforceable. It is interesting therefore to focus on the existence of a trade union representative in the workplace. Figure 29 shows

Figure 29: Presence of representative bodies (trade unions and OSH committees) or employee meetings (voice) by sector, 2015 (percentage of workers)



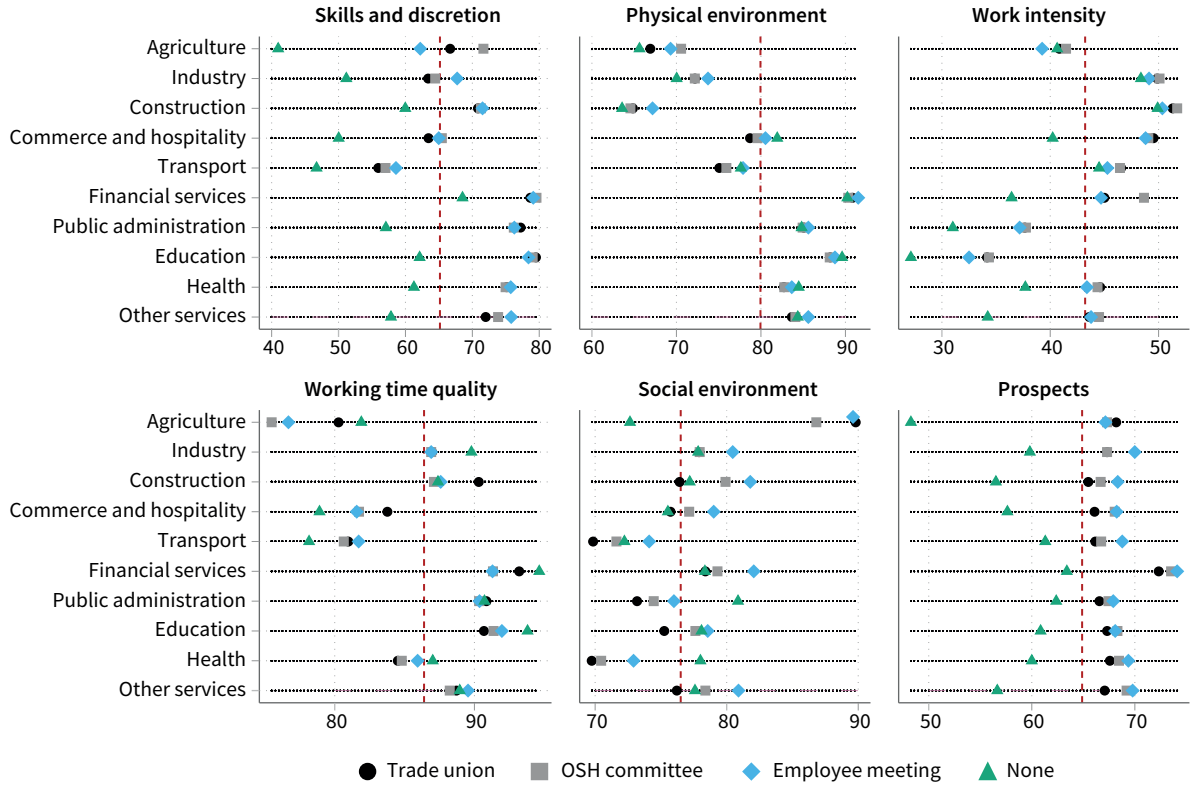
Source: *EWCS 2015*

that agriculture is the sector with the lowest share of trade unions in all country clusters (18%). Other sectors where less than 40% of workers report the existence of a trade union in the workplace are construction, commerce and hospitality and other services. For construction, this is especially the case in the Eastern countries and in Ireland and the UK. For commerce and hospitality, the lowest is in Eastern Europe. For other services, the lower shares are found in Eastern Europe, Southern Europe and Ireland and the UK. The low share of trade union representation in Eastern countries in financial services (25%), a sector with one of the highest levels of trade union representation at company level (57%), is also of note. In summary, we observe a sectoral variation, with the industrial relations characteristics of country clusters exerting a strong influence.

Employee representation and voice and job quality at sectoral level

Figure 30 shows job quality in the presence of one of the forms of representation or voice mentioned above, as well as in the absence of all of these forms. For most job quality indices, the three forms yield similar outcomes.[38] In fact, only the figures for social environment and prospects suggest an effect of a specific type. Employee meetings appear to be more beneficial, while union presence is correlated with less favourable conditions. It is clear from this that the structures of the sectors matter, as correlations may be spurious. For example, trade unions may have a stronger presence in larger companies, where job

Figure 30: Employee representation and voice and job quality by sector, 2015



Note: *Scales are different because individual scores are shown adjusted to the same graph size for each job quality indicator.*
Source: *EWCS 2015*

38 This may be because companies typically have more than one form in place (correlations between different types of representation).

quality is worse in some respects, for reasons other than the union presence itself. Moreover, large organisations are overrepresented in specific sectors, such as financial services, public administration and health, limiting these aspects of job quality further. Nevertheless, these graphs clearly demonstrate that the absence of any form of representation or voice is linked to noticeably lower skills and discretion levels, fewer prospects and lower work intensity. Within sectors, the differences in the physical environment are small, and differences in working time quality and social environment are less pronounced, both between sectors and depending on the forms of representation.

Relationship between representative bodies and voice and job quality

To isolate the impact of employee representation and voice on job quality, factors that may accompany representation need to be considered. For example, in sectors such as education and health, where older workers are overrepresented, these workers are likely also to be overrepresented within the trade unions and may assess job quality differently than other workers would. For this reason, the occupational and demographic (gender, age, education) structure of the sectors is introduced into regressions that link representation and voice to various job quality indices for each sector. The aim of this exercise is to understand how job quality differs between the sectors when there is no form of employee representation or voice in the workplace, and then to assess whether the impact of having one versus more forms of representation or voice on these job quality indices differs across sectors.

Table 14 summarises the results of these analyses. Only statistically significant results are included, and the full tables are available in the annexes (Eurofound, 2020a). First, the results of having no form of representation or voice are discussed (columns labelled (a) in the table). For skills and discretion, differences between the sectors are not statistically significant. However, as also illustrated in the graphs above, in most sectors, skills and discretion is lower in the absence of any form of representation or voice by an order of magnitude of around 10 percentage points, compared to when at least one type of representation or voice is present.[39] Working time quality and physical environment are also not statistically different between sectors. For work intensity, social environment and prospects, there are statistically significant differences between the 10 sectors. In other words, the absence of any form of representation or voice has a different impact on job quality indices in different sectors. The absence of any type of employee representation or voice raises work intensity in commerce and hospitality, education and other services, but reduces it in agriculture. Similarly, the absence of representation or voice worsens the social environment in agriculture, construction and commerce and hospitality, but improves it in the health sector. Finally, the effects are more universally negative with respect to prospects, reflecting the pattern of skills and discretion; transport and public administration are the only sectors where no significant effects are found.

The two forms of employee representation and voice are combined to make a scale of 0–100% in the columns labelled (b) in Table 14. This information can then be used to determine whether a different pattern appears as worker participation increases due to having the two forms of representation and voice in the company.[40] Whereas the overall picture reflects the findings presented above, the patterns within sectors are now significant with respect to physical environment and working time quality. As before, representation and voice are generally beneficial for skills and discretion, except in the transport sector. For physical environment, increasing representation is associated with lower scores on the commerce and hospitality, transport, education and other services indicators. In this case, it is important to note that the direction of causality could be reversed. When working in a more dangerous environment, employee representation (a health and safety delegate or committee) might be called upon to assess risks, or once problems occur. In fact, the requirements and inspections are stricter in activities with high level of risks, such as in the construction sector.

With respect to work intensity, more representation and higher work intensity firmly go together in most services sectors (commerce and hospitality, education, health, other services). Representation and voice correlate positively with social environment in agriculture, industry, construction and commerce and hospitality, but negatively in health. Finally, representation and voice together increase prospects (or vice versa) to a large degree in all sectors except for public administration.

39 Note, however, that skills are highly correlated with occupational level. Therefore, the result could be affected by the occupational structure of each sector.

40 The three indicators have equal weighting.

Table 14: Job quality and representation by sector, 2015

	Skills and discretion		Physical environment		Work intensity		Working time quality		Social environment		Prospects	
Sector	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
Agriculture	-19	32			32				-30	35	-22	31
Industry	-10	18					3			9	-8	12
Construction		13							-7	9	-14	19
Commerce and hospitality	-13	21	3	-4	-17	23	-4	5	-5	8	-10	18
Transport				-7				9				10
Financial services		15									-9	8
Public administration		15										
Education	-10	19	3	-4	-17	24		-7			-7	13
Health	-13	15				19			10	-8	-11	13
Other services	-8	14		-2	-20	23					-12	20
F-test (p-value)				0.030	0.000	0.007		0.000	0.000	0.000	0.043	0.000

Note: *Figures are marginal effects at the means, with logged dependent variables (semi-elasticity), controlling for age (squared), gender, occupation (ISCO-88, 1 digit) and education (ISCED – 3 categories). F-test for the joint significance of the interaction effects, assuming no difference between sectors as the null hypothesis. Column (a) shows the percentage change in the job quality index when no form of employee representation or voice exists; column (b) shows the additional effect when several forms of employee representation or voice exist (0–100: 0 = none; 100 = all three).*
Source: *EWCS 2015*

In brief

- Based on the EWCS 2015, over 90% of workers report the presence of at least some representative body (trade union, OSH committee) or voice in the workplace. The health, education and public administration sectors report the highest levels of employee representation. The absence of any form of representation and voice is more common in the agriculture, construction, commerce and hospitality, transport and other services sectors, which also record the highest shares of more vulnerable workers (low-paid, lower than secondary education, young) and smaller enterprises.
- Only 50% of employees report having trade union representation within their company. The smallest shares are found in agriculture, commerce and hospitality, construction and other services. Overall, figures are lower in the Eastern cluster than in other clusters for all sectors.
- The absence of any form of employee representation and voice (controlling for the occupational and demographic structure of the sector) is linked to a poorer social environment in agriculture, construction and commerce and hospitality; higher work intensity in commerce and hospitality, education and other services; and fewer prospects in almost all sectors.
- The presence of employee representation and/or voice improves prospects in all sectors (except public administration). It also improves the social environment in the agriculture, industry, construction and commerce and hospitality sectors. For physical environment and work intensity, representation is linked to worse conditions, which is explained by a reversed causality. In sectors with a poor physical environment and high work intensity, representation and OSH committees might be set up precisely with a view to tackle these issues – for example, in construction and industry.

COVID-19 crisis: Impact on working conditions in sectors

While this study was under way, the COVID-19 pandemic led to a sharp decrease in economic activity worldwide, with severe implications for employment and working conditions in Europe. The immediate impact on the different sectors of the economy varied substantially, and a detailed sector-by-sector analysis is not yet available.

Unlike the global financial crisis of 2007–2008, the current COVID-19 crisis initially affected services sectors most, especially those reliant on social gatherings and physical proximity. Examples of areas affected include live arts/entertainment, hotels and restaurants, sports and leisure, transport and all tourism-related activities (Fana et al, 2020).

Services regarded as non-essential, like leisure and hospitality, and large parts of the retail sector have been subject to closure and suspension or restriction of all activity. Employment in essential services and sectors, on the other hand, has continued. Essential services and sectors include agriculture and pharmaceutical production, utilities, transport and health and some forms of retail. In some such sectors, notably the retail of basic, everyday products (such as food, cleaning products and toiletries) and online retail, there is evidence of increasing employment to meet heightened demand, displaced from existing high-street retailers or from closed activities, such as restaurants (Eurofound 2020b, 2020e).

In essential services and sectors, the physical environment changed due to physical distancing protocols and the wearing of personal protective equipment (PPE). Despite these measures, the risk of infection remains high, putting additional strain on workers in these sectors. In some sectors, like agriculture or food processing, where maintaining physical distance can be difficult, the risk of infection is particularly high.

In many non-essential but 'teleworkable' activities, which include most professional service activities, workers have changed their place of work. This has had implications for the organisation of working time, working hours and work–family conflict. According to the first wave of Eurofound's online survey *Living, working and COVID-19*, conducted in March–April 2020, over a third (37%) of those currently working in the EU began to telework as a result of the pandemic. The survey results reveal that 18% of all workers report working in their free time at least every other day. However, over one in four workers (27%) who work from home as a result of the pandemic state that they work in their free time to meet the demands of work (at least every other day) (Eurofound, 2020f). The second wave of Eurofound's online survey, conducted in June and July 2020, will provide more information on the working conditions of workers in teleworkable sectors and occupations.

The health sector, already operating with high levels of work intensity and psychosocial demands, has experienced increased work demands. Increased levels of work intensity have also been reported in agriculture and industry because of a lack of personnel (due to difficulties in filling vacancies and high levels of sick leave) and in some commercial activities, because of increased workloads in warehouses as a result of the surge in online shopping.

To complement the above findings, Eurofound requested information from EU-level social partners about the impact of this crisis on working conditions in their respective sectors. While the information provided is anecdotal, social partner organisations have strong links to the workplace level so the data provided should have a good degree of reliability. The evidence is presented in the annexes (Eurofound, 2020a). Eurofound will continue its research on the impact of the COVID-19 crisis and will conduct a project to investigate how workplace practices have changed. This project will lead to a report in 2021. Social partner initiatives to combat the impact of the crisis are also recorded in Eurofound's COVID-19 EU PolicyWatch database.

7 Conclusions

This study examined how working conditions and job quality vary across and within economic sectors, as well as over time, using data from the EWCS 2015 and earlier waves. It focuses on four current topics of relevance in the world of work:

- changing tasks, skills, training and employability
- non-standard employment and employment security
- flexible work organisation, health and well-being
- employee representation and voice

Job quality differs between the 10 sectors of economic activity examined. In general, there is a divide between sectors dominated by manual or blue-collar labour (for example, construction) and those dominated by non-manual or white-collar labour (for example, financial services), though the patterns are less clear for some aspects like working time quality and social environment. Poor working time quality is found in agriculture, transport and commerce and hospitality, whereas a poorer social environment is found in transport and health.

There are also variations within the economic sectors. Job quality may vary according to the country cluster, occupation, workers' level of education or age and gender. For example, physical risk levels are very different between high-skilled and low-skilled workers in construction, and women tend to have better working time quality than men in industry.

Country differences are an important factor that influence the job quality of a sector. For example, the quality of the social environment in the health sector is better in the Eastern cluster of countries than in Scandinavian countries.

Changes in tasks impact on the skills needed and training provision

Employers might provide more training to employees who will be performing newer cognitive tasks than to other employees. More training may therefore be provided in some sectors and occupations than in others.

The examination of changes in the composition of tasks looked at three types of tasks (cognitive, physical routine and interactional tasks) based on EWCS 2010 and EWCS 2015 data. The results indicated that cognitive tasks (e.g. problem solving, teamwork, ICT-related tasks) are on the rise, while physical routine tasks are declining in all sectors except agriculture. Task change is usually associated with an upgrading of skills.

However, in this study, exceptions can be seen in some sectors like commerce and hospitality, where an increase in cognitive tasks has not led to a significant change in the occupational skill levels. In this particular sector, an increase in cognitive tasks coincided with an increase in low-skilled service workers. Therefore, technological change or the expansion of teamwork does not seem to necessarily imply an upgrade to higher occupational levels in all sectors. Interactional tasks (e.g. dealing with clients, pupils or customers) have declined in all sectors except agriculture, construction and public administration.

As stated, changes in the task content of occupations are an indicator for changes in the skills demanded in the sector and the need for training. Over the period 2010–2015, training opportunities provided by employers increased in all sectors, but to a lesser extent in education and other services, despite the substantial task changes faced by these two sectors. Over the years, sectors like agriculture, construction and commerce and hospitality have reported comparatively low levels of participation in training, which is cause for concern and could impact negatively on workers' career development and employability. An analysis of EWCS data also confirms that training opportunities provided by employers are mainly targeted at employees using skills that are in high demand. This helps the adaptation to new requirements in some sectors; in others, however, access to training is not very prevalent, with a possible negative impact on job adaptation.

The working conditions of some forms of non-standard employment are a concern

Although permanent full-time employment with a single employer is still the predominant form of employment in the EU, a third of the European workforce is in a non-standard employment relationship. Non-standard employment is found in all sectors, but it is especially prevalent in agriculture, construction, health, commerce and hospitality, education and financial services.

An analysis of the EWCS 2015 indicates that job quality is lower for workers in non-standard forms of employment, corroborating previous studies on this topic.

There are important links between non-standard employment, precarious work and job insecurity.

Although some types of non-standard employment are associated with higher job insecurity because the duration of the employment relationship is limited in time, the workers involved may still be confident in their ability 'to easily find a job of similar salary if [they] lose

or quit [their] current job'. Perceived employment security can still be acceptable. For example, workers in non-standard employment in financial services tend to report a relatively high level of employment security.

From a country perspective, the highest levels of job insecurity and lowest levels of employment security are found in Southern Europe in construction, commerce and hospitality, agriculture, industry and other services, and in Eastern Europe in industry and public administration. This reflects the role of the institutional characteristics of a country, the functioning of the labour market, the level of protection and also the seasonality of some economic activities in some countries.

Health and well-being results do not vary greatly from sector to sector – with some clear exceptions

In general, the health indicators for the different sectors are close to the European average. The health status of workers is determined to some extent by the working conditions in specific occupations and the country where the workers live. However, in construction and health, the levels of health and well-being at work (including sickness absence due to work, presenteeism, absenteeism due to health risks from work and work-related psychological well-being) are clearly lower than the EU average. For this reason, these sectors should put initiatives in place to improve their working conditions.

Digital work patterns could pose risks for the health and well-being of workers in some sectors

Highly flexible digital work organisation practices, characterised by the use of teleworking and digital technology, come with advantages and risks. They offer more flexibility in the arrangement of work schedules, but are also associated with longer working hours and the blurring of boundaries between private and working life. Highly flexible digital work organisation is prevalent in the services sectors, such as financial services, public administration and other services, and is reported mostly by those in high-skilled occupations, such as managers or professionals. These categories of workers score lower in terms of health and well-being and work–life balance compared to those who do not work as intensively in such work arrangements. Since the number of workers in services and knowledge-based activities is increasing, the effects of ICT-based flexible work need to be monitored, especially in sectors such as education and financial services.

Uneven distribution of employee representation across sectors has implications for job quality

Most workers in the EU benefit from at least one type of employee representation or have a chance to express their views through direct participation in meetings. However, formal in-company employee representation exists for only 50% of workers. This absence is particularly salient in agriculture, commerce and hospitality and other services, and is more evident in the Eastern countries. The importance of national industrial relations systems for the degree of employee representation in the workplace is confirmed by the fact that the specific presence of trade union representatives in the workplace is strongly influenced by geography.

Some of the sectors with lower levels of employee representation are also characterised by poorer job quality in a range of dimensions. This is a particular concern.

In summary, this study has shown that differences persist between sectors in relation to job quality and working conditions. Even though some aspects have improved in the majority of sectors – for example, there has been a reduction in physical demands and improvements in working time quality – some longstanding concerns, such as job insecurity or lack of participation in training, remain an issue in some sectors. New concerns arise, for example, from the spread of more flexible ICT-based work arrangements and the associated potential negative effects on workers' health and work–life balance, which are prominent in financial services and other services.

The COVID-19 crisis is affecting sectors very differently, both in terms of employment levels and working conditions. Disruptive effects are currently most visible in the health and safety of workers, organisation of working time, work intensity and job insecurity. A wide range of measures have been taken by governments, social partners and companies to combat the impact of the crisis. Further analysis will be required to determine which measures have been the most successful. Whether some of the changes to employment levels and working conditions in sectors will be more permanent is another question that cannot yet be answered.

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Megatrends, such as digitalisation, globalisation, demographic change and climate change, are transforming the world of work, with knock-on effects for working conditions and job quality. Against this background, this report examines working conditions and job quality from a sectoral perspective, using data from the 2015 European Working Conditions Survey (EWCS). The report first outlines the sectoral characteristics underpinning employment – economic structure, demographics, occupational level and employment status. It then goes on to focus on four main topics: changing tasks, skills, training and employability; non-standard employment and employment security; health, well-being and flexible work organisation; and employee representation and voice. Differences in working conditions arising from age, gender, occupation and education level are taken into account. According to the analysis, developing measures to address relevant issues such as skills development, job security and work intensity should be a priority for policy. The data also show that the presence of employee representation and voice is key to improving the situation of employees.

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