Working conditions in European sectors

The evolution of tasks and work practices, consequences for employability and well-being

Majda Seghir[1] Malo Mofakhami[1]

[1] Centre d'étude de l'emploi et du travail - LIRSA - CNAM

Séminaire transversal du CEET - 15 avril 2021

Presentation outline

1. Eurofound report, issues and scope of analysis

2. The post-2008's crisis, a period of accelerated trends

3. The recent task variations: a major issue for employability

4. The emergence of new digital forms of work raises new health and well-being concerns for European workers

Eurofound report, issues and scope of analysis

Eurofound report: Working conditions in sectors

- The Eurofound report studies the working conditions in European sectors and their variations
- The report is based on the European Working Conditions Survey (EWCS) and the Labor Force Survey (LFS) and follows the previous Eurofound's methodologies
- The covered themes and the definition of the sectors are set by the Eurofound teams
- Despite these constraints, we had some latitude about the purpose of analysis and the statistics used
- This report was made in collaboration with KU Leuven

Tasks and digital transformation what consequences?

- The parts of the report we carried out study the effect of tasks transformation and digital use and their consequences on some aspect of working conditions
- The presentation will focus on the two parts: tasks' variations and employability and health and well-being in relation with types of digital use
- These two topics meet different concerns in the Eurofound report, but they both reflect the digital disruption of skills and tasks
- $\Rightarrow$ What are the transformations workers faced within sectors? What are the consequences in terms of employability and health and well-being?

The sectors' perimeter in the study

Table 1: Sectoral coverage

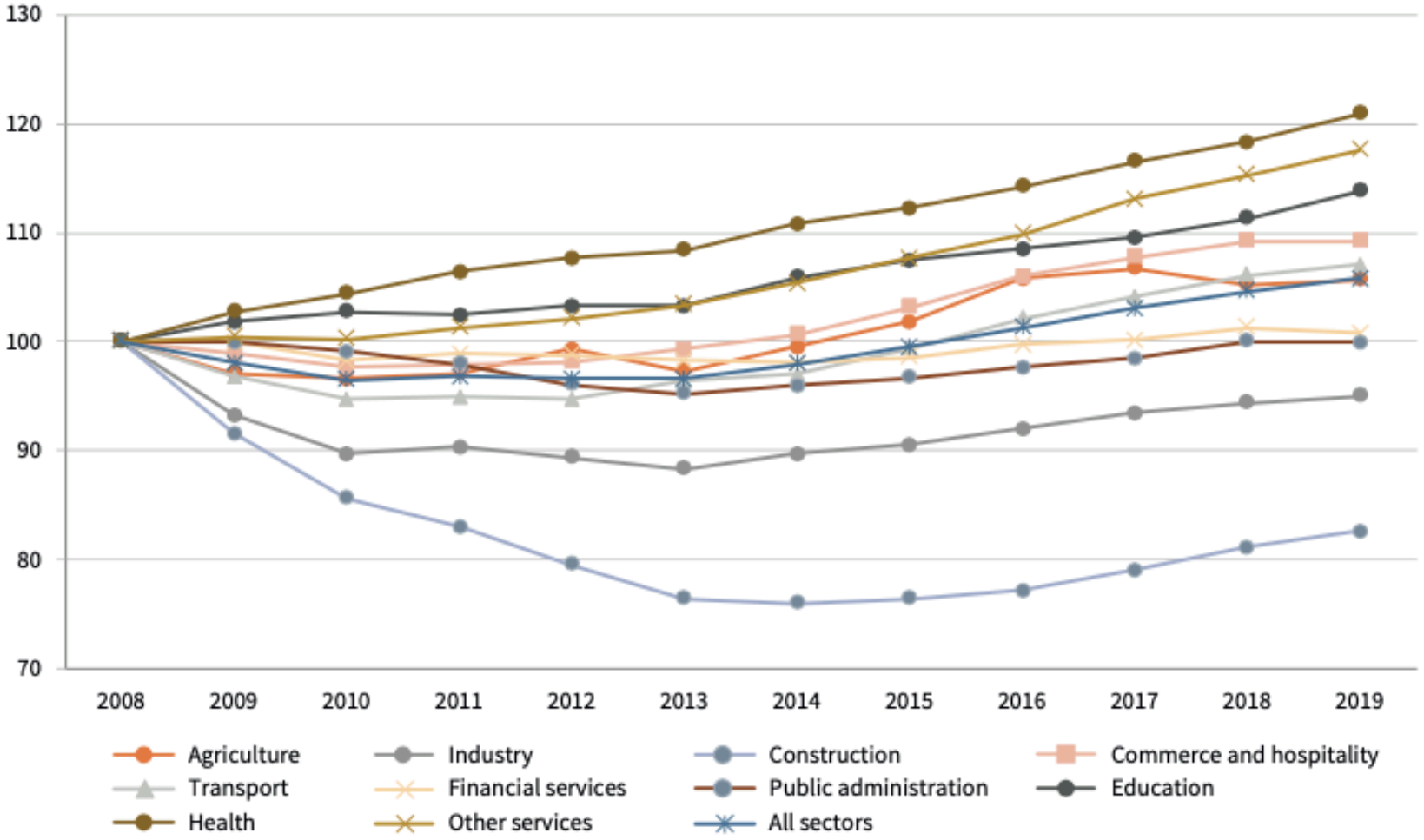
Sector	Corresponding NACE Rev. 2 sectors (subsectors in italics)	Sample size per sector*
Agriculture	Agriculture, forestry and fishing (A; 01–03)	553 observations
Industry	Mining and quarrying (B; 05–09)	5,065 observations
	Manufacturing (C; 10–33) *NACE 11–12 Food products; NACE 13–15 Textiles; NACE 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)	

Working conditions in sectors, Eurofound (2020)

The post-2008's crisis, a period of accelerated trends

Post 2008's crisis employment variations

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

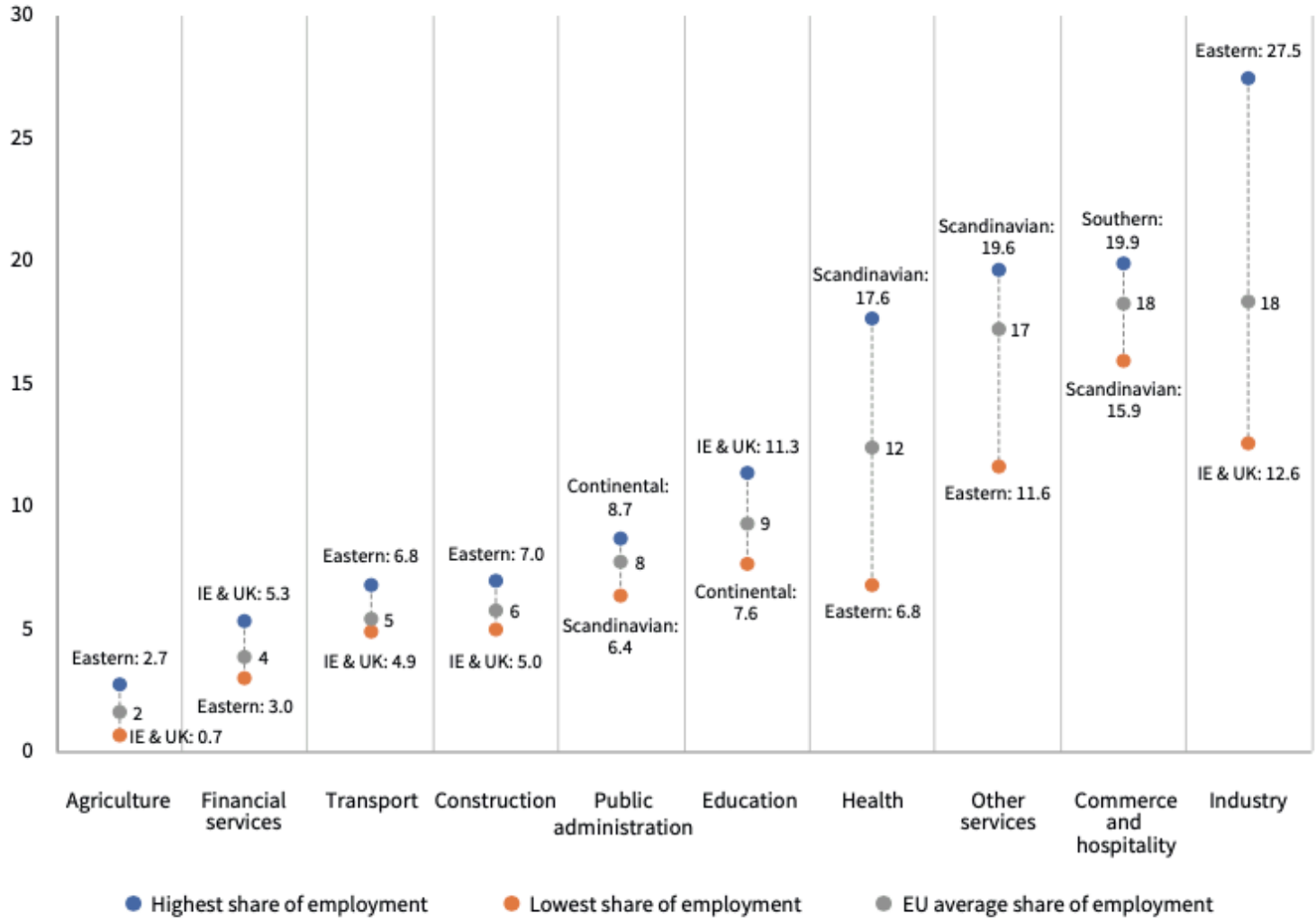


Source: *EU-LFS 2008–2019*

Working conditions in sectors, Eurofound (2020)

Occupational structure 2015

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

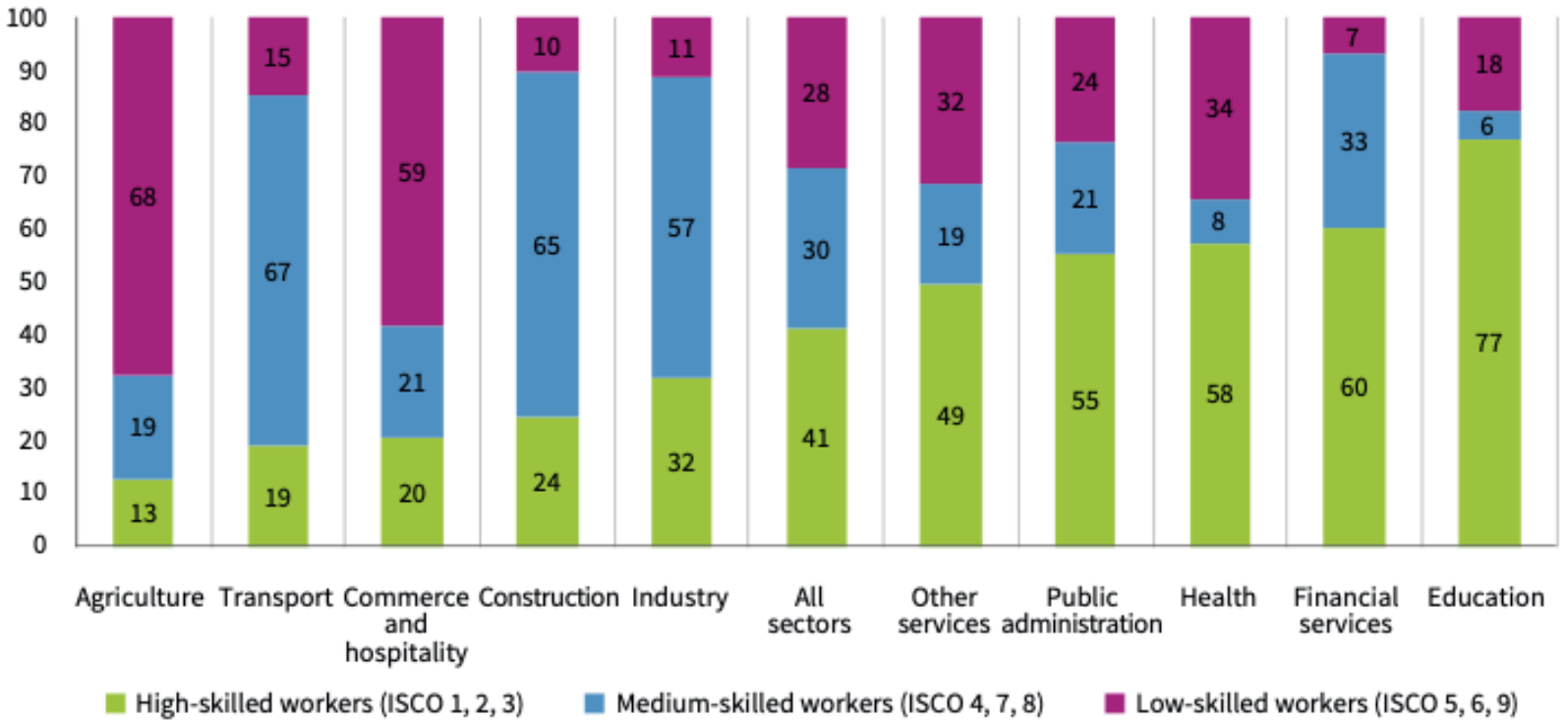


Note: *This figure reports the EU average share of employment as well as the highest and lowest shares by country cluster for each sector.*
Source: *EU-LFS 2015*

Working conditions in sectors, Eurofound (2020)

Variations in occupational structure

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

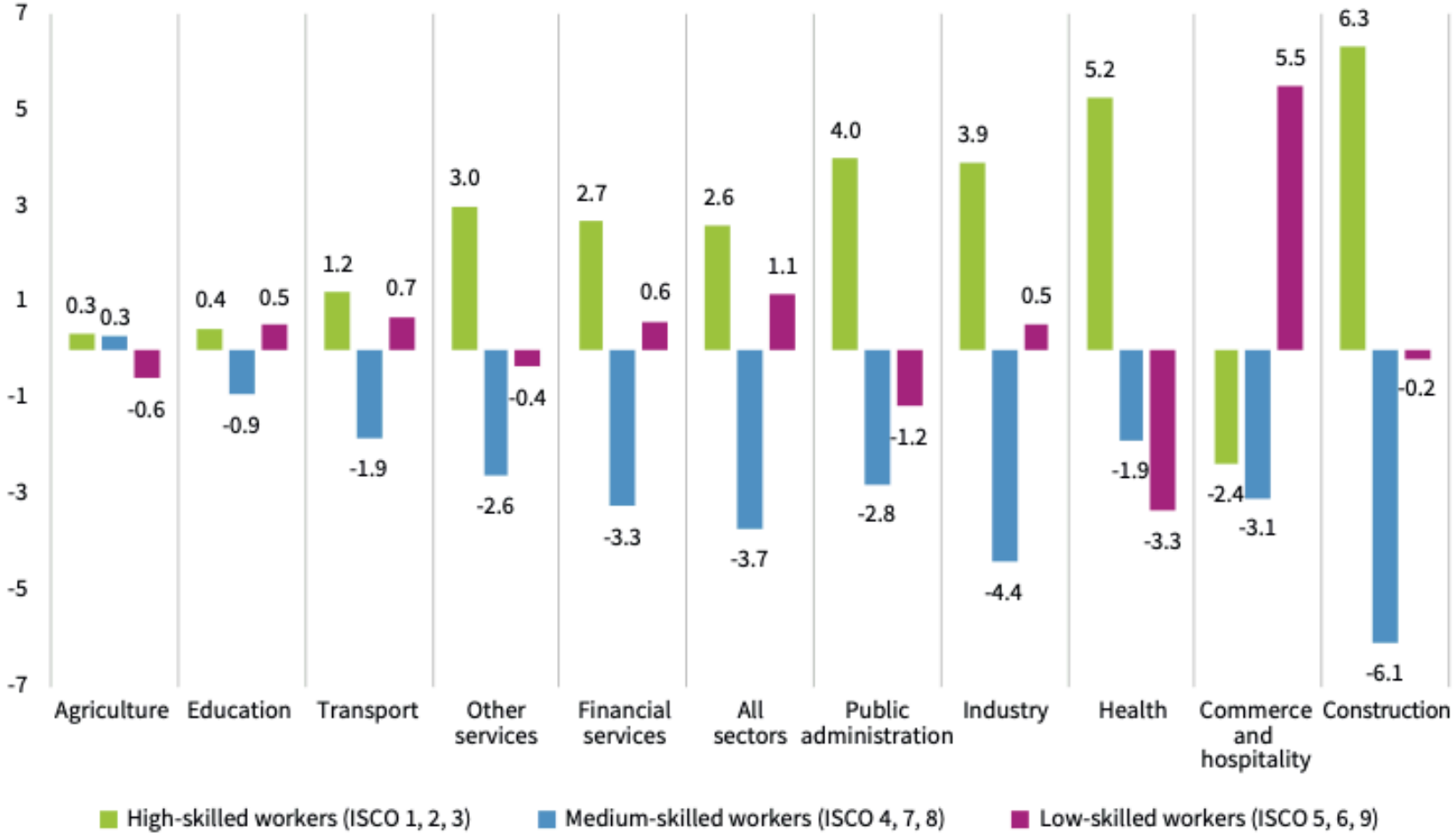


Source: *EU-LFS 2015*

Working conditions in sectors, Eurofound (2020)

Post 2008's crisis employees variation by sectors

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*

Workings conditions in sectors, Eurofound (2020)

In summary

- The 2008's crisis accelerated the trends of tertiarization of the economy, although some disparities appear between European countries
- The period shows an increase of high-skilled workers in most of the sectors
- Besides this upskill effect, a strong decline of the share of medium-skilled workers is observed but no decline of the low-skilled one, rather a rise.
- Confirms the polarization of the workforce in the recent period, but shows heterogeneity at sector level

The recent task variations: a major issue for employability

Tasks measure

The tasks' measure is obtained by following the Bisello et al. (2019 - JRC paper) methodology (8 indexes), then synthesized by a principal component analysis.

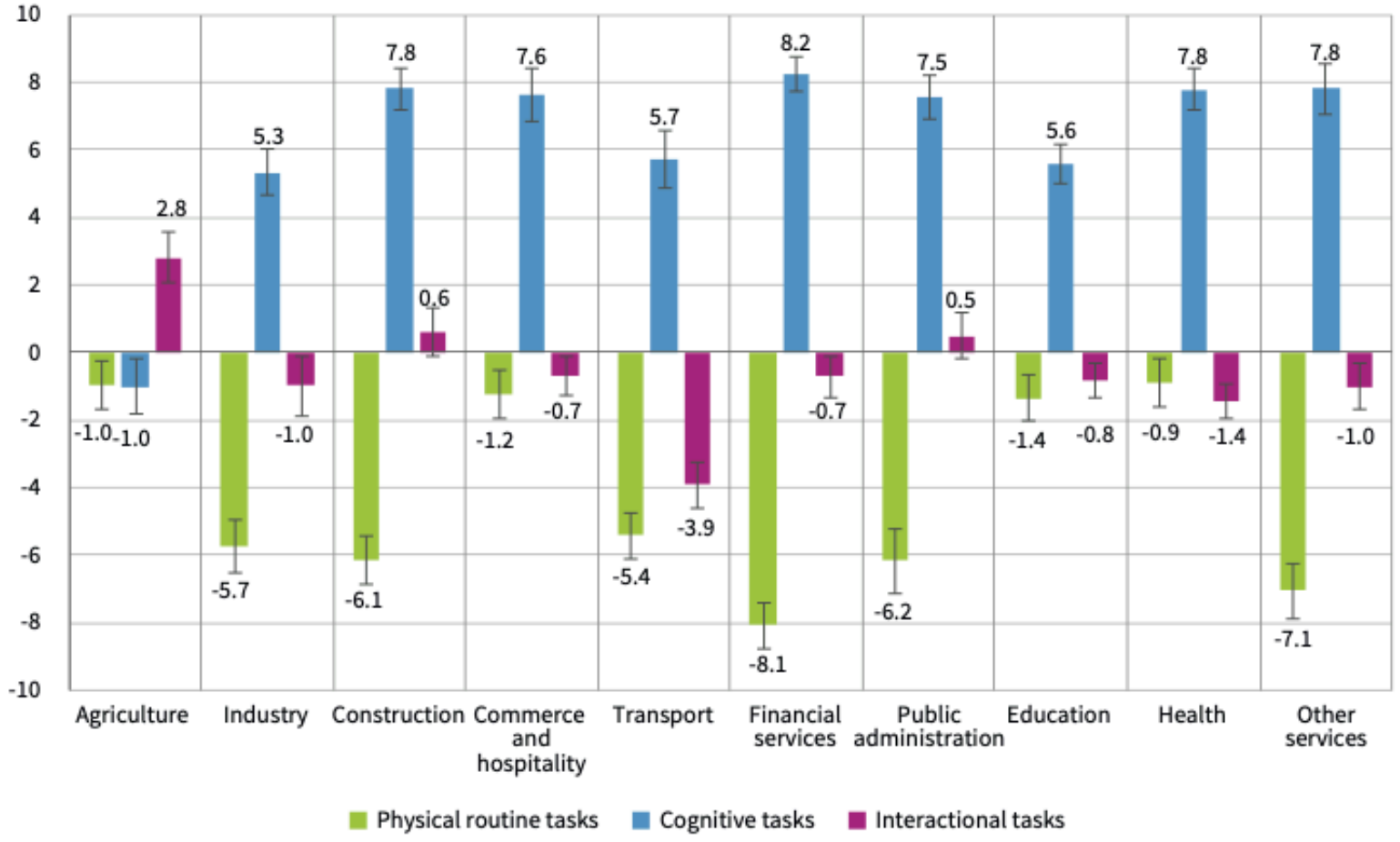
- Physical routine tasks are characterized by high levels of physical tasks, repetitiveness and standardization of work, predominant use of machines, relatively frequent teamwork and low levels of autonomy and ICT use

- Cognitive tasks include intellectual tasks, teamwork, problem-solving and setting quality standards and norms, as well as ICT use

- Interactional tasks are mainly defined by social tasks and, to a lesser extent, by physical tasks. Interactional tasks are negatively related to work standardization, highlighting the permanent adaptation effort required by social interaction.

Tasks change in sectors between 2010 and 2015

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*

Working conditions in sectors, Eurofound (2020)

Decomposition: model and strategy

For each sector one can adopt the following formula:

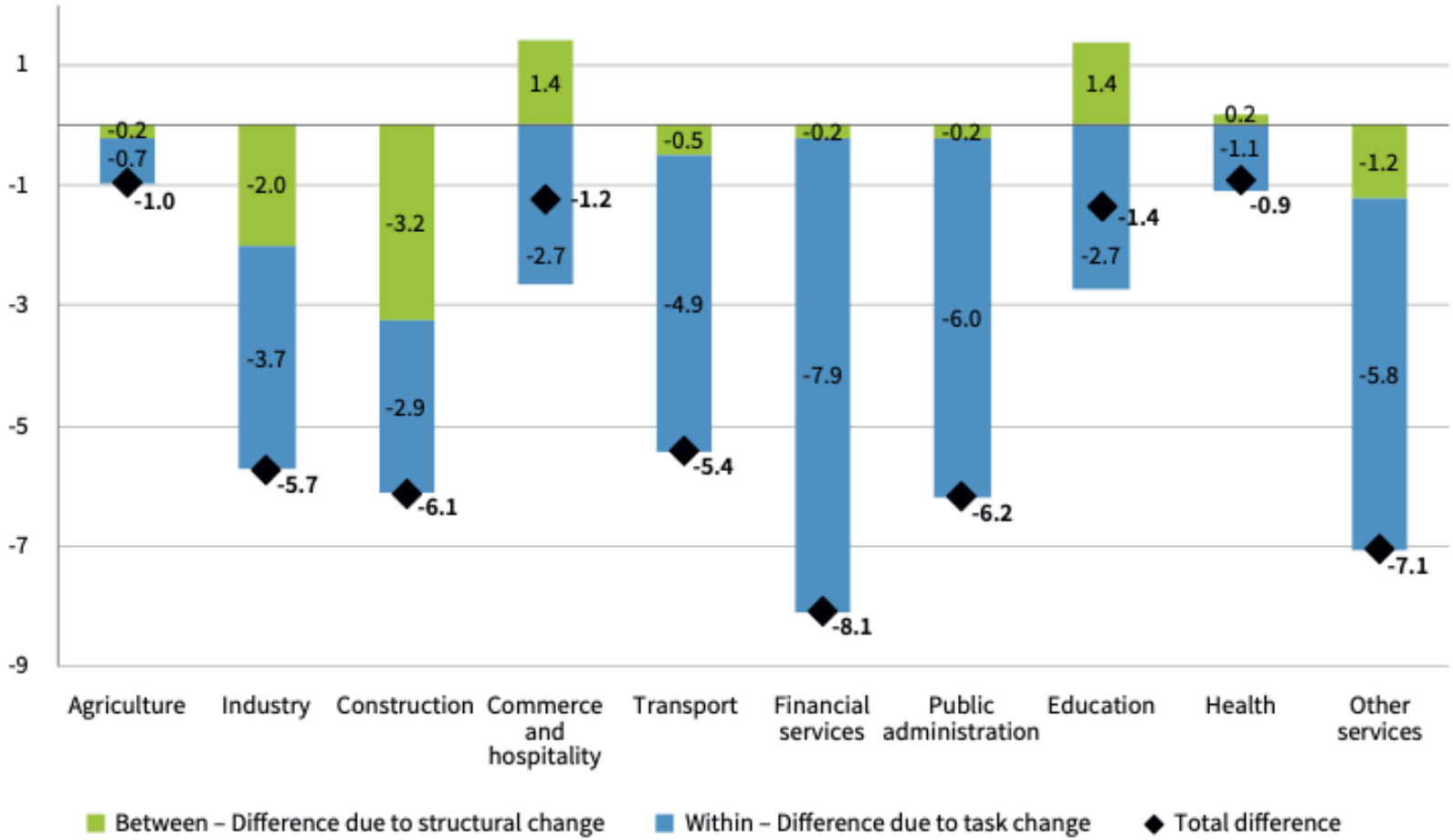
Aggregate change = Between change (structure of occupation) + Within change (job content of tasks)

$$\sum_{k=1}^{K}(\Delta task_{kjt} \times \Delta E_{kt}) = \sum_{k=1}^{K}(task_{kjt-1} \times \Delta E_{kt}) + \sum_{k=1}^{K}(\Delta task_{kjt} \times E_{kt-1}) + \varepsilon$$

- E_{kt} is the share of occupation k at the period t for a given sector
- $task_{kjt}$ is the average value of task index j for occupation k at the period t for a given sector
- $\Delta task_{kjt}$: the aggregate task change computed from the EWCS data between 2010 and 2015
- ΔE_{kt}: the measure of the employment structure of occupation by sector, built from the LFS database in 2010 and 2015
- $\Delta task_{kjt}$: the within tasks change is calculated as the difference between the aggregate tasks change ($\Delta task_{kjt}$) and the between tasks change (ΔE_{kt})

Decomposition: Physical routine tasks

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

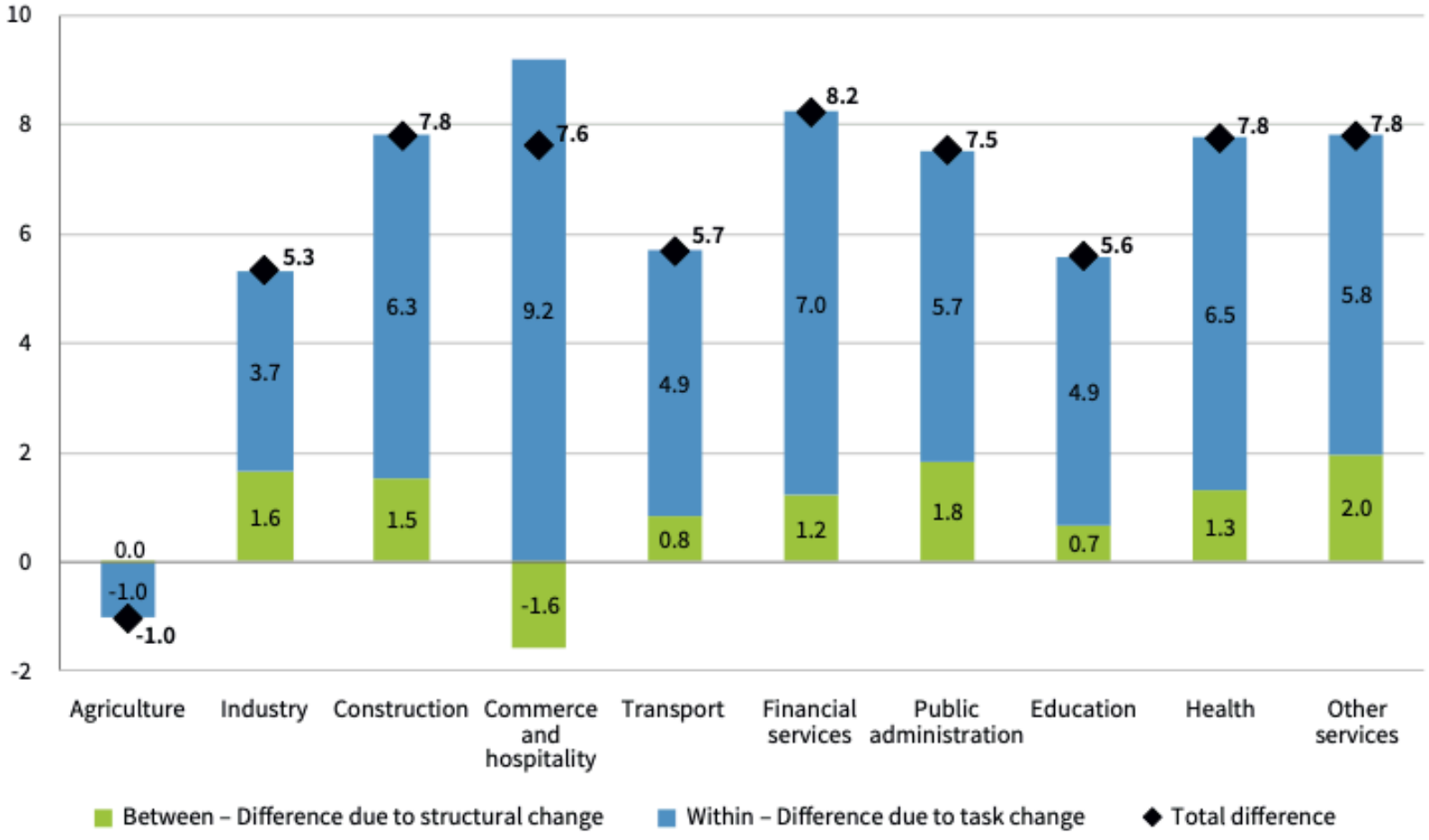


Note: *The sum of the between components (green) and the within components (blue) gives the overall task variation, presented in bold.*
Source: *EWCS 2010 and EWCS 2015*

Working conditions in sectors, Eurofound (2020)

Decomposition: Cognitive tasks

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

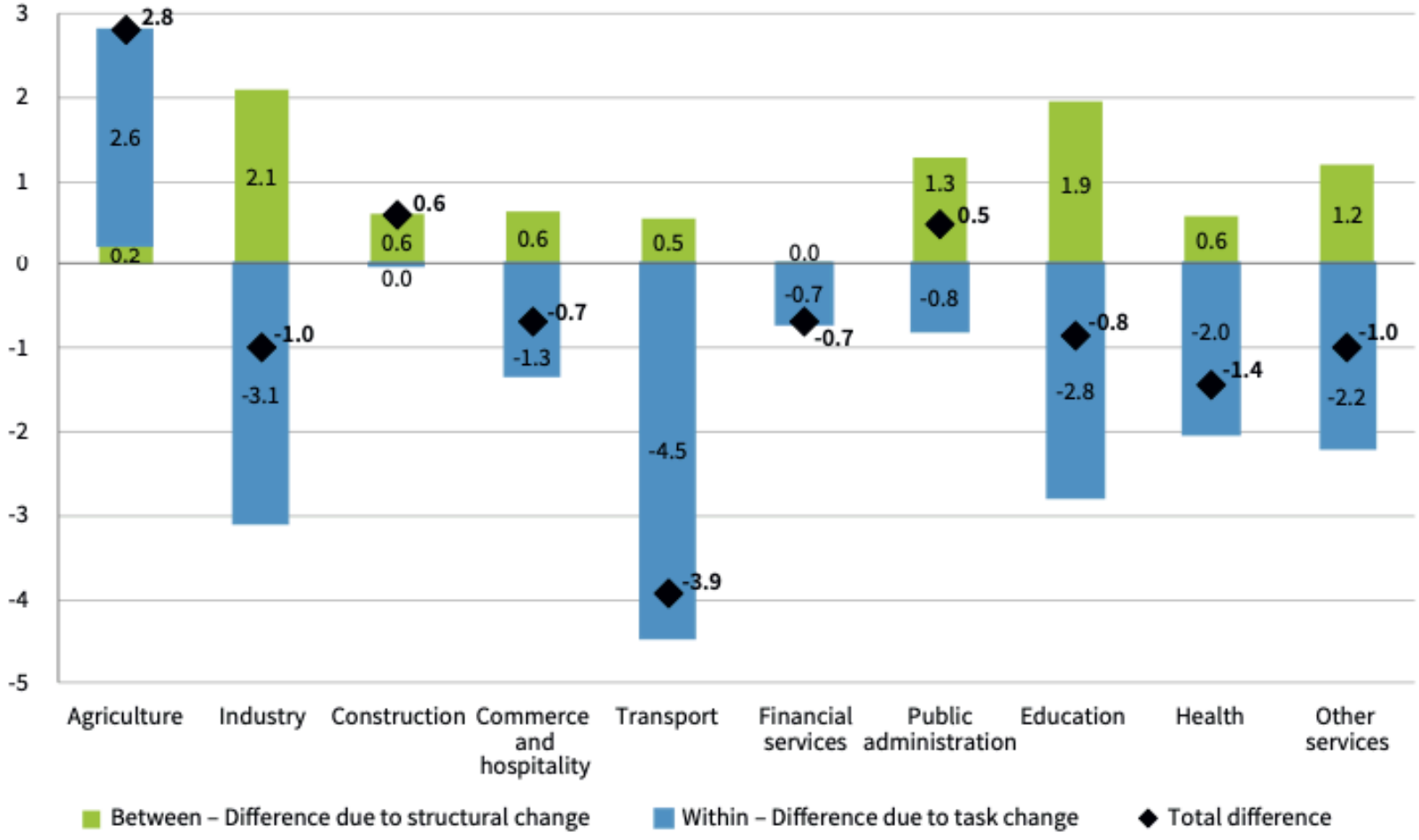


Note: *The sum of the between components (green) and the within components (blue) gives the overall task variation, presented in bold.*
Source: *EWCS 2010 and EWCS 2015*

Working conditions in sectors, Eurofound (2020)

Decomposition: Interactional tasks

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*

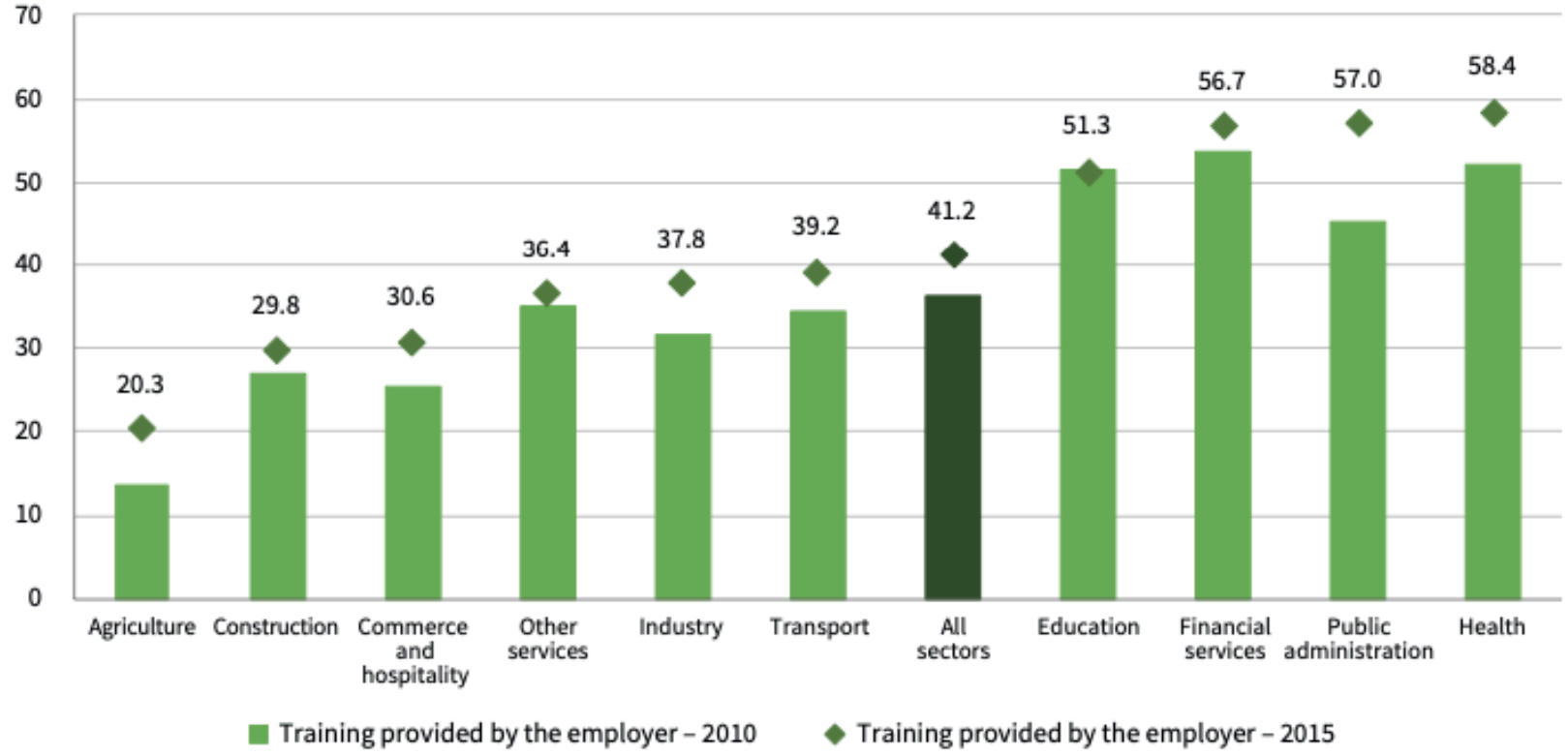
Working conditions in sectors, Eurofound (2020)

Decomposition: summary

- Physical routine tasks and cognitive tasks follow opposite patterns
- For both, between and within components go in the same direction
- While for interactional tasks, the between component increased and the within component decreased

Does training meet the challenge?

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

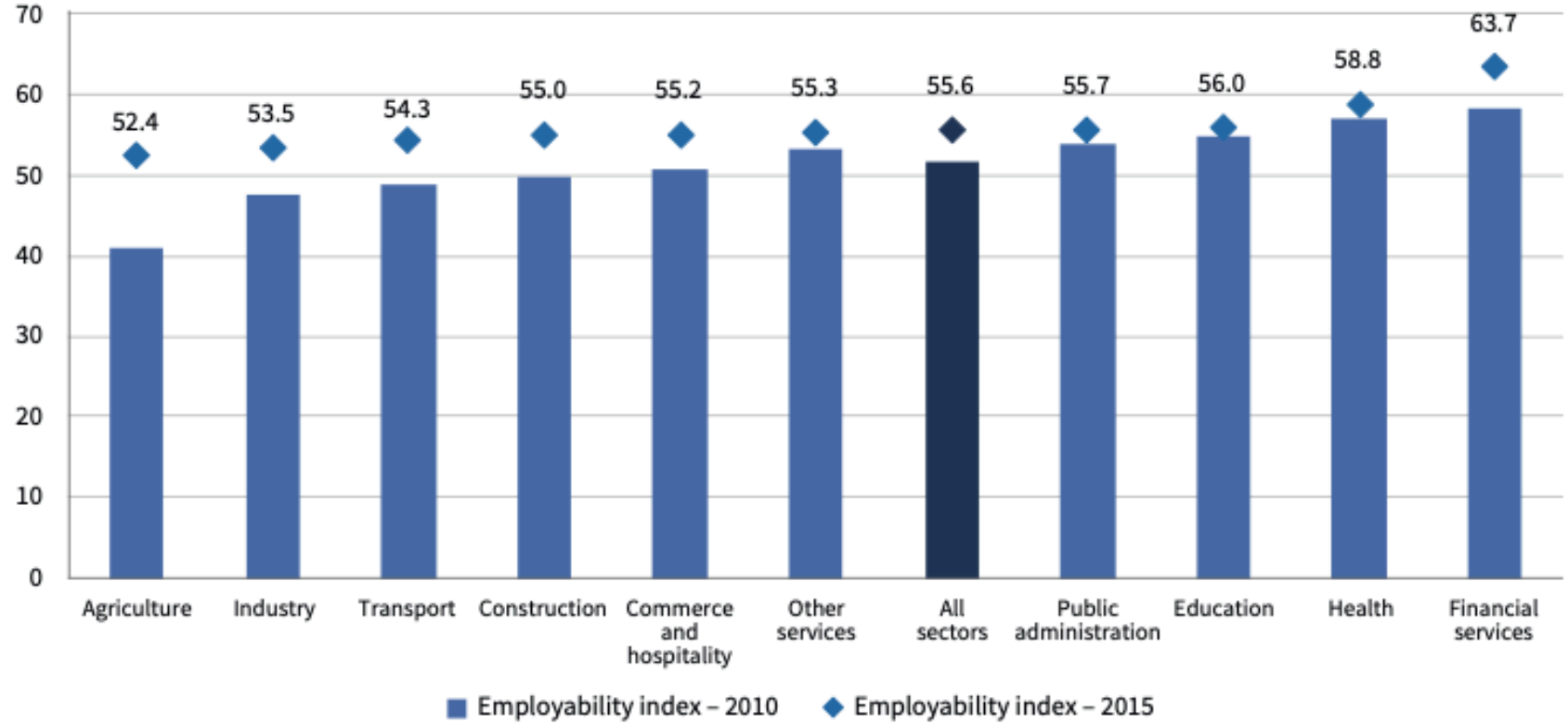


Source: *EWCS 2010 and EWCS 2015*

Working conditions in sectors, Eurofound (2020)

The issue of perceived employability, related to tasks' changes and lack of training?

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*

Working conditions in sectors, Eurofound (2020)

What are the determinants of perceived employability?

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*

Working conditions in sectors, Eurofound (2020)

Tasks and employability: in short

- Physical routine tasks are associated with lower levels of employability, while cognitive tasks with higher levels, especially in sectors with low employability (industry, construction, Agriculture and Transport)

- Interactional tasks are rather negatively associated with good employability, these skills seem nevertheless required in some specific sectors, such as health or financial services

- Have received training is slightly associated with better employability, especially in commerce and hospitality, agriculture and health

The emergence of new digital forms of work raises new health and well-being concerns for European workers

Identifying digital forms of work organization

To assess the impact of new practices of work organization from digital technology, we identify three main categories of workers (based on Eurofound 2020 - Teleworking report)

- **Digital workers with a high level of flexibility** have both a high use of ICT and high work mobility
- **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** don't use ICT and computers as the main work tool

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*

Working conditions in sectors, Eurofound (2020)

Distribution of digital worker categories

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*

Working conditions in sectors, Eurofound (2020)

Distribution of digital worker categories

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

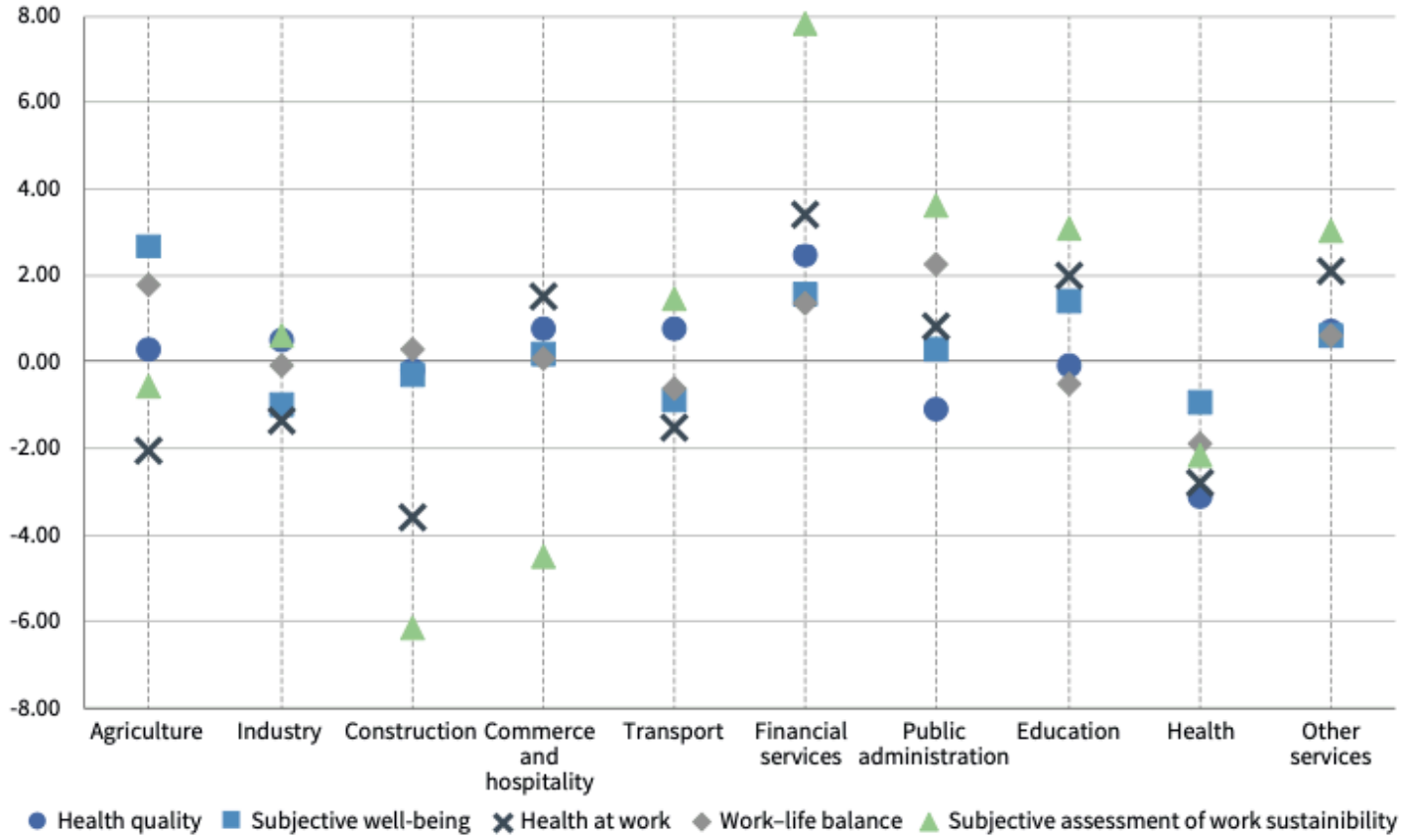
Occupation	High level of flexibility	Medium level of flexibility	Low-digital workers
Managers	34.0	25.5	40.5
Professionals	24.1	24.2	51.7
Technicians and associate professionals	19.1	32.2	48.7
Clerical support workers	10.9	60.6	28.5
Service and sales workers	4.2	12.1	83.7
Skilled agricultural, forestry 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*

Working conditions in sectors, Eurofound (2020)

Is the diffusion of digital work organization good for workers' health and well-being?

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*

Working conditions in sectors, Eurofound (2020)

Is the diffusion of digital work organization good for workers' health and well-being?

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*

Working conditions in sectors, Eurofound (2020)

Digital use relations with health and well-being: in short

- Digital use, in comparison to low digital use, is associated with better health and well-being at work
- But in case where it leads to high flexibility of working time and mobility, the subjective well-being and work-life balance are weaker
- The health at work and health quality negative relationships with high flexibility work fall in an undetermined sense of causality

Concluding remarks

- The European economies face fast transformations of its workforce structure due to inter-sector, intra-sector (occupational share) and intra-occupation (tasks' composition) changes at the same time

- These variations are partly related to technological change, especially new digital work practices

- The combination of these dynamics raises concern about employability, calls for efficient lifelong training and needs regulations to tackle new threats on working conditions

Of course, further works have to investigate in more detail these transformations to identify more precisely the mechanisms at stake

Merci de votre attention