LAMARTRA

Bridging decarbonization and labour market in sustainability transitions

Workers in four sectors affected by the green transition: Agriculture, Construction, Metallurgy and E-commerce

Lead beneficiary	
Authors	Arthur Apostel, Mikkel Barslund, Ilse Tobback, and Karolien Lenaerts
Contributors	
Submission date	
Dissemination level	
Keywords	

This project has received funding from Belspo BRAIN-be 2.0 programme under grant agreement B2/202/P3

Summary

This study uses the Belgian Labour Force Survey to analyse the characteristics of the workforce and working conditions in four sectors in Belgium: agriculture, construction, metallurgy, and e-commerce. These four sectors are likely to be impacted by the green transition in different ways. Indeed, we find that the four sectors differ from the rest of the economy in various ways. For the sector of e-commerce, however, most characteristics are not significantly different from the rest of the economy due to a low number of observations in this sector. For the sectors of agriculture, construction, and metallurgy we on the other hand, do find substantial differences as compared to the rest of the economy. The three sectors have a male-dominated, lower-educated workforce and have lower participation in formal and non-formal learning activities compared to the rest of the workforce. Workers in these sectors tend to be full time, with temporary workers having shorter contracts, and work more hours per week than workers in the rest of the economy. The agriculture sector has a relatively older and native dominated workforce with a high share of self-employed workers and longer tenure. We find that the construction sector has a relatively younger and more diverse workforce with blue-collar employees and shorter tenure. The metallurgy sector combines elements of both agriculture and construction with a large share of blue-collar workers and shift work but with higher wages compared to the rest of the economy. When considering the changes brought about by the green transition, all sectors must take into consideration the relatively lower-educated workforce and workers' participation in formal learning and adapt to the changes in skills required.

Key words: green transition, worker profiles, working conditions, labour force survey

Contents

Introduction

Europe is facing a transition towards a more sustainable and eco-friendly economy, the "green transition". An increased focus on renewable energy, sustainable products and practices, and a reduction in greenhouse gas emissions characterises this shift. Because of the scale of the required transition, substantial change in economic structures seems likely. As a result, the employment landscape will change, with certain sectors experiencing growth and others experiencing a decline.

Considering the focus of the LAMARTRA project on the inter-linkages between the transition to a low-carbon economy and the impact on employment and work, we examine the characteristics of workers in four sectors likely to be affected by the green transition. The four sectors chosen for more in-depth analyses are construction, metallurgy, agriculture, and e-commerce. These sectors are likely to be impacted differently by the transition to a low-carbon economy.

Construction, for example, may see an increase in demand for eco-friendly building materials and techniques as well as activities related to improve energy efficiency in the existing building stock. The construction sector is frequently identified as the sector with the highest potential for employment growth (Botta, 2019; Jaeger et al., 2011), and Smith et al. (2022) report that, in Flanders, the construction sector is frequently identified as a sector that will be heavily affected by the green transition with significant employment growth towards 2030. Meanwhile, the sector of metallurgy may face challenges as the use of fossil fuels in manufacturing processes decreases, and the methods and processes of production may have to change. Nevertheless, Berger (2021) reports that additional workforce will be needed in the 'primary metals' sector. Agriculture may also be impacted as changes in consumer demand are likely to persist over the coming decades. On the one hand, a shift from animal production towards more vegetable production might be required. On the other hand, research also suggests a decreased activity in agriculture (Botta, 2019; McCarthy et al., 2018). In a report on skills and green jobs in Flanders from 2017 (OECD, 2017) it is stated that the agrifood sector shows little preparedness for the green transition. E-commerce, in contrast, may see an increase in demand for low-carbon transportation and logistics solutions. These changes in processes and activities in the four sectors map to what OECD/Cedefop (2014) identified as drivers of changing skill needs: policies and regulation; technology and innovation; and markets for greener products and services, and consumer habits (see Hofmann & Strietska-Ilina, 2014).

By taking a closer look at the characteristics of workers and their jobs in each sector, we can gain a better understanding of the nature of employment affected by the green transition. The analysis also provides a background to the case studies on the transition processes undertaken as part of the LAMARTRA project. More specifically, we first provide a detailed overview of workers' background characteristics, such as gender, age and country of birth. Thereafter, we discuss workers' job characteristics (a.o. contract type, working hours, wage) and working conditions (a.o. atypical working hours and learning) and link them to one another as well as the background characteristics based on the existing literature. We

have selected characteristics based on, on the one hand, data availability and, on the other hand, relevant literature on sectorial differences, the "green transition" and low-carbon economy, and worker productivity and job satisfaction.

Choice of salient sectors in LAMARTRA: construction, agriculture, metallurgy, and e-commerce

The four sectors have been chosen in view of covering sectors across the primary-secondary, tertiary, and quaternary sector distinction. An additional concern for the choice of sectors was the possibility of complementing the quantitative analysis (as presented here) with qualitative case studies.

Taken together, these sectors cover a substantial part of the 'labour'/'carbon' transition dynamics (that will be) ongoing in Belgium. They correspond to different levels of economic development and represent a diversity of decarbonisation challenges, different mixtures of innovation and exnovation challenges, and, as will be shown, different skills and worker profiles. The sectors cover close to 10% of total employment (Table 1). The construction sector is by far the largest in terms of employment (almost 7%), with agriculture (1%) and metallurgy (close to 2%) being much smaller. E-commerce represents less than 0.1% of employment.

Table 1. Employment in the four sectors.

Sector	Number of observations (2017-2020)	Share of employment (%)	NACE
Agriculture	2 422	0.96	01
Construction	17 205	6.84	41-43
Metallurgy	4 423	1.76	24, 25
E-commerce	220	0.09	47910
Rest of economy	227 095	90.34	(remaining NACE codes)
Total	**251 366**	**100**	

Source: LFS Belgium, 2017-2020. All data are weighted.

Data sources

In this study, we rely on the Belgian Labour Force survey (LFS BE).[1] The LFS BE is a large-scale quarterly household survey among individuals living in Belgium.[2] The survey contains information about individuals' characteristics (such as education, region of residence, age and sex) and sheds light on the labour market status of these individuals (employed, unemployed and inactive). In addition, the survey provides some data on job characteristics and working conditions, as well as job search behaviour. The survey has been conducted for numerous years, but had a major methodological reform in 2017 and a new questionnaire was implemented in 2021.[3] Given these changes, we focus on the survey years from 2017-2020, including all observations in this period. During this timeframe, the LFS BE also provides (rotating) panel data. Here, individuals participate four times in the LFS BE. More precisely, individuals take part in the survey for two consecutive quarters (measurements 1 and 2). Thereafter, they do not participate for two consecutive quarters. Last, they again participate in the survey for two consecutive quarters (measurements 3 and 4). Given the time lag between measurements 2 and 3, each individual provides information from quarter to quarter (measurements 1-2 and 3-4) as well over a year (measurements 1-3 and 2-4).[4]

Around 250,000 observations of workers are included in our sample from 2017 to 2020. This allows us to get a substantial sample size for the three sectors of agriculture, construction, and metallurgy. For each of these sectors, we have several thousand observations (Table 1). This large number of observations means that the quantities presented in this study are reliable estimates of the represented quantities in the population of workers in these sectors in Belgium.[5] In contrast, the e-commerce sector is much smaller in economic size. Consequently, the survey coverage of workers in the e-commerce sector is less extensive. For the full four-year period only 200 observations in the e-commerce sector are included in the Belgian Labour Force Survey. Given the lower number of observations in the e-commerce sector, some quantities, e.g. detailed educational attainment of workers, are estimated with less precision for this sector. The latter is especially true for the dynamic analysis of entry and exit of workers, where we look at trends based on the panel data.

[1] The European Working Conditions Survey (EWCS) was also considered for this study. While the EWCS measures working conditions in great detail (including employment status, working time, social dialogue and life-long learning), the survey covers a much smaller sample compared to the BE LFS. Due to the limited number of observations per sector (see Appendix Table A1), working conditions cannot be analysed for most sectors. Also, for the sector of e-commerce, the EWCS does not provide NACE information beyond NACE level 2, therefore we are unable to identify this sector.

[2] This implies that *posted workers,* workers residing in another (EU) country, but *posted* by a company in that country to work in Belgium are not covered by the LFS (Barslund et al., 2017).

[3] For an overview of the topics covered in the LFS and the changes in the survey, please consult the Eurostat and Statbel websites (Eurostat, 2023; Statbel, 2022).

[4] Not all individuals participated in the consequent surveys in the next trimester or year, therefore, the number of observations further reduces when analysing the dynamics.

[5] For this reason, we do not present standard errors on the estimated quantities from the LFS in the main text. These are reported in the Annex together with relevant statistical tests.

Characterising workers in the four sectors

This section provides a succinct overview of the characteristics of workers and their jobs in the four sectors of agriculture, construction, metallurgy, and e-commerce, and compares these characteristics to those in the rest of the economy.

Worker characteristics in the four sectors

First, we take a closer look at the characteristics of workers in the four sectors. The main text gives a visual overview of the characteristics in each sector and the rest of the economy. The Appendix (Table A2) provides a more detailed overview of these statistics, reporting the means and estimated standard errors. In addition, the Table highlights those mean values in agriculture, construction, metallurgy or e-commerce that are significantly (p-value≤.10) lower (higher) than the mean in the rest of the economy in yellow (green).

In general, we find the four sectors to be rather male-dominated, as compared to the rest of the economy (Figure 1). While the share of male employees equals 50% in the rest of the economy, the considered sectors report shares between 58% and 91%. The sectors of agriculture, construction and metallurgy report significantly higher shares as compared to the rest of the economy. The share of men in the e-commerce sector meanwhile was not found to be significantly different from that of the rest of the economy. The sectors of construction and metallurgy report the highest shares of men, respectively 91% and 87%.

In addition, the sector of agriculture reports a relatively high share of workers that was born in Belgium (Figure 1) (92% compared to 83% in the rest of the economy). The sectors of metallurgy and e-commerce also report a higher share of 84%, however, this percentage is not significantly different from that of the rest of the economy. In construction, in contrast, relatively fewer workers are born in Belgium (78%). Moreover, for the construction sector, the share of workers born in Belgium obtained from the labour force survey is a large overestimate of the actual share of foreign-born people doing construction work in Belgium. This is due to the large share of construction workers who are posted (temporarily) from a company in another EU country and therefore are not covered by the labour force survey. De Wispelaere and Pacolet (2016) report that around 30 percent of construction workers in Belgium are posted workers.

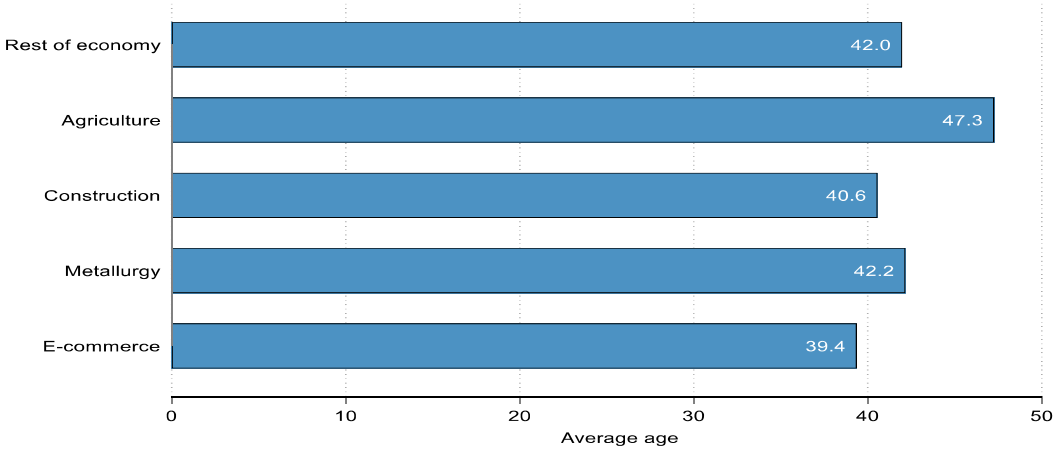
Figure 1. Share of workers by gender, country of birth and sector

Source: LFS Belgium, 2017-2020. All data are weighted.

Regarding the age of workers (Figure 2), the agricultural sector stands out with a relatively high average age of 47 years. In the rest of the economy, the average age equals 42 years. Looking at the median ages in the sectors (see Appendix Figure A1), the striking result of agriculture becomes even more apparent, with a median age of 49 years (compared to 42 years in the rest of the economy). The, on average, older workforce in agriculture could result in higher adjustment costs for the sector since older workers typically incur above-average displacement costs (Botta, 2019; Deelen et al., 2018).

In contrast, the construction sector seems to have a somewhat younger workforce, 41 years on average. For the sectors of metallurgy and e-commerce no significant difference was found with the average age in the rest of the economy.

Figure 2. Average age of workers by sector

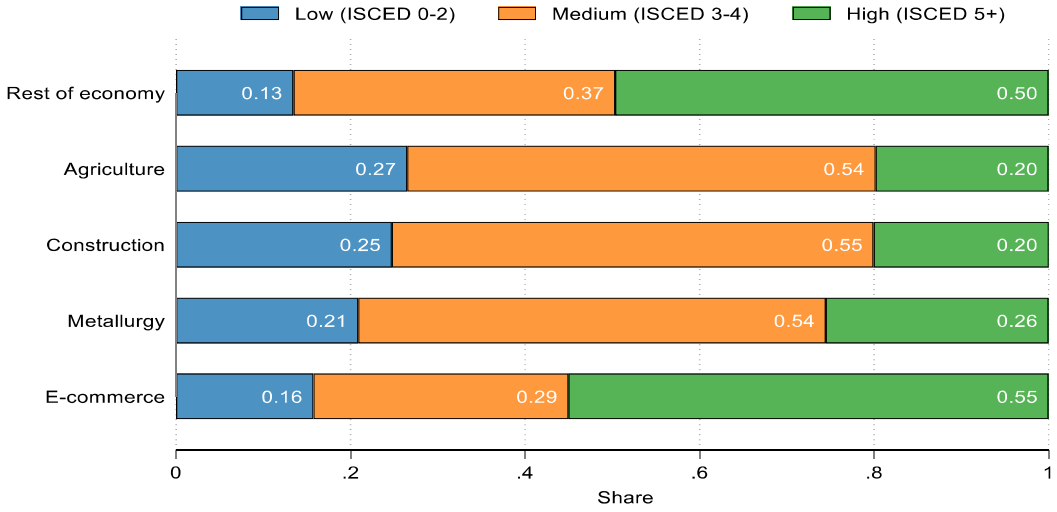


Source: LFS Belgium, 2017-2020. All data are weighted.

Comparing the highest attained educational level (ISCED 2011) of workers by sector (Figure 3), agriculture, construction and metallurgy generally seem to have a lower educated workforce, with 21% to 27% of workers being low educated (lower secondary education or lower) and just over 50% having a medium level

of education (upper secondary education and post-secondary non-tertiary education). In comparison, in the rest of the economy 14% and 37% have a low or medium level of education, respectively. For the e-commerce sector, we do not observe large differences from the rest of the economy regarding the level of education. Though Figure 3 seems to suggest workers in e-commerce are slightly higher educated, this difference is not statistically significant. The relatively lower educated workforces in the sectors of agriculture, construction and metallurgy could experience a stronger decline in labour market opportunities related to the green transition (compared to their higher-skilled peers), as was recently shown by Yip (2018) in British Columbia (Canada).

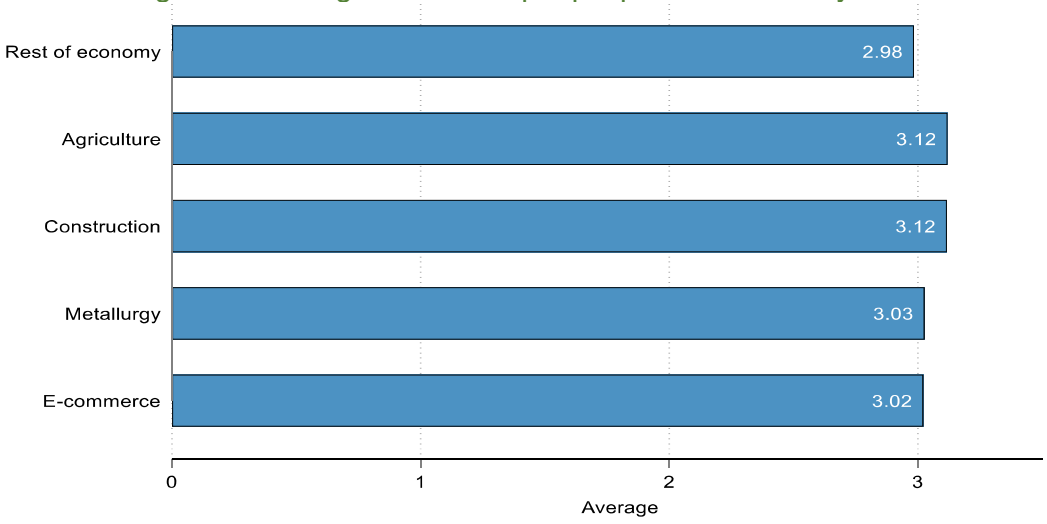
Figure 3. Share of workers by level of education and sector



Source: LFS Belgium, 2017-2020. All data are weighted.

Last, workers in the sectors of agriculture and construction report larger households, with on average just over three people (Figure 4). In the rest of the economy, workers report having a household with on average just under 3 people. For the sectors of metallurgy and e-commerce, the average household size is not significantly different from the rest of the economy.

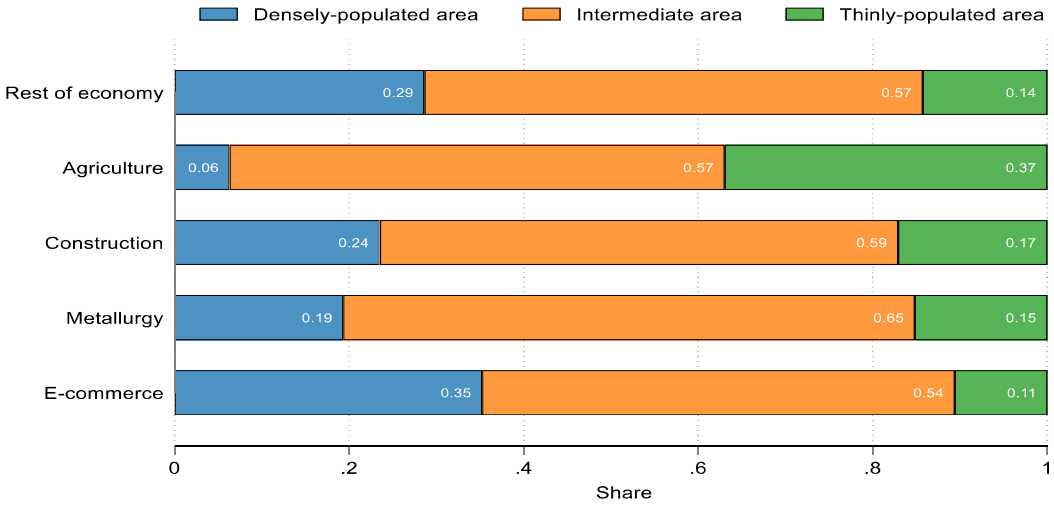
Figure 4. Average number of people per household by sector



Source: LFS Belgium, 2017-2020. All data are weighted.

In addition, the households of workers in agriculture, construction and metallurgy are less often situated in densely populated areas, as compared to the rest of the economy (Figure 5). The degree of urbanisation of workers in the e-commerce sector generally does not significantly deviate from the rest of the economy.

Figure 5. Share of workers by degree of urbanisation and sector



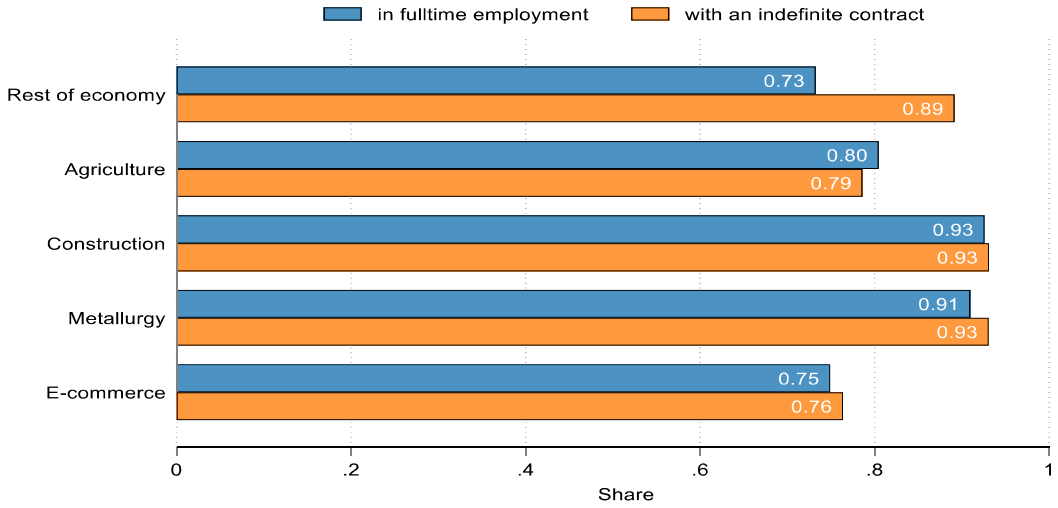
Source: LFS Belgium, 2017-2020. All data are weighted.

Job characteristics in the four sectors

This section focuses on the job characteristics of employees in four different sectors and how they compare to the rest of the economy. As above, the main text provides a visual representation of these characteristics by sector, while the Appendix (Table A3) offers a more in-depth look in the form of detailed statistics, including mean values, standard error estimates, and a comparison of these values to the mean in the rest of the economy. In the Appendix we also report if the mean values are significantly different (p-value≤.10) from those in the rest of the economy.

The results of our analysis show that three sectors, agriculture, construction, and metallurgy, have a higher proportion of workers in full-time employment as compared to the overall economy. The rest of the economy reports a full-time employment rate of 73%, while these three sectors have rates of 80%, 93%, and 91% respectively. In contrast, the e-commerce sector does not show a noticeable deviation from the full-time employment rate of the overall economy. Although Figure 6 may indicate a higher proportion of full-time employees in e-commerce, the difference is not statistically significant.

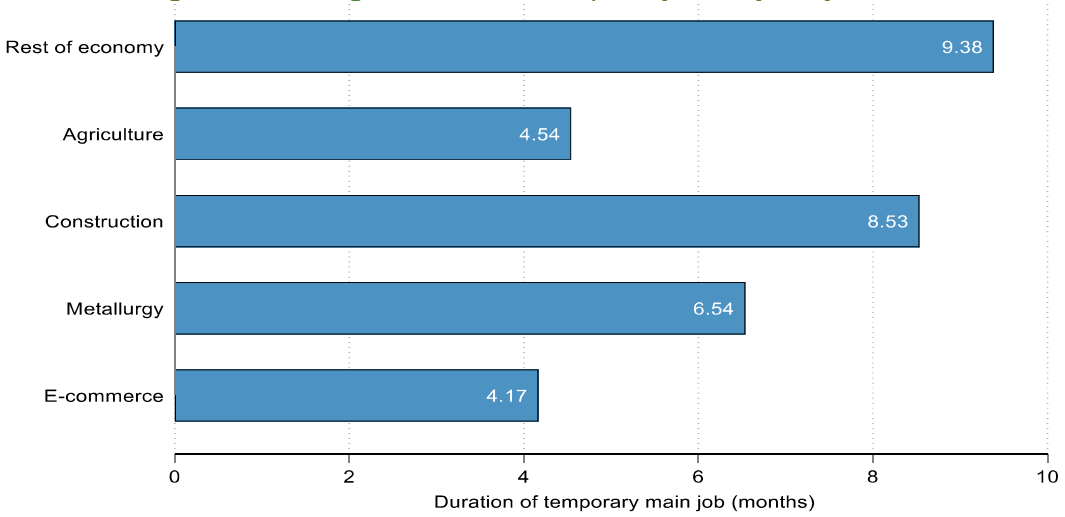
Figure 6. Share of workers in full-time employment and/or with an indefinite contract by sector



Source: LFS Belgium, 2017-2020. All data are weighted.

In terms of contract type, the sectors have varying employment arrangements for their workers (Figure 6). Agriculture and e-commerce have a smaller proportion of workers with permanent or unlimited duration contracts (79% and 76% respectively) when compared to the rest of the economy (89%). Additionally, workers in these sectors tend to have temporary contracts with shorter average durations, lasting only 4.2 to 4.5 months compared to the rest of the economy where the average duration of temporary contracts is 9.4 months (Figure 7). In contrast, the sectors of construction and metallurgy have higher shares of employees with an indefinite contract (equal to 93% for both sectors). Given that construction and metallurgy also report the highest shares of workers in full-time employment, these numbers suggest that the construction and metallurgy sectors provide better than average job security. Such higher (perceived) job security might in turn be positively linked to employee job satisfaction and organizational commitment (Hur, 2022). Nonetheless, also in the sector of metallurgy the average duration of temporary contracts is significantly lower than that in the rest of the economy.

Figure 7. Average duration of temporary main job by sector



Source: LFS Belgium, 2017-2020. All data are weighted.

In addition to differences in contract type, differences in employment status are also manifest between sectors. The agricultural sector differs substantially from the rest of the economy through its relatively high share of self-employed people, namely 61% (of which most without employees – 52% of all workers in agriculture), and a relatively high share of helpers (12%).[6] In contrast, the sector of metallurgy deviates from the rest of the economy by employing a very high share of blue-collar workers (61%). The construction sector meanwhile employs both relatively more blue-collar workers (49%), and more self-employed (29% is self-employed; 20% without employees and 9% with employees) compared to the rest of the economy.[7] In the e-commerce sector, in contrast to the other three sectors, but similar to the rest of the economy, 50% of all workers are white-collar workers. While we observe little significant differences with the rest of the economy, the e-commerce sector does report a higher share of self-employed people without employees, namely 19% compared to 9% in the rest of the economy.

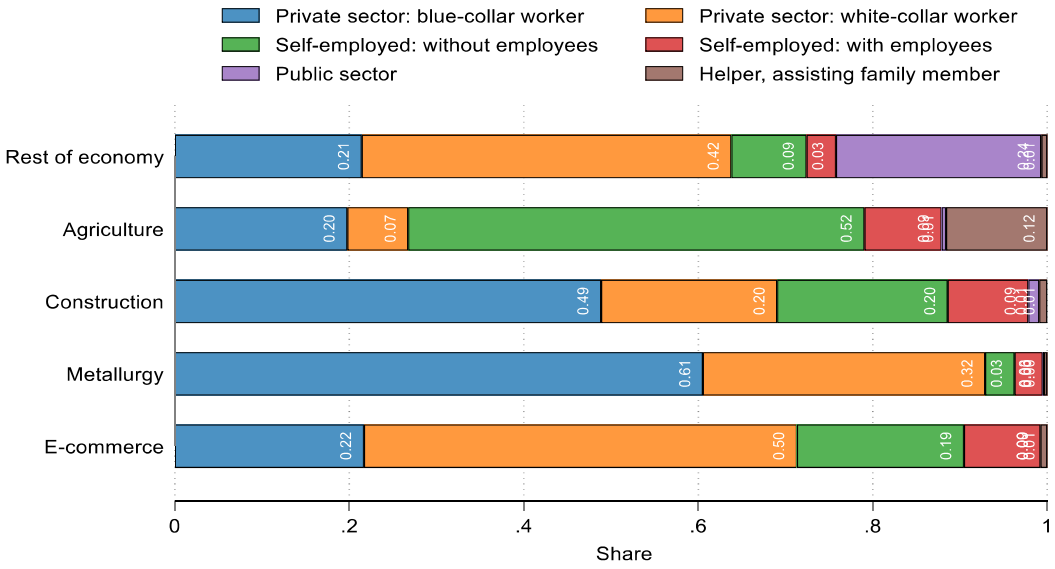
The relatively high share of blue-collar workers in construction and metallurgy likely will have different implications for both sectors. On the one hand, for the sector of construction, researchers anticipate an increase in employment opportunities for blue-collar workers following progressively higher carbon prices (Dall'Ora et al., 2016). On the other hand, the sector of metallurgy should be cautious of its relatively high share of blue-collar workers, as research shows that the increasing prices could lead to substantial job destruction for blue-collar workers in the industry sector (Dall'Ora et al., 2016).[8]

[6] Helpers include all individuals, often family members, who work at a company without renumeration.

[7] Similar to the sector of agriculture, the construction sector also employs relatively more helpers. Despite this relatively higher share, this category however only represents 1% of all workers in the sector.

[8] The industry sector entails multiple sectors, among which the metallurgy sector.

Figure 8. Share of workers by employment status and sector



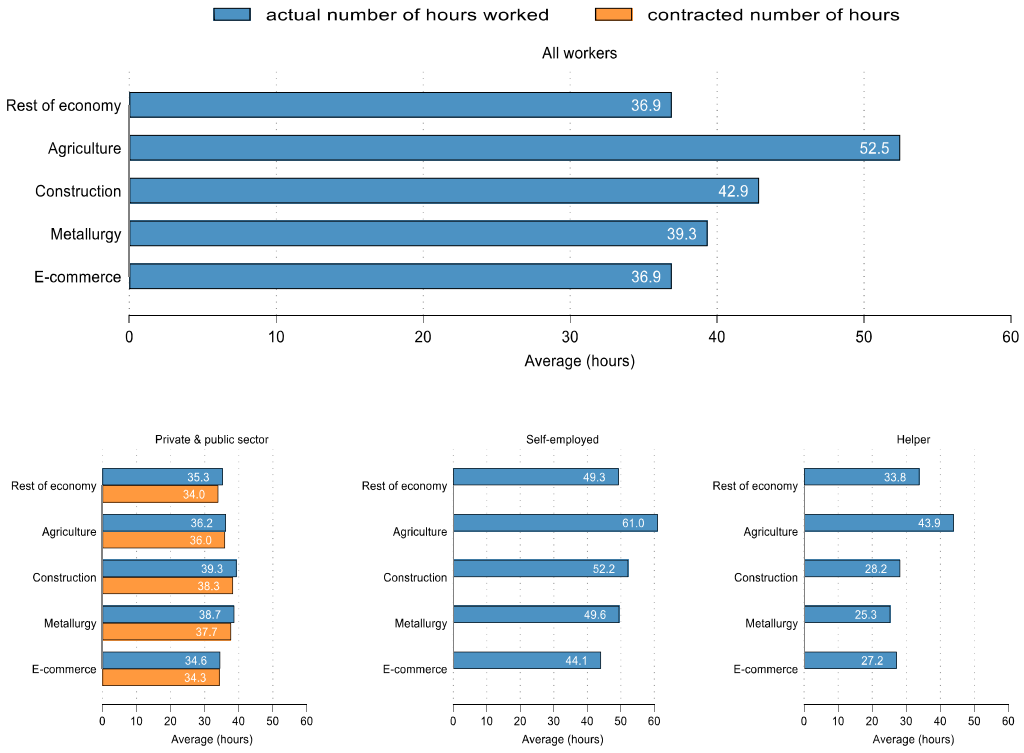
Source: LFS Belgium, 2017-2020. All data are weighted.

The previous observations regarding the relatively high share of workers in full-time employment are also reflected in the number of hours worked in the sectors of agriculture, construction and metallurgy. These three sectors all report a relatively higher number of hours worked per week, as well as a higher amount of contracted hours per week,[9] compared to the rest of the economy. The agriculture sector reports the most striking average hours, with workers on average working 52.5 hours per week. In the rest of the economy, workers on average perform 36.9 hours per week. The relatively high number in agriculture is driven by the self-employed, who work on average 61 hours per week, as well as helpers who work on average 44 hours per week. Looking at those who are employed in the public or private sector, we find the average number of hours per week is not significantly different from that in the rest of the economy, with employees working on average 36 hours per week, as well as being contracted for this amount of hours. Workers, thus, on average work 16 hours more per week than what was defined in their contract.

In the construction sector, workers on average work 42.9 hours per week, with again the self-employed reporting the highest average number of hours compared to other workers within their sector. In the sector of metallurgy, employees work 36.3 hours on average. For the e-commerce sector, no significant differences are observed from the mean values in the rest of the economy.

[9] The number of contracted hours per week is available only for those working in the private or public sector.

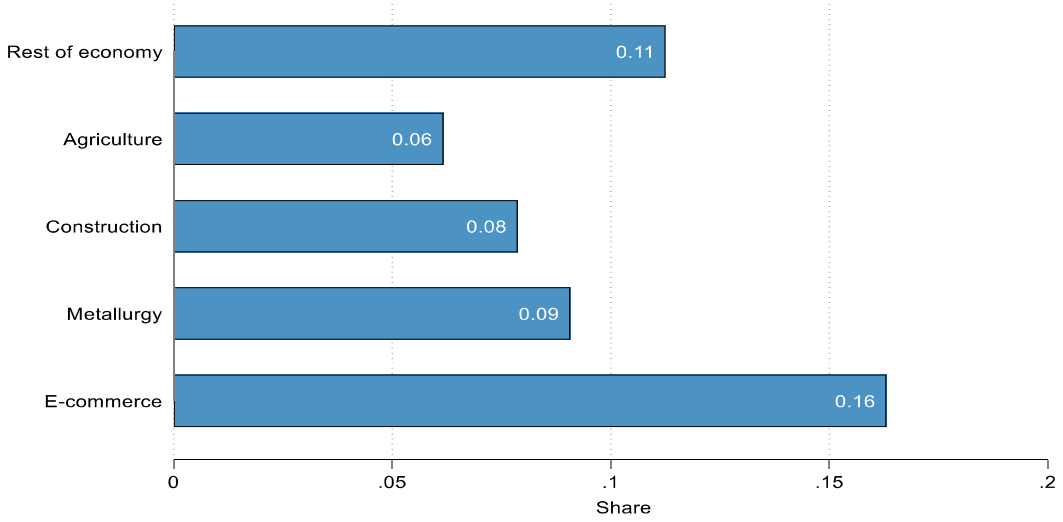
Figure 9. Average number of hours of work per week by sector



Source: LFS Belgium, 2017-2020. All data are weighted.

In accordance with the previously mentioned high number of working hours in the sectors of agriculture, construction, and metallurgy, a smaller percentage of workers in these sectors desire to work more hours per week compared to the rest of the economy. In the rest of the economy, 11% of workers wish to work additional hours, while only 6% of workers in agriculture have this desire. Similarly, in construction and metallurgy, the percentage of workers who desire more work hours stands at 8% and 9%, respectively. However, in the e-commerce sector, the largest share of workers desire to work more hours (16%), but this difference is not statistically significant compared to the rest of the economy.

Figure 10. Share of workers that wish to work more by sector

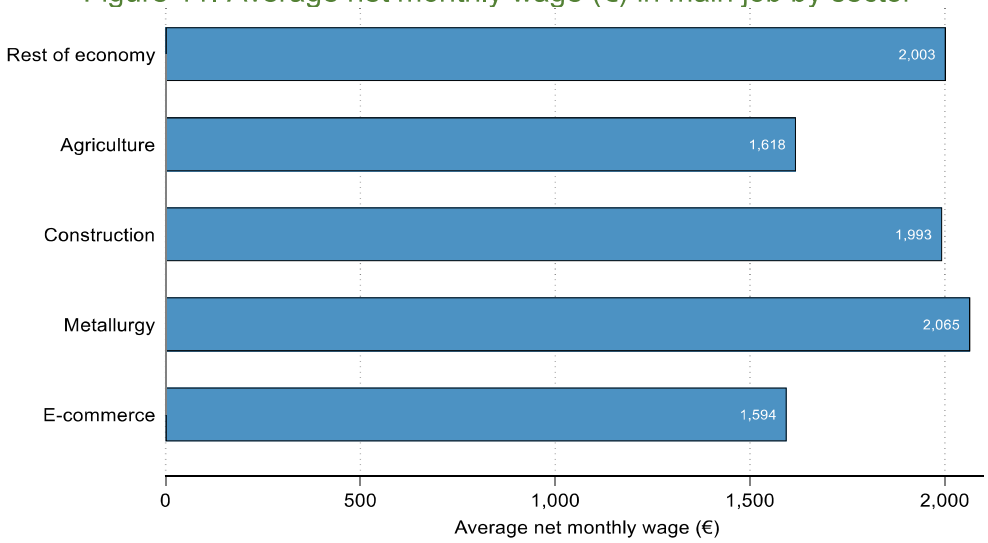


Source: LFS Belgium, 2017-2020. All data are weighted.

In this section, we zoom in on the net monthly wage in the main job by sector (Figure 10). We find that workers in the rest of the economy on average earn 2,003 euros per month. The construction sector reports a similar average monthly income. In the sector of metallurgy, the average is slightly higher and equals 2,065 euros per month. Given that this sector employs the highest share of blue-collar workers (61%) and relatively less high-educated workers (as compared to the rest of the economy), this is somewhat surprising. We therefore also study the median net monthly wages in each sector, see Figure A2 In the Appendix. Here, we find that the median wages in the sectors of construction and metallurgy do not deviate much from the median wage in the rest of the economy (1,877 euros per month), with a median of 1,880 euros and 1,942 euros per month respectively.

In contrast, the sector of agriculture reports a significantly lower average net monthly wage of 1,618 euros per month (as compared to the rest of the economy), despite workers reporting the highest number of actual hours worked per week and the workforce having a similar composition regarding educational level as those working in construction. Also, the sector of e-commerce reports a significantly lower average net monthly wage of 1,594 euros per month (as compared to the rest of the economy), while these employees work on average as much as those in the rest of the economy. For both agriculture and e-commerce, also the median monthly wages are well below the median monthly wage in the rest of the economy.

Figure 11. Average net monthly wage (€) in main job by sector

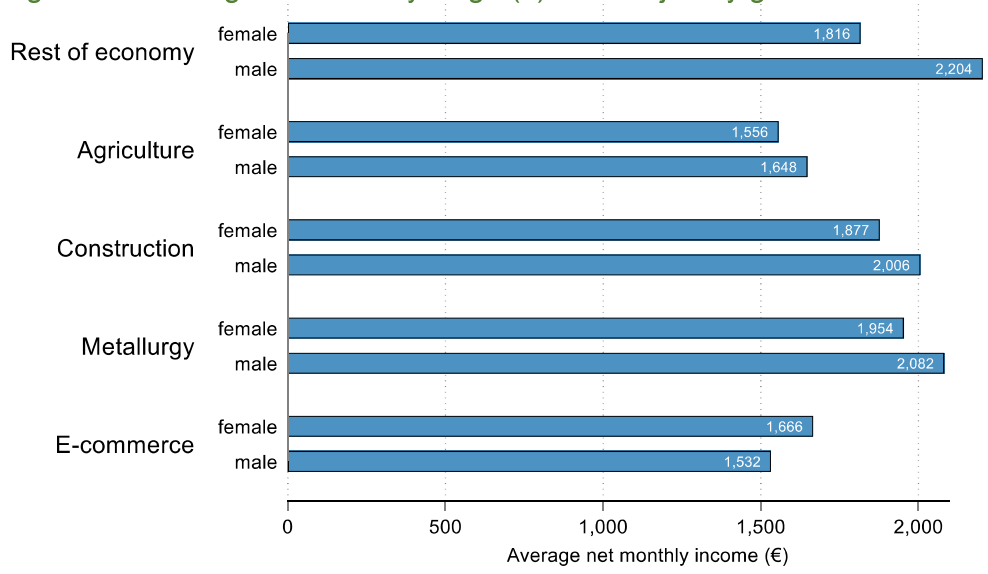


Source: LFS Belgium, 2017-2020. All data are weighted.
All wages are inflated to 2020 using the yearly Consumer Price Index.

In addition to the sectorial differences in net monthly wages, we also observe an interesting gender-effect (Figure 12). In the rest of the economy, we observe a substantial gender-pay gap where women earn on average 388 euro per month less compared to their male counterparts (average net monthly wage of men (women) equals €2,204 (1,816)).[10] In contrast, wage equality between men and women in the four considered sectors is relatively better. While we still observe a gender-pay gap with men earning more on average compared to women in the sectors of construction and metallurgy, this gap is significantly smaller compared to that in the rest of the economy, see Appendix Table A5. Moreover, in the agriculture and e-commerce sectors, we do not observe a significant difference in net monthly wages between men and women. The relatively smaller gender-pay gaps (if present) in these male-dominated sectors, of agriculture, construction and metallurgy are likely linked to the type of jobs performed by men and women. A recent study during the Covid-19 pandemic, for example, highlighted that "even in sectors dominated by men such as agriculture, mining, manufacturing, utilities and construction, women tend to perform tasks that are easier to perform remotely, due to being more office-based, secretarial or administrative in nature, with a lower share of physical handling tasks." (Nivakoski et al., 2022).

[10] Please note that these differences apply to all workers on average within a sector and do not take into account potential other explanatory elements such as differences regarding full-time versus part-time employment, amount of working hours and atypical working hours.

Figure 12. Average net monthly wage (€) in main job by gender and sector



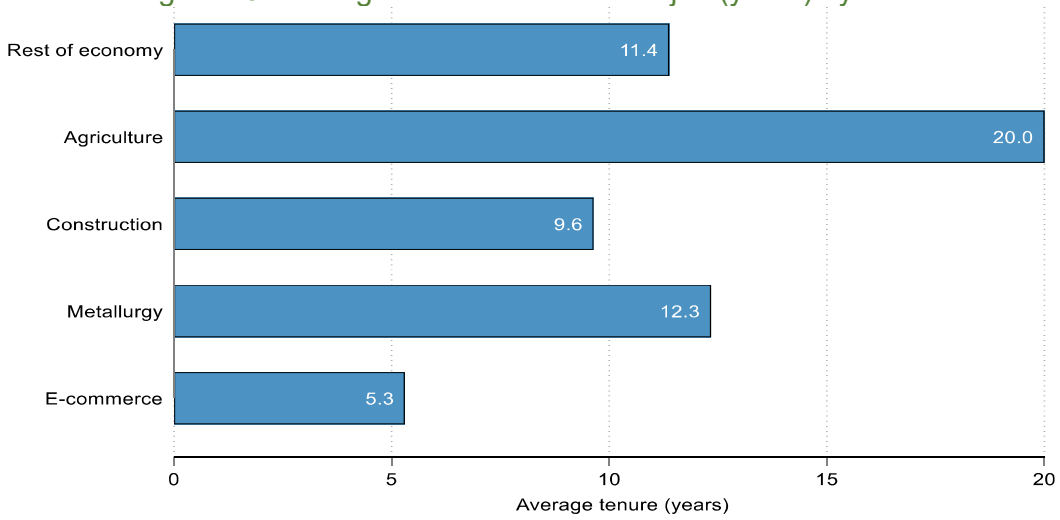
Source: LFS Belgium, 2017-2020. All data are weighted.
All wages are inflated to 2020 using the yearly Consumer Price Index.

The topic of tenure, or the length of time an employee has been with their current main job, is also examined in the four sectors of focus. Tenure length is a reflection of various worker and job characteristics and also serves as a job characteristic on its own. A study by Steenackers and Guerry (2016), for example, found that both gender and age impact the job-hopping frequency in Belgian employees, with young women being most likely to change jobs. However, as women age, they were found to be significantly more likely than their male counterparts to remain within the same company. On the other hand, the study found no relationship between educational level, organisational size, or sector and job-hopping frequency (Steenackers & Guerry, 2016).

We find the average tenure of workers in their main job to equal 11.4 years in the rest of the economy (Figure 13). In the four considered sectors, the averages deviate substantially from 11.4 years, with the sector of agriculture being the sector with the highest average tenure. In this sector, workers on average report having had the same job for 20 years. The unique position of the sector becomes even more apparent when looking at the distribution of tenure in Figure 14, which indicates the middle half of all workers in agriculture falls between a tenure of 5.5 years (25^{th} percentile) and 31.3 years (75^{th} percentile). To illustrate, in the rest of the economy the 75^{th} percentile equals 17.7 years which is even below the median in agriculture. The sector of agriculture must be wary of the higher average age and tenure among workers, as these factors may negatively impact the likelihood of employment and earning potential for workers when confronted with firm closure (Deelen et al., 2018).

Compared to the rest of the economy, the sector of metallurgy also reports a slightly, yet significantly, higher average tenure of 12.3 years. However, looking at the distribution of number of years of tenure, the differences between this sector versus the rest of the economy seem to be rather small with a median tenure of 9.3 years versus 8 years, respectively.

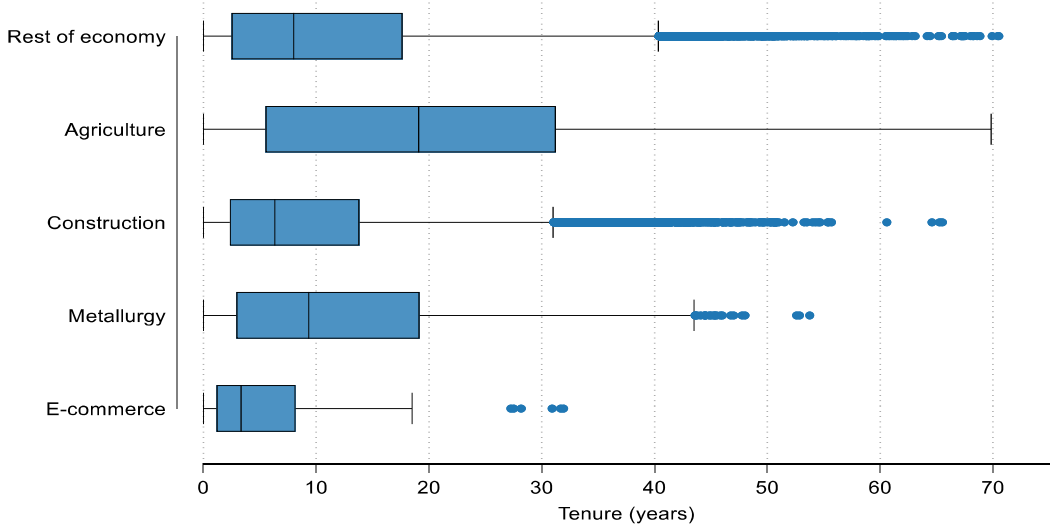
Figure 13. Average tenure of workers in job (years) by sector



Source: LFS Belgium, 2017-2020. All data are weighted.

In contrast, the sectors of construction and e-commerce have significantly lower average tenure (9.6 years and 5.3 years respectively) compared to the rest of the economy. E-commerce, especially, reports very low tenure with the middle half of all workers falling between tenure of just over one year (1.2 years) (25th percentile) and 8.2 years (75th percentile).

Figure 14. Distribution* of tenure of workers in job (years) by sector



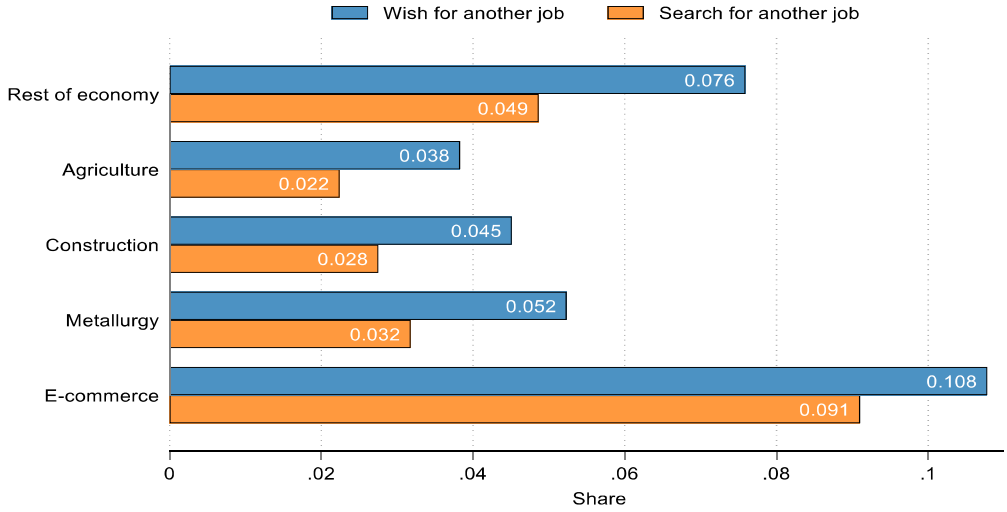
Source: LFS Belgium, 2017-2020. All data are weighted.
*Values of the 25th, 50th and 75th percentile are displayed in Appendix, Table A6

As a final job characteristic, we consider the share of workers that wish for and/or search for another job. In general, we find that one in thirteen workers (approximately 7.6%) in the rest of the economy wish for another job. In the sectors of agriculture, construction and metallurgy, this share is remarkably lower, ranging from 3.8% (in agriculture) to 5.2% (in metallurgy).

Interestingly, around 60% of workers also take action and search for another job. While for the rest of the economy around 5% of workers searches for another job, only 2.2% to 3.2% of workers do so in the sectors of agriculture, construction and metallurgy. In e-commerce, conversely, almost 10% of workers are searching for

another job. This percentage equals 85% of workers wishing for another job in this sector. This could suggest a rather low job security in the sector, as well as be a reflection of the previously discussed elements (among which the average net monthly wage and the rather low average tenure).

Figure 15. Share of workers that wish and/or search for another job by sector



Source: LFS Belgium, 2017-2020. All data are weighted.

Working conditions in the four sectors

In this section, we investigate the working conditions in the four sectors, focussing on the type of work as well as participation in learning activities. While the main text again gives a visual overview, the Appendix (Table A7) provides a more detailed overview of the statistics and indicates whether the mean values in the four sectors are statistically significantly (p-value≤.10) different from the mean in the rest of the economy.

Type of work

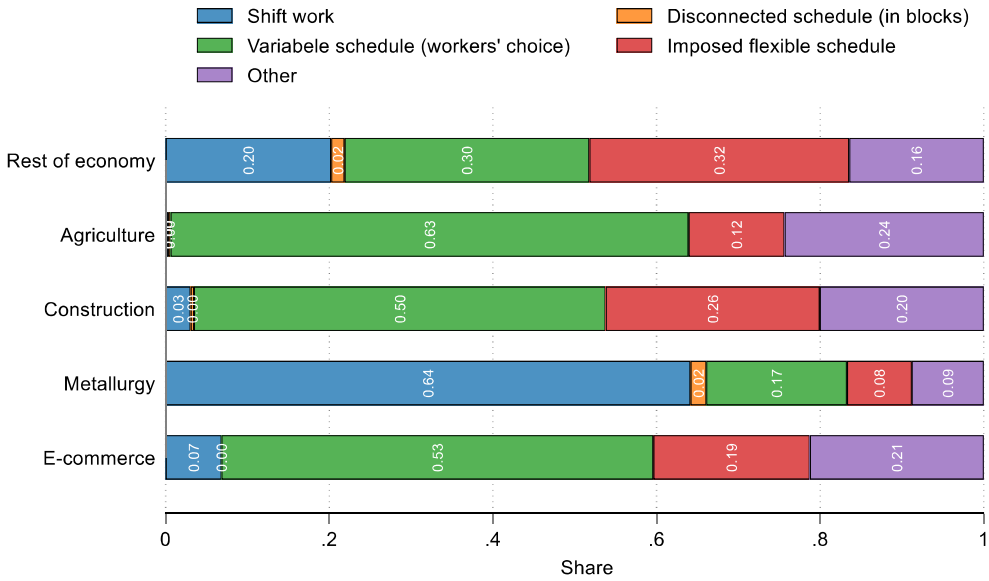
We start by looking at the type of timetable – e.g. shift work, flexible schedule, variable schedule – applying to employees' work (Figure 16). We differentiate between five types: (1) shift work (with 2 or more consecutive teams), (2) disconnected schedules (e.g. in two blocks in the morning and evening), (3) variable working schedules where the workers decide on working times (4) flexible working schedules where the employer decides on working times, (5) other. In the LFS BE, the different timetables are mutually exclusive, meaning that respondents were unable to select multiple answers. However, in practice these types likely overlap, as was shown by Apostel et al. (2023) who a.o. found shift work to be organised in various ways (rotating or fixed, changing in start and end times).

The sector of metallurgy stands out with its relatively high share of workers in shift work (64%) and (consequently) low share of workers with a variable and flexible timetable (17% and 8% respectively). In the rest of the economy, we observe the mirror image, with 20% of workers in shift work, 30% with a variable and 32% with a flexible timetable. The metallurgical sector should be mindful of the high percentage of employees working on rotating shifts, as this may negatively impact job performance and job satisfaction, as demonstrated by a

global literature review by Dall'Ora et al. (2016) and a study on German workers by Wanger (2017). Timely breaks and slower returns between shifts should help decrease fatigue and increase alertness (Dall'Ora et al., 2016).

For the sectors of agriculture, construction and e-commerce, in contrast, we observe a very low share of shift work (at max. 7%) and a relatively high share of workers with a variable timetable, ranging from 50% to 63%.

Figure 16. Share of employees by type of timetable and sector



Source: LFS Belgium, 2017-2020. All data are weighted.

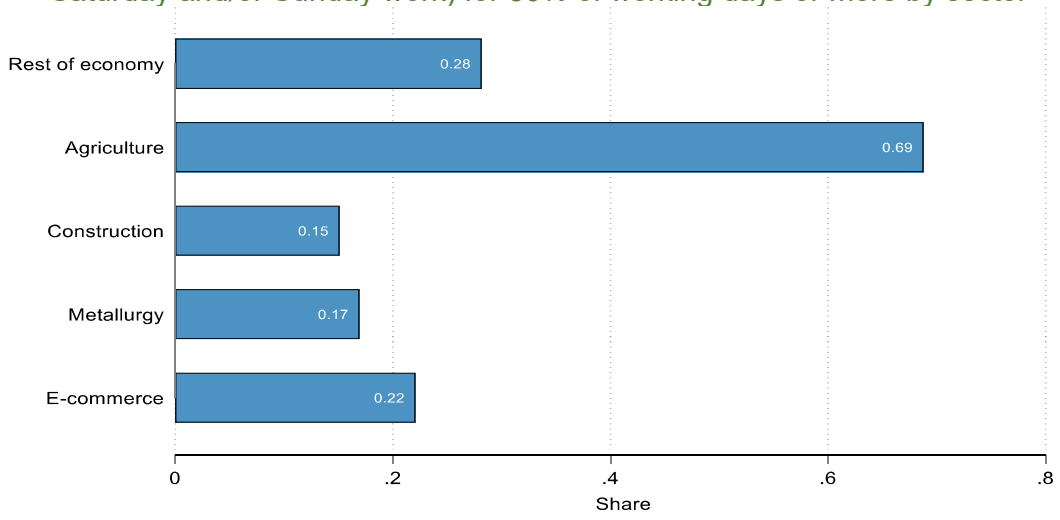
Zooming in on the timing of work (evening, night, Saturday/Sunday), we report on the share of workers with atypical working hours (Figure 17) and, specifically, the frequency of evening work, night work, Saturday work and Sunday work (Appendix, Figures A3-A6). Here, we considered a worker to have atypical working hours if he/she works 50% of working days or more in the evening, night and/or on Saturday or Sunday.

In agriculture a high share of workers has atypical working hours (69%). In comparison, only 28% of workers in the rest of the economy have atypical working hours. The relatively high share of atypical working hours in agriculture is because of a high frequency of evening work and/or on Saturday work and Sunday work (Appendix, Figures A3-A6). The agricultural sector should be wary of this high share of atypical working time arrangements as this could reduce satisfaction levels of workers (Wanger, 2017).

The sectors of construction and metallurgy, in contrast, report significantly fewer workers with atypical working hours, respectively 15% and 17% as compared to the rest of the economy. Especially weekend work is less frequent in these two sectors. For construction, also evening and night work is less frequent. For the e-commerce sector, we observe no significant differences from the mean values in the rest of the economy.[11]

[11] Also when using a dummy equal to one if an individual *never* works in the evening, at night or during the weekend and zero otherwise, the same pattern appears. Again the sector of agriculture

Figure 17. Share of workers with atypical working hours (evening, night, Saturday and/or Sunday work) for 50% of working days or more by sector

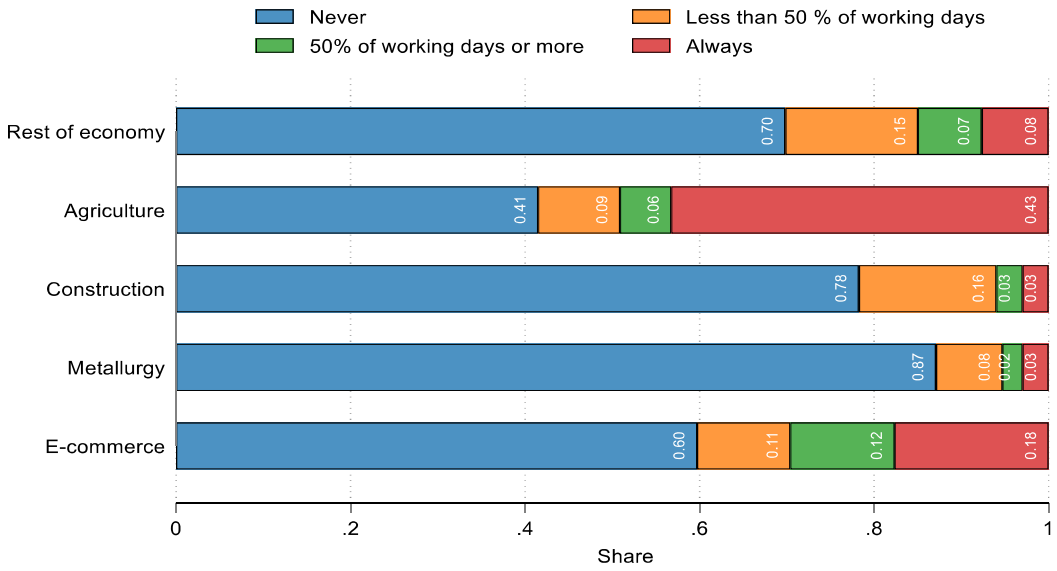


Source: LFS Belgium, 2017-2020. All data are weighted.

As a final indicator for the type of work, we look at the frequency of working from home. Here, the sectors of construction and metallurgy clearly distinguish themselves from the rest of the economy with a relatively high share of workers who never work from home (respectively 78% and 87%, compared to 70% in the rest of the economy). In contrast, agriculture and e-commerce report a relatively high share of workers that always work from home (respectively 43% and 18%), while in the rest of the economy this share equals 8%. For agriculture, the high share of people working from home is likely partly explained through the high share of self-employed, the nature of agricultural work and the rather low degree of urbanisation of their households.

(construction and metallurgy) appears (appear) to have relative high (low) shares of workers with atypical working hours as compared to the rest of the economy. In the e-commerce sector, again, the share is not found to be significantly different from that of the rest of the economy.

Figure 18. Share of workers by frequency of working at home and sector



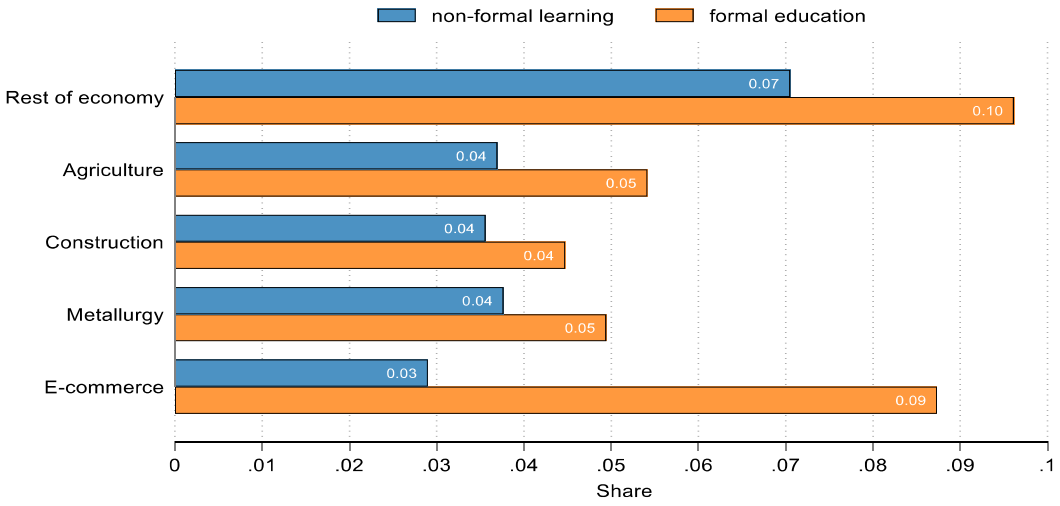
Source: LFS Belgium, 2017-2020. All data are weighted.

Participation in learning activities

In this section, we describe workers' participation in formal and non-formal learning activities. Formal learning activities include participation in courses, seminars, conferences and lessons in the last 4 weeks, while the non-formal learning activities include learning through education either within or outside the regular education system during a reference month.

We find overall rather low shares of workers involved in learning activities. In the rest of the economy, around 7% (non-formal) to 10% (formal) of all workers attend learning activities. Formal learning is also more prevalent than non-formal learning in all four sectors considered. The sectors of agriculture, construction, metallurgy and e-commerce report even lower shares of non-formal learning than in the rest of the economy with the shares ranging between 3% to 5%. The same is true for formal education, except for the e-commerce sector. In this sector, the share of workers in formal education (9%) is not significantly different from the share in the rest of the economy.

Figure 19. Share of workers attending (non-)formal* learning activities by sector



Source: LFS Belgium, 2017-2020. All data are weighted.

* Non-formal learning entails participation in courses, seminars, conferences and lessons in the last 4 weeks. Formal education entails attendance to education within and/or outside the regular education system during a reference month.

Conditioning outcomes on demographic composition of workers

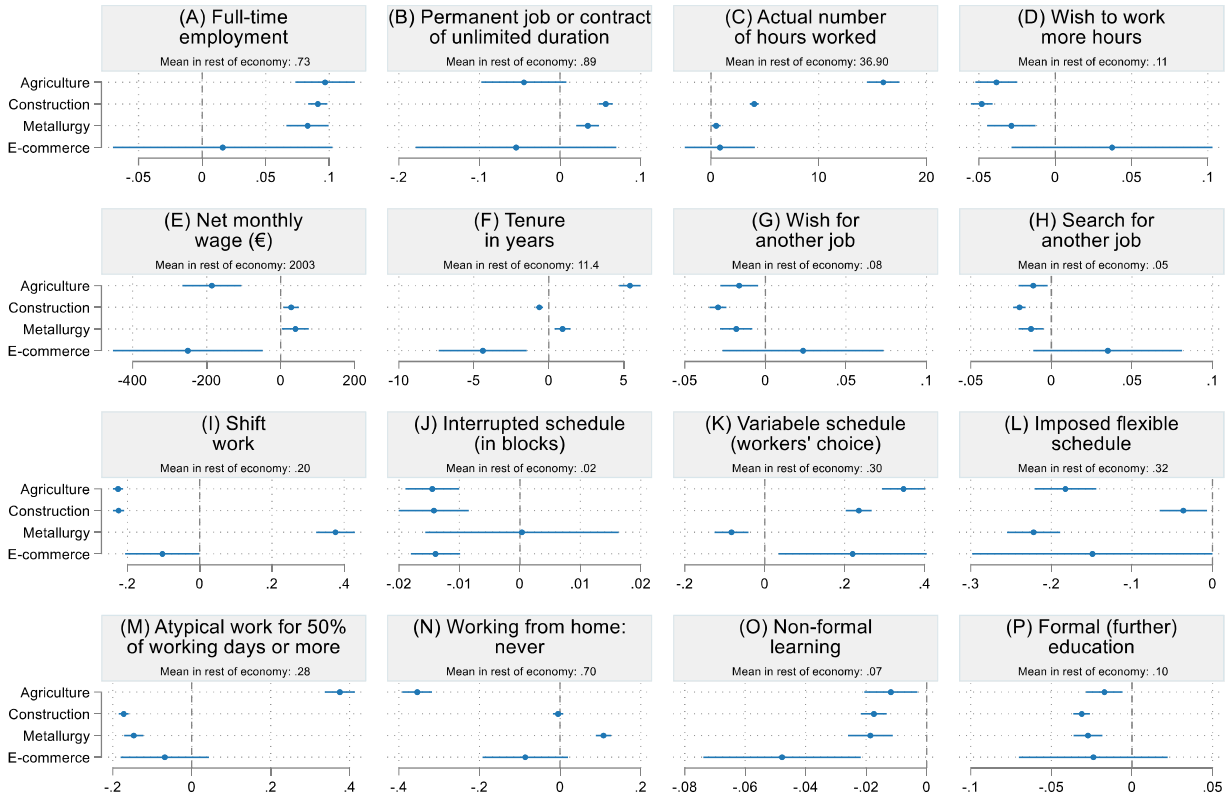
The descriptive analyses highlight the diversity of workforces in the four salient sectors covered in this report. Both worker characteristics and characteristics related to their job differ in various ways from the rest of the economy. However, the descriptives on job characteristics and working conditions, do not control for potentially confounding factors such as gender, ethnicity, age and education which were shown to vary over sectors. To better isolate the relationship between sectors and characteristics related to jobs, we conduct a linear regression analysis controlling for the aforementioned confounding variables.

These results largely confirm the basic descriptive statistics, indicating that the observed sectorial differences in job characteristics and working conditionals are, in general, not driven by worker characteristics (see Figure 20). In addition, the regression results are robust to the inclusion of controls for the survey year and province of residence (see Appendix, Figure A7). Also, restricting our analyses to non-public workers, as public sector workers are largely underrepresented in the four salient sectors, does not alter our results (see Appendix, Figure A8).

Similar to previous findings for the sector of e-commerce, the observed differences are often not statistically different from the rest of the economy. For the sectors of agriculture, construction and metallurgy, on the other hand, we do again observe multiple significant differences as compared to the rest of the economy. These differences are largely identical to those identified earlier, however controlling for the confounding factors, some differences change in size or become insignificant. In the following paragraph we elaborate on the changes in these differences, rather than the differences themselves.

Regarding the contract type, we now only observe a significantly higher share of workers with a permanent contract (see Figure 20 (B)) in the sectors of construction and metallurgy compared to the rest of the economy, as the lower shares in the sectors of agriculture and e-commerce turned insignificant after controlling for the confounding factors. Regarding the net monthly wages, we again find workers in the sectors of agriculture and e-commerce to earn less (see Figure 20 (E)). Nevertheless, the difference compared to the rest of the economy is now smaller with an average difference of around €190 for agriculture and €250 for e-commerce as opposed to around €400 in both sectors without controls for confounding factors. The difference in tenure between the sector of agriculture and the rest of the economy, while still substantial, also decreased in size with workers in agriculture on average having a 5.4 years longer tenure (as opposed to 8.6 years without controls), see Figure 20 (F). For the type of timetable (shift work, interrupted schedule, variable schedule and flexible schedule), we do not observe any substantial changes (see Figure 20 (I)-(L)). However, we do observe some changes for the organisation of work (see Figure 20 (M) and (N)), with the sectors of construction and metallurgy reporting an even lower share of workers in atypical work and an even lower share of workers in agriculture who never work from home compared to the rest of the economy. Also, the share of workers who never work from home in the construction sector is no longer significantly different from the rest of the economy.

Figure 20. Linear regression analyses on job characteristics and working conditions for all workers



Source: LFS Belgium, 2017-2020. The presented statistics are coefficient estimates and horizontal spikes for confidence intervals based on linear regressions for all workers. All regressions control for age (5-year dummy variables), gender (dummy variable for female), place of birth (dummy variable for born in Belgium) and education (dummy variables for medium and higher education). The standard errors are corrected for clustering of the observations at the participant level. All data are weighted. Above each regression, also, the mean in the rest of the economy for all workers is displayed. The number of observations equals (approximately) 251,350 for regressions A, D, F-H and O-P; 213,329 for regression B; 241,869 for regression C; 64,360 for regression E; 22,368 for regressions I-L; 72,422 for regression M and 100,234 for regression N.

Dynamic analysis of entry and exit

In this final section, we study the dynamics in the labour market with a specific focus on the transitions between employment statuses and between sectors. Doing so, exploits the panel element of the LFS BE, where we only consider observations for individuals who participate in (at least) two consecutive quarters in the LFS BE and study the transitions between two consecutive quarters. In total 202,832 observations are included of 137,240 unique individuals.[12,13]

In line with previous research (Vanderhoeft and Quintelier, 2021), we find that those who were employed in the first trimester predominantly remain employed, with over 95% being employed in the second trimester as well (see Appendix Table A8 for the transition matrix for all sectors combined). In addition, our analyses indicate that workers largely remain within the same sector, see Table 2. Only for the e-commerce sector, we find that less than 90% of workers remains within the sector. This number, however, is based on very few observations and is therefore estimated with less precision. Of those who are no longer employed, the majority shifted to an inactive status (3.6% of those initially employed in the rest of the economy) and the remaining 1% (of those initially employed in the rest of the economy) changed to unemployment. Again, these shares are quite similar in all sectors, except for agriculture where a significantly larger share equal to 7% of workers became inactive and the construction sector where a significantly smaller share equal 0.7% of workers became unemployed. Linking back to previous findings regarding the age and tenure of workers in the sector of agriculture, a large portion of those who became inactive are likely retired.

Second, for individuals in an inactive status, we again find that the status of the vast majority does not change, with 92% of the inactive remaining in this inactive status, 3% changing to an unemployed status and 5% becoming employed in the second trimester, also see Vanderhoeft and Quintelier (2021). As illustrated in Table 2, those that shifted to employment mainly work in the rest of the economy, but also the construction sector appears to be an interesting sector. Of those becoming employed (4,109 observations), 200 individuals started working in construction (5%).

Third, and in contrast to previous statements, individuals in unemployment in the first trimester change status more, with – only – 52% who remain unemployed, some 27% shifting to inactivity and 21% switching to employment. Again these results are in line with the findings of Vanderhoeft and Quintelier (2021). Additionally, we find that those shifting to employment mainly end up in the rest of the economy or the construction sector, with 78 individuals working in construction out of 1,526 individuals who became employed (5%). Given that the rest of the economy in our case makes up more than 90 percent total employment, this is what we would expect.

[12] We observe 71,648 individuals over two consecutive quarters and an additional 65,592 individuals over four quarters, with a two-quarter gap between each two consecutive quarters.
[13] Again, all data are weighted. In this section, however, we use longitudinal calibrated weights specifically designed to assess transitions between two trimesters. For more information on this weighting variable we refer to Vanderhoeft and Quintelier (2021)

Table 2. Labour market transitions between two consecutive trimesters, 2017-2020

			TRIMESTER 2							
			Unemployed	Inactive	Employed: Rest of economy	Employed: Agriculture	Employed: Construction	Employed: Metallurgy	Employed: E-commerce	**Total**
TRIMESTER 1	Unemployed	N	3,821	1,941	1,398	23	78	22	5	7,288
		Mean (estimated SE)	.524 (.008)	.266 (.007)	.192 (.007)	.003 (.001)	.011 (.002)	.003 (.001)	.001 (.000)	1.000
	Inactive	N	2,179	75,207	3,806	52	200	47	3	81,494
		Mean (estimated SE)	.027 (.001)	.923 (.001)	.047 (.001)	.001 (.000)	.002 (.000)	.001 (.000)	.000 (.000)	1.000
	Employed: Rest of economy	N	1,069	3,747	98,222	10	67	23	5	103,143
		Mean (estimated SE)	.010 (.001)	.036 (.001)	.952 (.001)	.000 (.000)	.001 (.000)	.000 (.000)	.0000 (.000)	1.000
	Employed: Agriculture	N	7	78	5	982	1	0	0	1,072
		Mean (estimated SE)	.006 (.003)	.072 (.008)	.005 (.002)	.916 (.009)	.001 (.001)	0 (omitted)	0 (omitted)	1.000
	Employed: Construction	N	54	252	74	2	7,347	7	0	7,735
		Mean (estimated SE)	.007 (.001)	.033 (.003)	.010 (.002)	.000 (.000)	.950 (.003)	.001 (.000)	0 (omitted)	1.000
	Employed: Metallurgy	N	14	55	23	0	7	1,900	0	2,000
		Mean (estimated SE)	.007 (.003)	.028 (.005)	.012 (.003)	0 (omitted)	.003 (.001)	.950 (.007)	0 (omitted)	1.000
	Employed: E-commerce	N	3	4	5	0	0	0	86	98
		Mean (estimated SE)	.033 (.019)	.039 (.024)	.049 (.024)	0 (omitted)	0 (omitted)	0 (omitted)	.878 (.039)	1.000
	Total	N	7,148	81,284	103,533	1,069	7,699	2,000	99	**202,832**
		Mean (estimated SE)	.035 (.001)	.401 (.002)	.510 (.002)	.005 (.000)	.038 (.001)	.010 (.000)	.000 (.000)	**1.000**

Source. LFS Belgium, 2017-2020. All data are weighted. Reported changes are changes in status – (un)employment or inactive – and sector of employment between two consecutive trimesters. N displays the number of observations. The standard errors are corrected for clustering of the observations at the participant level.

Conclusion

This study provides a comprehensive characterisation of the workforce and working conditions in the agriculture, construction, metallurgy, and e-commerce sectors. It provides an important background for understanding the nature of employment affected by the green transition in Belgium. According to the literature, these four sectors are expected to be affected differently by the transition to a low-carbon economy. Construction and e-commerce may experience growth due to the increasing demand for eco-friendly and low-carbon products and services, while the metallurgy and agriculture sectors are likely to undergo significant changes in product offerings and production processes (Botta, 2019; Jaeger et al., 2011; McCarthy et al., 2018).

Using the Belgian Labour Force Survey, we find that the four sectors differ on various characteristics from the rest of the economy. For the sector of e-commerce, these differences however were often not statistically different from the rest of the economy due to a low number of observations in this sector. In addition, the observed differences are largely robust to the inclusion of controls for potentially confounding factors such as gender, ethnicity, age and education as well as controls for the survey year and province of residence.

On the one hand, the sectors of agriculture, construction and metallurgy are to some extent quite similar. All three sectors have a relatively male-dominated and lower-educated workforce. The sectors have lower shares of participation in (non-)formal learning compared to the rest of the economy. Also, their workforce is more often situated outside of densely-populated areas. In terms of job characteristics, workers in these sectors are predominantly full time, with temporary workers typically having shorter contracts. Workers in these sectors also tend to work more hours per week compared to the rest of the economy and are less likely to want to work more hours. Additionally, there is a lower inclination and/or inclination to seek other employment opportunities in these sectors compared to the rest of the economy.

On the other hand, various workforce and job characteristics as well as working conditions in these sectors also deviate from the other sectors. This is especially true for the sectors of agriculture and construction, but also to some extent for the sector of metallurgy.

The agriculture sector has a relatively old and native-dominated workforce, with an average age of 47 years and 92% of workers being born in Belgium. They are often self-employed (61% of all workers) and tend to stay longer in their job with the highest average tenure of 20 years. This despite the sector of agriculture having a relatively low share of workers with an indefinite contract (79% as opposed to 89% in the rest of the economy), the highest number of average hours worked per week (53 hours as opposed to 37 hours in the rest of the economy),

a relatively low average wage (€1,618 opposed to 2,003 euros per month in the rest of the economy) and a very high share of almost 70% of workers with atypical working hours (compared to 28% in the rest of the economy). The quarter-to-quarter dynamic analysis also indicated workers in agriculture to transition relatively more often to inactivity (7%) than workers in the rest of the economy (4%).

In the construction sector, on the contrary, workers are on average relatively younger (41 years) and relatively more often born outside Belgium (78% born in Belgium as opposed to 83% in the rest of the economy). The workers are often blue-collar employees (49%) and have a relatively low number of years of tenure - on average 10 years compared to 11 years in the rest of the economy. This is true, despite the construction sector having a relatively high share of workers with an indefinite contract (93% as opposed to 89% in the rest of the economy) and a relatively low share of workers with atypical working hours (15% as opposed to 28% in the rest of the economy).

The sector of metallurgy, meanwhile, largely combines characteristics which are also present in agriculture and construction. Much like the construction sector, the sector reports high shares of blue-collar workers (61% as opposed to 21% in the rest of the economy) and workers with an indefinite contract (93% as opposed to 89% in the rest of the economy), as well as relatively low shares of workers with atypical working hours (17% as opposed to 28% in the rest of the economy). Similar to the agricultural sector, the workers in metallurgy have a relatively high average tenure compared to the rest of the economy. However, with workers on average staying 12 years in their job, average tenure is still well below that of the agricultural sector. In contrast to the sectors of agriculture and construction where three-quarters of workers have a variable or more flexible timetable than the rest of the economy, metallurgy reports a very high share of workers who work in shifts (64%). Also, wages are on average very good in this sector, potentially partially compensating for the shift work, with the sector of metallurgy being the only sector where the average wage (of 2,065 euros per month) is significantly higher than that in the rest of the economy. While the low share of workers with atypical working hours is found to be beneficial for both job satisfaction and performance (Dall'Ora et al., 2016), the relatively high share of blue-collar workers and shift work pose substantial challenges for the sector.

When sectors are confronted with the anticipated changes linked to the "green transition", the diverse composition of workforces and work must be taken into consideration. One element all sectors should consider is their relatively lower educated workforces and workers' participation in (non-)formal learning compared to the rest of the economy. The predicted changes in demand, products and methods of production likely also impact the required skills. While literature suggests that a high share of skills are transferable to low-carbon jobs (Cedefop, 2010), generally low-carbon jobs require a set of "traditional" and "green" generic skills (Botta, 2019). This implies that workers' specific skills are likely to become obsolete more quickly, and increases the need for lifelong learning and the acquisition of transferable skills even more. Additionally,

research indicates individuals with low qualifications to have limited opportunities to benefit from the greening of economies (Hofman et al., 2022), making access to further education and training an even more important topic in these sectors. Adjacently, given that workers in the considered sectors already on average work more hours per week compared to the rest of the economy, these learning activities will likely have to take place during work hours.

We end with some suggestions for continued exploration. While this study provides a detailed overview of the workers and their job in four important sectors in light of the green transition, interesting avenues for future research remain. Given the differences between workers and jobs across sectors, further analyses could focus on the link between these characteristics and adaptability (of both the sectors and their employees) to the green transition. Given the rapid transition towards a more sustainable and eco-friendly economy, future research quantifying the changes in worker characteristics over time and by sector could provide new insights, as well as validate the expected changes as suggested by the literature.

References

Apostel, A., Vandekerckhove, S., Desiere, S., Lenaerts, K., & Walter, C. (2023). *Wat is de welzijnsimpact van atypische arbeidstijden onder ABVV-leden in de metaalsector en de sectoren van ABVV algemene centrale-Samenvatting*.

Barslund, M., Busse, M., & De Wispelaere, F. (2017). Posted workers–for some it matters. CEPS Policy Insights No 2017/37, 26 October 2017.

Botta, E. (2019). *A review of "Transition Management" strategies: Lessons for advancing the green low-carbon transition*. OECD. https://doi.org/10.1787/4617a02b-en

Cedefop, E. C. for the D. of V. T. (2010). *Skills for green jobs: European synthesis report*. Publications Office of the European Union. https://data.europa.eu/doi/10.2801/31554

Dall'Ora, C., Ball, J., Recio-Saucedo, A., & Griffiths, P. (2016). Characteristics of shift work and their impact on employee performance and wellbeing: A literature review. *International Journal of Nursing Studies*, *57*, 12–27. https://doi.org/10.1016/j.ijnurstu.2016.01.007

Deelen, A., de Graaf-Zijl, M., & van den Berge, W. (2018). Labour market effects of job displacement for prime-age and older workers. *IZA Journal of Labor Economics*, *7*(1), 3. https://doi.org/10.1186/s40172-018-0063-x

Eurostat. (2023). *European Union Labour Force Survey (EU LFS): Description of the dataset*. https://ec.europa.eu/eurostat/web/microdata/european-union-labour-force-survey

Hofman, J., Bruckmayer, M., Feyerabend, K., Larmour, S., Reed, M., & Lymperis, L. (2022). *Green jobs and skills development for disadvantaged groups*. RAND Corporation. https://doi.org/10.7249/RRA1603-1

Hur, H. (2022). Job security matters: A systematic review and meta-analysis of the relationship between job security and work attitudes. *Journal of Management & Organization*, *28*(5), 925–955. https://doi.org/10.1017/jmo.2019.3

Jaeger, C., Paroussos, L., Mangalagiu, D., Kupers, R., Mandel, A., & Tàbara, J. D. (2011). *A New Growth Path for Europe: Generating Prosperity and Jobs in the Low-Carbon Economy* (European Climate Forum).

McCarthy, A., Dellink, R., & Bibas, R. (2018). *The Macroeconomics of the Circular Economy Transition: A Critical Review of Modelling Approaches, OECD Environment Working Papers, No. 130*.

Nivakoski, S., Calò, X., Mencarini, L., & Profeta, P. (2022). *COVID-19 pandemic and the gender divide at work and home*. Publications Office of the European Union.

OECD (2017), Boosting Skills for Greener Jobs in Flanders, Belgium, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264265264-en

Roland Berger (2021). Skills roadmap voor de Vlaamse klimaattransitie – Focus op de energie-intensieve sectoren [2020-2035]. https://publicaties.vlaanderen.be/view-file/43900

Smith, M., Cihlarova, P., Lardot, M., Zell, T and Williams, R. (2022). Green Skills Roadmap Flanders Final Report on Green Skills Need in Flanders. REFORM/SC2021/111. https://publicaties.vlaanderen.be/view-file/51654

Statbel. (2022). *Changes to the Labour Force Survey (LFS) in 2021*. https://statbel.fgov.be/en/changes-labour-force-survey-lfs-2021

Steenackers, K., & Guerry, M.-A. (2016). Determinants of job-hopping: An empirical study in Belgium. *International Journal of Manpower*, *37*, 494–510. https://doi.org/10.1108/IJM-09-2014-0184

Vanderhoeft, C., & Quintelier, E. (2021). *Het schatten van IAB-arbeidsmarkttransities op basis van de paneldata van de Belgische Enquête naar de Arbeidskrachten* (No. 17).

Wanger, S. (2017). *What makes employees satisfied with their working time? The role of working hours, time-sovereignty and working conditions for working time and job satisfaction*. IAB-Discussion Paper.

Yip, C. M. (2018). On the labor market consequences of environmental taxes. *Journal of Environmental Economics and Management*, *89*, 136–152.

Appendix

Table A1. Sample size in the EWCS

Sector	Number of observations (2021)	Share of employment (%)	NACE
Agriculture	38	0.89	01
Construction	272	6.42	41-43
Metallurgy	53	1.25	24, 25
Rest of economy*	3,871	91.44	(remaining NACE codes)
Total	**4,233**	**100**	

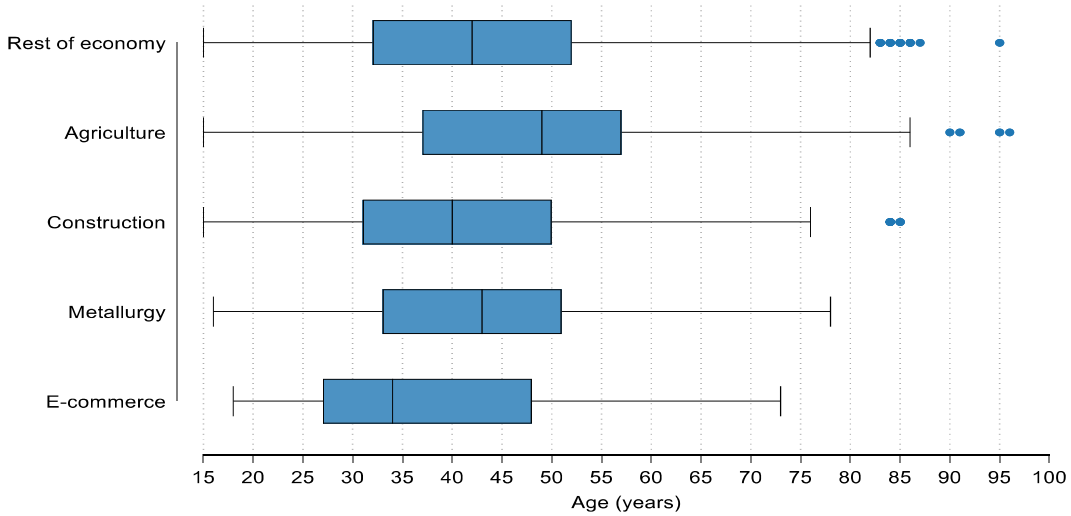
* The e-commerce sector is captured within the rest of the economy.
Source: EWCS Belgium, 2021. All data are weighted.

Table A2. Employee characteristics by sector

	Mean (estimated SE)					
	All sectors	Agriculture	Construction	Metallurgy	E-commerce	Rest of economy
Gender: male	.533 (.002)	.690 (.017)	.909 (.004)	.874 (.011)	.579 (.065)	.497 (.002)
Country of birth: Belgium	.826 (.002)	.924 (.010)	.781 (.007)	.837 (.015)	.835 (.043)	.828 (.002)
Age	41.931 (.049)	47.260 (.509)	40.561 (.183)	42.161 (.377)	39.375 (2.921)	41.976 (.051)
Highest educational attainment level						
• Low (ISCED 0-2)	.145 (.001)	.265 (.015)	.247 (.007)	.209 (.015)	.158 (.073)	.135 (.001)
• Medium (ISCED 3-4)	.386 (.002)	.537 (.018)	.552 (.008)	.536 (.017)	.292 (.056)	.369 (.002)
• High (ISCED 5+)	.469 (.002)	.198 (.016)	.201 (.007)	.255 (.014)	.550 (.070)	.497 (.002)
Total number of persons in the household	2.995 (.006)	3.119 (.047)	3.116 (.022)	3.027 (.054)	3.022 (.153)	2.984 (.006)
Degree of urbanisation						
• Densely-populated area	.279 (.002)	.063 (.009)	.235 (.007)	.193 (.016)	.352 (.062)	.286 (.002)
• Intermediate area	.574 (.002)	.567 (.018)	.594 (.008)	.655 (.017)	.542 (.068)	.571 (.002)
• Thinly-populated area	.147 (.001)	.370 (.017)	.171 (.005)	.152 (.010)	.106 (.036)	.143 (.001)
N	251,366	2,829	17,163	4,178	193	227,003

Source: LFS Belgium, 2017-2020. All data are weighted. SE stands for standard error. The standard errors are corrected for clustering of the observations at the participant level. The mean values in Agriculture, Construction, Metallurgy or E-commerce that are significantly (p-value≤.10) lower (higher) than the mean in the rest of economy are highlighted in yellow (green).

Figure A1. Distribution of age of workers (years) by sector



Source: LFS Belgium, 2017-2020. All data are weighted.

Table A3. Job characteristics by sector

	All sectors		Agriculture		Construction		Metallurgy		E-commerce		Rest of economy	
	N	Mean (estimated SE)	N	Mean (estimated SE)	N	Mean (estimated SE)	N	Mean (estimated SE)	N	Mean (estimated SE)	N	Mean (estimated SE)
Employment type: full-time employment	251,366	.749 (.002)	2,829	.805 (.013)	17,163	.926 (.004)	4,178	.909 (.009)	193	.749 (.072)	227,003	.732 (.002)
Contract type: Permanent job or work contract of unlimited duration	213,329	.894 (.001)	672	.786 (.028)	11,802	.931 (.004)	3,842	.931 (.007)	139	.764 (.059)	196,874	.891 (.001)
Duration of temporary main job (months)	21,204	9.279 (0.140)	139	4.543 (0.848)	817	8.533 (0.709)	277	6.537 (0.829)	34	4.167 (1.558)	19,937	9.385 (0.145)
Professional status												
• Private sector: blue-collar worker	251,366	.240 (.002)	2,829	.198 (.014)	17,163	.489 (.008)	4,178	.605 (.016)	193	.217 (.072)	227,003	.214 (.002)
• Private sector: white-collar worker	251,366	.404 (.002)	2,829	.070 (.012)	17,163	.202 (.007)	4,178	.323 (.016)	193	.496 (.069)	227,003	.424 (.002)
• Self-employed: without employees	251,366	.097 (.001)	2,829	.523 (.018)	17,163	.196 (.006)	4,178	.034 (.005)	193	.192 (.050)	227,003	.086 (.001)
• Self-employed: with employees	251,366	.038 (.001)	2,829	.089 (.011)	17,163	.092 (.004)	4,178	.032 (.005)	193	.088 (.035)	227,003	.034 (.001)
• Public sector	251,366	.214 (.002)	2,829	.005 (.002)	17,163	.013 (.002)	4,178	.001 (.001)	193	.000 (omitted)	227,003	.235 (.002)
• Helper, assisting family member	251,366	.008 (.000)	2,829	.116 (.011)	17,163	.009 (.001)	4,178	.004 (.001)	193	.008 (.006)	227,003	.007 (.000)
Hours work per week												
• Usual (all workers)	241,869	37.500 (.050)	2,527	52.454 (.820)	16,593	42.850 (.197)	4,079	39.340 (.205)	178	36.910 (2.022)	218,492	36.904 (.052)
○ Usual (workers in the public and private sector)	206,711	35.680 (.041)	617	37.211 (.871)	11,530	39.411 (.158)	3,763	38.702 (.163)	132	34.844 (1.557)	190,669	35.378 (.043)
○ Usual (self-employed)	33,372	50.261 (.212)	1,629	61.003 (.971)	4,913	52.191 (.463)	295	49.564 (1.854)	44	44.087 (5.657)	26,491	49.346 (.243)
○ Usual (helper)	1,786	34.690 (.866)	281	43.904 (2.673)	150	28.246 (2.090)	21	25.263 (5.721)	2	27.167 (5.599)	1,332	33.848 (.972)

• Contract (workers in the public and private sector)	199,284	34.323 (.036)	582	35.988 (.816)	11,177	38.287 (.090)	3,670	37.715 (.121)	120	34.332 (1.407)	183,735	33.997 (.039)
Desire to work more than usual hours	251,366	.109 (.001)	2,829	.062 (.007)	17,163	.079 (.003)	4,178	.091 (.008)	193	.163 (.035)	227,003	.113 (.001)
Net monthly wage (€)*	64,360	2,001.738 (3.855)	208	1,617.995 (45.908)	3,701	1,993.141 (10.841)	1,163	2,064.933 (20.149)	47	1,594.318 (105.813)	59,241	2,002.686 (4.112)
Tenure (years)	251,311	11.349 (.043)	2,827	20.000 (.551)	17,158	9.636 (.145)	4,177	12.340 (.327)	193	5.303 (.723)	226,956	11.373 (.045)
Wish for another job (all)	251,365	.073 (.001)	2,829	.038 (.006)	17,163	.045 (0.002)	4,178	.052 (.005)	193	.108 (.027)	227,002	.076 (.001)
Search for another job	251,365	.047 (.001)	2,829	.022 (.004)	17,163	.028 (.002)	4,178	.032 (.004)	193	.091 (.025)	227,002	.049 (.001)

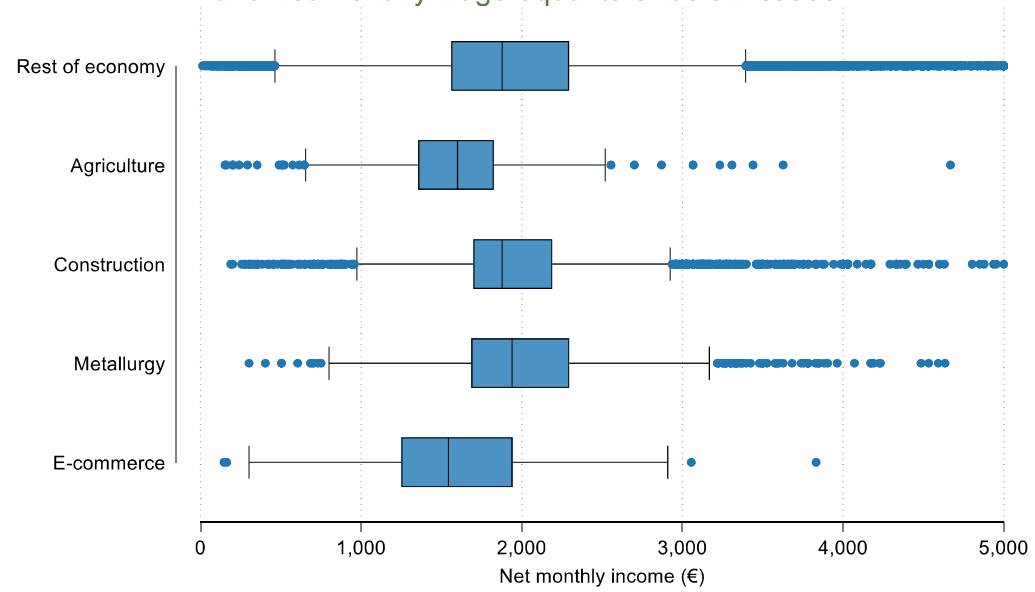
Source: LFS Belgium, 2017-2020. All data are weighted. SE stands for standard error. The standard errors are corrected for clustering of the observations at the participant level. The mean values in Agriculture, Construction, Metallurgy or E-commerce that are significantly (p-value≤.10) lower (higher) than the mean in the rest of economy are highlighted in yellow (green).
* The net monthly wages are inflated to 2020 using the yearly Consumer Price Index.

Table A4. Workers in full-time employment based on the usual number of hours worked per week by sector

	All sectors		**Agriculture**		**Construction**		**Metallurgy**		**E-commerce**		**Rest of economy**	
	N	Mean (estimated SE)	N	Mean (estimated SE)	N	Mean (estimated SE)	N	Mean (estimated SE)	N	Mean (estimated SE)	N	Mean (estimated SE)
Employment type: workers who usually work 30 hours or more per week in their main job (full-time employment)	241,869	.831 (.002)	2,527	0.871 (0.012)	16,593	0.958 (0.003)	4,079	0.962 (0.005)	178	0.773 (0.076)	218,492	.819 (.002)

Source: LFS Belgium, 2017-2020. All data are weighted. SE stands for standard error. The standard errors are corrected for clustering of the observations at the participant level. The mean values in Agriculture, Construction, Metallurgy or E-commerce that are significantly (p-value≤.10) lower (higher) than the mean in the rest of economy are highlighted in yellow (green).

Figure A2. Distribution of net monthly wage (€) in main job by sector, for those with a net monthly wage equal to or below €5000*



Source: LFS Belgium, 2017-2020. All data are weighted.
All wages are inflated to 2020 using the yearly Consumer Price Index.
* 99,00% of all employees have a net monthly wage (inflated to 2020) equal to or below 5000 euro.

Table A5. Average net monthly wage (€) in main job by gender and sector

	Net monthly wage (€)				**Difference in mean net monthly wage between men and women**
	Men		**Women**		
	N	Mean (estimated SE)	N	Mean (estimated SE)	
Rest of economy	27,790	2,203.888 (6.579)	31,451	1,816.351 (4.786)	**387.537**
Agriculture	139	1,647.523 (58.571)	69	1,556.185 (73.083)	91.338
Construction	3,328	2,005.809 (11.386)	373	1,877.027 (35.156)	**128.783**
Metallurgy	998	2,081.725 (21.699)	165	1,953.680 (53.706)	**128.045**
E-commerce	23	1,532.370 (166.601)	24	1,665.964 (125.311)	-133.593

Source: LFS Belgium, 2017-2020. All data are weighted. SE stands for standard error. The standard errors are corrected for clustering of the observations at the participant level. The net monthly wages are inflated to 2020 using the yearly Consumer Price Index. The wage differences between men and women in Agriculture, Construction, Metallurgy or E-commerce that are significantly (p-value≤.10) lower (higher) than the wage difference between men and women in the rest of economy are highlighted in yellow (green). Additionally, if women earn significantly less (more) than men within a sector, the wage difference is mentioned in **bold**.

Table A6. Distribution of tenure of workers in job (years) by sector

	N	Q1 (25th percentile)	Median (years)	Q3 (75th percentile)
Rest of economy	226,956	2.5	8	17.7
Agriculture	2,827	5.5	19.1	25.8
Construction	17,158	2.3	6.3	13.8
Metallurgy	4,177	2.9	9.3	19.2
E-commerce	193	1.2	3.3	8.2
All sectors	**251,311**	**2.5**	**7.9**	**17.6**

Source: LFS Belgium, 2017-2020. All data are weighted.

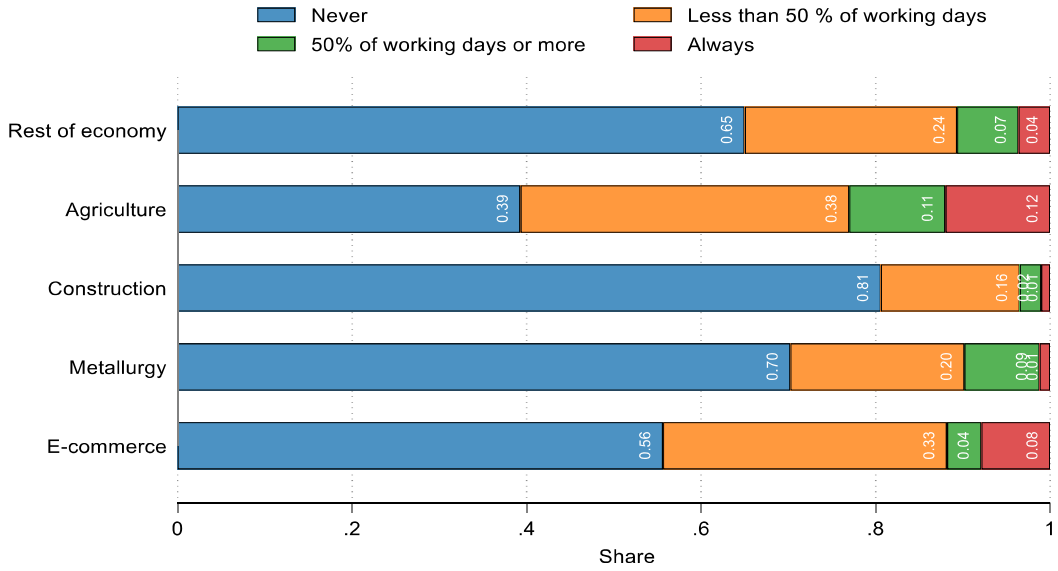
Table A7. Working conditions by sector

	All sectors		Agriculture		Construction		Metallurgy		E-commerce		Rest of economy	
	N	Mean (estimated SE)	N	Mean (estimated SE)	N	Mean (estimated SE)	N	Mean (estimated SE)	N	Mean (estimated SE)	N	Mean (estimated SE)
Timetable (work)												
• Shift work	22,368	.198 (.003)	368	.003 (.003)	1,143	.031 (.006)	338	.641 (.029)	25	.068 (.047)	20,494	.202 (.003)
• Interrupted schedule (in blocks)	22,368	.016 (.001)	368	.003 (.002)	1,143	.004 (.003)	338	.019 (.008)	25	.000 (.000)	20,494	.016 (.001)
• Variable schedule (workers' choice)	22,368	.312 (.004)	368	.633 (.028)	1,143	.503 (.016)	338	.172 (.023)	25	.528 (.107)	20,494	.299 (.004)
• Imposed flexible schedule	22,368	.308 (.004)	368	.117 (.020)	1,143	.262 (.015)	338	.079 (.015)	25	.191 (.080)	20,494	.318 (.004)
• Other	22,368	.166 (.003)	368	.243 (.024)	1,143	.200 (.013)	338	.088 (.018)	25	.213 (.093)	20,494	.165 (.003)
Atypical working hours (evening, night, Saturday and/or Sunday work) for 50% of working days or more	72,422	.274 (.002)	835	.688 (.019)	5,174	.151 (.006)	1,215	.169 (.012)	65	.221 (.055)	65,133	.282 (.002)
Evening work												
• Never	72,422	.660 (.002)	835	.393 (.020)	5,174	.806 (.006)	1,215	.702 (.014)	65	.556 (.067)	65,133	.650 (.002)
• Less than 50% of working days	72,422	.238 (.002)	835	.377 (.019)	5,174	.159 (.006)	1,215	.199 (.013)	65	.325 (.063)	65,133	.243 (.002)
• 50% of working days or more	72,422	.068 (.001)	835	.110 (.011)	5,174	.025 (.002)	1,215	.086 (.009)	65	.040 (.025)	65,133	.070 (.001)
• Always	72,422	.035 (.001)	835	.120 (.012)	5,174	.010 (.001)	1,215	.012 (.003)	65	.079 (.035)	65,133	.036 (.001)
Night work												
• Never	72,422	.884 (.001)	835	.716 (.017)	5,174	.964 (.003)	1,215	.853 (.011)	65	.865 (.044)	65,133	.880 (.001)
• Less than 50% of working days	72,422	.085 (.001)	835	.258 (.016)	5,174	.031 (.003)	1,215	.112 (.010)	65	.080 (.033)	65,133	.087 (.001)
• 50% of working days or more	72,422	.015 (.001)	835	.015 (.004)	5,174	.004 (.001)	1,215	.027 (.005)	65	.040 (.028)	65,133	.016 (.001)
• Always	72,422	.016 (.001)	835	.012 (.004)	5,174	.001 (.000)	1,215	.008 (.003)	65	.015 (.015)	65,133	.018 (.001)
Saturday work												
• Never	72,422	.637 (.002)	835	.236 (.018)	5,174	.748 (.007)	1,215	.780 (.013)	65	.686 (.062)	65,133	.630 (.002)
• Less than 50% of working days	72,422	.140 (.001)	835	.089 (.011)	5,174	.115 (.005)	1,215	.117 (.010)	65	.156 (.050)	65,133	.143 (.002)

• 50% of working days or more	72,422	.128 (.001)	835	.135 (.014)	5,174	.075 (.004)	1,215	.075 (.009)	65	.040 (.028)	65,133	.134 (.002)
• Always	72,422	.094 (.001)	835	.541 (.020)	5,174	.062 (.004)	1,215	.027 (.005)	65	.117 (.041)	65,133	.093 (.001)
Sunday work												
• Never	72,422	.778 (.002)	835	.348 (.019)	5,174	.918 (.004)	1,215	.869 (.011)	65	.771 (.055)	65,133	.770 (.002)
• Less than 50% of working days	72,422	.100 (.001)	835	.140 (.014)	5,174	.049 (.004)	1,215	.069 (.008)	65	.058 (.027)	65,133	.105 (.001)
• 50% of working days or more	72,422	.082 (.001)	835	.085 (.010)	5,174	.020 (.002)	1,215	.051 (.007)	65	.059 (.033)	65,133	.087 (.001)
• Always	72,422	.040 (.001)	835	.427 (.019)	5,174	.013 (.002)	1,215	.011 (.003)	65	.111 (.041)	65,133	.038 (.001)
Working at home												
• Never	100,234	.704 (.002)	1,146	.415 (.019)	7,057	.783 (.006)	1,654	.871 (.013)	95	.597 (.065)	90,282	.698 (.002)
• Less than 50% of working days	100,234	.151 (.001)	1,146	.094 (.010)	7,057	.158 (.006)	1,654	.076 (.007)	95	.107 (.032)	90,282	.152 (.001)
• 50% of working days or more	100,234	.069 (.001)	1,146	.059 (.007)	7,057	.030 (.002)	1,654	.023 (.005)	95	.120 (.037)	90,282	.073 (.001)
• Always	100,234	.076 (.001)	1,146	.432 (.020)	7,057	.030 (.002)	1,654	.030 (.009)	95	.176 (.059)	90,282	.077 (.001)
Non-formal learning: courses, seminars, conferences, lessons received in the last 4 weeks	251,366	.067 (.001)	2,829	.037 (.004)	17,163	.036 (.002)	4,178	.038 (.004)	193	.029 (.013)	227,003	.071 (.001)
Formal (further) education within and/or outside the regular education system during a reference month.	251,366	.091 (.001)	2,829	.054 (.006)	17,163	.045 (.002)	4,178	.049 (.005)	193	.087 (.025)	227,003	.096 (.001)

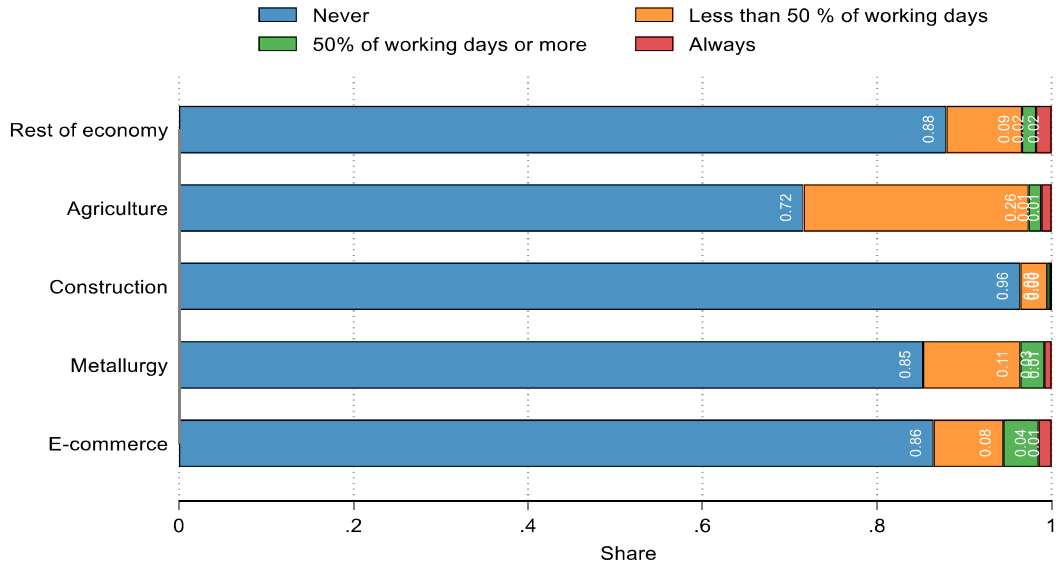
Source: LFS Belgium, 2017-2020. All data are weighted. SE stands for standard error. The standard errors are corrected for clustering of the observations at the participant level. The mean values in Agriculture, Construction, Metallurgy or E-commerce that are significantly (p-value≤.10) lower (higher) than the mean in the rest of economy are highlighted in yellow (green).

Figure A3. Share of workers by frequency of evening work and sector



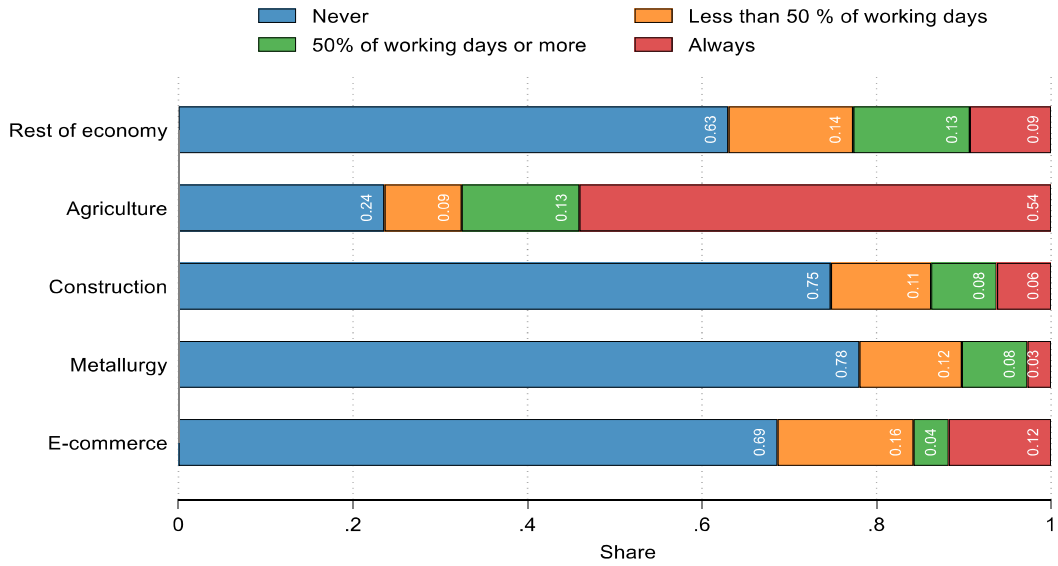
Source: LFS Belgium, 2017-2020. All data are weighted.

Figure A4. Share of workers by frequency of night work and sector



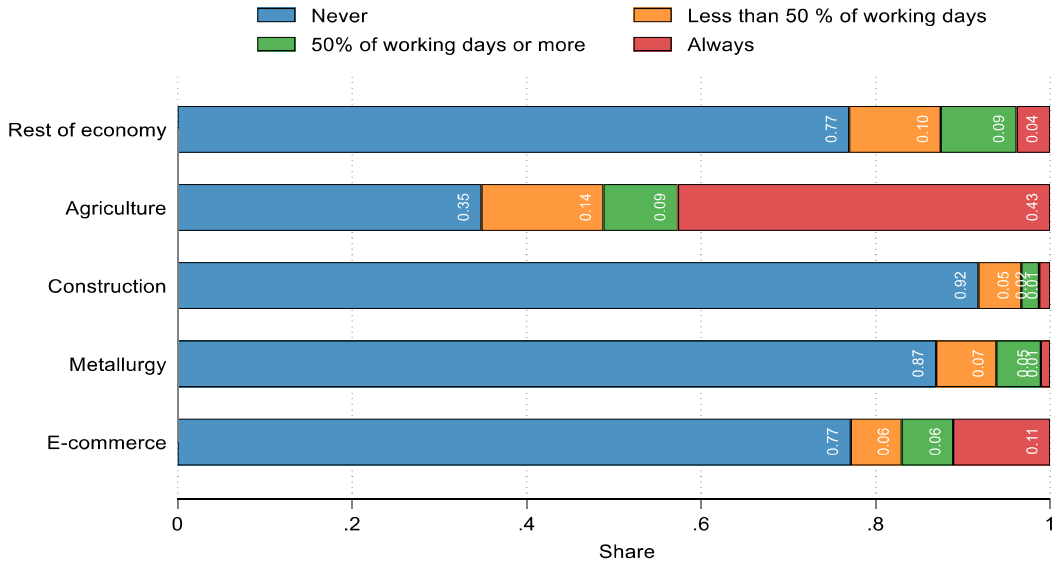
Source: LFS Belgium, 2017-2020. All data are weighted.

Figure A5. Share of workers by frequency of Saturday work and sector



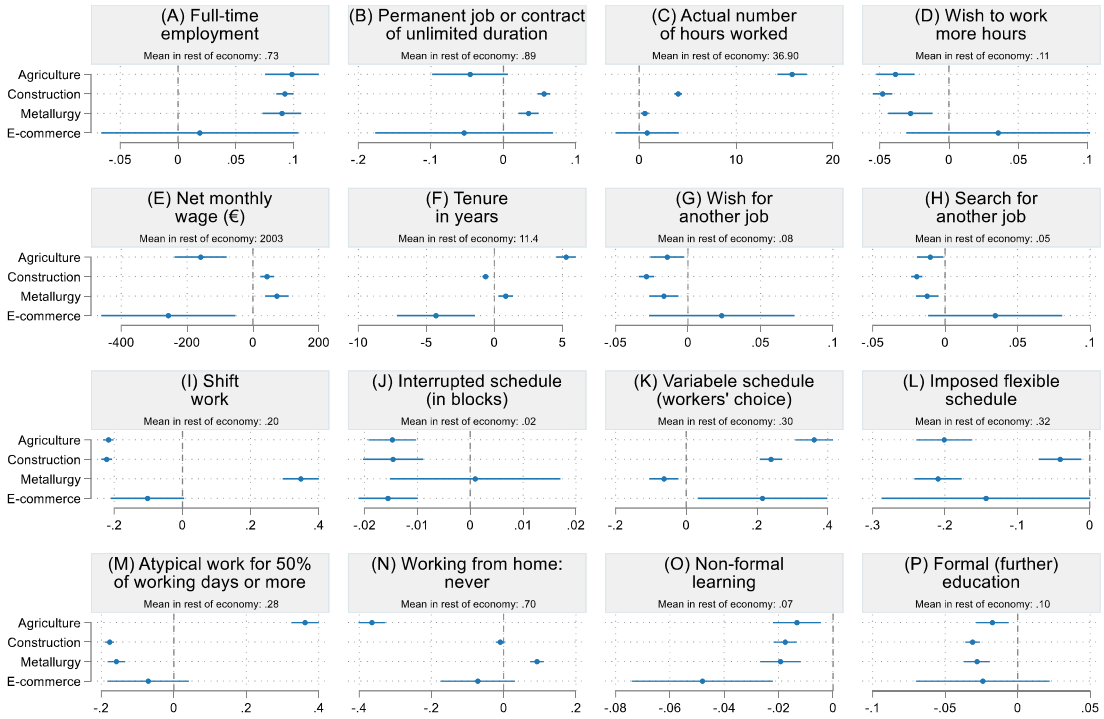
Source: LFS Belgium, 2017-2020. All data are weighted.

Figure A6. Share of workers by frequency of Sunday work and sector



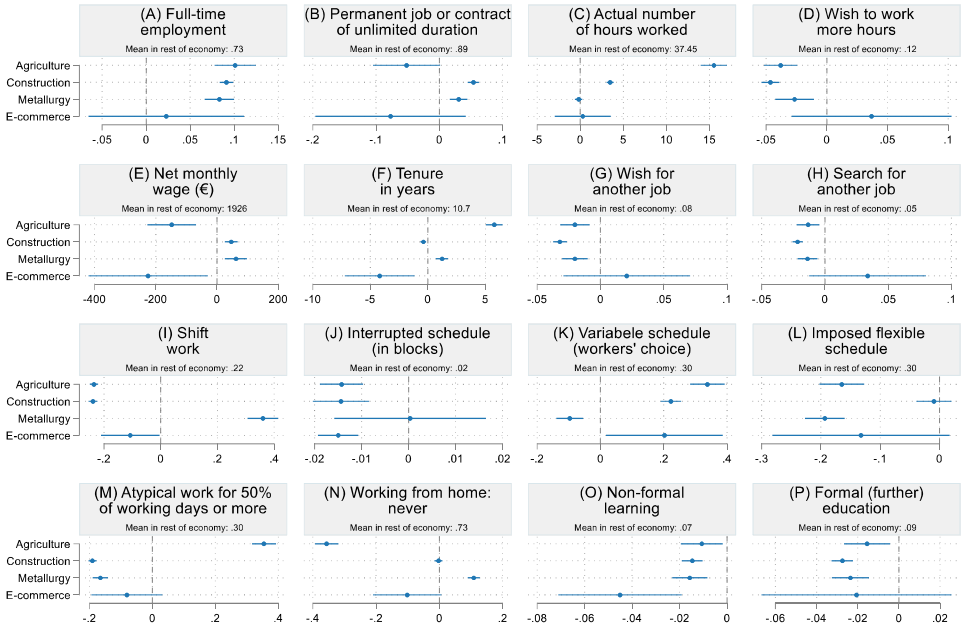
Source: LFS Belgium, 2017-2020. All data are weighted.

Figure A7. Linear regression analyses on job characteristics and working conditions for all workers, including additional controls for survey year and province of residence



Source: LFS Belgium, 2017-2020. The presented statistics are coefficient estimates and horizontal spikes for confidence intervals based on linear regressions for all workers. All regressions control for age (5-year dummy variables), gender (dummy variable for female), place of birth (dummy variable for born in Belgium), education (dummy variables for medium and higher education), survey year (dummy variable for each year with 2017 as reference category) and province of residence (dummy variable for each province with one province as reference category). The standard errors are corrected for clustering of the observations at the participant level. All data are weighted. Above each regression, also, the mean in the rest of the economy for all workers is displayed. The number of observations equals (approximately) 251,350 for regressions A, D, F-H and O-P; 213,329 for regression B; 241,869 for regression C; 64,360 for regression E; 22,368 for regressions I-L; 72,422 for regression M and 100,234 for regression N.

Figure A8. Linear regression analyses on job characteristics and working conditions for non-public sector workers



Source: LFS Belgium, 2017-2020. The presented statistics are coefficient estimates and horizontal spikes for confidence intervals based on linear regressions for all non-public sector workers. All regressions control for age (5-year dummy variables), gender (dummy variable for female), place of birth (dummy variable for born in Belgium) and education (dummy variables for medium and higher education). The standard errors are corrected for clustering of the observations at the participant level. All data are weighted. Above each regression, also, the mean in the rest of the economy for all non-public sector workers is displayed. The number of observations equals (approximately) 196,500 for regressions A, D, F-H and O-P; 158,445 for regression B; 188,414 for regression C; 48,324 for regression E; 18,007 for regressions I-L; 57,321 for regression M and 79,028 for regression N.

Table A8. Labour market transitions between two consecutive trimesters, 2017-2020

			TRIMESTER 2			
			Unemployed	Inactive	Employed (all sectors)	Total
TRIMESTER 1	Unemployed	N	3,821	1,941	1,526	7,288
		Mean (estimated SE)	.524 (.008)	.266 (.007)	.209 (.007)	1.000
	Inactive	N	2,179	75,207	4,109	81,494
		Mean (estimated SE)	.027 (.001)	.923 (.001)	.050 (.001)	1.000
	Employed (all sectors)	N	1,147	4,136	108,766	114,049
		Mean (estimated SE)	.010 (.000)	.036 (.001)	.954 (.001)	1.000
	Total	N	7,148	81,284	114,401	**202,832**
		Mean (estimated SE)	.035 (.001)	.401 (.002)	.564 (.002)	**1.000**

Source. LFS Belgium, 2017-2020. All data are weighted. Reported changes are changes in status –(un)employment or inactive–between two consecutive trimesters. N displays the number of observations. The standard errors are corrected for clustering of the observations at the participant level.