



TWING PROJECT

Quantitative Analysis Report

PARTNER: PRAXIS CENTER FOR POLICY STUDIES

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1. Summary

The analysis in the current paper will focus on telework trends in European countries. The analysis makes use of Labour Force Survey data. We will compare two time periods – combined data of 2018-2019 and 2020-2021. This enables to compare the cut-off point of the Covid outbreak and the rapid increase of telework in European countries. The analysis in chapter 2.1 (Convergence) will include the 27 EU countries (unless stated otherwise) and a longer period (10-year period of 2012-2021) to analyse convergence or divergence trends. All other chapters will include data on six selected countries: Estonia, Finland, Poland, Portugal, Spain, and Austria.

Some of the main results from the analysis:

- Working from home in European countries remained stable over 2012-2019 and increased sharply as the COVID-19 crisis hit. Increase occurred primarily due to the increasing share of people who work from home most of their working time.
- There are considerable cross-country variances in the six countries analysed in this project. Telework is most prevalent in Finland and it was the case already before the pandemic. Spain and Poland are falling behind, although increase occurred in these countries during the pandemic as well. Austria, Estonia, and Portugal fall between the two groups.
- Share of telework has increased in all 27 EU countries included in the convergence analysis and countries with low starting point have been catching up – this process accelerated particularly since 2020. Still, as telework has increased fast in many countries, variation between European countries has increased, i.e. telework is describe by upward divergence. Only exception is the ICT sector where increase in telework has been uniform and European countries have become more similar in telework patterns.
- Teleworkers are most often 35–44-year-olds and have higher education. This profile has not changed much compared to the time before the pandemic. Teleworkers tend to be younger in Estonia and fall into older age groups (35–54-year-olds) in Austria, Portugal, and Spain.
- Across economic sectors, teleworkers are younger in ICT and fall into 45+ age groups in public administration. The share of women among teleworkers is higher compared to non-teleworkers in manufacturing and particularly public administration.
- Teleworkers are mostly in high-skilled white-collar occupations and have supervisory responsibilities more often than non-teleworkers. Teleworkers do not face atypical working conditions (e.g. working in evenings or weekends).
- Working overtime tends to be more common among teleworkers than for non-teleworkers, although this has decreased slightly in last years. Still, working overtime is particularly high in Austria and Portugal while it is less common among teleworkers in Estonia. Overtime work is most common for teleworkers in the manufacturing sector while in ICT, overtime work is much less common.

2. Prevalence of telework and trends

Overall, share of employees working from home was increasingly slowly but steadily during 2012-2019 from 12% to 15% in 27 EU countries on average. A sharp turn occurred as the COVID-19 crisis hit in 2020 raising the share to 21% in 2020 and further increasing to 24% in 2021. The increase occurred mostly on the account of employees working from home most of the time as the share of employees working home sometimes has remained relatively stable even in the pandemic.

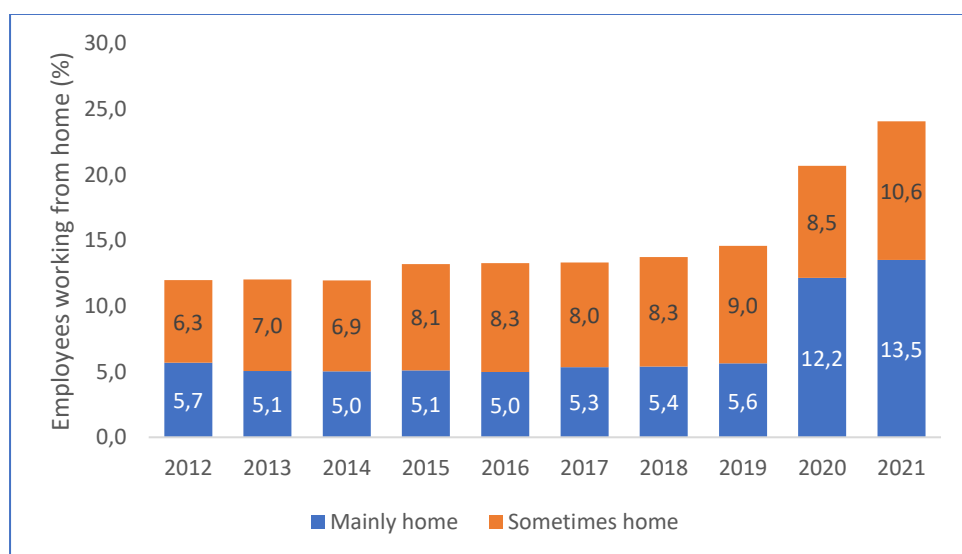


Figure 1. Employees working from home all the time or most of the time, 2012-2021, average of 27 EU countries

The six countries analysed in the current project have varying shares of teleworkers and the patterns leading up to 2021 have been somewhat different. The share of teleworkers in Finland was increasing rapidly already before the pandemic and reached as high as 41% by 2021. Estonia and Portugal have caught up with Austria by 2021 with the share of teleworkers between 25% and 29%. The share of teleworkers remains well below the average in Spain and Poland, although an increase was noticeable in these countries during the pandemic as well.

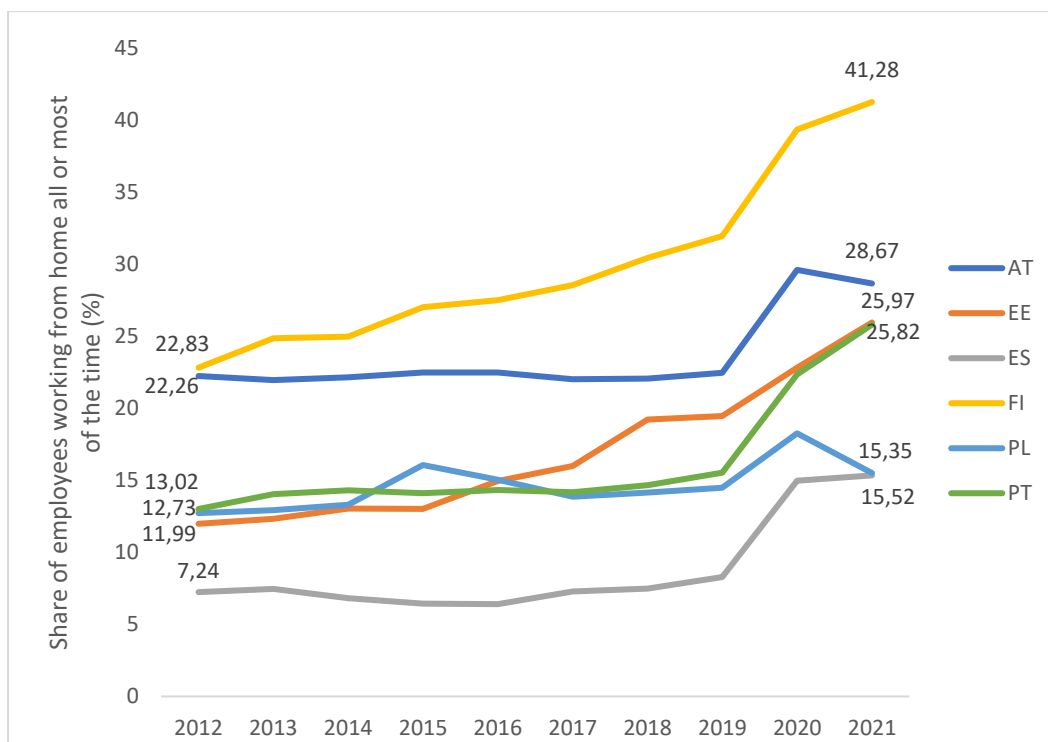


Figure 2. Employees working from home all or most of the time in 6 countries, 2012-2021

Telework patterns are very different across economic sectors as well. In the current analysis, we compare the following four sectors:

- Information and communication
- Financial and insurance activities
- Manufacturing
- Public administration and defence, compulsory social security

The share of teleworkers is the highest in ICT and finance, as would be expected. The increase in telework has also been higher in those sectors. Telework has also increased considerably in public administration but remains more modest compared to the first two sectors. Telework has also increased in manufacturing, but moderately as there are not many jobs that can be done outside the employers' premises.

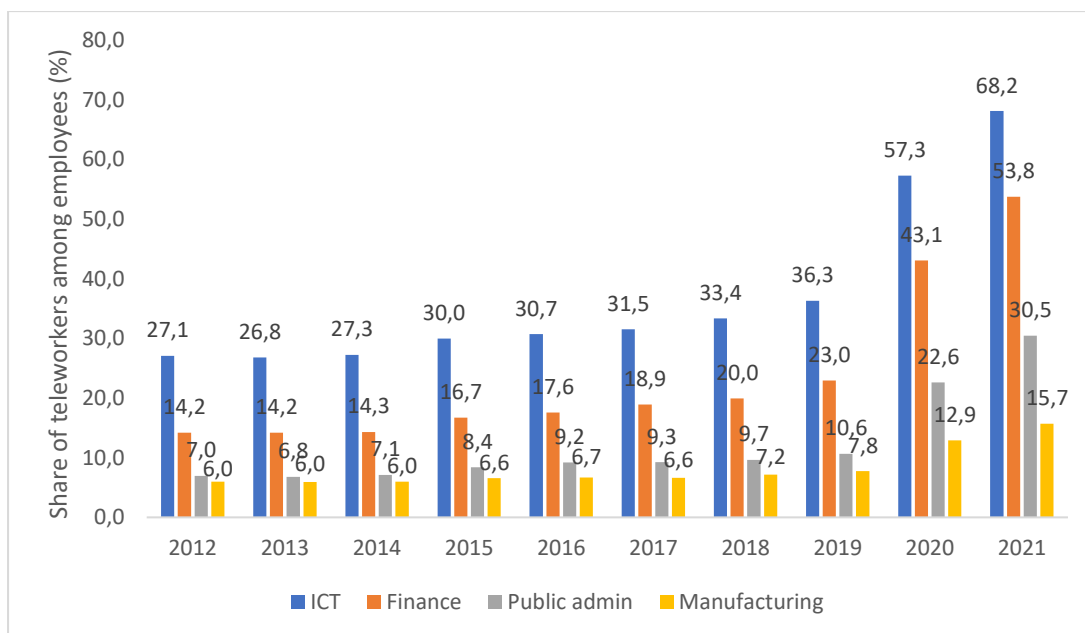


Figure 3. Share of teleworkers by economic sectors, EU-27, 2012-2021

The share of teleworkers by sectors follows largely the overall patterns. Finland is the best performer in all sectors analysed while the share of teleworkers remains the lowest in Spain and Poland. The share of teleworkers increased sharply in 2020 in all sectors. Estonia has followed a longer-term increasing trend in the sectors analysed and hence the increase in 2020 remained more modest. In Poland, the share of teleworkers in manufacturing has remained around 5-6% and there was no change in 2020.

Differences between the lowest and highest share of teleworkers are in public administration (difference 54 percentage points) and finance (43 percentage points) in 2021. Over the 10-year period differences increased in all sectors but ICT where the six countries have become more similar. The patterns of convergence across all European countries are analysed in more detail below.

2.1 Convergence

Different statistical methods exist to measure convergence. Among these, beta and sigma convergence are the most common to measure different aspects of convergence.

- Beta-convergence is used to measure whether countries starting from initially low performance levels grow faster than better-performing countries, a process referred to as ‘catching up’.
- Sigma-convergence refers to the overall reduction in disparities among countries over time and is measured by the evolution of the statistical measures of dispersion, such as the standard deviation or the coefficient of variation.

These measures of convergence are applied in the analysis to provide background information of the evolution of convergence over time. We are hereby particularly interested in the effects of the Covid pandemic which increased the use of telework across EU countries – have these changes in the world of work increased cross-country differences or have working place patterns become more similar? The analysis includes 27 EU countries to analyse convergence across Europe overall over a period of 10 years (2012-2021). We analyse convergence in two dimensions: convergence in European countries overall and convergence in selected economic sectors.

2.1.1 Convergence in telework overall

When considering the total share of teleworkers (including working from home most or some of the time), the average share increased between 2012-2021 in all 27 countries in the analysis. The mean share increased from 12% in 2012 to 24% in 2021. The indicator for beta convergence for the 10-year period is negative, indicating that countries with initially lower values on telework participation have increased more in relative terms. Data shows that the catching-up phase occurred in the Covid-period – the indicator for beta convergence is insignificant in 2012-2019 while the slope turns significant ($p < .001$) in 2019-2021 (see also Table 1). This is illustrated in the next figure.

When differentiating between two indicators of telework: the share of employees working mainly home and working sometimes home, convergence trends are relatively similar. However, a weak catching up trend is measured in the pre-Covid period for the share of people working mainly home.

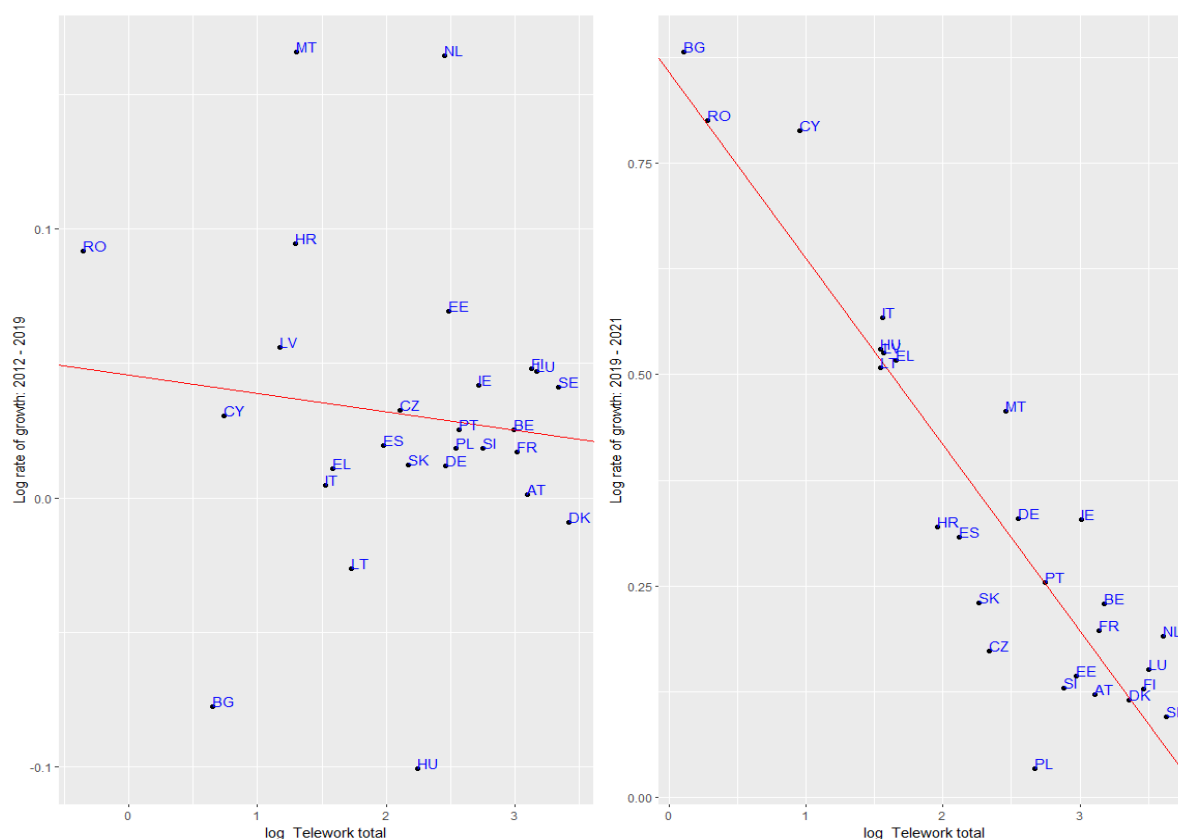


Figure 4. Unconditional beta convergence in two periods: 2012-2019 and 2019-2021, EU-27.

Table 1. Unconditional beta-convergence in 27 EU countries, by indicator, 2012-2021

	2012-2019	2019-2021	2012-2021
Working mainly home	-0.025*	-0.136***	-0.043***
Working from home sometimes	-0.005	-0.292***	-0.069***
Working mainly or sometimes home (combined indicator)	-0.004	-0.300***	-0.054***

* $P < .05$, ** $P < .01$, *** $P < .001$

The second aspect of convergence – measured by sigma convergence – shows whether the disparities between countries have increased or decreased overall. Change in the SD shows that the differences between countries are increasing overall from 2012-2021 – countries are more spread out. This is the result of increasing differences in the share of telework among those working mainly from home (Figure 5). As the standard deviation for the share of employees working sometimes home has decreased in the Covid period, cross-country differences are declining for this indicator.

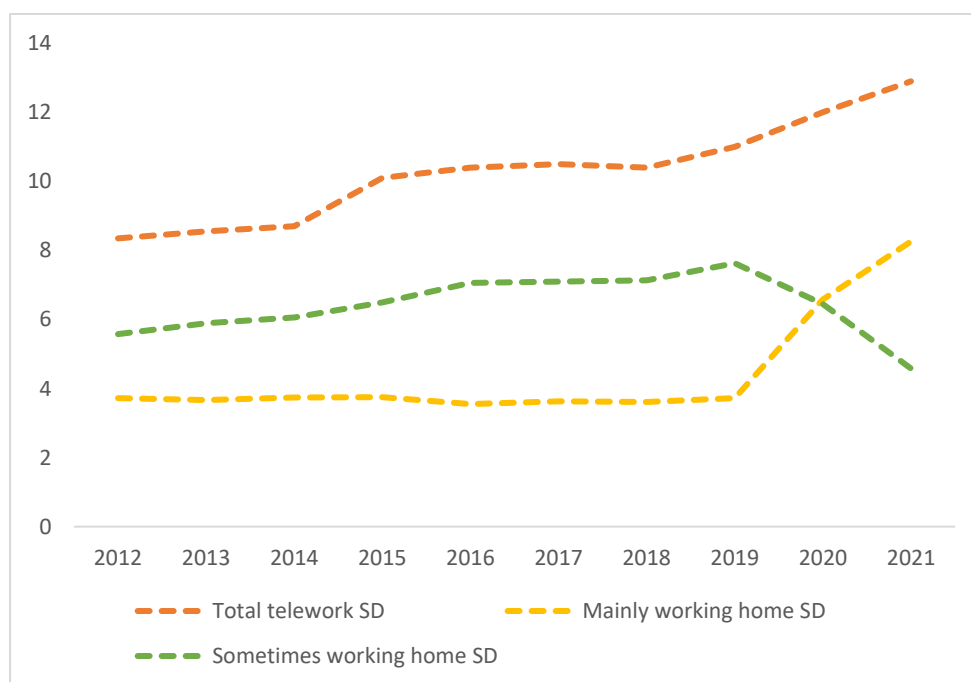


Figure 5. Standard deviation change during 2012-2021 by indicator, EU-27

Among the countries that are the focus of this study, three different convergence patterns are identified. Austria is described by a pattern of flattening, i.e. the telework participation rate grows slower in Austria than EU average but remains above the average. Portugal, Finland, and Estonia also perform above EU average while these countries are outperforming, i.e. the share of telework increases faster than the average. Spain and Poland are the only countries where telework rates remain below the EU average and the growth is slower than in the EU on average – these countries are falling behind in the overall telework increase trend.

2.1.2 Convergence in four economic sectors

Next, we will investigate the convergence patterns in four selected sectors. The number of countries included in the analysis varies by sectors due to limitations in sample size (countries where the sample size was too small in at least one of the years analysed, were excluded from the analysis)¹. Due to the small sample sizes, we will only analyse total telework (combining those working from home most of the time and some of the time).

The process of catching up where the countries with the lowest starting position have increased relatively most has occurred in all economic sectors over the ten years. Catching up has been stronger in ICT and finance sectors (see Table 2). However, this has not been the case across the whole period. Before the pandemic (in 2012-2019) beta convergence was only weakly significant in the ICT sector while catching up accelerated in all four sectors in the pandemic.

Table 2. Unconditional beta-convergence by sectors in total share of teleworkers, 2012-2021

	2012-2019	2019-2021	2012-2021
Manufacturing	-0.002	-0.119**	-0.025*
ICT	-0.032**	-0.320***	-0.080***
Finance	-0.024	-0.333***	-0.090***
Public administration	0.031	-0.223***	-0.035*

* $P < .05$, ** $P < .01$, *** $P < .001$

Cross-country differences have increased in public administration and manufacturing over the ten-year period as shown by the analysis of sigma convergence (see Figure 6). Hence, countries are diverging in telework patterns in manufacturing and public administration. Diverging trends are also observed in finance, this has been a longer trend since 2017 and there was no acceleration in divergence in the pandemic. The only sector where countries have converged in telework patterns is the ICT as was also evident in the six countries in our analysis.

¹ Countries excluded from the analysis due to small sample size include in manufacturing: Bulgaria, Cyprus, and Latvia; ICT: Bulgaria, Latvia, Romania, and Croatia; Finance: Bulgaria, Latvia, Lithuania, Romania, Croatia, Cyprus, Estonia; Public administration: Bulgaria, Latvia, Lithuania, Cyprus, Croatia, Czech Republic

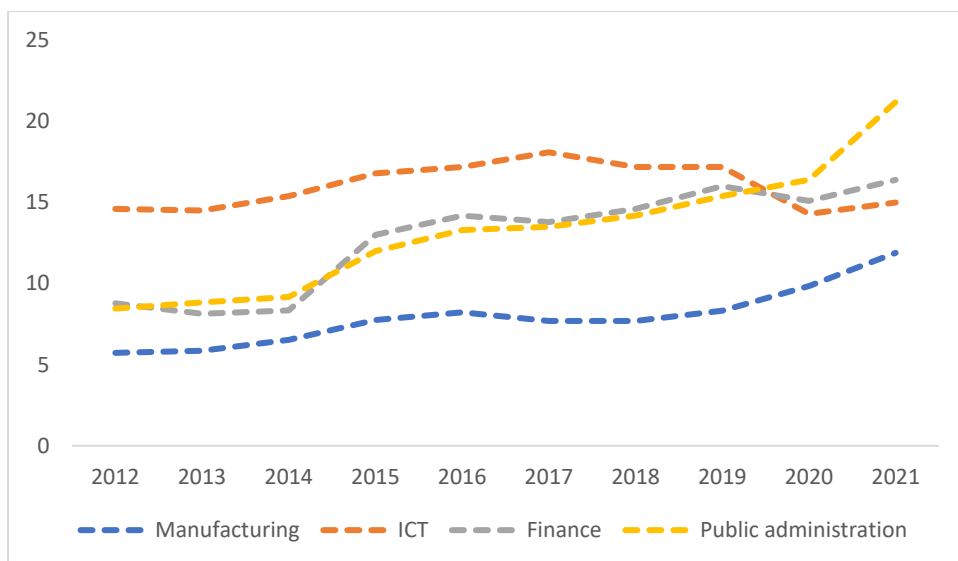


Figure 6. Standard deviation during 2012-2021 by economic sectors, EU-27

2.2 Telework profile

In this chapter, the focus will be on whether we can observe a distinct profile of teleworkers and whether this profile varies across countries or sectors under analysis. The analysis of telework profiles is based on the data of the six countries analysed in the current study. We will first investigate the socio-demographic characteristics of teleworkers.

The profile of teleworkers based on 2020-2021 combined data show that teleworkers (working mostly from home) are slightly more often women compared to those not working from home (50% compared to 45%) (see Figure 7). Teleworkers also tend to be more often in the 35-44 age groups compared to those not working from home. Thus, telework is not for those starting their careers or it is not more common among older age groups. Telework is clearly mostly used among people with higher education indicating this type of work is more accessible to certain high-level jobs. There does not seem to be a specific household profile in terms of the number of children among teleworkers.

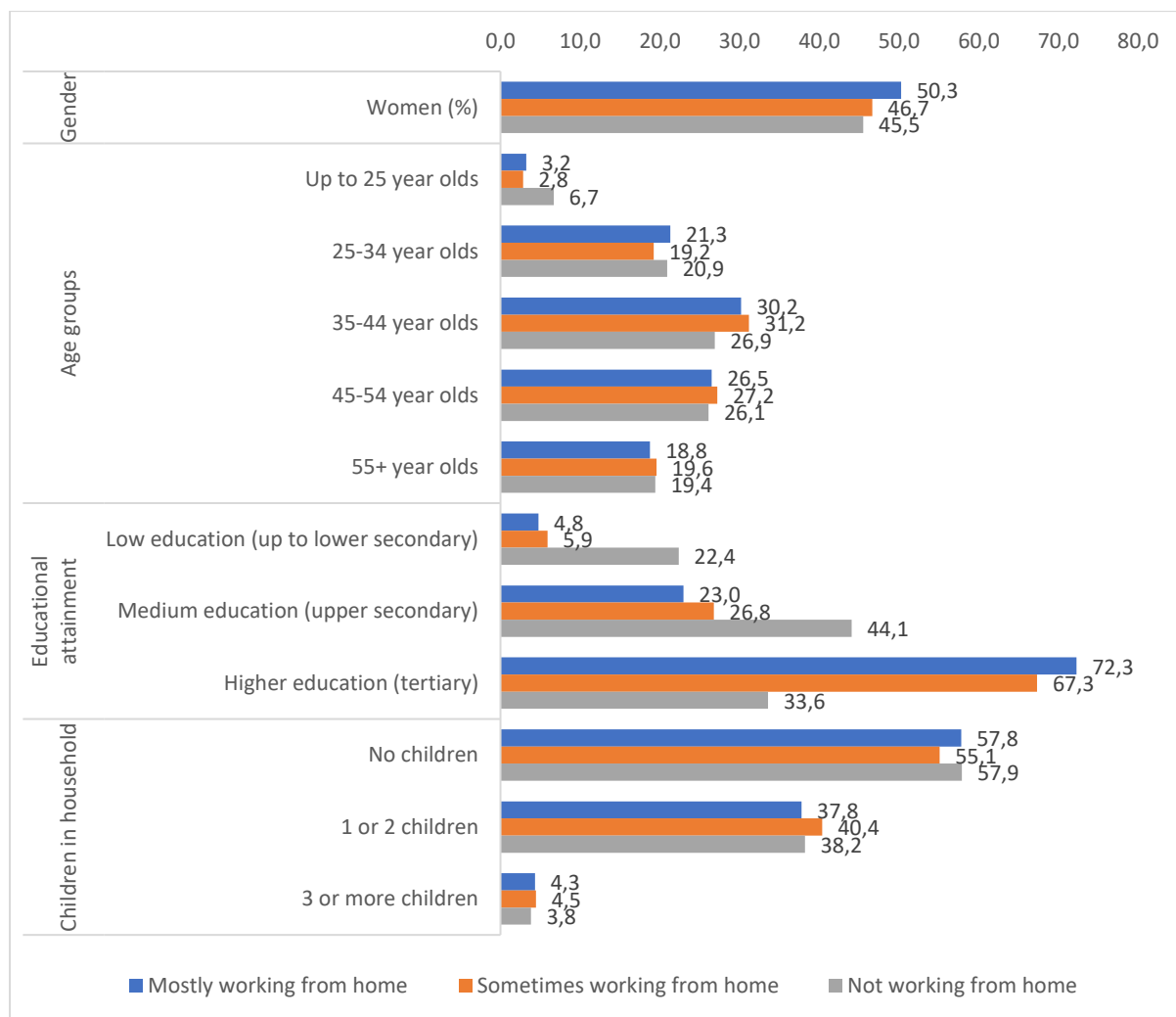


Figure 7. Socio-demographic profile of teleworkers based on 2020-2021 combined data by telework categories

To compare the teleworker profile across different units, we will follow the overall definition of teleworker, including those working from home most of the time and working from home sometimes. The overall teleworker profile has not changed much when comparing the years before the pandemic (2018-2019) and during the pandemic when telework increased (2020-2021). The share of women among teleworkers increased slightly from 45% to 49% and the share of teleworkers with higher education increased from 63% to 70%. All other profile indicators remained largely unchanged (see also Table 3 in Annex).

Teleworker profiles across the six countries have slight variations. For instance, the age profiles of teleworkers differ across countries (see Figure 8). In Austria, Portugal and Spain, teleworkers fall mostly in the 35-54 age group. In Finland and particularly Poland, 35-44-year-olds prevail among teleworkers (although in Finland the differences between age groups are smaller compared to Poland). In Estonia, teleworkers are the youngest, mostly in the 25-44 age group.

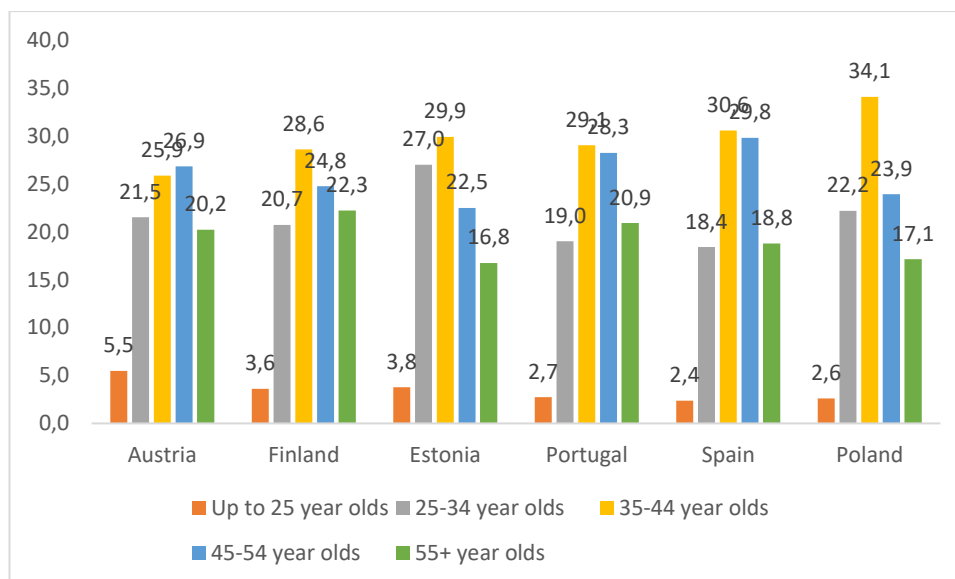


Figure 8. Age profiles of teleworkers in 2020-2021 by countries (total share of teleworkers, including working mostly and sometimes home)

In terms of educational attainment, in Spain the share of people with higher education among teleworkers is considerably higher compared to other countries (79% in Spain compared to 67-68% in the other countries). In Austria, the share of highly educated teleworkers is the lowest (62%) indicating that people with lower education have better access to teleworking options compared to other countries.

In Portugal, Estonia and Finland, the share of employees with children is higher among teleworkers compared to those not working from home. This indicates that telework might be an attractive selection for people with children in these countries.

Profiles by sector

Gender profiles of teleworkers tend to be different across economic sectors. The share of women among teleworkers is higher compared to non-teleworkers in manufacturing and particularly public administration. This might be an indication of the types of jobs done by women in these sectors (e.g. clerical work) which can be more easily done at distance. In the ICT and finance, the share of women among teleworkers is lower compared to those working at employers’ premises indicating that women in these sectors do not have as good access to telework options compare to working at the workplace (see detailed data in Table 4 in Annex).

The age profile of teleworkers in manufacturing, finance and ICT does not differ much from those not working from home in these sectors. As the ICT labour force is relatively younger compared to other sectors, the share of 25–34-year-olds among teleworkers is the highest across sectors. However, this age group is also overrepresented among non-teleworkers in the sector. In public administration, on the contrary, teleworkers tend to be older workers in 45+ age group.

Education profiles follow the patterns that are evident in all economic sectors – telework options are more accessible to people with higher education.

Teleworker profiles by sector and country are shown in tables 5-10 in Annex.

2.3 Telework jobs

Next, we will investigate the types of jobs and working conditions that teleworkers hold. First it is evident that telework is largely open for high-skilled white-collar jobs (see Figure 9). This also explains the high relevance of higher education among teleworkers if people employed in high-skilled white-collar jobs are mostly highly educated. This also coincides with the fact that teleworkers have more often supervisory responsibilities compared to non-teleworkers. While it might be possible that teleworkers face more often atypical working conditions (e.g. working in evenings or weekends), this does not reflect in our data. On the contrary – atypical working conditions are less common among teleworkers compared to non-teleworkers. It also might be the case that atypical working conditions are not part of formal work arrangements for teleworkers but working in atypical times is more random and is hence not reported as part of their work arrangement.

While full-time work is most common arrangement for both teleworkers and non-teleworkers, it is evident that teleworkers are more prone to overtime work (i.e. working more than 40 hours per week). This refers to reported usual working time hence indicating that working more than 40 hours per week is a more common arrangement among teleworkers compared to those not working from home².

When comparing the period before Covid and since the onset of the pandemic, job profiles of teleworkers have shifted slightly. Before the pandemic, telework was also more common among high-skilled blue-collar workers while since the pandemic, high-skilled white-collar workers have prevailed.

Before the pandemic, telework was mostly in the domain of medium or large companies while with the increase of telework since 2020, it has become more common among smaller enterprises as well – the share of teleworkers working in medium or large companies (more than 50 employees) has decreased from 44% in 2018-2019 to 32% in 2020-2021. It also seems that working conditions of teleworkers were worse before the onset of the pandemic as the share of people with atypical working conditions was higher (37% in 2018-2019 compared to 24% in 2020-2021) and overtime work was even more common (31% compared to 20%) (detailed data in Table 11 in Annex).

² Firm size does not differ between teleworkers and non-teleworkers

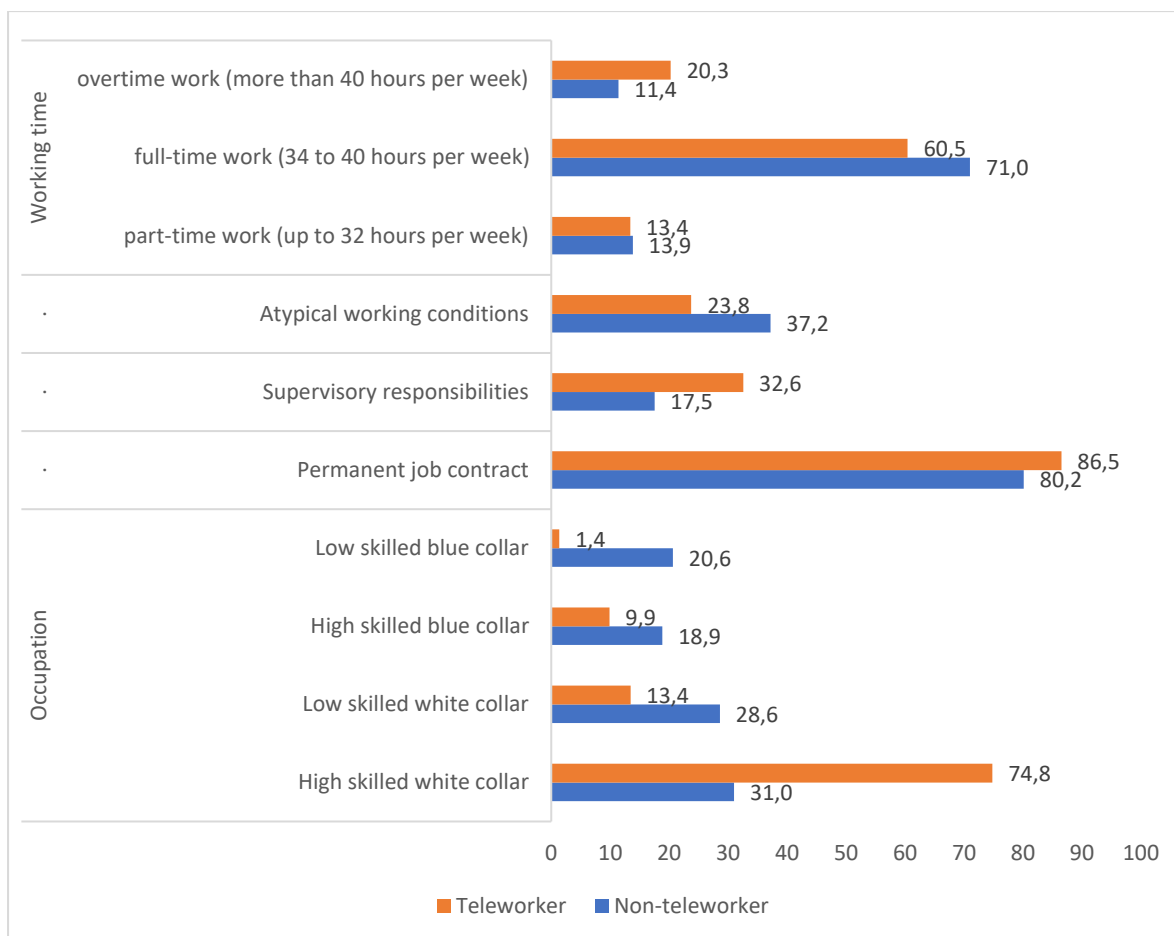


Figure 9. Working conditions of teleworkers and non-teleworkers in 2020-2021

Comparing job profiles of teleworkers across countries also shows some variations (see more detailed results in Table 11 in Annex). Overall, occupation profiles are relatively similar across countries. However, domination of high-skilled white-collar jobs among teleworkers is even more dominant in Estonia (85% of teleworkers are employed in this occupational group) and Portugal (82%). In Poland, the share of high-skilled blue-collar employees among teleworkers is the highest across countries (18%) and is comparable to the cross-country patterns before the onset of Covid.

Atypical work patterns in individual countries are like overall patterns – atypical work is less common among teleworkers compared to non-teleworkers in all countries and the share of atypical working conditions is relatively similar (from 20% in Estonia to 26% in Spain). The only country where the share of atypical working conditions is the same for teleworkers and non-teleworkers is Austria.

Working overtime is generally more common among teleworkers than non-teleworkers. An exception is Estonia where overtime work among teleworkers is low and there is no difference between teleworkers and non-teleworkers. Nevertheless, the share of people working more than 40 hours per week is particularly high in Austria and Portugal (30% among teleworkers in each).

Job profiles across economic sectors

Overall, the job profiles in the selected four economic sectors follow the same patterns that were found in all economic sectors combined. Occupation profiles of teleworkers follows the overall trend – telework is mostly accessible for high-skilled white-collar occupations. In ICT more than 90% of teleworkers fall into this category. Teleworking in blue-collar jobs in the analysed sectors is almost non-existent particularly as there are very little blue-collar workers in three of the sectors analysed (ICT, finance, and public administration). See more detailed data by economic sectors in Table 12 in Annex.

In manufacturing, finance and public administration, people working from home, work in medium or large companies more often than people not doing telework. In ICT large companies do not dominate as much and the size of firm in main job does not differ for teleworkers compared to non-teleworkers.

In all economic sectors, teleworkers have supervisory responsibilities more often than non-teleworkers. The difference with non-teleworkers is particularly large in manufacturing and public administration while in ICT and finance, supervisory responsibilities are less common.

We saw that in all economic sectors, teleworkers mostly do not face atypical working conditions. This is also the case in the selected economic sectors. In economic sectors where atypical working conditions are more prevalent (manufacturing and public administration), the difference with non-teleworkers is particularly large. In ICT and finance atypical working conditions are less common overall and so there is almost no difference between teleworkers and non-teleworkers.

In all economic sectors, teleworkers work more than 40 hours per week more often than non-teleworkers. It is surprising that overtime work is most common for teleworkers in the manufacturing sector while in ICT, overtime work is much less common (24% of teleworkers work overtime in manufacturing compared to 16% in ICT).

3. Multivariate analysis

While previous chapters provided an overview of telework patterns in terms of socio-demographic background and working conditions, we will now turn to multivariate analysis to take a more in-depth look into telework profiles when controlling for various background conditions.

The dependent variable is an overall indicator of telework, i.e. people working from home either most or some of the time. Independent variables in the analysis include socio-demographic characteristics: gender, age, education, having a child in the household; job characteristics: occupation, atypical working conditions, working time, economic sector. Finally, time (pre- or post-Covid) and country variables are added to the models. As the dependent variable is defined on a dichotomous scale, the analysis uses logistic regression models.

Estimation results (Table 13 in Annex) show that all variables included in the model remain relevant as the sample size for the combined dataset is large (more than 1 million

observations). As the average marginal effects (AME) estimations show, differences with some variables remain very small – for instance difference in probability of telework for men and women is less than 1 percentage point.

The relevance of education decreases slightly as working conditions are added to the models. As people working in highly skilled professions tend to have higher education, this partly explains the relevance of education among teleworkers. When all background other variables are controlled (model 4), people with higher education still have 14% higher probability for teleworking.

In the regression model as well, working overtime remains relevant among teleworkers. In model 4, people working overtime are 8% more likely to do telework compared to those working part time.

Sectoral differences also remain relevant when controlling for background conditions. Compared to manufacturing sector, people employed in all other sectors are more likely to do telework (AME estimates are positive). Differences are largest compared to ICT.

In the final model, countries are added to the analysis. Compared to Austria, telework is more likely only in Finland while it remains lower in all other countries.

4. Conclusion

As the COVID-19 crisis hit in 2020, telework became increasingly popular in all EU countries and across most of economic sectors. The share of people working most of their working time from home offices increased fast and remained high through 2021 as well. Analysis of convergence between 27 EU countries shows that countries that had initially very low shares of teleworkers (e.g. Bulgaria, Romania, Cyprus, Italy etc.) increased more in relative terms catching up to the rest of the EU countries (i.e. increase was faster in the initially low-performing countries). This process of catching up especially accelerated in the Covid years and occurred in all economic sectors analysed for this study although to a varying extent. At the same time, cross-country differences among the EU-27 countries are increasing as the best performing countries are also increasing fast, increasing the overall differences between EU countries. Among the countries analysed for this study, for instance Portugal, Finland and Estonia perform above EU average and the share of telework increases faster than the average – these countries are among those outperforming the overall trend. The only sector where countries have converged in telework patterns (i.e. telework participation has become more similar over ten years) is the ICT.

When comparing teleworkers to people not working from home, the share of women is slightly higher. Gender composition of teleworkers differs across sectors – women have better access to telework in manufacturing and public administration while in ICT and finance, the share of women is lower among teleworkers compared to those working from employers' premises. The 35-44 age group prevails among teleworkers. Thus, telework is not for those

starting their careers or in the older age groups while it is most common among mid-career professionals. Teleworkers are overwhelmingly more often highly educated suggesting that this type of work is more accessible to certain high-level jobs. Despite the fast increase in the number of teleworkers since 2020, the overall profile of teleworkers has largely remained unchanged.

One of the aims of this study was also to take a more in-depth look at the working conditions among teleworkers compared to the conditions of those working at the employers' premises. Telework is mostly accessible to high-skilled white-collar jobs – in ICT more than 90% of teleworkers fall under this category of workers. This also coincides with the fact that teleworkers have more often supervisory responsibilities compared to non-teleworkers.

An interesting result that deserves a more in-depth look is that teleworkers do not seem to report atypical working conditions (i.e. working evenings/nights or weekends) more often than non-teleworkers. It might be the case that atypical working conditions are not part of formal work arrangements for teleworkers but working in atypical times is more random and is hence not reported as part of their typical work arrangement. Hence, it would be interesting to see more qualitative results on how working arrangements are agreed in case of teleworkers or whether working in atypical time would be considered an agreement between the employer and employee or it would rather be considered as the sole responsibility of the employee.

While full-time work is most common arrangement for both teleworkers and non-teleworkers, it is evident that teleworkers are more prone to overtime work (i.e. working more than 40 hours per week). It is surprising that overtime work is most common for teleworkers in the manufacturing sector while in ICT, overtime work is much less common.

Overall, analysis of the Labour Force Survey data gives an overall picture of telework in EU countries and the selected sectors for this study. For a more in-depth look into the working conditions and arrangements for teleworkers, further qualitative information is necessary. Also, qualitative analysis would give more context to interpret the results of the statistical analysis.

5. Annex

Table 3. Teleworker socio-demographic profiles across different dimensions

		Time		Countries					
		Before Covid	After Covid	Austria	Finland	Estonia	Portugal	Spain	Poland
Gender	Women (%)	44.9	48.8	46.4	46.7	52.7	51.6	47.8	50.1
Age groups	Up to 25-year-olds	2.6	3.1	5.5	3.6	3.8	2.7	2.4	2.6
	25–34-year-olds	18.6	20.4	21.5	20.7	27.0	19.0	18.4	22.2
	35–44-year-olds	30.8	30.6	25.9	28.6	29.9	29.1	30.6	34.1
	45–54-year-olds	27.6	26.8	26.9	24.8	22.5	28.3	29.8	23.9
	55+ year olds	20.5	19.1	20.2	22.3	16.8	20.9	18.8	17.1
Educational attainment	Low education (up to lower secondary)	7.8	5.2	4.0	4.4	2.4	9.6	7.5	2.1
	Medium education (upper secondary)	28.8	24.5	33.8	28.4	29.7	22.2	13.9	30.9
	Higher education (tertiary)	63.4	70.2	62.2	67.2	67.9	68.2	78.6	67.0
Children in household	No children	55.3	56.7	63.1	60.2	54.9	53.4	58.5	52.1
	1 or 2 children	39.4	38.9	32.2	32.8	38.8	43.8	38.1	43.0
	3 or more children	5.1	4.4	4.7	7.0	6.3	2.8	3.4	4.9

Table 4. Teleworker and non-teleworker socio-demographic profiles by economic sectors, 2020-2021

		Manufacturing		ICT		Finance		Public administration	
		Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker
Gender	Women (%)	30.5	37.8	34.7	29.0	59.2	48.8	44.1	60.9

Age groups	Up to 25-year-olds	6.74	3.31	7.95	4.93	5.07	3.4	2.93	1.77
	25–34-year-olds	21.62	19.65	30.26	32.59	20.61	21.19	14.94	11.86
	35–44-year-olds	28.9	33.07	30.28	33.28	32.63	34.18	29.38	26.58
	45–54-year-olds	26.97	26.83	22.01	21.61	27.02	27.51	28.78	32.68
	55+ year olds	15.78	17.14	9.5	7.59	14.67	13.71	23.96	27.11
Educational attainment	Low education (up to lower secondary)	22.29	5.22	4.59	1.85	4.34	2.07	11.54	2.07
	Medium education (upper secondary)	52.86	27.74	26.56	18.64	25.3	21.41	34.9	20.39
	Higher education (tertiary)	24.83	67.04	68.84	79.51	70.36	76.51	53.55	77.54
Children in household	No children	56.43	54.32	58.9	58	53.09	53.83	56.52	58.39
	1 or 2 children	39.62	40.99	37.83	38.52	42.6	42.19	40.68	37.96
	3 or more children	3.95	4.69	3.27	3.48	4.32	3.97	2.8	3.66

Table 5. Teleworker and non-teleworker socio-demographic profiles by economic sectors, 2020-2021, Austria

		Manufacturing		ICT		Finance		Public administration	
		Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker
Gender	Women (%)	25.9	29.7	39.9	29.5	59.6	43.4	47.4	56.2
Age groups	Up to 25-year-olds	13.25	5.63	15.12	5.75	10.99	5.05	8.14	4.93
	25–34-year-olds	22.88	23.92	29.69	30.11	17.83	19.11	19.72	18.09
	35–44-year-olds	23.16	29.2	24.3	26.64	18.36	25.03	19.78	25.62
	45–54-year-olds	25.78	24.08	16.58	23.71	29.31	32.32	30.5	29.95
	55+ year olds	14.93	17.17	14.3	13.79	23.5	18.49	21.86	21.42

Educational attainment	Low education (up to lower secondary)	16.19	2.62	8.98	3.06	7.01	1.34	9.94	2.92
	Medium education (upper secondary)	61.23	29.67	41.14	26.95	44.33	39.18	61.12	40.18
	Higher education (tertiary)	22.58	67.71	49.89	7.0	48.66	59.48	28.94	56.9
Children in household	No children	62.2	61.36	63.68	66.65	63.06	60.06	66.5	64.14
	1 or 2 children	33.14	34.24	33.34	29.81	33.43	34.88	30.93	32.56
	3 or more children	4.66	4.41	2.98	3.53	3.5	5.06	2.58	3.3

Table 6. Teleworker and non-teleworker socio-demographic profiles by economic sectors, 2020-2021, Finland

		Manufacturing		ICT		Finance		Public administration	
		Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker
Gender	Women (%)	23.14	33.01	34.35	29.28	70.47	48.96	42.91	64.26
Age groups	Up to 25-year-olds	10.59	...	...	3.73	...	...	...	...
	25–34-year-olds	20.17	19.95	32.04	26.13	24.7	26.91	21.45	19.6
	35–44-year-olds	22.4	31.72	26.82	32.34	...	31.68	23.22	27.58
	45–54-year-olds	23.71	26.81	15.91	21.95	16.6	21.05	23.61	27.51
	55+ year olds	23.12	19.54	16.45	15.85	39	15.64	25.64	23.93
Educational attainment	Low education (up to lower secondary)	10.71	2.65	...	...	...	...	...	...
	Medium education (upper secondary)	70.85	27.22	39.16	27.22	25.31	24.02	43.58	16.36
	Higher education (tertiary)	17.93	70.13	54.93	71.34	71.2	74.94	53.25	82.06

Children in household	No children	67.16	55.45	69.14	61.72	74.06	59.13	62	63.28
	1 or 2 children	26.13	37.33	24.84	32.83	22.77	35.52	31.89	30.88
	3 or more children	6.71	7.23	...	5.45	...	...	6.11	5.84

... sample size >20

Table 7. Teleworker and non-teleworker socio-demographic profiles by economic sectors, 2020-2021, Estonia

		Manufacturing		ICT		Finance		Public administration	
		Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker
Gender	Women (%)	39.21	43.65	32.98	36.08	63.35	58.95	43.83	69.07
Age groups	Up to 25-year-olds	4.85	4.07	10.68	7.1	...	...	6.93	...
	25–34-year-olds	23.3	25.21	38.43	38.81	29.88	38.41	22.62	22.04
	35–44-year-olds	24	32.32	28.61	34.91	21.83	29.1	23.7	33.5
	45–54-year-olds	23.44	26.4	14.59	12.58	27.46	19.55	25.68	24.96
	55+ year olds	24.42	12.01	7.69	6.59	16.9	9.48	21.07	17.35
Educational attainment	Low education (up to lower secondary)	15.33	4.18	...	...	...	...	2.23	...
	Medium education (upper secondary)	62.31	38.49	40.1	34.82	30.81	16.99	44.35	13.6
	Higher education (tertiary)	22.36	57.32	57.22	63.6	68.91	83.01	53.42	86.24
Children in household	No children	62.91	48.35	66.55	57.43	54.46	60.05	59.46	53.73
	1 or 2 children	31.43	44.65	28.51	36.95	41.56	34.53	35.09	42.5
	3 or more children	5.66	7	4.93	5.62	...	5.42	5.45	3.77

Table 8. Teleworker and non-teleworker socio-demographic profiles by economic sectors, 2020-2021, Portugal

		Manufacturing		ICT		Finance		Public administration	
		Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker
Gender	Women (%)	39.6	39.56	37.4	34.58	45.63	43.15	35.61	54.71
Age groups	Up to 25-year-olds	6.41	3.44	6.67	5.09	5.45	...	3.9	...
	25–34-year-olds	20.73	18.94	32.76	37.9	15.41	15.19	11.84	10.99
	35–44-year-olds	26.32	33.4	21.85	27.3	27.78	33.71	25.45	22.69
	45–54-year-olds	28.72	29.09	25.3	23.42	36.09	32.33	32.57	36.07
	55+ year olds	17.81	15.13	13.42	6.28	15.27	16.26	26.24	28.82
Educational attainment	Low education (up to lower secondary)	57.29	16.04	12.4	3.41	6.7	5.7	29.87	4.24
	Medium education (upper secondary)	31.94	27.59	44.9	25.44	44.73	31.16	48.99	28.38
	Higher education (tertiary)	10.77	56.37	42.69	71.15	48.58	63.13	21.14	67.38
Children in household	No children	56.76	52.8	59.1	57.06	50.61	46.31	58.17	53.12
	1 or 2 children	41.94	42.61	37.85	42.04	46.61	51.19	40.93	45.48
	3 or more children	1.3	4.59	...	...	...	...	...	1.41

Table 9. Teleworker and non-teleworker socio-demographic profiles by economic sectors, 2020-2021, Spain

		Manufacturing		ICT		Finance		Public administration	
		Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker
Gender	Women (%)	26.77	42.69	33.75	30.5	53.28	50.03	40.86	60.29
Age groups	Up to 25-year-olds	4.38	3.08	6.06	5.87	2.85	...	1.76	...
	25–34-year-olds	18.51	13.11	25.12	27.27	16	20.26	9.85	4.18

	35–44-year-olds	31.51	33.6	31.57	32.64	33	31.4	25.51	19.17
	45–54-year-olds	30.22	31.32	27.25	27.11	32.66	33.31	32.72	37.76
	55+ year olds	15.38	18.89	10.01	7.11	15.49	12.82	30.16	37.98
Educational attainment	Low education (up to lower secondary)	37.34	7.54	5.42	2.46	7	3.58	17.37	2.35
	Medium education (upper secondary)	24.87	18.64	19.79	12.62	15.98	12.78	28.14	14.56
	Higher education (tertiary)	37.79	73.81	74.79	84.92	77.02	83.63	54.49	83.09
Children in household	No children	56.32	54.29	59.62	58.82	53.04	52.52	61.89	65
	1 or 2 children	40.39	42.77	37.65	37.6	42.12	44.12	36.33	31.41
	3 or more children	3.29	2.95	2.73	3.58	4.84	3.36	1.79	3.59

Table 10. Teleworker and non-teleworker socio-demographic profiles by economic sectors, 2020-2021, Poland

		Manufacturing		ICT		Finance		Public administration	
		Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker
Gender	Women (%)	32.05	39.08	34.66	23.72	68.15	51.78	49.48	66.63
Age groups	Up to 25-year-olds	7.18	2.6	9.5	3.71	6.21	3.75	2.76	...
	25–34-year-olds	23.95	23.96	37.12	39.99	27.43	23.21	20.53	14.03
	35–44-year-olds	29.23	35.68	31.57	39.26	37.64	42.37	37.81	39.02
	45–54-year-olds	24.71	22.61	15.38	13.7	18.47	19.63	22.87	28.46
	55+ year olds	14.93	15.15	6.45	3.33	10.24	11.04	16.03	17.2
Educational attainment	Low education (up to lower secondary)	4.94	0.83	...	...	...	...	0.91	...
	Medium education (upper secondary)	75.54	36.36	28.49	15.77	28.76	16.94	33.7	12.61

	Higher education (tertiary)	19.53	62.81	70.61	84.06	71.06	83.06	65.39	87.33
Children in household	No children	54.41	50.1	55.44	52.89	50.24	53.27	46.75	47.2
	1 or 2 children	40.9	44.48	40.72	43.6	45.55	42.54	48.91	48.33
	3 or more children	4.69	5.42	3.85	3.51	4.21	4.18	4.34	4.47

Table 11. Teleworker job profiles across different dimensions

		Before Covid	Since Covid	Austria	Finland	Estonia	Portugal	Spain	Poland
Occupation	High skilled white collar	69.86	74.8	71.35	77.53	85.15	81.54	76.02	70.66
	Low skilled white collar	10.6	13.4	16.53	11.65	8.09	12.7	17.4	9.12
	High skilled blue collar	16.74	9.9	10.36	7.27	4.85	4.07	5.18	18.37
	Low skilled blue collar	2.45	1.4	1.65	2.47	1.47	1.12	1.24	1.09
Size of firm	Microenterprises (up to 10 employees)	39.66	39.57	37.82	41.51	40.56	31.74	39.55	43.26
	Small enterprises (11 to 49 employees)	16.14	28.17	24.56	30.43	28.86	31.07	25.85	30.18
	Medium or large enterprises (50 or more employees)	44.2	32.26	37.63	28.07	30.58	37.19	34.6	26.56
	Permanent job contract	85.81	86.5	91.95	87.52	98.69	83.01	83.45	87.74
	Supervisory responsibilities	37.26	32.6	33.79	30.04	42.46	43.72	30.21	28.76
	Atypical working conditions	37.1	23.8	20.04	25.65	19.79	24.48	26.44	21.8
Working time	part-time work (up to 32 hours per week)	16.01	13.4	26.28	14.76	14.14	8.79	13.21	11.68
	full-time work (34 to 40 hours per week)	53	60.5	43.38	68.11	78.39	61.45	67.31	69.97
	overtime work (more than 40 hours per week)	30.99	20.3	30.34	17.12	7.48	29.76	19.49	18.35

Table 12. Teleworker job profiles by economic sectors

		Manufacturing		ICT		Finance		Public administration	
		Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker	Non-teleworker	Teleworker
Occupation	High skilled white collar	25.1	73.29	79.14	93.38	67.05	82.24	45.51	78.47
	Low skilled white collar	9	10.43	13.66	5.55	30.36	17.32	32.89	17.4
	High skilled blue collar	35.6	13.67	4.46	0.73	0.42		3.77	
	Low skilled blue collar	29.91	2.43	2.41	0.23	1.79		8.26	
Size of firm	Microenterprises (up to 10 employees)	24.44	27.57	32.69	29.74	48.41	28.77	19.16	15.81
	Small enterprises (11 to 49 employees)	34.38	25.61	28.66	31.12	21.46	25.22	37.58	34.9
	Medium or large enterprises (50 or more employees)	41.17	46.81	38.66	39.13	30.13	46.02	43.26	49.3
	Permanent job contract	84.73	92.75	84.83	87.74	91.29	91.45	84.57	87.54
Working time	Supervisory responsibilities	19.66	43.48	27.01	32.77	26.63	30.77	26.02	36.27
	Atypical working conditions	38.88	14.35	18.88	16.04	9.08	11.25	26.88	13.15
	part-time work (up to 32 hours per week)	4.43	8.31	9.91	8.5	7.86	9.05	5.83	6.34
	full-time work (34 to 40 hours per week)	86.6	67.96	80.64	75.66	81.14	72.99	89.63	82.74
	overtime work (more than 40 hours per week)	8.97	23.73	9.45	15.84	11	17.96	4.54	10.92

Table 13. Average marginal effects, estimation results in logistic regression analysis

	M1	M2	M3	M4
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Women (Ref: men)	-0.018***	-0.005***	-0.005***	-0.002**
Age	0.002***	0.002***	0.002***	0.002***
Education (ref: low education)				
Medium education	0.056***	0.044***	0.041***	0.036***
Tertiary education	0.262***	0.143***	0.140***	0.144***
Children in household (ref: no children)				
1 or 2 children in HH	0.008***	0.008***	0.008***	0.015***
3 or more children in HH	0.033***	0.032***	0.031***	0.030***
Occupation (ref: high-skilled white-collar)				
Low-skilled white-collar		-0.162***	-0.163***	-0.156***
High-skilled blue-collar		-0.105***	-0.105***	-0.091***
Low-skilled blue-collar		-0.235***	-0.235***	-0.227***
Atypical working conditions (ref: no atypical work)		0.010***	0.013***	0.018***
Working time (ref: part-time work)				
Full-time work		-0.070***	-0.071***	-0.045***
Overtime work		0.076***	0.077***	0.085***
Sector (ref: manufacturing)				
ICT		0.229***	0.229***	0.230***
Finance		0.115***	0.116***	0.116***
Public administration		0.008***	0.008***	0.011***
All other economic sectors		0.065***	0.065***	0.068***
Time (ref: 2008-2009)				

2020-2021			0.042 ^{***}	0.044 ^{***}
Country (ref: AT)				
EE				-0.023 ^{***}
ES				-0.125 ^{***}
FI				0.071 ^{***}
PL				-0.087 ^{***}
PT				-0.043 ^{***}
N of cases	1,274,051	1,190,106	1,190,106	1,190,106
Pseudo R-squared	0.0841	0.1792	0.1828	0.2025

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$