Post-COVID developments in remote work, migrations, and self-employment in the EU

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Deliverable: D4.4

Due date: 12.2024

Document control sheet

Project Number:	**101061388**
Project Acronym:	WeLaR
Work-Package:	4
Last Version:	18.12.2024
Issue Date:	[ ]

Classification

Draft	
Final	X
Confidential	
Restricted	
Public	X

Legal notice

This project, WeLaR, has received funding under the Horizon Europe programme. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

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Abstract

This report examines the post-COVID surge in remote work and its impact on labour relations and cross-border employment. We document variations in remote work adoption, with Western and Northern European countries showing both higher prevalence of remote work in 2019 and greater increases from 2019 to 2022. We find that the surge in remote work opportunities has not led EU employees to change their workplace country while remaining in their home country. Similarly, we do not find evidence on the impact of remote work opportunities on the prevalence of self-employment. We also examine international migration patterns of remote workers, considering both destination and origin countries. Although digital nomads became visible in labour market statistics after the pandemic, their numbers remain relatively small, not exceeding 0.2% of the domestic workforce in host countries (except Luxembourg). Furthermore, for most countries, we find no evidence of significant emigration of high-skilled workers capable of working remotely.

1. Introduction

The COVID-19 pandemic brought profound changes to European labor markets, reshaping how and where people work. One of the most significant shifts was the widespread adoption of remote work, as businesses and employees adapted to lockdowns and social distancing measures. While the work-from-home (WFH) model was initially seen as a temporary solution, it has persisted in many sectors, with some occupations experiencing a substantial surge in remote work opportunities.

There is limited evidence on the fiscal consequences of the surge in WFH, such as the rise in cross-border work or the increase in precarious forms of employment. Theoretical studies indicate that migration and working from home alter the optimal tax policies to be pursued by the governments (Agrawal & Brueckner, 2022). Governments attracting digital nomads may engage in a race to the bottom, resulting in negative social effects (Agrawal & Stark, 2022). In particular, the possibility of levying different taxes on natives and migrants may result in very attractive tax schemes for immigrants (Guerreiro et al., 2020). However, the wide adoption of such schemes would be welfare-reducing, causing redistribution from low-skilled to high-skilled workers (de Sousa & Teles, 2023).

In this report, we document the evolution of WFH and highlight important heterogeneities between occupations and EU countries. We study three potential labour market adjustments associated with increased WFH. First, we focus on individuals staying in their country of nationality while working for companies based in other countries. The share of employees working remotely for a foreign company increased in the EU from 0.04% in 2019 to 0.13% in 2021. However, the overall share of employees having a main job abroad did not increase. In the econometric analysis, we confirm that occupation-specifc WFH opportunities did not cause an increase in cross-border employment.

Second, WFH may influence the prevalence of self-employment. On the one hand, some workers become more detached from firms, and may loosen their relationship with the employer. On the other hand, WFH opportunities may increase the attractiveness of employment contracts for those who value flexibility. At the EU level, there was no lasting increase in the share of self-employment after the COVID-19 pandemic. However, the situation varies by country, with Belgium, Ireland, and France witnessing noticeable increases. Our analysis reveals that occupation-specific WFH opportunities did not contribute to higher self-employment prevalence. Instead, we find a weak negative relationship between WFH opportunities and self-employment.

Third, some EU citizens may relocate to other countries with better living conditions or more favourable tax systems. More than half of the EU countries offer tax incentives for immigrants. While Northern EU countries restrict such incentives to immigrants who work for domestic employers, Southern EU countries often provide attractive tax schemes for digital nomads who earn income from foreign sources. The EU-LFS data indicates that several countries, mainly Luxembourg, Austria, Belgium, and Malta, saw noticeable inflows of digital nomads relative to their domestic labor forces. These inflows were especially significant in Luxembourg but remained generally small in other countries, not exceeding 0.2% of the domestic workforce. However, a key limitation of the EU-LFS data is the potentially low response rate among immigrants, which could affect the accuracy of these estimates. Consequently, while the observed trends are informative, they should be interpreted with caution, as the data may not fully capture the scale of the phenomenon.

We further examine potential relocations of labour supply by tracking developments in the educational structure of tertiary-educated people in their countries of origin. We argue that any significant emigration of high-skilled workers would be reflected in a lower share of people with a given field of education than expected based on data from previous years. Due to data availability, this analysis is limited to 14 EU countries and to the population aged 26–34. In some countries, we detect developments that may reflect emigration of high-skilled employees who can work remotely. This is the case for arts and humanities specialists in Romania and Austria, as well as business administration and law specialists in Denmark, Italy, and Lithuania. In contrast, we do not find any indications that a significant number of ICT specialists might have emigrated from countries in our sample. However, these findings should be interpreted with caution and validated with country-specific administrative data.

2. Data and definitions

We base our report on the EU labour force survey (EU-LFS). It is a harmonised, large-scale survey designed to provide comprehensive and comparable data on labour market conditions across the European Union. It adheres to standardised definitions and methodologies established by Eurostat, ensuring consistency and reliability in the data collected. The survey captures a wide range of information on the labour force, including its demographic, educational, and occupational structure.

In the EU-LFS survey, employed respondents report whether they work from home "mainly," "sometimes," or "never." We focus on the first category, which indicates working from home for at least half of the reference period. Jobs primarily performed from home have the potential to be done from abroad. Therefore, the term "WFH employees" in this report refers to persons working mainly from home.

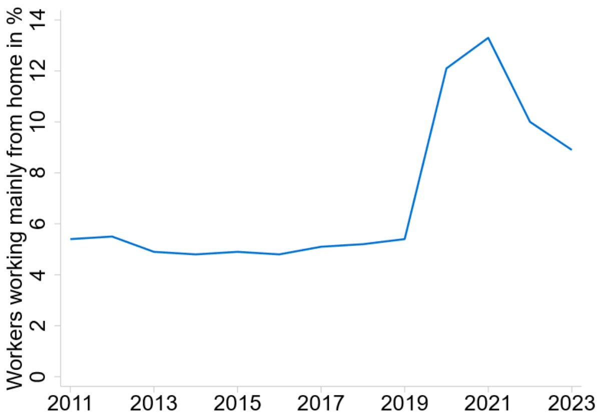
Each employee is classified into an occupation group, in line with the International Standard Classification of Occupations (ISCO). For descriptive analysis, we utilise sub-major (2-digit level) occupation groups. Although the classification contains 43 sub-major groups, we exclude agricultural workers, who form three of these groups. Agricultural workers often declare working from home, but this is not the telework popularised during the COVID-19 pandemic. For the econometric analysis, we use more detailed minor occupation groups (3-digit level). There are 121 non-agricultural minor occupation groups.

We define workers with a workplace abroad, or working for a foreign employer, as those whose country of work for their main job differs from the country in which they reside (and in which they are covered by the survey). In section four, we focus on persons whose nationality matches their country of residence. Individuals with foreign nationality who work from home with a workplace abroad are denoted as digital nomads. They are the focus of section seven.

3. Evolution of work from home

In this section, we analyze changes in WFH patterns across EU countries. Before 2019, the fraction of workers working from home in the EU was around 5% (Figure 1). In the pandemic year of 2020, it surged from 5.4% to 12.2%. It further increased to 13.6% in 2021 and fell to 10.5% in 2022.

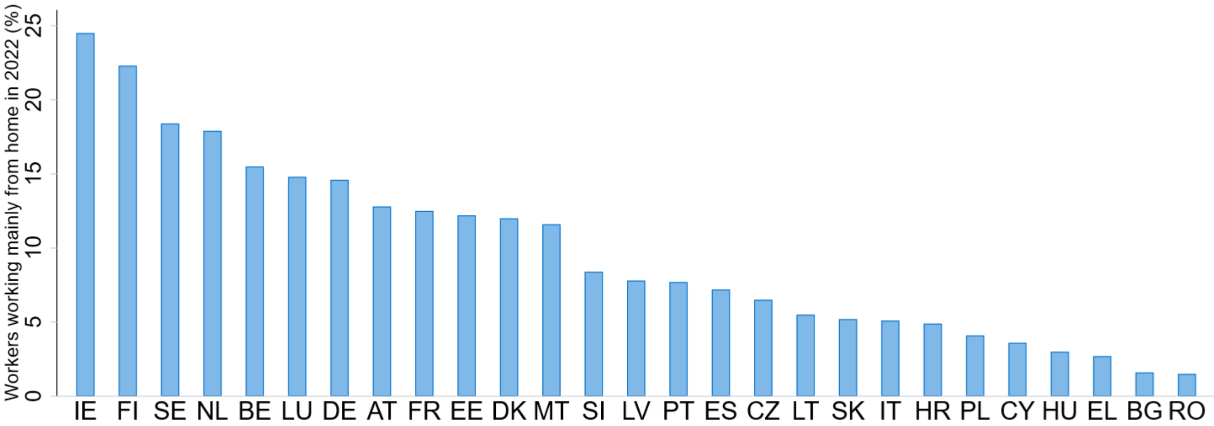
Figure 1. Work from home in the EU, 2011- 2023



Source: own elaboration based on Eurostat data

The prevalence of WFH varies significantly across countries (Figure 2). Europe is notably divided, with higher shares of employees working from home in Western and Northern countries, exceeding the EU average of 10.5%. In 2022, the highest proportions of employees primarily working from home were in Ireland (25%) and Finland (23%). In contrast, Southern, Central, and Eastern European countries generally had WFH rates below the EU average, with exceptions of Estonia and Malta. The lowest shares were observed in Greece (3%), Bulgaria (2%), and Romania (2%). One reason for the regional heterogeneity when it comes to WFH are the differences in employment structures between the countries. As shown by Sostero et al.(2020), countries with a higher share of white-collar occupations have also a higher share of teleworkable jobs.

Figure 2. Work from home by country in 2022

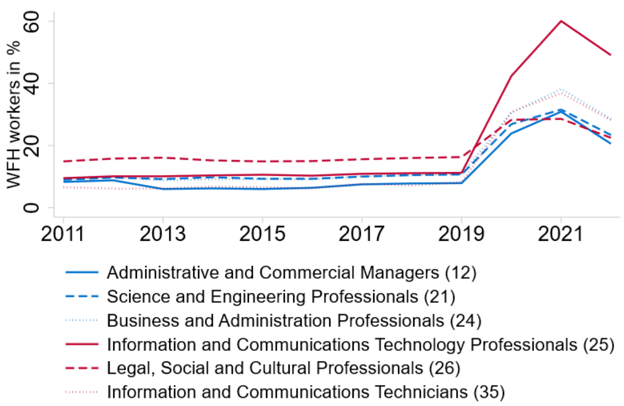


Source: own elaboration based on the EU-LFS

The top six occupation groups in terms of WFH prevalence as of 2022 were:

- Information and Communications Technology Professionals (42%),
- Business and Administration Professionals (25%),
- Information and Communications Technicians (24%),
- Legal, Social and Cultural Professionals (21%),
- Science and Engineering Professionals (20%),
- Administrative and Commercial Managers (20%).

Figure 3. Work from home in top 6 occupation groups in the EU between 2011 and 2022



Source: own elaboration based on the EU-LFS

Before 2019, most of these occupation groups had higher-than-average rates of WFH (6% - 14%), and all have experienced a significant rise in the share of remote work between 2019 and 2022 (Figure 3). Most occupation groups followed the path of a sharp rise in 2020, continued growth in 2021, and a slight decline in 2022. Information and Communications Technology Professionals recorded the highest increase between 2019 and 2021, from 10% to 51%. The occupation group with relatively modest growth was Legal, Social and Cultural Professionals, for which, already in the pre-COVID years, 14% of workers worked from home.

Apart from the top six occupation groups outlined above, a high increase was also observed for Science and Engineering Professionals (from 9% to 20%) and Business and Administration Associate Professionals (from 7% to 17%, see Table 1). Notably, even occupations with low WFH prevalence in 2019 saw a meaningful increase compared to pre-COVID levels. For instance, the share of Customer Service Clerks working from home rose from 3% in 2019 to 12% in 2022. Similarly, Other Clerical Support Workers saw an increase from 2% to 7%, while Numerical and Material Recording Clerks recorded a rise from 3% to 10%. In 17 occupation groups there has been no increase in the share of WFH workers. These are mostly occupations with high content of manual tasks. Noteworthy, 15% of teaching professionals worked from home in 2019. This figure rose to 26% in 2020 but dropped below pre-COVID levels to 11% by 2022.

Table 1. Work from home in the EU from 2019 to 2022 across sub-major occupation groups

Occupation	2019	2020	2021	2022
Commissioned Armed forces Officers	3%	9%	8%	5%
Non-commissioned Armed Forces Officers	1%	5%	4%	2%
Armed Forces Occupations, Other Ranks	1%	3%	2%	2%
Chief Executives, Senior Officials and Legislators	13%	20%	22%	17%
Administrative and Commercial Managers	10%	22%	28%	20%
Production and Specialized Services Managers	8%	16%	17%	12%
Hospitality, Retail and Other Services Managers	12%	13%	11%	11%
Science and Engineering Professionals	9%	21%	27%	20%
Health Professionals	4%	5%	5%	4%
Teaching Professionals	15%	26%	21%	11%
Business and Administration Professionals	9%	25%	35%	25%
Information and Communications Technology Professionals	10%	36%	51%	42%
Legal, Social and Cultural Professionals	14%	24%	27%	21%
Science and Engineering Associate Professionals	3%	7%	8%	6%
Health Associate Professionals	3%	4%	4%	4%
Business and Administration Associate Professionals	7%	17%	23%	17%
Legal, Social, Cultural and Related Associate Professionals	7%	10%	11%	9%
Information and Communications Technicians	8%	23%	33%	24%
General and Keyboard Clerks	4%	13%	18%	12%
Customer Services Clerks	3%	9%	16%	12%
Numerical and Material Recording Clerks	3%	10%	14%	10%
Other Clerical Support Workers	2%	9%	12%	7%
Personal Service Workers	4%	4%	4%	4%
Sales Workers	3%	4%	4%	3%
Personal Care Workers	8%	8%	8%	8%
Protective Services Workers	1%	2%	2%	1%
Building and Related Trades Workers (excluding Electricians)	3%	3%	2%	1%
Metal, Machinery and Related Trades Workers	2%	2%	2%	2%
Handicraft and Printing Workers	8%	9%	11%	10%
Electrical and Electronics Trades Workers	2%	4%	3%	2%
Food Processing, Woodworking, Garment and Other Craft and Related Trades Workers	4%	5%	5%	5%
Stationary Plant and Machine Operators	1%	1%	1%	1%
Assemblers	1%	1%	1%	5%
Drivers and Mobile Plant Operators	1%	1%	1%	1%
Cleaners and Helpers	2%	1%	1%	1%
Agricultural, Forestry and Fishery Labourers	4%	6%	6%	4%
Labourers in Mining, Construction, Manufacturing and Transport	1%	0%	1%	1%
Food Preparation Assistants	0%	1%	1%	1%
Street and Related Sales and Service Workers	3%	9%	4%	1%
Refuse Workers and Other Elementary Workers	2%	1%	2%	2%

Source: own elaboration based on the EU-LFS

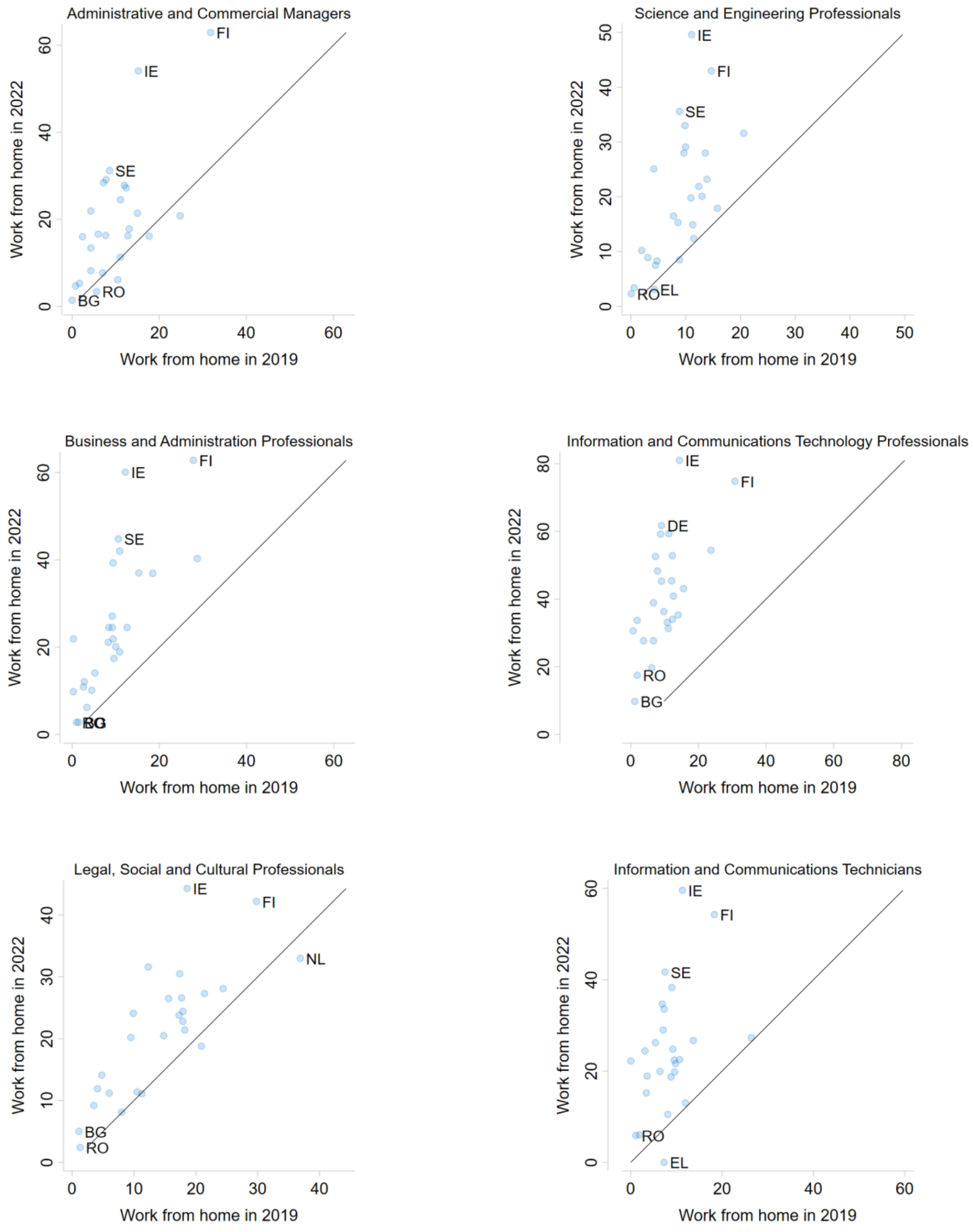
Within occupation groups with high WFH opportunities, the percentage of WFH employees varied significantly across countries (Figure 4). The rise in remote work following the pandemic was most pronounced in countries where WFH rates were already above average. Ireland and Finland saw the largest increases, whereas countries like Greece, Romania, and Bulgaria, which initially had low WFH prevalence, experienced minimal changes.

We confirm the divergence in WFH prevalence across countries through regression analysis (Table 1 in the Appendix). We regress occupation-specific WFH shares from 2022 on their corresponding shares from 2019 and a constant. The constant term represents the universal increase in WFH across countries, while the coefficient on 2019 WFH share sheds light on the extent of convergence or divergence between countries.

For four occupation groups, the coefficient on the 2019 WFH share was significantly greater than one, indicating divergence in WFH shares. The largest coefficients were observed for Business and Administration Professionals and Information and Communications Technology Professionals, where a 10 percentage point higher WFH share in 2019 was associated with an additional 7 percentage point increase in the 2022 WFH share. In contrast, no such divergence was detected for Legal, Social, and Cultural Professionals or for Information and Communication Technicians, for whom the coefficient was close to unity.

However, this pattern should not be interpreted as a definitive long-term trend. A Eurofound report (2024) highlights a noticeable weak convergence, rather than divergence, in telework shares across regions when comparing data from 2013 to 2022. This long-term convergence may be driven by two interconnected factors: urbanization trends and structural changes in the composition of the service sector workforce. Variations in remote work adoption likely reflect regional differences in economic structures, technological infrastructure, and workforce characteristics.

Figure 4. WFH in 2019 and 2022 in 6 occupations with highest fraction of WFH in 2022

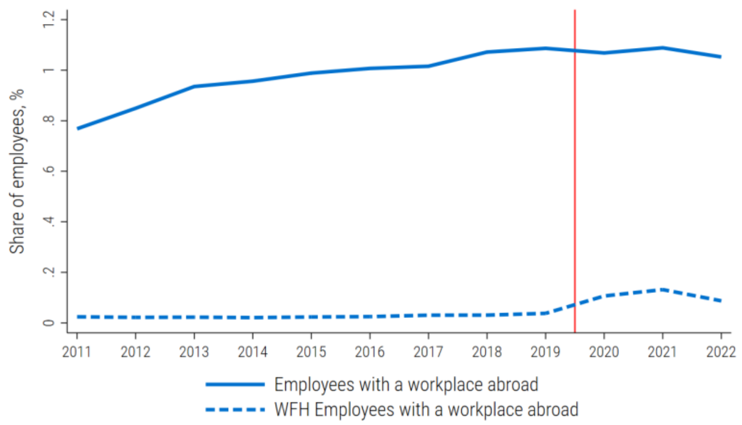


Source: own elaboration based on the EU-LFS

4. Relocation of labour demand

In this section, we assess whether the surge in WFH was also associated with an increased popularity of working for foreign companies. There is limited evidence on the changing patterns of offshoring enabled by widespread acceptance of remote work since the COVID pandemic. Rani (2023) documents the post-pandemic surge in online labour demand, with India, the Philippines, and Ukraine being the largest recipients of outsourced tasks. Eurofound (2022) reports recent trends in telework in the EU countries but does not account for its cross-border dimensions.

Figure 5. Shares of the EU employees working abroad, 2011 - 2022

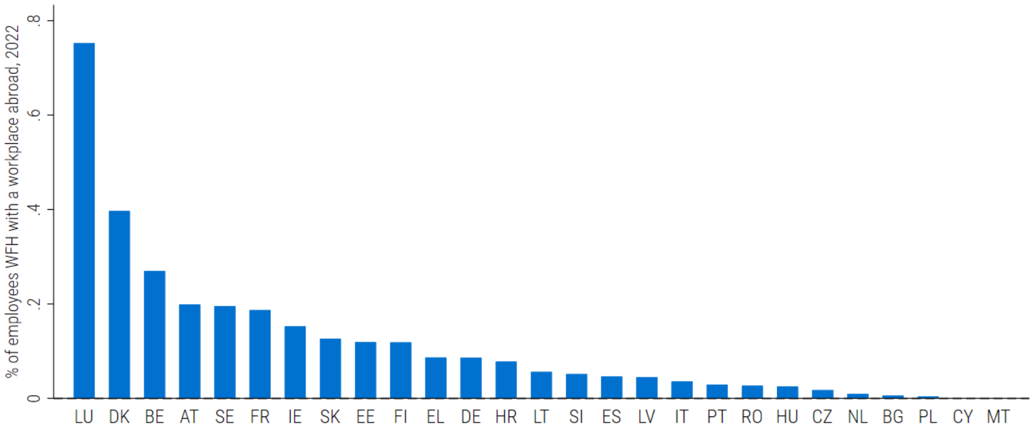


Source: own elaboration based on the EU-LFS

We focus on employees residing in their country of citizenship. The proportion of such employees working abroad increased within the EU from 0.77% in 2011 to 1.09% in 2019 (Figure 5). During the 2020–2022 period, fluctuations were minimal, not exceeding the pre-pandemic level. In contrast, the pandemic brought a relative increase in employees working remotely for foreign employers. Prior to 2020, such workers accounted for less than 0.04% of the native workforce. This figure rose to 0.11% in 2020 and further to 0.13% in 2021. However, by 2022, it declined to 0.09%, suggesting that part of the rise in cross-border telework was temporary.

As of 2022, Luxembourg had the highest percentage of people working from home with a workplace abroad (0.75%), followed by Denmark (0.40%) and Belgium (0.27%) (Figure 6). However, there was no clear division between Western and Eastern Europe as was in the case of general WFH (Figure 2). Working for a foreign employer was relatively popular in Slovakia and Estonia, while in the Netherlands, this share of employees was negligible (0.01%).

Figure 6. Share of workers working from home with a workplace abroad in 2022, by country



Source: own elaboration based on the EU-LFS

At the country-level, we do not see major shifts in the prevalence of working abroad between 2019 and 2022 (Figure 7). An exception is Denmark where in 2019 3.8% of employees worked abroad compared with only 2.2% in 2022. In 20 countries, the prevalence of WFH with a workplace abroad increased between 2019 and 2022, while only in 5 countries it decreased (Figure 8).

Figure 7. Shares of the employees working abroad, 2019 vs 2022

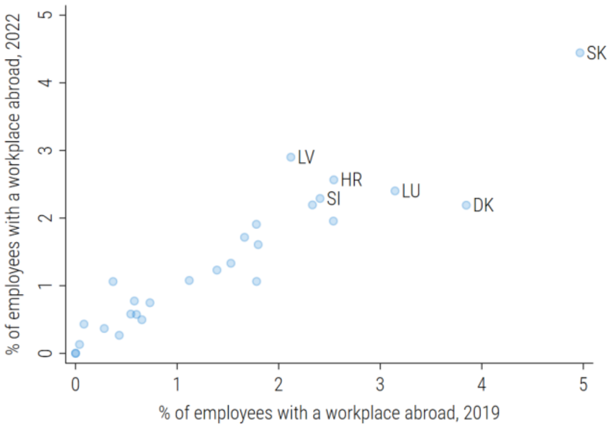
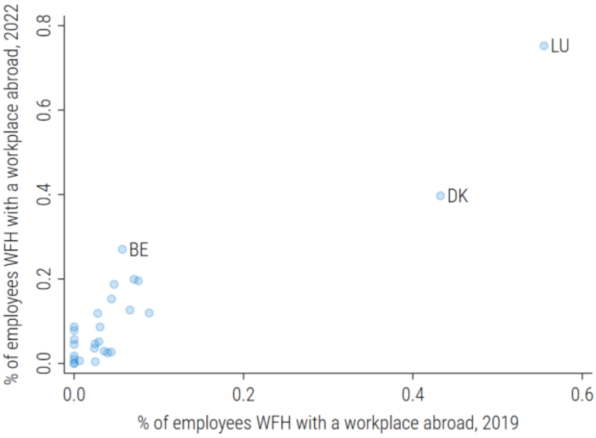


Figure 8. Shares of the WFH employees working abroad, 2019 vs 2022

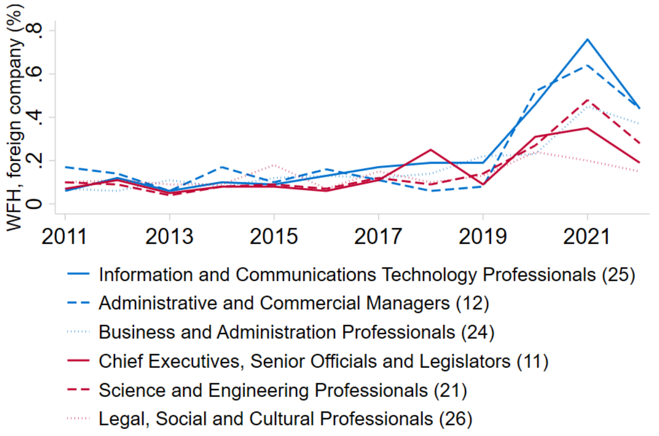


Source: own elaboration based on the EU-LFS

We now zoom in on six occupation groups with the highest rates of WFH for a foreign company in the EU. In 2019, the highest share of such workers within any occupation group was 0.22% (Figure 9). A noticeable increase occurred in 2020, with the average across all six groups rising from 0.14% to 0.34%. However, the magnitude of the increase varied significantly, ranging from just 0.01 percentage points for Business and Administration Professionals to 0.44 percentage points for Administrative and Commercial Managers.

In 2021, the largest shares of workers remotely employed by a foreign company were observed among Information and Communications Technology Professionals (0.76%) and Administrative and Commercial Managers (0.64%). By 2022, the average share across the top six occupations had declined slightly, from 0.48% to 0.31%. Despite this decrease, the rank order of occupations remained largely unchanged.

Figure 9. Work from home for a foreign company in top 6 occupations in 2022 in the EU between 2011 and 2022



Source: own elaboration based on the EU-LFS

In order to assess how the possibilities to work from home contributed to working for foreign employers, we estimate a number of econometric models. In each of the models, the dependent variable is the 3-year difference in the share of employees working abroad within a minor occupation group. The comparison is made between 2022 and 2019, capturing the medium-term effects of the pandemic. Specifically, we estimate the following regression:

$$\Delta y_{o,c} = \alpha_c + \beta \times \Delta WFH_{o,c} + \epsilon_{o,c} \tag{1}$$

Where α_c represents country fixed effects and $\Delta WFH_{o,c}$ stands for the 3-year difference in the share of employees working from home in a minor occupation group o in country c. However, $\Delta WFH_{o,c}$ may be considered an endogenous variable. That is, it may be influenced by some unobserved factors that also determine the outcome variable. Then, the parameter β would not represent the causal effects of changes in the WFH opportunities. Furthermore, the explanatory variable could be also influenced by the outcome variable itself, leading to a problem of reversed causality. To address potential endogeneity concerns, we also estimate equation (1) using a two-stage least squares (2SLS) estimator where $\Delta WFH_{o,c}$ is instrumented with the 3-year difference in the WFH share in the same occupation group in other EU countries.

In line with the focus of this section, we restrict the analysis to employees with local citizenship when deriving both the dependent and independent variables. In the regression sample, we do not include Bulgaria, Malta, and Slovenia, as detailed occupation classification is missing for these countries. Observation weights reflect the employment size in each country-occupation cell as of 2019. To reduce statistical noise, we drop cells with less than 100 observed employees within a year.

We do not find a positive impact of occupation-specific WFH opportunities on the likelihood of working for a foreign company (Table 2). For the OLS estimates (columns 1 and 2), the coefficient of interest is very close to zero. The results from the instrumental variable specification (columns 3 and 4) display weakly negative relationship between the 3-year change in WFH opportunities and the change in cross-border work. However, these estimates are also statistically non-significant. Overall, we find that the increased prevalence of WFH did not led to an increase in cross-border work that might be detrimental for local employers.

Table 2. The estimated relationships between the changes in WFH prevalence and the changes in cross-border work

	(1) OLS	(2) OLS	(3) 2SLS	(4) 2SLS
3-year change in WFH	0.0004	-0.0010	-0.0023	-0.0016
	(0.0030)	(0.0032)	(0.0043)	(0.0045)
Couuntry fixed effects?	NO	YES	NO	YES
F test of excluded instrument			218.6	332.7
Observations	1,553	1,553	1,553	1,553

Note: The table presents the estimated coefficients of the OLS and 2SLS regressions given by equation (1). The dependent variable is the 3-year change with respect to 2019 in the share of workers working remotely for a foreign company, within a minor occupation group. Standard errors robust for heteroskedasticity are reported in brackets. *, **, *** denote statistical significance at the 0.1, 0.05, 0.01 levels, respectively.

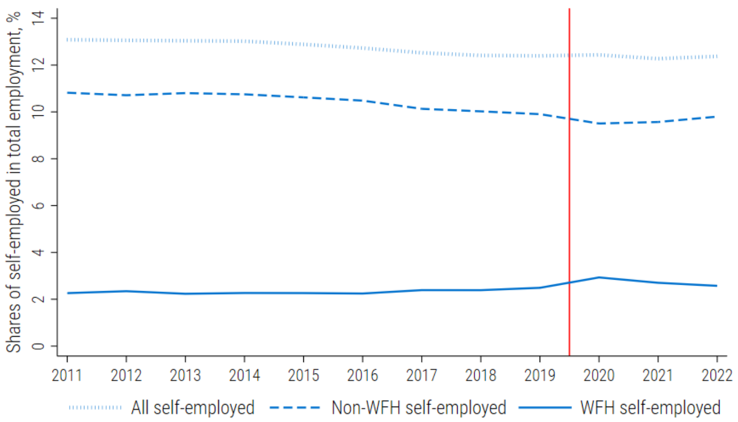
Source: Authors' calculations based on the EU-LFS data

5. The links between WFH and self-employment

In this section, we analyse whether post-pandemic developments in WFH translated into an increase in the prevalence of self-employment. For firms, replacing employment contracts with B2B contracts may be cost-effective and provide greater flexibility. In many countries, self-employment also allows individuals to reduce their tax burden. These transitions are more likely to occur if jobs are done remotely, outside a firm's premises. However, self-employment may be a precarious form of employment with relatively limited insurance against economic or health shocks. Furthermore, the reduction in tax revenues related to transitions from employment to self-employment may constitute a problem for public finances.

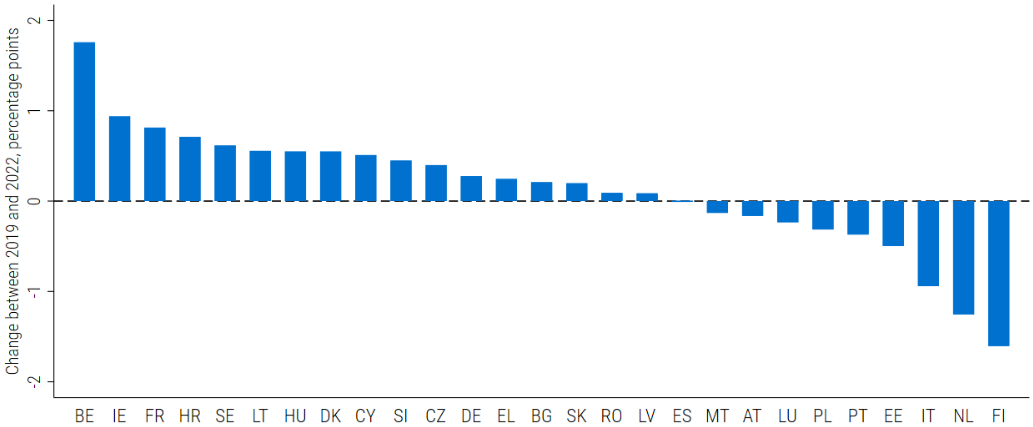
The share of self-employed individuals in the EU remained unaffected by the pandemic, standing at 12.4% in 2022, the same level as before COVID-19 (Figure 10). Prior to the pandemic, self-employed individuals working from home made up 2.5% of total employment. This figure increased to 2.9% in 2020 but declined to 2.6% by 2022. Thus, the overall rise in WFH (Figure 1) did not significantly impact the self-employed group. This provides initial evidence that workers who transitioned to WFH did not change their legal employment status. However, there is significant variation across countries (Figure 11). The largest increase in the share of self-employed workers who worked from home occurred in Belgium, with a rise of 1.8 percentage points between 2019 and 2022. In contrast, Finland, the Netherlands, and Italy experienced notable declines in the shares of these workers over the same period.

Figure 10. Share of self-employment total employment in the EU, 2011-2022



Source: own elaboration based on the EU-LFS

Figure 11. Changes in the shares of self-employed WFH in total employment, 2022 vs 2019



Source: own elaboration based on the EU-LFS

Now, we formally test whether increased prevalence of WFH had an effect on the incidence of self-employment. We estimate equation (1) where the dependent variable is the 3-year change (between 2019 and 2022) in the share of workers in a minor occupation group being self-employed. As in section four, the explanatory variable is the 3-year change in the share of WFH workers within an occupation group. We find that the surge in WFH did not cause an increase in self-employment. In our preferred specification, with EU 3-year difference in the WFH as an instrumental variable, an increase in the share of WFH workers by one precentage point led to a decrease in the share of self-employeed by 0.04% (Column 4 of Table 3). However, this result is not statistically significant at the 5% level.

Table 3. The estimated relationships between the changes in WFH prevalence and the changes in self-employment

	(1)	(2)	(3)	(4)
	OLS	OLS	2SLS	2SLS
3-year change in WFH	-0.0046	0.0069	-0.0427	-0.0420*
	(0.0152)	(0.0161)	(0.0280)	(0.0255)
Country fixed effects?	NO	YES	NO	YES
F test of excluded instrument			218.6	332.7
Observations	1,553	1,553	1,553	1,553

Note: The table presents the estimated coefficients of the OLS and 2SLS regressions given by equation (1). The dependent variable is the 3-year change with respect to 2019 in the share of self-employed within a minor occupation group. Standard errors robust for heteroskedasticity are reported in brackets. *, **, *** denote statistical significance at the 0.1, 0.05, 0.01 levels, respectively.

Source: Authors' calculations based on the EU-LFS data

6. Tax incentives to attract high-skilled immigrants

Many countries try to attract high-skilled migrants by offering them financial incentives, such as reduced tax rates. These policies were popular also in the pre-COVID era. Already in 2010, 15 OECD countries had in place such tax incentives (OECD, 2011). The pandemic might have increased their popularity, as a new pool of potential migrants entered the market. In contrast with traditional economic migrants, digital nomads may not contribute to hosting economies as employees, but their consumption spending can boost local economies.

The literature shows that migration decisions are highly resposnsive to tax policies. Kleven et al. (2020) study the effects of a preferential foreigner tax scheme introduced in Denmark in early 90s. They find large elasticities of migration with respect to the net-of-tax rate (one minus tax rate), ranging between 1.5 and 2. Timm et al. (2022) analyse a similar reform of 2012 in the Netherlands and also identify very large elasticities of migration, amounting to around 2. Bassetto and Ippedico (2023) investigate the effects of the 2010 Italian reform providing tax exemptions to high-skilled expatriates who relocate to Italy. In this setting, the migration elasticity to the net-of-tax rate is found to be slightly above 1. Akcigit et al. (2016) focus on a very specific type of migrant – inventors. Using data for eight OECD countries, they estimate the elasticity of migrants to the net-of-tax rate at around 1.

A number of the EU countries implemented new tax incentives for immigrants after the outbreak of the COVID pandemic. Among them were Mediterranean countries (Greece, Cyprus, Croatia), but also Poland, Latvia, and Belgium. As of 2024 more than half of the EU countries offers lower tax burden for immigrants compared to their nationals (Table 4). Two types of instruments are used. Tax exemptions mean that some part of the taxpayer's income is not subject to taxation. This proportion ranges from 25% (in Sweden) to 50% (in Greece and Italy). It can be also expressed as a fixed nominal amount (the case of Poland). Tax exemptions may be justified by the fact that immigrants need to cover additional costs due to their relocation. Importantly, the overall tax attractiveness of a jurisdiction offering a tax exemption depends on its normal tax rates applied to non-exempted income. For example, the effective tax wedge in Belgium, which offers a 30% exemption, is higher than in Estonia or Bulgaria, which do not offer exemptions but have a low tax wedge. The second popular instrument is a lowered tax rate, usually a flat one, applicable to foreigners.

In many EU countries, tax incentives are provided for immigrants that work for a domestic company rather than for freelancing nomads. Such requiriements are at the core of regulations in Belgium, France, Ireland, the Netherlands, and Sweden. In contrast, Southern European countries also offer explicit tax reliefs for immigrants working remotely for a foreign company. This is the case of Greece, Cyprus, Malta, Croatia and Spain. These countries may also be attractive to digital nomads due to their Mediterranean climate. Hence, tax competition in the EU seems to be segmented with countries differing in their priorities.

Table 4. Tax incentives for immigrants across the EU countries

Country	Average tax wedge for high earners*	Tax incentives dedicated for immigrants#
Austria	39%	30% exemption only for researchers and professors
Belgium	49%	30% exemption for high-income employees and researchers
Bulgaria	22%	-
Croatia	36%	Full exemption from local income tax on foreign income for non-EU citizens (digital nomads)
Cyprus	20%	50% exemption for high-income employees, full exemption on foreign income
Czechia	28%	-
Denmark	44%	flat tax rate of 32.8% for high-skilled workers and researchers
Estonia	23%	-
Finland	41%	flat tax rate of 32% for high-skilled workers and researchers
France	32%	30% exemption for employees recruited for a specific position in a French company.
Germany	43%	-
Greece	36%	50% exemption for foreign workers and freelancers
Hungary	33%	-
Ireland	37%	30% exemption for employees assigned to Ireland by their employers
Italy	41%	50% exemption for skilled professionals, 90% for researchers or professionals.
Latvia	29%	Flat tax rate of 15% for OECD citizens with digital nomad visa
Lithuania	40%	-
Luxembourg	40%	-
Malta	25%	Flat tax rate of 15% on foreign-sourced income for non-citizens; Full exemption for one year, and then flat rate of 10% for non-EU citizens (nomad residence permit)
Netherlands	47%	30% exemption for high-skilled employees
Poland	29%	Income up to 20 thousand euro annually is tax-exempted for all new tax residents
Portugal	36%	flat tax rate of 20% for high-skilled workers
Romania	41%	-
Slovak Rep.	27%	-
Slovenia	39%	-
Spain	29%	Flat rate of 24% for non-residents and 19% for EU citizens
Sweden	41%	25% tax exemption for high-income employees

* Combined personal income tax and social security contributions for a single without children, earning 200% of the average wage; based on OECD (2022). # Own elaboration based on OECD (2024), PwC (2024), government websites, and other country-specific sources.

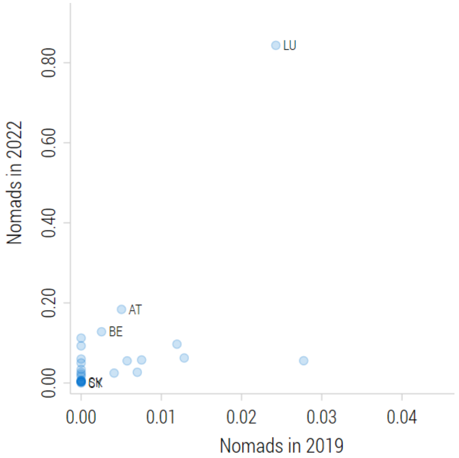
7. Relocation of labour supply

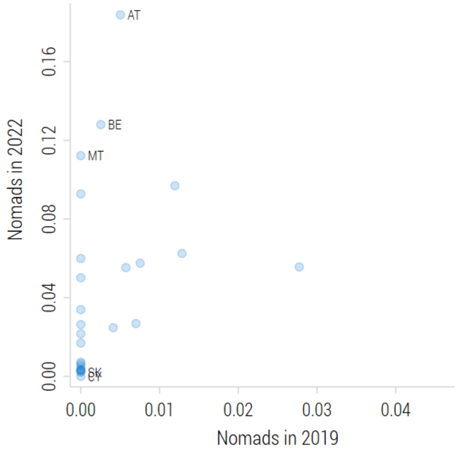
In this section, we examine whether the COVID shock was followed by significant cross border relocations of highly skilled employees who can work remotely. Such relocations might have been induced by the surge in WFH opportunities (as discussed in section three) and also by differential tax policies across countries (section six). First, we report the changes in the shares of digital nomads - immigrants working remotely for a foreign company - in the labour force of hosting EU countries. However, this analysis is limited by the accuracy of the EU-LFS survey and low response rates by immigrants. Therefore, in the second step, we investigate the educational structures of the labour force in the EU countries and assess whether there are significant outflows of persons who are able to work remotely.

We define digital nomads as individuals who reside in a country different from their country of citizenship, have a workplace abroad, and primarily work remotely. While digital nomads constitute a very small proportion of the workforce in all analyzed countries, a notable increase in their numbers was observed in the years following the COVID-19 pandemic. In 2019, digital nomads constituted less than 0.004% of the workforce across EU member states. However, by 2022, their presence became more pronounced in several countries. Notably, Luxembourg, Austria, and Belgium experienced significant increases in the proportion of digital nomads, rising to 0.84%, 0.18%, and 0.12% of their respective workforces (Figure 12).

In absolute terms, the highest number of digital nomads in 2022 was recorded in France (over 17,000), Spain (11,000), and Germany (10,000). This marks a substantial increase compared to 2019, when the corresponding figures were approximately 3,000 in France and just over 1,000 in both Spain and Germany. However, we expect the results derived from the EU-LFS survey to underestimate the actual number of digital nomads, as these persons are less likely to participate in the survey conducted by the domestic statistical offices. Furthermore, the detailed analysis of nomads' characteristics would be problematic, as the underlying numbers of observations in the survey are very small.

Figure 12. Digital nomads in 2022 and 2019 (without Luxembourg on the right) in %





Source: own elaboration based on the EU-LFS

Next, we focus on the perspective of origin countries. A substantial emigration of high-skilled workers would be a reason for concern as it decreases labour supply and the tax base. We expect any large emigration of high-skilled workers to be reflected in the educational structure of population. Therefore, to detect such outflows we calculate the differences between the expected fraction of tertiary-educated people in a given field of education and their actual fraction. Formally, we derive $D_{c,f,t}$ as the above-mentioned difference scaled by the expected fraction of tertiary-educated people in a given field of education:

$$D_{c,f,t} = \frac{\frac{N_{c,f,t}}{\sum_f^F N_{c,f,t}} - \frac{E[N_{c,f,t}]}{\sum_f^F E[N_{c,f,t}]}}{\frac{E[N_{c,f,t}]}{\sum_f^F E[N_{c,f,t}]}} \tag{2}$$

Where $N_{c,f,t}$ is the number of tertiary-educated people aged 26-34 in country *c*, having field of education *f*, in year *t*. Values of *D* larger than 0 mean that the actual fraction exceeds the expected one. We derive $E[N_{c,f,t}]$ from age-*a*-specific $E[N_{c,f,a,t}]$ values, considering the number of tertiary-educated individuals in field *f*, aged $a-1$ from the previous year, along with the expected number of new graduates:

$$E[N_{c,f,a,t}] = N_{c,f,a-1,t-1} + S_{c,a-1,t-1} \times \frac{G_{c,f,a-1,t-1}}{\sum_f^F G_{c,f,a-1,t-1}} \times \frac{1}{4} \tag{3}$$

where $S_{c,a,t-1}$ is the number of non-tertiary educated people participating in formal education and $G_{c,f,a,t-1}$ is the number of people who graduated in the field *f* in the last 5 years up to year t-1. We assume that the average duriation of tertiary education (either bachelor programs or integrated master's programs) amounts to four years. We focus on people aged 26-34, as they are the most likely to migrate, and information on the field of education is often unavailable for older age groups in the EU-LFS survey.

The group of countries covered in this analysis is limited by the data availability. We exclude five countries because of missing data on the exact age of respondents. Furthermore, we exclude eight countries with small sample sizes – less than 1500 tertiary-educated respondents aged 25-34 in some years. The credibility of our analysis increases with the sample size, and for small samples, the results may reflect sampling errors rather than true developments in the labour supply.

Based on the EU-LFS data, we can distinguish 11 fields of education. We focus on the results for three educational groups with the highest fraction of people working mainly from home as of 2020:

- Information and Communication Technologies (ICT)
- Arts and humanities
- Business, administration and law

Our results do not reveal consistent patterns of outflows of ICT graduates following the COVID shock (Figure 13). There was no country exhibiting negative differences between the expected and actual fractions of ICT graduates in all post-2019 years. We found a significant shortfall in the number of people educated in the field of ICT in France and Spain in 2020. However, these developments were mostly reversed in 2021, suggesting that the findings for 2020 may have been influenced by sampling errors. Similarly, Austria and Germany experienced a shortfall in the number of ICT graduates in both 2020 and 2021, but this trend was reversed in 2022. In Table 2 in the Appendix, we also report the trends in absolute numbers of people educated in the field of ICT.

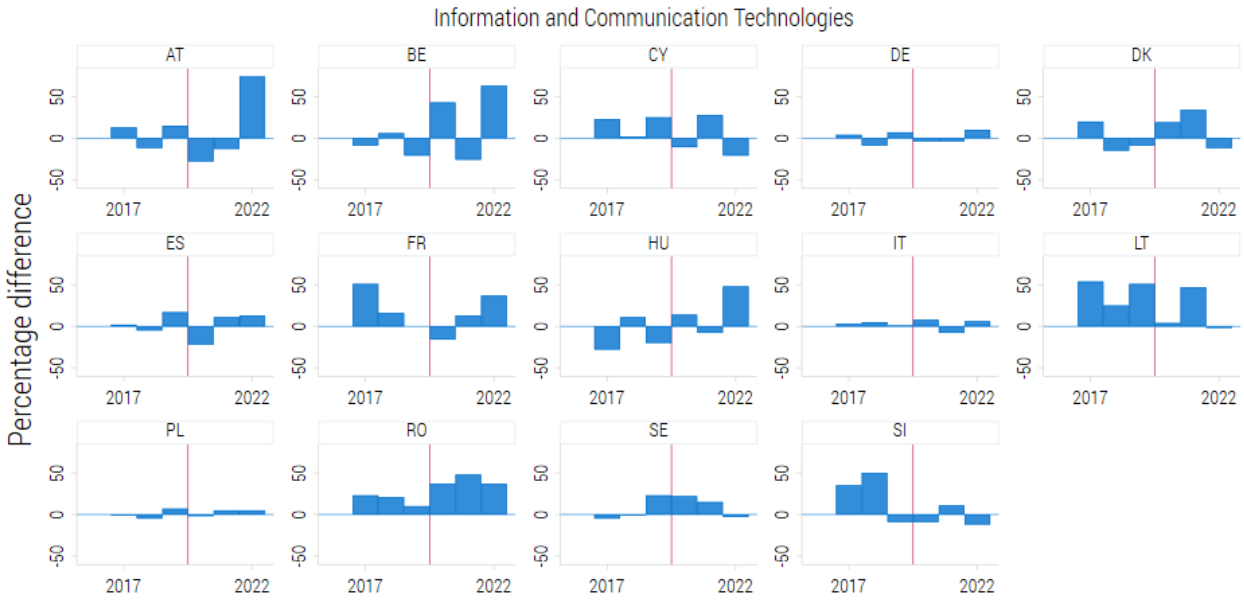
For graduates in the field of arts and humanities, Romania consistently showed negative deviations in all post-2019 years (Figure 14). This trend was reflected in the absolute number of graduates, which in 2022 was 31% lower than the 2019 figure (see Table 3 in the Appendix). In 2020, the fraction of arts and humanities graduates was significantly lower than expected in Belgium (-25%) and Austria (-21%). While Belgium experienced a partial recovery in 2021, the absolute number of graduates in the field of arts and humanities still remained below pre-COVID levels. In Austria, the number of graduates declined sharply from 32,000 in 2019 to 18,000 in 2020. Although a slight downward trend had been evident in the years leading up to 2019, the drop in 2020 was considerably more pronounced.

Systematic shortfalls in business administration and law graduates were observed in Denmark, Italy and Lithuania (Figure 15). In Denmark, the gap between the actual and expected share of graduates in this field was -16% in 2021 and -17% in 2022. However, the absolute number of graduates decreased only by

13% with respect to the pre-COVID period (Table 4 in Appendix). In Italy, the gaps were smaller, at -6% in both 2021 and 2022, but the absolute number of graduates fell by 15%. In Lithuania, the gap amounted to 9% in 2020, 8% in 2021, and 3% in 2022.

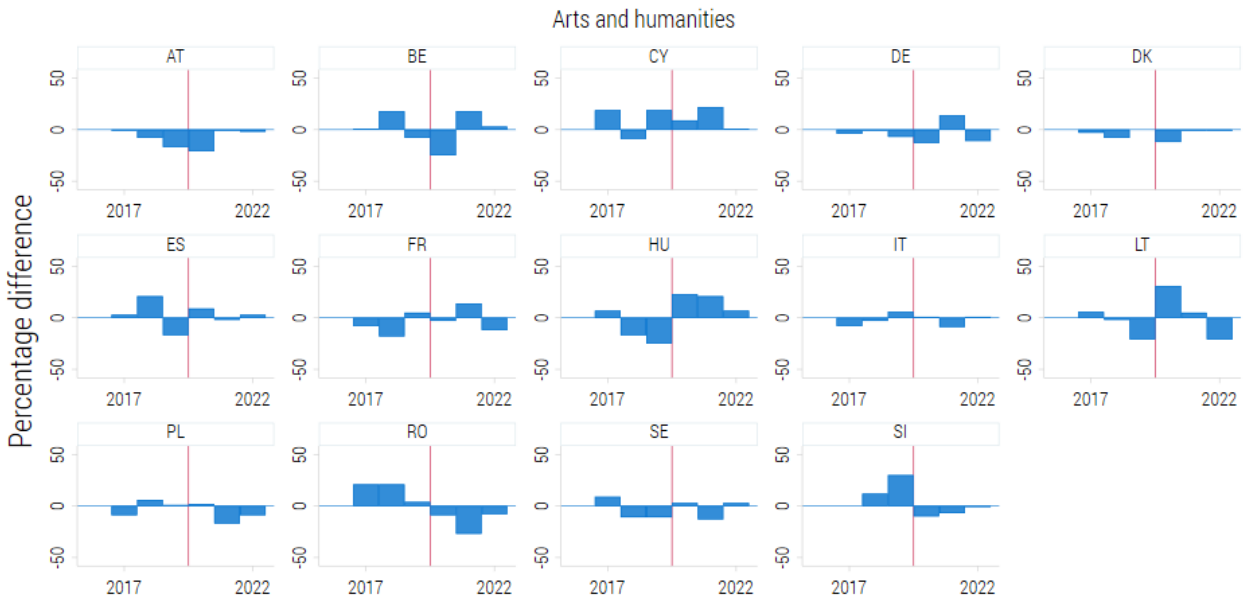
Our analysis is a first attempt to investigate, in a cross-country setting, whether post-COVID relocations of workers constitute an important policy issue. While our findings highlight some significant developments in certain countries, they should be interpreted with caution. Further research, utilizing country-specific administrative data, is needed to validate these findings.

Figure 13. The differences in expected and actual shares of Information and Communication Technologies graduates in the tertiary-educated population aged 26-34



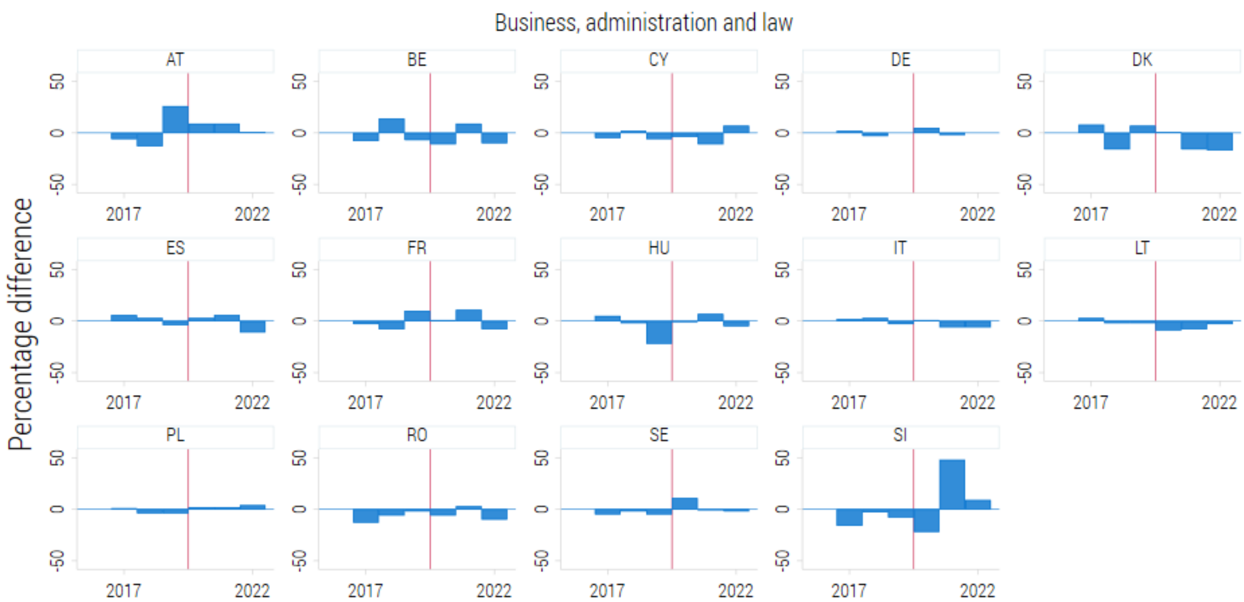
Source: own elaboration based on the EU-LFS

Figure 14. The differences in expected and actual shares of Arts and humanities graduates in the tertiary-educated population aged 26-34



Source: own elaboration based on the EU-LFS

Figure 15. The difference in expected and actual shares of Business Administration and Law graduates in the tertiary-educated population aged 26-34



Source: own elaboration based on the EU-LFS

8. Conclusions

The widespread adoption of remote work (WFH) following the COVID-19 pandemic has had significant effects on European labour markets, reshaping not only how and where people work but also influencing various aspects of labour mobility and employment structures. While WFH opportunities might have broadened labour market prospects for employees, allowing them to work for foreign companies, the data do not reveal an increase in such cross-border work. In particular, an increase in occupation-specific WFH opportunities is not associated with a higher prevalence of working for a foreign employer.

Our analysis further reveals that WFH has not contributed to a rise in self-employment at the EU level, despite the potential for greater autonomy in remote work arrangements. In fact, we find a weakly negative impact of occupation-specific WFH opportunities on the prevalence of self-employment. It might be the case that WFH opportunities improved the relative attractiveness of regular employment contracts. Although some countries, such as Belgium, Ireland, and France, have witnessed increases in self-employment, these changes do not appear to be directly linked to the surge in occupation-specific remote work opportunities. Therefore, while WFH may facilitate more flexible working arrangements, it does not appear to be a driver of self-employment growth across the EU.

Finally, the movement of digital nomads and other remote workers has led to noticeable, though limited, inflows into certain EU countries. Luxembourg, Austria, Belgium, and Malta have seen increases in digital nomads, although their numbers do not exceed 0.2% of the domestic workforce, with Luxembourg being an exception. However, these findings are based on the EU-LFS data, which may have limitations, particularly regarding the response rate of immigrants. From the perspective of origin countries, we observe some changes in the educational structure of the labour force that may suggest emigration of high-skilled workers capable of remote work. Specifically, arts and humanities specialists in Romania and Austria, and business administration and law specialists in Denmark, Italy, and Lithuania may be part of this trend. In contrast, we do not detect such developments for ICT specialists. Nevertheless, further research using more detailed, country-specific data is needed to validate these findings.

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Appendix

Table A1. The estimated relationship between the shares of WFH workers in 2019 and 2022.

	(1) Administrative and Commercial Managers	(2) Science and Engineering Professionals	(3) Business and Administration Professionals	(4) Information and Communications Technology Professionals	(5) Legal, Social and Cultural Professionals	(6) Information and Communications Technicians
% WFH in 2019	1.338***	1.542***	1.701***	1.659***	0.974***	1.000*
	(0.300)	(0.396)	(0.290)	(0.394)	(0.155)	(0.468)
Constant	6.477	5.882	9.275*	25.37***	7.271**	16.15**
	(3.635)	(4.089)	(3.411)	(4.729)	(2.571)	(4.647)
N	26	26	26	26	26	26

Note: The dependent variable is the share of workers working mainly from home in 2022 within a country and an occupation group denoted in column header. Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A2. The approximate number of graduates in the Information and Telecommunication field of study in the years 2016-2022 in the age group 25-34 (in thousands).

country	2016	2017	2018	2019	2020	2021	2022
AT	13	16	12	14	7	7	11
BE	30	26	30	22	28	23	25
CY	3	3	4	4	3	3	3
DE	160	165	152	162	143	140	154
DK	8	11	10	10	12	17	16
ES	91	93	86	108	84	90	101
FR	98	122	138	144	126	140	136
HU	27	19	23	19	23	23	25
IT	26	26	28	28	31	28	30
LT	10	12	12	13	15	20	17
PL	138	128	115	110	98	101	107
RO	32	38	41	40	47	45	57
SE	10	10	10	14	16	19	20
SI	3	4	5	5	5	5	4

Source: own elaboration based on the EU-LFS

Table A3. The approximate number of graduates in the Arts and Humanities field of study in the years 2016-2022 in the age group 25-34 (in thousands).

country	2016	2017	2018	2019	2020	2021	2022
AT	32	35	34	32	18	19	20
BE	61	62	74	68	51	64	56
CY	7	8	8	7	6	8	8
DE	237	232	237	225	181	207	190
DK	35	34	35	37	33	35	36
ES	123	134	162	135	140	135	138
FR	268	257	233	239	220	254	234
HU	32	30	25	21	27	30	32
IT	300	298	295	309	308	274	289
LT	13	14	15	12	14	13	11
PL	171	152	154	150	143	114	97
RO	53	52	50	52	50	32	36
SE	29	32	28	26	25	22	23
SI	7	7	6	8	8	7	7

Source: own elaboration based on the EU-LFS

Table A4. The approximate number of graduates in the Business Administration and Law field of study in the years 2016-2022 in the age group 25-34 (in thousands).

country	2016	2017	2018	2019	2020	2021	2022
AT	57	58	52	70	51	56	60
BE	126	119	140	132	113	136	130
CY	19	18	18	21	19	17	19
DE	758	784	779	799	782	786	819
DK	39	44	39	45	49	44	39
ES	346	375	378	376	377	387	355
FR	642	658	658	732	738	858	828
HU	62	66	66	53	54	66	62
IT	358	379	397	381	380	339	322
LT	66	72	71	70	68	66	62
PL	562	550	515	480	450	441	435
RO	212	194	184	189	181	153	158
SE	73	72	74	74	78	80	81
SI	19	16	14	13	10	12	13

Source: own elaboration based on the EU-LFS

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WeLaR is Horizon Europe research project examining the impact of digitalisation, globalisation, climate change and demographic shifts on labour markets and welfare states in Europe. It aims to improve the understanding of the individual and combined effects of these trends and to develop policy proposals fostering economic growth that is distributed fairly across society and generates opportunities for all.

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