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The evolution of (post) pandemic labour market outcomes of older workers in Europe

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Keywords
work interruptions, retired, unemployed, not employed

JEL Codes
J08, J71, J78

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The evolution of (post) pandemic labour market outcomes of older workers in Europe

Brugiavini Agar, Buia Raluca Elena, Simonetti Irene

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1. Introduction

The extremely tight restrictions meant to limit the spread of COVID-19 severely impacted economic activity in all countries, resulting in exceptional work disruptions and sizable layoffs. Job losses at the onset of the pandemic amounted to as much as 20 million jobs in the USA (Forsythe et al., 2022) raising the unemployment rate from 3.5% in February 2020 to 14.7% in April of the same year (Hall and Kudlyak, 2022).

Differently from the US, European countries experienced a more limited increase in unemployment due to the large use of job retention policies, such as short-time work (STW), furlough and wage subsidy schemes (Ebbinghaus and Lehner, 2022, Drahokoupil and Muller, 2021). Still, according to data from the European Central Bank, in the countries from the euro area, employment decreased by about 3.1 million workers (around 2.2% for men and 1.5% for women) between the fourth quarter of 2019 and the same period of 2020 while the increase in unemployment reached a peak in the third quarter of 2020, amounting to 10.5% for men and 12.8% for women (Botelho and Neves, 2021), with significant heterogeneities among countries. It is important to observe that not the entire employment reduction translated into unemployment, as a large number of individuals exiting employment left the labour market. Eurofound documents that net flows from employment to inactivity were more than twice as high as net flows from employment towards unemployment (Eurofound, 2021). If we also consider the number of individuals employed but not working reaching 17% in the second quarter of 2020 (Eurofound, 2021) (temporary layoffs accounted for about 38.5% of total absences during the

second quarter of 2022, (Botelho and Neves, 2021)), we obtain a more comprehensive image of the magnitude of the short-term impact of the pandemic on the labour markets in EU countries.

The next step is to understand whether such effects have been transitory or permanent and how long it takes for the employment rate to recover. Recent evidence for the US documents that most of the work disruptions have been temporary, and employment trends gradually have returned to the pre-pandemic figures. Forsythe et al, 2022, analyzing monthly detailed data on employment/unemployment and job vacancies, show that in the USA, by July 2022, labour market had almost recovered to pre-pandemic levels, with some slight variations among types of industries/occupations and by age group. Indeed, the labour market became tight again, and the employment-to-population ratio returned to the 2019 levels for most sectors while it remained slightly lower for the "customer facing sectors"[1]. When analyzing such indicators by job categories, they show that, by the spring of 2022, the employment shares converged back to pre-pandemic levels for sales, administrative and blue-collar workers, increased above the 2019 figures for professionals and were still slightly below for workers in low-skilled occupations. These positive trends were partly supported by the fact that layoffs due to the pandemic were in most cases only temporary, increasing dramatically especially the category of the "unemployed with jobs" (Hall and Kudlyak, 2022).

Nevertheless, some concern is raised by older workers. Based on data from the USA Current Population Survey, Forsythe et al., 2022, show that while employment-to-population ratio converged to pre-pandemic levels in all the age groups below 65 by spring 2022, this measure remained below 2019 levels for the individuals aged 65 and above. They attribute such a decline to increased exits through retirement. Recent literature documents the existence of an age bias in the recruitment of new employees, making older workers a vulnerable category if they experience work disruptions. We investigate to what extent having experienced work interruptions during the first wave of the pandemic might have affected the working careers of older workers.

A number of recent contributions have outlined that the pandemic crisis had heterogeneous effects, and impacted various population categories differently, by generally exacerbating already existing inequalities (Blundell et al., 2022, Adams-Prassl et al., 2020). While several papers analyzed the different impact of the pandemic on the labour market outcomes of men and women, less attention has been devoted to, and little has been said about, the effects of the COVID-19 crisis on the employment situation of older individuals. Older workers represent a particular category: (i) they have extensive work experience but (ii) the important recent

[1] Forsythe and al. 2022, group in this category the activities in the NAICS industry codes 71, 72 and 81, which comprise: Leisure and hospitality as well as other services including personal care.

evolution/changes in the labour market, due to the digital revolution, may have unexpectedly turned obsolete/outdated some of their skills (iii) they may be affected by the age-bias in the recruitment process if applying for a new job.

We attempt to fill this gap and (i) describe the employment dynamics during the pandemic for the individuals aged 50 and above, (ii) analyze to what extent the work disruptions experienced by older employees have been temporary or permanent. A novel aspect of our study, compared to existing research, is that we take advantage of the longitudinal dimension of our data, which allows us to follow the individuals over time and perform an analysis at the individual level. The results show that having experienced work disruptions during the first wave of the pandemic is associated with increased probabilities of older workers transitioning from employment to a not-employment situation (either retirement or unemployment/homemaker).

2. Data and methods

2.1 The data

We use data from the Survey on Health, Ageing and Retirement in Europe (SHARE). SHARE is a longitudinal multidisciplinary survey conducted every two years, focusing on the population age 50 and above in Europe. The Survey began in 2004 in 11 European countries and it has gradually extended so that, since 2017 (wave 7), it covers 28 countries (all EU countries except for Ireland, plus Switzerland and Israel). SHARE collects detailed information with respect to the most relevant aspects of respondents' current lives (e.g. family composition, accommodation, employment status and income sources, health status, health care, assets, etc.) through its regular waves. In addition, each participant was required to answer a comprehensive retrospective interview asking questions on her/his past life history (SHARELIFE) either in wave 3 (2008) or in 2017 (wave 7). After the pandemic outbreak, two Computer Assisted Telephone Interview waves of the so-called SHARE Corona Survey (SCS) (2020 and 2021) enquired about a set of relevant elements in relation to the pandemic, providing a broad picture of the main issues and concerns of older Europeans during this dramatic period. More recently, the SHARE regular wave of 2022 (wave 9) allows us to observe whether and how the lives of older Europeans changed after COVID-19 and to what extent alterations due to the pandemic have been temporary or permanent.

We focus on individuals who reported working at the time of the pandemic outbreak and who participated in either both SCS waves or in the first wave of the SCS (2020) and in the regular wave 9 of SHARE (2022). We include only individuals aged 50-70 in 2021, and we exclude observations from Hungary due to the low sample size. Additionally, we drop individuals that are disabled or in the "other" employment status, as they represent very small and selected groups,

making the interpretation of the estimates difficult. Our final samples include 5,217 individuals who participated in both SCS waves and 4,614 who answered the first SCS and the SHARE regular wave 9. Table 1, hereafter, describes our data. Although there are some differences between the two subsamples, the main characteristics remain similar: about 57% of the individuals under analysis are women, and 18% experienced work interruptions during the first wave of the pandemic. Private employees represent 52% of the sample, public employees count for 36% and the rest are represented by self-employed. Approximately 45% have higher education (more than high-school) and 26% report excellent IT skills.

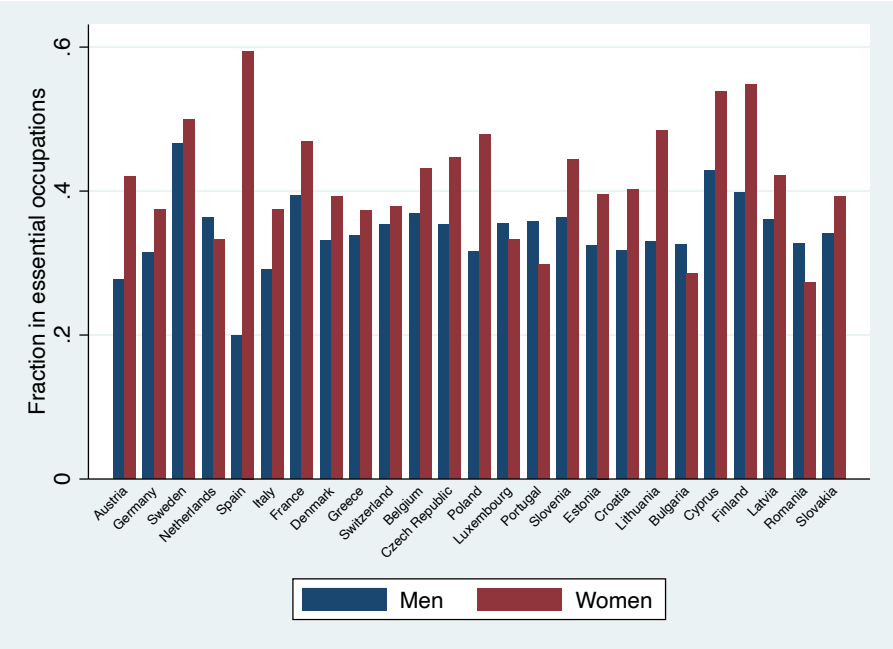
Table 1 – Sample description

Variable	Participating in SCS 1 and SCS 2 Percentage/Mean	Participating in SCS 1 and in SHARE regular wave 9 Percentage/Mean
Work interruptions	18%	18%
Age in 2021	60.545	60.59648
Women	57%	57%
Married	76%	76%
Private employee	52%	52%
Public employee	36%	36%
Self employed	12%	12%
Essential Job	38%	38%
Social interaction index	0.73	0.73
Teleworkability	0.32	0.32
Less th High School	13%	12%
High School	42%	43%
More than High School	45%	45%
IT abilities: poor	7%	7%
IT abilities: fair	33%	33%
IT abilities: good	34%	33%
IT abilities: excellent	26%	27%

Thanks to the longitudinal dimension of the survey, we can follow respondents over time and observe how their working situation evolved between 2020-2021 and further on, in 2022. The unexpected outbreak of the COVID-19 pandemic led to the limitation of most economic activities, including the total closure of some considered “not essential”. These events caused significant and sudden work disruptions, displaying large heterogeneities among countries, primarily due to differences in the sectoral composition of their economies (Fana et.al, 2020) or variations in the

stringency of restrictions. Figure 1 shows the share of individuals involved in essential occupations, as classified by Fasani and Mazza (2020) (at the pandemic outbreak), separately by country and gender. The picture highlights substantial variations among countries; generally, women display higher employment in essential occupations, with some exceptions, such as the Netherlands, Portugal, Bulgaria or Romania where the share of men in such jobs is slightly larger.

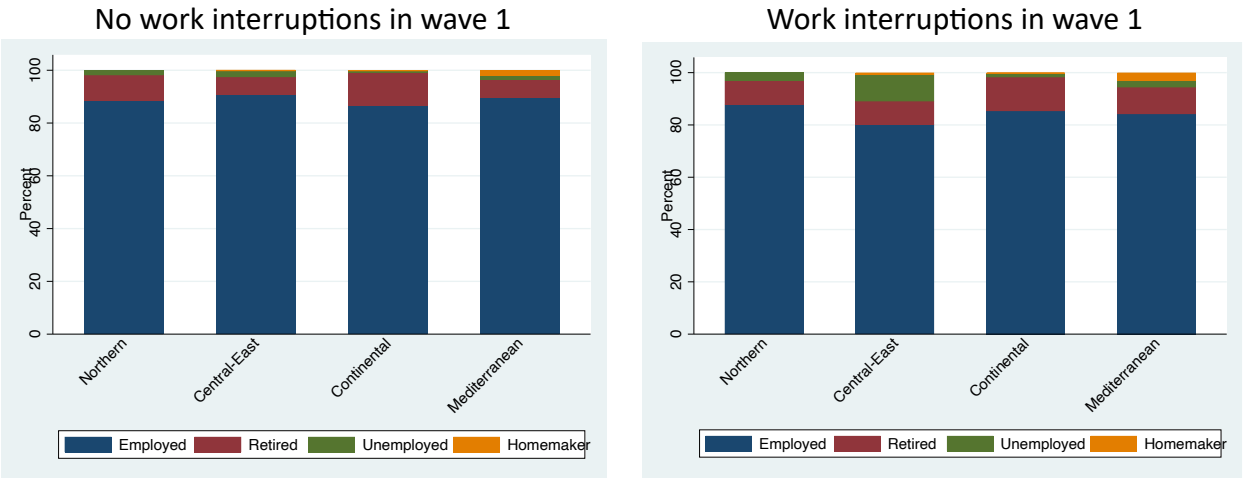
Figure 1. Employment in essential occupations, by country and gender



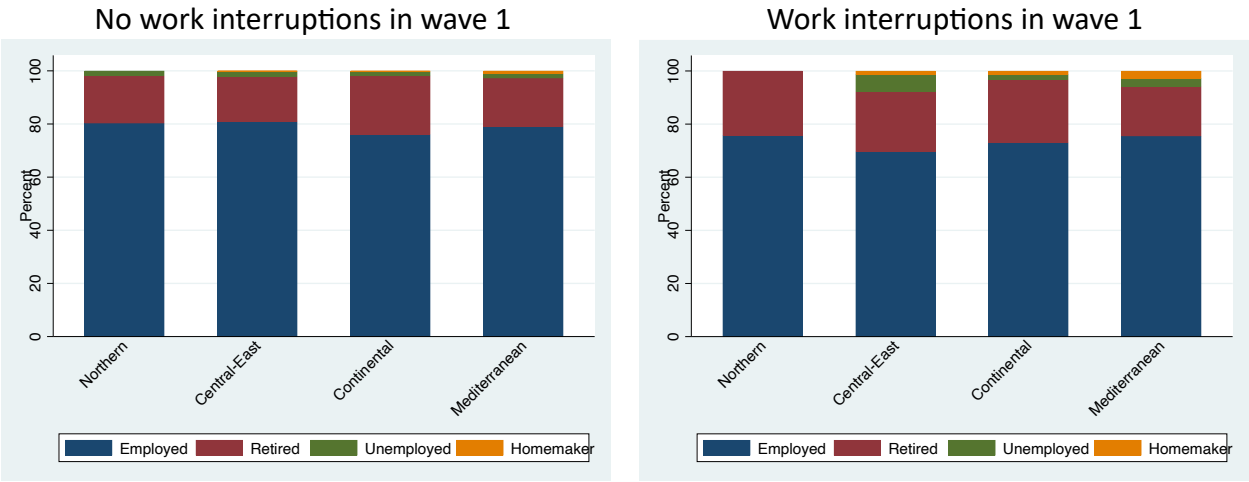
Figures 2 a) and b) describe the employment situation in 2021 and in 2022, respectively, for individuals who were working at the time of the pandemic outburst, by country cluster. These are shown separately for those who experienced work disruptions during the first wave of the pandemic and those who did not. While in Nordic and Continental countries, the medium and long-term employment situation is similar between those with and those without work interruptions, some differences can be observed in the other two country clusters. Specifically, in Central-East European countries, the fractions of unemployed and retired individuals are higher among respondents who experienced work disruptions due to the pandemic. In Mediterranean countries, those who went through such events display slightly larger shares of retirees and homemakers, both in 2021 and in 2022.

Figure 2. Post-pandemic short - and longer-term employment situation, with and without work disruptions, by country cluster

a) Employment situation in 2021, by country cluster



b) Employment situation in 2022, by country cluster

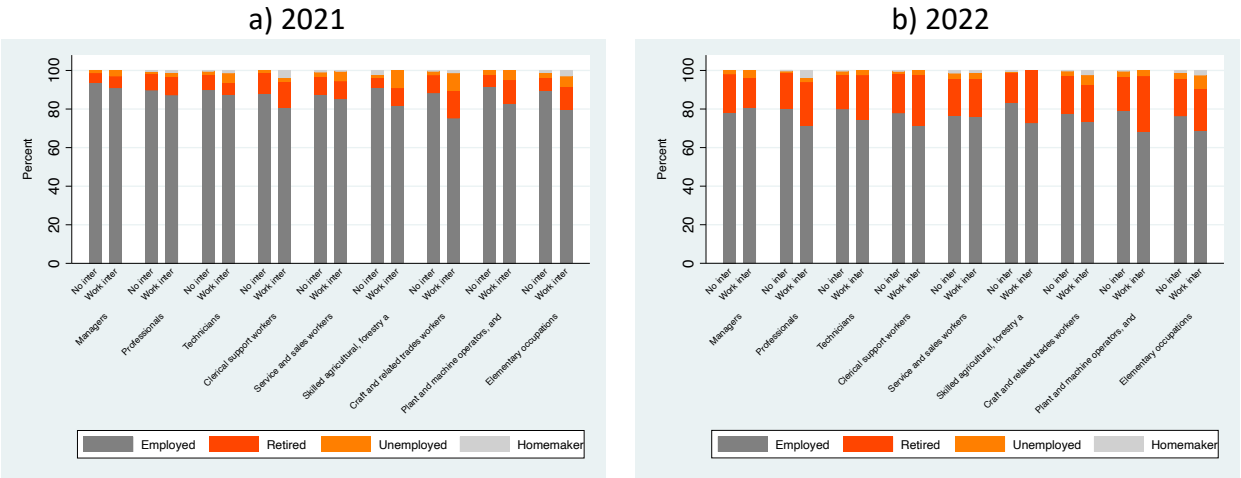


There is a noticeable increase in the percentages of retirees between 2021 and 2022. While this is rather expected, given the ageing of our sample along time, panel b) also show slightly larger differences between the subsample of those with and without work disruptions in all country clusters. Specifically, individuals who experienced work interruptions during the first wave of the

pandemic were more likely to be retired in all regions, while in Central-East Europe, they continued to display a higher likelihood of being unemployed in 2022.

Figure 3 describes the employment situation of the individuals in our sample, by occupation major, with and without work interruptions. Overall, individuals with work disruptions exhibit larger percentages of exists from employment in both years across all job categories, except for the managers, who, in the longer term, show slightly higher fractions of retirement among those with no disruptions.

Figure 3. Employment situation by occupation major in 2021 (left panel) and 2022 (right panel), with vs. without work interruptions.



2.2 Empirical specification

We examine three outcomes, separately for 2021 and 2022. First, we estimate the probability of respondents being in a broad not-employment status; the dependent variable in this case is a binary variable, taking a value of 1 if the respondent reported being not employed (unemployed, retired or homemaker) and 0 otherwise. This allows us to evaluate the potential effect of the pandemic on older individuals exiting from work. In a second step, we distinguish between the probability of being retired and that of ending up in a "restricted" not-employment status, which includes only the unemployment and homemaker. Here, the outcome variable is categorical, taking a value of 1 if retired, 2 if employed, and 3 if not employed (unemployed or homemaker).

The key regressor is a binary variable indicating the presence of work interruption spells during the first wave of the pandemic. Alternatively, we also consider the overall length of work

interruption spells prior to the first SCS. As additional controls, we include socio-demographic characteristics such as marital status, age, level of education, IT-skills, occupation type and main features. Regarding the latter, SHARE has the significant advantage of providing extremely detailed information on respondents' professions. This data is collected and classified at a four-digit ISCO-08 level, allowing us to benefit of the substantial heterogeneity among jobs in terms of their characteristics. Our analysis considers several dimensions of occupations, with three being particularly relevant in relation to the pandemic: suitability to remote work, the level of social interaction required under "normal" conditions, and whether the job is considered essential. We also include among the regressors three indexes that account for the quality of work environment.

To capture the role of the welfare regime, we use four binary variables identifying four country clusters, following Ebbinghaus and Lehner (2022). Based on the Esping-Andersen (1990) classification of welfare states, they distinguish the Continental and Nordic regimes, as well as the Mediterranean and Central-East European regimes (Adascalitei, 2012 and Ferrera, 1996) (see Table 1A in the Appendix). Finally, we control for the scope of job retention policies during the first wave of the pandemic by including among the regressors the government expenditure on job retention schemes in 2020, measured as percentage of GDP (Eurofound, 2021).

We perform logistic regressions to estimate the probability of ending up in the broad not-employment status, and we use multinomial logit specifications to estimate the probability of being retired or not employed (unemployed or homemaker) versus being employed. We run separate regressions for short-medium term (2021) and for longer-run (2022) outcomes. In addition, to account for potential selection bias between the treated (individuals with work disruptions in the first wave of the pandemic) and the non-treated group, we use propensity score matching to estimate the average treatment effect. When analyzing retirement and restricted not-employment, due to the inability to use multinomial logit, we employ separate logit regressions to estimate the propensity score. As for the matching method, we employ the kernel matching.

2.3 Occupation characteristics and work environment

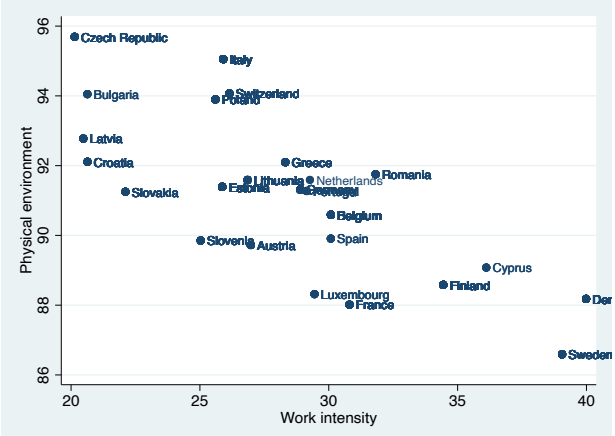
The teleworkability and social interaction indexes are constructed as in Brugiavini et al. 2021, following Basso et al. 2020, based on information from the O*NET survey of 2018. The two measures are generated at an ISCO-08 three-digit level and range from 0 (not feasible for remote work/no social interaction in performing occupation tasks) to 1 (fully teleworkable/strong level of social contacts at work).

We control for the quality of the work environment by including three indexes generated by Eurofound at ISCO-08 2-digit occupation level, using data from the European Working Conditions Survey of 2015 (Eurofound, 2017). The first index, which evaluates the quality of the physical environment, considers exposure to various physical hazards such as noise, extreme temperatures, biological and chemical factors, and posture at the workplace. A second index captures the work intensity based on information about the job's quantitative requirements, the pace of work, interdependency and emotional demands. Finally, we include an indicator of working time quality, reflecting flexibility in working arrangements, working schedules, and other issues related to working time. All these indexes are based on the 2015 EWCS data, and we link them to our sample at country-ISCO-08 2-digit occupation level.

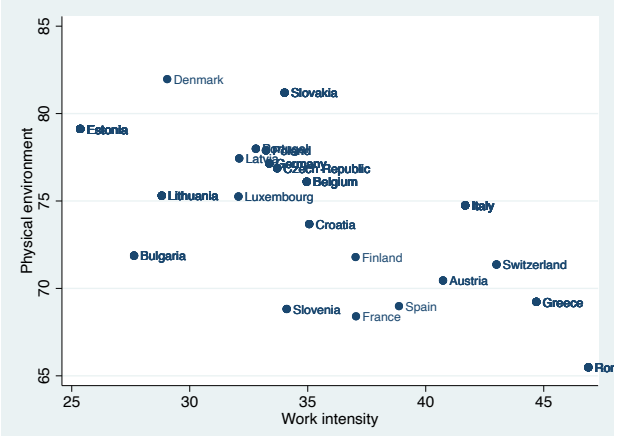
While using data from the EWCS has the drawback of not allowing the construction of various measures at a level of occupation detail higher than the 2-digit ISCO-08, it offers the advantage of capturing cross-country variability in job features and working conditions. This is particularly important in the European context, where work environments and occupational characteristics can vary significantly among countries. Figure 4 a) and b) plot the physical environment and work intensity indexes for the countries in our sample for sub-major "23 Teaching professionals" and for sub-major "93 Labourers in mining, construction, manufacturing".

Figure 4. Physical environment and work intensity by country

a) Sub-major 23 - Teaching professionals



b) Sub-major 93 - Labourers in mining, construction, manufacturing

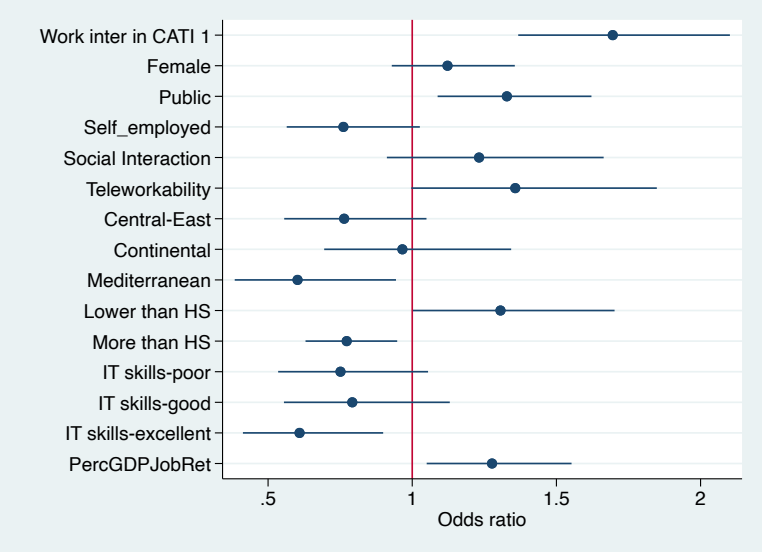


3. Results

3.1 Estimates at medium-term

When estimating the probability to exit employment at large, our results indicate that having experienced work interruptions during the first wave of the pandemic is associated with a 1.7 higher probability of exiting employment in 2021. Figure 5 presents the results in form of odds ratio with respect to the probability of being employed, while the coefficients in specification 1 of Table A2 in the appendix provide a more complete picture of the magnitude of these effects. A few other estimates deserve attention. First, a high level of education (more than high school) and excellent IT-skills significantly decrease the likelihood of having exited employment by 2021, even after controlling for the suitability of the occupation for telework. Second, more surprisingly, being employed in the public sector and the percentage of GDP spent in job retention schemes are positively and significantly related to the probability of being not employed at the time of the second wave of the SCS.

Figure 5. Estimates of the probability to be in a broad not employment status in SCS wave 2



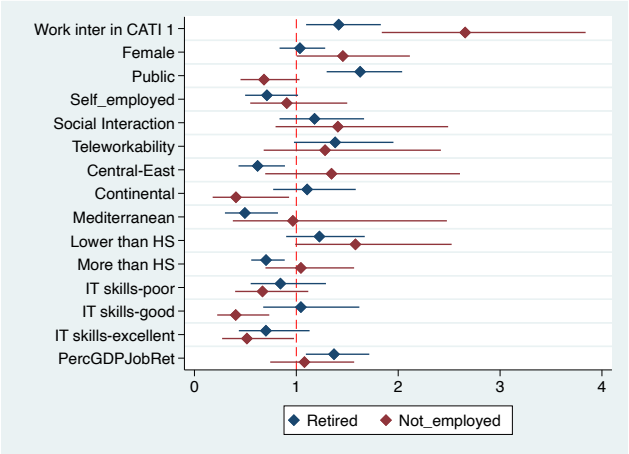
The second specification in table A2 includes among the regressors the interaction between having experienced work interruptions and the level of government expenditure in job retention schemes, while the third regression also accounts for the length of work interruptions. We do this by using as key regressor a categorical variable taking a value of 1 if no work disruptions occurred,

2 for work interruptions shorter than 8 weeks, and 3 if such spells lasted for more than 8 weeks[2]. The results are consistent with the first specification. The length of work interruption is important, longer disruptions are associated with significantly a larger probability of exiting employment by the time of the second SCS interview.

To gain more insight into how various variables relate to exiting employment, we run a multinomial logit specification that distinguishes between retirement and "restricted" not-employment[3] (unemployment or homemaker) status. Figure 6 displays the estimates of the main explanatory variables as relative risk ratios with respect to the probability of being employed at the time of the second SCS. The presence of work disruptions during the first wave of the pandemic is significantly and positively related to both the probability of being retired and the probability of being in a non-employment situation at the time of the SHARE interview in 2021. However, it is important to observe that the magnitude of the effect is more than twice as high for the non-employment status. Employment in the public sector is associated with a significantly higher likelihood of retiring by 2021, while the effect is negative (although not significant) for the "restricted not employment" outcome. The effects of welfare regimes are also noteworthy: compared to the Nordic baseline category, the Central-East European and the Mediterranean countries display a lower probability of retirement, while individuals from countries with a Continental welfare regime have a significantly lower likelihood of being unemployed.
Regarding job retention schemes, the larger the expenditure in 2020 (expressed as a percentage of GDP), the higher the probability of retirement, while the effect is not significant for non-employment. This result may suggest that job retention measures helped to smooth the transition to retirement for older workers in the medium term.

[2] We consider the threshold of 8 weeks because this value represents the median number of weeks of work interruptions reported by SHARE respondents.
[3] We group together the individuals reporting to be unemployed with those declaring to be homemakers because the question collecting this information allows also people that do not fully respect the "official" unemployment definition to qualify themselves as unemployed.

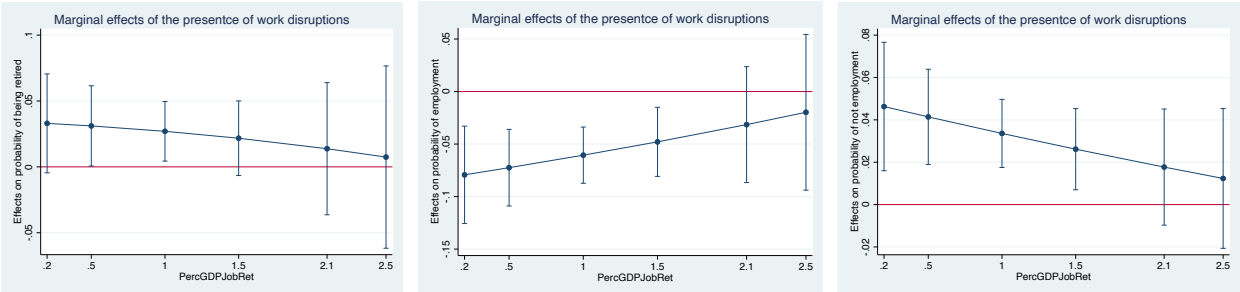
Figure 6. Estimates of the probability of being retired or in a "restricted not employment" status in 2021 (odds ratios)



Note: Baseline situation: being employed

Based on the intuition that job retention schemes may have been more important for those who experienced work disruptions, we also add to the initial regressors an interaction variable between the presence of work interruptions and government expenditure on job retention schemes. Figure 7 below displays the marginal effects of having experienced work disruptions on each of our three outcomes (probability of retirement - left - , probability of employment – middle - and probability of restricted not employment – right panel) for various levels of government expenditure on job retention schemes.

Figure 7. Marginal effects of work disruptions for various levels of expenditure in job retention schemes



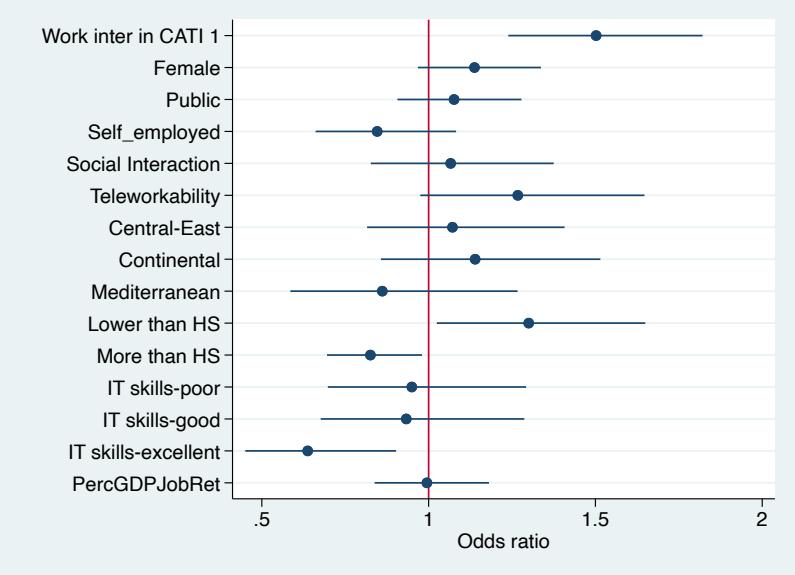
The results indicate that with low government expenditure on JRS in 2020, individuals who experienced work disruptions during the first wave of the pandemic have lower probabilities of employment compared to those without interruptions. However, as the expenditure in JRS increases, the difference between the two groups of workers disappears (middle panel).

Conversely, the combination of work interruptions and low percentages of GDP directed towards job hoarding measures significantly increases the likelihood of being not employed in 2021. This effect gradually decreases and eventually vanishes as expenditure in JRS increases.

3.2 Estimates at longer term

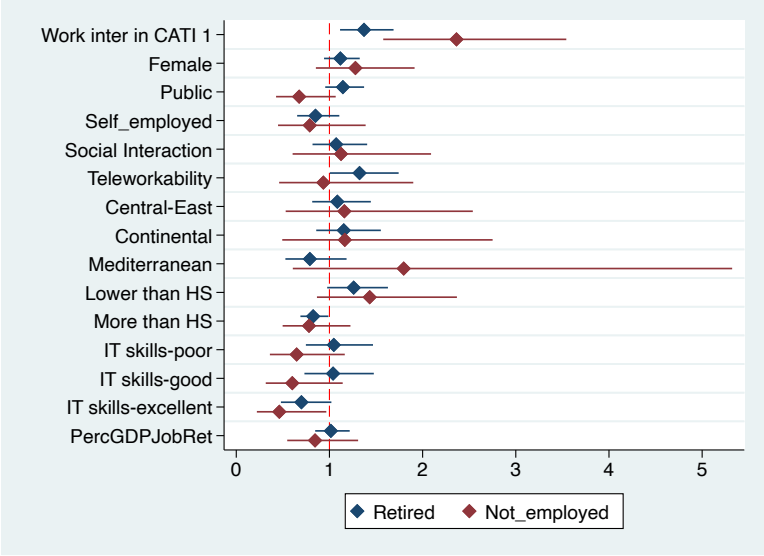
In a second step, we estimate the probability that a respondent is in a non-employment status during the ninth regular wave of SHARE, conducted in 2022. The estimates for broad non-employment are presented in Figure 8 below and table A4 in the appendix. The results point out that having experienced work interruptions during the first wave of the pandemic is associated with a 1.5 times higher relative risk ratio of having exited employment by 2022. Individuals with less than high school education were more likely to exit employment, while the opposite is true for the those with higher education.

Figure 8. Odds ratio of being in a broad not employment status in 2022



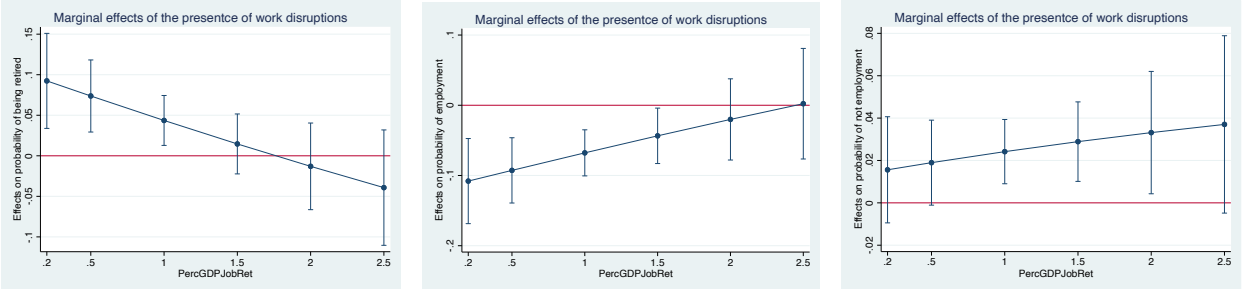
When examining the probabilities of retirement and restricted non-employment separately, the estimates highlight once more the importance of work disruptions for the future employment situation of older workers. Work interruptions are associated with a significantly higher likelihoods of both retiring and being not employed at a two years distance from the pandemic outbreak.

Figure 9. Relative risk ratios of being retired or not employed in 2022



When including in the regressions also the interaction term between the work interruption dummy and the expenditure in job retention schemes, the results are again rather interesting. Work interruptions in economies with low levels of job protection are associated with a significantly higher probability of becoming a retiree by 2022 and a lower likelihood of employment. However, both effects vanish with higher levels of JRS expenditure. Interestingly, differently from the outcomes observed in the previous time period, medium-high levels of expenditure in JRS are associated with a significantly higher probability of unemployment in the longer run. This finding aligns with the literature suggesting that job hoarding measures can protect employment in the short run but may also lead to unintended consequences, such as delaying the exit of inefficient firms that would otherwise have closed even in absence of a crisis. This, in turn, can lead to increased unemployment in the longer run, once job retainment policies are no longer active.

Figure 10. Marginal effects of work disruptions for various levels of expenditure in job retention schemes

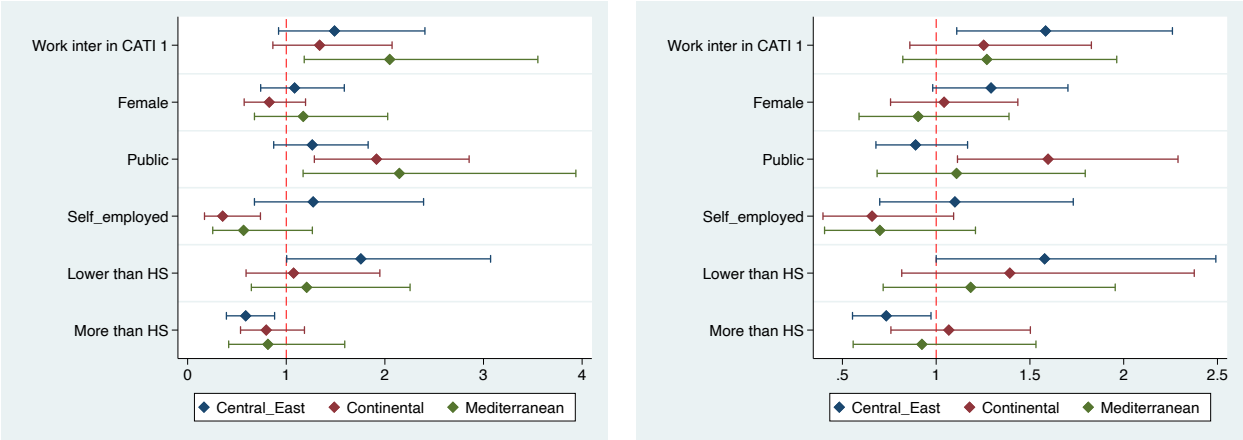


3.3 A focus on welfare systems

In what follows, we explore whether and to what extent welfare systems may have influenced the relationship between work disruptions during the first wave of the pandemic and the probability of retirement/not employment in the short and longer term. To do this, we re-run the previous specifications separately by country cluster and reference period (2021 and 2022). The results reveal some differences between welfare regimes. Figure 10 displays the estimates of the probability of being retired in 2021 and 2022, while Figure 11 shows the results for the probability of non-employment; both are reported as relative risk ratios.

Work interruptions during the first wave of the pandemic are positively and significantly related to the probability of being retired in 2021 only for Mediterranean countries, while the effect is not significant for the other country clusters. In the longer term, the coefficients remain positive for all welfare states, but the correlation is significant only for Central-East European countries. Being employed in the public sector is associated with higher likelihood of retirement one year after the pandemic outbreak, for both Continental and Mediterranean welfare regimes, while in the longer run the effect remains significant only for Continental countries.

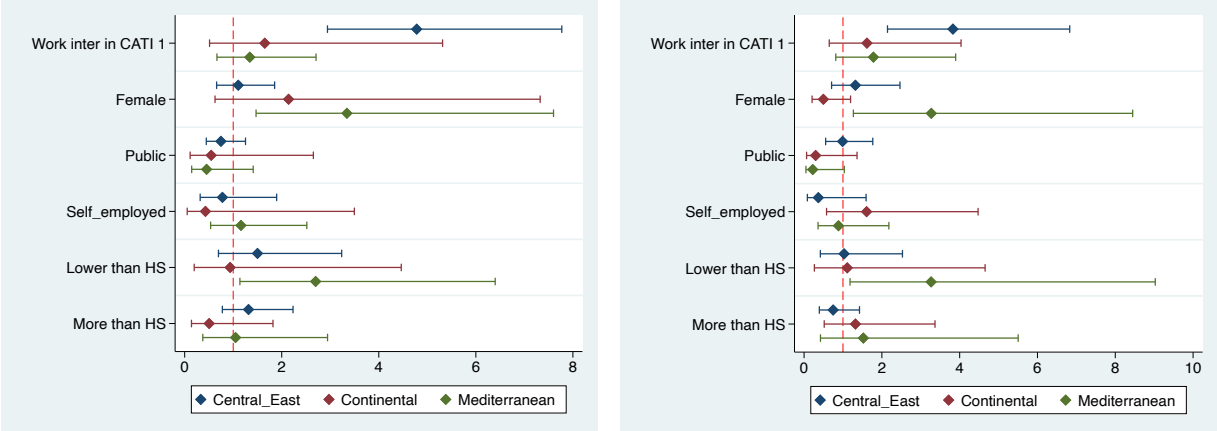
Figure 10. Estimates of the probability of being retired in 2021 (left panel) and 2022 (right panel), by country cluster (relative risk ratios).



As for the probability of non-employment (Figure 11), experiencing work disruptions during the first wave of the pandemic is associated with a significantly higher likelihood of becoming unemployed or homemaker in Central-East European countries, while the coefficients are positive but not significant for Continental and Mediterranean regimes. These effects are similar in sign and magnitude for both time periods, indicating potential difficulties for older workers in Central and East European countries to return to the labour market after work interruption spells. Notably,

being a woman is associated with a four times larger likelihood of being not employed (compared to being employed) in the Mediterranean countries in both 2021 and in 2022. Additionally, in the same country cluster, having a level of education below high school is associated with significantly larger relative risk ratios of not employment.

Figure 11. Estimates of the probability of being in a "restricted" not employment status in 2021 (left) and 2022 (right) by welfare regime (relative risk ratios).



3.4 A propensity score matching approach

To better understand the extent to which work interruptions during the first wave of the pandemic may have influenced the labour market outcomes of older workers, we perform a propensity score matching estimation, in which the treatment is the presence of work disruptions up to the first SCS interview. On the explanatory side, we control for the respondent's age and education, the occupation sector (private, public or self-employed) and whether the occupation is classified as essential. We conduct the analysis separately for the working situation in 2021 and in 2022, running five specifications for each period: one for the full sample and one for each of the four European regions as defined in Table A1. We use the kernel matching method, and the balancing property is satisfied in all the specifications. The average treatment effects on the treated for 2021 and 2022 are displayed in Table 1 and Table 2 below, respectively.

Table 1. Average treatment effects of work disruptions on employment situation in 2021

Sample	Exiting employment		Retirement		Not employment	
	ATT	Std. Err.	ATT	Std. Err	ATT	Std. Err.
Full	0.058***	0.012	0.025**	0.011	0.033***	0.009
Nordic	0.001	0.04	-0.009	0.036	0.01	0.02
Central-East European	0.104***	0.023	0.022	0.015	0.082***	0.018

Continetal	0	0.022		0.023	0.023		0.007	0.008
Mediterranean	0.054**	0.024		0.043**	0.02		0.011	0.015

The results indicate that having experienced work interruptions during the first wave of the pandemic leads to a 10.4% higher probability of being out of work in 2021 in the Central-East European countries and a 5.1% higher likelihood in the Mediterranean region, while it has no significant effect in the other country clusters. In the Central-East European region, this effect is mainly driven by a significantly larger probability of being unemployed or homemaker in the summer of 2021. Indeed, work interruptions are associated with an 8.2% higher likelihood of being in such a non-employment situation. In contrast, in the Mediterranean countries, older workers with disruptions mainly exited employment through retirement, displaying a 4.3% higher probability of retiring by the time of the second SCS interview.

In a longer term, the effects of work interruptions on employment remain significant only for Central-East European countries. Notably, in this region, work disruptions during the first wave of the pandemic lead to an 11.1% larger probability of being out of employment after two years. This effect is evenly distributed between retirement and being unemployed or homemaker, with work interruption spells resulting in a 5.7% increase in the likelihood of becoming a retiree and a 5.4% increase in the probability of non-employment.

Table 2. Average treatment effects of work disruptions on employment situation in 2022

Sample	**Exiting employment**			**Retirement**			**Not employment**	
	ATT	**Std. Err.**		**ATT**	**Std. Err**		**ATT**	**Std. Err.**
Full	0.058***	0.016		0.032	0.017		0.026***	0.009
Nordic	0.037	0.062		0.059	0.059		-0.021***	0.008
Central-East European	0.111***	0.029		0.057**	0.027		0.054***	0.017
Continetal	0.039	0.036		0.032	0.035		0.007	0.01
Mediterranean	0.019	0.031		0.004	0.029		0.015	0.016

4. Conclusions

The COVID-19 pandemic triggered a dramatic increase in unemployment in all countries. European governments enacted or extended various job retention measures, which helped limiting job losses in the short term. Unlike other crisis, employment recovery has been relatively fast, with little reallocation, contrary to initial expectations. However, the recovery patterns vary

among different population groups and by country. Our focus is to understand the extent to which work disruptions experienced by older European workers have been temporary or permanent.

We run a set of logit and multinomial logit specifications to understand the role that work interruptions during the first wave of the pandemic may have played on employment outcomes in 2021 and later, in 2022. To do this, we take advantage of the panel dimension of the Survey on Health Ageing and Retirement in Europe (SHARE) and the specific information collected through the two waves of the SHARE Corona Survey, conducted between June-August 2020 and 2021, respectively. Our results indicate that older workers who experienced work interruptions had higher probabilities of exiting employment one and a half year after the pandemic outbreak, either through retirement or by becoming unemployed or homemakers. The effects persist when we explore the employment situation of the individuals in the longer run, in 2022.

It is important to note the relevance of welfare regimes. Performing the analysis separately by country cluster reveals that the positive relationship between work interruptions and the probability of non-employment is mainly driven by Central-East European countries, while the effect on retirement is mostly due to the Mediterranean ones.
Although we cannot distinguish among different types of job retention policies and we only dispose of national figures, the amount of government expenditure in job retention schemes is relevant. Higher levels of such expenditure may reduce or eliminate short-term differences in non- employment probability between individuals who experienced work interruptions and those who did not. However, they may also generate inefficiencies and delay the exit of potential inefficient firms from the market (Giupponi and Landais, 2023), leading to increased unemployment in the longer run.

In addition, our results contribute to the evidence documenting the unequal impact of the pandemic on different categories of individuals. Specifically, the vulnerability of low educated persons and women was driven by two channels: (i) on the one hand they were more prone to work disruptions (Brugiavini et al, 2021), which subsequently led to higher probabilities of exiting employment, as documented by our estimates (ii) on the other hand, we find that women and low-educated individuals were more likely to experience non-employment (unemployed or homemakers) in the longer run, particularly in countries within the Mediterranean cluster. Therefore, governments should adopt policy measures targeted at protecting these vulnerable groups through additional training/skills enhancement, which have been shown to have a mitigating effect, as well as through carefully designed job hoarding schemes. Such measures are particularly important for older workers, who may otherwise be unable to return to the labour market after experiencing work disruptions.

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Appendix

Table A1: Classification of countries based on welfare regimes[4] and percentage of expenditure in job retention schemes in 2020.

Country	Welfare Regime	% GDP in job ret schemes
Czech Republic	Central-East	0.80
Poland	Central-East	0.30
Slovenia	Central-East	0.90
Estonia	Central-East	1.00
Croatia	Central-East	2.10
Lithuania	Central-East	0.30
Bulgaria	Central-East	0.60
Latvia	Central-East	0.20
Romania	Central-East	0.60
Slovakia	Central-East	0.30
Austria	Continental	1.60
Germany	Continental	0.70
Netherlands	Continental	1.90
Switzerland	Continental	1.50
Belgium	Continental	0.90
Luxembourg	Continental	1.30
Spain	Mediterranean	1.80
Italy	Mediterranean	1.60
France	Mediterranean	1.00
Greece	Mediterranean	2.40
Portugal	Mediterranean	0.50
Cyprus	Mediterranean	2.50
Sweden	Northern	0.70
Denmark	Northern	0.60
Finland	Northern	0.30

[4] Following Ebbinghaus and Lehner, 2022.

Table A2: Estimates of the probability of exiting employment in 2021

VARIABLES	(1) Not employed (broad)	(2) Not employed (broad)	(3) Not employed (broad)
Work interruptions	1.695***	2.335***	
0 to 8 weeks of WI			1.414**
More th. 8 weeks WI			2.343***
Age 60-69	4.348***	4.351***	4.406***
Female	1.122	1.12	1.11
Married	1.052	1.049	1.045
Public	1.328***	1.330***	1.332***
Self_employed	0.761*	0.779	0.758*
Social Interaction	1.232	1.232	1.229
Teleworkability	1.357*	1.357*	1.367**
Central-East	0.764*	0.761*	0.762*
Continental	0.966	0.965	0.969
Mediterranean	0.602**	0.624**	0.608**
Lower than HS	1.306**	1.296*	1.302*
More than HS	0.773**	0.776**	0.772**
IT skills-poor	0.751*	0.749*	0.764
IT skills-good	0.792	0.788	0.8
IT skills-excellent	0.609**	0.608**	0.618**
Perc GDP Job Ret Schemes	1.277**	1.361***	1.266**
Other controls			
Job features	yes	yes	yes
Interaction terms	no	yes	no
Stringency	yes	yes	yes
Observations	5214	5214	5202

Relative risk ratios; baseline outcome: being employed

*** p<0.01, ** p<0.05, * p<0.1

Table A3: Multinomial logit estimates of the probability to be retired or not employed in 2021

VARIABLES	(1)		(2)		(3)	
	Retired	Not employed	Retired	Not employed	Retired	Not employed
Work interruptions 0-8 weeks of WI	1.416***	2.657***	1.751**	4.007***	1.205	2.190***
More than 8 weeks of WI					1.913***	3.646***
Age 60-69	12.11***	1.151	12.12***	1.146	12.23***	1.172
Female	1.036	1.457**	1.035	1.452**	1.026	1.437*
Married	1.298**	0.619***	1.295**	0.615***	1.289**	0.617***
Public employee	1.627***	0.683*	1.627***	0.687*	1.626***	0.693*
Self_employed	0.711*	0.906	0.721*	0.943	0.710*	0.896
Social Interaction	1.179	1.408	1.18	1.393	1.175	1.403
Teleworkability	1.381*	1.282	1.383*	1.268	1.383*	1.319
Central-East	0.620***	1.346	0.618***	1.352	0.619***	1.344
Continental	1.106	0.408**	1.104	0.413**	1.105	0.416**
Mediterranean	0.495***	0.966	0.505***	1.045	0.499***	0.982
Lower than HS	1.227	1.580*	1.221	1.568*	1.223	1.575*
More than HS	0.703***	1.045	0.705***	1.055	0.700***	1.051
IT skills-poor	0.844	0.668	0.842	0.665	0.856	0.683
IT skills-good	1.045	0.405***	1.042	0.401***	1.054	0.410***
IT skills-excellent	0.702	0.515**	0.701	0.511**	0.711	0.521**
Perc GDP Job Ret	1.370***	1.08	1.421***	1.221	1.363***	1.062
Other controls						
Job features	yes	yes	yes	yes	yes	yes
Interaction terms	no	no	yes	yes	no	no
Stringency	yes	yes	yes	yes	yes	yes
Observations	5214	5214	5214	5214	5202	5202

Relative risk ratios; baseline: being employed

*** p<0.01, ** p<0.05, * p<0.1

Table A4: Estimates of the probability of exiting employment in 2022

VARIABLES	(1) Not employed (broad)	(2) Not employed (broad)	(3) Not employed (broad)
Work inter in CATI 1	1.502***	1.982***	
0-8 weeks of WI			1.296**
More th. 8 weeks of WI			1.951***
Age 60-69	7.321***	7.318***	7.371***
Female	1.137	1.134	1.130
Married	1.214**	1.211**	1.203**
Public employee	1.076	1.076	1.076
Self_employed	0.846	0.859	0.827
Social Interaction	1.066	1.067	1.076
Teleworkability	1.267*	1.266*	1.262*
Central-East	1.071	1.068	1.084
Continental	1.140	1.139	1.151
Mediterranean	0.861	0.887	0.880
Lower than HS	1.300**	1.290**	1.291**
More than HS	0.826**	0.828**	0.824**
IT skills-poor	0.950	0.948	0.961
IT skills-good	0.933	0.931	0.947
IT skills-excellent	0.637**	0.638**	0.643**
Perc GDP Job Ret	0.995	1.046	0.994
Other controls			
Job features	yes	yes	yes
Interaction terms	no	yes	no
Stringency	yes	yes	yes
Observations	4,593	4,593	4,581

Relative risk ratios; baseline: being employed

*** p<0.01, ** p<0.05, * p<0.1

Table A5: Estimates of the probability of being retired or not employed in 2022

VARIABLES	(1) Retired	(1) Not employed	(2) Retired	(2) Not employed	(3) Retired	(3) Not employed
Work interruption	1.371***	2.364***	2.081***	1.752		
0-8 weeks of WI					1.263*	1.587*
More th 8 weeks of WI					1.589***	4.025***
Age 60-69	12.76***	1.277	12.76***	1.284	12.77***	1.315
Female	1.117	1.279	1.113	1.287	1.112	1.249
Married	1.311***	0.753	1.305***	0.756	1.300***	0.739
Public employee	1.145	0.675*	1.145	0.675*	1.14	0.691
Self_employed	0.85	0.789	0.869	0.771	0.83	0.773
Social Interaction	1.072	1.125	1.074	1.129	1.086	1.117
Teleworkability	1.323**	0.935	1.321**	0.939	1.311*	0.967
Central-East	1.085	1.16	1.08	1.158	1.098	1.192
Continental	1.154	1.165	1.155	1.165	1.157	1.242
Mediterranean	0.79	1.797	0.825	1.717	0.804	1.886
Lower than HS	1.260*	1.432	1.245*	1.446	1.250*	1.45
More than HS	0.825**	0.781	0.829**	0.777	0.821**	0.793
IT skills-poor	1.047	0.648	1.045	0.649	1.052	0.671
IT skills-good	1.039	0.601	1.038	0.604	1.049	0.618
IT skills-excellent	0.700*	0.462**	0.701*	0.461**	0.703*	0.474**
PercGDPJobRet	1.016	0.846	1.091	0.753	1.022	0.815
Job features	yes	yes	yes	yes	yes	yes
Interaction terms	no	no	yes	yes	no	no
Stringency	yes	yes	yes	yes	yes	yes
Observations	4593	4593	4593	4593	4581	4581

Relative risk ratios; baseline: being employed

*** p<0.01, ** p<0.05, * p<0.1