



Work-life balance during the COVID-19 pandemic. A European perspective

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Abstract

The EU's remote working landscape, marked by heterogeneity, underwent significant changes due to COVID-19. We use Eurofound's longitudinal *Living, Working and COVID-19* e-survey to explore work-life balance shifts among remote workers from spring 2020 to spring 2022. Quantitative analysis reveals heightened work-life balance challenges for married, female, parent, and university-educated remote workers. Employer work-life balance intensified post-pandemic, while self-employed workers faced consistent challenges. Countries with less of a history of remote work exhibited reduced remote worker satisfaction through all phases of the pandemic. While sectoral effects were not pronounced, this study underscores nuanced demographic and employment-related impacts of remote work on work-life balance. Its findings provide new insights to the study of EU remote work dynamics, offering implications for workforce well-being and management strategies.

Keywords Remote work · COVID-19 · Pandemic · Life satisfaction

JEL Codes J22 · J28 · J81

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1 Introduction

Before the COVID-19 pandemic, the prevalence of teleworking in EU countries was heterogeneous (Sostero et al., 2020). According to the ILO (2020), teleworking is one of several possible working arrangements, together with agile working, smart working, and working from home. All these working arrangements constitute “remote working” (RW). In 2019, in northern Europe (Sweden, the Netherlands, Luxembourg, Finland, and Denmark), 25% of employees teleworked regularly or at least a few days each month. By contrast, the percentages were much lower in Italy, Cyprus, Romania, and Bulgaria (Sostero et al., 2020). This diversity originates from certain structural factors typical of each European economy, such as company size, specialization in knowledge- and innovation-intensive sectors, and organizational culture (Barbieri et al., 2022). Of course, different regulatory frameworks also significantly influence how companies manage work (Eurofound, 2020). The economic activities best suited to the teleworking model are professional, scientific, technical, finance and insurance, as well as public administration (Barbieri et al., 2022).

During the COVID-19 pandemic, 39% of workers in the EU said they began working from home; however, there was a significant variation in occurrence between countries (from 18% in Romania to 59% in Finland) (Sostero et al., 2020). RW decreased in the spring of 2022, with two out of three respondents working exclusively from the office (Eurofound, 2022). As the restrictions of the pandemic eased, many employees returned to their employers’ offices, and working from home (WFH) decreased (12% of employees worked entirely from home in spring 2022). At the same time, hybrid work (i.e., work done partly remotely and partly at the place of work) gained ground: the percentage of employees engaged in hybrid work increased from 14% in the summer of 2020 to 18% in the summer of 2022. Incidentally, most employees in the EU said they preferred working from home several times a week in the long run (Eurofound, 2022). Furthermore, there are geographical differences in RW: it is more common in eastern and southern EU Member States for workers to work entirely in the workplace, compared to other countries, even in the case of jobs that are teleworkable (Eurofound, 2022).

It has already been suggested that work ethics influenced the unfolding of the pandemic, through its impact on the efficacy of Non-Pharmaceutical Interventions (Alfano, 2022). Did new working arrangements due to the pandemic also affect workers’ well-being? Our study uses the *Living, Working and COVID-19* e-survey by Eurofound (2022), looking at the first wave of the pandemic (spring 2020) and the fifth wave (spring 2022), to investigate within a quantitative framework how the work-life balance satisfaction of remote workers changed over the pandemic period (spring 2020–spring 2022).¹ With questions ranging from health and levels of trust in institutions to life satisfaction, happiness, and optimism, the survey looked at the quality of society and life throughout the pandemic. It also focused on the respon-

¹ The first and fourth waves are not included due to substantial differences in the questions asked by the survey, which does not allow us to set the model homogeneously for the different waves. For the first wave variable, the question about the number of children per age is missing, making it impossible to compare this with the third and fourth waves, while in the fourth wave there is no question about remote working.

dents' employment circumstances, work-life balance, and usage of RW throughout the crisis. Data were gathered from a representative sample of citizens from all EU countries over a period covering the entire pandemic.

Specifically, our study focuses on those who were employed and working remotely in European countries at different times. To reach this goal, a regression analysis is employed. Our results show that work-life balance deteriorated for: (i) married workers; (ii) women (with higher adverse effects at the end of the pandemic); (iii) those with children; and (iv) university graduates. Moreover, analysis of the various waves of the COVID-19 pandemic shows that (v) employers' work-life balance improved at the end of the pandemic; (vi) self-employed workers suffered before, during, and after the pandemic; (vii) the less the country used remote working, the worse the satisfaction of its remote workers before, during and after the pandemic; and (viii) there were no significant effects at the sectoral level.

The article is divided into four sections. A literature review on RW and work-life balance satisfaction follows this introduction. Data and methodology are described in Sect. 3, and the results are analyzed in Sect. 4. The paper ends with a discussion and conclusions.

2 Literature review

2.1 Remote working

Teleworking is not a new work arrangement. In 1975, Nilles (1975) foresaw that the increased availability of computer and telecommunications technologies would be an opportunity for increased flexibility in organizational development, with many employees adapting quickly to telecommunications-assisted working. According to the ILO (2021a, p.2) definition, 'telework' ('telecommuting' is the American term) means "the use of information and communications technologies (ICTs), such as smartphones, tablets, laptops, and desktop computers, for work that is performed outside the employer's premises". Telework implies working anywhere outside the employer's location. When teleworkers work from home, they "go straight from the breakfast table to the work desk (and indeed the two are often the same), which may lead to stress and overwork. Presenteeism and work flexibility are two sides of the same coin" (ILO, 2021b; p. 160). RW is an umbrella term that involves: teleworking, agile working, smart working, and WFH. Since the pandemic, there has been an increase in hybrid work, which is a work arrangement involving a few working days from home, which is now desired by workers and accepted by employers (Eurofound, 2022). A recent study by Aksoy et al. (2023) shows that full-time employees worked from home an average of 0.9 days each week in April-May 2023 across 34 nations. Data indicate that RW levels are higher in English-speaking nations (Australia, Canada, New Zealand, the UK, and the US), where full-time employees worked an average of 1.4 fully paid days from home per week. Lower levels characterize the seven Asian countries covered by the G-SWA, with only 0.7 days per week, the European countries, with 0.8 days, and South Africa, and four Latin American countries with 0.9 days per week.

Several valuable outcomes are associated with RW. The possibility of improving work-life balance “is often cited as the major benefit that the worker who elects to telecommute will receive” (Siha & Monroe, 2006, p. 460). The balance between work and life involves two key dimensions: engagement in work life and non-work life, with minimal conflict between work and non-work roles (Sirgy & Lee, 2018).

Remote workers generally: (1) enjoy autonomy (Harpaz, 2002), also interpreted as the ability to choose when and how to work (Kazekami, 2020); (2) can manage their jobs flexibly, and (3) work close to their families, meaning that they likely have the opportunity to devote time to family, with a better division of time between work and family. Flexibility and autonomy mean that workers feel better able to decide where, when, and how to work; this, in turn, makes them feel that they can allocate time to work and family (Bailey & Kurland, 2002) more effectively than would be the case in a conventional workplace. Indeed, when workers work from home, there is a continuous overlapping between work and personal life, and this can help workers manage family responsibilities better (Bakker & Geurts, 2004; Voydanoff, 2004). Although this seems favourable for workers’ work-life balance, the literature on this topic is controversial.

Work and family are two crucial parts of individuals’ lives and require time and attention. According to Boundary theory, the workplace and the family space (home) are assumed to be physically separated (Allen, 2001; Bulger et al., 2007; Allvin et al., 2011; Mellner et al., 2014). Since a remote worker’s workplace is within the family domain, managing the work–family boundary can be a big challenge, which, in turn, is likely to lead to family-to-work conflict and work-to-family conflict (Eddleston & Mulki, 2017). Conflicts will likely arise when work or personal life demands more resources than the person wants or can give when required (Barber et al., 2015). This could stress teleworkers by introducing confusion as to which role – work or family – they should prioritize in the home (Eddleston & Mulki, 2017).

The other advantages of RW for workers are: (1) having the freedom to plan their own time (Gurstein, 2001); (2) increased available time for leisure (Ammons & Markham, 2004); (3) reduced time and costs for commuting (Morgan, 2004); and (4) increased productivity (Bailey & Kurland, 2002) because of less frequent disruptions from colleagues (Thulin et al., 2019), as well as the greater effort put into one’s work as a consequence of the job autonomy one enjoys.

However, there is controversy regarding the effects of RW on workers’ productivity (see Bailey & Kurland, 2002 for a review of the possible impacts of teleworking on productivity). Indeed, productivity does not necessarily increase, since teleworkers could suffer family interferences while working, or experience isolation (Jackson and Fransman, 2018). In addition, long work hours could stress workers when balancing paid work and personal life commitments (ILO, 2021a, b). At the same time, they could be another cause for the decrease in teleworkers’ labour productivity (Kazekami, 2020).

Indeed, the advantages of RW need to be weighed against the disadvantages. The so-called autonomy paradox is among the drawbacks that can arise from teleworking. “The more the job autonomy that remote e-workers have, the greater the effort they put into their work with adverse effects on individual wellbeing” (Curzi et al., 2020,

p. 108). Furthermore, RW can also generate negative career consequences (Williams et al., 2013).

However, there seems to be a substantial difference between ordinary teleworking and the RW imposed during the COVID-19 pandemic, in which employees were not given a choice in the matter. Indeed, during the COVID-19 pandemic, RW was mandatory and full-time in nature (ILO, 2021a, b). Consequently, RW may have had different effects on employees during the pandemic compared to those it had before (Allen et al., 2020).

2.2 Remote working: which occupations?

During the COVID-19 pandemic remote working was predicted to become the “new normal”; however, many occupations are “non-teleworkable”. Without a doubt, working from home is a privilege for a small share of workers, and is not a generalized opportunity for all occupations. Indeed, in the US, only 37% of jobs can be performed completely from home, with workers in those jobs normally earning more than workers who cannot work from home. However, there are substantial differences across cities and industries (Dingel & Neiman, 2020). Dingel and Neiman (2020) classify the possibility of working from home for all occupations using the US O*NET dataset. When they aggregate the occupational classification to the major group (2-digit) level, it emerges that managers, educators, and people employed in computers, finance, and law are mostly able to work from home. By contrast, people who work in farms, construction, and production cannot work from home. As reported by Dingel and Neiman (2020), significant variations occur across countries. For instance, in Mexico and in Turkey, less than 25% of occupations can be performed from home, whereas in Sweden and in the UK the share is much higher, i.e., more than 40%. Figures are very different in developing countries. Saltiel (2020) adopts Dingel and Neiman’s (2020) approach and employs worker-level data from the STEP survey to examine the possibility of working from home in ten low- and middle-income countries (namely, Armenia, Bolivia, Yunnan Province in China, Colombia, Georgia, Ghana, Kenya, Laos, Macedonia and Vietnam). The findings show that in those countries only 13% of workers could work from home. The share is lowest (5.5%) in Ghana and highest (23%) in Yunnan. As in other countries, including the STEP countries, there is a positive correlation between the possibility of working from home and high earning jobs. Figures for advanced countries are considerably different. Research on developed economies shows that the share of the workforce that shifted to teleworking during the pandemic is generally much higher, ranging from 30 to 50% (Cetrulo et al., 2022).

In Europe, on the other hand, as reported by Cetrulo et al. (2020), for working activities to be performed from home, “material and immaterial infrastructure” must be available. “However, a large fraction of European workers do not meet these feasibility conditions” (Cetrulo et al., 2020, p. 143). To calculate the jobs that can be performed from home, Cetrulo et al. (2020) employ the Italian database of occupations, “Indagine Campionaria delle Professioni”, a survey like the US O*NET dataset and linked to the Italian Labour Force Survey. Their investigation shows that in Italy only 30% of all jobs in the survey can be done from home.

According to their findings, the jobs that could be performed from home mainly include managerial and executive categories, academics, technical professionals, and clerical support workers (Cetrulo et al., 2020, p. 143). Meanwhile, sales and service workers, manual operators, artisans and elementary occupations have either no possibility at all of working from home, or only a slight possibility of doing so, since they are not likely to use a computer at work. However, as reported by Cetrulo et al. (2022), teleworking does not only concern the use of ICT. It is also related to the division of labour and to the implicit hierarchy within organizations. Cetrulo et al. (2022) focus on the Italian case, employing the “Indagine Campionaria delle Professioni”, the “Indagine delle Forze di Lavoro” and the Inail archive. Their results show that although the use of ICT contributes significantly to one’s possibility of working from home, “teleworkability” is influenced by one’s level of authority and by workers’ independence in taking decisions when working, and therefore by their hierarchical position within the organization. Jobs which cannot be done from home generally occupy the lowest positions (the tail end) of the employment structure. By contrast, workers who have a high degree of autonomy in their jobs, and command or control of high-level administrative tasks, can work from home (Cetrulo et al., 2022, p. 357).

2.3 Work-life balance

Work-life balance can be defined as “the relationship between the institutional and cultural times and spaces of work and non-work in societies where income is predominantly generated and distributed through labour markets” (Felstead et al., 2002, p. 56), and “a high level of engagement in work life and nonwork life with minimal conflict between social roles in work and nonwork life” (Sirgy & Lee, 2018, p. 232).

According to Eurofound (2022), EU workers’ work-life balance declined during the first wave of the pandemic compared to 2015. Focusing on work proved to be more challenging for working women in the EU-27 than for working men (8% of women and less than 5% of men), which had a more detrimental effect on women’s housework than that of men. According to Corsi and Ilkcaracan (2022), a quarter of males and nearly a third of women reported feeling too exhausted after work to complete required household activities. Additionally, none of them was able to spend enough time with their family. A little over 21% of both men and women said that their jobs kept them from spending as much time as they would have liked with their families. This is significant because it represents a ten-point rise from 2015.

Flexible work arrangements, meaning “the possibility for workers to adjust their working patterns, including through the use of remote working arrangements, flexible working schedules or reduced working hours” (Eurofound, 2020, p. 8), provide employees with more control over juggling a variety of job and non-work activities, which is vital to work-life balance satisfaction (Allen, 2001; Thomas & Ganster, 1995). Only flexible scheduling considerably improved the psychological and physiological indicators of job strain outcomes, according to Thomas and Ganster’s (1995) research. These results may arise from the fact that flexible work arrangements benefit all workers.

The study by Teodorovicz et al. (2021) of full-time employees in knowledge-intensive occupations in the US before and during the pandemic found that the forced

transition to work-from-home (WFH) brought about by the pandemic resulted in reduced commuting time and increased time spent on work and/or personal activities. However, this change was heterogeneous depending on the worker's position and organization: managers were more willing to reallocate the time gained from commuting into more time for meetings, and WFH did not impact self-reported measures of well-being (Teodorovicz et al., 2021).

On the other hand, Bu et al. (2021) discovered that variations in the amount of time spent on different activities (e.g., volunteering, cleaning, gardening, working out, reading, taking up a hobby, chatting online with loved ones, and listening to music or the radio) during the COVID-19 lockdowns were all linked to higher levels of life satisfaction. On the other hand, a lower level of life satisfaction was associated with spending more time watching COVID-19 news (Bu et al., 2021). Recently, Alfano et al. (2023) explored the factors influencing work–life balance satisfaction during the COVID-19 pandemic in Italy. They found that remote working improved work–life balance conditions during the pandemic but widened gender inequalities in the labour market.

Boca et al. (2020) study the impact of working arrangements adopted because of COVID-19 on housework, childcare and home schooling among couples in which both partners are working. Their findings show that in Italy women bore most of the burden of the extra housework and childcare related to COVID-19, though childcare was more evenly distributed between the couple than housework. Findings on work–life balance satisfaction show that during COVID-19, balancing work and family responsibilities was more difficult for women with children aged 0–5. Women whose partners did not start working from home during the pandemic found the work–life balance particularly hard to achieve.

3 Data and methodology

For a quantitative framework with which to measure the characteristics associated with greater work–life balance satisfaction among remote workers, we relied on a simple model where different aspects of this satisfaction are expressed as a function of a set of explanatory variables. Theoretically, this would let us know which variables correlate with positive or negative self-reporting of different facets of satisfaction with this balance. Moreover, we estimate this equation on several samples, referred to distinct respondents to the survey at different times, to check the evolution of the impact of these variables on the dependent variable over time. More precisely, our empirical analysis is performed with the use of regression analysis, which estimates the following equation:

$$Y_{cw} = \alpha + \beta_1 Mar + \beta_2 Fem + \beta_3 CLChild + \beta_4 Edu + \beta_5 Emp + \beta_6 Aut + \beta_7 WS + \beta_8 RWC + \beta_9 Wave_w + \beta_{10} Country_c + \varepsilon \quad (1)$$

Where:

- Y , the dependent variable, is (alternatively) operationalized as one of the four

- different aspects of work-life balance satisfaction (more details on this below);
- *Mar* is a variable controlling for the effect of being a married remote worker;
 - *Fem* is a variable controlling for the effect of being a remote female worker;
 - *CLChild* is a matrix controlling for the effect in households with at least one co-living child. This variable requires special attention because it may indicate different effects on work-life balance satisfaction. Whenever the data allows it, this matrix is constituted of two variables: one controlling for households with children up to 11 years old, and the other for children between 12 and 17 years old;
 - *Edu* is a variable controlling for the effect of being a highly educated remote worker;
 - *Emp* and *Aut* are two variables controlling for whether the respondents are employees or autonomous workers (with the omitted, and hence reference, modality of autonomous workers with employees, i.e., an entrepreneur);
 - *WS* is a matrix of dichotomous dummy variables controlling for the different Work Sectors to which the respondent may belong (where services are omitted, and hence are the reference modality);
 - *RWC* is a variable measuring how established remote working was in the country before the pandemic, on average;
 - *Wave* is a matrix of dichotomous dummy variables controlling for the pandemic wave of the survey in which the question was asked, to avoid systemic differences due to wave-specific effects biasing the analysis (for obvious reasons, this matrix is included only when including more than one wave in the sample);
 - *Country* is a matrix of dichotomous dummy variables controlling for the respondent's country of residence to prevent systemic differences due to country-specific effects from biasing the analysis.

To estimate Eq. (1), we relied on data from the first, second, third, and fifth waves (since they include the key variables used in the study) of the *Living, Working and COVID-19* e-survey undertaken by Eurofound. As specified above, the fourth wave was not included in the survey because it does not contain the questions on remote working necessary for our analysis. According to the agency's description, the survey "examined the quality of life and quality of society during the pandemic, with questions ranging from life satisfaction, happiness and optimism, to health and levels of trust in institutions. It also focused on the work situation of respondents, their work-life balance and their use of teleworking during the crisis."² More generally speaking, the dataset offers several interesting microdata, gathered from a representative sample of citizens of all the European Union countries, over a period that covers the entire pandemic, ranging from a first round during spring 2020, to a final round in spring 2022. Specifically, the first wave occurred in spring 2020, the second in summer 2020, the third in spring 2021, and the fifth in spring 2022. To estimate the impact on work-life balance satisfaction of remote workers, we proceeded to the listwise deletion of all the respondents who declared they were unemployed and not working remotely.

²<https://www.eurofound.europa.eu/surveys/living-working-and-covid-19-e-survey>, URL accessed on 15/4/23.

We exploited these data to operationalize the variables included in Eq. (1). First, we built the dependent variables, covering four facets of work-life balance satisfaction. More precisely, the survey asks the respondent how often:

- (s)he is too tired after work to do household chores (*TTTDH*);
- her/his job prevents her/him from giving time to family (*JPTTF*);
- (s)he finds it hard to concentrate on the job because of the family (*HTCBF*);
- her/his family prevents her/him from giving time to the job (*FPGTTJ*).

In the data, to simplify the interpretation of the coefficients, higher values of the variable always correspond to higher satisfaction with life-work balance³. Hence, higher values of *TTTDH* correspond to people who are less often too tired after work to do household chores. Each variable has five possible modalities, ordered on a Likert scale (Table 1). Table 1 describes the independent variables and presents descriptive statistics, while Fig. 1 presents heat maps for the key variables, to give the reader an idea of the country levels at a glance. The *RWC* variable measures how established RW working was in the country before the pandemic, and this comes from Eurostat data. These data gathered information about the number of employed persons working from home as a percentage of total employment (series *LFSA_EHOMP*⁴). Specifically, we computed the share for each country of workers aged between 25 and 64 who declared in 2019 that they had never worked remotely. Then, we divided the sample into quartiles, obtaining a variable ranging from 1 to 4 according to how widespread remote working was. The countries in the sample are thus divided into four groups, according to how established remote working was among the workforce before the pandemic, and hence, how great a shock the imposition and spread of this form of work organization during the pandemic had on society. Table A in the Appendix presents the four clusters in which the countries are divided according to this procedure.

Since all four possible alternative operationalizations of the dependent variable are ordinal variables, the natural candidate for estimating Eq. (1) is an ordered probit (or logit) estimator. This type of estimator is an appropriate fit for these kinds of data, as it preserves the ordering of response options while making no assumptions about the interval distances between options (Greene, 2012; Liddell & Kruschke, 2018).

We proceeded to estimate this model on three different samples: (i) one consisting only of respondents during the first wave; (ii) one consisting only of respondents during the fifth wave; and (iii) one on a repeated cross-sectional sample, consisting of respondents during the first, second, third and fifth waves. Furthermore, to obtain more generalizable, robust and easily interpretable results, we also computed the average of the different operationalizations of Y, obtaining a new variable bordered between 0 and 1, labelled *Ave. Work-Life Satisfaction*. This variable, the normal-

³ As per standard Ordered Probit and Logit models, per each one unit increase in an independent, the z score of probability to move to the next level of life satisfaction increases by coefficient times the dependent variable.

⁴ https://ec.europa.eu/eurostat/databrowser/view/LFSA_EHOMP__custom_315091/default/table?%20lang=en URL consulted on 24/4/24.

Table 1 Descriptive statistics

Variable	Label	Obs	Mean	Std. dev.	Min	Max
The ordinal variable is equal to the answer to the question: "How often are you too tired after work to do household chores?". Based on the variable D004_02 of the original dataset. Higher values correspond to higher satisfaction.	TTTDH	23,645	3.036118	0.9738841	1	5
Ordinal variable equal to the answer to the question: "How often does your job prevent you from giving time to your family?". Based on the variable D004_03 of the original dataset. Higher values correspond to higher satisfaction.	JPTTF	23,490	3.334823	1.091022	1	5
Ordinal variable equal to the answer to the question: "How often is it hard to concentrate on your job because of family?". Based on the variable D004_04 of the original dataset. Higher values correspond to higher satisfaction.	HTCBF	23,543	3.764941	0.9693542	1	5
Ordinal variable equal to the answer to the question: "How often does your family prevent you from giving time to your job?". Based on the variable D004_05 of the original dataset. Higher values correspond to higher satisfaction.	FPGTTJ	23,515	3.977376	0.9612719	1	5
The mean value of the previous five variables is divided by 5 to obtain a 0–1 normalization.	Av. Work-Life Sat.	23,363	0.7057077	0.1568604	0.2	1
Dichotomous dummy variable, equal to 1 if the respondent is married.	Married	23,735	0.7811249	0.4134924	0	1
Dichotomous dummy variable, equal to 1 if the respondent is female.	Women	23,735	0.658479	0.4742298	0	1
Dichotomous dummy variable, equal to 1 if the respondent has any co-living children in the household (e.g., variable H204 in the original dataset).	Children	23,735	0.5018749	0.500007	0	1
Variable equal to the number of children in the household aged between 0 and 11 years old. Based on the variable H005 of the original dataset.	Number of children aged 0–11	10,334	0.7691117	1.002518	0	10

Table 1 (continued)

Variable	Label	Obs	Mean	Std. dev.	Min	Max
Variable equal to the number of children in the household aged between 12 and 17 years old. Based on the variable H006 of the original dataset.	Number of children aged 12–17	9,710	0.4733265	0.874007	0	10
Dichotomous dummy variable, equal to 1 if the respondent has a tertiary education (e.g., variable F004 in the original dataset is equal to 3).	Degree	23,735	0.8374131	0.3689961	0	1
Dichotomous dummy variable, equal to 1 if the respondent is an employee (e.g., variable D001 in the original dataset is equal to 1).	Employee	23,735	0.8724247	0.3336234	0	1
Dichotomous dummy variable, equal to 1 if the respondent is an autonomous worker without an employee (e.g., variable D001 in the original dataset is equal to 2).	Aut.Worker	23,735	0.0257426	0.1583697	0	1
Dichotomous dummy variable, equal to 1 if the respondent is working in the agricultural sector (e.g., variable F236 in the original dataset is equal to 1).	Sec. Agriculture	23,735	0.0097325	0.0981741	0	1
Dichotomous dummy variable, equal to 1 if the respondent is working in the industrial sector (e.g., variable F236 in the original dataset is equal to 2).	Sec. Industry	23,735	0.0559511	0.2298322	0	1
Dichotomous dummy variable, equal to 1 if the respondent is working in the construction sector (e.g., variable F236 in the original dataset is equal to 3).	Sec.Building	23,735	0.0234253	0.1512532	0	1
The quartile to which the country belongs for several workers aged 25–64 who in 2019 declared they had never worked remotely.	Nev.Rem.Worker	23,735	2.241247	1.064068	1	4

ization of the average work-life balance satisfaction expressed by each respondent, was used as the dependent variable in a fractional probit and logit model, estimated with the same set of independent variables. The fractional outcome probit (Papke & Wooldridge, 1996, 2008) estimator fits models on continuous zero-to-one data, using probit (or logit) regression. The literature often uses these models to estimate outcomes such as rates, proportions, and fractional data. It also seems appropriate for our case since the dependent variable is expressed as a 0–1 bordered variable.

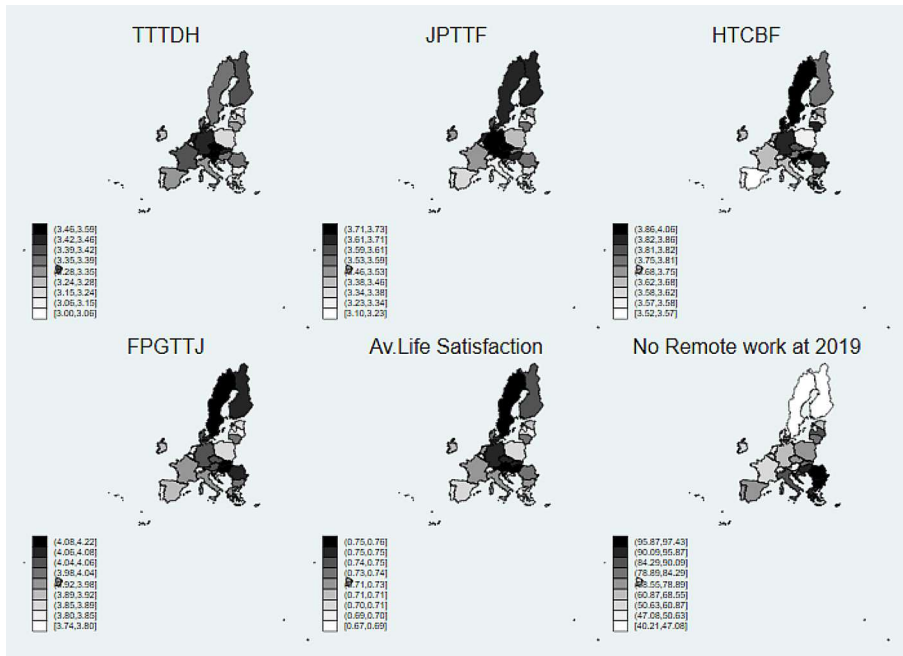


Fig. 1 Heat maps of main variables of the study

4 Results

This section presents the results of our econometric analysis, investigating the determinants of work-life balance satisfaction for remote workers. The analysis will start from the results concerning the largest possible sample from the COVID-19 pandemic period. The results will then compare changes that occurred between the beginning (spring 2020) and the end of the pandemic emergency⁵ (spring 2022). Estimations of Eq. (1) through ordered probit⁶ estimators, with clustered standard errors at the country level, on the respondents from the second, third and fifth waves, are presented in Table 2, and include approximately 23,000 respondents for the period from the second (summer 2020) to the fifth wave (spring 2022).

As can be seen from Table 2, being married (*married*) improved work-life balance satisfaction because remote workers claimed they less often felt too tired after work to do household chores (TTTDH). In contrast, these respondents felt that their work: (i) prevented them from giving time to their family (JPTTF); (ii) was done with less concentration because of the family (HTCBF); and (iii) was hampered by the time given to the family.

⁵ Although the World Health Organization officially declared the end of the pandemic on 5 May 2023, already during the spring of 2022 (the fifth wave) the context in Europe had radically changed, both because of the relaxation of the restrictions put in place by the various countries and because of the individual behavior of the public.

⁶ We also ran ordered logit estimators, obtaining similar results. Estimations are available upon request.

Table 2 All waves – ordered probit

	(1.1)	(1.2)	(1.3)	(1.4)
	TTTDH	JPTTF	HTCBF	FPGTTJ
Married	0.0951**** (4.93)	-0.123**** (-7.39)	-0.141**** (-9.03)	-0.167**** (-8.66)
Women	-0.321*** (-14.07)	-0.132*** (-6.99)	-0.133*** (-11.34)	-0.105**** (-8.14)
Children	-0.110**** (-6.35)	-0.350**** (-11.90)	-0.665**** (-15.18)	-0.691**** (-14.07)
Degree	-0.00239 (-0.10)	-0.134**** (-4.95)	-0.0505** (-2.44)	-0.0912**** (-4.66)
Employee	-0.196*** (-6.24)	-0.205*** (-6.99)	0.0325 (1.18)	0.168*** (5.81)
Aut.Worker	-0.0747 (-1.22)	-0.112* (-1.90)	0.0760 (1.50)	0.147*** (2.83)
Nev.Rem.Worker	-0.322**** (-68.22)	-0.288**** (-46.53)	-0.230**** (-40.03)	-0.139**** (-26.19)
Sec. Agriculture	-0.0346 (-0.44)	-0.00775 (-0.10)	-0.00638 (-0.10)	0.0345 (0.42)
Sec. Industry	-0.0304 (-1.11)	0.0199 (0.59)	0.0293 (0.84)	0.0781** (2.03)
Sec.Building	-0.0616 (-1.47)	-0.00610 (-0.17)	0.0220 (0.47)	0.0203 (0.56)
Waves Fixed Effects	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES
Cut1	-2.756**** (-40.89)	-2.769**** (-44.10)	-3.147**** (-52.74)	-3.104**** (-48.02)
Cut2	-1.592**** (-26.00)	-1.914**** (-29.19)	-2.351**** (-45.47)	-2.343**** (-46.68)
Cut3	-0.431**** (-9.52)	-0.909**** (-18.04)	-1.193**** (-27.19)	-1.319**** (-29.74)
Cut4	0.439**** (9.03)	-0.0860* (-1.85)	-0.196**** (-4.17)	-0.338**** (-7.14)
Observations	23,645	23,490	23,543	23,515
Pseudo R ²	0.020	0.022	0.045	0.048

t statistics in parentheses;
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The dummy for women (*women*) presents a negative sign in all dimensions of the work-life balance, highlighting a significant gender gap compared to men, especially regarding being “too tired after work to do household chores” (TTTDH). Remote workers with children (*children*) did not have a better work-life balance satisfaction than those without children. In this case, too, the variable always has a negative sign, especially regarding the ability to concentrate on work from home (HTCBF) and family commitments that do not allow time to work (FPGTTJ), where the coefficients have a considerable magnitude. Tertiary education (degree) did not improve work-life balance satisfaction. The professional status of remote workers (employee and autonomous worker) presents mixed results that change in sign and magnitude according to the specific work-life balance dimension and time, suggesting that a crucial role is played by the wave considered in the analysis. The results of the dummies related to the Agriculture, Industry, and Building sectors, with Services taken as

reference sectors, are weak and statistically not very significant. Finally, the higher the share of workers aged 25–64 who in 2019 (*nev.rem.workers*) said they had never worked remotely, the lower the work-life balance satisfaction. This can be explained by the lower ability of workers and work organizations to adapt to the radical changes that occurred during the pandemic.

In Table 2 we present the results of the first and fifth waves to observe how the impact of the determinants of remote working changed in relation to the different dimensions of work-life balance satisfaction at the beginning and end of the pandemic. As regards marital status (*married*), only the TTTDH dimension presents statistically significant coefficients in the two periods, suggesting that being married was a condition that positively impacted work-life balance satisfaction and that this impact was stronger in magnitude in the last period than the first. However, in other work-life balance dimensions, the results suggest a decrease in satisfaction among married people, especially at the beginning of the pandemic.

The dummy *women* suggests that household chores were carried out by women, and the effect increased considerably between the start of the pandemic and its end (for TTTDH the coefficient moves from -0.19 to -0.32). As expected, remote workers with children had more difficulties achieving work-life balance satisfaction. If we compare the two waves, this effect was always statistically significant and, on average, higher during the first lockdown of spring 2020 than it was two years later. The coefficients are much higher in the case of children aged 0–11 and in regard to the concentration capacity of remote workers (HTCBF) and their ability to engage in work without family interference (FPGTTJ).

As for graduates, the only dimension that allows a comparison between the two periods is the ability to concentrate on work while staying at home. In this case the coefficient changes sign from negative values for the first wave (-0.08) to positive values for the fifth (0.07). The results regarding the professional condition and particular employee status (*employee*) are more mixed. The remote workers of this category were less satisfied after the pandemic with their ability to do household chores after work (TTTDH) than they were with the time they could devote to family without being hindered by professional commitments (JPTTF).

The family did not prevent these workers from giving time to work, and they declared themselves satisfied with this, especially after the pandemic (FPGTTJ). As for autonomous workers (*aut. workers*), their work-life balance satisfaction decreased, worsening with regard to JPTTF. Finally, as expected, the higher the share of workers aged 25–64 years old who in 2019 had not had remote working experience, the worse their work-life balance satisfaction. The coefficients of this variable, while remaining negative, all improved between the first and last waves, indicating a progressive and general adaptation of workers to the practice of remote working. Finally, the family did not prevent these workers from giving time to work, declaring themselves satisfied with this, especially after the pandemic (FPGTTJ). While remaining negative, the coefficients of this variable all improved between the first and last waves.

For a robustness check of our analysis, we also present fractional probit models computing the average values of the different operationalizations of Y , and normalize it, obtaining a new variable bordered between 0 and 1, labelled *Ave. Work-Life*

Satisfaction. This variable is the normalization of each respondent's average work-life balance satisfaction. Second, we used this variable as the dependent variable in a fractional probit model, estimated with the same set of independent variables. In Table 3 we present the results in terms of marginal effects to obtain more generalizable and easily interpretable results. Generally, the estimates obtained with this other estimation method confirm the previous results.

Married remote workers (*married*) interviewed in the first wave had an average satisfaction in terms of work-life balance that was about 5.6% lower than unmarried people and, throughout the period, less than 4.2% lower. Women (*women*) were between 7.9% and 9.3% less satisfied than men for the three periods considered. Having children (*children*) substantially impacted the work-life balance, especially when they are young and aged between 0 and 11. Specifically, in the first wave, this impact was close to 23%, and it exceeded 3% in the 12-17-year-old category. The effect remained high in the fifth wave and in the category "all waves", where children were not classified by age; here they had an impact of -16.6% and -23.5%, respectively.

Table 3 First, fifth and all waves – marginal effects of fractional probit models

	Ave. Work-Life Satisfaction		
	(4.1)	(4.2)	(4.3)
	1st Wave	5th Wave	All Waves
Married	-0.0565*** (7.16)	-0.00351 (-0.20)	-0.0423 *** (-0.20)
Women	-0.0796*** (-9.09)	-0.0866*** (-6.76)	-0.0936*** (-15.49)
Children 0–11	-0.233*** (-18.61)	-	-
Children 12–17	-0.0387*** (-4.36)	-	-
Children	-	-0.166*** (-12.21)	-0.235*** (-15.05)
Degree	-0.0553*** (-5.74)	0.0182 (1.40)	-0.0378*** (-3.78)
Employee	0.0219* (1.79)	-0.0379 *** (-3.11)	-0.0317 *** (-2.66)
Aut. Worker	-0.0567** (-2.10)	-0.0499 (-1.45)	-0.00198 (-2.66)
Nev. Rem. Work	-0.185*** (-78.15)	-0.109*** (-36.59)	-0.128*** (-61.47)
Sec. Agriculture	-	-0.0128 (-0.30)	-0.00607 (0.18)
Sec. Industry	-	0.00222 (0.10)	0.0112 (0.75)
Sec. Building	-	0.0641* (1.85)	-0.00702 (-0.57)
Country Fixed Effects	YES	YES	YES
Waves Fixed Effects	NO	YES	NO
Observations	17,464	5765	23,363
Pseudo R ²	0.021	0.007	0.011

Marginal effects; *t* statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4 First and fifth waves -ordered probit

	(2.1) TTTDH		(2.2) JPTTF		(2.3) HTCBF		(2.4) FPGTTJ	
	1st Wave	5th Wave	1st Wave	5th Wave	1st Wave	5th Wave	1st Wave	5th Wave
	Wave		Wave		Wave		Wave	
Married	0.0790*** (4.26)	0.130*** (3.73)	-0.136*** (-8.16)	-0.0667 (-1.54)	-0.173*** (-7.00)	-0.0278 (-0.52)	-0.169*** (-9.14)	-0.0583 (-1.24)
Women	-0.199*** (-7.27)	-0.323*** (-8.39)	-0.126*** (-6.16)	-0.119*** (-3.12)	-0.112*** (-7.45)	-0.123*** (-4.55)	-0.108*** (-6.54)	-0.0975*** (-3.56)
Children 0–11	-0.162*** (-11.42)	-	-0.342*** (-16.30)	-	-0.619*** (-18.71)	-	-0.637*** (-18.92)	-
Children 12–17	0.0218* (1.69)	-	0.0645*** (-4.29)	-	-0.134*** (-5.50)	-	-0.126*** (-6.09)	-
Children	-	-0.0448* (-1.79)	-	-0.234*** (-6.92)	-	-0.507*** (-11.20)	-	-0.550*** (-13.85)
Degree	-0.0410 (-1.47)	0.0915** (2.40)	-0.120*** (-5.07)	-0.0330 (-0.91)	0.0855*** (-3.49)	0.0724** (1.98)	-0.138*** (-6.55)	0.0240 (0.68)
Employee	-0.111*** (-2.63)	-0.249*** (-7.96)	-0.180*** (-5.42)	-0.200*** (-4.96)	0.0438 (1.29)	0.0316 (0.86)	0.144*** (6.14)	0.184*** (6.92)
Aut. Worker	-0.109** (-2.01)	-0.133 (-1.52)	-0.173** (-2.40)	-0.195** (-2.38)	-0.0100 (-0.20)	-0.0486 (-0.69)	-0.0789 (-1.29)	0.0192 (0.32)
Nev. Rem. Work	-0.331*** (-60.43)	-0.147*** (-16.28)	-0.418*** (-52.61)	-0.153*** (-15.41)	-0.337*** (-44.19)	-0.292*** (-23.87)	-0.322*** (-42.26)	-0.248*** (-23.07)
Sec. Agriculture	-	-0.106 (-1.07)	-	-0.0579 (-0.53)	-	0.00704 (0.06)	-	0.113 (0.95)
Sec. Industry	-	0.0881** (2.01)	-	0.00721 (0.12)	-	0.0154 (0.28)	-	0.0950* (1.67)
Sec. Building	-	0.0871 (1.08)	-	0.129* (1.65)	-	0.147* (1.81)	-	0.162* (1.86)
Country FE	YES	YES	YES	YES	YES	YES	YES	YES
Cut1	-2.842*** (-38.97)	-2.230*** (-26.26)	-3.186*** (-50.75)	-2.165*** (-24.66)	-3.258*** (-55.20)	-2.946*** (-30.93)	-3.462*** (-67.06)	-2.895*** (-31.76)
Cut2	-1.741*** (-27.00)	-1.094*** (-13.99)	-2.246*** (-37.37)	-1.353*** (-15.32)	-2.255*** (-43.82)	-2.190*** (-24.58)	-2.534*** (-49.84)	-2.198*** (-28.08)
Cut3	-0.687*** (-13.57)	0.0799 (1.38)	-1.280*** (-23.35)	-0.339*** (-4.56)	-1.182*** (-25.50)	-0.939*** (-12.88)	-1.544*** (-34.93)	-1.090*** (-17.21)

Table 4 (continued)

	(2.1) TTTDH		(2.2) JPTTF		(2.3) HTCBF		(2.4) FPGTTJ	
	1st Wave	5th Wave	1st Wave	5th Wave	1st Wave	5th Wave	1st Wave	5th Wave
Cut4	0.146*** (3.12)	0.931*** (15.96)	-0.493*** (-9.45)	0.498*** (6.88)	-0.239*** (-4.90)	0.0654 (0.95)	-0.590*** (-12.08)	-0.0786 (-1.33)
Observations	17,994	5846	17,653	5809	17,714	5825	17,690	5819
Pseudo R ²	0.013	0.023	0.034	0.016	0.081	0.031	0.086	0.033

t statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Being a graduate (*degree*), as in the models presented in the previous tables, reduced work-life balance satisfaction by 5.5% at the beginning of the pandemic and by 3.7% for all waves. Meanwhile, the results are confirmed for professional categories where employees (*employee*) were on average more satisfied in the first wave (2.1%) than they were in the last (-3.1%), and autonomous workers (*aut. workers*) had a lower average work-life balance satisfaction in the first wave, with -5.6%, while no statistically significant effect is registered during the fifth wave.

To conclude, the variable *nev. rem. work*, used as a control for the pre-pandemic habits of workers, presents the negative signs that we have already commented on, and a higher magnitude, namely -18% in the first wave, -10.9% in the last, and -12.8% over the entire period. As mentioned above, this decreasing trend leads us to assume that the sudden change in the organizational modes of work changed the habits of workers, making them more willing to work remotely, though they remained unsatisfied in terms of work-life balance satisfaction.

4.1 Further results – gender asymmetries

As highlighted by the economic literature, using gender dummies to discriminate between men and women is an empirical approach that, though widely used, is often simplistic. In particular, Figart (1997) emphasizes the importance of moving beyond simplistic gender categorizations in economic analysis. Taking this into consideration, together with the discovery by Boca et al. (2020) of several channels that determined unequal impacts of the COVID-19 pandemic on different groups, we thought it would be worthwhile to expand our analysis to control for the impact of being a woman and married, or having children, on life satisfaction. To estimate the impact of this interaction we computed the marginal effects of the estimation of a modified version of Eq. (1), which includes an interaction term between either Fem and Mar or Fem and Child. More precisely, we estimated the following Eq. (2):

$$Y_{cw} = \alpha + \beta_1 Mar + \beta_2 Fem + \beta_3 CLChild + \beta_4 Edu + \beta_5 Emp + \beta_6 Aut + \beta_7 WS + \beta_8 RWC + \beta_9 Wave_w + \beta_{10} Country_c + \beta_{11} Inter + \epsilon \quad (2)$$

where the interaction term *Inter* is equal to either *Mar*Fem* or *Fem*CLChild*. To avoid having different estimations for each category of the dependent variable,

complicating the interpretation of the finding and giving a less linear reading of the results, we decided to rely on the fractional regression model as our estimator, using Ave.Work-Life Satisfaction as dependent variable.

The marginal effects obtained as results of this estimation are presented in Figs. 2 and 3, and show that being married does not reduce men's life satisfaction in a statistically significant way, whereas for women it is correlated to a decrease in life satisfaction. This suggests that in our sample of home-workers being married has asymmetric effects on the two genders, and more specifically that marriage reduces women's life satisfaction, but not men's. This might be due to an unequal division of household work.

On the other hand, Fig. 3 suggests that having children reduces both men and women's life satisfaction. This might be related to the difficulties of working from home for families with children, a situation that affects the whole family. Detailed results are presented in Appendix 2.

In conclusion, this analysis moves beyond simplistic gender categorizations in economic analysis, echoing Figart's (1997) emphasis on the need for nuanced approaches. The results highlight gender asymmetries, where marriage correlates with decreased life satisfaction for women but not for men, potentially indicating unequal household responsibilities, while parenthood negatively impacts on the life satisfaction of both genders, likely influenced by the challenges of doing remote work with children.

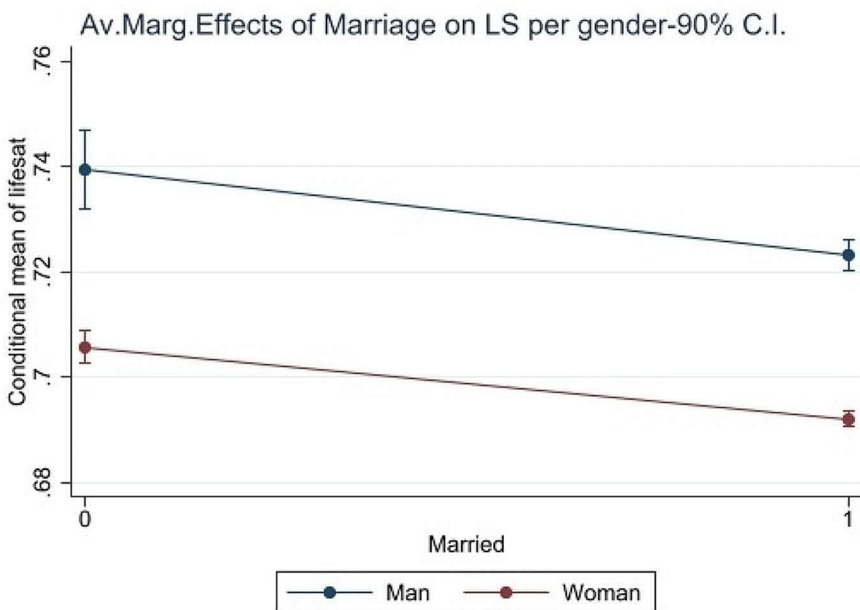


Fig. 2 Average marginal effects of marriage on LS per gender

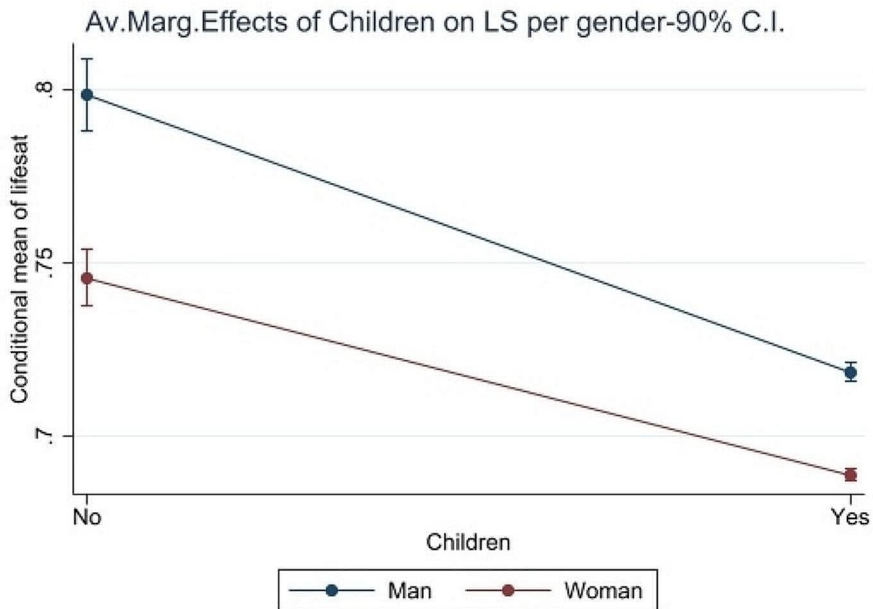


Fig. 3 Average marginal effects of children on LS per gender

5 Discussion and conclusions

This study has analyzed remote workers' work-life balance satisfaction in Europe during the COVID-19 pandemic, using data from Eurofound's *Living, Working and COVID-19* e-survey (2022). We have constructed our study around the roles that several individual socio-demographic characteristics and job factors play in shaping remote workers' work-life balance satisfaction. Our results show the importance of institutional assistance in terms of making private/family responsibilities and work compatible. Furthermore, our empirical evidence underlines that workers' work-life balance satisfaction was, on average, higher in countries that adopted remote working before the COVID-19 pandemic (e.g., Sweden, the Netherlands, Denmark, Finland, France, and Sweden; see Appendix 1).

According to the literature (Park et al., 2023), marital status and the presence of children have a particularly strong impact on work-life balance satisfaction. This can be explained if one considers that single people and people without children are expected/required to work more than colleagues with partners and children since they have more time and fewer responsibilities (DePaulo, 2006). During the COVID-19 pandemic, when remote workers' working time was longer than usual – sometimes without a precise schedule and with continuous overlapping between private and working life – family and work were likely to conflict for married teleworkers. Indeed, in line with the literature (Alfano et al., 2023; Barber et al., 2015; Eddleston & Mulki, 2017), results show that married remote workers experienced family-to-work and work-to-family conflicts. At the same time, married remote workers were

less worried about work when not working, and claimed they were less often too tired after work to do household chores. This may have happened because married workers, when not working, were more focused on their private lives than their unmarried colleagues. If we compare different periods (the first, fifth, and all waves), married workers increased their work-life balance satisfaction when it came to being too tired after work to do household chores, possibly because there was stricter regulation of working time.

Results on gender show that women were less satisfied than men with work-life balance. This seems to be a result of the ordinary division of unpaid work within the family, i.e., household duties and childcare. According to the literature (see among others, Alon et al., 2020; Carlson et al., 2022), in industrialized countries women still bear the burden of childrearing and domestic labour. Therefore, women suffered from the closure of schools more than men. Findings in the literature (Alon et al., 2020; Carlson et al., 2022) show that the COVID-19 pandemic was a considerable challenge within families, with an increasing gender gap. Although women worked within the same working environment as men, they were more exposed than men to the pressures incurred by the multiple roles that were demanded of them in a period when high work demands with long working hours were the norm. In addition, data (see for instance, OECD, 2021) show that unpaid work performed by women increased during the pandemic. This overload of domestic work was probably due to a lack of domestic assistants who had previously been hired to help families with household chores, and who had mobility restrictions during the lockdown. Women therefore became overloaded with domestic household tasks, experiencing reductions in their time and energy, increased fatigue, and, in turn, work-life unbalance. As the OECD (2021) has suggested, governments must consider inequalities in unpaid work.

Our results show that public support for families and benefits provided by governments aimed at reducing gender inequality at home did not improve women's satisfaction with work-life balance during the pandemic. If we look at how women's satisfaction with work-life balance changed between the start of the pandemic and its end, our results suggest that this satisfaction got even worse, likely because of a growing sensation of frustration, as well as isolation from the standard work environment which would allow solidarity with colleagues.

In line with the literature (see among others Ajjan et al., 2020), our results show that remote workers with children were less satisfied with their work-life balance than workers without children. During the pandemic schools were closed, and children studied from home, sharing the house with their working-from-home parents. Looking after children while studying from home became an additional task for many parents, who had to supervise online education. In addition, sometimes parents had to share devices with children, making work challenging to arrange, with a severe overlap of their private and professional roles as they went about their work and life tasks.

Our results show that devoting quality time to family was a major challenge during the pandemic. This seems to have been true for both men and women, who, in modern societies, share childcare within the family, and who thus, when they are married and have children, are likely to suffer from similar levels of work-life conflict. Because of demographic changes caused by very low birth rates in Europe and given the impact of marital status on work-life balance, governments should promote

proper motivational policies to prevent working people from having children. The main aim should be to enhance family-friendly labour environments characterized by adaptable work schedules, easy access to kindergartens and after-school entertainment/out-of-school support for children, and parental leave for fathers. Tailored policies should promote the equilibrium between job demand and workers' private lives. Further research is needed to detect which factors have the greatest impact on work-life balance satisfaction, while also taking into account welfare regime characteristics. Besides, the analysis should be advanced by exploring the heterogeneity in terms of employment and the degree of occupational autonomy.

Appendix 1: Countries per quartile of remote working

Country	I quartile	II quartile	III quartile	IV quartile
Austria	X			
Belgium	X			
Bulgaria				X
Croatia			X	
Cyprus				X
Czechia		X		
Denmark	X			
Estonia		X		
Finland	X			
France	X			
Germany		X		
Greece				X
Hungary			X	
Ireland	X			
Italy			X	
Latvia			X	
Lithuania			X	
Luxembourg	X			
Malta			X	
Netherlands	X			
Poland		X		
Portugal		X		
Romania				X
Slovakia			X	
Slovenia		X		
Spain		X		
Sweden	X			

Appendix 2: Marginal effects - probit - interaction model

	(A2.1)	(A2.2)
	Ave.Work-Life Satisfaction	Ave.Work-Life Satisfaction
Ave.Work-Life Satisfaction		
Married	-0.0493*** (-2.92)	-0.0308*** (-4.16)
Women	-0.101*** (-6.68)	-0.178*** (-8.84)
Children	-0.234*** (-15.02)	-0.272*** (-15.26)
Degree	-0.0377*** (-3.77)	-0.0345*** (-3.62)
Employee	-0.0317*** (-2.67)	-0.0286** (-2.48)
Aut.Worker	0.00206 (0.07)	0.00451 (0.17)
Sec.Agriculture	-0.00637 (-0.19)	0.0000455 (0.00)
Sec.Industry	0.0114 (0.75)	0.0104 (0.72)
Sec.Building	-0.00712 (-0.58)	-0.00797 (-0.60)
Quart.Nev.Rem.Worker	-0.128*** (-61.01)	-0.142*** (-82.84)
Married*Woman	0.00958 (0.53)	
Children		-0.262*** (-10.12)
Children*Woman		0.0914*** (4.07)
Wave Fixed effects	YES	YES
Country Fixed effects	YES	YES
Observations	23,363	23,363
Pseudo R ²	0.011	0.012

Marginal effects; *t* statistics in parentheses.

(d) for discrete change of dummy variable from 0 to 1.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

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Declarations

Conflict of interest None of the authors perceive any conflict of interest.

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