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IZA DP No. 17997

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Mylène Feuillade
PSE

Dominique Goux
INSEE and CREST

Eric Maurin
PSE, EHESS and IZA

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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Rise in Home Working and Spousal Labor Supply*

This article explores how an employee's choice to work from home (WFH) influences his or her spouse's outcomes. Drawing on the specific features of the French institutions, we show that a spouse's switch to WFH leads to a sharp increase in the probability that his or her partner will also switch to WFH, as well as in the number of hours worked by the partner. These cross-effects are particularly strong on the better-paid partner within the couple (whether the man or the woman) who appears to condition his or her decision to work from home on that of his or her (less-paid) partner. The effects of WFH on the volume of hours worked are greatly underestimated when spillovers within couples are neglected. On the other hand, we detect no significant effect on partners' commuting distance, nor on the type of urban unit they choose to live in.

JEL Classification: J22, J16
Keywords: work from home, social interactions, hours worked

Corresponding author:
Eric Maurin
Paris School of Economics
48 Bd Jourdan
75014 Paris
France
E-mail: eric.maurin@ens.fr

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1 Introduction

The pandemic shock of the early 2020s catalyzed an unprecedented expansion of work from home worldwide. A growing number of experimental and quasi-experimental studies are examining whether and how this development might impact the productivity or well-being of affected employees, with mixed and still-debated results (e.g., Atkin et al., 2023, Emanuel et al., 2023, Angelici and Profeta, 2024, Bloom et al., 2024, Emanuel and Harrington, 2024). In contrast, the implications of this development for those living with teleworkers have received far less attention and remain largely unexplored. Exploring these implications is all the more important as the interdependence of individual decisions within families has long been identified as a key parameter for understanding the full range of consequences that can result from developments or from reforms that directly affect only part of the population (e.g., Ashenfelter and Heckman, 1974, Gelber, 2014, Goux et al., 2014, Lalive and Parrotta, 2017, Johnsen et al., 2022).

As working from home drastically reduces commute times, it has the potential to considerably change how men and women spend their days and interact with each other within families. Several scenarios are possible. For example, the transition to working from home for some employees may lead them to take on a greater share of domestic work and childcare, freeing up time for their partners, enabling the latter to invest more in their work and increase the number of hours they work. Given the importance that the ability to work long hours can have in many occupations, the consequences can be considerable for both spouses and their relative occupational status (e.g., M. Bertrand et al., 2010, Goldin, 2014, Cortés and Pan, 2019). Conversely, having one partner work from home might encourage the other to also work remotely, not necessarily to work more hours, but simply to spend more time with the family, without any major impact on the number of hours worked by either spouse. Depending on which of these scenarios dominates the other, the consequences of the rise in home working on the number of hours worked in the economy or on inequalities between men and women within couples are potentially very different.

The aim of this article is to shed light on these issues and to estimate the causal ef-

fect of an employee's choice to work from home on his or her spouse's labor outcomes. To the best of our knowledge, there are still no studies that have addressed these issues, one of the difficulties being to find independent variations in spouses' exposure to WFH. Our research strategy draws on the particular institutional context in which the 2020 epidemic shock hit French firms. In late 2017, France passed legislation that facilitated the adoption of work-from-home (WFH) through collective bargaining agreements. This reform created two groups of establishments: those that had signed WFH agreements in 2018 or 2019 (our treatment group) and those that had only signed agreements on other topics during the same period (our control group). While both groups showed similar remote work patterns in the years before the pandemic, the 2020 shock led to significantly larger increases in WFH in treatment group firms. We leverage this variation by comparing labor market outcomes of employees whose spouses work at treatment versus control group firm, essentially comparing workers whose partners faced high versus low exposure to pandemic-induced WFH adoption.

This approach first suggests the existence of very significant cross effects on WFH: employees were significantly more likely to work from home in the years following the 2020 pandemic if their spouse worked at a treatment group establishment, regardless of their own establishment's treatment status. Importantly, no such differences existed in the pre-pandemic period, supporting our identification strategy. Employees whose spouses are in the treatment increased their WFH by an amount equal to roughly 80% of their spouses' increase. This suggests that when one spouse adopts WFH, it raises the probability of the other spouse also working from home by approximately 0.8. Unsurprisingly, these cross-effects on WFH are only noticeable in couples whose members have remotable occupations and not in couples whose occupations are difficult to perform remotely.

Employees with spouses in the treatment group were not only more likely to work from home after the epidemic shock, but they also significantly increased their usual number of hours worked per week compared to employees with spouses in the control group. According to our estimates, an employee's switch to home working is followed on average by a 20% increase in the spouse's usual weekly working time. A closer look at

this increase shows that it essentially corresponds to the substitution of long workweeks (40 hours or more) for weeks of 35 hours or less (35 hours being the legal length of the workweek). Consistent with the idea that these cross-effects on hours worked are linked to the effects on WFH, they are also only noticeable in couples whose members have remotable occupations.

Additional analyses reveal that cross-effects on WFH and hours worked primarily affect men whose spouse is in the treatment group, while almost no cross-effects are detected for women whose spouse is in the treatment group. Conversely, direct effects on WFH and hours worked affect women in the treatment group much more than men in the treatment group. We show that these profound asymmetries between men and women are consistent with a simple model where less-paid spouses (in the vast majority of cases, women) work from home as much as legally possible in their companies, independently of the choices of their partners, while better-paid spouses (in the vast majority of cases, men) only increase their rate of work at home to the extent that their partners also increase it, so as to be able to benefit from the time saved on the home-work commute without having to worry about having to increase their contribution to domestic tasks or childcare.

As an employee's move to WFH greatly increases his or her partner's propensity to work from home, we may ask whether this is not also accompanied by a change in their place of residence. We find no evidence to support this hypothesis, as the switch to home working for an employee is not accompanied by any significant change in his or her partner's home-work distance, or in the likelihood of the couple deciding to live away from urban centers. The rise of remote working has reduced the commuting costs associated with moving away from urban centers for the many white-collar workers working and living in those centers, but not enough to offset the other costs of such distance, notably in terms of reduced access to better educational, medical, or cultural infrastructure. Ultimately, the reduction in the frequency of home-to-work journeys induced by the switch to WFH does not seem to be offset by an increase in home-to-work distances, which helps to explain the gains in available time (particularly for work) achieved by couples with remotable occupations.

Our article contributes to the long-standing literature exploring the influence that workers have on each other within couples. An important strand of this literature has shown how workers respond to changes in their spouses' earnings or work hours, whether at the time of their spouses' retirement, during unemployment spells, or after a tax reform (e.g., Lundberg, 1988; Bingley and Lanot, 2007; Gelber, 2014; Lalive and Parrotta, 2017; Johnsen et al., 2022). Using changes in the regulation of public holidays or the legal workweek, another stream of literature has further highlighted the importance that workers place on the possibility of adjusting and synchronizing their working hours with those of their spouse (e.g., Hunt and Katz, 1998, Goux et al., 2014; Hamermesh et al., 2017; Georges-Kot et al., 2024). In this article, we highlight the value employees place on being able to coordinate their presence at home with that of their spouse, and the far-reaching consequences this coordination can have on their working hours.

We also contribute to the burgeoning literature exploring the causes and consequences of the rise in WFH that has followed the pandemic shock. Several articles have shown that workers, and especially women, have a distaste for commuting and a strong willingness to pay for remote work (e.g. Mas and Pallais, 2017, He et al., 2021, Chen et al., 2023, Cullen et al., 2025, Le Barbanchon et al., 2021, Bütikofer et al., 2024). Our article suggests that the value employees place on working from home reflects at least in part the particular value they place on interactions within the couple, with employees' demand for working from home appearing all the stronger the more their partner works from home themselves.

Another important strand of the literature focuses on the effects of WFH on the productivity and labor outcomes of the employees involved (e.g., Bloom et al., 2015, Choudhury et al., 2021, Emanuel et al., 2023, Gibbs et al., 2023, Barrero et al., 2023, Atkin et al., 2023, Angelici and Profeta, 2024, Emanuel and Harrington, 2024, Bloom et al., 2024). This literature is based on local experiments and quasi-experiments conducted in specific companies and focuses on the effects of working from home on the employees concerned. Using a large-scale natural experiment, we focus on a different question: the induced effects on the spouses of the employees concerned. We find that when an employee switches to WFH, this greatly increases the likelihood of his or her spouse switching to

WFH, but it also increases the number of hours the spouse devotes to work, particularly the better-paid spouse. These results suggest that we have a very incomplete view of the effects of WFH if we do not take into account the strong interdependencies existing within couples.

The paper proceeds as follows. Section 2 provides an overview of the French institutional context. Section 3 develops a simple model for understanding the effects on an employee's working time (and on the proportion of that time spent at home) of a shock that specifically increases his or her spouse's opportunities to work from home. Section 4 describes the data used. Sections 5 and 6 present our main graphical and regression results. Section 7 further discusses the effects of the rise of WFH on residential choices. Section 8 concludes.

2 Institutional Context

In September 2017, France changed the legal framework for teleworking, with the aim of reducing administrative barriers to the use of teleworking for employers and employees. This reform marked a profound change from the previous framework, which required complete formal revisions of employment contracts for any new working from home (WFH) arrangement, even temporary.

The new legal provisions eliminate the need to modify employment contracts on a case-by-case basis. Instead, employers can sign collective agreements outlining both the eligibility criteria and implementation procedures for telework. Once such an agreement is in place, employees can initiate or modify WFH arrangements through a simple email exchanges with their employer, streamlining what was previously a more formal negotiation process.

While collective agreements facilitated the adoption of telework, they did not guarantee its implementation. Even when a collective agreement is in place, the law maintains a voluntary principle: teleworking requires mutual consent from both parties. Employers cannot mandate telework (with exceptions during extraordinary circumstances such as lockdown periods, which we exclude from our analysis), and refusal by employees does not constitute grounds for dismissal. Conversely, employers retain the right to de-

cline telework requests, although they need to provide justification. Either party can terminate the telework arrangement upon request, reverting to on-site work. The legislation ensures teleworkers maintain equal rights and benefits compared to their on-site colleagues. The legislation further specifies that switch to telework cannot affect other employment terms (such as remuneration, working hours, leave entitlements...).

The law outlines several necessary components for telework agreements to address. All agreements should first define activities and occupations eligible for telework, as well as criteria for employees' eligibility (if any). They should also include permissible telework locations, which most often corresponds to employee's primary or secondary residences but can also include designated shared spaces. Finally, the agreement should detail employer provisions for technology-related expenses.

Following this legal change, approximately 2,600 telework agreements were established in 2018 or 2019, before the COVID-19 pandemic. As we will come back to later, our research strategy will be based on comparing employees in establishments that signed these telework agreements (treatment group) with employees in establishments that signed agreements on other themes during the same 2018-2019 period (control group), before and after the 2020 pandemic shock. It is likely that many of the establishments in the control group ended up signing a telework agreement in the years following the pandemic shock, so our strategy amounts at least in part to comparing employees in early and late signatory establishments.

3 Conceptual framework

In this section, before moving on to the empirical analysis, we develop a labor supply model to understand how and why a shock affecting the WFH opportunities of a group of employees can influence their spouses' choice to work from home as well as the number of hours worked by their spouses. This model helps identify some of the fundamental reasons why cross-effects can be very different from one spouse to another, depending in particular on the commuting time of each spouse, but also on their respective pay levels. The model also allows us to understand the importance that certain domestic tasks can play, namely those whose sharing between spouses potentially varies greatly depending

on who remains working at home.

3.1 The Model

We consider a sample of individuals married or cohabiting, and denote c their consumption level, ℓ their leisure time, h their paid work time, d the time they allocate to domestic tasks (and childcare), and m their home-to-work commuting time. We further denote π the fraction of their working days they spend at home. If m_0 represents commuting time in the absence of work-from-home, the effective commuting time can be written as $m = (1-\pi)m_0$. With these notations, the time constraints faced by individuals can be written as:

$$T_0 = \ell + h + (1-\pi)m_0 + d \tag{1}$$

where T_0 represents the total number of available hours. Similarly, if ℓ_s, h_s, d_s, and m_s represent the leisure time, work time, domestic task contribution, and commuting time of spouse s, we have:

$$T_0 = \ell_s + h_s + (1-\pi_s)m_{0s} + d_s \tag{2}$$

where π_s is the fraction of working days spent at home by s. In this context, increasing the share of work time spent at home has the obvious advantage of reducing commuting time and increasing time available for other activities.[1] We will assume this comes at the cost of increasing the share of domestic work and childcare time for the individuals concerned. More precisely, denoting d_0 as the total volume of domestic work that the spouses must do (volume assumed to be constant), we will write,

$$d = d_0 f(\pi, \pi_s) \text{ and } d_s = d_0 - d, \tag{3}$$

where $f(\pi, \pi_s)$ represents the share of domestic work performed by individuals when they spend a fraction π of their working days at home and their spouse spends a fraction π_s. The function $f(\pi, \pi_s)$ will be assumed to be increasing with π and decreasing with π_s.[2]

[1] Commuting time is on average around 50 minutes per person per day in France (Zilloniz, 2015). Aksoy et al. (2023) estimates that the average daily commute time savings when working from home are 72 minutes in a sample of 27 countries.

[2] To our knowledge, there is still little evidence on the causal effect of WFH on the sharing of housework and childcare in the post-pandemic period. See, however, von Gaudecker et al. (2024) or Schüller (2025) who provide evidence that employees in remotable occupations have increased their childcare contribution

3.2 Preferences and choices

Regarding preferences, we will represent the utility that individuals derive from leisure and consumption by a function $U(\ell, c)$ increasing in each of its arguments and quasi-concave. Similarly, we will represent the utility that spouses derive from leisure and consumption by a function $U_s(\ell_s, c_s)$, which is also well-behaved. In the spirit of (Chiappori, 1992), both spouses are assumed to make their choices cooperatively to maximize a linear combination of individual utilities:

$$\begin{aligned} & \max \mu U(\ell, c) + (1-\mu) U_s(\ell_s, c_s) \qquad (4) \\ \text{subject to} \quad & T_0 = \ell + h + (1-\pi) m_0 + d_0 f(\pi, \pi_s) \\ & T_0 = \ell_s + h_s + (1-\pi) m_{0s} + d_0 (1 - f(\pi, \pi_s)) \\ & c + c_s = w_0 h + w_{0s} h_s \ ; \ \pi \leq D \ ; \ \pi_s \leq D_s \end{aligned}$$

where μ is a measure of the individual's bargaining power, while w_0 and w_{0s} represent the hourly wages of the individual and their spouse.[3] By convention, the subscript s will be reserved for the less-paid spouse and we will therefore assume $w_0 \geq w_{0s}$.[4] The parameters D and D_s represent the constraints on the fraction of working days that can be spent at home. They typically capture the limits that employers place on their employees' teleworking possibilities.

Finally, in the remainder of this section, we will denote π^*, ℓ^*, d^*, h^* (resp., $\pi_s^*, \ell_s^*, d_s^*, h_s^*$) the optimal choices for π, ℓ, d, and h (resp., π_s, ℓ_s, d_s, and h_s) and our objective will be to identify the effects of exogenous increases in D_s (resp. D) on these quantities.

3.3 Work from Home Decisions

The resolution of the program of the couple is detailed in the appendix. We can first show that it is always optimal for spouse s (the less paid one) to set π_s at its maximum level,

in the post-pandemic period. Also, in the experiment conducted in an Italian bank by Angelici and Profeta (2024), employees randomly selected to work from home significantly increased the time spent on domestic tasks and childcare.

[3] Note that the parameter μ potentially depends on w_0 and w_{0s}, the latter being assumed to be constant in our discussion.

[4] As discussed below, the less-paid partner in the couple happens to be the woman in more than two-thirds of the couples in our work sample.

namely,

$$\pi_s^* = D_s. \tag{5}$$

Working more from home not only saves commuting time for less-paid spouses but also leads them take on a larger share of domestic work and childcare, which is always optimal for the household because it opens up the possibility of substituting better-paid working time for less-paid working time.

With respect to the better-paid partners, their optimal π^* depends on several parameters, including the sensitivity of the share that they take in domestic work to their rate of work at home (as captured by the first derivative of function f). If the share that they take in domestic work varies little according to their rate of work at home, then then there is no real cost to them of working more at home and they too will have an interest in setting π^* at its maximum value, namely $\pi^* = D$.

If, on the other hand, the share they take in domestic work varies strongly depending on their rate of WFH, then they will not necessarily have an interest in setting their rate of WFH at its maximum value. They will arbitrate between saving commuting time and losing time on domestic work and childcare, which will lead them to choose π^* satisfying the first-order condition,

$$(w_0 - w_{0s}) d_0 f_1'(\pi^*, D_s) = m_0 w_0. \tag{6}$$

The left-hand side of the equation represents what the couple loses (due to changes in the sharing of domestic tasks) from an elementary increase in the frequency of WFH by the partner with the highest hourly wage, while the right-hand side represents what the couple gains (due to gains in commuting time).

3.4 Cross Effects on Work from Home

From the above discussion, it emerges that an increase ΔD_s in WFH possibilities for less-paid spouses has a very direct impact on their actual remote work time, namely $\Delta\pi_s = \Delta D_s$. The next question is whether such a shock might not also have a significant cross-effect on the remote work time of their partners.

If we first focus on partners whose optimal remote work time is constrained (i.e., π^*=D), the answer is, by construction, negative: an increase in D_s has no effect on their

optimal π^*, which remains D. In this first case, there are no cross-effects on the better-paid partners.

On the other hand, if we focus on partners whose optimal remote work time is unconstrained (i.e., $\pi^* < D$), an increase in D_s leads to a modification of their optimal level of WFH π^*. The sign and magnitude of the shift depend on the shape of $f(\pi, \pi_s)$. In the case where this function can be written simply in the form $g(\pi - \pi_s)$ with g increasing and convex function, it is not difficult to show that $\frac{\partial \pi^*}{\partial D_s} = 1$.[5] In this case, the cross effect on the remote work time of the better-paid partners is of the same order of magnitude as the direct effect on their spouses.

So far we have focused on the cross effects on WFH likely to be observed following a relaxation of constraints limiting the WFH possibilities of the less-paid spouses. The cross effects likely to be observed following a relaxation of constraints limiting the WFH possibilities of the better-paid spouses are a priori much more limited, since their partners work from home as much as possible anyway.

To sum up, we expect that an increase in WFH opportunities in some companies will primarily have an effect on the WFH choices of the less-paid spouses directly affected, but also a significant cross-effect on the choices of some of their better-paid spouses. As we shall see later, the available data are consistent with these predictions.

3.5 Cross Effects on Hours Worked

As we have just shown, an increase ΔD_s in WFH possibilities for less-paid spouses can have significant cross-effects on their partners' WFH decisions. We will now explore whether such a shock might not also have significant cross-effects on the number of hours worked by their partners.

If we first focus on those of these partners whose optimal WFH is constrained (i.e., $\pi^* = D$), an increase in D_s does not change their optimal choice of WFH, but potentially reduces their contribution to housework and childcare, with the consequence of increasing the time available for leisure and paid work. To the extent that consumption and leisure

[5] If, for example, higher-paid partners (typically male partners) only start increasing their contribution to housework and childcare when they are alone at home when working remotely (which necessarily happens when $(\pi > \pi_s)$) then there are positive parameters α and β such that the function f can be approximated by $\alpha + \beta(\pi - \pi_s)1(\pi - \pi_s > 0)$, that is, by a convex increasing function of $(\pi > \pi_s)$.

are normal goods, we can therefore detect a significant cross effect on their number of paid hours h.

If we now focus on partners whose optimal WFH is unconstrained (i.e., $\pi^* < D$), an exogenous increase in D_s can lead to a significant increase in their optimal choice of WFH π^*, without necessarily being accompanied by an increase in participation in domestic work or childcare. Here again, we can finally detect a significant cross effect on the number of paid hours h, even if, this time, it is the consequence of the cross effect on WFH (and the associated decrease in commuting time) rather than the consequence of a possible decrease in participation in domestic tasks.

Just as an exogenous increase in D_s can have a positive cross-effect on the number of paid hours h, an exogenous increase in D for higher-paid spouses can also have a positive cross-effect on h_s, the number of hours worked of the lower-paid partner, by inducing a decrease in housework for this partner. It should be noted, however, that this type of cross-effects can only be observed in the case where the better-paid spouse works at home to the maximum of his or her possibilities ($\pi^* = D$), that is, in the case where his or her contribution to domestic tasks is not very sensitive to his or her work at home. The cross-effects on the less-paid partner are therefore by construction likely to be of small magnitude.

Ultimately, even though it is highly stylized and only takes one modeling path among many others, our conceptual framework allows us to understand some of the reasons why an exogenous shock on the possibilities of working remotely can have effects on the spouses of the workers concerned, even if these spouses are not themselves directly affected. Beyond that, this conceptual framework also allows us to understand why the direct effects of such a shock are likely to be greater on the spouses with the lowest salaries in the couple (typically women) and, conversely, the indirect effects are greater on the spouses with the highest salaries (typically men), particularly if a significant portion of the home tasks are likely to fall to them when they are alone working from home.

4 Data and variables

We use the French Labor Force Survey (LFS) conducted each year by the French statistical office between 2013 and 2023. For each household member aged 15 or above, the LFS provides information on gender, marital status, employment status, detailed occupation, firm size, seniority, education, industry, employer's identification number, monthly earnings, and usual number of hours worked per week.[6] The survey also provides information on the proportion of their working time that respondents spent at home during the 4 weeks preceding the interview (0%, more than 0% but less than 50%, between 50% (included) and 100% (excluded), 100%). Between 2013 and 2020, this information (as well as the information on monthly wage) is collected for one third of the sample. From 2021, this information is collected for one sixth of the sample. Finally, the survey provides the identifier of the municipality of residence for each household surveyed.

In addition to the LFS data, we also used the administrative database on collective agreements (so called *D@ccord* database) for the period between 2018 and 2019. This database is operated by the Ministry of Labor and lists all agreements between employers and employee representatives. For each agreement, the register provides the date of the agreement, the identifiers of the employers who sign the agreement as well as the topics covered by the agreement (and in particular if it relates to teleworking). Agreements can be signed by groups of establishments. When this is the case, we use the Financial Links between Enterprises database (Liaisons financières entre sociétés, so called LiFi), 2013 to 2021, co-produced by the French statistical office (INSEE) and the French Ministry of Finance, which lists the identifiers of the establishments that make up each group. Ultimately, whether an agreement was signed by a single establishment or by a group of establishments, we were able to identify the respondents to the LFS covered by this agreement. We were hence able to supplement the LFS with information on whether and when respondents' establishments had signed an agreement with workers' representative (and on whether this agreement covered teleworking). Prior to 2018, agreements

[6] The legal length of the working week is 35 hours in France, but a majority of white-collar workers have a contract (called *forfait jour*) which stipulates only the number of days they must work per year (which must be below 218 days), and there is no limitation to their working hours.

on teleworking were very rare and not listed as such in the database. They only began to be listed as such (rather than placed in the "other" category) from 2018 onwards.

To examine the impact of WFH on workers' place of residence, we supplement these data with three additional sources. First, we use the publicly available data on the geolocation of French establishments which we can match to our other data sources using establishment identifiers. Second, we rely on the GeoFla database, which contains the coordinates of the centroids of French municipalities in the same geodetic reference frame (RGF93) as that use to geolocate establishments. This database provides us with the coordinates of each worker's municipality of residence. We then calculate, for each worker, the Euclidean distance between the centroid of his or her municipality of residence and the location of his or her establishment. Finally, we used the official classification of urban units to group municipalities by type of urban context (i.e., urban center, suburbs, rural area or small town).

Treatment and control groups

To identify the cross-effects of WFH, we consider establishments that signed a collective agreement with workers' representatives during the period 2018-2019 following the 2017 law and preceding the 2020 epidemic shock (whether or not this agreement covered WFH). We focus on individuals who work in these establishments and who are married (or cohabit) with individuals who also work in these establishments. We also focus on opposite-sex couples and exclude observations collected during the lock-down periods decided when the first waves of the Covid-19 epidemic hit the country between March 2020 and May 2021.[7] All in all, our main working sample comprises about 36,000 observations. Individuals working for an establishment who signed an agreement on WFH will be considered part of the treatment group while those working for an establishment who signed agreements on other subjects only will form our control group. In 13% of cases, the individual and their spouse are both in the treatment group, while in 55% of cases the individual and their spouse are both in the control group, and in 32% of cases,

[7] There were three periods of national lockdown in France, the first between March 7 and May 11, 2020, the second between October 30 and December 5, 2020, and the last between April 3 and May 3, 2021, or about 4 months in total. Working from home was only mandatory (for those who could) during these specific periods.

one of the two is in the treatment group and the other in the control group. Figure A1 in the Online Appendix shows that these proportions remained very stable throughout the period studied, with no perceptible change at the time of the pandemic shock.

Using this sample and treatment definition, our first main objective will be to verify that the epidemic shock induced a larger increase in the probability of the spouse working from home for individuals whose spouse is in the treatment group, whereas no significant difference existed in the years preceding the shock. Once this fact is established, our central research question will then be to identify the consequences that this may have had for the individuals themselves (independently of whether they belong to the treatment group or the control group).

Table A1 in the online appendix provides a set of statistics comparing the characteristics of employees in our work sample with the average characteristics of married (or cohabiting) employees in the private sector. The table shows that the employees in our sample are close to the average in terms of age and gender. However, they appear to be better educated and more frequently employed in large firms, which is in line with the fact that we focus on firms where agreements are concluded with employee representatives. The table also shows that there are no major differences in age, gender, education, or employer size between employees whose spouse is in the treatment group and those whose spouse is in the control group. As in any difference-in-differences design, the key point will however be to show (as we will do in the following sections) that the differences between these two groups of employees have not changed at the time of the epidemic shock.

By construction, individuals in our work sample belong to establishments that signed collective agreements in 2018-2019. Table A2 in the online appendix presents the themes of these collective agreements. It also shows that these themes are similar for individuals whose spouse is in the treatment group and individuals whose spouse is in the control group, regardless of individuals own treatment status.

Remotable vs non-remotable occupations

Before moving on to the empirical analysis, it should be emphasized that available information on the occupation of respondents makes it possible to identify those who have an occupation that is very difficult to carry out remotely (i.e., manual workers, transport workers, sale assistants, nursery or care assistants, etc.). Specifically, following Goux and Maurin (2025), we used the French (2-digit) occupational classification to define non-remotable occupations as those for which the WFH rate remained below 10% during the three periods of confinement, when the official health protocol required all those who could to work at home. Other occupations will be considered remotable.[8] Using this definition, part of our analyses will be conducted by distinguishing between couples whose spouses have remotable occupations and couples where at least one member has a non-remotable occupation. The first group represents about 51% of respondents in our sample and the second group about 49%. In the following, the effects of exposure to WFH on employees and their spouses will be mainly detected on the sample of couples with remotable occupations.

5 Cross effects on WFH: graphical analysis

Figure 1 shows the evolution of the probability of WFH in our sample, depending on whether or not they or their spouse are in the treatment group. More precisely, the figure shows the evolution of the proportion of employees working from home separately for the four groups defined by the treatment status of the employees themselves and the treatment status of their spouse. The proportion of WFH remains similar (and relatively low) for all 4 groups throughout the years preceding the epidemic shock, with a slight overall upward trend. The shock then induced a rapid increase, followed by stabilization at levels significantly higher than those preceding the shock. Above all, this increase is even more marked for employees in the treatment group, and for those whose spouse is in the treatment group. To be more specific, whether we consider employees whose spouse is in the control group or employees whose spouse is in the treatment group, a

[8] The detailed list of non-remotable and remotable occupations is provided in Table A3 in Appendix.

gap of about 10 percentage points widens after the 2020 epidemic shock between those in the treatment group and those in the control group. Similarly, whether we consider employees in the control group or employees in the treatment group, a gap again close to about 10 percentage points widens after the shock between those whose spouse is in the treatment group and those whose spouse is in the control group.

To better visualize these developments, Figure 2a shows the evolution of the differences in WFH between employees in the treatment group and those in the control group. The figure confirms that the difference remains stable and small in the period preceding the epidemic shock, before rising to over 12 percentage points in the years 2021-2023 following the shock, with 2020 (the year of the shock itself) at an intermediate level. Figure 2b further shows the evolution of the differences in WFH between employees whose spouse is in the treatment group and those whose spouse is in the control group. Again, the figure shows that the difference remains stable and small throughout the years preceding the shock, and even in the year of the shock itself, fluctuating around 3 percentage points, before growing to about 15 percentage points in the years 2021-2023 following the shock.

Figure A2 in the online appendix further confirms that a similar diagnosis is obtained whether we restrict our analysis to employees in the control group or those in the treatment group. Whatever the employee's own status, the status of his or her spouse appears to make a significant difference after the shock.

All in all, our different graphical results confirm that the epidemic shock catalyzed a particularly strong increase in WFH in the treatment group and suggest that this increase in turn induced a strong increase in WFH among the spouses of the individuals in the treatment group, even when these spouses were not themselves in a particularly pro WFH environment.

6 Cross Effects on Labor Outcomes: Regression Results

The graphical analysis in the previous section suggests that employees are more likely to work from home when their spouse also works from home, consistent with the idea that people value WFH more highly when their partner does too. In the following section, we

test the robustness of this finding and we also ask whether spouses' WFH has an effect on the number of hours worked by their partners, or on their hourly wages. To be more specific, we consider the same LFS sample as that used for the graphical analysis and we estimate the following model,

$$Y_{i,t} = \underbrace{\alpha T_{i,t} + \beta T_{i,t} * Post_t}_{\text{Own treatment}} + \underbrace{\gamma T_{s(i),t} + \delta T_{s(i),t} * Post_t}_{\text{Partner's treatment}} + \underbrace{X_{i,t}\theta + X_{s(i),t}\psi}_{\text{Own \& Partner's char.}} + \underbrace{\mu_t}_{\text{Year FE}} + u_{i,t} \quad (7)$$

where $Y_{i,t}$ represents the outcome of individual i on year t while $T_{i,t}$ (resp. $T_{s(i),t}$) represents a dummy variable indicating that individual i (resp. the spouse of i) works in year t in an establishment that has signed a telework agreement in the two years following the 2017 law. The $Post_t$ variable is a dummy variable indicating that the observation year is 2020 or later while μ_t represents year fixed effects. Finally, $X_{i,t}$ (resp. $X_{s(i),t}$) represents a set of control variables including the gender, education and age of i (resp. the spouse of i) as well as the interactions of these control variables with $Post_t$. Standard errors are clustered at the household level.

The two main parameters of interest are β and δ. The β parameter captures the degree to which the epidemic shock induced a different evolution of labor outcomes between employees in the treatment group and those in the control group. For its part, the δ parameter captures cross-effects, i.e. the degree to which the epidemic shock induced a different evolution of labor outcomes between employees whose spouses were in the treatment group and those whose spouses were in the control group.

6.1 Workforce Composition

Before moving on to the analysis of hours worked and wages, we will use model (7) to compare the evolution before and after the pandemic shock of the characteristics of employees in the treatment group and the control group as well as the evolution of the characteristics of employees depending on whether their spouses are in the treatment group or in the control group. The aim is to assess the extent to which the pandemic shock induced differential changes in the composition of the groups defined either by the treatment status of employees or by the treatment status of their spouses. Such changes could for example be detected if the shock had led some employees in the treatment group to stay in their firm rather than leaving it, or had led some unemployed people to

apply to firms in the treatment group rather than those in the control group.

To test for the existence of such post-pandemic shifts, Table 1 shows the main regression results when the dependent variable is, in turn, (a) an age variable, (b) a gender dummy, (c) a high-school graduation dummy, (d) a dummy indicating whether the employee has less than 4 years of seniority (i.e., was hired after the 2020 shock), (e) a dummy indicating that the employee holds a "remotable" occupation,[9] (e) a firm size dummy, (f) a set of industry dummies. For each of these dependent variables, the first column shows the estimated δ parameter (i.e., the direct effect) while the second column shows the estimated β parameter (i.e., the cross effect).

Whatever the dependent variable considered, the table shows that the two estimated parameters are small and almost never statistically significant at standard levels, in line with the idea that the pandemic shock induced only little differential changes in the composition of the treatment group or in the composition of the group of employees whose spouse is in the treatment group.[10] In particular, no differential variations in age, gender, level of education, type of occupation or firm size were detected between groups defined by the treatment status of individuals or defined by the treatment status of their spouses. The absence of differential change in the share of employees with 4 or more years of seniority suggests that the rise of WFH in the treatment group did not particularly encourage existing employees (or their spouses) to leave (or stay with) their employer. Also, the absence of differential change in the proportion of remotable jobs confirms that the pandemic shock did not coincide with a change in the structure of occupations that would have been more particularly favorable to the development of WFH in the treatment group or among the partners of individuals in the treatement group.

All in all, we have a set of results in line with idea that the characteristics of employees in the treatment group (and the characteristics of their spouses) did not evolve differently than those of employees in the control group (and those of their spouses) after the pandemic shock. If in the next section we detect a differential evolution in the num-

[9] As mentioned above, the list of occupations considered as remotable is provided in Table A3 in Appendix. It includes all upper-level and mid-level occupations (one-digit items 4 and 3 of the French classification of occupations) to which we add lower-lever administrative occupations (two-digit item 54 of the French classification).

[10] Specifically, among the 2x20=40 estimated parameters, none is significant at the 5% level.

ber of hours worked or in wages, these evolutions can be interpreted without too much ambiguity as a consequence of the rise in WFH among employees in the treatment group and/or among their spouses.

6.2 Cross Effects on Hours Worked and Earnings

Table 2 shows the main regression results when the dependent variable is in turn (a) a variable indicating that the employee has spent at least part of his/her working time at home during the last 4 weeks, (b) a variable indicating that the employee has spent 50% or more of his/her working time at home in the last 4 weeks, (c) the number of hours usually worked per week, (d) a dummy variable indicating that the employee usually works 40 hours or more per week (long work week), (e) the (log of) hourly wage. Panel A shows the results obtained on the full sample while panel B shows the results obtained on the sample where both spouses have a remotable occupation and panel C on the sample where one of the two spouses has a non-remotable occupation.

If the post-pandemic increase in WFH among employees whose spouses are in the treatment group truly reflects spillover effects from their partners' increased remote work, we would expect this pattern to vary by occupation type. Specifically, the cross-effects on WFH should be strongest when both spouses can work remotely (Panel B), since both partners have the flexibility to make WFH decisions. Conversely, when one spouse has a non-remotable occupation (Panel C), we expect much weaker cross-effects on WFH, as at least one partner lacks the ability to increase remote work regardless of the pandemic shock.

To begin with, the results given in the first two columns of panel A confirm that the epidemic shock is followed by a significantly stronger rise in WFH for employees in the treatment group, but also (holding own treatment status constant) for employees whose spouses belong to the treatment group. The direct effect is estimated at around 6.0 percentage point, while the cross-effect is estimated at around 5.0 percentage point (a 28% increase). Almost all of the direct effect and a third of the cross effect correspond to an increase in arrangements where employees spend 50% or more of their working time at home. Assuming that the cross effect of 5.0 percentage points on employees whose

spouses are in the treatment group can be interpreted as the consequence of the direct effect of 6.0 percentage points on their spouses, these results suggest that the transition to WFH of an employee's spouse leads on average to an increase of around 0.8 in the probability that the employee himself/herself will move to WFH (with $0.8 \approx 5.0/6.0$). These results are consistent with our previous graphical analysis and in line with the assumption that employees tend to be all the more inclined to work from home the more their spouses work from home.

The last columns of Panel A further show that the epidemic shock is not followed by any differential change in hourly wages. However, the shock appears to be followed by a differential increase in the number of hours worked by employees whose spouse belongs to the treatment group. We detect an increase of about 0.46 in the number of hours usually worked per week and an increase of about 2.5 percentage points in the probability of working 40 hours or more per week. Assuming again that these cross-effects can be interpreted as a consequence of the direct effect on spouses' WFH, these results suggest that the transition to WFH of an employee's spouse leads on average to an increase of about 20% in the number of hours of the employee himself/herself (with $0.2 \approx 0.46/(0.06 \times 37.8)$). Remarkably, these cross-effects on hours worked by individuals whose spouse is in the treatment group tend to be much larger than the direct effects on hours worked by individuals in the treatment group, although the difference between the two estimated effects is not statistically significant. This is suggestive that the time freed up for work by an increase in remote work is larger when this increase in remote work responds to an increase in the spouse's remote work, in line with the idea that an increase in the spouse's remote work protects the individual from an excessive increase in participation in domestic tasks if they also choose to work from home.

Panel B shows the results obtained by replicating the analysis of Panel A on the subsample where both spouses are in remotable occupations. The first two columns confirm that both direct and cross effects on WFH are stronger with this subsample than with the full sample. Specifically, the direct effect on WFH is estimated at about 7.6 percentage point, while the cross-effect is estimated at about 5.2 percentage point (a 18% increase).

The last columns of Panel B further show that the cross-effect on the number of hours

worked is also stronger in this sub-sample. In particular, when we focus on these predominantly mid-level and upper-level employees, we detect a 0.78 hours increase in the number of hours usually worked per week (and a 4.1 percentage point increase in the proportion of long work week) for those whose spouse is in the treatment group compared with those whose spouse is in the control group. Again, these cross effects on the number of hours worked by those whose spouse is in the treatment group tend to be even more significant than the direct effects on the number of hours worked by those in the treatment group.[11]

Finally, Panel C of Table 2 confirms that there is no cross effect on WFH when one of the spouses has a non-remotable occupation. Reassuringly, it is only when both spouses have a job in which WFH is possible that we observe a significant post-epidemic increase in WFH for those whose spouse is in the treatment group. It should also be noted that we do not observe any cross-effect on hours worked in this sample either, which suggests that individuals whose spouse is in the treatment group only increase their hours worked to the extent that they are able to first increase their rate of working from home and reduce their commuting time.[12]

To better visualize the cross-effect on hours worked by spouses with remotable occupations, Figure 3 focuses on the same sample as Panel B and plot the yearly evolution of the difference in hours worked between the group of employees whose spouse is in the treatment group and the group whose spouse is in the control group. The figure shows that the difference in hours worked between the two groups is statistically non-significant (fluctuating around -0.25 hours) throughout the pre-shock period, with no clear trend, in line with the familiar assumption of parallel trends. The difference then

[11] To go further, Figure A3 in the online appendix plots the estimated cross effects on the probability of usually working h hours or more in the week, for all possible values of h between 25 and 65 hours. Significant cross-effects are detected for h between 36 and 45 hours. They fluctuate between a little less than 4 percentage points (for h=36 hours or h=45 hours) and 5 percentage points (for h=39 hours). Simplifying a bit, these results suggest that the cross effects essentially consisted of a drop of about 4 percentage points in the probability of working between 35 and 40 hours a week, combined with a symmetrical increase in the probability of working 45 hours or more.

[12] The sample used in panel C can be broken down into three sub-samples, namely the one where individuals have a remotable occupation but not their spouses, the one where individuals have a non-remotable occupation and their spouses a remotable occupation and the one where neither spouse has a remotable occupation. We verified that no cross effects are observed on either WFH or paid hours for any of these three sub-samples.

increases to about one hour, significantly above its pre-pandemic average level. As with the cross-effect on WFH, the cross-effect on hours worked does not materialize immediately at the time of the pandemic shock, but in the years 2021-2023 following the shock, again in line with the idea that the cross-effect on hours worked is conditional on the cross-effect on WFH.

To further test the robustness of the main results of Table 2 , Table A4 in the online appendix shows the results of replicating our regression analysis using the remotable sample and focusing in turn (a) on the subsample of employees with 4 years of seniority or more (i.e., who were already in their company at the time of the pandemic shock), (b) on the subsample obtained by removing the two epidemic years, i.e., the two years 2020-2021 which precede the generalization of vaccination in France, and (b) the subsample obtained by removing the two years 2020-2021 and focusing on employees with 4 years or more of seniority.

When we focus on employees with 4 years of seniority in the company or more, we obtain results very similar to those in Table 2. Our main results reflect changes in the choices and outcomes of employees who were already present in their company before the pandemic shock. When we remove the years 2020-2021 and focus on the years following the return to post-epidemic normality, estimated cross effects on the probability of WFH become slightly stronger (+7.2 percentage point), but now only concern the probability of working from home less than half the time. Cross effects on the number of hours worked also become more significant than with the full sample (+1.2 hours), in line with Figure 3.The results remain similar when we remove the years 2020-2021 and focus on employees with 4 or more years' seniority.

6.3 Heterogeneous Effects

The regression results obtained so far suggest that by working more from home, many employees not only induce their spouses to work more from home but also enable them to work longer hours. To better interpret these results we will now explore whether they are equally valid for the better and the less-paid spouses within couples, one of our main working hypothesis being that responses to increased remote working opportunities are

likely to be very different depending on the relative pay level of the spouse concerned, as discussed above. This subgroup analysis is reported in Panel A of Table 3, focusing on couples in which both partners work in a remotable occupation.

Consistent with our conceptual framework, the table first confirms a major difference between the effects observed for the better-paid spouses and those observed for the less-paid spouses. For the latter, we observe very significant direct effects on those in the treatment group, but almost no cross-effects on those whose (better-paid) spouse is in the treatment group. This result is consistent with the idea that less-paid spouses often tend to work from home to the maximum extent possible in their companies, which makes them particularly responsive to shocks affecting WFH opportunities in their companies, but much less so to shocks affecting WFH opportunities in their spouses' companies.

For better-paid spouses, the situation is the opposite. We observe, in particular, cross-effects on the number of hours worked by those whose spouse is in the treatment group that are much more significant than the direct effects on the number of hours worked by those in the treatment group. These results are consistent with the idea that better-paid spouses do not necessarily work from home to the maximum extent possible within their companies, preferring instead to adjust their working hours at home to those of their spouse. When their (less-paid) spouse benefits from new WFH opportunities, they respond by increasing their WFH time in parallel, reducing their commuting time without increasing their contribution to domestic tasks, which ultimately allows them to free up time to significantly increase their working hours.[13]

When we repeat the analysis by gender in Panel B, we find results consistent with men being on average the better-paid individual of their couple.[14] For men, the cross-effects on the number of hours worked for those whose partners are in the treatment group are, for example, much greater than the direct effects on the number of hours worked of those who are themselves in the treatment group. For women, the opposite

[13] As shown in Appendix Table A6, we find similar results when excluding from our sample the two pandemic years 2020-2021 as well as when focusing on employees with at least four years seniority in their firm. In both subsamples, the direct effects are significant only for the less-paid partners and the cross-effects only for the better-paid partners.

[14] Men have the higher hourly wage in 67% of couples in our full sample. In 1.6% of couples both partners have exactly the same hourly wage.

is true; only the direct effects on those in the treatment group are statistically significant. The cross-effects for those whose partners are in the treatment group are weaker and statistically nonsignificant.

To go a little further, Table A5 in the appendix shows the regression results separately for the four subgroups defined by gender and relative salary within the couple. This analysis confirms that the cross-effects primarily concern better-paid spouses, even when these better-paid spouses are women, and even if these cross-effects are less well estimated for the sample of better-paid women due to its small sample size. In contrast, there are virtually no cross-effects on less-paid spouses, even when the less-paid spouse is a man. This analysis suggests that it is not gender per se that determines the asymmetry of responses to a shock on homeworking opportunities, but rather the relative position within the couple, with the direct effects of the shock primarily affecting less-paid spouses and its cross-effects primarily affecting better-paid spouses.

Finally, Table A7 in the appendix explores whether results differ in families with children and families without children. This analysis does not reveal any major differences between the two types of families, although the small size of the subsamples makes it difficult to draw very precise conclusions. Whether or not there are children in the household, the cross-effects appear again primarily noticeable for better-paid spouses, while the direct effects are more significant for less-paid spouses.

6.4 Triple differences

The difference-in-differences model used so far assumes that the labor outcomes of employees whose spouse is in the treatment group would have evolved in the same way as that of employees whose spouse is in the control group, had there been no pandemic shock in 2020. In this section, we develop a triple-difference (DDD) approach, based on the assumption that the differences in labor outcomes between the group of individuals living in couples with remotable occupations and the group living in other couples would have evolved in the same way in the treated group and the control group, had there been no pandemic shock in 2020. To be more specific, Table 4 focuses on the same subsamples of better-paid and less-paid spouses as Table 3 and shows the results of re-

gressing the main outcomes of interest on the three-way interactions between a post-pandemic dummy variable, an occupational group dummy (i.e., a dummy variable indicating whether both spouses have a remotable occupation) and dummies indicating either the treatment status of the respondent or the treatment status of his/her spouse, controlling for the same variables as in model (1) and for their interactions with the occupational group dummy. In this set-up, for each of the outcomes studied, the three-way interaction coefficients capture how the gap between the two occupational groups has evolved after the epidemic shock in the treatment group compared with the evolution in the control group, whether the treatment group is defined by the individual's treatment status or that of his/her spouse.

The table first confirms that the epidemic shock coincided with an increase in the WFH gap between occupational groups which is significantly stronger for respondents in the treatment group than for those in the control group. Consistent with the previous DD analysis, this specific change in the WFH gap is particularly marked for less-paid spouses.

The table further confirms that the shock also coincided with an increase in the gap in the number of hours worked between occupational groups which is significantly stronger for respondents whose spouses are in the treatment group than for those whose spouses are in the control group. Also, consistent with the DD analysis, this shift in the gap in the number of hours worked is most noticeable for the better-paid spouses.

Ultimately, the results of this triple-difference approach are entirely consistent with those of the double-difference approach, confirming that the direct effect of the pandemic shock was primarily on the probability of less-paid spouses working remotely, and resulted in a simultaneous rise in the WFH and the number of hours worked by their (better-paid) spouses.

7 Commuting Distance and Residential Choices

Working from home reduces the frequency of commuting, and the freed-up time can be used, as we have seen, to increase the number of hours worked. In theory, the reduced frequency of commuting also makes it possible to change residence, move further away

from one's workplace, choose a place to live far from city centers, where housing prices are much lower and where it is possible to have much more spacious accommodation at a lower cost.[15] Moving away from expensive urban centers, however, comes at the cost of moving away from the best educational infrastructure as well as the best medical (and personal service) infrastructure, so it is not clear that the greater possibilities for working from home are enough to change the residential equilibrium and the distribution of households across the territory.[16]

To explore these issues, we replicated our main regression analysis using the distance to work as the dependent variable. We measure this as the euclidean distance between the exact establishment location and the centroid of the municipality of residence. This analysis is reported in Table 5. It reveals no differential effect of the pandemic shock on the distance to work of individuals in the treatment group or on the distance to work of individuals whose spouse is in the treatment group. This finding holds for both men and women, in families with children as well as in families without children. The data suggest that the specific increase in working from home did not coincide with any distance from the workplace, either for the treatment group or for the group whose spouses are in the treatment group.

To go further, we also regressed a set of three dependent variables characterizing households' residential choices on a set of dummy variables indicating (a) whether only the man is in the treatment group, (b) whether only the woman is in the treatment group, (c) whether both are in the treatment group, (d) whether neither is in the treatment group (taken as reference), as well as the interaction of these dummy variables with a variable indicating the post-pandemic shock period. The three dependent variables are dummy variables indicating whether the household resides (a) in the central city of an urban unit[17], (b) a suburban city of an urban unit, (c) a small isolated municipality (i.e., urban

[15] According to the French Statistical Office, in urban units with more than 700,000 inhabitants, house prices vary, for example, by a factor of two between the most central and the most peripheral areas (P. Bertrand, 2025). In urban units with more than 200,000 inhabitants, prices are 80% higher in the center than in the most peripheral areas.

[16] Regarding territorial inequalities in access to cultural or medical facilities in France, see for example Couleaud et al. (2021) or Legendre (2021).

[17] A urban unit is defined as a city or group of cities with a continuous built-up area (no gap of more than 200 meters between two buildings) with at least 2,000 inhabitants.

unit without suburbs) or in a rural area (i.e., outside urban units). Panel A of Table A8 in the appendix shows the regression results obtained with the full sample while Panel B refers to the sample of couples holding remotable occupations. These analyses reveal no clear differential effect of the pandemic shock on the residential choices of families of individuals in the treatment group. Whether one or both spouses were particularly affected by the increase in WFH, no change in the likelihood of residing in urban centers, suburbs, or rural areas was detected.

8 Conclusion

The rise of working from home reduces commuting time and considerably changes the way men and women spend their days and interact within couples. To shed light on these transformations, this article draws on the specificities of the French experience, a country where the 2020 epidemic shock was followed by a much larger increase in WFH in establishments where a collective agreement on remote work had been signed in the years preceding the shock. We show that the spouses of employees working in these establishments also started working more from home after the shock, regardless of whether there was a WFH agreement in their own establishment, suggesting very strong complementarity in the choice of WFH between spouses. When an employee switches to remote work, we find that the probability of his or her partner also working from home increases by about 0.8. Furthermore, by switching to WFH, partners save time on commuting, allowing them to considerably increase their number of hours worked.

Further investigations reveal that these cross-effects on WFH and number of hours worked are much more significant for men than for women while the opposite is true for the direct effects of the pandemic shock: they are much stronger for women than for men in the treatment group. Men are, in the vast majority of cases, those who have the best occupational positions in the couple, and the importance of cross-effects for men suggests that better-paid spouses are even more responsive to an increase in their spouse's remote work than to an increase in remote work opportunities granted by their companies. These findings are consistent with a model where couples coordinate so that the better-paid spouse only increases the number of days he or she works from home to the extent that

his or her partner works more from home and can take on more domestic tasks and childcare.

Aside from time use, another potentially very important consequence of the rise in WFH could have been a change in where people live, away from urban centres. However, we find no evidence of any such change,i.e. no evidence that the adoption of work-from-home arrangements leads to residential relocation or changes in commuting distances. The rise of remote work opportunities has reduced the commuting costs associated with moving away from urban centers, but not enough to actually incentivize affected workers to move away from the educational, medical, and cultural amenities of urban centers. In the end, the time gains from remote work does not seem to be offset by longer commutes, which makes it possible to understand the very significant cross-effects on working time that we have been able to identify.

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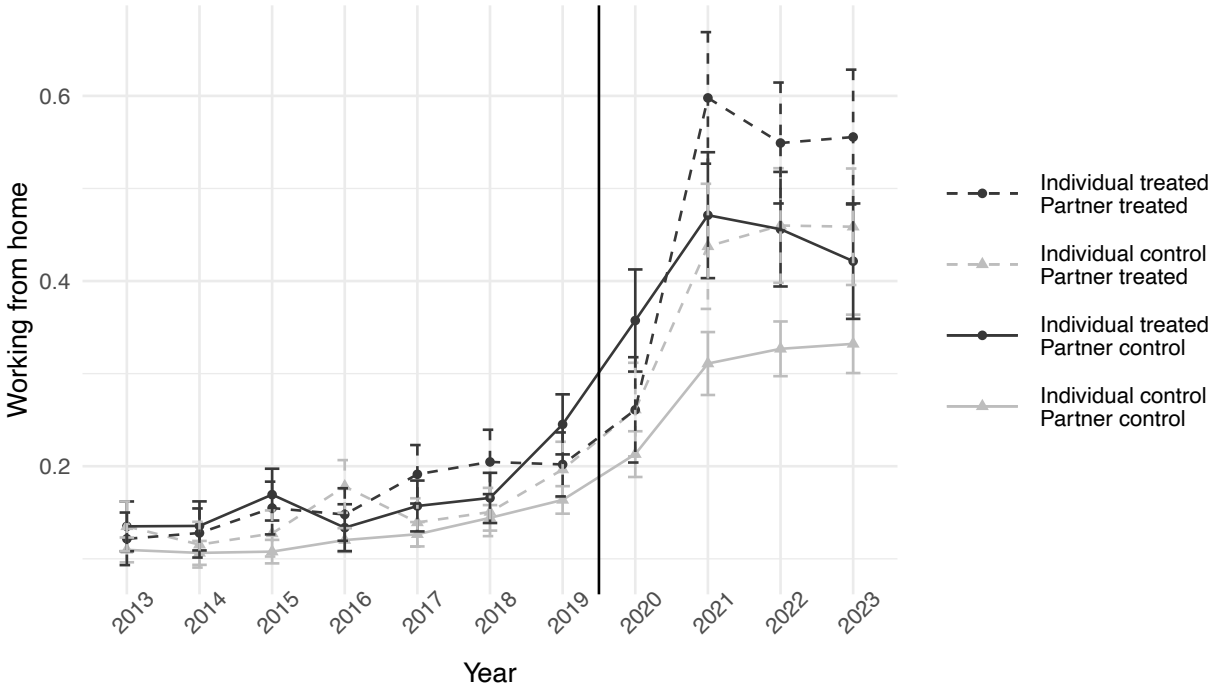
9 Tables and Figures

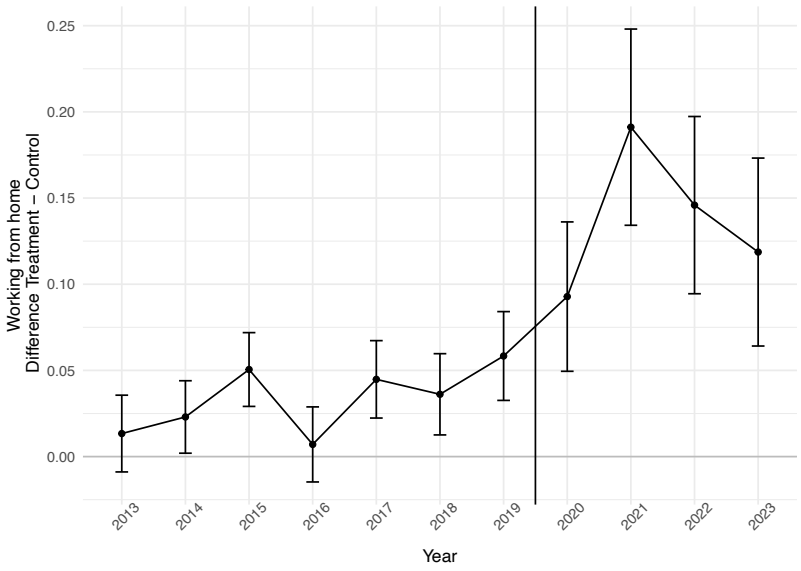
Figure 1: Evolution of WFH by own and partner treatment status



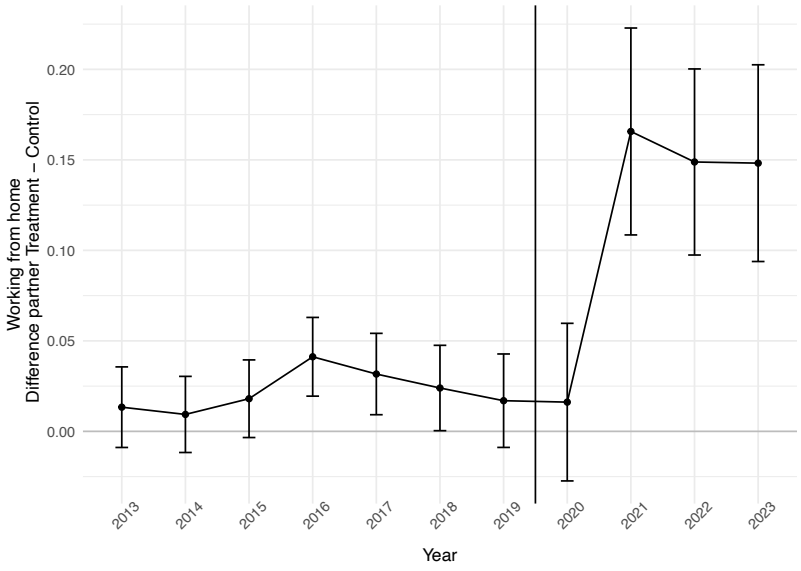
Note: This figure refers to our working sample of employees working in a private sector establishment that signed at least one collective agreement in 2018 or 2019 and who are married (or cohabiting) with an employee working in the same type of establishment. For each combination of own and spousal treatment status, the Figure displays the evolution of the share of employees who worked from home over the last four weeks. The light grey lines correspond to individuals who belong to the control group, and the black lines to those who belong to the treatment group. The full lines refer to individuals whose spouse is in the control group, and the dotted line to individuals whose spouse is in the treatment group. The bars represent 95% confidence intervals. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor.

Figure 2: Evolution of Differences in WFH between Groups Defined by Own or Spouse's Treatment Status

(a) Differences in WFH between groups defined by own treatment status



(b) Differences in WFH between groups defined by spouse's treatment status



Note: This figure refers to the same sample as Figure 1. Panel (a) displays the difference in the evolution of the share of employees working from home in the last four weeks between those who belong to the treatment and control groups. Panel (b) displays the evolution of the same difference between employees whose spouse belongs to the treatment and control groups. The bars represent 95% confidence intervals. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor.

Table 1: Direct and Cross-Effects on Employee Characteristics

	Own Treatment × Post (1)	Partner Treatment × Post (2)	Mean
Age	-0.1816	-0.0639	42.99
	(0.2664)	(0.2665)	
Woman	0.0151	-0.0151	0.5
	(0.0180)	(0.0180)	
High school grad	0.0137	0.0055	0.652
	(0.0134)	(0.0137)	
Seniority under 4 years	-0.0042	-0.0159	0.230
	(0.0130)	(0.0134)	
Remotable occupation	0.0026	-0.0005	0.646
	(0.0140)	(0.0142)	
Firm size ≥ 50	0.0221	-0.0022	0.723
	(0.0140)	(0.0144)	
Agriculture	-0.0017	-0.0023	0.003
	(0.0018)	(0.0018)	
Manufacturing	-0.0179	0.0228*	0.250
	(0.0128)	(0.0136)	
Energy	-0.0088	0.0018	0.033
	(0.0076)	(0.0068)	
Construction	0.0009	-0.0054	0.040
	(0.0069)	(0.0064)	
Commerce	0.0086	-0.0040	0.150
	(0.0106)	(0.0114)	
Transport	-0.0183	-0.0182*	0.104
	(0.0124)	(0.0109)	
Hospitality	0.0071*	0.0002	0.017
	(0.0040)	(0.0040)	
Information, communication	-0.0072	-0.0051	0.045
	(0.0081)	(0.0077)	
Finance, Insurance	0.0199*	0.0157	0.081
	(0.0111)	(0.0101)	
Real Estate	0.0022	0.0031	0.012
	(0.0033)	(0.0034)	
Science and Tech	0.0172	-0.0104	0.129
	(0.0110)	(0.0114)	
Administration	-0.0078	-0.0014	0.121
	(0.00297)	(0.0108)	
Arts	0.0059	0.0033	0.015
	(0.0044)	(0.0045)	
Observations	36,192		

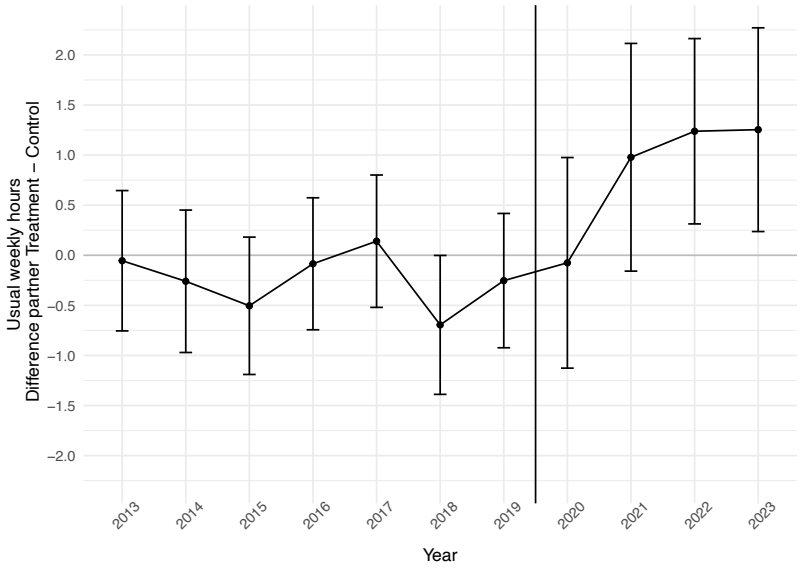
Note: The table refers to our working sample of employees working in a private sector establishment that signed at least one collective agreement in 2018 or 2019 and who are married (or cohabiting) with an employee working in the same type of establishment. Column (1) reports the regression coefficient corresponding to the direct treatment variable in model (7), meaning the interaction of own treatment status and *Post*. Column (2) reports the coefficient corresponding to the cross treatment variable: the interaction of one's partner's treatment status and *Post*. Column (3) reports the mean of the dependent variable. Each row corresponds to a specific dependent variable. The dependent variable is, in turn, a continuous variable for age (row 1), a gender dummy (row 2), a dummy indicating high-school graduation (row 3), a dummy indicating a seniority within the firm below four years (row 4), a dummy indicating that the respondent works in a remotable occupation (row 5), a series of dummies for the size of the firm the respondent works in (rows 6, 7, 8), and a series of dummies for the industry the respondent works in (rows 9 and below). Standard errors (in parentheses) are clustered at the household level. Regressions include control for year dummies. Due to missing values, there are only 35,178 observations in the firm size regressions. ***: p<0.01, **: p<0.05, *: p<0.1. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor.

Table 2: Direct and Cross-Effects on Labor Outcomes

	WFH	WFH $\geq$ 50%	Usual weekly hours	Hours $\geq$ 40	Log hourly wage
	(1)	(2)	(3)	(4)	(5)
Panel A: Full sample					
Own WFH agreement × Post	0.0596***	0.0514***	0.1280	0.0286*	-0.0128
	(0.0137)	(0.0102)	(0.2210)	(0.0149)	(0.0109)
Partner WFH agreement × Post	0.0498***	0.0175*	0.4575**	0.0247*	0.0058
	(0.0134)	(0.0099)	(0.2225)	(0.0147)	(0.0108)
Dependent variable mean	0.178	0.037	37.8	0.322	2.53
Observations	36,192	36,192	36,192	36,192	36,192
Panel B: Remotable sample					
Own WFH agreement × Post	0.0756***	0.0727***	0.4166	0.0401**	-0.0135
	(0.0191)	(0.0152)	(0.2992)	(0.0204)	(0.0140)
Partner WFH agreement × Post	0.0525***	0.0200	0.7844***	0.0406**	0.0100
	(0.0190)	(0.0149)	(0.2977)	(0.0202)	(0.0140)
Dependent variable mean	0.296	0.061	39.8	0.462	2.71
Observations	18,376	18,376	18,376	18,376	18,376
Panel C: Non-remotable sample					
Own WFH agreement × Post	0.0091	0.0048	-0.3480	-0.0006	-0.0073
	(0.0163)	(0.0096)	(0.3067)	(0.0194)	(0.0163)
Partner WFH agreement × Post	0.0186	0.0018	-0.0693	-0.0101	-0.0048
	(0.0156)	(0.0091)	(0.3208)	(0.0192)	(0.0154)
Dependent variable mean	0.056	0.013	35.8	0.179	2.35
Observations	17,816	17,816	17,816	17,816	17,816

Note: Panel A refers to the same sample as Table 1. Panel B focuses on the subsample where both spouses have a remotable occupation. Panel C focuses on the subsample where at least one spouse has a non-remotable occupation. Each column corresponds to a specific dependent variable. In each panel, the first row refers to the regression coefficient for the direct treatment variable in model (7) (i.e., the interaction between dummies indicating own treatment status and the post-pandemic period) while the second row refers to the coefficient corresponding to the cross-treatment variable (i.e., the interaction between dummies indicating spouse's treatment status and the post-pandemic period). The dependent variable is in turn (1) a dummy variable indicating that the respondent worked at home in the previous 4 weeks, (2) a dummy variable indicating that s/he worked at home at least 50% of the time in the previous 4 weeks, (3) a variable indicating the number of hours usually worked per week, (4) a dummy variable indicating that the respondent usually works 40 hours or more per week, (5) the log of hourly wage. Standard errors (in parentheses) are clustered at the household level. Regressions include controls for year (dummies) as well as age, education (high school or more) and gender of both members of the couple (and the interaction of these variables with *Post*, a dummy indicating the post-pandemic period). ***: p<0.01, **: p<0.05, *: p<0.1. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor

Figure 3: Evolution of Differences in Hours Worked between Groups Defined by Spouse's Treatment Status



Note: This figure refers to the sample where both spouses have a remotable occupation (i.e., same sample as Panel B of Table 2). It displays the difference in the evolution of number of hours usually worked per week between employees whose spouse belongs to the treatment and control groups. The bars represent 95% confidence intervals. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor.

Table 3: Direct and Cross Effects on Labor Outcomes by Gender and Relative Pay

	WFH	WFH ≥50%	Usual weekly hours	WFH	WFH ≥50%	Usual weekly hours
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: By Spouse's Relative Wage	**Better-paid spouse**			**Less-paid spouse**		
Own WFH agreement × Post	0.0597**	0.0449**	-0.0480	0.0992***	0.1036***	0.8326**
	(0.0273)	(0.0213)	(0.4364)	(0.0274)	(0.0224)	(0.4162)
Partner WFH agreement × Post	0.0833***	0.0379*	1.417***	0.0173	0.0035	0.0745
	(0.0277)	(0.0215)	(0.4466)	(0.0268)	(0.0213)	(0.4027)
Dependent variable mean	0.335	0.063	40.6	0.258	0.058	38.96
Observations	9,062	9,062	9,062	9,062	9,062	9,062
Panel B: By Gender	**Men**			**Women**		
Own WFH agreement × Post	0.0517*	0.0538***	0.1516	0.0975***	0.0898***	0.7026*
	(0.0275)	(0.0207)	(0.4313)	(0.0270)	(0.0227)	(0.4212)
Partner WFH agreement × Post	0.0719***	0.0221	0.9787**	0.0347	0.0195	0.6057
	(0.0278)	(0.0205)	(0.4363)	(0.0265)	(0.0220)	(0.4141)
Dependent variable mean	0.327	0.057	41.7	0.265	0.065	37.8
Observations	9,188	9,188	9,188	9,188	9,188	9,188

Note: This table refers to the sample where both spouses have a remotable occupation (same as Panel B of Table 2). Columns (1) to (3) of Panel A correspond to the better-paid spouse (with the highest hourly wage in the couple), and columns (4) to (6) to the less-paid spouse. Couples in which both partners earn the same hourly wage are excluded. Columns (1)to (3) of Panel B correspond to men, and columns (4) to (6) to women. In each panel, the first row refers to the regression coefficient for the the interaction of own treatment status and *Post* in model (7) while the second row refers to the coefficient corresponding to the interaction of spouse's treatment and *Post*. The dependent variable is in turn (1) a dummy variable indicating that the respondent worked at home in the previous 4 weeks, (2) a dummy variable indicating that the respondent worked at home at least 50% of their time in the previous 4 weeks, (3) a variable indicating the number of hours usually worked per week Standard errors (in parentheses) are clustered at the household level. Regressions include controls for year (dummies) as well as gender (in panel A only), age, and education (high school or more) of both members of the couple (and their interaction with *Post*). ***: p<0.01, **: p<0.05, *: p<0.1. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor

Table 4: Direct and Cross Effects on Labour Outcomes: A Triple Difference Approach by Relative Pay

	WFH	WFH $\geq$ 50%	Usual weekly hours	WFH	WFH $\geq$ 50%	Usual weekly hours
	(1)	(2)	(3)	(4)	(5)	(6)
	Better-paid spouse			**Less-paid spouse**		
Own WFH agreement	0.0247	0.0013	-0.5424	-0.0053	0.0055	-0.1617
$\times$ Post	(0.0241)	(0.0137)	(0.4578)	(0.0206)	(0.0133)	(0.4426)
Partner WFH agreement	0.0290	-0.0060	0.0846	0.0122	0.0085	-0.1421
$\times$ Post	(0.0246)	(0.0138)	(0.4623)	(0.0186)	(0.0121)	(0.4779)
Own WFH agreement $\times$	0.0341	0.0446*	0.5103	0.1081***	0.0981***	0.9847
Both remotable $\times$ Post	(0.0364)	(0.0254)	(0.6330)	(0.0343)	(0.0261)	(0.6065)
Partner WFH agreement $\times$	0.0571	0.0439*	1.316**	0.0034	-0.0042	0.2292
Both remotable $\times$ Post	(0.0371)	(0.0257)	(0.6428)	(0.0326)	(0.0246)	(0.6253)
Dependent variable mean	0.206	0.039	38.57	0.151	0.035	37.0
Observations	17,806	17,806	17,806	17,806	17,806	17,806

Note: This table refers to our main working sample (same as Table 1). Columns (1) to (3) correspond to the better-paid spouse (with the highest hourly wage in the couple), and columns (4) to (6) to the less-paid spouse (couples earning equal hourly wage are excluded). These regressions correspond to the triple-difference model described in section 6.4. The first and second row report respectively the coefficients corresponding to own and partner's treatment variable interacted with *Post*. The third and fourth rows report the coefficient corresponding respectively to own and partner treatment status interacted with *Post* and with a dummy indicating that both spouses have remotable occupations. The dependent variable is in turn (1) a dummy variable indicating that the respondent worked at home in the previous 4 weeks, (2) a dummy variable indicating that they worked at home at least 50% of their time, (3) a variable indicating the number of hours usually worked per week. Standard errors (in parentheses) are clustered at the household level. Regressions include controls for year (dummies) as well age, education (high school or more) and gender of both members of the couple (and their interactions with *Post* and the occupational group dummy). ***: p<0.01, **: p<0.05, *: p<0.1. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor

Table 5: Direct and Cross Effects on Commuting Distance, by Gender and Family Type

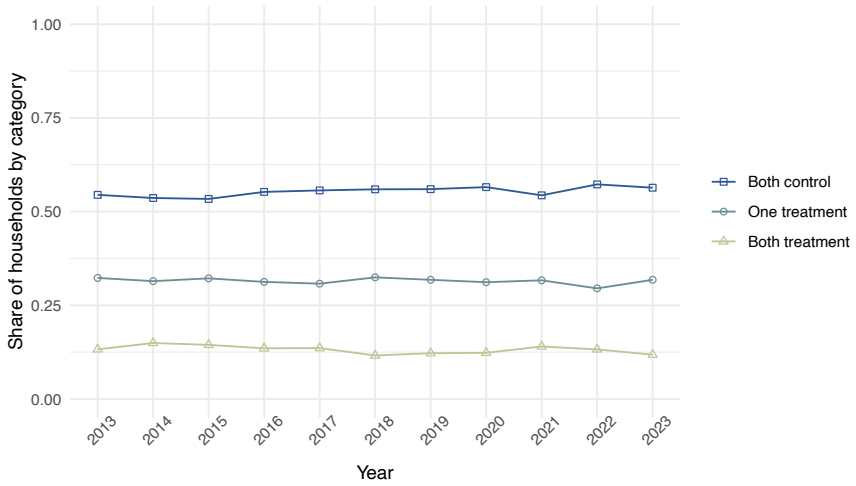
	Distance between firm and residence municipality (km)		
	(1)	(2)	(3)
Panel A: Full Sample	**All**	**Men**	**Women**
Own WFH agreement × Post	-0.9250	0.0569	-1.825
	(2.418)	(3.810)	(2.845)
Partner WFH agreement × Post	0.0317	2.852	-2.971
	2.522	(3.982)	(3.024)
Dependent variable mean	26.0	30.3	21.7
Observations	35,648	17,795	17,853
Panel B: Remotable sample	**All**	**Men**	**Women**
Own WFH agreement × Post	-3.283	-1.676	-4.129
	(3.522)	(5.354)	(4.527)
Partner WFH agreement × Post	-0.4338	3.713	-5.401
	(3.730)	(5.677)	(4.725)
Dependent variable mean	32.2	37.4	26.9
Observations	18,119	9,057	9,062

Note: Panel A refers to our main working sample (same as Table 1). Panel B focuses on the subsample where both spouses have a remotable occupation (same as Panel B in Table 2). In each panel, the first row refers to the regression coefficient for interaction of own treatment status and *Post* in model (7) while the second row refers to the coefficient corresponding to the interaction between spouse's treatment status and *Post*. The dependent variable in all columns is the euclidean distance between individuals' exact firm location, and the centroid of their municipality of residence. Standard errors (in parentheses) are clustered at the household level. Regressions include controls for year (dummies) as well as age, education (high school or more) and gender of both members of the couple (and their interaction with *Post*). ***: p<0.01, **: p<0.05, *: p<0.1. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor

A Appendix

A.1 Additional Figures and Tables

Figure A1: Share of Households by Treatment Status of both Spouses



Note: This figure refers to our main working sample (same as Figure 1). It shows the share of households by whether both spouses work in a treatment group firm; whether only one spouse works in a treatment group firm; or whether neither spouse works in a treatment group firm. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor.

Table A1: Sample Composition by Own and Partner Treatment Status

			Own: Control		Own: Treatment	
		Full	Partner		Partner	
	All	Sample	Control	Treatment	Control	Treatment
	(1)	(2)	(3)	(4)	(5)	(6)
Age	44.1	43.0	42.7	42.8	43.0	44.3
	(10.6)	(9.5)	(9.6)	(9.4)	(9.5)	(9.4)
Woman	0.463	0.500	0.500	0.531	0.469	0.500
	(0.499)	(0.500)	(0.500)	(0.499)	(0.499)	(0.500)
High school grad	0.552	0.651	0.610	0.676	0.707	0.730
	(0.497)	(0.477)	(0.488)	(0.468)	(0.455)	(0.444)
Seniority <4 yrs	0.308	0.230	0.246	0.273	0.203	0.145
	(0.462)	(0.421)	(0.430)	(0.445)	(0.403)	(0.352)
Remotable occupation	0.534	0.646	0.591	0.685	0.707	0.754
	(0.499)	(0.478)	(0.492)	(0.465)	(0.455)	(0.430)
Firm size above 50	0.493	0.723	0.712	0.692	0.742	0.785
	(0.500)	(0.447)	(0.453)	(0.462)	(0.438)	(0.411)
Agriculture	0.005	0.003	0.003	0.002	0.002	0.001
	(0.071)	(0.051)	(0.057)	(0.048)	(0.042)	(0.038)
Manufacturing	0.181	0.250	0.299	0.238	0.164	0.161
	(0.385)	(0.433)	(0.458)	(0.426)	(0.370)	(0.367)
Energy	0.022	0.033	0.020	0.019	0.058	0.075
	(0.146)	(0.179)	(0.139)	(0.136)	(0.234)	(0.263)
Construction	0.075	0.040	0.037	0.039	0.057	0.037
	(0.264)	(0.197)	(0.188)	(0.194)	(0.233)	(0.189)
Commerce	0.158	0.150	0.173	0.179	0.104	0.077
	(0.364)	(0.357)	(0.378)	(0.383)	(0.305)	(0.266)
Transport	0.074	0.104	0.060	0.055	0.193	0.243
	(0.262)	(0.306)	(0.237)	(0.228)	(0.395)	(0.429)
Hospitality	0.033	0.017	0.020	0.017	0.013	0.010
	(0.179)	(0.129)	(0.138)	(0.129)	(0.115)	(0.099)
Information Communication	0.035	0.045	0.035	0.042	0.065	0.070
	(0.185)	(0.208)	(0.184)	(0.200)	(0.246)	(0.255)
Finance, Insurance	0.047	0.081	0.048	0.073	0.148	0.150
	(0.212)	(0.273)	(0.213)	(0.260)	(0.355)	(0.357)
Real Estate	0.015	0.012	0.014	0.011	0.009	0.013
	(0.122)	(0.110)	(0.116)	(0.104)	(0.093)	(0.114)
Science and Technology	0.136	0.129	0.135	0.158	0.108	0.099
	(0.343)	(0.336)	(0.341)	(0.364)	(0.310)	(0.299)
Administration	0.153	0.121	0.143	0.152	0.068	0.052
	(0.360)	(0.326)	(0.350)	(0.359)	(0.251)	(0.222)
Arts	0.058	0.015	0.015	0.015	0.012	0.014
	(0.234)	(0.120)	(0.123)	(0.122)	(0.109)	(0.117)
Number of observations	228,168	36,192	19,962	5,718	5,718	4,794

Note: The table gives the mean value of variables indicating the gender, age, education, seniority, age, occupation, firm size or industry of individuals (one variable per row). Each column corresponds to a different sample: (1) full sample of married (or cohabiting) employees who are working in a private sector establishment, (2) main working sample (same as Table 1), (3) subsample where the individual and his/her spouse are both in the control group, (4) subsample where the individual is in the control group and his/her spouse is in the treatment group, (5) subsample where the individual is in the treatment group and his/her spouse is in the control group, (6) subsample where the individual and his/her spouse are both in the treatment group. Standard deviation in parenthesis. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor.

Table A2: Type of Agreement by Own and Partner Treatment Status

		Own: Control		Own: Treatment	
	Full	Partner		Partner	
	Sample	Control	Treatment	Control	Treatment
	(1)	(2)	(3)	(4)	(5)
Wage	0.177	0.236	0.229	0.044	0.033
	(0.382)	(0.424)	(0.421)	(0.204)	(0.177)
Working time	0.201	0.178	0.19	0.238	0.27
	(0.401)	(0.382)	(0.393)	(0.426)	(0.444)
Job Preservation	0.092	0.076	0.072	0.11	0.158
	(0.289)	(0.265)	(0.259)	(0.313)	(0.365)
Digital disconnection	0.03	0.017	0.016	0.063	0.064
	(0.172)	(0.131)	(0.127)	(0.242)	(0.244)
Working conditions	0.198	0.031	0.024	0.637	0.573
	(0.398)	(0.174)	(0.152)	(0.481)	(0.495)
Training	0.013	0.014	0.011	0.012	0.009
	(0.111)	(0.118)	(0.103)	(0.107)	(0.095)
Pension, Insurance	0.036	0.046	0.04	0.016	0.015
	(0.187)	(0.209)	(0.196)	(0.124)	(0.123)
Profit sharing	0.222	0.306	0.321	0.012	0.007
	(0.416)	(0.461)	(0.467)	(0.11)	(0.083)
Diversity	0.16	0.152	0.141	0.168	0.203
	(0.366)	(0.359)	(0.348)	(0.374)	(0.402)
Other	0.332	0.337	0.34	0.298	0.345
	(0.471)	(0.473)	(0.474)	(0.457)	(0.475)
Number of observations	36,192	19,962	5,718	5,718	4,794

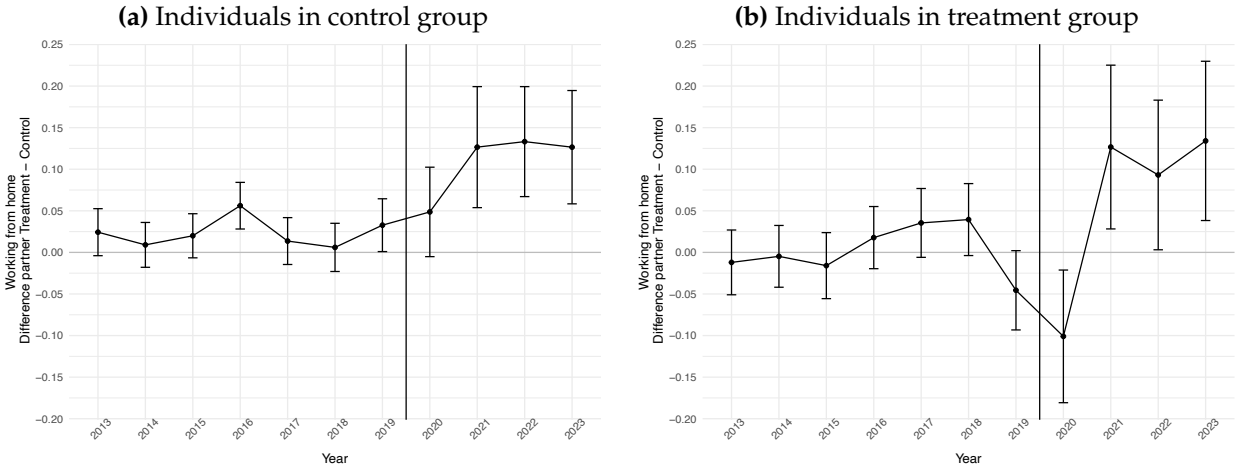
Note: This table refers to our main working sample (same as Table 1). Each column corresponds to a different subsample: (1) full sample, (2) the individual and his/her spouse are both in the control group, (3) the individual is in the control group and his/her spouse in the treatment group, (4) the individual is in the treatment group and his/her spouse in the control group, (5) the individual and his/her spouse are both in the treatment group. There are ten possible topics for collective agreements and each row corresponds to a specific topic. It provides the share of individual working in a firm which signed a collective agreement on the corresponding topic in 2018-2019, for each subsample. Standard deviation in parenthesis. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor.

Table A3: Remotable and Non-Remotable Occupations

Panel A - Remotable occupations	Sample Share (1)	Lockdown WFH Share (2)
33 - Public administrative and technical executives	0.008	0.774
34 - Teachers and advanced scientific occupations	0.005	0.531
35 - Media and arts professionals	0.007	0.720
37 - Coporate managers and executives	0.117	0.776
38 - Technical managers and engineers	0.125	0.742
42 - Elementary, vocational, adult education and sports professionals	0.004	0.351
43 - Healthcare and social work practitioners	0.041	0.250
45 - Mid-level public administration	0.004	0.526
46 - Mid-level business administrators and sales professionals	0.125	0.513
47 - Technicians	0.076	0.297
48 - Foremen, intermediate level supervisors	0.042	0.184
54 - Corporate administrative staff	0.088	0.397
Panel B - Non-remotable occupations	Sample Share (1)	Lockdown WFH Share (2)
52 - Public administrative employees, health auxiliaries, care assistants	0.047	0.044
53 - Law enforcement, military, fire service, and security personnel	0.006	0.000
55 - Commercial employees, retail workers	0.058	0.100
56 - Personal service workers	0.019	0.061
62 - Skilled industrial workers	0.074	0.020
63 - Skilled craft/artisanal workers	0.026	0.019
64 - Transport vehicle drivers, delivery drivers, and couriers	0.029	0.030
65 - Heavy equipment operators, warehouse staff, and non-road transport workers	0.031	0.015
67 - Low-skilled industrial workers	0.048	0.010
68 - Low-skilled craft/artisanal workers	0.019	0.041

Note: This table shows how occupations (as defined by the 2-digit French classification) are distributed across remotable and non-remotable occupations. Panel A refers to occupations that we define as remotable, while Panel B refers to those that we define as non-remotable. The sample used for the first column corresponds to our main work sample. It shows the distribution of workers across occupations. The sample used for the second column 2 corresponds to the observations made during the lockdown periods. It shows for each occupation the share of employees in our work sample who worked from home during these particular periods. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor.

Figure A2: Difference in WFH Between Groups Defined by Spouse's Treatment Status



Note: This figure refers to our main working sample (same as Figure 1). It displays the difference in the share of employees who worked from home in the previous four weeks, between employees whose spouse belongs to the treatment and control groups. Panel (a) corresponds to individuals who are themselves part of the control group, while panel (b) corresponds to individuals part of the treatment group. The bars represent 95% confidence intervals. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor.

Table A4: Direct and Cross Effects on Labor Outcomes: a Subsample Analysis

	WFH	WFH $\geq$ 50%	Usual weekly hours	Hours $\geq$ 40	Log hourly wage
	(1)	(2)	(3)	(4)	(5)
Panel A: subsample with at least 4 years of seniority					
Own WFH agreement × Post	0.0616***	0.0585***	0.3968	0.0422*	-0.0097
	(0.0217)	(0.0173)	(0.3450)	(0.0228)	(0.0158)
Partner WFH agreement × Post	0.574***	0.0199	0.7392**	0.0229	0.0155
	(0.0217)	(0.0172)	(0.3420)	(0.0228)	(0.0159)
Dependent variable mean	0.291	0.060	39.6	0.454	2.743
Observations	14,458	14,458	14,458	14,458	14,458
Panel B: subsample excluding years 2020-2021					
Own WFH agreement × Post	0.0525**	0.0723***	0.2137	0.0429	-0.0271
	(0.0255)	(0.0209)	(0.3892)	(0.0271)	(0.0190)
Partner WFH agreement × Post	0.0724***	0.0003	1.213***	0.0665**	0.0116
	(0.0255)	(0.0205)	(0.3844)	(0.0269)	(0.0188)
Dependent variable mean	0.276	0.0433	39.7	0.459	2.71
Observations	16,658	16,658	16,658	16,658	16,658
Panel C: subsample with at least 4 years of seniority, excluding years 2020-2021					
Own WFH agreement × Post	0.0511*	0.0778***	0.2270	0.0474	-0.0181
	(0.0291)	(0.0237)	(0.4345)	(0.0296)	(0.0217)
Partner WFH agreement × Post	0.0914**	-0.0113	1.179***	0.0426	0.0138
	(0.0294)	(0.0235)	(0.4347)	(0.0297)	(0.0216)
Dependent variable mean	0.270	0.043	39.6	0.450	2.74
Observations	13,112	13,112	13,112	13,112	13,112

Note: This table refers to three sub-samples from the remotable sample. Panel A focuses on individuals with at least four years of seniority in their firm. Panel B excludes observations recorded in 2020 or 2021. Panel C combines both restrictions. Each column corresponds to a specific dependent variable. In each panel, the first row refers to the regression coefficient for the direct treatment variable in model 7 (the interaction of own treatment status and *Post*) while the second row refers to the coefficient corresponding to the cross-treatment variable (the interaction of spouse's treatment status and *Post*). The dependent variable is in turn (1) a dummy variable indicating that the respondent worked at home in the previous 4 weeks, (2) a dummy variable indicating that they worked at home at least 50% of their time, (3) a variable indicating the number of hours usually worked per week, (4) a dummy variable indicating that the respondent usually works 40 hours or more per week, (5) the log of hourly wage. Standard errors (in parentheses) are clustered at the household level. Regressions include controls for year (dummies) as well as age, education (high school or more) and gender of both members of the couple (and their interaction with *Post*). ***: p<0.01, **: p<0.05, *: p<0.1. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor

Table A5: Direct and Cross Effects on Labor Outcomes, by Gender of Better-Paid Spouse

	WFH	WFH ≥50%	Usual weekly hours	WFH	WFH ≥50%	Usual weekly hours
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: better-paid male spouse	**Men** (better paid)			**Women** (less paid)		
Own WFH agreement × Post	0.0475	0.03	-0.1456	0.1118***	0.1027***	1.021**
	(0.0336)	(0.0249)	(0.5222)	(0.0333)	(0.0276)	(0.4896)
Partner WFH agreement × Post	0.1007***	0.0251	1.452***	0.0239	-0.0037	0.1871
	(0.0342)	(0.0250)	(0.5301)	(0.0322)	(0.0263)	(0.4669)
Dependent variable mean	0.348	0.059	41.717	0.244	0.062	37.548
Observations	6,092	6,092	6,092	6,092	6,092	6,092
Panel B: better-paid female spouse	**Men** (less-paid)			**Women** (better-paid)		
Own WFH agreement × Post	0.0737	0.01120***	0.4753	0.0763*	0.0637	0.1275
	(0,0491)	(0,0386)	(0,7799)	(0,0464)	(0,0397)	(0,7990)
Partner WFH agreement × Post	0,0061	0,0165	-0,0299	0,0469	0,0676*	1,292
	(0,0486)	(0,0365)	(0,7774)	(0,0473)	(0,0408)	(0,8277)
Dependent variable mean	0,286	0,051	41,869	0,30875	0,07003	38,168
Observations	2,970	2,970	2,970	2,970	2,970	2,970

Note: This table refers to the remotable sample (same as Panel B of Table (2)). Panel A refers to the subsample of couples where the man earns the highest hourly wage. Panel B refers to the subsample where the woman earns the highest hourly wage. Columns 1 to 3 correspond to men, and columns 4 to 6 to women. In each panel, the first row refers to the regression coefficient for the the interaction of own treatment status and *Post* in model (7) while the second row refers to the coefficient corresponding to the interaction of spouse's treatment status and *Post*. The dependent variable is in turn (1) a dummy variable indicating that the respondent worked at home in the previous 4 weeks, (2) a dummy variable indicating that they worked at home at least 50% of their time, (3) a variable indicating the number of hours usually worked per week Standard errors (in parentheses) are clustered at the household level. Regressions include controls for year (dummies) as well as age, and education (high school or more) of both members of the couple (and their interaction with *Post*). ***: p<0.01, **: p<0.05, *: p<0.1. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor

Table A6: Direct and Cross Effects on Labor Outcomes: a Subsample Analysis, by Relative Pay

	WFH	WFH ≥50%	Usual weekly hours	WFH	WFH ≥50%	Usual weekly hours
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Subsample with at least 4 years of seniority						
	Better-paid spouse			**Less-paid spouse**		
Own WFH agreement × Post	0.0296	0.0243	-0.4837	0.0965***	0.0967***	1.253**
	(0.0304)	(0.0231)	(0.4897)	(0.0315)	(0.0265)	(0.4946)
Partner WFH agreement × Post	0.0902***	0.0355	1.799***	0.0181	0.0050	-0.4291
	(0.0309)	(0.0236)	(0.5008)	(0.0309)	(0.0257)	(0.4747)
Dependent variable mean	0.328	0.061	40.4	0.252	0.059	38.8
Observations	7,382	7,382	7,382	7,382	7,382	7,382
Panel B: Subsample excluding 2020-2021						
	Better-paid spouse			**Less-paid spouse**		
Own WFH agreement × Post	0.0312	0.0348	-0.3126	0.0936***	0.1102***	0.7485
	(0.0367)	(0.0284)	(0.5883)	(0.0363)	(0.0295)	(0.5287)
Partner WFH agreement × Post	0.1303***	0.0204	1.741***	0.0089	-0.0281	0.5744
	(0.0364)	(0.0280)	(0.5805)	(0.0368)	(0.0290)	(0.5205)
Dependent variable mean	0.31572	0.04542	40.515	0.23755	0.04042	38.972
Observations	8,213	8,213	8,213	8,213	8,213	8,213
Panel C: Subsample with at least 4 years of seniority, excluding years 2020-2021						
	Better-paid spouse			**Less-paid spouse**		
Own WFH agreement × Post	-0.0048	0.0088	-0.7963	0.1152***	0.1491***	1.204*
	(0.0406)	(0.0305)	(0.6467)	(0.0417)	(0.0351)	(0.6187)
Partner WFH agreement × Post	0.1594***	0.0278	2.336***	0.0124	-0.0591*	-0.0636
	(0.0404)	(0.0312)	(0.6480)	(0.0423)	(0.0345)	(0.6144)
Dependent variable mean	0.310	0.045	40.4	0.230	0.040	38.8
Observations	6,689	6,689	6,689	6,689	6,689	6,689

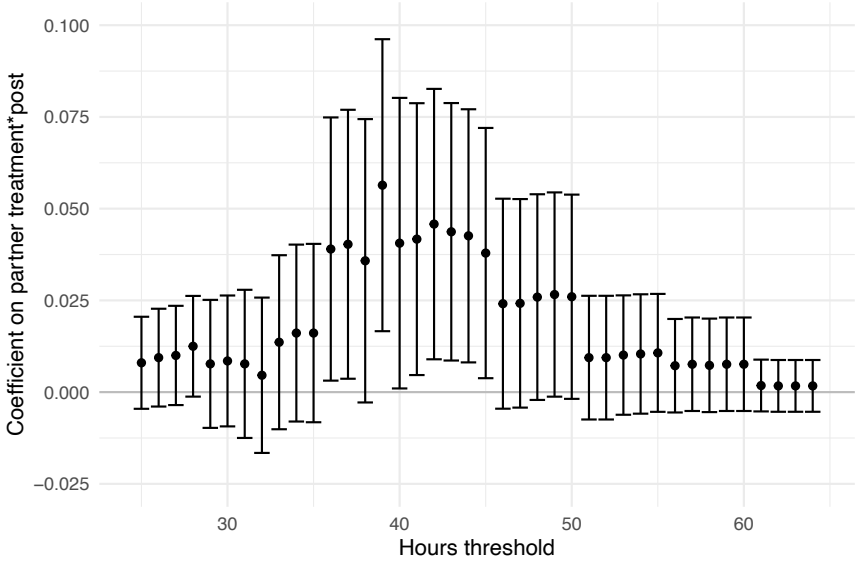
Note: This table refers to the remotable sample (same as Panel B of Table 2). Panel A focuses on individuals with at least four years of seniority in their firm. Panel B excludes observations recorded in 2020 or 2021. Panel C combines both restrictions. Columns 1 to 3 correspond to the better-paid spouse (with the highest hourly wage in the couple), and columns 4 to 6 to the lower paid spouse. Couples earning equal hourly wage are excluded. In each panel, the first row refers to the regression coefficient for the the interaction of own treatment status and *Post* in model 7 while the second row refers to the coefficient corresponding to the interaction of spouse's treatment status and *Post*. The dependent variable is in turn (1) a dummy variable indicating that the respondent worked at home in the previous 4 weeks, (2) a dummy variable indicating that they worked at home at least 50% of their time, (3) a variable indicating the number of hours usually worked per week Standard errors (in parentheses) are clustered at the household level. Regressions include controls for year (dummies) as well as age and education (high school or more) of both members of the couple (and their interaction with *Post*). ***: p<0.01, **: p<0.05, *: p<0.1. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor

Table A7: Direct and Cross Effects on Labor Outcomes, by Relative Pay and Family Type

	WFH	WFH ≥50%	Usual weekly hours	WFH	WFH ≥50%	Usual weekly hours
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Without children	**Better-paid spouse**			**Less-paid spouse**		
Own WFH agreement × Post	0.1327***	0.0337	-1.127	0.1354***	0.0931**	0.5722
	(0.0453)	(0.0353)	(0.7817)	(0.0451)	(0.0368)	(0.7229)
Partner WFH agreement × Post	0.1153**	0.0136	1.198	0.0505	-0.0012	-0.5054
	(0.0460)	(0.0363)	(0.7867)	(0.0440)	(0.0353)	(0.6816)
Dependent variable mean	0.302	0.062	40.3	0.219	0.057	39.3
Observations	3,080	3,080	3,080	3,080	3,080	3,080
Panel B: With children	**Better-paid spouse**			**Less-paid spouse**		
Own WFH agreement × Post	0.0197	0.0516*	0.5016	0.0807**	0.1118***	0.9348*
	(0.0340)	(0.0267)	(0.5185)	(0.0345)	(0.0283)	(0.5061)
Partner WFH agreement × Post	0.0678**	0.0499*	1.557***	-0.0011	0.0063	0.4615
	(0.0344)	(0.0267)	(0.5387)	(0.0337)	(0.0267)	(0.4948)
Dependent variable mean	0.352	0.063	40.7	0.278	0.059	38.8
Observations	5,982	5,982	5,982	5,982	5,982	5,982

Note: This table refers to the remotable sample (same as Panel B of Table 2). Panel A focuses on individuals living in a household without children, and panel B on individuals living in a household with children. In each panel, the first row refers to the regression coefficient for the interaction of own treatment status and *Post* in model (7) while the second row refers to the coefficient corresponding to the interaction of spouse's treatment status and *Post*. The dependent variable is in turn (1) a dummy variable indicating that the respondent worked at home in the previous 4 weeks, (2) a dummy variable indicating that they worked at home at least 50% of their time, (3) a variable indicating the number of hours usually worked per week. Standard errors (in parentheses) are clustered at the household level. Regressions include controls for year (dummies) as well as gender age and education (high school or more) of both members of the couple (and their interaction with *Post*). ***: p<0.01, **: p<0.05, *: p<0.1. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor

Figure A3: Cross-Effect on the Distribution of Hours Worked



Note: This figure refers to the sample where both spouses have a remotable occupation (same as Panel B of Table 2). The x-axis corresponds to a series of hours thresholds h. The dots display the estimated cross-effects for the regression in which the dependent variable is a dummy variable indicating that the number of usual hours worked per week is larger or equal to the threshold h. The bars represent 95% confidence intervals, computed from standard errors clustered a the household level. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor.

Table A8: Treatment Effects on Residential Choices

	Household lives in:		
	Suburbs	Urban center	Rural area or Small town
	(1)	(2)	(3)
Panel A: All			
Only the man is in group T × Post	0.0060	-0.0200	0.0140
	(0.0248)	(0.0210)	(0.0238)
Only the woman is in group T × Post	-0.0184	0.0192	-0.0008
	(0.0253)	(0.0216)	(0.0249)
Both spouses are in group T × Post	-0.0234	0.0213	0.0022
	(0.0280)	(0.0235)	(0.0265)
Dependent variable mean	0.401	0.225	0.375
Observations	61,183	61,183	61,183
Panel B: Remotable sample			
Only the man is in group T × Post	0.0473	-0.0487*	0.0014
	(0.0334)	(0.0274)	(0.0301)
Only the woman is in group T × Post	-0.0018	0.0176	-0.0158
	(0.0345)	(0.0294)	(0.0314)
Both spouses are in group T × Post	-0.0016	0.0077	-0.0061
	(0.0354)	(0.0297)	(0.0324)
Dependent variable mean	0.462	0.235	0.303
Observations	31,575	31,575	31,575

Note: Panel A of this table refers to our main working sample (same as Table 1). Panel B focuses on the subsample where both spouses have a remotable occupation. In each panel, the rows correspond to regression coefficients for the interaction of the *Post* dummy variable with three dummy variables indicating that (1) only the male partner is in the treatment group, (2) only the female partner is in the treatment group, (3) both are in the treatment group. The dependent variable is in turn a dummy variable indicating that the household lives (1) in the suburbs, (2) in a city center, (3) in a rural area or a small isolated town. Standard errors (in parentheses) are clustered at the household level. The control variables include the four variables indicating whether both spouses belong to the control group, whether they belong to the treatment group, whether only the man belongs to the treatment group, or whether only the woman belongs to the treatment group. The controls also include year fixed effects as well as variables describing the gender, age, and education of both spouses (and the interaction of these demographic variables with *Post*). ***: p<0.01, **: p<0.05, *: p<0.1. Source: LFS, 2013-2023, INSEE, and D@ccord database, Ministry of Labor

A.2 Model details

With the notations of the main text, solving the couple's program reduces to maximizing over the six variables π, h, c, π_s, h_s and c_s the following objective function V:

$$\begin{aligned} V =& \mu U(T_0 - h - (1-\pi)m_0 - d_0 f(\pi, \pi_s), c) + \\ & (1-\mu) U_s(T_0 - h_s - (1-\pi_s)m_{0s} - d_0(1 - f(\pi, \pi_s)), c_s) \end{aligned} \tag{8}$$

$$\begin{aligned} \text{subject to} \quad & c + c_s = w_0 h + w_{0s} h_s \\ & \pi \leq D \\ & \pi_s \leq D_s. \end{aligned}$$

From the first order conditions for the variables c, c_s, h and h_s we get, for each of the two spouses, the usual equality between the real wage and the marginal rate of substitution of consumption for leisure, that is:

$$\frac{U_1'}{U_2'} = w_0 \quad \text{and} \quad \frac{U_{s1}'}{U_{s2}'} = w_{0s}. \tag{9}$$

These same first-order conditions also lead to similar equalities between the marginal rate of substitution of the individual's leisure to that of their spouse and their relative wage; as well as between the marginal rate of substitution of the individual's consumption to that of their spouse and the relative price of these consumptions (here assumed to be unity), that is,

$$\frac{\mu U_1'}{(1-\mu)U_{s1}'} = \frac{w_0}{w_{0s}} \quad \text{and} \quad \frac{\mu U_2'}{(1-\mu)U_{s2}'} = 1. \tag{10}$$

Regarding now the decisions relative to π_s, we verify:

$$\frac{\partial V}{\partial \pi_s} = ((1 - \frac{w_0}{w_{0s}}) d_0 f_2' + m_{0s})(1-\mu) U_{1s}'. \tag{11}$$

Since U_{1s}' is positive, f_2' negative and $w_0/w_0 s \geq 1$, this derivative is always positive. The lower-paid spouse of the two (with our conventions, assumed to be spouse s) always has an interest in setting π_s to its maximum value, that is $\pi_s^* = D_s$

Regarding finally the decisions relative to π, we find:

$$\frac{\partial V}{\partial \pi} = ((1 - \frac{w_0}{w_{0s}}) f_1'(\pi, D_s) d_0 + m_{0s} \frac{w_0}{w_{0s}})(1-\mu) U_{s1}'. \tag{12}$$

In our set-up, the individual's choices regarding remote work will therefore depend crucially on the domain of variation of the function $f_1'(\pi, D_s)$. In what follows, we will

organize the discussion according to whether this domain of variation is or is not sufficiently large for the optimal choice of π to be interior to the segment $(0, D)$ rather than constrained to be on the boundary of the segment.

Constrained case:

We begin with the case where $f_1'(\pi, D_s)$ remains small for all values of $\pi \in (0, D)$ (i.e., never exceeds the threshold $\frac{\frac{w_0}{w_{0s}} m_0}{(\frac{w_0}{w_{0s}} - 1) d_0)}$. In this case the partial derivative of V with respect to π remains positive and the better-paid spouse of the two always has an interest in working from home to the maximum of their possibilities, that is

$$\pi^* = D.$$

This situation corresponds to the case where the sharing of tasks between the two spouses varies little depending on which of the two works (or not) at home. In this case, the couple's program can be rewritten,

$$V = \mu U(\ell, c) + (1 - \mu) U_s(\ell_s, c_s) \tag{13}$$

$$\text{subject to} \quad c + c_s + w_0 \ell + w_{0s} \ell_s + w_0 T_1 + w_{0s} T_{1s} = (w_0 + w_{0s}) T_0, \tag{14}$$

where T_1 and T_{1s} represent the cumulative time spent on domestic tasks and commuting by each of the spouses. These quantities are fixed and depend only on D and D_s. More precisely, they are written,

$$T_1 = d + m = (1 - D) m_0 + f(D, D_s) d_0 \tag{15}$$

$$\text{and} \quad T_{1s} = d_s + m_s = (1 - D_s) m_{0s} + (1 - f(D, D_s)) d_0. \tag{16}$$

With these notations, an exogenous increase in D_s affects the couple's decisions only insofar as it affects the quantity $(w_0 T_1 + w_{0s} T_{1s})$, which can be interpreted as the income lost by the couple in commuting time or unpaid domestic activities.

Since $w_0 T_1 + w_{0s} T_{1s} = w_{0s}(T_1 + T_{1s}) + (w_0 - w_{0s}) T_1$, and both T_1 and $(T_1 + T_{1s})$ are decreasing with D_s, we deduce that $(w_0 T_1 + w_{0s} T_{1s})$ is also decreasing with D_s. An exogenous increase in D_s thus resembles an exogenous increase in income. Insofar as leisure and consumption are normal goods, we can therefore expect this increase to result in an increase in leisure, consumption and paid work income. The increase in D_s has no cross-effect on the WFH of the better-paid spouse, but (by freeing up time for them otherwise

devoted to domestic work) it allows them to work more.

Unconstraind case:

If $f_1'(\pi, D_s)$ is increasing and can exceed the threshold $\frac{\frac{w_0}{w_{0s}} m_0}{(\frac{w_0}{w_{0s}} - 1) d_0)}$ then the better-paid spouse of the two no longer necessarily has an interest in working from home to the maximum of their possibilities. Their optimal behavior π^* is implicitly defined by the following equation,

$$f_1'(\pi^*, D_s) = \frac{\frac{w_0}{w_{0s}} m_0}{(\frac{w_0}{w_{0s}} - 1) d_0} \tag{17}$$

In this case, an exogenous increase in D_s has a cross-effect on the remote work decisions of the better-paid spouse. The sign and amplitude of this cross-effect depend on the form of the function f. By deriving the previous equation with respect to D_s we show,

$$\frac{\partial \pi *}{\partial D_s} = -\frac{f_{12}''}{f_{11}''} \tag{18}$$

Assuming that an increase in remote work is accompanied by an increase in domestic work that is all the weaker as the spouse already works at home, we can speculate that $f_{12}'' < 0$ and $f_{11}'' > 0$, with the consequence of a positive cross effect of an increase in D_s on the remote work rate of the better paid partner. This situation corresponds for example to the case where $f(x, y) = g(x - y)$ with g increasing and convex. In this latter case, the cross-effect is even very important, since we find that $\frac{\partial \pi *}{\partial D_s} = 1$.

Regarding now the cross effect of an increase in D_s on work time, it depends (as in the constrained case) on the effect that this increase has on the income lost by the couple in commuting time or unpaid domestic activities, that is (with the previous notations) on the quantity $(w_0 T_1 + w_{0s} T_{1s})$. Now this effect is unambiguously negative. We verify in fact on one hand that

$$\frac{\partial T_1}{D_s} = f_2' d_0 + \frac{\partial \pi}{\partial D_s} \frac{m_0}{\frac{w_0}{w_{0s}} - 1} \tag{19}$$

and on the other hand that

$$\frac{\partial (T_1 + T_{1s})}{\partial D_s} = -m_{0s} - m_0 \frac{\partial \pi}{\partial D_s} \tag{20}$$

which allows us to conclude that

$$\frac{\partial (w_0 T_1 + w_{0s} T_{1s})}{\partial D_s} = -w_{0s} m_{0s} + (w_0 - w_{0s}) d_0 f_2' < 0 \tag{21}$$

Again, an exogenous increase in D_s resembles a positive income shock. Under the maintained hypothesis that consumption and leisure are normal goods, we can expect a joint increase in leisure time, consumption and income from work, with therefore a priori once again a positive cross-effect on paid work time.