HAL open science

Working time arrangements, innovation and job satisfaction: a workplace level analysis for France

Christine Erhel, Mathilde Guergoat-Larivière, Malo Mofakhami

▶ To cite this version:

Christine Erhel, Mathilde Guergoat-Larivière, Malo Mofakhami. Working time arrangements, innovation and job satisfaction: a workplace level analysis for France. 2021. halshs-03180531v2

HAL Id: halshs-03180531

https://shs.hal.science/halshs-03180531v2

Preprint submitted on 16 Sep 2021 (v2), last revised 8 Jun 2023 (v4)

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Distributed under a Creative Commons Attribution - NonCommercial - NoDerivatives 4.0 International License

le cnam
ceet

Mars 2021

Working time arrangements, innovation and job satisfaction: a workplace level analysis for France

Christine Erhel
Mathilde Guergoat-Larivière
Malo Mofakhami

204

Document de travail

Centre d'études de l'emploi et du travail

« Le Descartes »
29, promenade Michel Simon
93166 Noisy-le-Grand CEDEX/
Téléphone : (33) 01 45 92 68 00

ceet.cnam.fr

Working time arrangements, innovation and job satisfaction: a workplace level analysis for France

CHRISTINE ERHEL
christine.erhel@lecnam.net
Centre d'Etudes de l'Emploi et du Travail (CEET – CNAM), LIRSA

MATHILDE GUERGOAT-LARIVIERE
mathilde.guergoat-lariviere@lecnam.net
Centre d'Etudes de l'Emploi et du Travail (CEET – CNAM), LIRSA

MALO MOFAKHAMI
malo.mofakhami@lecnam.net
Centre d'Etudes de l'Emploi et du Travail (CEET – CNAM)

DOCUMENT DE TRAVAIL

N° 204

Mars 2021

ISSN 1629-7997
ISBN 978-2-11-151925-1

Directrice de publication : **Christine Erhel**
Secrétaire de redaction : **Bilel Osmane**

ORGANISATION DU TEMPS DE TRAVAIL, INNOVATION ET SATISFACTION : UNE ANALYSE SUR LES ENTREPRISES FRANÇAISES

Christine Erhel, Mathilde Guergoat-Larivière et Malo Mofakhami

RÉSUMÉ

Au cours des vingt dernières années, la tendance à la baisse de la durée du travail s'est ralentie dans les pays développés, tandis qu'on assiste à une flexibilisation croissante des formes d'organisation du temps de travail, s'éloignant de la norme du travail à horaires réguliers et contrôlés sur site : modulation et annualisation de la durée du travail, horaires variables, travail « nomade » et télétravail, etc. Ces nouvelles formes de flexibilité des horaires viennent s'ajouter aux formes plus traditionnelles, temps partiel et heures complémentaires, horaires atypiques (nuit, soir, week-end…).

Face à ces tendances se pose la question des liens avec l'innovation technologique et organisationnelle. En effet, l'innovation constitue un facteur facilitant ces nouvelles formes d'organisation du temps, avec le développement des technologies numériques autorisant le travail à distance, mais aussi de logiciels de gestion RH facilitant la gestion de plannings flexibles. Par ailleurs, les conséquences pour le bien-être des travailleurs de ces nouvelles formes d'organisation du temps de travail doivent également être évaluées. Si la flexibilité de temps et de lieu dans le travail peut permettre une meilleure conciliation avec d'autres activités familiales et privées, elle peut également devenir une contrainte si elle s'accompagne d'horaires imprévisibles, de plus longues heures de travail et de conditions de travail dégradées. Cette question, devenue cruciale dans le contexte de la crise du COVID et du développement du télétravail à grande échelle, constitue un enjeu très important pour l'avenir du travail et de son organisation.

La littérature existante, française et internationale, confirme tout d'abord la diversité des formes de flexibilité existantes à l'échelon international, avec des particularités propres à certains pays. Ainsi, les contrats « zéro heure » au Royaume-Uni constituent une forme extrême de flexibilité du volume horaire sans aucune garantie pour le salarié. Au contraire, en Allemagne, on voit apparaître des modes de gestion du temps de travail fondées sur la confiance et laissant un fort degré de maîtrise aux salariés. Les travaux existants confirment également les liens entre nouvelles formes d'organisation du temps de travail et innovation : les technologies numériques les facilitent, mais dans l'autre sens, ces formes innovantes de gestion du temps semblent également favoriser l'innovation dans les entreprises. Sur la question du bien-être des salariés, des analyses de la satisfaction au travail montrent l'importance du contrôle sur les horaires, au-delà de leur nature et de leur régularité, et ce tout particulièrement pour les femmes. Enfin, les travaux montrent également l'importance du contexte national, la flexibilité étant en général mieux perçue dans des environnements institutionnels protecteurs (comme les pays du Nord de l'Europe).

Concernant le télétravail, certains travaux montrent ses effets favorables en termes de productivité et de satisfaction au travail des salariés, ainsi que sa place spécifique, fortement valorisée, dans les préférences des salariés (et notamment des femmes). Toutefois, des effets négatifs apparaissent également, notamment en termes d'intensification du travail et/ou d'augmentation des volumes horaires. En France, des travaux récents (sur des données de 2017) montrent une absence de différentiel de satisfaction entre les cadres qui télétravaillent et ceux qui ne font pas. Le télétravail s'accompagne certes d'une autonomie accrue, mais également d'une plus forte intensité du travail et d'une moindre collaboration avec les collègues.

Dans ce document de travail, nous revenons sur ces deux questions du lien entre innovation et formes flexibles d'organisation du temps de travail, et de leurs conséquences pour les salariés, en utilisant des données françaises récentes (2017). Ces données sont issues d'une enquête couplée donnant à la fois des informations sur les salariés et sur les établissements dans lesquels ils travaillent (enquête REPONSE). Pour 21320 salariés dans 4271 établissements, nous disposons de trois types d'informations portant : sur l'organisation du temps de travail (durée, temps plein/temps partiel, horaires stables ou variables/alternants, télétravail), sur le contexte économique de l'entreprise et sur la place de l'innovation dans sa stratégie, et sur le contexte social (information des salariés, négociation collective). On notera que la question du télétravail est abordée pour la première fois dans cette enquête REPONSE.

Les principaux résultats des analyses empiriques sur la base de régressions logistiques sont les suivants. Ces régressions sont conduites pour l'ensemble des salariés, mais également par genre et par niveau de qualification pour capter l'hétérogénéité des salariés

Premièrement, on confirme un lien positif entre une stratégie d'innovation et le télétravail, tandis que l'innovation tend au contraire à réduire le temps partiel (en particulier pour les salariés les moins qualifiés), et apparaît sans effet sur les horaires variables ou alternants.

Deuxièmement, les effets des formes flexibles d'organisation du temps de travail sur la satisfaction sont complexes. Le temps partiel ne semble pas influencer la satisfaction, tandis que les horaires variables la dégradent. En revanche, le télétravail a un effet positif. Toutefois, cet effet positif disparaît lorsque l'on introduit une variable qui permet de capter la qualité de la conciliation entre vie professionnelle et vie privée. Ceci suggère que l'effet positif du télétravail sur la satisfaction tient entièrement au fait qu'il facilite cette conciliation par une meilleure capacité de contrôle du salarié sur l'organisation de son temps. Lorsque l'on décompose selon les caractéristiques socio-économiques des salariés, on trouve un effet propre du télétravail (hors conciliation) positif pour les femmes et pour les moins qualifiés, qui n'apparaît pas pour les hommes. Pour les femmes et les moins qualifiés, on peut donc faire l'hypothèse qu'ils « gagnent » plus au télétravail, non pas en termes de conciliation avec la vie familiale, mais en termes d'autonomie et/ou de contenu du travail.

Troisièmement, les pratiques des entreprises en matière de négociation semblent avoir des effets ambivalents, ce qui renvoie à la nature du dialogue social en entreprise, facteur de flexibilité tout autant que de protection des salariés dans un contexte de décentralisation du droit du travail. L'information sur le temps de travail a en revanche un effet clairement positif sur la satisfaction des salariés.

Mots-clefs : temps de travail, innovation, organisation du travail, satisfaction au travail, télétravail

Working time arrangements, innovation and job satisfaction: a workplace level analysis for France

Abstract

This working paper analyses the links between innovation and some flexible working time arrangements (part-time, non-stable hours, teleworking), as well as their consequences on workers' satisfaction. A French matched employee-employer survey for 2017 (REPONSE), shows that an innovative workplace context increases the probability of working remotely, whereas it decreases the probability of working part-time (especially for the low-skilled) and has no significant effect on the stability of working hours. The paper also finds a positive link between teleworking and workers' satisfaction, unlike non-stable hours for which the relationship appears negative. However, that link disappears when considering work-family balance, except for women and the low-skilled.

Key words: working time arrangements, innovation, work organisation, job satisfaction, teleworking

NB : This working paper is part of work led in the Beyond4.0 project (https://beyond4-0.eu/the-project). This project aims to help deliver an inclusive European future by examining the impact of the new technologies on the future of jobs, business models and welfare. BEYOND 4.0 addresses the general priorities of the H2020 Work Programme (2018-2020) "Europe in a changing world - Inclusive, innovative and reflective societies" and it has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 822296.

INTRODUCTION

Over the last 25 years, working time has been decreasing on average in developed countries, but it has also become more flexible (Messenger, 2018). This global trend towards working time flexibility developed in the 1990s and 2000s and was reinforced during the 2008 recession as a way of mitigating the employment effects of the crisis. At that time, Germany, in particular, was considered a model of using internal flexibility to avoid lay-offs and retain skills, using short-time work as well as modulation of working time over the year to adjust to the level of economic activity. During the ongoing COVID crisis, there has been widespread use of short-time work in European countries to limit the social and economic consequences of the recession.

However, the importance of working time flexibility goes beyond cyclical use and quantitative flexibility. It is also a major component of work organization, contributing to the efficiency of the production process. Traditional forms of flexible working time include atypical hours (working at night, in the evenings or weekends), shift work, part-time, etc.; more recent forms include flexible schedules as well as teleworking and mobile working. Such flexible arrangements are directly or indirectly related to innovation and digital technologies: mobile working and teleworking clearly require digital technologies, but human resource management software also facilitates time management.

Working time flexibility is also supposed to increase workers' well-being by giving them more control over their working hours and better opportunities to balance their work and family life. However, given the variety of flexible forms of working time, which also includes part-time, non-social hours, evening and night work, as well as fragmented hours during the day, such a positive view may not be true for all workers and all forms of flexibility. Even in the case of teleworking, there is evidence that it does not necessarily improve job satisfaction because of higher work intensity and lack of social support (Hallépée, Mauroux, 2019). The context of the COVID crisis, which has led to a massive rise in non-voluntary teleworking, also reveals the limits of this form of work organization. Therefore, it is crucial to understand more about the relationships between flexible forms of working time and workers' satisfaction, which is usually considered as a measure of well-being in the literature (Clark, 1997).

In the French context, working time regulation has evolved towards more flexibility, despite the existence of a legal weekly working time. Indeed, working time reduction in 1998 (35 hours) has introduced and even promoted many forms of working time flexibility at firm level (Askenazy, 2013): working time modulation, annual calculation of working time, working time accounts to transfer holidays from one year to another. Reforms of working time regulation in the 2000s have also facilitated the use of overtime hours and even provided some incentives for overtime (through social security contributions and tax cuts from 2007 to 2012, and since 2019).

More recently, French labour law reforms (2016 and 2017) have developed firm-level flexibility (Erhel, 2020), including increased capacity to define working-time rules through firm-level agreements and to adjust working time if the firm is experiencing temporary difficulties. Some working-time regulation components are also defined at industry level, concerning part-time work (minimum duration, compensation for additional hours, etc.) and atypical hours (night work). These recent laws also include specific rules for teleworking: the possibility to ask the employer to work from home, the "right to disconnect" from work, teleworking agreements, etc. These rules have been adapted to face the COVID crisis through some of the Government's emergency decisions (for instance, the obligation to work 100% of

the time from home for all jobs for which it is possible during lockdowns) and through social dialogue (a national agreement on teleworking was signed at the end of 2020).

The trend towards more working time (WT) flexibility raises specific questions on which the literature is relatively limited. Beyond part-time work, which is relatively well-identified, which forms of working time flexibility (including variable hours, teleworking, etc.) are typical of French companies and workers? Are these flexible forms related to the innovative context? What are the consequences of these flexible working time forms on job satisfaction? Are specific companies' practices and context important to the relationship between flexible WT arrangements and job satisfaction (informing employees about WT, collective agreements, etc.)?

In this paper, we use a matched employer-employee dataset (REPONSE survey) that contains information about individual working time as well as job satisfaction, and information about the context of the workplace in terms of innovation and working-time management. The last available wave of the survey (2017) also includes new questions about teleworking, a dimension of working time flexibility that has developed during the Covid pandemic and is likely to be particularly important in the future.

In the second section, we identify some drivers of working time flexibility and the consequences for workers, based on the literature. The third section presents the dataset and methods, as well as some descriptive statistics. The fourth section presents the main results relating to three flexible working-time practices (part-time, alternate or variable hours, teleworking) and their consequences for workers' job satisfaction.

DEVELOPMENT OF WORKING TIME FLEXIBILITY: WHAT ARE THE DRIVERS AND THE CONSEQUENCES FOR WORKERS?

A trend towards flexible working time arrangements…

Analyses of working-time trends from an international perspective show a global trend towards reducing working hours (both legal and actual), but also towards the development of flexible working time arrangements (Lee *et al.*, 2007, Messenger, 2018). Working hour flexibility appears to be a method of internal flexibility, which also includes wage flexibility and functional flexibility. In a relatively narrow approach, working time involves variations of one of the following elements: number of hours worked daily, number of hours worked each week, specific hours and timing of work during a working day, specific hours of the day during which work is performed (Messenger, 2018). However, other flexible working forms involve some particular dimensions of working time (CIPD, 2019). In addition to fairly traditional forms (such as part-time work, atypical hours or shift work), such practices include flexitime (giving workers control over when they begin and end work, within certain limits), compressed hours (fewer and longer blocks during the week), annual hours, teleworking, career breaks or sabbaticals (generally unpaid). Within these general trends, some national specificities emerge. In the UK, flexibility may even involve employment contracts with no fixed hours (paid on commission, involving an output target, or zero-hour contracts, CIPD, 2019). In Germany, there has been a significant development in so-called "trust-based working hours" ("Vertsrauensarbeitszeit"): within the working time organization, employers control their employees' output rather than their working time (Godart *et al.*, 2017).

… related to innovation, in both directions

These trends are related to technological innovation and, more specifically, to ICT. Indeed, ICT can be considered a technology for time and space management, which challenges the basic, traditional concepts of working time and work location. It directly supports the development of flexible work forms (Mas and Pallais, 2020), based on an extension of services accessibility that tends to lengthen the working day, on tuned management of task flows, or on extension and diversification of teleworking. In the French context, Askenazy (2003) shows that the use of ICT increased the early adoption of working time reduction (35 hours), as early adoption allows firms to introduce organizational changes that go beyond a reduction in weekly working time (modulation, just-in-time, functional flexibility).

In the context of a more general debate on the links between flexibility and innovation, the relationship between working time flexibility and innovation is also analysed in the other direction. Based on a panel of Italian manufacturing firms, Gianetti and Madia (2013) show that internal flexibility (including the use of part-time work on a daily, weekly, monthly, or annual basis) has a positive impact on companies' ability to innovate, for both high-tech and low-tech businesses. On the contrary, some variables of external flexibility (such as labour turnover) show a negative impact. In the same vein, Godart *et al.* (2017) show, based on a panel of German firms, that companies adopting trust-based working hours (which is a form of flexible working time) are more likely to improve their products and to undertake process innovation. They also show that the effect is driven by the degree of employee control over their working hours, rather than by quantitative working-time flexibility through working-time accounts.

Therefore innovation and working time flexibility seem to be related in both directions, with technological innovation (especially ICT) favouring the development of flexible working time arrangements and new forms of work organization, while these new working time arrangements also lead to innovation.

Workers' satisfaction: the importance of time sovereignty and the role of the context (family, country, etc.)

For workers, the consequences of increasing flexible working time practices are ambiguous. On the one hand, they may provide more control over working hours and work intensity, and more autonomy, as well as improving the balance between work and family/personal life. On the other hand, flexible work forms (including teleworking) are blurring the boundaries between working time and other social times, between professional and family/personal spheres, which may generate stress and dissatisfaction.

Using a German survey (BIBB) of German fully employed workers, Wanger (2017) studies the effects of working time arrangements on working time and job satisfaction. She shows that reduced hours per week positively affect working time satisfaction, which is consistent with other results for part-time work, showing that part-timers are more satisfied (Booth and Van Ours, 2008, 2009).

Self-determined working hours with control over the timing of working hours also contribute positively to working time satisfaction. On the contrary, unpaid overtime, atypical working time arrangements, shift work, and less autonomy over the timing of working hours are factors of dissatisfaction with working hours.

Looking at overall job satisfaction confirms the general idea that time-sovereignty and self-directed work planning are key factors in satisfaction and constitute essential factors in balancing work with other areas of life.

However, the effects are not necessarily homogeneous across gender and countries. Using the European Working Conditions Survey, Lott (2015) shows that working-time flexibility and autonomy increase time adequacy for women but favour overtime and work intensification for men. Time adequacy is measured through a question of work-family balance: "in general, do your working hours fit in with your family and social commitments outside work?" National working-time regimes and institutions also shape time arrangements and their consequences. In the Netherlands (and to a lesser extent in Sweden), flexible hours are generally more favourable for employees' work-family balance for both men and women, whereas in the UK, fixed working hours have a positive impact. This result may, of course, be related to the more protective working time regime in the Netherlands or in Sweden, in comparison to the UK.

In the case of part-time work, results also differ across countries. Some results contradict the positive relationship with satisfaction, especially in the case of developing countries. In a study for Chile (Montero and Rau, 2015), the authors show that part-time work has a negative impact on men's job and life satisfaction. The impact is generally not significant for women, which does not confirm that part-time work is a solution for increasing women's labour market participation and life satisfaction, as often presented in European countries. In some regressions, it even reduces their life satisfaction. In the UK, despite the fact that part-time workers report lower levels of excessive workload and pressure, it does not mean improved perceptions of parents' relationships with their children (CIPD, 2019), so the positive link with work-family balance is not straightforward.

In the French case, using the INED "Familles et Employeurs" survey, Georges *et al.* (2010) show that working hours and working time organization of both spouses have a strong incidence on men's and women's work-life balance satisfaction, much more than socio-demographic variables. Extensive, atypical or irregular hours have a negative effect on men's and women's satisfaction, whereas part-time work has a positive effect for women only. According to REPONSE data, there is also evidence of a positive link between work-family balance and job satisfaction (Le Flanchec *et al.*, 2011).

The ambiguous effects of teleworking on work-family balance and job satisfaction

Among flexible working arrangements, teleworking and mobile working have significantly developed over the last decade and are increasingly considered to be the work arrangements for the future.

In the international literature, they are related to the latest developments in ICT and characterised by Eurofound and by the ILO as "telework and ICT-based mobile work (TICTM)", offering workers a high degree of flexibility in where they work and when they work (Eurofound, 2020; Eurofound and ILO, 2017). TICTM arrangements have advantages for workers: they generally increase autonomy, reduce commuting time, and favour work-life balance. However, they are also associated with long working hours and higher work intensity, and with overlapping of work and family life. These effects depend on the working environment and on the way TICTM is implemented, as well as on the family situation.

In this context, there is growing literature on the impact of teleworking on workers' well-being and satisfaction.

A Chinese experiment in a travel agency (based on a random assignment between working from home and working in the office among employees who volunteered for working from home) shows that working from home increases both performance and work satisfaction (Bloom *et al.*, 2013). However, other studies show more mitigated effects. For instance, Dockery and Bawa (2014), looking at Australian data, find that the ability to work some hours from home generally increases job satisfaction but is also associated with long hours of work, which have a negative effect on satisfaction. This leads the authors to distinguish between "home workers", who have explicit or implicit arrangements for working from home (at least half of their time), who clearly benefit from this arrangement, and workers who work long hours and use working from home as a way to cope with their long hours. In the Netherlands, teleworking combined with flexi-time is seen as a way to increase the supply of working hours in a country where part-time work is widespread and where some tensions in the labour market appear. However, according to Possenriede *et al.* (2016), there is only a small effect of working from home on hours worked (which seems to be related to unpaid overtime) and no other significant effect of temporal and locational flexibility of work on labour supply. However, another study (Possenriede and Plantega, 2014) reports positive effects of flexible hours and teleworking on job satisfaction. Arntz *et al.* (2019) use the German Socio-Economic Panel between 1997 and 2014 to investigate the impact of working from home on hours worked, wages and life satisfaction. The results show heterogeneous effects, depending on gender and family situation. Childless employees increase their working time (one hour of unpaid overtime on average) and report higher life satisfaction, but this positive effect is not observed for parents. Fathers experience an increase in their wages when they start working from home, but this is not the case for mothers, except if they change employer.

From the perspective of workers' preferences, Mas and Pallais (2017) have estimated the value given by workers to different working arrangements through an experiment (recruiting staff for a call centre in the US), including a choice between standard fixed working hours and randomly assigned flexible scheduling, working from home, and employer-controlled working time. The main result is that the great majority of workers do not value scheduling flexibility and have a strong aversion to jobs that give employers discretion as to their working time. However, their most valued option within flexible arrangements is working from home. In terms of gender, women place higher value on working from home and avoid irregular work schedules.

In France, teleworking remained limited until the COVID crisis and concerned only 3% of workers in 2017 if regular teleworking is considered, 7% if also considering occasional teleworking. This figure is slightly above the European average (5%), but below the Netherlands or Finland. A majority of regular teleworkers were managers, especially engineers and IT technicians (Batut and Tabet, 2020). A recent study based on two different worker level surveys (working conditions and health survey as well as industrial relations survey, Hallépée, Mauroux, 2019) shows that managers who are regularly teleworking (one day or more) do not generally benefit from better working conditions in comparison to other managers. Although they enjoy more autonomy, their work intensity is high, and they have less cooperation with other colleagues and declare themselves less satisfied with the working environment ("ambiance de travail"). They work in companies where the economic environment is often less stable and feel more insecure in their jobs. Finally, these managers are more likely to declare poor health, although it is impossible to know if this health condition explains why they are teleworking or if it is the result of teleworking. This study also focuses on job satisfaction: other things being equal, there is no significant difference between teleworkers

and non-teleworkers in terms of job satisfaction. The most frequent teleworkers and those who work under a collective teleworking agreement even seem to be less satisfied.

Based on that literature and on the specificity of the French case, we want to test the following hypotheses:

1. Innovative companies tend to promote flexible working time arrangements
2. Companies' working time practices (part-time, non-stable working hours, teleworking) impact workers' job satisfaction but this impact changes when taking into account control over working hours and work-life balance opportunities
3. Firm-level practices (information, collective bargaining) are important in terms of job satisfaction
4. Relationships between innovation, flexible working time arrangements and satisfaction may vary across social groups, especially by gender or skill level

AN ANALYSIS BASED ON A MATCHED EMPLOYEE-EMPLOYER SURVEY FOR FRENCH WORKPLACES IN 2017

Data

The empirical strategy is based on the REPONSE survey. This French survey aims at understanding the dynamics of industrial relations between firm management, employee representative bodies (IRPs), and employees. The survey has been carried out every six years on different samples since 1993, providing cross-sectional datasets. The empirical analysis uses the last edition of the survey, collected in 2017, which contains new topics such as teleworking. The survey is a matched employee-employer survey, with variables stemming from three questionnaires for employees, employers, and employee representatives. The 2017 edition of the survey is addressed to workplaces employing at least 11 employees in all sectors except agriculture and public administration. In this article, we use the employees' and employers' questionnaires. Thus, the dataset contains 21,320 employees from 4,271 companies, corresponding to five employees per workplace on average (the minimum is one and the maximum is ten).

The employee survey gives, in particular, information about the type of contract, working time arrangement, health and satisfaction. Working time arrangement is measured at employee level through three dummy variables: part-time status (vs. full-time), use of teleworking (yes, whatever the intensity, vs. no), and stability of working hours (alternate or variable hours vs. same working hours every week). Employees also answer a question about the quality of information about working time at workplace level in 2016.

Workers' satisfaction is measured by an index (from 0 to 1)[1] based on six questions. One refers to general job satisfaction and the others to specific aspects of jobs: satisfaction with working time, working conditions, pay, training, and social environment. In line with our hypothesis that working time latitude and autonomy could improve satisfaction with working time arrangements, a variable referring to work-life balance is also used, as well as a variable about information on working time. Details about all these variables and related questions from the

[1] This index is equal to the mean of each satisfaction variable for which the answer scale from 1 to 4 was previously translated from 0 to 1.

survey can be found in table A1 in the appendix. The dataset also provides socio-demographic variables such as gender, age, and occupation.

At workplace level, the dataset provides information about collective bargaining (at least one collective bargaining agreement during the last three years within the workplace), and about the working time regime (35 hours or not). The technological and digital environment at the workplace can be measured by a question about the firm's primary strategy, with innovation as one of the seven answers proposed. The variables referring to technology use are relatively limited in this survey; only some technology usage aspects are reported concerning robots or specific software (Computer Aided Design and Desktop Publishing mainly). These questions do not show the extent of use among workers, and they do not reflect the broader view of digital and innovative usage. In that respect, the question about companies' primary strategy seems the best measurement of the general innovative and digital working environment; it can therefore be used as a proxy for the innovative workplace[2]. Besides, several additional variables are mobilised to control the companies' characteristics: size of workplace, sector, status (profit versus non-profit and type of ownership), and business activity situation (growing, stable, or declining).

Our employee-level final dataset represents French employees working in 2017 within more than ten workplaces in private sectors (except agriculture)[3]. Furthermore, 36.1% of these employees work in small and medium workplaces (less than 50 employees), while 47.6% are in intermediate workplaces (between 50 and 499 employees), and the rest (16.3%) work in large workplaces (more than 500 employees) (table 1). Concerning economic sectors, 20.7% are employed in manufacturing, 6.9% in construction, while the rest work in services (in the broadest sense). The three largest sectors are wholesale and retail (16.8% of employees surveyed), professional, scientific, and technical activities (14.4%) and health, education, and social activities (13.9%).

Concerning employee characteristics, 47.0% are women, 30.5% are between 15 and 34 years old, 56.9% are between 35 and 54 years old, while 12.6% are older than 54. In terms of occupation, 19.7% are professionals or managers, 21.4% are technicians and associate professionals, 27.6% are clerical or sales workers, and finally, 31.3% are manual workers (blue collar workers).

Concerning working time practices, the average working hours of the employees in the survey amount to 36.7 hours, and 14.7% of them are on part-time contracts. In addition, 9.1% of employees declare that they carry out at least part of their work by teleworking (this rate is 20.1% for professionals and managers and 6.4% for other occupations). Finally, 42.8% report non-stable working hours.

Overall, 35.8% of the employees are in establishments that have concluded collective bargaining agreements in the last three years, while around 10.5% of the employees work in an innovative environment (workplaces where the declared primary strategy is innovation). Most of the innovative workplaces are the largest ones and are in the manufacturing or professional, scientific and technical sectors. Therefore, the employees working in these companies are more likely to be professionals or managers and, to a lesser extent, manual

[2] The use of robots and CAD or DTP is strongly related (84% of the workplaces where robots are used also use CAD or DTP and around 50% of the CAD or DTP are coupled with robot use). Robots and CAD or DTP are also preferably used in workplaces that declared a primary innovation strategy (40% compared to 20% for robot use and 59% compared to 36% for CAD or DTP).

[3] All the statistics given are weighted with the sample weight variable dedicated to the employee-level analysis, with the aim of truthfully representing the targeted population.

workers. Employees who work in innovative workplaces are less likely to work part-time, since 7.7% of these workers are part-time compared to 15.5% in the other workplaces (table 2). Similarly, innovative workplaces make greater use of teleworking, as 15.4% of their employees are teleworkers compared to 8.4% for the other workplaces. The difference is less pronounced (non-significant) concerning non-stable working hours (41.0% compared to 43.0%).

Table 1. Some characteristics of the sample

Size of the workplace	In %
Less than 50 employees	36.1
Between 50 and 499 employees	47.6
More than 499 employees	16.3
Sectors	
Manufacturing	23.1
Construction	6.9
Transport	8.4
Retail and Wholesale	16.8
Other Services	44.9
Gender	
Female	41.8
Male	58.2
Age	
Between 15 and 34 years old	30.5
Between 35 and 54 years old	56.9
Older than 54	12.6
Occupation	
Professionals and managers	19.7
Technicians and associate professionals	21.4
Clerical or sales workers	27.6
Manual workers	31.3
Working time arrangements	
Part-time	14.71
Non-stable working hours	42.8
Teleworking	9.12
N	21320

Source: REPONSE database, 21,320 employees in 4,271 workplaces.

Table 2. Innovation and working time arrangements

In %	Innovative workplaces	Other workplaces	Overall
Part-time	7.7	15.5	14.7
Non-stable working hours	41.0	43.0	42.8
Teleworking	15.4	8.4	9.1

Source: REPONSE database, 21,320 employees in 4,271 workplaces.

All these characteristics influence the average level of satisfaction (table 3). Employees working in innovative workplaces have, on average, a slightly higher level of satisfaction (4.6% higher than employees working in non-innovative workplaces, 0.66 compared to 0.63). Similarly, teleworkers show a higher level of satisfaction (5.9% higher than non-teleworkers), while workers with non-stable working hours are mostly less satisfied in their job (0.59 compared to 0.66, i.e. 9.5% lower). On the contrary, part-time contracts are not associated with a significant difference in terms of satisfaction. In terms of occupations, high-skilled workers show a higher level of satisfaction on average (12% above the average) which may be related to the higher probability of working in innovative workplaces or being teleworkers. This confounding factor, like many others, has to be taken into account through regressions analysis.

Table 3. Employee satisfaction and working time arrangements

Index from 0 to 1	**Satisfaction level**
Part-time	0.63
Full-time	0.63
Non-stable working hours	0.59
Regular working hours	0.66
Teleworking	0.66
Not-teleworking	0.63
Innovative workplaces	0.66
Other workplaces	0.63
Overall	0.63

Source: REPONSE database, 21,320 employees in 4,271 workplaces.

Empirical method

The empirical strategy follows a two-step analysis.

The first set of models analyses the relationship between innovation (proxied with innovation as the firm's primary strategy) and three specific working-time arrangements: part-time work, non-stable working hours and teleworking. This first set of regression uses logit models with control variables at employee level (socio-demographic characteristics) and firm level (including collective bargaining).

The second step aims to identify the relationships between employee satisfaction indexes and the different working time arrangements. This second step of analysis carries out OLS regressions and includes innovation strategy as well as employees' and companies' characteristics as independent variables. In addition to part-time work, non-stable hours and teleworking, we also introduce a dummy capturing workers' information about working time, as well as the usual average number of weekly working hours (continuous variable), to better characterise workers' working time. Finally, the literature review emphasises the central role played by time sovereignty to explain job satisfaction. To test the relevance of this mechanism, an additional model introduces a variable on work-life balance[4].

In all the models, the control variables at firm level are the size, sector and status of the firm (profit/non-profit and ownership), the firm activity over the past three years, the collective working time regime (35 hours or not), and the existence of collective bargaining. The models are also controlled by employees' characteristics such as gender, age, qualification, and hours worked (for the second part on satisfaction analysis only). In addition, all the regressions have workplace-clustered errors to consider specific variance heterogeneities from unobserved workplace characteristics.

The literature supports the view of heterogeneous relationships between innovation, working time arrangements, and satisfaction according to socio-economic characteristics. From that perspective, the previous regressions are extended on subsamples (women/men; high-skilled/low-skilled) to take this heterogeneity into account.

RESULTS: INNOVATION STRATEGY, FLEXIBLE WORKING TIME ARRANGEMENTS AND JOB SATISFACTION

In the first part of the results, we analyse whether a firm's innovation strategy is related to the development of different flexible working time arrangements and whether this relationship varies across groups of workers (by gender and skill level). The second part of the results focuses on the effect of innovation and flexible working time arrangements on workers' satisfaction.

Are flexible working time arrangements more frequent in innovative workplaces, and for whom?

In the first set of regressions, we test the hypothesis of a relationship between innovation and flexible working-time arrangements. More precisely, we look at whether working in an establishment whose primary strategy is innovation has an impact on the probability of:

1. working part-time;
2. working non-stable (alternate or variable) hours;
3. working remotely (teleworking).

We control for the establishment's and the employees' characteristics. We also run regressions for different subgroups of workers (by gender, skill level) to check if the effect of working in an innovative workplace on flexible working-time arrangements is the same across these groups (corresponding results are presented in the appendix, table A3).

[4] A regression using work-life balance as the dependent variable is also presented in the appendix to analyse its links with working time arrangements.

The probability of working part-time is lower in establishments whose strategy mainly relies on innovation (table 4). This result contradicts some previous results from the literature showing a positive relationship between innovation and part-time work, such as those from Gianetti and Madia (2013) based on a sample of Italian manufacturing firms. However, this difference could be related to both national and industry specificities since our sample includes French firms from all industries[5].

Some other interesting results appear when we break down our sample by skill level. Innovation strategy tends to reduce part-time work for low-skilled workers only, while the effect is not significant for high-skilled workers. This result resonates with some recent findings showing that innovation can be more beneficial to low-skilled than to high-skilled workers in terms of wages (Aghion *et al.*, 2019 on British data). Our results here suggest that low-skilled workers may be better off in terms of working time (less frequently for part-time given that part-time work is often involuntary in France) when they work in a firm whose primary strategy is innovation.

As far as non-stable working hours (alternate and variable) are concerned, men and lower-skilled workers have a higher probability of working non-stable hours. No significant relationship appears when innovation is implemented as the primary strategy of the establishment in the global sample. However, working in an innovative workplace seems to reduce the probability of this kind of flexible working time arrangement for men, who are on average more concerned by non-stable working hours.

The last flexible working-time arrangement we analyse in relation to the establishment's innovation strategy is teleworking. Teleworking is not very widespread in 2017 (about 9% in REPONSE survey), but it is unevenly distributed across individual and establishment characteristics. Teleworking is more frequent for men, high-skilled workers and in large establishments and less frequent in manufacturing compared to all other industries. When we look at the relationship between innovation and teleworking, we find that workers more frequently work remotely when they work in an establishment whose primary strategy is innovation. This positive relationship holds for all subgroups of employees when we run separate regression by gender or skill level.

Innovative workplaces are therefore more likely to develop teleworking compared to establishments whose primary strategy does not rely on innovation. This could be related both to the diffusion of ICT devices (more widespread in innovative companies) and to the organization of work (relying more on workers' autonomy) in these companies (Lorenz, 2015; Eurofound, 2017).

Our results also illustrate some of the characteristics of working time regulation in France. Indeed, working in a 35-hour workplace decreases the probability of working part-time or with non-stable hours or remotely, which may indicate that these establishments favour other types of working time flexibility (through overtime, annual flexibility). Collective bargaining at workplace level has contrasting effects: it increases the probability of working non-stable hours, while it reduces part-time work. It has no significant effect on teleworking.

[5] Indeed, when we run regressions by industry in the robustness checks, we observe that the negative relationship between innovation strategy and part-time work is only significant in services while it is non-significant in manufacturing.

Table 4. Working-time arrangement regressions

	Part-time	**Non-stable working hours**	**Teleworking**
Innovation strategy	-0.239+ (0.137)	-0.154 (0.097)	0.481*** (0.131)
Collective bargaining	-0.390*** (0.084)	0.232*** (0.067)	-0.018 (0.101)
Female	1.570*** (0.074)	-0.162*** (0.044)	-0.248** (0.076)
Occupation (*ref. manual workers*)			
Professionals and managers	-0.816*** (0.114)	-0.338*** (0.066)	1.269*** (0.108)
Technicians and associate professionals	-0.565*** (0.112)	-0.195** (0.064)	0.417*** (0.109)
Clerical or sales workers	-0.208* (0.100)	-0.028 (0.066)	-0.024 (0.134)
Age (*ref. Between 35 and 54 years old*)			
Between 15 and 34 years old	-0.210** (0.068)	0.275*** (0.042)	0.063 (0.082)
Older than 54	0.722*** (0.075)	0.038 (0.052)	0.092 (0.097)
Workplace applying the 35 hour rule	-0.321** (0.109)	-0.167* (0.070)	-0.217+ (0.112)
Size of the workplace (*ref. Less than 50 employees*)			
Between 50 and 499 employees	0.086 (0.082)	0.217** (0.069)	0.140 (0.105)
More than 499 employees	0.278* (0.115)	0.360*** (0.089)	0.269+ (0.137)
Sector (*ref. Manufacturing*)			
Construction	-0.444* (0.221)	-0.682*** (0.113)	0.444** (0.149)
Transport	0.839*** (0.115)	0.220** (0.074)	0.628*** (0.138)
Retail and Wholesale	0.365* (0.169)	0.490*** (0.097)	-0.036 (0.163)
Other Services	1.252*** (0.112)	-0.078 (0.067)	0.442*** (0.120)
Non-profit firm	0.402*** (0.105)	-0.164+ (0.090)	-0.122 (0.127)
Establishment activity (*ref. Stable*)			
Growing	0.019 (0.081)	0.096+ (0.054)	-0.002 (0.084)
Declining	0.246* (0.097)	-0.031 (0.068)	-0.077 (0.117)
Establishment's status (*ref. Single-establishment*)			
Firm headquarters	-0.302*** (0.086)	-0.290*** (0.061)	0.101 (0.094)
Subsidiary establishment	-0.023 (0.083)	-0.146* (0.061)	-0.212* (0.099)
Intercept	-3.058*** (0.126)	-0.371*** (0.080)	-3.118*** (0.127)
Number of Obs.	20911	20991	20338
Pseudo R2	0.2	0.0	0.1
Log pseudo likelihood	-3.47e+06	-6.67e+06	-2.75e+06
Chi2	1382.78	325.46	491.01

*Note: Standard errors in parentheses, level of significance + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. Logit regression analysis.*
Source: REPONSE database, 21,320 employees in 4,271 workplaces.

To conclude, establishments whose primary strategy relies on innovation do not therefore present the same relationship with the different types of flexible working-time arrangements we analyse. Working in an innovative workplace increases the probability of working remotely while it reduces the probability of working part-time and does not significantly change the probability of working alternate or variable hours. The analysis by subgroup also shows that the effect on part-time work varies slightly across skill level. Given that part-time work is more frequent for low-skilled workers, it seems that innovation tends to close the gap across skill level in the use of this flexible working-time arrangement.

Are innovation and flexible working-time arrangements important to satisfaction?

In the second part, we run another set of regressions to look at the effects of both innovation and flexible working time arrangements on workers' satisfaction. We first run a basic model including only innovation and control variables (model 1). Then we introduce working time arrangements and information about working time in model 2, before introducing work-life balance to see if a good work-private life balance affects the relationships between working time arrangements and job satisfaction (model 3 with balance, see table 5 below).

Our control variables (see appendix table A2) provide some results about the effects of the characteristics of the individual and the establishment on job satisfaction. Women appear slightly less satisfied than men when we control for both working-time arrangements and work-life balance, which differs from some results based on data from the beginning of the 2000s pointing to a "job satisfaction gender paradox" (Clark, 1997 on British data, Davoine, 2007 including French data). However, these studies do not include as much information about working time arrangements, which may explain the difference. The effect of occupation and age is similar to previous studies. Workers with higher-skilled occupations have higher levels of satisfaction (Bryson *et al.*, 2016; Siebern-Thomas, 2005), while the relationship between age and satisfaction is concave: senior and younger workers tend to have higher levels of satisfaction than workers between 35 and 54 (depending on controls in the model).

In terms of workplace characteristics, we find lower levels of satisfaction in intermediate size establishments (50 to 499 employees, compared to smaller establishments from 11 to 50 employees). Quite logically, satisfaction is related to the activity level of the establishment: it is lower in establishments with declining activity and higher in establishments with growing activity. Workers tend to be more satisfied in the non-profit sector, which is in line with previous studies pointing to the importance of intrinsic motivations of employees in these organizations (Benz, 2005, Lee, 2015). Conversely, satisfaction appears lower in dependent establishments, compared to single establishments.

Satisfaction also appears lower in establishments where there is some collective bargaining, which may seem counterintuitive, but points to the ambiguous nature of social dialogue at firm level in France. Indeed, collective bargaining may improve employees' participation and social climate, but it is also a way of introducing more flexibility at firm level.

As far as the relationship between innovation strategy and satisfaction is concerned, we observe a slightly positive link (model 1), which disappears when taking into account working time arrangements and information about working time (model 2). Focusing on working time arrangements, model 2 also shows that working remotely and stable hours tend to increase satisfaction. The coefficient for part-time is positive but not significant. Conversely, the number of hours worked has a slightly negative effect on satisfaction. Finally, information about working time (hours and arrangements) increases satisfaction.

In the next model (model 3), we introduce the variable on work-life balance to see if these working time arrangements have a positive effect on satisfaction independently of the effect on work-life balance. The effect of the work-life balance variable on satisfaction is strongly positive and significant. Besides, when it is introduced in the regression, the effects of some working-time arrangements change. The positive effect of teleworking on satisfaction vanishes, while the effect of stable hours is reduced. In addition, the slightly negative effect of the number of hours worked on satisfaction becomes slightly positive.

Table 5. Employee satisfaction and working time arrangements

Satisfaction index	**Model 1**	**Model 2**	**Model 3**
Non-stable working hours		-0.045*** (0.004)	-0.012*** (0.004)
Part-time		0.003 (0.007)	0.009 (0.006)
Teleworking		0.020** (0.007)	0.006 (0.006)
Well-informed about working hours		0.164*** (0.005)	0.132*** (0.004)
Weekly working hours	-0.001*** (0.000)	-0.001** (0.000)	0.001* (0.000)
Work-life balance (*ref. bad work-life balance*)			
Very good work-life balance			0.226*** (0.005)
Quite good work-life balance			0.141*** (0.004)
Innovation strategy	0.014+ (0.007)	0.010 (0.007)	0.007 (0.006)
Collective bargaining	-0.011+ (0.006)	-0.017** (0.006)	-0.015** (0.005)
Number of Obs. Adjusted R2 Log pseudo likelihood	20709 0.042 1565.56	19950 0.161 2927.58	19919 0.282 4459.69

*Note: Standard errors in parentheses, level of significance + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.*
Controlled by gender, occupation, age, size of the workplace, sector, establishment's activity, regulation and status (details in appendix table A2). OLS regression analysis. Model 1 includes controls, innovation strategy and weekly working hours.
Model 2 adds working time arrangements and information about working time. Model 3 adds work-life balance.
Source: REPONSE database, 21,320 employees in 4,271 workplaces.

The result about teleworking shows that its positive link with satisfaction can probably be explained by the positive effect of teleworking on work-life balance (which is confirmed by model 2 in Table A5 in the appendix). Teleworking would not have a positive effect on satisfaction in itself but only through its impact on work-life balance. It would ease work-life balance and thus increase satisfaction. The change in the sign of the effect of working hours (even though the effect is very small) can also be interpreted the same way. Longer hours can decrease satisfaction unless they allow a good work-life balance.

These results are in line with recent results from the literature that show what matters the most in terms of work satisfaction is time sovereignty, namely the possibility for workers to organise their time in a way that fits in with their other commitments (Lott, 2015; Flanchec *et al.*, 2015; Wanger, 2017). Teleworking, as a flexitime device, could play that role and contributes to increasing the satisfaction of the workers who use it.

Do flexible working-time arrangements have heterogeneous effects on satisfaction across social groups?

Some variables seem to have very similar effects across subsamples (detailed results are presented in the appendix, table A4). Information on working time increases satisfaction for all workers, as well as a good work-life balance. Conversely, collective bargaining reduces satisfaction in all subsamples.

In terms of working hours, we find in the global sample that the number of hours worked is slightly negatively correlated with satisfaction, but this correlation becomes slightly positive when we control for work-life balance. We find the same result for men and the same kind of effect in all other subsamples, even though the amplitude remains limited and variations appear in terms of significance: working more hours is generally correlated to lower job satisfaction, but this effect disappears or becomes positive when we control for work-life balance[6].

Besides these similar effects of some variables on satisfaction for all groups of workers, the effects of the three working time arrangements we analyse here (part-time, non-stable hours and teleworking) are not always the same for all workers.

We first look at differences by gender. The negative effect of non-stable working hours on satisfaction is more pronounced for women than for men and does not vanish when we take work-life balance into account. Working non-stable hours is thus less frequent for women, but it decreases their satisfaction more than men's and being able to balance work and personal life does not cancel this negative effect on satisfaction for women.

Once controlled for other working time arrangements and companies' characteristics, part-time work does not seem to be related to higher satisfaction for either women or men.

Teleworking has a positive effect both on women's and men's satisfaction. This positive effect vanishes for men when we control for work-life balance, while it is reduced but remains positive and (slightly) significant for women. Women thus show higher levels of satisfaction when they work remotely, but this is less related to work-life balance than it is for men.

This means that teleworking would increase satisfaction mainly through its effect on work-life balance for men, while it has a (slightly significant) positive effect on women's satisfaction independently from its effect on work-life balance. This is confirmed by the results of another regression presented in the appendix (using work-life balance as the dependent variable), which shows that teleworking has a positive and significant effect on men's work-life balance but not on women's.

[6] More specifically, for women, low-skilled workers and workers in the service industry, the number of hours reduce satisfaction but the effect becomes non-significant when we control for work-life balance. For high-skilled workers and workers in manufacturing, the effect of the number of hours on satisfaction is not significant and becomes positive and significant when we control for work-life balance.

This result may seem counterintuitive, given that teleworking has been presented as a tool to improve work-life balance mainly for women, especially since the beginning of the Covid-19 pandemic. However, we can think of at least two reasons why teleworking would be more correlated to work-life balance for men than for women.

First, work-life balance can be interpreted in a more or less broad sense. The question in the survey asks if "work allows you to organise your personal life satisfactorily", which is not restricted to family life. Second, our result questions the efficiency of teleworking in improving work-life balance when domestic and parental tasks are heavier. Since women are still in charge of about two-thirds of domestic and parental tasks in France (Champagne *et al.*, 2015), men may find that teleworking improves work-life balance, while women may not. Otherwise, this positive effect of teleworking for women is also in line with findings from Mas and Pallais (2017) showing that women value flexible working time as well as working from home more than men.

We also find differences in the effect of innovation and flexible working-time arrangements across skill levels. Working in an innovative workplace seems to affect the satisfaction of low-skilled workers positively, while it does not affect the satisfaction of high-skilled ones. Working remotely increases the satisfaction of all workers, but the effect is more significant for low-skilled workers and is only true for them when we control for work-life balance, while it vanishes for high-skilled workers.

This could mean that teleworking increases satisfaction for high-skilled workers primarily through its effect on work-life balance, while for low-skilled workers teleworking has an impact on the satisfaction that goes beyond the balancing effect. The remaining positive effect of teleworking for low-skilled workers once controlled for work-life balance could be related to a higher autonomy in their work due to teleworking.

The interplay between non-stable hours and work-life balance is also different for high- and low-skilled workers. While non-stable hours decrease satisfaction for all workers, the effect is significantly larger for low-skilled workers and does not vanish as it does for high-skilled workers when we introduce the work-life balance variable. Non-stable hours can thus be a source of lower satisfaction at work for low-skilled workers even when they manage to achieve a good work-life balance. For high-skilled workers, non-stable hours probably relate more to variable hours (less to alternate hours) and do not affect their satisfaction if they can still manage to keep a good work-life balance.

Robustness checks

Finally, a set of robustness tests are carried out[7]. Complementary analyses include other available variables to capture innovation at firm level, either through technology use (robot use and CAD and DTP use) and through organizational innovation such as just-in-time or performance-quality organizations. The results of the effects of the innovative context on working time practices are very similar and the most relevant variables seem to be those related to work organization. Other robustness analyses estimate the previous models on subsamples by workplace size and by industry, and show that the effects of innovation on teleworking are higher in larger establishments as well as in manufacturing. The positive effect of teleworking on satisfaction in the full model is specific to services. A final additional analysis consists in introducing a new working-time quality dimension based on the measurement of non-typical

[7] Detailed results are available on request.

working hours (such as working late in the evening or at night or at the weekend). This additional working time variable is not related to the innovation and technology environment and does not affect the satisfaction index.

CONCLUDING REMARKS

This research investigates in two steps the role of the innovative workplace on working time arrangements and then the joint effect of this innovative environment and working time practices on employee satisfaction level. First, we find that innovation strategy is associated with more widespread teleworking and less part-time work. Our results also suggest these relationships are more pronounced for low-skilled workers, supporting the view of a rent-sharing and/or human capital investment process (Aghion, 2019). In other words, an innovative workplace seems to offer better working-time conditions and satisfaction for workers.

In terms of satisfaction, our study confirms several findings from the literature. The analysis underlines the key role of time sovereignty on satisfaction. Balancing work and personal life mitigates the negative effect of non-stable working time and the positive one of teleworking on satisfaction. Although these two working-time arrangements influence time sovereignty, their own effects on satisfaction are smaller than we might expect. However, they still remain central for some workers, especially women and low-skilled workers.

The role of social dialogue and the context of the firm remains unclear. Information about working-time arrangements seems to be a good lever for increasing the satisfaction level. By contrast, the effects of collective bargaining are hard to interpret: given the French context, they can reflect at the same time a good social dialogue but also a strategy to promote more flexibility (which requires agreements at firm level).

Finally, our findings provide interesting insights in terms of public policy. They confirm that teleworking is not in itself a lever for increasing employee satisfaction for all workers. It is a suitable way of improving work-life balance and then satisfaction, but this effect should not be counterbalanced by increasing work intensity at the same time. Our study also raises the issue of non-stable working-time on satisfaction, which could not be fully overcome by time-sovereignty for women and low-skilled workers, calling for the need for regulation. Lastly, our study joins those asserting that promoting innovative strategy at firm level is a way of improving working conditions, especially for low-skilled workers. It supports the view of more benefits from competitiveness through quality than competitiveness through cost reduction.

BIBLIOGRAPHIE

AGHION, P., BERGEAUD, A., BLUNDELL, R. W. AND GRIFFITH, R. (2019) "The Innovation Premium to Soft Skills in Low-Skilled Occupations", *SSRN Electronic Journal*. https://www.ssrn.com/abstract=3489777

ARNTZ M., BEN YAMED S., BERLINGIERI F. (2019), "Working from Home: Heterogeneous Effects on Hours Worked and Wages", *ZEW Discussion Paper* 2019-15, https://www.zew.de/publikationen/working-from-home-heterogeneous-effects-on-hours-worked-and-wages

ASKENAZY P. (2003), « Dynamique de l'innovation organisationnelle lors de la réduction du temps de travail : évidences sur la France des années quatre-vingt-dix », *Économie & prévision*, n°158, 2003-2. pp. 27-45

ASKENAZY P. (2013), "Working time regulation in France from 1996 to 2012", *Cambridge Journal of Economics*, 37, 323–347

BATUT C., TABET Y. (2020), « Que savons-nous aujourd'hui des effets économiques du télétravail ? », *Trésor Eco*, N° 270, November 2020

BENZ M. (2005), "Not for profit, but for satisfaction? Evidence on worker well-being in non-profit companies", *Kyklos*, 58, 155-176.

BLOOM N., LIANG J., ROBERTS J., YING S. (2013), "Does Working from Home work? Evidence from a Chinese Experiment", *CEP Discussion Paper* No 1194

BOOTH A., VAN OURS J. (2008), "Job satisfaction and family happiness: Does Part- Time Work Make the Family Happier?", *Economica*, 76(301), p. 176–196.

BOOTH A., VAN OURS J. (2009), "Hours of Work and Gender Identity: the part- time work puzzle", *The Economic Journal*, 118 (526), F77–F99.

BRYSON A., ERHEL C., SALIBEKYAN S. (2016), "Job quality", in Amossé T., Bryson A., Forth J., Petit H. (eds), *Employment relations in France and Britain*, Palgrave, https://www.palgrave.com/gp/book/9781137574183

CIPD (2019), *Mega trends: flexible working*, https://www.cipd.co.uk/knowledge/work/trends/megatrends/flexible-working

CHAMPAGNE C., PAILHE A., SOLAZ A. (2015), « Le temps domestique et parental des hommes et des femmes : quels facteurs d'évolutions en 25 ans? », *Economie et statistique*, No. 478-479-480, pp 209-242.

CLARK A. E. (1997), "Job satisfaction and gender: Why are women so happy at work?", *Labour Economics*, Volume 4, Issue 4, P.341-372

DAVOINE L. (2007), « La qualité de l'emploi : une perspective européenne », Université Paris 1

DOCKERY A. M., BAWA S. (2014), "Is Working from Home Good Work or Bad Work? Evidence from Australian Employees", *Australian Journal of Economics*, Volume 17, No. 2, pp 163 – 190 Employment series, Publications Office of the European Union, Luxembourg.

ERHEL C. (2020, forthcoming), "Reforms and new challenges for work and employment in France: social dialogue under pressure", in Vaughan-Whitehead (ed.), *Enhancing social partners' and social dialogue's roles and capacity in the new world of work*, Edward Elgar.

EUROFOUND (2017) *Innovative Changes in European Companies: 3rd European Company Survey*, Luxembourg, Publications Office of the European Union.

EUROFOUND (2020), *Telework and ICT-based mobile work: Flexible working in the digital age*, New forms of employment series, Publications Office of the European Union, Luxembourg.

EUROFOUND AND THE INTERNATIONAL LABOUR OFFICE (2017), *Working anytime, anywhere: The effects on the world of work*, Publications Office of the European Union, Luxembourg, and the International Labour Office, Geneva.

GEORGES N., MÉDA D., TRANCART D. (2010), "Working hours and Work-Life Balance Satisfaction in Couples", working paper halshs-00809667

GIANNETTI C., MADIA M. (2013), "Work arrangements and company innovation: is there any relationship?", *Cambridge Journal of Economics* 2013, 37, 273–297

GODART O., GÖRG H., HANLEY A. (2017), "Trust-Based Work Time and Innovation: Evidence from Firm-Level Data", *ILRR Review*, vol 70 n°4, pp. 894–918

HALLEPEE S., MAUROUX A. (2019), « Le télétravail permet‑ il d'améliorer les conditions de travail des cadres ? », *INSEE Références*.

LE FLANCHEC A., MULLENBACH A., ROJOT J. (2015), « Favoriser la satisfaction au travail : les apports de l'enquête REPONSE 2011 », Management et Avenir, N° 81, pp 37-55

LEE S., MCCANN D., MESSENGER J. (2007), *Working Time Around the World*, Routledge.

LEE Y.-J. (2015), "Comparison of Job Satisfaction Between Non-profit and Public Employees", *Non-profit and Voluntary Sector Quarterly*, Volume: 45 issue: 2, page(s): 295-313

LORENZ, E. (2015) "Work Organisation, Forms of Employee Learning and Labour Market Structure: Accounting for International Differences in Workplace Innovation", *Journal of the Knowledge Economy*, 6, 437–466.

LOTT Y. (2015), "Working-time flexibility and autonomy: A European perspective on time adequacy", *European Journal of Industrial Relations,* Vol. 21(3), 259–274.

MAS A., PALLAIS A. (2017), "Valuing Alternative Work Arrangements", *American Economic Review*, 107(12): 3722–3759

MAS A., PALLAIS A. (2020), "Alternative Work Arrangements", *NBER Working Paper*, No. 26605, January

MESSENGER J. (2018), "Working time and the future of work", *ILO Research Papers Future of Work series*, 6.

MONTERO R., RAU T. (2015) "Part-time Work, Job Satisfaction and Well-being: Evidence from a Developing OECD Country", *The Journal of Development Studies*, 51:4, 370-385.

POSSENRIEDE D, PLANTENGA J. (2014) "Temporal and locational flexibility of work, working-time fit, and job satisfaction", *IZA Discussion Paper* 8436, http://ftp.iza.org/dp8436.pdf

POSSENRIEDE D., HASSINK W., PLANTENGA J. (2016), "Does temporal and locational flexibility of work increase the supply of working hours? Evidence from the Netherlands", *IZA Journal of Labor Policy* (2016) 5:16

WANGER S. (2017), "What makes employees satisfied with their working time? The role of working hours, time-sovereignty and working conditions for working time and job satisfaction", *IAB-Discussion Paper* 20/2017

ANNEXES

Table A1. Variables, questions and modalities

Final variable	Code in REPONSE survey	Question	Final modalities	Level
Satisfaction Index	SATISW	When you think about your work in general, are you very satisfied, rather satisfied, not really satisfied or not at all satisfied?	1 to 4 scale transformed in index from 0 to 1	Employee level
Satisfaction Index	SATIS_HOR	And more specifically, are you very satisfied, rather satisfied, not really satisfied or not at all satisfied with ... - Your working hours	1 to 4 scale transformed in index from 0 to 1	Employee level
Satisfaction Index	SATIS_CONDT	And more specifically, are you very satisfied, rather satisfied, not really satisfied or not at all satisfied with ... - Your working conditions	1 to 4 scale transformed in index from 0 to 1	Employee level
Satisfaction Index	SATIS_REMU	And more specifically, are you very satisfied, rather satisfied, not really satisfied or not at all satisfied with ... - Your income	1 to 4 scale transformed in index from 0 to 1	Employee level
Satisfaction Index	SATIS_FORM	And more specifically, are you very satisfied, rather satisfied, not really satisfied or not at all satisfied with ... - Your opportunities to follow a training course	1 to 4 scale transformed in index from 0 to 1	Employee level
Satisfaction Index	SATIS_AMB	And more specifically, are you very satisfied, rather satisfied, not really satisfied or not at all satisfied with ... - The atmosphere at your workplace	1 to 4 scale transformed in index from 0 to 1	Employee level
Part-time	TPART	Do you work? (full-time/part-time)	Dummy	Employee level
Non-stable working hours	HORAIRE	Are your working hours ...? (regularity of timetables)	Transformed in dummy (answer "alternate hours" or "variable hours")	Employee level
Teleworking	TELETRAV	Do you carry out all or part of your activity by teleworking?	Dummy	Employee level
Work-life balance	CONCIL	Does your work allow you to organise your private life satisfactorily?	Transformed in ordinal categorical variable (1 to 3)	Employee level
Well-informed about working hours	INFOTW	For each of the following topics, do you consider yourself well informed about the situation in your establishment in 2016 - Working time (duration, arrangements)	Dummy	Employee level
Number of working hours per week	NBHSEM1	How many hours do you work on average per week?	Continuous variable	Employee level
Innovation strategy	STRATEGIE	Main element of the firm's strategy in face of the competition	Transformed in dummy (answer "the innovation")	Workplace level
Collective bargaining	NEGOCOLL	Collective bargaining with employee representatives in the firm or establishment, with the aim of reaching a collective agreement, whether or not it has been signed, over the last three years (2014-2016).	Dummy	Workplace level

Source: REPONSE database, 21,320 employees in 4,271 companies.

Table A2. Employee satisfaction and working time arrangements: results for control variables

	Model 1	Model 2	Model 3
Female	-0.007	-0.007	-0.013**
	(0.005)	(0.005)	(0.004)
Occupation (*ref. manual workers*)			
Professionals and managers	0.112***	0.111***	0.087***
	(0.007)	(0.007)	(0.006)
Technicians and associate professionals	0.048***	0.048***	0.042***
	(0.006)	(0.006)	(0.005)
Clerical or sales workers	0.008	0.008	0.011+
	(0.007)	(0.007)	(0.006)
Age (*ref. Between 35 and 54 years old*)			
Between 15 and 34 years old	0.004	0.004	0.010*
	(0.005)	(0.005)	(0.004)
Older than 54	0.013*	0.014*	-0.002
	(0.007)	(0.007)	(0.007)
Workplace under the 35 hours regulation	0.002	0.002	-0.000
	(0.007)	(0.007)	(0.006)
Size of the workplace (*ref. Less than 50 employees*)			
Between 50 and 499 employees	-0.013*	-0.013*	-0.013**
	(0.006)	(0.006)	(0.005)
More than 499 employees	0.002	0.001	-0.003
	(0.008)	(0.008)	(0.006)
Sector (*ref. Manufacturing*)			
Construction	0.020*	0.022*	0.035***
	(0.010)	(0.010)	(0.009)
Transport	-0.025**	-0.023**	-0.004
	(0.008)	(0.008)	(0.007)
Retail and Wholesale	-0.011	-0.009	0.017*
	(0.009)	(0.009)	(0.008)
Other Services	-0.016*	-0.015*	0.003
	(0.006)	(0.006)	(0.006)
Non-profit firm	0.015*	0.017*	0.004
	(0.008)	(0.008)	(0.006)
Establishment activity (*ref. Stable*)			
Growing	0.015**	0.014**	0.013**
	(0.005)	(0.005)	(0.004)
Declining	-0.023***	-0.023***	-0.016**
	(0.006)	(0.006)	(0.005)
Establishment's status (*ref. Single establishment*)			
Firm headquarters	-0.006	-0.006	-0.006
	(0.006)	(0.006)	(0.005)
Subsidiary establishment	-0.014*	-0.015**	-0.017***
	(0.006)	(0.006)	(0.005)
Intercept	0.671***	0.670***	0.393***
	(0.012)	(0.012)	(0.013)
Number of Obs.	20709	20709	19919
Adjusted R2	0.042	0.042	0.282
Log pseudo likelihood	1562.09	1565.56	4459.69

*Note: Standard errors in parentheses, level of significance + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. OLS regression analysis. Model 1 includes controls, innovation strategy and weekly working hours.*

Model 2 adds working time arrangements and information about working time. Model 3 adds work-life balance.

Source: REPONSE database, 21,320 employees in 4,271 workplaces.

Table A3. Effects of innovation strategy on working-time arrangements, by subsamples (regression coefficients)

Effect of innovation strategy on	**Women**	**Men**	**Higher-skilled**	**Lower-skilled**
Part-time work	-0.188 (0.141)	-0.386 (0.241)	0.030 (0.159)	-0.442* (0.212)
Non-stable working hours	-0.035 (0.134)	-0.197+ (0.103)	-0.159 (0.103)	-0.198 (0.134)
Teleworking	0.692*** (0.185)	0.414** (0.143)	0.511*** (0.135)	0.682** (0.233)

*Note: Standard errors in parentheses, level of significance + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. The coefficients come from subsample logit regressions controlled by gender, occupation, age, size of the workplace, sector, establishment's activity, regulation and status (not reported here). Source: REPONSE database, 21,320 employees in 4,271 workplaces.*

Table A4. Employee satisfaction and working time arrangements by subsamples (gender, skills)

Satisfaction index	Women - without work-life balance	Women - full model	Men without work-life balance	Men - full model	Higher-skilled without work-life balance	Higher-skilled - full model	Lower-skilled without work-life balance	Lower-skilled - full model
Non-stable working hours	-0.058*** (0.005)	-0.021*** (0.005)	-0.033*** (0.005)	-0.005 (0.005)	-0.023*** (0.005)	-0.002 (0.005)	-0.061*** (0.006)	-0.019*** (0.005)
Part-time	-0.002 (0.007)	0.003 (0.007)	0.015 (0.015)	0.020 (0.013)	0.011 (0.009)	0.012 (0.008)	-0.002 (0.009)	0.005 (0.009)
Teleworking	0.023* (0.009)	0.015+ (0.009)	0.017+ (0.009)	0.001 (0.008)	0.015+ (0.009)	0.001 (0.008)	0.034** (0.011)	0.024* (0.010)
Well-informed about working hours	0.165*** (0.006)	0.134*** (0.006)	0.164*** (0.007)	0.131*** (0.006)	0.166*** (0.006)	0.134*** (0.006)	0.166*** (0.006)	0.132*** (0.006)
Weekly working hours	-0.001** (0.000)	0.000 (0.000)	-0.001+ (0.000)	0.001** (0.000)	-0.000 (0.000)	0.001*** (0.000)	-0.001* (0.000)	0.000 (0.000)
Work-life balance (*ref. bad work-life balance*)								
Very good work-life balance		0.221*** (0.007)		0.228*** (0.007)		0.215*** (0.007)		0.233*** (0.007)
Quite good work-life balance		0.137*** (0.006)		0.143*** (0.006)		0.139*** (0.006)		0.143*** (0.006)
Innovation strategy	0.009 (0.010)	0.005 (0.009)	0.011 (0.008)	0.009 (0.008)	0.005 (0.008)	0.002 (0.008)	0.026+ (0.014)	0.024* (0.011)
Collective bargaining	-0.010 (0.007)	-0.012+ (0.007)	-0.023** (0.008)	-0.018** (0.007)	-0.018* (0.008)	-0.013+ (0.007)	-0.016* (0.008)	-0.017* (0.007)
Number of Obs.	8800	8783	11150	11136	9052	9043	10898	10876
Adjusted R2	0.167	0.282	0.160	0.283	0.132	0.251	0.141	0.267
Log pseudo likelihood	1459.52	2107.18	1523.99	2393.47	1904.20	2568.36	1147.39	2002.03

*Note: Standard errors in parentheses, level of significance + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.*

OLS regression analysis. Controlled by gender (when relevant), occupation (when relevant), age, size of the workplace, sector, establishment's activity, regulation and status (not reported here). For each subsample, the first model includes controls, innovation strategy, working time arrangements and weekly working hours. The second model adds work-life balance.

Source: REPONSE database, 21,320 employees in 4,271 workplaces.

Table A5. Work-life balance, innovation and working time arrangements

Work-life balance	**Model 1**	**Model 2**
Teleworking		0.038***
		(0.009)
Non-stable working hours		-0.116***
		(0.005)
Part-time		0.046***
		(0.007)
Primary innovation strategy	0.012	0.007
	(0.010)	(0.009)
Well-informed about working hours	0.125***	0.116***
	(0.005)	(0.005)
Collective bargaining	-0.016*	-0.006
	(0.007)	(0.006)
Female	0.027***	0.017**
	(0.005)	(0.005)
Occupation *(ref manual workers)*		
Professionals and managers	0.004	-0.005
	(0.008)	(0.008)
Technicians and associate professionals	0.001	-0.003
	(0.007)	(0.007)
Clerical or sales workers	-0.017*	-0.018*
	(0.008)	(0.008)
Age *(ref 35 to 54 years old)*		
Between 15 and 34 years old	-0.036***	-0.026***
	(0.006)	(0.005)
Older than 54	0.065***	0.060***
	(0.007)	(0.007)
35 hours workplace	-0.013+	-0.013+
	(0.008)	(0.008)
Size *(ref. less than 50)*		
Between 50 and 499 employees	-0.005	0.000
	(0.007)	(0.006)
More than 499 employees	-0.009	-0.002
	(0.009)	(0.008)
Sector *(ref Manufacturing)*		
Construction	-0.017	-0.036***
	(0.011)	(0.011)
Transport	-0.020*	-0.019*
	(0.008)	(0.008)
Retail and Wholesale	-0.075***	-0.060***
	(0.010)	(0.010)
Other services	-0.010	-0.019**
	(0.007)	(0.007)
Non-profit firm	0.044***	0.038***
	(0.009)	(0.008)
Establishment's activity *(ref stable)*		
Growing establishment	0.001	0.004
	(0.006)	(0.005)
Declining establishment	-0.010	-0.010
	(0.007)	(0.007)

Establishment status *(ref single-establishment)*		
Firm headquarters	-0.008	-0.017**
	(0.007)	(0.006)
Subsidiary establishment	-0.006	-0.011+
	(0.006)	(0.006)
Intercept	0.540***	0.588***
	(0.010)	(0.010)
Number of Obs.	20603	20086
Adjusted R2	0.068	0.112
Log pseudo likelihood	-1793.67	-1145.72

*Note: Standard errors in parentheses, level of significance + p<0.10, * p<0.05, ** p<0.01, *** p<0.001. OLS regression analysis. Model 1 includes controls, innovation strategy and information about working time. Model 2 adds working time arrangements.*
Source: REPONSE database, 21,320 employees in 4,271 workplaces

DERNIERS NUMÉROS PARUS :

téléchargeables à partir du site http://ceet.cnam.fr/

N° 203 *Les canaux de (non) recrutement des chômeurs. Une exploration à partir de l'enquête Ofer 2016*
YANNICK FONDEUR, CLAUDE MINNI
novembre 2020

N° 202 *Les repères de la sélection à l'embauche et leur évaluation*
GUILLEMETTE DE LARQUIER, EMMANUELLE MARCHAL
septembre 2020

N° 201 *Les pratiques de recrutement des entreprises : un pouvoir de segmentation et de valorisation*
GUILLEMETTE DE LARQUIER, GÉRALDINE RIEUCAU
février 2020

N° 200 *L'espace de l'articulation emploi/hors-emploi chez les indépendant.e.s*
JULIE LANDOUR
novembre 2019

N° 199 *Le présentéisme au travail. Mieux évaluer pour mieux prévenir*
SYLVIE HAMON-CHOLET, JOSEPH LANFRANCHI
juin 2019

N° 198 *L'analyse des données de concours au regard des discriminations à l'entrée dans la Fonction Publique d'État*
NATHALIE GREENAN, JOSEPH LANFRANCHI, YANNICK L'HORTY, MATHIEU NARCY, GUILLAUME PIERNE
juin 2019

N° 197 *Effet d'une réduction de la durée d'indemnisation du congé parental sur l'activité des mères : une évaluation de la réforme de 2015.*
MATHIEU NARCY, FLORENT SARI
décembre 2018

N° 196 *De l'emploi stable au travail insoutenable. Trajectoires d'ouvrières agricoles en groupement d'employeurs.*
NICOLAS ROUX
avril 2018

N° 195 *Work Organisation and Workforce Vunerability to Non-Employment: Evidence from OECD's Survey on Adult Skills (PIAAC) /* Organisation du travail et vulnérabilité au non-emploi : une étude empirique à partir de l'évaluation des compétences des adultes de l'OCDE (PIAAC)
NATHALIE GREENAN, EKATERINA KALUGINA, MOUHAMADOU MOUSTAPHA NIANG
décembre 2017

N° 194 *Enjeux et usages de la formation professionnelle dans la sécurisation des trajectoires d'emploi : des initiatives territoriales aux réformes nationales*
CAROLE TUCHSZIRER
septembre 2017