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Evidence from Portugal and France

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Abstract

Mandatory reductions in the workweek can be used by governments to attempt to reduce unemployment, and are usually assumed to improve the well-being of workers. Nevertheless, the net impact of shorter workweeks on worker welfare is ambiguous *ex ante* and little empirical effort has been devoted to identify how worker satisfaction changes with mandatory reductions in working time. Using data from the European Community Household Panel, this paper evaluates the impact of the exogenous reductions in weekly working hours induced by reforms implemented in Portugal and France. Difference-in-difference estimation results suggest that reduced working hours generated significant and robust increases in job and leisure satisfaction of the workers affected in both countries, with the rise in the former mainly being explained by greater satisfaction with working hours and working conditions.

Keywords: Working-hours reductions, job satisfaction.

JEL Classification Codes: J22, J23, J28.

1. Introduction

Mandatory reductions in the standard number of working hours have been discussed and implemented in a number of countries in recent decades. By expanding the hours for which overtime is due, and so increasing the cost of long working hours, one objective was to tackle unemployment via work-sharing. A substantial number of theoretical and empirical contributions have already shed light on the efficiency of such mechanisms.[2]

However, reductions in the standard workweek are also implemented to limit the supposed detrimental impacts of long working hours on workers' quality of life (Bell *et al.* (2012), Bassanini and Caroli (2014)). Mostly considered to be straightforwardly positive by governments, the net impact of reductions in the workweek is in fact ambiguous.

Let $U = U(c,z)$ be the individual utility function, where $c >= 0$ is consumption and $z >= 0$ is leisure time. Under standard assumptions and without any market failure, a reduction in working hours, keeping income constant, likely increases utility, as leisure time rises without any fall in consumption.

If we relax the assumption of a perfect labor market and consider an economy in which workers differ in their ability, and that wages are function of effort and time which are difficult to observe, Akerlof (1976) demonstrates that workers may provide sub-optimal excess effort to distinguish themselves from workers of a lower type in order to share the output of workers of greater ability. Akerlof (1976) considers the "Speed" of assembly lines as the indicator of working conditions to distinguish between occupations, but "Speed" can be easily replaced by "Working hours" without affecting the reasoning. This "rat-race" leads to an equilibrium in which workers have longer working hours and lower utility than in a world in which all workers have the same known level of ability. Alternatively, Manning (2003) considers monopsony as the best simple model to describe

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[2]Kapteyn *et al.* (2004) proposes a complete review of the most relevant theoretical and empirical literature on the employment effects of a reduction in working hours.

the decision problem facing an individual employer under the two following central labor-market assumptions: there are frictions in the labor market and employers set wages. These assumptions give employers bargaining power over their workers, as their labor supply is not infinitely elastic. One of the implications here is that employers might impose long working hours on their workers that do not maximize their utility. In these two cases, a government-imposed shorter working week is also likely to generate worker welfare improvements.

Nevertheless, worker welfare does not only depend on working hours and earnings, job quality matters too (Clark (1998, 2005)) and a shorter workweek can have negative consequences on job quality. First, a shorter workweek is likely to introduce new working practices and thus work intensification (Kelliher and Anderson (2010), Rudolf (2014)). Second, in Farzin and Akao (2004), labor is not only a source of income, allowing material needs to be satisfied, it also provides "non-pecuniary benefits" like status and recognition. Empirical work in labor economics has already shown that the cost of unemployment is not only pecuniary (Clark and Oswald (1994), Winkelmann and Winkelmann (1998)). Winkelmann and Winkelmann (1998), using German data, suggest that the pecuniary costs are actually much lower than the non-pecuniary costs. If labor enters positively in the utility function, working-hours restrictions may reduce these "non-pecuniary benefits". Finally, by extending the range of hours considered as overtime, governments expect employment to rise. However, the model in König and Pohlmeier (1987) proposes a technological difference between workers and hours, and nonlinearity of labor cost, and concludes that employment and hours are complements: policies reducing working hours may then produce the substitution of labor by capital. This substitution may reduce job security and thus worker well-being.

The net impact of a reduction in working hours on subjective well-being is hence ambiguous *ex ante*, requiring us to turn to empirical analysis, which has to date only been limited. To the best of my knowledge, only two papers have explicitly evaluated the

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consequences of a legal reduction in the workweek on subjective well-being: Rudolf (2013) and Hamermesh *et al.* (2014). Based on a Korean reform, Rudolf (2014) finds no significant effect on the job and life satisfaction of the workers concerned, and suggests that greater work intensity might have offset any other positive impact on subjective well-being. Hamermesh *et al.* (2014), using the same Korean experience and a change in Japanese working-hours legislation, rather find a positive effect on life satisfaction. The details of these two contributions are set out in Table A1.[3]

The existing evidence then comes exclusively from Asian countries, and nothing is known about the relationship between reductions in working time and subjective well-being in Europe. In this paper, I aim to contribute to this literature by considering the relationship between the changes in working-time regulations adopted in France and Portugal at the end of the 1990's and job and leisure satisfaction. The results in both countries indicate that the shorter workweek increased the well-being of the workers affected. The main channels for the rise in job satisfaction are satisfaction with working hours and working conditions. However, as we will see there are differences between country in terms of the categories of workers whose subjective well-being is affected by working hours.

2. Institutional background and Identification

2.1. Portugal

At the beginning of the 1990's, the average number of working hours per week in Portugal was relatively high among European countries (see Figure 1). To move towards European standards, the Portuguese government in October 1996 decided to reduce standard working hours from 44 to 40 hours per week (Varejao (2005)). This law was implemented

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[3] Estevao and Sa (2008) consider the impact of the French reform analyzed in the current paper on satisfaction with working hours only. Hamermesh *et al.* (2014) suggest that this is insufficient for a complete welfare analysis.

gradually. On December 1st 1996, all workweeks between 40 hours and 42 hours had to meet the new standard threshold, while workweeks above 42 hours were reduced by two hours. On December 1st 1997, all workweeks had to respect the new standard threshold of 40 hours. According to the Portuguese government, monthly wages were to remain constant during these changes.

2.2. France

By the end of the 1990s, the unemployment rate in France was relatively high. When the Socialist party returned to power at the head of a Left coalition composed of Socialists, Communists and the Green Party in 1997, two Laws were proposed to tackle unemployment. The first, known as the Loi Aubry I and introduced on June 13th 1998, announced a reduction of the workweek from 39 hours to 35 hours for large firms in 2000 and for small firms (<20 workers) in 2002. Financial incentives to alleviate labor cost were provided to help the immediate reduction in hours worked and job creation. On January 19th 2000 the second Law, known as the Loi Aubry II, confirmed the 35-hour standard workweek and provided more accurate definitions of work time, overtime hours and finally modified the relevant articles of the Code du Travail.

The French government stated that the nominal monthly wage should remain constant during these changes, implying higher hourly wages. Payroll taxes were cut to compensate firms for these higher labor costs. The overtime payment scheme remained unchanged, with overtime being paid at a premium of 25% for the first eight hours and 50% for any additional hours.

2.3. Empirical strategy

The causal impact of the shorter workweek on worker well-being is estimated by comparing the change in job and leisure satisfaction for the control and treatment groups using the following fixed-effect difference-in-difference (D-i-D) equations[4]:

$$SWB_{it} = \beta_1(Treat_i * Post_t) + \beta_2 X_{it} + \alpha_i + \lambda_t + \epsilon_{it} \qquad (1)$$

Here SWB_{it} refers to the job or leisure satisfaction of worker i at time t and X_{it} is a vector of standard controls. $Treat_i$ is a dummy for worker i being affected by the workweek reduction and $Post_t$ is a dummy for observations after the implementation of the workweek reductions. The coefficient of interest is β_1, as this reveals the impact of the treatment in a D-i-D regression. In Portugal, the treated are all those who worked over 42 hours per week before October 1996 and the control group those who worked between 35 hours and 40 hours prior to the reform;[5] $Post_t$ equals 1 after December 1996. In France, the treated are workers in "large firms" who worked over 35 hours per week before January 2000 and the control group those in "small" firms, since these workers were not concerned by the reform between 2000 and 2001.[6] Equation (1) includes an individual fixed effect, α_i, that picks up unobserved individual heterogeneity (such as personality traits) and year fixed effects, λ_t. The variables $Treat_i$ and $Post_t$ do not appear explicitly in

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[4]A specification with actual working hours being instrumented by the standard number of working hours per week is proposed in the Appendix. This identification strategy only captures the causal impact of working hours on satisfaction, as in Collewet and Loog (2014). The D-i-D strategy does not isolate the causal impact of working hours on satisfaction but rather captures the global impact of the reform, picking up the net impact of the reduction in working hours but also the increase in hourly wages and any other unobserved changes that might have come with the reforms (such as work intensification or changed working conditions). Even though these two strategies are not strictly isomorphic, their results turn out to be qualitatively consistent (see Tables 2 and A5, and Tables 3 and A6).

[5] The composition of the treatment group is similar to that proposed by Raposo and Van Ours (2010), except that individuals working between 40 hours and 42 hours are excluded here. This is due to the small number of workers working between 40 and 42 hours prior to the reform in Portugal in the sample (more details on the data are provided in Section 3).

[6] "Large" firms have over 20 employees according to the Loi Aubry I.

the equation as they are collinear with α_i and λ_t respectively. Standard errors are clustered at the individual level.

The D-i-D regressions are run separately by country. The samples are similar. Part-time workers, the self-employed and workers in apprenticeships are excluded, and we include only full-time workers aged from 18 to 60. To ensure the consistency of comparisons, individuals working under 35 or over 50 hours a week before December 1st 1996, are not included in Portugal. Since the application there was not clear, the public sector is excluded from the French sample (Askenazy (2008)). Similarly, managers benefited from a special version of the Law, which is why we do not include them.[7] There is also the possibility that employers may marginally adjust their current number of employees around the threshold of 20 employees. To avoid the issue of self-selection into the treatment, I exclude employees who switch from a large (small) to a small (large) firm and who stay in the same firm but report a change in its size between 1998 and 2001.[8]

3. Data

The empirical analysis is based on data from the European Community Household Panel (ECHP). The ECHP is a household panel covering France, Portugal and twelve other European countries. This started in 1994 and stopped in 2001, and was carried out annually using a standardized questionnaire cover in a wide range of topics concerning living conditions. It includes information on income, the financial situation, working life, housing, social relations, health and demographics.

There is no life satisfaction question in the ECHP. Our main dependent variables here will be job and leisure satisfaction. These come respectively from the responses to the following questions:

How satisfied are you with your present situation in the following areas:

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[7]The inclusion of managers actually makes the results stronger.

[8]1998 is taken here as the starting point here as the details of the reform were already known in June 1998.

- Your work or main activity?

- The amount of leisure time you have?

These questions are answered on a 1 to 6 scale, where 1 means *"Not Satisfied"* and 6 means *"Fully Satisfied"*. I consider both job and leisure satisfaction as changes in the workweek affect not only the entire income-hours package and working conditions but also decisions regarding non-market time. We will also look at satisfaction with working hours, earnings and working conditions.

A growing literature argues that subjective well-being is a good measure of individual utility. One advantage here is that we do not have to list and sum up all the dimensions of a good job or a good life. Questions about job or leisure satisfaction allow individuals to apply their own weights to all relevant dimensions to produce one summary figure (see Clark (2015, 2016)). Although concerns can be raised about the validity of such subjective measures, there is evidence of strong positive correlation between the answers to subjective well-being questions and physiological expressions of emotions or brain activity (Urry *et al.* (2004)). Moreover, subjective well-being measures capture meaningful information as they are strong predictors of future behavior (Clark *et al.* (1998), Ward (2015)).

The ECHP also contains information on job characteristics. Firm size is reported in the following bands: "None", "1 to 4", "5 to 19", "20 to 49", "50 to 99", "100 to 499" and "500 or more". This allows us to distinguish treated from non-treated workers in France.

Table 1 shows the means and standard deviations of the main variables used in the analyses for both Portugal and France. On average, the French report significantly higher satisfaction scores than do the Portuguese, except regarding satisfaction with working conditions. The share of women is the same in both samples (36%), as is the number of children. The share of married and never married workers is significantly higher in Portugal than in France, and that of divorced and widowed is higher in France. The log of labor income figures cannot be compared as they are in different currencies. More details

on the descriptive statistics by treatment group and period can be found in Appendix Tables A2 and A3.

Figures 2 and 3 illustrate graphically the reduction in working time respectively in Portugal and France. In Portugal, the average number of working hours was almost 44 in the treatment group and drops to 42 when the new standard threshold of 40 hours per week was implemented. The workweek in the control group did not change over time at around 40 hours per week. In France, the workweek fell for both groups before 2000. However, the reduction in the standard number of working hours generated a sharp drop in the workweek of treated workers. A D-i-D estimation, as described above, with weekly working hours as the outcome suggests that the reform generated a fall of 1.7 hours/week in Portugal and of 1.1 hours/week in France (See Table A4). Both estimates are statistically significant at all conventional levels. The same exercise with monthly income (expressed in logs) as the outcome reveals, as announced by the governments, no difference in the change in monthly income between the treated and control groups (See Table A4).

4. The shorter workweek and subjective well-being

4.1. Main Results

Table 2 presents the estimates of β_1 from equation (1) in Portugal with standardized job satisfaction and leisure satisfaction as the dependent variables, controlling for X_{it} in columns 2 and 4. The estimates of β_1 are positive and very statistically significant. The mandatory reduction in the workweek in Portugal produced a rise of 0.07 standard deviations in job satisfaction and 0.13 standard deviations in leisure satisfaction. The French results are similar (Table 3), with rises of 0.09 and 0.15 standard deviations in job and leisure satisfaction, respectively. The reductions in the workweek were then beneficial in well-being terms for the workers who were affected. The rises in job and leisure satisfaction in Portugal and France are of the same size

One requirement for D-i-D estimation to yield causal effects is that there is a common trend in job and leisure satisfaction in the control and treatment groups prior to the policy change. Figures 4 to 7 plot mean job and leisure satisfaction in Portugal and France over time. The satisfaction trends in the treatment (solid line) and control (dashed line) groups are fairly similar pre-treatment, which provides support for the common-trend assumption.[9]

I also carry out placebo regressions to test the common-trend assumption. In the placebo experiment I assume that the workweek reductions came into force one year earlier in each country. The resulting point estimates in Table 4 are statistically insignificant for all outcomes, and confirm the common-trend assumption.

4.2. Robustness checks

Tables 5 and 6 show the results from a number of robustness checks.

As satisfaction responses are on an ordinal scale, ordered response models might be thought more appropriate than ordinary least squares with individual fixed-effects. However, Ferrer-i-Carbonell and Frijters (2004) demonstrates that the choice of linear or non-linear models does not qualitatively affect the results in panel subjective well-being regressions. I check the main results by re-estimating the regressions via ordered probit and probit-adjusted OLS (Van Praag and Ferrer-i-Carbonell (2008)). The results, in columns (2), (3), (7) and (8) of Tables 5 and 6, do not differ significantly from the baseline results. The estimated treatment coefficient is only insignificant in column (3) of Table 6, although the P-value is close to the 10% threshold (P-value=0.12). I also re-estimated the baseline model without the individual fixed-effects in column (1). The results are qualitatively similar but differ in their magnitude. This difference can be explained by measurement error and selection. The use of a fixed-effects model in the case of measurement error introduces attenuation bias, meaning that FE estimates are always smaller than OLS estimates in absolute terms. However, measurement error is not a valid candidate as long

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[9] The residuals of the job and leisure satisfaction regressions also have similar trends. These figures are available upon request.

as the treatment effect cannot be misreported: the treatment effect here is the interaction between the variables $Treat_i$ and $Post_t$. This is also confirmed by the fact that the treatment effect estimated in France is higher in presence of individual fixed effects than in pooled OLS (0.094 vs. 0.079). Selection can also play a role. In Tables 2 and 3, the introduction of the control variables did not affect the magnitude of the treatment effects, implying that treatment was orthogonal to these individual observable characteristics. But if treatment is correlated with unobservable time-invariant characteristics, the OLS estimates will be biased. The introduction of individual fixed-effects will then correct for this potential bias. Comparing the results in column (1) of Tables 5 and 6 to the baseline results suggests positive selection in Portugal and negative selection in France.

To see whether attrition is also a concern, I re-estimate the baseline models on the balanced panel: the results in columns (4) and (9) are very similar to those in Tables 2 and 3.[10]

Figures 8 to 11 show the distributions of job and leisure satisfaction in Portugal and France, as well as the kurtosis and skewness figures. All the distributions have negative skewness, so they are skewed left (i.e. the left tail is long relative to the right tail). This is commonly-found for most satisfaction measures. This skewness is particularly noticeable for job satisfaction in France: 80% of the responses are 4 and 5. To ensure that the main results are not affected by this skewness, I split the latter into high and low values of job/leisure satisfaction with the median as the cut-point. I then re-estimate the effect of the reforms in the baseline specification on the probability of having high job/leisure satisfaction. The results remain consistent with those in the baseline (see columns (5) and (10) of Tables 5 and 6).

4.3. Channels

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[10] Treatment effects are also estimated using the balanced samples without individual fixed-effects. The results, which are unchanged, are available upon request.

The French and Portuguese reforms acted to reduce working hours but stipulated that monthly earnings should remain constant. This implied a mechanical rise in hourly wages. As the entire income-hours package was affected by the legislation, there are at least two potential channels for the rise in subjective well-being: the fall in actual working hours and the rise in hourly wages. In addition, the reduction in the workweek may bring about changes in working practices and working conditions.

I can test for these channels by looking at the impact of the shorter workweek on the other well-being measures in the ECHP: working-hours satisfaction, earnings satisfaction and working-conditions satisfaction.[11] Tables 7 and 8 show the results: the reform increased working-hours satisfaction but did not affect earnings satisfaction. The shorter workweek affects working-conditions satisfaction differently by country: positively in Portugal and insignificantly in France. These results are not in line with Rudolf (2014), who suggests that the positive impact of the reduction in Korean working time was entirely offset by work intensification and worse working conditions. Nevertheless, work intensification is a positive and convex function of working hours (Askenazy (2000)). Also Askenazy (2001) notes that reductions in working time may generate efficient organizational innovations and hence improvements in terms of satisfaction with working conditions.

These results suggest that lower actual working hours is a better candidate than higher hourly wages to explain the rise in subjective well-being following the reforms in France and Portugal. Income satisfaction then seems to be a function of monthly earnings, not earnings per hour, so that empirical work using hourly earnings may be mis-specified. The shorter workweek may also have produced beneficial changes in working practices and conditions (although we only find evidence for this in Portugal).

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[11]Again answered on a one to six scale.

5. Additional Results

5.1. Exploring heterogeneity

Overall the estimated impacts of the shorter workweek on job and leisure satisfaction are of relatively equal size in both countries. However, it may be the case that the effects across groups within country differ.

5.1.1.Job satisfaction and heterogeneity

I first consider gender by adding an interaction term "Treatment*Female" to the analysis. The determinants of subjective well-being different by gender (Fugl-Meyer *et al.* (2002)), and women likely occupy different jobs and are exposed to different working conditions. We might then expect the response to treatment to differ by sex. Table 9 shows that the effects of the shorter workweek are only significantly different from zero for women in Portugal and for men in France, but the difference across gender is only statistically significant in Portugal.

The treatment effect may also differ by industry or occupation. Workers in physically-demanding jobs may benefit more from shorter working hours, for example, so that we expect a greater treatment effect in Industry and Agriculture. In Table 10, the positive impact of the reform on job satisfaction in France is indeed mainly driven by workers in Industry and Agriculture.

Distinguishing the treatment effects by gender or industry first demonstrates that the reforms affected different groups within country. So how can we explain that certain groups benefited more in terms of well-being from shorter workweeks than did other groups? I consider three potential explanations. First, the treatment effect in terms of lower hours may be higher for some workers. Second, monthly income may have evolved differently across groups. Last, other job characteristics may have changed differently across groups. I thus reestimate the D-i-D equations with the interaction terms but with the outcomes of weekly working hours, monthly income (in logs) and a set of three satisfaction questions: satisfaction with working hours, earnings and working conditions.

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Tables A7 and A8 show the results of all these regressions, for Portugal and France respectively. The fall in working hours is of equal size within country across groups,[12] and monthly income did not significantly change (See columns (1) and (2)). However, satisfaction with the different job dimensions changed significantly and differently across groups. The detailed results can be found in columns (3), (4) and (5) of Tables A7 and A8, but for clarity are summarized in Table 11. This Table shows whether the impact of the treatment on the different satisfaction measures for each group within each country is positive and significant at least the 10% level. I also added the impact on job satisfaction in the first column of the Table. Table 11 shows almost no heterogeneity in the treatment effect on hours satisfaction and earning satisfaction: positive and significant for the former and zero for the latter. The results are different for working-conditions satisfaction. Lower standard weekly working hours produced significant increases in working-conditions satisfaction for mean and Industry in France, and for women and in Services in Portugal. A pattern appears when job satisfaction is taken into account: job satisfaction only rose when there was a simultaneous increase in working-hours satisfaction and working-conditions satisfaction. An increase in working-hours satisfaction on its own does not suffice to produce a significant rise in job satisfaction (like in Services in France or for men in Portugal). A rise in satisfaction with working hours may then be a necessary but not sufficient condition for welfare gains. Determining the intrinsic contribution of working-conditions satisfaction is more difficult, as they are here always accompanied by higher working-hours satisfaction.

This heterogeneity in the welfare gains from a shorter workweek does not reflect the different changes in hours of work or labor income. I only observe increases in job satisfaction when both working hours satisfaction and working conditions satisfaction

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[12] The reduction in working time is significantly higher for women than for men in Portugal, but this did not translate into a significantly higher level of working-hours satisfaction.

increase, meaning that reducing working hours is not sufficient in order to produce welfare improvements, working conditions has also to improve.

5.1.2. Heterogeneity in leisure satisfaction

Columns (3) and (4) in Tables 9 and 10 show the treatment estimates on leisure satisfaction by gender and industry in Portugal and France. We here find no heterogeneity.[13] The lack of heterogeneity here is consistent with leisure satisfaction depending only on leisure time, as the drop in hours of work were the same across groups within country (See Tables A7 and A8).

However, a number of contributions in the well-being literature suggest that measures like life satisfaction or GHQ have a relative component (Clark (2003)) and depend on both own and others' outcomes. More specifically, Clark and Etilé (2011) find a positive cross-partial effect between own and spousal BMI on life satisfaction. The same reasoning can be applied to leisure satisfaction, which may reflect both own leisure time and that of other household members. We might expect the welfare gains of shorter workweeks to be higher for the partnered if leisure is jointly produced. Second, under the gender-identity model (Akerlof and Kranston (2000)), partnered men are supposed to take the role of breadwinners while partnered women are homemakers. More leisure time for partnered men will may not then increase their satisfaction as it violates the gender norm, while it may increase that of partnered women.

I explore these hypotheses by interacting treatment with a dummy for being partnered. Columns (1) and (3) of Table 12 show the results for Portugal and France respectively, which are of opposite sign. The positive impact on leisure satisfaction in the baseline regressions seems to be completely driven by partnered workers in France, while in Portugal it is higher for non-partnered workers (although the rise in leisure satisfaction is significant for partnered workers too). The French result is consistent with leisure being

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[13] The treatment estimate is significantly higher for women in Portugal but is also positive and significant for men.

jointly produced, with the positive effect of the treatment potentially being enhanced by partners deciding to work less, even if they are not themselves affected by the shorter workweek (Goux et al. (2014)). To better understand the Portuguese results, I distinguish between partnered men and partnered women. The results by country are presented in columns (2) and (4). I find no significant difference between non-partnered workers and partnered women, while the impact of the shorter workweek is finally statistically non-significantly different from zero for partnered males. This is consistent with the gender-identity model shaping male preferences, as the breadwinner role is violated.

The above analysis showed that the effect of the reduced workweek on leisure satisfaction differs by marital status. I also investigated heterogeneity by the presence of children, or the presence of children interacted by marital status, but found no significant differences.[14]

5.2. Spillover effects in France

The treatment group in the French sample to date has been composed of workers in large firms working more than 35 hours per week prior to the 2000 reform. However, other workers in large firms, who worked less than 35 hour prior to the reform, may have been affected by spillovers. First, Wunder and Heineck (2013) show that underemployed workers have lower subjective well-being. Workers working under 35 hours per week may then benefit from the fall in standard working hours if firms substitute the overtime of treated workers by longer normal hours for those working under 35 hours per week. Second, lower working hours and constant monthly income mechanically implies higher hourly wages. Under the assumption of collective wage bargaining and the mandatory presence of unions in firms with more than 50 employees according to French legislation, this hourly wage rise may be extended to the other workers in large firms. Finally, any improvement in working conditions in large firms will benefit all workers.

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[14] Different specifications were tested (interactions with the number of children in the household, with a dummy for at least one child in the household, and with dummies for children by age bands) but no significant results were found. The detailed results are available upon request.

To check whether workers working under 35 hours in large firms prior to the French reform were exposed to spillovers, I add them to the sample. I distinguish between the direct and spillover effects of the reduction in working time by interacting treatment with a dummy for individual i working under 35 hours prior to the reform.

I first explore spillovers in the objective and observable outcomes: weekly hours of work and log monthly income in columns (1) and (2) respectively. Table 13 shows the results. As expected, the working hours of those working under 35 hours prior to the reform increased by almost 0.9 hours per week, suggesting substitution in large firms between normal and overtime hours. If workers were previously underemployed, longer hours may increase welfare, but those who were initially at their equilibrium and were forced by firms to increase their labor supply may lose out. Estimating the spillover effects on working-hours satisfaction in column (3) shows that workers enjoyed working more (suggesting that they were previously underemployed). This rise in working-hours satisfaction is larger than that of the treated workers. This may reveal that working hours are rival. Clark and Oswald (1996) demonstrates that higher peer income reduces job satisfaction; equally, lower peer hours may increase job satisfaction. Moreover, if promotions are prizes from rank-order tournaments, as in Lazear and Rosen (1981), reducing the gap between employees' working hours (as a measure of effort) in the same firm likely increases the relative contribution of luck to promotions, and so the promotion probability of workers who worked under 35 hours prior to the reform.

Column (2) of Table 13 shows that the monthly labor income of the workers directly concerned by the reduction in working time remained constant, as stated by the French government. However, the other workers in large firms experienced a 3.9% rise in monthly income. Even if this increase is not significantly different from zero (P-value = 0.111), this would be consistent with the hypothesis of collective wage bargaining. No significant impact on earnings satisfaction in column (4) is detected.

It is difficult to measure working conditions here, and I instead consider working-conditions satisfaction. The results in column (5) do not reveal any significant changes in this dimension.

As those working under 35 hours prior to the reform increased their labor supply and benefited from higher monthly income, we might expect their job satisfaction to rise. However, if leisure satisfaction is positively correlated with hours of leisure, this should fall. Columns (6) and (7) evaluate the spillover effects on job and leisure satisfaction. The spillover estimates here are both positive, but not statistically significant. However, while the spillover effect on leisure satisfaction (0.054 with a standard error of 0.094) is far from being significant, this is somewhat less the case for the spillover effect on job satisfaction (0.066 with a standard error of 0.067). This lack of precision reflects that I cannot precisely identify colleagues in the ECHP. The share of workers above the threshold of 35 hours per week might differ within large firms, and so will the intensity of the spillover effects. Interacting the treatment variable with a proxy for spillover intensity (the share of workers working under 35 hours prior to the reform by firm) would certainly increase the precision of these estimates.

5.3. Long run reform impacts

A large number of contributions in psychology argue that utility is subject to hedonic adaptation. According to Frederick and Lownstein (1999), "Hedonic adaptation refers to a reduction in the affective intensity of favorable and unfavorable circumstances". This adaptation has been demonstrated empirically using subjective well-being data: Clark et al. (2013) shows that individuals fully adapt to life events like marriage, divorce and widowhood, but not to unemployment. Oswald and Powdthavee (2008) concludes that adaptation to physical disability is only partial.

The analysis of adaptation to a reform is of policy importance, as it helps to determine whether public spending on labor-market reforms will produce long-run increases in happiness. The analysis of adaptation requires panel data on the same

individuals for a number of years after the reform. As the ECHP stopped in 2001, we cannot address adaptation in France. But the Portuguese reform was implemented earlier in December 1996. I explore this question via the following empirical equation for Portugal:

$$SWB_{it} = \sum_{s=-1}^{4} \beta(Treat_i * Year_t) + \gamma_5 X_{it} + \alpha_i + \lambda_t + \epsilon_{it} \qquad (2)$$

where $t=0$ in the first year of implementation. Using 1994 and 1995 as the reference periods, I estimate the impact of the shorter workweek on job and leisure satisfaction by year. The anticipation effects are measured at *t-1* and we expect no significant impacts, consistent with the placebo tests above. We estimate one coefficient per year, from the year of implementation to the last wave of the dataset. If workers adapt to the reform, the estimated coefficient should converge towards zero over time; without adaptation, the coefficients should remain significantly different from zero and of relatively similar size.

I previously compared Portugal and France in Tables 2 and 3 by estimating the impact of the workweek reform two waves after its implementation (as I could not go further forward in time for the French reform with these data); re-estimating equation (1) over all of the five future waves available in Portugal yields estimates similar to those in the baseline (See columns (1) and (3) of Tables 2 and 14). This is a first piece of evidence that adaptation does not seem to play a role here. Estimating equation (2) yields a more detailed picture of adaptation, and columns (2) and (4) of Tables 14 show the results for job and leisure satisfaction respectively. The estimates are insignificant one year before the treatment, so that there is no anticipation. This is consistent with the parallel-trend assumption and the results of the placebo tests. The coefficients between the first and the third treatment year are all positive and significantly different from zero at the 1% level. The effect of the reduction in working time on leisure satisfaction is remarkably steady over time, while there is a peak during the second year in job satisfaction. However, the Wald tests do not reject the hypothesis of equality of this three coefficients. In the last wave, the impact of the shorter workweek on job and leisure satisfaction is a little lower but still positive and significant. I should also stress that the estimates are less precise in

the last year due to the falling number of observations in the sample over time for various reasons (such as attrition and leaving the labor force).

Regarding columns (2) and (4) of Table 14, it is difficult to conclude that Portuguese workers adapted to the reduction in working time. The welfare gains do not then seem to be transitory and they remain over a number of years.

6. Conclusion

I exploit changes in working-time regulations in Portugal and France to evaluate the net impact of a shorter workweek on worker subjective well-being. These reforms increased the job and leisure satisfaction of the affected workers in both countries. A number of potential channels are explored. Satisfaction with working hours and working conditions appear more important than earnings satisfaction. The positive well-being effects of shorter workweeks are larger for women and those with relatively strong family constraints in Portugal, and for workers in Industry and Agriculture in France.

By altering the price of overtime, the Portuguese and French governments then provided incentives for employers to offer a new earning-hours package that increased the well-being of their employees, without a drop in job quality that might offset the positive satisfaction impact of the new income-hours package. While the previous literature (Rudolf (2014), Hamermesh *et al.* (2014)) found mixed evidence regarding worker welfare, this paper is the first to identify positive and robust effects on the satisfaction of treated workers. This paper is also the first to evaluate the long-run impact of such reforms, concluding that workers did not adapt to the positive impacts of the shorter workweek.

These results do of course come from two specific countries and the external validity of the present analysis remains open to debate. However, this is not necessarily an intrinsic limitation but should lead to further research to understand and identify under which

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conditions a shorter workweek improves worker well-being and when falling job quality may offset these gains.

While the present analysis has shown that a shorter workweek benefits workers, it should also be stressed that these reforms came at a cost that has not been taken into account. Payroll taxes were partially cut in France to ease the implementation of the shorter workweek, which continues to represent a significant annual cost. The French Ministry of Labor published estimates in 2011 of the raw cost per year between 2002 and 2010. This rose over time, from 16 billion Euros in the first year to 22 billion Euros during later years[15]. Assuming that 7 million of workers in France did benefit from the shorter workweek, does an increase of 700,000 points of job satisfaction[16] worth such costs? The question of the net welfare impact is raised here but the results of this article are not sufficient to draw any conclusion and further researches need to be done to fully account for all the costs and benefits of reduced workweeks.

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[15] https://www.senat.fr/questions/base/2011/qSEQ110217120.html

[16] The average increase in job satisfaction produced by the reduced workweek is close to 0.1. Multiplying this average effect by the total number of workers concerned in France leads to an increase of 700,000 points of job satisfaction (0.1x7,000,000).

References

Akerlof, G. (1976). The economics of caste and of the rat race and other woeful tales. *Quarterly Journal of Economics*, 599-617.

Akerlof, G., & Kranton, R. E. (2000). Economics and identity. *Quarterly Journal of Economics, 65*(3), 715-753.

Askenazy, P. (2000). Réduction du temps de travail : organisation et conditions de travail. *Revue Economique*, 547-556.

Askenazy, P. (2001). Réduction du temps de travail et innovations organisationnelles négociées. *Revue d'Economie Politique*, *111*(2), 247-269.

Askenazy, P. (2008). A Primer on the 35-Hour in France, 1997-2007. *Available at SSRN 1136207*.

Bassanini, A., & Caroli, E. (2014). Is work bad for health? The role of constraint vs choice. *Annals of Economics and Statistics/ANNALES D'ÉCONOMIE ET DE STATISTIQUE,* 119-120.

Bell, D., Otterbach, S., & Sousa-Poza, A. (2012). Work hours constraints and health. *Annals of Economics and Statistics/ANNALES D'ÉCONOMIE ET DE STATISTIQUE*, 35-54.

Clark, A. E., & Oswald, A. J. (1994). Unhappiness and unemployment. *Economic Journal*, *104*(424), 648-659.

Clark, A. E., & Oswald, A. J. (1996). Satisfaction and comparison income. *Journal of Public Economics*, *61*(3), 359-381.

Clark, A.E., Georgellis, Y., and Sanfey, P. (1998). Job Satisfaction, Wage Changes and Quits: Evidence from Germany. *Research in Labor Economics,* 17, 95-121.

Clark, A. E., & Etilé, F. (2011). Happy spouse: Spousal weight and individual well-being. *Journal of Health Economics, 30*(5), 1124-1136.

Clark, A. E., & Georgellis, Y. (2013). Back to baseline in Britain: adaptation in the British household panel survey. *Economica, 80*(319), 496-512.

Clark, A. E. (1998). Les indicateurs de la satisfaction au travail: Quelles sont les caractéristiques d'un bon emploi? Observations recueillies dans certains pays de l'OCDE. *OECD Labour Market and Social Policy Occasional Papers*.

Clark, A. E. (2003). Unemployment as a social norm: Psychological evidence from panel data. *Journal of Labor Economics, 21*(2), 323-351.

Clark, A. (2005). What makes a good job? Evidence from OECD countries. In *Job Quality and Employer Behaviour*. Palgrave Macmillan UK, 11-30

Clark, A. E. (2015). What makes a good job? Job quality and job satisfaction. *IZA World of Labor*, Article 215.

Clark, A.E. (2016). "SWB as a Measure of Individual Well-Being". In M. Adler and M. Fleurbaey (Eds.), *Oxford Handbook of Well-Being and Public Policy*. Oxford: Oxford University Press

Collewet, M., & Loog, B. (2014). The effect of weekly working hours on life satisfaction. *Working paper – Maastricht University*

Estevão, M., & Sá, F. (2008). The 35-hour workweek in France: Straightjacket or welfare improvement?.*Economic Policy*, *23*(55), 418-463.

Farzin, Y. H., & Akao, K. I. (2004). Non-pecuniary value of employment and individual labor supply. *FEEM Working Paper No. 24*.

Ferrer-i-Carbonell, A., & Frijters, P. (2004). How Important is Methodology for the estimates of the determinants of Happiness?. *Economic Journal*, *114*(497), 641-659.

Frederick, S. & Loewenstein, G., (1999). Hedonic adaptation. In E. Diener, N. Schwarz and D. Kahneman (EDS.) *Hedonic Psychology: Scientific Approaches to Enjoyment, Suffering, and Well-being*. Russell Sage Foundation. New-York. 302-329.

Fugl-Meyer, A. R., Melin, R., & Fugl-Meyer, K. S. (2002). Life satisfaction in 18-to 64-year-old Swedes: in relation to gender, age, partner and immigrant status. *Journal of Rehabilitation Medicine*, *34*(5), 239-246.

Goux, D., Maurin, E., & Petrongolo, B. (2014). Worktime regulations and spousal labor supply. *American Economic Review*, *104*(1), 252-276.

Hamermesh, D. S., Kawaguchi, D., & Lee, J. (2014). Does labor legislation benefit workers? Well-being after an hours reduction. *National Bureau of Economic Research. (No. w20398).*

Kapteyn, A., Kalwij, A., & Zaidi, A. (2004). The myth of worksharing. *Labour Economics*, *11*(3), 293-313.

Kelliher, C., & Anderson, D. (2010). Doing more with less? Flexible working practices and the intensification of work. *Human Relations*, *63*(1), 83-106.

König, H., & Pohlmeier, W. (1989). Worksharing and factor prices: a comparison of three flexible functional forms for nonlinear cost schemes. *Journal of Institutional and Theoretical Economics (JITE)/Zeitschriftfür die gesamteStaatswissenschaft*, *145*(2), 343-357.

König, H., & Pohlmeier, W. (1988). Employment, labour utilization and procyclical labour productivity. *Kyklos*, *41*(4), 551-572.

Manning, A. (2003). *Monopsony in Motion: Imperfect Competition in Labor Markets*. Princeton University Press.

Oswald, A. J., & Powdthavee, N. (2008). Does happiness adapt? A longitudinal study of disability with implications for economists and judges. *Journal of Public Economics, 92*(5), 1061-1077.

Raposo, P. S., & van Ours, J. C. (2010). How working time reduction affects jobs and wages. *Economics Letters*, *106*(1), 61-63.

Rudolf, R. (2014). Work shorter, be happier? Longitudinal evidence from the Korean five-day working policy. *Journal of Happiness Studies*, *15*(5), 1139-1163.

Urry, H., Nitschke, J., Dolski, I., Jackson, D., Dalton, K., Mueller, C., Rosenkranz, M., Ryff, C., Singer, B., & Davidson, R. (2004). Making a life worth living neural correlates of well-being. *Psychological Science*, *15*(6), 367-372.

Van Praag, B. M., & Ferrer-i-Carbonell, A. (2008). *Happiness Quantified: A Satisfaction Calculus Approach*. Oxford University Press.

Varejao, J. (2005). *Work-sharing revisited-lessons from a natural experiment*. Mimeo, Universidade do Porto.

Ward, G. (2015). Is Happiness a Predictor of Election Results?. *CEP Discussion Paper No 1343*.

Winkelmann, L., & Winkelmann, R. (1998). Why are the unemployed so unhappy? Evidence from panel data. *Economica*, *65*(257), 1-15.

Wunder, C., & Heineck, G. (2013). Working time preferences, hours mismatch and well-being of couples: Are there spillovers?. *Labour Economics, 24*, 244-252.

Figure 1: The Evolution of Working Hours in Europe (1983-2014)
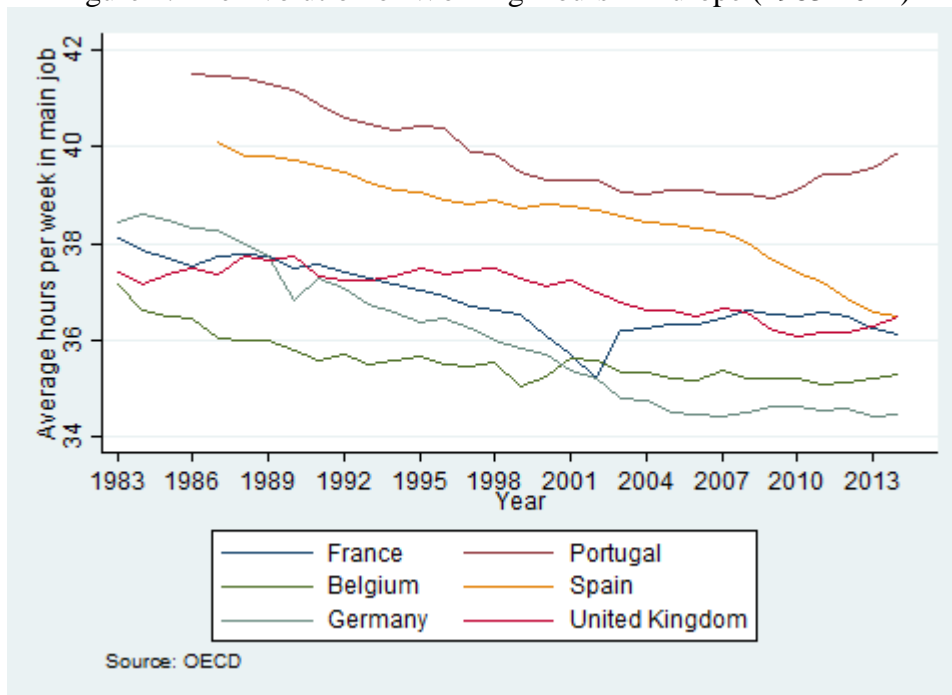
Figure 2: The Evolution of Actual Working Hours - Portugal

Source: Own calculations - ECHP
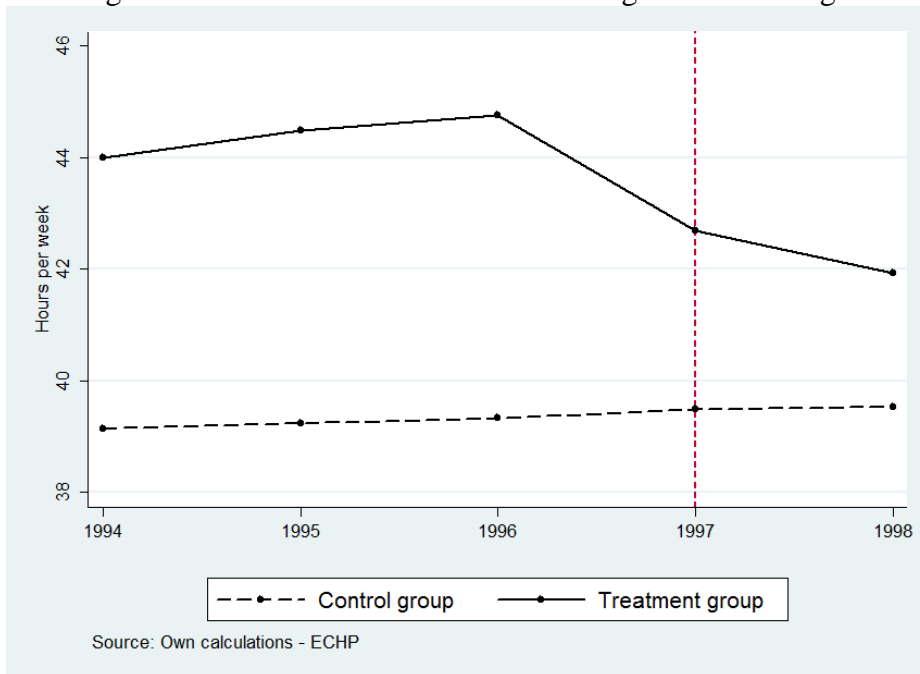
Figure 3: The Evolution of Actual Working Hours - France

Source: Own calculations - ECHP
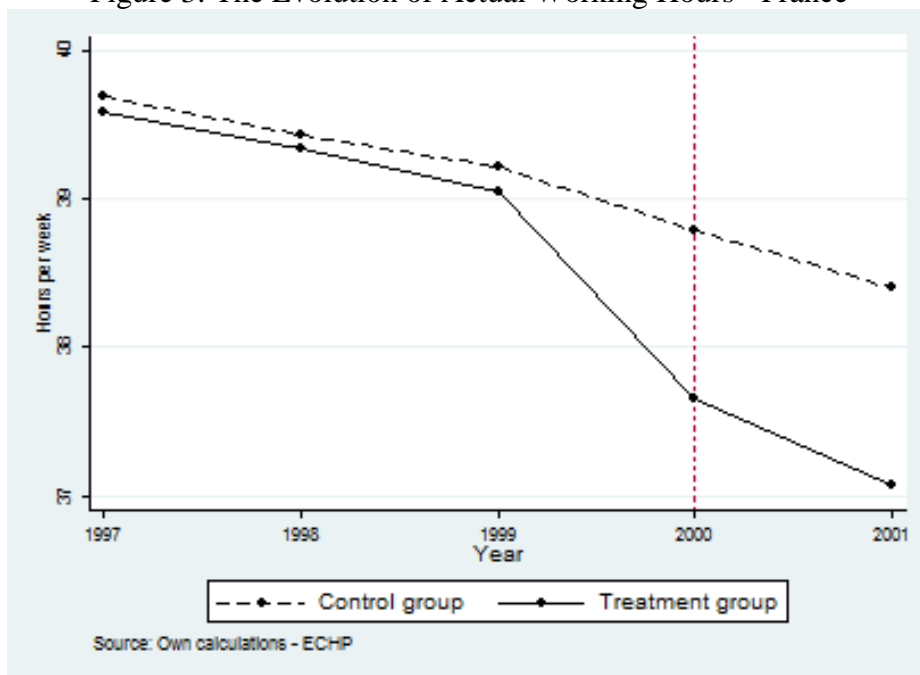
Figure 4: The Evolution of Job Satisfaction - Portugal

Source: Own calculations - ECHP
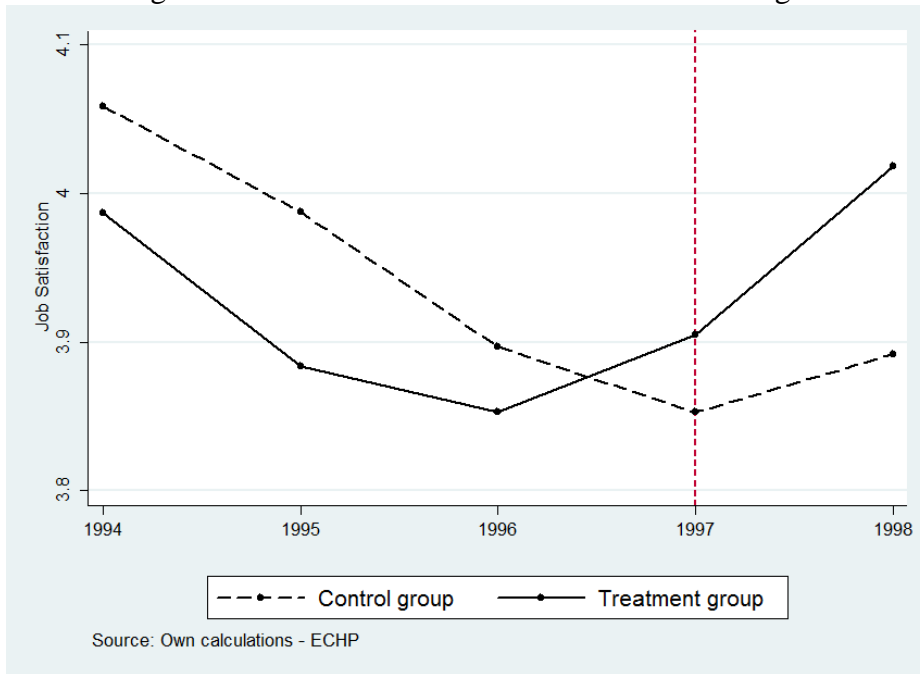
Figure 5: The Evolution of Leisure Satisfaction – Portugal

Source: Own calculations - ECHP
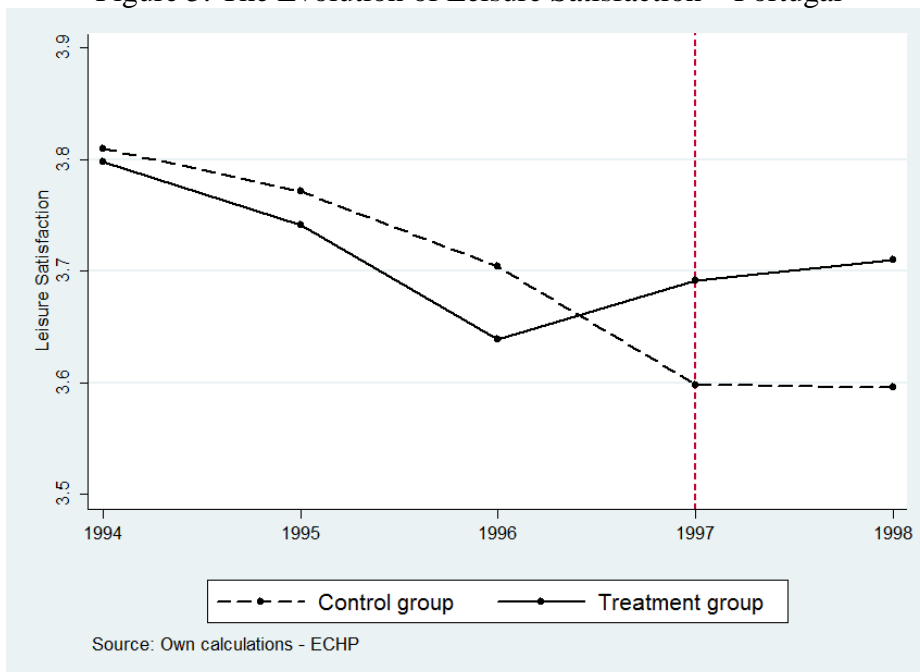
Figure 6: The Evolution of Job Satisfaction - France

Source: Own calculations - ECHP
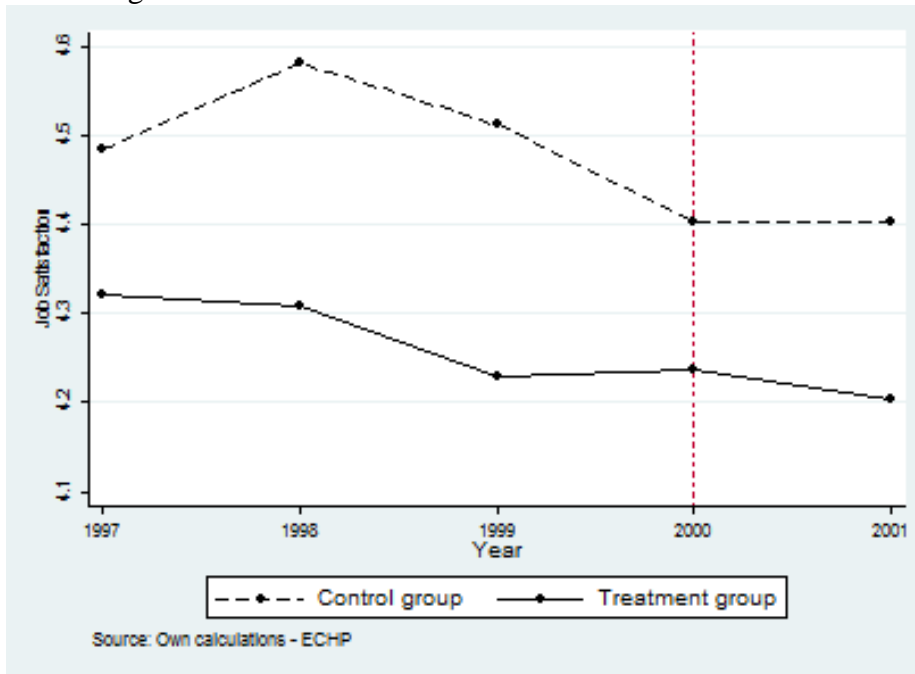
Figure 7: The Evolution of Leisure Satisfaction - France

Source: Own calculations - ECHP
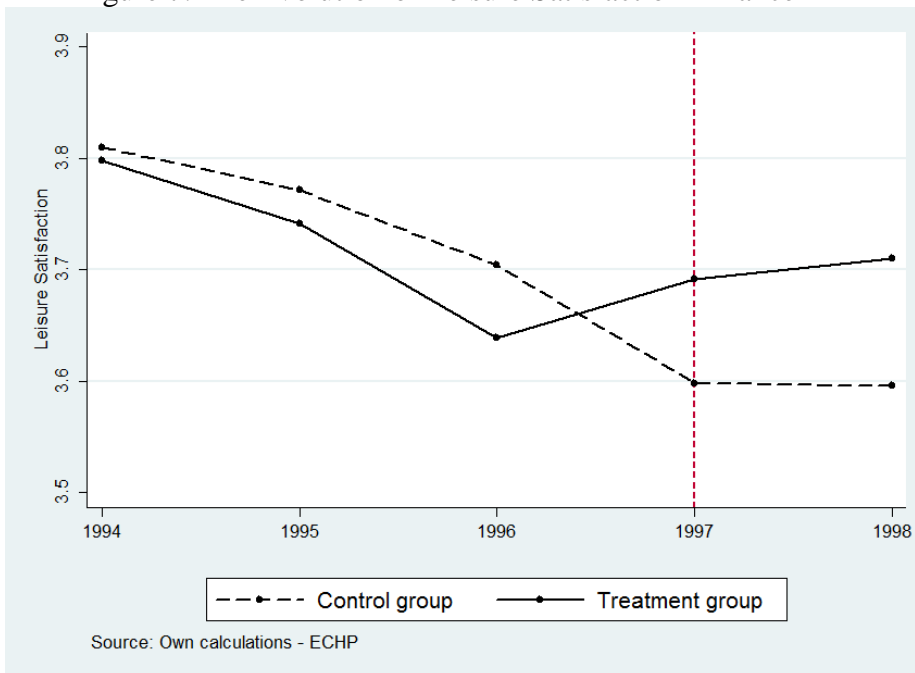
Figure 8: The Distribution of Job Satisfaction - Portugal

Skewness = -0.30   Kurtosis = 4.16
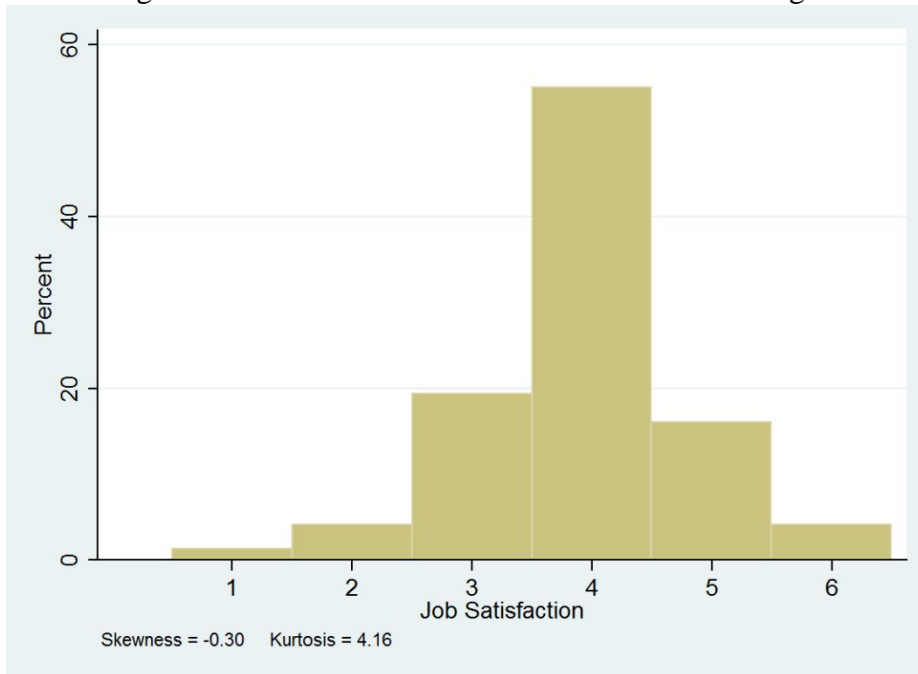
Figure 9: The Distribution of Leisure Satisfaction - Portugal

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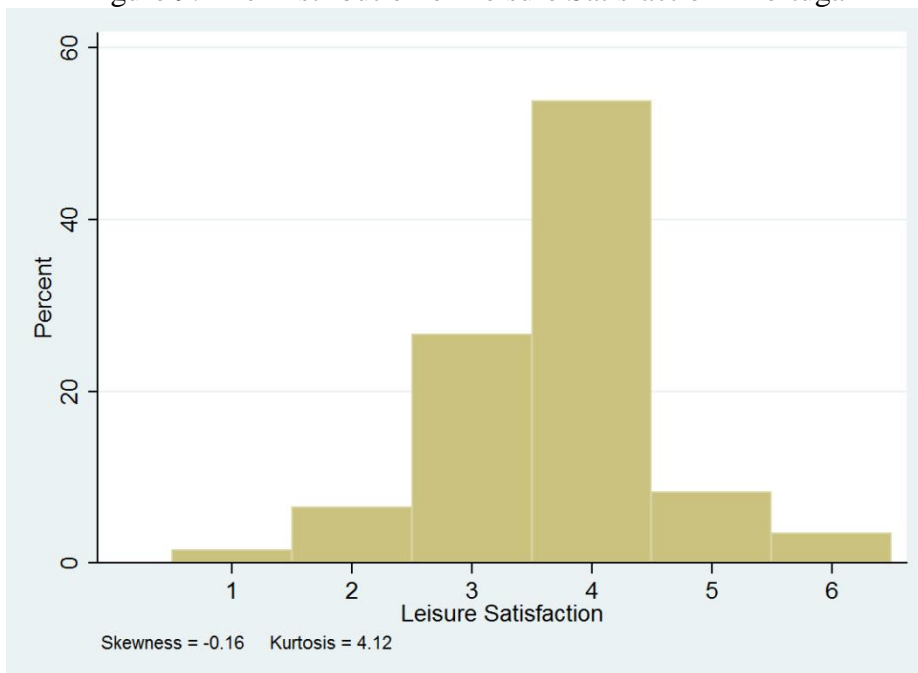
Figure 10: The Distribution of Job Satisfaction - France

Skewness = -1.05   Kurtosis = 4.58
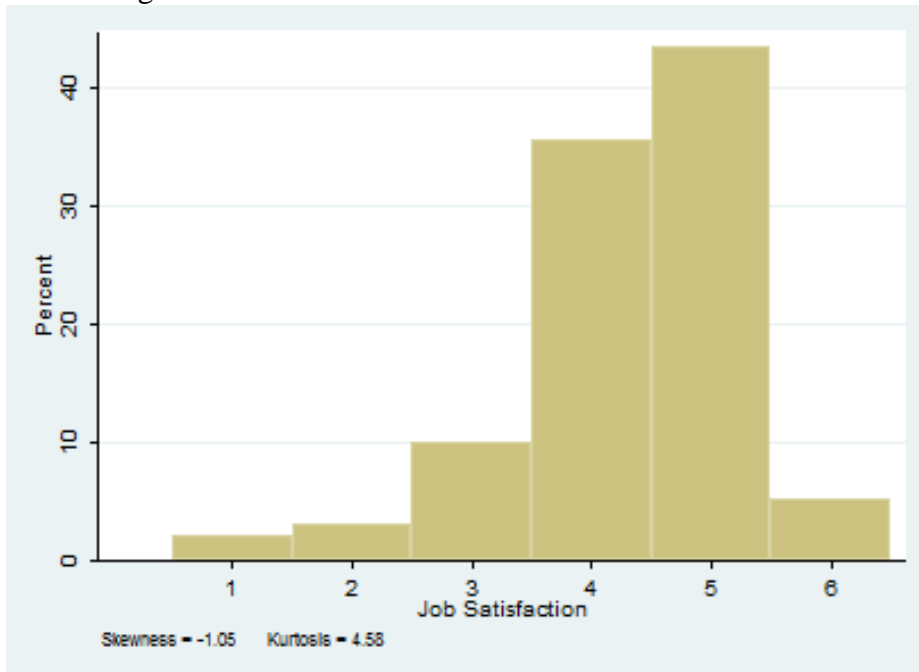
Figure 11: The Distribution of Leisure Satisfaction - France

Skewness = -0.66   Kurtosis = 3.00
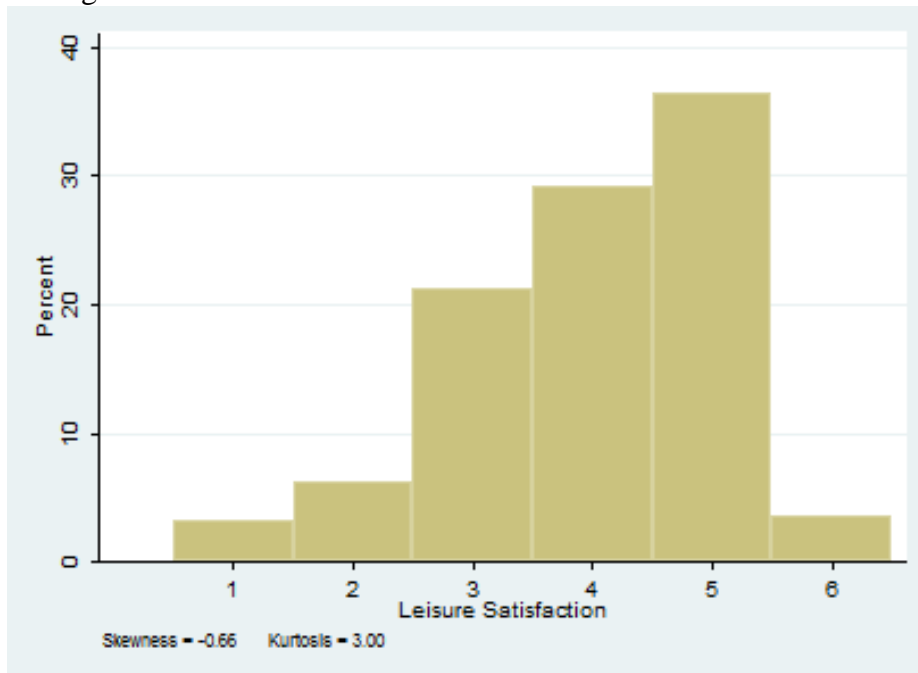
Table 1: Descriptive Statistics

	Portugal (1)	France (2)	Difference (1)-(2)
Outcomes:			
Job Satisfaction [1-6]	3.927	4.316	-0.389***
	(0.893)	(0.981)	[0.017]
Leisure Satisfaction [1-6]	3.711	4.005	-0.294***
	(0.895)	(1.123)	[0.018]
Working-hours Satisfaction [1-6]	3.922	4.229	-0.306***
	(0.822)	(1.018)	[0.016]
Earnings Satisfaction [1-6]	3.171	3.508	-0.337***
	(1.004)	(1.184)	[0.019]
Working-conditions Satisfaction [1-6]	4.144	4.144	0.000
	(0.882)	(1.124)	[0.018]
Individual characteristics:			
Age	35.018	39.662	-4.643***
	(11.00)	(9.046)	[0.186]
Female (%)	0.364	0.354	0.011
	(0.481)	(0.478)	[0.009]
Married (%)	0.636	0.614	0.022**
	(0.481)	(0.487)	[0.009]
Separated (%)	0.011	0.004	0.008***
	(0.104)	(0.061)	[0.002]
Divorced (%)	0.017	0.071	-0.054***
	(0.128)	(0.256)	[0.003]
Widowed (%)	0.013	0.020	-0.007***
	(0.114)	(0.141)	[0.002]
Never Married (%)	0.320	0.292	0.028***
	(0.468)	(0.455)	[0.008]
Number of children	0.870	0.861	0.008
	(0.996)	(1.019)	[0.018]
Personal labor income (log)	11.212	9.057	2.155***
	(0.405)	(0.364)	[0.007]
Professionals (%)	0.020	0.048	-0.028***
	(0.141)	(0.215)	[0.001]
Technicians (%)	0.066	0.203	-0.138***
	(0.248)	(0.402)	[0.006]
Clerks (%)	0.119	0.171	-0.052***
	(0.324)	(0.376)	[0.006]
Service Workers (%)	0.167	0.084	0.083***
	(0.373)	(0.278)	[0.006]
Skilled Agricultural Workers (%)	0.027	0.012	0.015***
	(0.163)	(0.107)	[0.003]
Craft and Related Trade Workers (%)	0.315	0.211	0.104***
	(0.465)	(0.408)	[0.008]
Plant and Machine Workers (%)	0.128	0.210	-0.082***
	(0.334)	(0.407)	[0.007]
Elementary Occupations (%)	0.150	0.061	0.090***
	(0.357)	(0.239)	[0.006]
Observations	8575	4819	N/A

Standard deviations are in parentheses. Standard errors are in brackets. *, **, *** respectively indicate that the difference between the means is significant at the 10, 5 and 1% levels.

Table 2: The Shorter Workweek and Subjective Wellbeing:
Panel results in Portugal

	Job Satisfaction		Leisure Satisfaction	
	(1)	(2)	(3)	(4)
Treatment	0.070**	0.070**	0.134***	0.130***
	(0.028)	(0.028)	(0.032)	(0.032)
Observations	8575	8575	8575	8575
Individuals	2531	2531	2531	2531
R²	0.005	0.018	0.006	0.014
Controls	No	Yes	No	Yes

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in the private sector. "Treatment" corresponds to the interaction "Treat$_i$*Post$_t$" in equation (1). Controls include the log of income, occupation, region, marital status, the number of children, individual and time fixed effects. *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table 3: The Shorter Workweek and Subjective Wellbeing:
Panel results in France

	Job Satisfaction		Leisure Satisfaction	
	(1)	(2)	(3)	(4)
Treatment	0.100**	0.094**	0.140***	0.148***
	(0.042)	(0.043)	(0.047)	(0.047)
Observations	4819	4819	4819	4819
Individuals	1166	1166	1166	1166
R²	0.008	0.015	0.006	0.014
Controls	No	Yes	No	Yes

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in the private sector. "Treatment" corresponds to the interaction "Treat$_i$*Post$_t$" in equation (1). Controls include the log of income, occupation, region, marital status, the number of children, individual and time fixed effects. *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table 4: The Shorter Workweek and Subjective Wellbeing:
Placebo tests

	Portugal		France	
	(1)	(2)	(3)	(4)
	Job Sat.	Leisure Sat.	Job Sat.	Leisure Sat.
Placebo	-0.007	-0.048	-0.014	0.004
	(0.042)	(0.049)	(0.053)	(0.060)
Observations	5332	5332	2847	2847
Individuals	2386	2386	1166	1166
R²	0.026	0.002	0.015	0.020
Controls	Yes	Yes	Yes	Yes

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in the private sector and the waves after the implementation of the legislation changes are excluded. "Placebo" is a dummy equal to 1 one year before the legislation change in the treatment group. Controls include the log of income, occupation, region, marital status, the number of children, individual and time fixed effects. *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table 5: Robustness checks: Portugal

	Job Satisfaction					Leisure Satisfaction				
	(1) Pooled OLS	(2) Adjusted Probit	(3) Ordered Probit	(4) Balanced Panel	(5) High JS	(6) Pooled OLS	(7) Adjusted Probit	(8) Ordered Probit	(9) Balanced Panel	(10) High LS
Treatment	0.130**	0.082**	0.313**	0.085**	0.056**	0.170**	0.139**	0.418**	0.123**	0.063**
	(0.028)	(0.033)	(0.072)	(0.033)	(0.016)	(0.033)	(0.033)	(0.073)	(0.038)	(0.018)
Observations	8575	8575	8575	6220	8575	8575	8575	8575	6220	8575
Individuals	2531	2531	2531	1244	2531	2531	2531	2531	1244	2531
R²	0.100	0.018	0.041	0.047	0.030	0.074	0.014	0.027	0.014	0.008

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in the private sector and waves after the implementation of the legislation changes are excluded. Controls include the log of income, occupation, region, marital status, the number of children, individual and time fixed effects. *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table 6: Robustness checks: France

	Job Satisfaction					Leisure Satisfaction				
	(1) Pooled OLS	(2) Adjusted Probit	(3) Ordered Probit	(4) Balanced Panel	(5) High JS	(6) Pooled OLS	(7) Adjusted Probit	(8) Ordered Probit	(9) Balanced Panel	(10) High LS
Treatment	0.079*	0.110**	0.168	0.092**	0.051*	0.120**	0.145***	0.221**	0.150***	0.045*
	(0.043)	(0.052)	(0.072)	(0.046)	(0.029)	(0.048)	(0.048)	(0.098)	(0.052)	(0.027)
Observations	4819	4819	4819	4045	4819	4819	4819	4819	4045	4819
Individuals	1166	1166	1166	809	1166	1166	1166	1166	809	1166
R²	0.053	0.016	0.021	0.014	0.010	0.051	0.013	0.019	0.013	0.012

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in the private sector and waves after the implementation of the legislation changes are excluded. Controls include the log of income, occupation, region, marital status, the number of children, individual and time fixed effects. *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table 7: The Shorter Workweek and Other Subjective Outcomes:
Panel results in Portugal

	Hours Satisfaction	Earning Satisfaction	Working-conditions Satisfaction
Treatment	0.104***	0.004	0.070**
	(0.031)	(0.006)	(0.032)
Observations	8568	8568	8568
Individuals	2531	2531	2531
R²	0.009	0.006	0.006

Note: Standard errors are clustered at the individual level. The sample is constituted of full-time employees in the private sector. "Treatment" corresponds to the interaction "$Treat_i*Post_t$" in equation (1). *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table 8: The Shorter Workweek and Other Subjective Outcomes:
Panel results in France

	Hours Satisfaction	Earning Satisfaction	Working-conditions Satisfaction
Treatment	0.145**	0.008	0.065
	(0.057)	(0.009)	(0.058)
Observations	4819	4819	4819
Individuals	1166	1166	1166
R²	0.012	0.011	0.013

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in the private sector. "Treatment" corresponds to the interaction "$Treat_i*Post_t$" in equation (1). *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table 9: The Shorter Workweek and Subjective Well-being:
Panel results by Gender

	Job Satisfaction		Leisure Satisfaction	
	Portugal	France	Portugal	France
Treatment	0.046	0.105**	0.103***	0.164***
	(0.036)	(0.045)	(0.035)	(0.050)
Treatment*Female	0.099**	-0.035	0.080*	-0.045
	(0.046)	(0.051)	(0.048)	(0.050)
Observations	8575	4819	8575	4819
Individuals	2531	1166	2531	1166
R²	0.018	0.015	0.014	0.014
Total implied effect for Women	0.145***	0.071	0.183***	0.119**
	(0.044)	(0.056)	(0.045)	(0.052)
Total implied effect for Men	0.046	0.105**	0.104***	0.164***
	(0.036)	(0.045)	(0.035)	(0.050)

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in the private sector. "Treatment" corresponds to the interaction "Treat$_i$*Post$_t$" in equation (1). Controls include the log of income, occupation, region, marital status, the number of children, individual and time fixed effects. *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table 10: The Shorter Workweek and Subjective Well-being:
Panel results by Industry

	Job Satisfaction		Leisure Satisfaction	
	Portugal	France	Portugal	France
Treatment	0.086**	0.037	0.155***	0.128**
	(0.037)	(0.053)	(0.041)	(0.055)
Treatment*Industry	-0.012	0.083*	-0.043	0.055
	(0.039)	(0.048)	(0.044)	(0.048)
Observations	8575	4720	8575	4720
Individuals	2531	1144	2531	1144
R²	0.018	0.016	0.014	0.015
Total implied effect in Industry	0.074**	0.119***	0.112***	0.184***
	(0.036)	(0.046)	(0.036)	(0.052)
Total implied effect in Services	0.086**	0.037	0.155***	0.128**
	(0.037)	(0.053)	(0.041)	(0.055)

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in private sector. "Treatment" corresponds to the interaction "$Treat_i * Post_t$" in equation (1) and "Industry" is a dummy for individual i working in Industry or Agriculture. Controls include the log of income, occupation, region, marital status, the number of children, individual and time fixed effects. *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table 11: The Shorter Workweek and Other Subjective Outcomes:
Panel results by Gender and Industry

			Job Sat.	Hours Sat.	Earnings Sat.	Working cond. Sat.
France	Gender	Men	+	+	0	+
		Women	0	0	0	0
	Sector of activity	Industry	+	+	0	+
		Services	0	+	0	0
Portugal	Gender	Men	0	+	0	0
		Women	+	+	0	+
	Sector of activity	Industry	+	+	0	0
		Services	+	+	0	+

Note: "+" indicates that the treatment has a positive impact on the outcome significant at 10% level at least. "0" means that the treatment has no significant impact on the outcome. Detailed regressions can be found in Tables A7 and A8.

Table 12: The Shorter Workweek and Leisure Satisfaction:
Panel results by Marital Status

	Portugal		France	
	(1)	(2)	(3)	(4)
Treatment	0.186***	0.186***	0.038	0.038
	(0.043)	(0.043)	(0.067)	(0.067)
Treatment*Partnered	-0.081*	-0.118**	0.137**	0.158**
	(0.045)	(0.049)	(0.059)	(0.062)
Treatment*Partnered*Female		0.107		-0.065
		(0.060)		(0.058)
Observations	8575	8575	4819	4819
Individuals	2531	2531	1166	1166
R²	0.014	0.015	0.015	0.015
Total implied effect for non-partnered	0.186***	0.186***	0.038	0.038
	(0.043)	(0.043)	(0.067)	(0.067)
Total implied effect for partnered	0.105***		0.175***	
	(0.035)		(0.049)	
Total implied effect for partnered men		0.068*		0.196***
		(0.040)		(0.052)
Total implied effect for partnered women		0.176***		0.131**
		(0.053)		(0.063)

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in the private sector. "Treatment" corresponds to the interaction "Treat$_i$*Post$_t$" in equation (1) and "Partnered" is a dummy for individual i having a partner at time t. Controls include the log of income, occupation, region, marital status, the number of children, individual and time fixed effects. *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table 13: Spillover Effects of the Shorter Workweek on Different Outcomes:
Panel results in France

	WH/week	Log(income)	Hours Sat.	Earnings Sat.	Working Cond. Sat.	Job Sat.	Leis Sat.
	(1)	(2)	(3)	(4)	(5)	(3)	(4)
Treatment	-1.148***	-0.004	0.125**	0.010	0.009	0.096**	0.132***
	(0.150)	(0.009)	(0.058)	(0.010)	(0.009)	(0.043)	(0.047)
Treatment*	2.046***	0.043*	0.147	0.016	0.012	-0.030	-0.077
<35 hours prior to the reform	(0.409)	(0.024)	(0.091)	(0.016)	(0.014)	(0.062)	(0.074)
Observations	5371	5371	5368	5368	5368	5371	5371
Individuals	1367	1367	1367	1367	1367	1367	1367
R^2	0.161	0.199	0.004	0.002	0.005	0.008	0.006
Direct effects of the Reduced	-1.148***	-0.004	0.125**	0.010	0.009	0.096**	0.132***
Workweek	(0.150)	(0.009)	(0.058)	(0.010)	(0.009)	(0.043)	(0.047)
Spillover effects of the	0.897**	0.039	0.272***	0.026	0.021	0.066	0.054
Reduced Workweek	(0.419)	(0.024)	(0.096)	(0.017)	(0.015)	(0.067)	(0.095)

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in the private sector. "Treatment" corresponds to the interaction "Treat$_i$*Post$_t$" in equation (1). Controls include the log of income (except in column (2)), occupation, region, marital status, the number of children, individual and time fixed effects. *, **, *** indicate significance at the 10%, 5% and 1% levels respectively

Table 14: The Long-Run Impacts of the Shorter Workweek on Well-being:
Panel results in Portugal

	Job Satisfaction		Leisure Satisfaction	
	(1)	(2)	(3)	(4)
Treatment	0.086***		0.100***	
	(0.019)		(0.028)	
One year before the treatment		0.018		-0.038
		(0.035)		(0.040)
First year of Treatment		0.081***		0.095***
		(0.027)		(0.034)
Second year of Treatment		0.122***		0.107***
		(0.031)		(0.039)
Third year of Treatment		0.088***		0.100***
		(0.026)		(0.037)
Fourth year of Treatment		0.071*		0.069*
		(0.042)		(0.041)
Observations	14045	14045	14045	14045
Individuals	2531	2531	2531	2531
R²	0.010	0.011	0.011	0.012

Note: Standard errors are clustered at the individual level. The sample is constituted of full-time employees in the private sector. "Treatment" corresponds to the interaction "$Treat_i*Post_t$" in equation (1). *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Appendix:

Table A1: Review of the existing literature

Author(s)	Countries	Years of implementation	Reduction in working time	Dataset	Nature of the dataset	Results
Rudolf (2014)	Korea	From 1998 to 2008	44 hours/week to 40 hours/week	Korean Labor and Income Panel Study	Panel	• Women: Increase in WHS but no impact on JS and LS • Men: Increase in WHS but no impact on JS and LS
	Japan	From 1988 to 1997	48 hours/week to 40 hours/week	National Surveys of Lifestyle Preferences	Cross-section	• Women: Increase in LS • Men: No impact on LS
Hamermesh *et al.* (2014)	Korea	From 1998 to 2008	44 hours/week to 40 hours/week	General Social Survey	Cross-section	• Women: No impact on LS • Men: Increase in LS
				Korean Labor and Income Panel Study	Panel	

Note: WHS = Working Hours Satisfaction; JS = Job Satisfaction; LS = Life satisfaction.

Table A2: Descriptive statistics by treatment group and period: Portugal

Variables:	Control Group			Treatment Group			Diff-in-diff
	Pre-period	Post-Period	Difference	Pre-period	Post-Period	Difference	
Female	0.422	0.393	-0.028*	0.370	0.363	-0.007	0.021*
	(0.010)	(0.012)	(0.016)	(0.007)	(0.008)	(0.011)	(0.011)
Age	35.731	35.706	-0.025	34.926	35.302	0.376	0.401
	(0.223)	(0.277)	(0.356)	(0.151)	(0.193)	(0.245)	(0.245)
Married	0.655	0.636	-0.019	0.634	0.640	0.006	0.025**
	(0.010)	(0.012)	(0.016)	(0.007)	(0.008)	(0.011)	(0.011)
Separated	0.014	0.017	0.002	0.011	0.012	0.001	-0.001
	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)	(0.002)
Divorced	0.017	0.018	0.001	0.017	0.016	-0.000	-0.001
	(0.003)	(0.003)	(0.004)	(0.002)	(0.002)	(0.003)	(0.003)
Widowed	0.011	0.012	0.001	0.012	0.014	0.001	0.000
	(0.002)	(0.003)	(0.004)	(0.002)	(0.002)	(0.003)	(0.003)
Never Married	0.302	0.318	0.015	0.325	0.318	-0.007	-0.022**
	(0.010)	(0.012)	(0.015)	(0.006)	(0.008)	(0.010)	(0.010)
Children	0.867	0.806	-0.060*	0.891	0.831	-0.059***	0.001
	(0.020)	(0.025)	(0.032)	(0.014)	(0.017)	(0.022)	(0.022)
Monthly income (log)	11.241	11.338	0.097***	11.177	11.282	0.104***	0.007
	(0.008)	(0.010)	(0.013)	(0.005)	(0.007)	(0.009)	(0.009)
Professionals	0.026	0.036	0.010**	0.018	0.024	0.006*	-0.004
	(0.003)	(0.004)	(0.005)	(0.002)	(0.002)	(0.003)	(0.003)
Technicians	0.097	0.091	-0.006	0.070	0.062	-0.008	-0.003
	(0.005)	(0.006)	(0.008)	(0.003)	(0.004)	(0.005)	(0.005)
Clerks	0.194	0.173	-0.021**	0.128	0.115	-0.013*	0.008
	(0.006)	(0.008)	(0.010)	(0.004)	(0.006)	(0.007)	(0.007)
Service workers	0.149	0.132	-0.016	0.173	0.154	-0.019**	-0.003
	(0.008)	(0.009)	(0.012)	(0.005)	(0.007)	(0.008)	(0.008)
Skilled agricultural workers	0.026	0.017*	-0.009*	0.028	0.025	-0.003	0.006*
	(0.003)	(0.004)	(0.005)	(0.002)	(0.003)	(0.004)	(0.004)
Craft and related trade workers	0.228	0.222	-0.006	0.311	0.306	-0.005	0.001
	(0.009)	(0.012)	(0.015)	(0.006)	(0.008)	(0.010)	(0.010)
Plant and machine operators	0.115	0.141	0.026**	0.115	0.148	0.032***	0.006
	(0.007)	(0.008)	(0.011)	(0.005)	(0.006)	(0.007)	(0.007)
Elementary occupations	0.152	0.176	0.025**	0.147	0.158	0.012	-0.013
	(0.007)	(0.009)	(0.012)	(0.005)	(0.006)	(0.008)	(0.008)

*, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table A3: Descriptive statistics by treatment group and period: France

Variables:	Control Group			Treatment Group			Diff-in-diff
	Pre-period	Post-Period	Difference	Pre-period	Post-Period	Difference	
Female	0.379	0.370	-0.009	0.362	0.363	0.000	0.009
	(0.017)	(0.020)	(0.026)	(0.010)	(0.013)	(0.016)	(0.031)
Age	38.101	40.277	2.175***	39.091	41.236	2.145***	-0.031
	(0.310)	(0.373)	(0.485)	(0.195)	(0.234)	(0.304)	(0.573)
Married	0.604	0.624	0.020	0.609	0.635	0.026	0.005
	(0.017)	(0.020)	(0.026)	(0.011)	(0.013)	(0.017)	(0.031)
Separated	0.007	0.002	-0.006*	0.005	0.001	-0.004**	0.001
	(0.002)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)	(0.004)
Divorced	0.051	0.061	0.010	0.073	0.079	0.006	-0.004
	(0.009)	(0.011)	(0.014)	(0.006)	(0.007)	(0.009)	(0.016)
Widowed	0.029	0.024	-0.005	0.018	0.018	-0.000	0.004
	(0.005)	(0.006)	(0.008)	(0.003)	(0.004)	(0.005)	(0.009)
Never Married	0.309	0.289	-0.020	0.295	0.268	-0.028	-0.007
	(0.016)	(0.019)	(0.025)	(0.010)	(0.012)	(0.015)	(0.029)
Children	0.903	0.922	0.018	0.851	0.848	-0.003	-0.021
	(0.035)	(0.042)	(0.055)	(0.022)	(0.027)	(0.035)	(0.065)
Monthly income (log)	8.907	8.995	0.088***	9.067	9.148	0.081***	-0.008
	(0.012)	(0.015)	(0.019)	(0.008)	(0.009)	(0.012)	(0.023)
Professionals	0.037	0.038	0.001	0.050	0.051	0.001	-0.000
	(0.007)	(0.009)	(0.011)	(0.005)	(0.006)	(0.007)	(0.014)
Technicians	0.158	0.141	-0.017	0.214	0.222	0.008	0.025
	(0.014)	(0.017)	(0.022)	(0.009)	(0.010)	(0.014)	(0.026)
Clerks	0.171	0.188	0.016	0.183	0.181	-0.003	-0.019
	(0.013)	(0.016)	(0.021)	(0.008)	(0.010)	(0.013)	(0.025)
Service workers	0.120	0.139	0.020	0.068	0.065	-0.004	-0.023
	(0.010)	(0.012)	(0.015)	(0.006)	(0.007)	(0.009)	(0.018)
Skilled agricultural workers	0.029	0.030	0.001	0.004	0.004	-0.000	-0.001
	(0.004)	(0.004)	(0.006)	(0.002)	(0.003)	(0.004)	(0.007)
Craft and related trade workers	0.290	0.282	-0.008	0.180	0.180	-0.000	0.008
	(0.014)	(0.017)	(0.022)	(0.009)	(0.011)	(0.014)	(0.026)
Plant and machine operators	0.117	0.115	-0.002	0.247	0.241	-0.006	-0.004
	(0.014)	(0.017)	(0.022)	(0.009)	(0.011)	(0.014)	(0.026)
Elementary occupations	0.077	0.068	-0.009	0.052	0.057	0.005	0.014
	(0.008)	(0.010)	(0.013)	(0.005)	(0.006)	(0.008)	(0.015)

*, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

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Table A4: Impact of the reforms on weekly working hours & earnings

	Portugal		France	
	WH/Week	Log(income)	WH/Week	Log(income)
Treatment	-1.702***	0.001	-1.112***	-0.003
	(0.110)	(0.007)	(0.149)	(0.009)
Observations	8575	8575	4819	4819
Individuals	2531	2531	1166	1166
R^2	0.101	0.287	0.232	0.224

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in the private sector. "Treatment" corresponds to the interaction "$Treat_i * Post_t$" in equation (1). Controls include individual and time fixed effects. *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table A5: Two-stage Least Squares - Portugal

	(1) Actual WH	(2) Job Satisfaction	(3) Actual WH	(4) Leisure Satisfaction
Standard WH	0.595***		0.595***	
	(0.035)		(0.035)	
Actual WH		-0.040**		-0.077***
		(0.016)		(0.018)
Observations	8575	8575	8575	8575
Individuals	2531	2531	2531	2531
Cragg-Donald F-test	-	291.544	-	291.544

Standard errors in parentheses. The 2SLS results consider the actual number of working hours as endogenous and the standard number of working hours as an exogenous instrument. Controls include the log of income, occupation, region, marital status, the number of children, individual and time fixed effects. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Table A6: Two-stage Least Squares - France

	(1) Actual WH	(2) Job Satisfaction	(3) Actual WH	(4) Leisure Satisfaction
Standard WH	0.253***		0.253***	
	(0.030)		(0.030)	
Actual WH		-0.086**		-0.153***
		(0.040)		(0.045)
Observations	4968	4968	4968	4968
Individuals	1167	1167	1167	1167
Cragg-Donald F-test	-	69.064	-	69.064

Standard errors in parentheses. The 2SLS results consider the actual number of working hours as endogenous and the standard number of working hours as an exogenous instrument. Controls include the log of income, occupation, region, marital status, the number of children, individual and time fixed effects. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Table A7: The Shorter Workweek and Other Outcomes:
Detailed panel results by Gender and Industry in Portugal

	WH/week	Log(income)	Hours Sat.	Earnings Sat.	Working Cond. Sat.
	(1)	(2)	(3)	(4)	(5)
Panel A: Men vs. Women					
Treatment	-1.560***	-0.002	0.085**	0.002	0.037
	(0.127)	(0.009)	(0.035)	(0.007)	(0.036)
Treatment*Female	-0.418**	0.011	0.056	0.004	0.101**
	(0.166)	(0.010)	(0.048)	(0.009)	(0.048)
Observations	8575	8575	8572	8569	8570
Individuals	2531	2531	2531	2531	2531
R^2	0.109	0.269	0.009	0.052	0.006
Total implied effect for Men	-1.560***	-0.002	0.085**	0.002	0.037
	(0.127)	(0.009)	(0.035)	(0.007)	(0.036)
Total implied effect for Women	-1.978***	0.009	0.141***	0.006	0.138***
	(0.146)	(0.008)	(0.045)	(0.008)	(0.045)
Panel B: Industry vs. Services					
Treatment	-1.543***	-0.007	0.097**	-0.005	0.108**
	(0.159)	(0.159)	(0.042)	(0.008)	(0.043)
Treatment*Industry	-0.256	0.015	0.010	0.014*	-0.063
	(0.173)	(0.010)	(0.044)	(0.008)	(0.045)
Observations	8575	8575	8572	8569	8570
Individuals	2531	2531	2531	2531	2531
R^2	0.109	0.269	0.009	0.052	0.006
Total implied effect in Industry	-1.799***	0.007	0.108***	0.009	0.045
	(0.122)	(0.009)	(0.035)	(0.007)	(0.036)
Total implied effect in Services	-1.543***	-0.007	0.097**	-0.005	0.108**
	(0.159)	(0.159)	(0.042)	(0.008)	(0.043)

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in the private sector. "Treatment" corresponds to the interaction "Treat$_i$*Post$_t$" in equation (1). Controls include the log of income (except in column (2)), occupation, region, marital status, the number of children, individual and time fixed effects. *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.

Table A8: The Shorter Workweek and Other Outcomes:
Detailed panel results by Gender and Industry in France

	WH/week	Log(income)	Hours Sat.	Earnings Sat.	Working Cond. Sat.
	(1)	(2)	(3)	(4)	(5)
Panel A: Men vs. Women					
Treatment	-1.105***	-0.009	0.161***	0.065	0.123**
	(0.160)	(0.010)	(0.061)	(0.062)	(0.062)
Treatment*Female	0.018	0.017*	-0.048	-0.046	-0.168**
	(0.172)	(0.010)	(0.069)	(0.065)	(0.069)
Observations	4819	4819	4816	4818	4818
Individuals	1166	1166	1166	1166	1166
R^2	0.242	0.224	0.013	0.011	0.015
Total implied effect for Men	-1.105***	-0.009	0.161***	0.065	0.123**
	(0.160)	(0.010)	(0.061)	(0.062)	(0.062)
Total implied effect for Women	-1.087***	0.008	0.113	0.019	-0.045
	(0.187)	(0.011)	(0.074)	(0.071)	(0.074)
Panel B: Industry vs. Services					
Treatment	-1.140***	0.011	0.192***	0.041	-0.030
	(0.185)	(0.010)	(0.069)	(0.068)	(0.072)
Treatment*Industry	0.049	-0.025***	-0.0822	0.013	0.166**
	(0.170)	(0.009)	(0.066)	(-0.12)	(0.067)
Observations	4819	4819	4816	4818	4818
Individuals	1166	1166	1166	1166	1166
R^2	0.232	0.226	0.012	0.010	0.013
Total implied effect in Industry	-1.091***	-0.014	0.110*	0.055	0.137**
	(0.160)	(0.010)	(0.063)	(0.064)	(0.062)
Total implied effect in Services	-1.140***	0.011	0.192***	0.041	-0.030
	(0.185)	(0.010)	(0.069)	(0.068)	(0.072)

Note: Standard errors in parentheses are clustered at the individual level. The sample is constituted of full-time employees in the private sector. "Treatment" corresponds to the interaction "$Treat_i*Post_t$" in equation (1). Controls include the log of income (except in column (2)), occupation, region, marital status, the number of children, individual and time fixed effects. *, **, *** indicate significance at the 10%, 5% and 1% levels respectively.