

A note on the employment effects of 35-hour workweek regulation in France: using Alsace-Moselle's "droit local" to build a diff-in-diff.*

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Abstract

France's 1998 implementation of the 35-hour workweek has been one of the greatest regulatory shocks on labor markets. There have been few studies on the impact of this regulation due to a lack of identification strategies. For historical reasons due to the way Alsace-Moselle was returned to France in 1918, the implementation of France's 35-hour workweek was less stringent in that region than in the rest of the country, which is confirmed by double and triple differences. Yet it shows no significant difference with the rest of France, which casts a serious doubt on the effectiveness of this regulation.

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1 Introduction

The experience of working time reduction in France has been one of the most significant regulatory shocks imposed on any large economy. In 1998 and 2000, following laws known as Aubry I (which encouraged firms of over 20 employees to reduce working time) and Aubry II (which made reduction mandatory), France changed its working time regulation from the official 39 to 35 hours. This ten percent reduction was implemented with no change to net monthly wages of already employed workers. The experience constitutes a relatively far-reaching and unique experience from which much can be learnt in regards to the underlying functioning of labor markets in general¹. The experience also generated considerable debate in several of France's European neighbors.

Despite the importance of this shock and the political controversy surrounding it, there have so far been very few studies based on microeconomic evidence that show the impact of working time reduction in France. This is mainly due, in our view, to the fact that proper identification strategies are lacking: France, unlike the US or Canada, lacks a federal structure, with most laws and decrees applying to the whole territory, making the design of appropriate control groups of firms or workers unaffected by the experiment very problematic. On top of that, reduction in working time (hereafter RWT) has been accompanied by payroll tax exemptions, working time cancelizations and a number of collective labor agreements which, together, add to the difficulty of disentangling the RWT's effects.

Our task in this paper is to provide a methodology with which to overcome the identification problem by making use of a relatively unknown French specificity. France's territorial organization is less Jacobinistic, i.e. centralized and homogenous, than is generally assumed. The region of Alsace and the department of Moselle, for example, have, for historical reasons, laws that differ from the rest of the Republic. Both belonged to Germany from 1870 to 1918 and upon rejoining France they retained some favorable elements of the German legal system, in particular two holidays unrecognized elsewhere in the country: Saint-Etienne (Saint Steven's Day, Dec. 26) and Vendredi Saint (Good Friday). When the RWT took effect in 1998 and 2000, firms in Alsace-Moselle decided that both holidays would be counted as part of the working time reduction, or *les jours de RTT* as they are commonly known. The application of the RWT has therefore been less favorable in Alsace-Moselle than in the rest of France, at least until employee recourses began to be examined by various legal courts.

This is the basis for our identification strategy. We will compare the evolution of hours, employment and wages in both France (by which we mean France without Alsace-Moselle) and in Alsace-Moselle. Using data from *Enquête Emploi*, a French labor force

¹Despite the official obligation that wages not be cut in response to working time reduction, theory indicates that newly hired workers must have faced a decline in monthly wages, attenuating the law's impact. Similarly, fringe benefits to already employed workers may have been renegeged following the law's application in order to restore hourly wages.

survey of 1996-2000, we are able to use a standard difference-in-differences approach, and investigate the differential impact of RWT in Alsace-Moselle and in France.

This, however, is not as simple as it seems: an obvious caveat is that Alsace and Moselle have the particular distinction of being the only regions in France that share a border with Germany. This is a serious issue in our identification process because Germany during the period under investigation has faced a relatively strong recession, one which threatened to spill over into Alsace-Moselle. The simple comparison of the latter with the rest of France is thus likely to be spurious. It is very possible that a rise in relative unemployment in Alsace-Moselle could simply be the result of Germany's recession disproportionately affecting North-East France.

For this reason, we will mostly present triple difference (DDD) estimates, where the additional reference groups will be based on those firms or occupations unaffected by the RWT, namely firms of less than 20 employees or independent workers. It is interesting to note at this stage that, using a DDD approach, we find that working hours in Alsace-Moselle rose relative to the rest of France approximately by the amount predicted by theory, despite the fact that Germany was then experiencing a recession relative to France. This makes us fairly confident that the difference in hours in Alsace-Moselle is in fact exogenous to the German economic cycle and implied by legislation differences within France.

Our paper is organized as follows. In Section 2 presents, in order, France's RWT experiment and a selective literature review of the ex-post evaluations, based on either microeconomic data or macroeconomic models. All such studies have ignored the France-Alsace-Moselle divide. We will then discuss the specificity of the Alsace-Moselle experiment. Section 3 presents a model with which we discuss a number of econometric issues, such as the selection of firms that entered into early RWT agreements. Section 4 describes in greater detail our identification strategy. Since the existence of regional differences is typically ignored in examinations of French data, we devote Section 5 to providing detailed evidence that the strategy is valid. In particular, we show that less hours worked were reduced in Alsace-Moselle than in France, and by approximately what the theory predicts, namely by 0.2 to 0.3 hours per week, that is, 10 to 15 hours per year, which corresponds to the two days of work which were considered by employers as part of the working time reduction. As a falsification exercise, we also find that leisure time increased more in the rest of France than in the Alsace-Moselle. In Section 6, we employ the identification to measure the effect of RWT on employment probability, unemployment and hourly wages. We observe that the differential application of the 35-hour law across regions did not have any relative employment impact.

2 Reduction in working time

2.1 35 hours: the Law

From a legal viewpoint, France's switch from a 39 to a 35-hour work week in 2000 was a very complex process. The French labor market is regulated by the Code du Travail, a long document in which hundreds of lines (L101-1 to L993-5) refer to the law itself, called the *partie législative*. The Code is augmented by many other articles, starting with the letter R (the *partie réglementaire* which constitute decrees decided upon by the Conseil des Ministres without need of parliamentary votes). Superimposed onto the Code du Travail are 330 *conventions de branche* applicable to sectors or industries following a collective labor agreement by representatives of employees and employers. There are also 221 local agreements, such as the *Convention du textile de Roubaix-Tourcoing-Vallée de la Lys*, which encompasses some industry agreements. Of the three levels, only those documents most favorable to workers will apply: collective agreements are often more generous than the Code du Travail, and local collective agreements are generally even more favorable.

In this context, the 35-hour workweek was implemented after a fairly long negotiation process and several litigations. Two laws were proposed by the Jospin government, a coalition of socialists, communists and the Green Party, and voted in Parliament. The first, that of June 13 1998 (known as the *Loi Aubry I*, after then Labor Minister Martine Aubry), was designed so as to provide firms with strong incentives to negotiate working time reductions at the firm or industry level by at least ten percent. Incentives were numerous: first, firms raising employment by at least six percent after a decline in working time obtained a subsidy for each worker in the firm. The subsidy was quite generous (9000 FF the first year if the agreement was signed in 1998 or during the first semester of 1999), degressive in time (8000 for the first, 7000 for the second and 6000 FF for the third year, and then 5000 FF for the next three years) and was to be uniformly declined if agreements were signed after the second semester of 1999 for the firms of 20 employees or more; a delay of one or two subsequent years was left to smaller firms. As a final incentive, Aubry I specified that in 2000 (for firms with more than 20 employees) and in 2002 (for smaller firms), the 35-hour work week would be irreversible and would apply to all firms, even those not having signed agreements. The second law of 19 January 2000, known as the *Loi Aubry II*, implements the promise of Aubry I in that it fixes the official working time at 35 hours per week uniformly, modifying all relevant articles of the Code du Travail.

The fact that official working time decreased from 39 to 35 hours represents a 11 per cent decrease. However, this does not mean that, at a fixed weekly wage and in the absence of subsidies, firms faced an 11 percent increase in hourly labor costs. Firms had various adjustment mechanisms. One was overtime. Before the reform, firms had to pay a compulsory overtime premium of 25 percent for the first 8 hours above 39 and

then a 50 percent premium afterwards. Following the reform, the activation point for the overtime premium was simply shifted to 35 hours. Figure 1 represents the wage profile before and after the 2000 reform (valid until 2003 when the overtime premium was eventually reduced, see below).

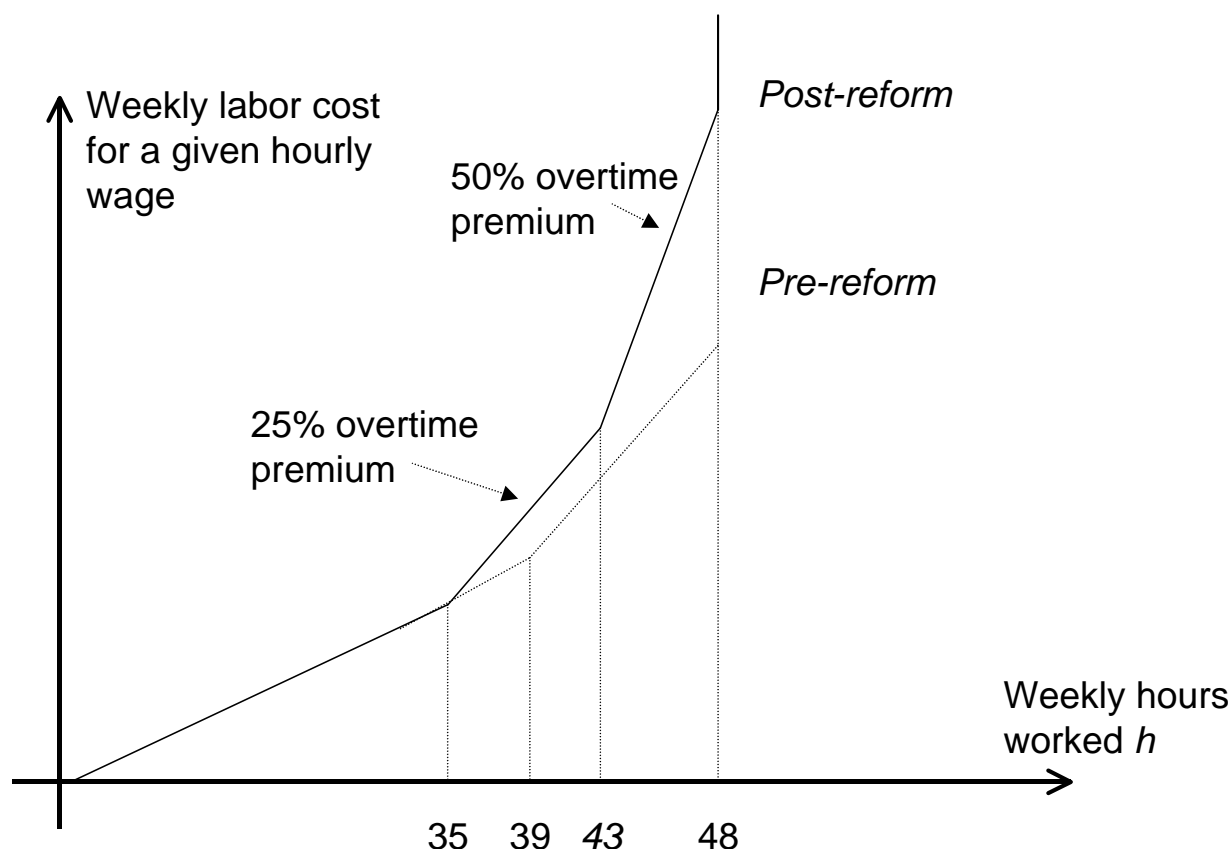


Figure 1: Wage profile before and after the reform.

For instance, in regards to hourly wages earned by employees working 39 hours before and after the reform, labor costs increased by $(4 \cdot 0.25) / 39 = 2.5$ percent. For employees working 43 hours before and after, labor costs increased by $(0.25 \cdot 8) / 43 = 4.7$ percent. Finally, for employees working 45 hours before and after the reform, the increase in labor costs amounted to $(0.25 \cdot 8 + 0.5 \cdot 2) / 45 = 11.3$ percent. In short, the reform made overtime more costly the higher the supplementary hours.

The two laws have been widely debated. The Conseil Constitutionnel (France's equivalent of the Supreme Court) censored several items of the Aubry II law. There were then many different interpretations of how vacations should be counted, how overtime should be paid and how collective agreements should encompass the law. As late as October

2006, more than six and half years after the reform, the Conseil d'Etat invalidated a collective agreement in the hospitality sector due to a conflict with the main law.

Jospin's left-wing coalition was defeated after the 2002 Presidential Elections. In 2003 and 2004, the now right-wing Parliament voted two additional laws attenuating constraints on overtime. In particular, the additional overtime costs were reduced from 25 to 10 percent in 2003, while in the following year the target of 1600 annual hours was augmented to 1607, which imposed an additional day of work on all French firms and administrations, usually on the Pentecost, in order to finance health spending for the elderly.

In short, the timing of the RWT was not simple, and can be decomposed as follows:

- between 1998 and 2000, incentives were provided in order to reduce working time by 10 percent or even more (for example, subsidy *majorations* in cases where working time was reduced by 15 percent and employment expanded by 9 percent; subsidies were also given to firms who claimed they would be obliged to fire workers in the absence of an agreement on working time reduction; after a period of time, all subsidies would disappear, giving incentives to reduce working time as early as possible following the first law).
- In 2000, the reduction in working time was enforced by law, and almost uniformly on the territory. It was applied differently according to activity sectors and depending on renegotiations with the various *conventions de branches* and the timing of the agreement.
- In 2003-2004, recourse to overtime was then eased and its cost decreased.

The number of firms and employees having switched to the 35-hour regime was recorded on a monthly basis by the administration. We report here data gathered which show the progressive switch for larger firms between 1998 and 2000, the sudden increase in 2000, and the same process, but with a lag of two years, for firms with less than 20 employees. Note that the TPE (*très petites entreprises*, i.e. firms with less than 10 employees), have so far not been subject to any working time reduction.

Figures 2 and 3 provide an overview of the timing of the change for the firms with more and less than 20 employees (the second one is using a logarithmic scale).

2.2 A selective literature review

The literature on work sharing is vast. It has typically concluded to a negative employment effect (Rosen 1968, Ehrenberg 1971, Crepon and Kramarz 2002, Calmfors and Hoel, 1988, Hunt 1999). The purpose of this paper is not to survey systematically the theoretical and empirical arguments for work sharing, but rather to survey various evaluations of the French experiment, which is arguably the most spectacular example of

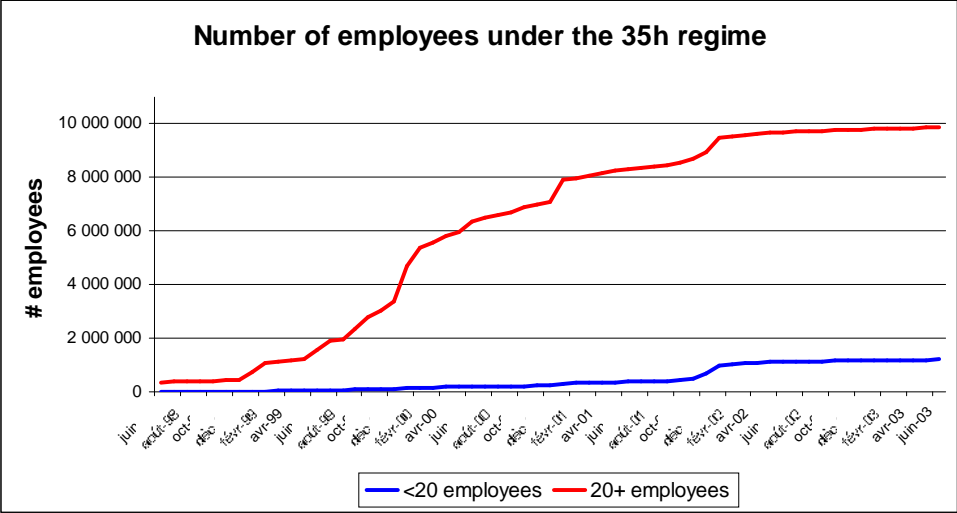


Figure 2: Timing of the 35 hours reform for firms with more and less than 20 employees

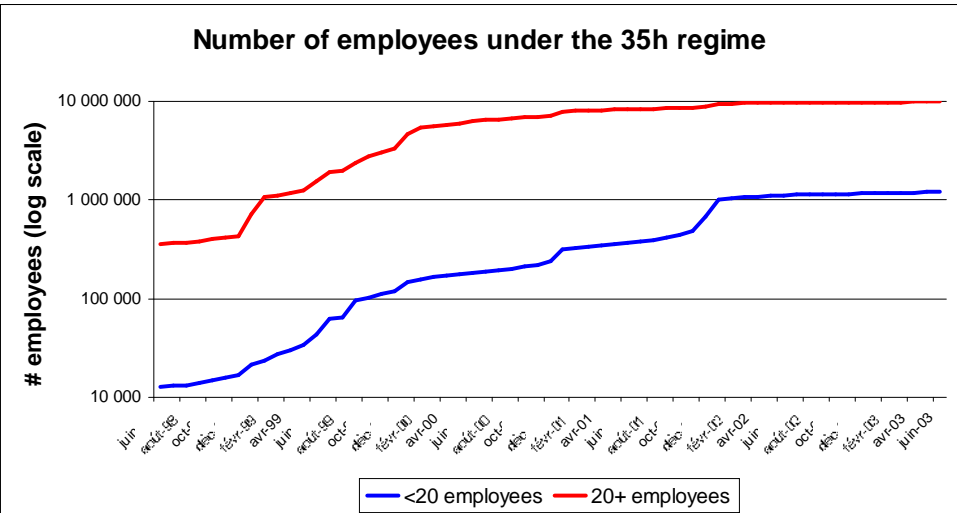


Figure 3: Timing of the 35 hours reform for firms with more and less than 20 employees (logarithmic scale)

work sharing in terms of its magnitude and the pervasiveness of its application, France being the world's fifth largest economy.

The three most comprehensive surveys on the 35h experience are by Pierre Cahuc (2001), Philippe Askenazy (2005) and Cahuc et al. (2006). The first two authors (Cahuc and Askenazy) classify the various available estimates of the 35h into two categories: approaches based on macroeconomic models, and approaches based on microeconomic evidence.

In the first category, for significant effects to occur, it is necessary to introduce Keynesian effects: firms must be constrained on the demand side and thus are required to hire in order to be productive with the same total number of hours. In models and empirical works based on labor demand estimates, positive effects may also take place provided that gains in productivity and wage moderation be large enough to compensate for the basic wage push factor that the new wage schedule represents. Pierre Cahuc shows that such scenarios are quite implausible and concludes that the 35-hour experiment was a source of employment decline relative to what would have happened in the absence of both Aubry laws, even though the range of evaluations is quite large and inconclusive: it ranges from large gains to moderate losses (Coutrot and Gubian, 1999).

Askenazy (2005) discusses in greater detail the subsequent ex-post evaluations of the 35-hour reform. He further classifies them into three main categories. The first comprises studies based on administrative data and counts of firms and employees having signed a 35-hour agreement, known in French as *la liste des conventions Aubry I* and *Aubry II*. It is based on a file recording all agreements and promises made by firms either to raise employment or reduce layoffs in accordance with the agreement. This leads to evaluations in the order of magnitude of 500 000 jobs created or saved, with the obvious caveats that this is based on declarations by firms having been incited to overdeclare job creations or jobs "saved" in order to be eligible for subsidies.

A second category of evaluations is based on comparisons of trends in quarterly employment series before and after the Aubry Laws, with VAR models including various other macroeconomic variables such as output or wages. These approaches, leading to estimates of 400 000 to 500 000 jobs created, have also been severely criticized: using exactly the same methodology for other OECD countries and notably Spain and Italy, other authors have found positive employment impacts in these countries over the same time period, but without a 35-hour reform. See Husson (2002), Didier and Martinez (2003) and Askenazy (2005) for a discussion of these methodological issues.

The third category of evaluations is based on microeconomic data and is arguably the most informative, if not the only rigorous method in such a context. The idea is to compare employment evolution in firms not having switched to the 35-hour regime (as the control group) with firms having switched (the treated). Unfortunately, it is likely that the treatment on the treated differs from the treatment of the control group: the key difficulty consists in dealing with the endogeneity of the agreement at the firm level on the 35-hour regime. Matching methods are therefore a potentially powerful method

with which to build a control group but, as explained in Askenazy (2005), only account for selection in a 35-hour agreement based on observables. This raises the question as to why similar firms selected into the 35-hour reform while others did not.

The last survey is also the most recent. In Cahuc et al. (2006), the authors explore the impact of the 35-hour reform with a similar methodology. The authors recognize that their analysis cannot be fully causal, because it is difficult to find a good model of why and when firms decided to switch to the 35-hour regime and sign agreements with their workers. Crépon, Leclair, and Roux (2004) attempt to find an instrumental variable that would affect the decision to reduce working time without having an impact on economic outcomes. They use the predicted amount per worker of Aubry II subsidies that firms would have obtained had they switched to 35 hours. However, the source of variation in the amount per worker of Aubry II subsidies across firms is correlated with the share of low and high wage workers. The instrument may therefore not be totally valid: comparing firms with more or less Aubry II subsidies may be equivalent to comparing firms with more or less low wage workers. Firms with more or less low wage workers differ systematically in unobservable ways. For example, one might argue that firms with more low wage workers are more unionized and would be more likely to switch to the 35-hour reform. Additionally, a considerable amount of economic literature argues that unions have an independent impact on employment and productivity. Therefore, the amount per worker of Aubry II subsidies may not be exogenous and may not be used as an instrumental variable.

3 A model of working time reduction

3.1 Setup

Our goal in this Section is to provide a simple analytical model of working time reduction applicable to the French case. In particular, our setup includes both extra overtime costs for employers (weekly wages are convex in hours) and overtime costs affected by legislation changes. Other aspects of working hour regulation, such as the impact of labor costs on prices and hence on demand for produced goods, are ignored: to make the simplest possible illustration of the empirical challenge facing most evaluations of the 35-hour law, we start from the latter's most favorable case, one in which firms face a fixed demand for its output and thus must supply a fixed number of hours denoted by H . It would be very easy to relax such an assumption and assume that H depends negatively on the cost of labor due to the elasticity of the demand for goods. We denote by h the number of hours per worker and N employment in a given firm. The latter thus chooses hours and employment subject to

$$hN = H.$$

The firm's program is to minimize its total production cost $C(h, N)$. To account for the fact that employment and hours are not perfect substitutes, this cost can be decomposed as follows:

$$C(h, N) = w(h)N + \delta_j N,$$

where δ_j is the cost per worker in firm j (which here could be interpreted as a loss of information in cases where the number of employees in the firm grows) and where the function $w(h)$ is an increasing, convex weekly wage profile.

Different firms may have different workplace organization and hence a larger or a smaller δ_j .

Replacing h by H/N in the cost function, we have the program of the firm as follows:

$$\text{Min}_N C(H/N, N) = \text{Min}_N w(H/N)N + \delta_j N,$$

which leads to a simple first order condition:

$$w(h)(\varepsilon - 1) = \delta_j$$

Figure 4 illustrates the determination of the equilibrium hours as the intersection between the curve $w(h)(\varepsilon - 1)$ and the horizontal line δ_j in a point h_A . The higher the cost-per employee, the higher the choice of hours h_A and thus the lower employment $N_A = H/h_A$. As Figure 4 further illustrates, a reduction in legal working time which makes overtime more costly will raise the wage profile w to w^+ after a given threshold point h_0 which can be thought as the new legal working time, say 35h. With this new wage profile, overtime above the legal threshold is more costly and thus the firm optimally raises employment and reduces hours worked, to a point h_B .

However, the employment effect may not be large enough. First, even assuming that H does not vary with the increase in labor costs, h_B may still be above the target h_0 . Second, the total demand for hours at the firm level may decline: if labor costs raise production prices and that demand for goods is elastic, H itself will decline. This is why, in the process of the reduction in working time, the government added a subsidy to firms, made roughly proportional to hirings (or equivalently, linear in employment). The cost function of the firm is thus augmented by a (negative) term $-(a + SN)$ where S is the per worker subsidy and a is a possibly lump sum transfer. After taking the first order conditions, this subsidy simply moves the horizontal line (cost per employee) to a lower level. See Figure 5.

To sum up:

- even with a constant volume of hours H required of firms, the employment effect can be lower than expected if firms prefer to choose an intermediate level of hours (say between $h_0 = 35$ and $h_A = 39$)
- H can be reduced due to the rise in labor costs and the government needs to subsidize employment with a positive S per employee.

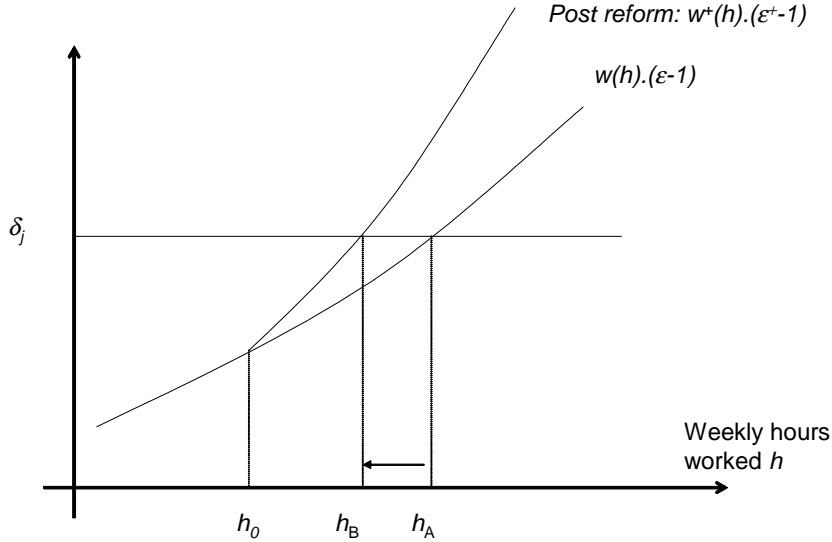


Figure 4: Equilibrium determination of hours worked per employee before and after the reform, in the absence of other government intervention.

3.2 Self-selection of firms

The model also points out the potential drawback of econometric methods. There is some heterogeneity at the firm level, illustrated by the fact that δ_j depends on the firm. This simply means that firms have a different hours-employment trade-off and thus react differently to changes in overtime regulation. For the employment impact of a policy change to be the same across all firms despite different δ_j , we need that the profile $w(h)(\varepsilon - 1)$ be linear, a condition unlikely to be met. More fundamentally, firms may also face differential adjustment costs. In particular, internal reorganization from a level of employment and hours (N_A, h_A) to another one, say here (N_0, h_0) may not be optimal even with a subsidy S . Denote by Λ_j the firm-specific adjustment cost, and by C_A the pre-reform total cost of production. The firm will move to the new legal level of hours only if the new cost C_0 augmented of transition costs Λ_j net of the subsidy $a + SN_0$ is smaller than C_A , i.e.

$$C_0 + \Lambda_j - a + SN_0 < C_A$$

It follows that firms that switch to the 35-hour week are not randomly selected in the

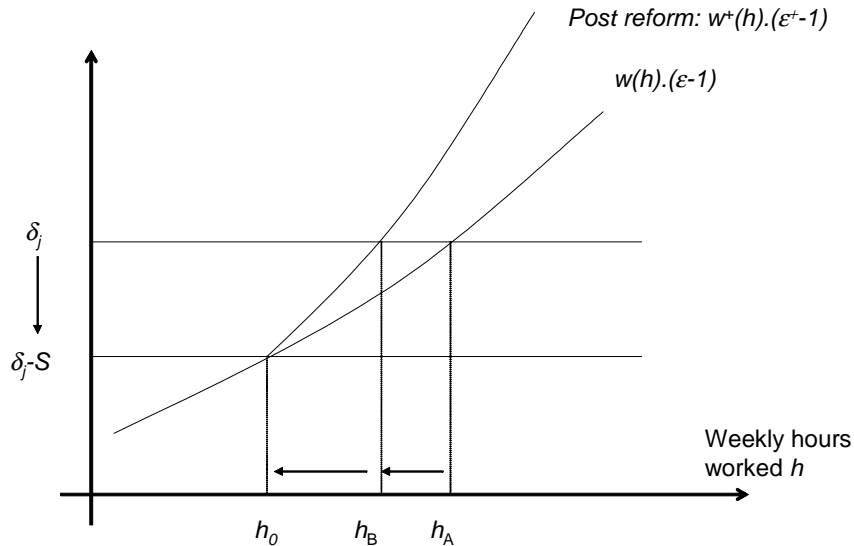


Figure 5: Equilibrium determination of hours worked per employee after the reform and with government subsidies S .

sample of firms. They correspond to both low values of Λ_j and particular values of δ_j . Even in the absence of correlation across firms in Λ_j and δ_j , there is self-selection and the employment effect measured in comparing firms switching regimes and firms keeping their pre-reform organization is misleading. This effect has been recognized by several authors (see e.g. Askenazy 2005) and has seriously limited the number of studies on the French experience of working time reduction. It has also eroded economists' confidence in the existing results where those effects are not recognized. As we will discuss below, our identification strategy is immune to these problems.

4 Identification strategy: the 35-hour reform in Alsace Moselle

4.1 Details of the Alsace-Moselle experience

As noted earlier, the implementation of the 35-hour reform was to a large extent nationwide, making the identification of the causal effect difficult at the macroeconomic



Figure 6: Map of France

level. Simply comparing unemployment rates before and after the reform would confound the impact of the reform with the ongoing macroeconomic trend. In contrast, an identification based on regional differences is able to capture the reform’s causal effect.

An historical accident provides a regional difference in the implementation of the reform between Alsace-Moselle and the rest of France. Figure 6 represent France, and Alsace-Moselle corresponds to three “departements” in the Northeastern part of France, those with numbers 67, 68 (Haut-Rhin and Bas-Rhin) and 57 (Moselle). As noted above, Alsace-Moselle has two supplementary public holidays in effect since the application of the German legal code in 1890. These days are December 26 and Good Friday. Insofar as they were opportunistically converted by employers into the RWT, the amount of work supplied in firms decreased less in Alsace-Moselle than elsewhere. As a matter of fact, there is clear anecdotal evidence confirming this phenomenon.

For instance, Laurence Grisey-Martinez, a lawyer at the *Institut du droit local Alsacien-Mosellan*, an institute in charge of raising awareness about the specificities of local Alsace-Moselle laws, writes about this phenomenon in the *Revue du Droit Local*, n. 44, June 2005. A case was brought to the attention of the courts in 2002: the mention RTT, the French equivalent of RWT, was written on the planning of a firm next to December 26.

The employees, having been stripped of a “RWT day”, questioned the legitimacy of employers “using” the RWT on a day that is, according to Alsace-Moselle’s local laws, supposed to be a statutory holiday. On October 23 2002, the local council (called prud’hommes de Metz) stated that “December 26 must be considered a bank holiday

as per the special dispositions of the local laws in Alsace-Moselle, this day cannot be counted as a reduction of working time (RWT)”.

This is the basis of our identification strategy: between 2000 and 2002 some employers attempted to attenuate the impact of RWT by counting holidays as part of the reduction in working time, thereby attempting to integrate them into the less favorable regime of France’s common law Code du Travail. Since these two additional days are nowhere mentioned in the Code du Travail, this was a relatively easy task for Alsace-Moselle employers, at least until the local council established a jurisprudence.

It follows that we should observe a milder impact of the 35-hour reform in Alsace-Moselle: two days represent 16 hours of work per year. The 35-hour reform corresponds to a drop in hours worked of 4 hours per week during 46 weeks, hence 184 hours. There is therefore a 9 percent variation in the impact of the 35-hour reform in Alsace-Moselle as opposed to the rest of France. 16 hours per year correspond to 0.35 hours per week. Workers in Alsace Moselle were expected to work 0.35 hours more than workers in the rest of France in 2001, relative to 1999.

4.2 The pros and cons of this identification strategy

We discussed extensively in earlier Sections the various firm-level selection issues that make the evaluation more difficult. In contrast, our difference-in-differences approach addresses this concern by comparing firms having switched regimes in Alsace-Moselle with firms having switched regimes in the rest of France. The only difference between these firms is that the 35-hour reform, for historical reasons, has been implemented in a milder way in Alsace-Moselle. Of course, firms in Alsace Moselle might have a systematically different δ_j compared to firms in France, but the outcomes of firms in Alsace-Moselle are differenced before and after the reform so that this will not be a problem. Another problematic assumption with a difference-in-differences approach is the “common time effects” assumption: in the absence of the reform, firms in Alsace-Moselle may have evolved differently compared to firms in France. To address this concern, we will present triple difference (DDD) estimates, where the additional reference groups will be based on those occupations or firms unaffected by the RWT, namely independent workers or firms with less than 20 employees.

As a matter of fact, the most important potential drawback in our view is that the identification is based on an impact which has thus far not been documented, namely the differential application of the 35-hour reform in a particular region of France. Being initially if not skeptical then at least cautious, we first verified that the shock could indeed be observed in terms of hours. This is what we did first, verifying whether the identification strategy actually holds by using the 1996 to 2003 *Enquête Emploi*, a representative sample of 1.3 million French individuals.

5 Verification, robustness and falsification of the identification method

5.1 Sample

Our sample is based on the France’s Labor Force Survey, or *Enquête Emploi*. We selected a pool of eight representative cross-sections of the population between 1996 and 2002, to which we added the 2003 cross-section. The latter has a different design but similar questions and can be merged into the previous waves. Since focusing on years 1996-2002 did not change our results (available on request), we only present the results obtained from the most exhaustive dataset of 1996-2003.

5.2 First verification: a double difference approach

For this check, a simple difference-in-differences strategy is used according to the following framework:

$$\begin{aligned} hours_{ijt} = & \alpha_j + \beta_t + \gamma_1(Alsace - Moselle) * (2003)_{ijt} + \gamma_2(Alsace - Moselle) * (2001 - 2002)_{ijt} \\ & + \gamma_3(Alsace - Moselle) * (1999 - 2000)_{ijt} + \theta X_{ijt} + \eta job_{ijt} + u_{it} \end{aligned} \quad (1)$$

where i corresponds to individual i , j to department j and t to year t . The dependent variable $hours_{ijt}$ is the number of hours usually worked per week by individual i . The sample is restricted to active full-time individuals². α_j are department fixed effects (95), β_t year fixed effects (7). $(Alsace - Moselle) * (2003)_{ijt}$ is a variable that takes the value 1 if individual i works in Alsace-Moselle and is interviewed in 2003. $(Alsace - Moselle) * (2001 - 2002)_{ijt}$ is a variable that takes the value 1 if individual i works in Alsace-Moselle and is interviewed in 2001 or 2002. $(Alsace - Moselle) * (1999 - 2000)_{ijt}$ is a variable that takes the value 1 if individual i works in Alsace-Moselle and is interviewed in 1999 or 2000. The reference period is therefore 1996 to 1998. The coefficient of interest is γ_2 . It measures the relative increase in hours worked by individuals in Alsace-Moselle after the reform. If the identification strategy is correct, this coefficient should be equal to 0.35, as stated above: 2 days, that is 16 hours per year, correspond to 0.35 hours per week over the year. The coefficient γ_1 should be equal to 0, after a 2002 decision by the local council (prud’homme de Metz) explicitly forbade the practice of converting public holidays into RWT days, effectively canceling the regional disparity in the implementation of the 35-hour reform. The introduction of the variable $(Alsace - Moselle) * (1999 - 2000)_{ijt}$ allows

²We considered only full-time workers because the theoretical effect of 0.35 more hours for Alsace-Moselle workers is calculated for full-time workers. There are 1.4 millions individuals in the database. Only 630,000 of these are active. 470,000 of these active individuals are full-time workers. 96,000 are part-time. We have replicated all the results with the full sample of full-time and part-time workers and results do not vary. This is probably due to the low number of part-time workers.

us to test the common time effects assumption. This assumption states that treated individuals, had they not been treated, should evolve in the same way as non-treated individuals having evolved. In other words, prior to the reform, there should be no significant difference in the evolution of individuals within and without Alsace-Moselle. The coefficient γ_3 should therefore be equal to 0. Additionally, 14 control variables (5 age dummies, sex, size of household and 7 diploma dummies) and 30 occupation fixed effects are included. Standard errors are clustered at the level of region to take into account issues of serial correlation.

Table 1 presents the results of this difference-in-differences approach. In column (1), the sample is restricted to firms with more than 20 employees (and therefore affected by the 35-hour reform, the Aubry I law having specified that by 2000, for firms with more than 20 employees, and by 2002, for smaller firms, the 35-hour workweek will be irreversible and will apply to all firms, even those not having signed agreements). The results are exactly as expected. γ_2 , the coefficient in front of $(Alsace - Moselle) * (2001 - 2002)_{ijt}$ is equal to 0.38 and is statistically significant. This means that workers in Alsace-Moselle worked 0.38 hours more per week than their counterparts in France, in 2001-2002 compared to 1996-1998. The 35-hour reform was indeed milder in Alsace-Moselle than in the rest of France. This difference disappears in 2003 as γ_1 is not significantly different from zero and as expected from the decision by the local council (prud'homme de Metz). The common time effects assumption is verified as γ_3 is not significantly different from zero.

5.3 Second verification: a triple difference based on size of firm

A falsification exercise is presented in Column (2). We should see no difference arising for individuals in firms with less than 20 employees. Column (2) of Table 1 shows that the difference between Alsace-Moselle and the rest of France is not valid for individuals working in firms with less than 20 employees. This was expected as there was no obligation for such firms to implement the 35-hour reform prior to 2002. The coefficient of $(Alsace - Moselle) * (2003)_{ijt}$ is also not significantly different from zero as per the decision of the local council (prud'homme de Metz) which suppresses the difference between Alsace-Moselle and the rest of country.

A key concern in this paper is the systematic difference between Alsace-Moselle and the rest of France. As noted above, Alsace and Moselle are the only french localities sharing a common border with Germany. Many French workers cross the border daily to find work in Germany. A particular macroeconomic trend in Germany could significantly affect performance in Alsace-Moselle. We would then confound the impact of the reform with a particular event that might have taken place in Germany at the same time. The inclusion of $(Alsace - Moselle) * (1999 - 2000)_{ijt}$ constitutes a first step in showing that there is no systematic difference in the evolution over time between Alsace-Moselle and the rest of France.

All the information can be collapsed in a DDD approach, which compares individuals within Alsace-Moselle who are more or less affected by the 35-hour reform while at the same time exposed to the same German macroeconomic trend. As noted above, the Aubry I law specified that in 2000 (for firms with more than 20 employees) and in 2002 (for smaller firms), the 35-hour workweek would be irreversible and would apply to all firms, even those not having signed an agreement. We could therefore compare individuals working in firms with more than 20 employees to individuals working in firms with less than 20, in Alsace-Moselle compared to the rest of France and in 2001-2002 compared to 1996-1998, in order to capture the causal effect of the 35-hour reform. This strategy relies on the assumption that firms with more or less than 20 employees in Alsace-Moselle are equally affected by the German macroeconomic trend.

Column (3) of Table 1 presents the DDD results. The “+20 employees” dummy variable is equal to 1 if the individual belongs to a firm employing more than 20 employees, to 0 if the firm employs less than 20 employees. This dummy variable is interacted with department fixed effects, year fixed effects and $(Alsace - Moselle) * (2003)_{ijt}$, $(Alsace - Moselle) * (2001 - 2002)_{ijt}$, $(Alsace - Moselle) * (1999 - 2000)_{ijt}$. The coefficient of interest is the one in front of $(Alsace - Moselle) * (2001 - 2002) * (+20_employees)_{ijt}$. This coefficient measures the relative increase in hours worked for individuals working in firms with more than 20 employees as opposed to individuals in smaller firms, in Alsace-Moselle compared to the rest of France, in 2001-2002 compared to 1996-1998. This coefficient is significantly positive and close to 0.35, the expected coefficient, though somewhat lower. This confirms that the impact of the 35 hours reform was indeed milder in Alsace Moselle than elsewhere in the country.

Columns (4) and (5) present robustness checks. In Column (4), standard errors are clustered at the department level with very little change in coefficients. In Column (5), 30 interaction dummies between Occupations and the +20 employees dummy are added with again very little change in coefficients.

5.4 Robustness II: a triple difference based on sectorial collective agreements (*conventions collectives de branche*)

A triple difference based on firms’ size relies on the assumption that firms with more or less than 20 employees in Alsace-Moselle are equally affected by German macroeconomic trends. This was not definitive evidence, since one could still argue that firms with more than 20 employees do more business with German firms. To overcome this possible criticism, we present a further triple difference.

Different sectors of the Alsace-Moselle economy could be more or less affected by the deduction of two extra public holidays. We use important differences across sectors of the economy which stem from local collective labor agreements (*conventions collectives*) regulating all aspects of work. A collective agreement is an agreement negotiated be-

tween employers and trade unions in order to clarify general dispositions from the Code du Travail. There are 528 national, regional and departmental collective agreements in France. On reading Lower Rhine’s (“département du Bas-Rhin”, one of the two sub-regions in Alsace) ten collective agreements, Upper Rhine’s (the other “département” in Alsace) one, Alsace’s four region-wide agreements, Moselle’s six and Lorraine’s one, it is interesting to note that only four sectors (retailing and repairs, metallurgy and metal transformation, construction and hotels and restaurants) have collective agreements that do explicitly mention the two supplementary public holidays. We argue that it will be easier for an employer to substitute public holidays for RWT days, since workers in these sectors seem to be less aware of their rights. In other sectors, it will be less easy to do so. In Column (1) of Table 2, the dependent variable is the number of hours worked by workers in the above-mentioned sectors potentially affected by the milder version of the 35-hour reform in Alsace. We find a significant difference between Alsace-Moselle and the rest of France. In Column (2), the dependent variable is the number of hours worked by workers in other sectors unaffected by the mechanism that deduces the two extra public holidays. There is no difference for these workers as opposed to those in the rest of France since the substitution mechanism key to this paper’s identification strategy is not at play. Column (3) implements a triple difference comparing workers in affected sectors with workers in unaffected sectors, in Alsace-Moselle and in the rest of France, before and after the reform. We find that these workers worked more, indicating that the suggested identification strategy is valid. The point estimate is roughly consistent with what was expected (0.35).

5.5 Robustness III: a triple difference based on affected occupations

A triple difference based on affected sectors relies on the assumption that it will be easier for employers to substitute both public holidays for RWT days due to the fact that workers in sectors where collective labor agreements do not explicitly mention the supplementary holidays seem less aware of their rights. This is far from obvious and to overcome further criticism, we present yet another triple difference.

Some occupations, namely those requiring employees or workers, are affected by the 35-hour reform, while self-employed occupations are not. By comparing affected and unaffected occupations, in Alsace-Moselle and in the rest of France, in 2001-2002 and in 1996-1998, we are better able to capture the causal effect of the 35-hour reform. This strategy relies on the assumption that affected and unaffected occupations are equally affected by German macroeconomic trends. It is called a difference-in-difference-in-differences, or triple difference.

In Column (1) of Table 3, the sample is restricted to occupations affected by the

35-hour reform³. The results are exactly as expected. γ_2 , the coefficient in front of $(Alsace - Moselle) * (2001 - 2002)_{ijt}$ is equal to 0.36 and is statistically significant. This means that workers in Alsace-Moselle worked 0.36 hours more per week than their counterparts in France, in 2001-2002 compared to 1996-1998. The 35-hour reform was indeed milder in Alsace-Moselle than in the rest of France. This difference disappears in 2003 as γ_1 is not significantly different from zero and as expected from the judgement by the local council (prud’homme de Metz). The common time effects assumption is verified as γ_3 is not significantly different from zero. A falsification exercise is presented in column (2). We should see no difference arising for individuals in Occupations unaffected by the 35-hour reform such as self-employed individuals⁴. No coefficient is significantly different from zero.

Column (3) of Table 3 presents the results of the triple difference analysis. An “Occupations affected” dummy variable is built and equals 1 if the individual belongs to an occupation studied in column (1) of Table 3. The “Occupations affected” dummy variable is equal to 0 if the individual belongs to a job category studied in column (2) of Table 1. This dummy variable is interacted with department fixed effects, year fixed effects and $(Alsace - Moselle) * (2003)_{ijt}$, $(Alsace - Moselle) * (2001 - 2002)_{ijt}$, $(Alsace - Moselle) * (1999 - 2000)_{ijt}$. The coefficient of interest is the one in front of $(Alsace - Moselle) * (2001 - 2002) * (Occupations_affected)_{ijt}$. This coefficient measures the relative increase in hours worked for affected as opposed to unaffected occupations, in Alsace Moselle compared to the rest of France, in 2001-2002 compared to 1996-1998. This coefficient in column (3) is significantly positive, higher than the expected 0.35.

5.6 Robustness and falsification: other regions

An important falsification test of the identification strategy would be to apply the same analysis to all regions in France: due to sample size limitations in the labor force survey, we could possibly stumble upon evidence showing that hours declared in Alsace-Moselle increased relative to France in 2001-2002. A first falsification would thus explore whether or not other regions faced an increase in hours worked over the same period. Replacing Alsace-Moselle by any other region should yield no significant results. If it is the case,

³These are: civil service cadres, university professors, scientists, information and entertainment workers, administrative and commercial business cadres, engineers and technical business cadres, teachers and others, mid-level health professionals and social workers, mid-level administrative civil servants, mid-level administrative and commercial business professionals, technicians, supervisors or foremen, civil servants and public service agents, police and military officers, administrative business employees, commercial enterprise employees, qualified industrial workers, qualified craftspeople, chauffeurs or taxi drivers, qualified industrial goods handlers and retail and transport workers, unqualified industrial workers, unqualified craftspeople, and agricultural workers.

⁴The complete list includes: farmers, merchants and assimilated, business owners of ten or more employees, and the liberal professions.

we could be more certain that we are effectively picking up an “exogenous” regional specificity of Alsace-Moselle. We replicated column (5) of Table 1 for the 21 regions in France and obtained reassuring results. Out of the 21 regions⁵, 5 had positive and significant coefficients. These are Alsace, Lorraine (which includes Moselle), two small regions (Upper-Normandy and Franche-Comté), both half to a third the size of Alsace, and a larger region (Rhone-Alpes), for which we found no good reason for this sign. Note also that when we replicate the DDD approach of Table 3 (based on occupations), we find that in these three regions, the coefficient was no longer positive and significant, while it was still positive and strongly significant for Alsace. Overall, this is quite reassuring in regards to Alsace’s specificity and the exogeneity of the relative increase in hours in triple differences.

5.7 Ultimate falsification: looking at regional leisure

A final test of the identification strategy examines leisure time. To do this, we use the “*Enquêtes permanentes sur les conditions de vie, Indicateurs sociaux d’octobre - Fichier historique 1996-2003*”. This dataset, although smaller than the *Enquête Emploi*, presents the advantage of having extensive information on leisure time. If individuals in Alsace-Moselle worked relatively more than their counterparts in the rest of France, before and after the reform, then we should see a similar impact on leisure. In Table 4, we use a triple difference approach comparing affected to unaffected occupations, in Alsace-Moselle compared to the rest of France, in 2001-2002 compared to 1996-1998. In Column (1), the dependent variable is the number of national newspapers read per month. Individuals affected by the reform read less newspapers in Alsace Moselle compared to the rest of France, in 2001-2002 compared to 1996-1998. We also see that individuals visited fewer exhibitions (Column (2)), read less books (Column (3)) but did not watch more TV (Column (4)). This is consistent with the statement that individuals worked relatively more in Alsace-Moselle compared to the rest of France, in 2001-2002 compared to 1996-1998. The impact of the 35-hour reform was milder in Alsace-Moselle due to the two extra public holidays converted into RWT days.

6 Impact of the 35 hours reform on other outcomes

Thanks to the previous Section, we can be fairly confident that the application of working time reduction was different in Alsace-Moselle. We can also be confident that this difference is exogenous, that is, due to the specificity of labor laws. Considering that the reform was 10 percent less effective in Alsace-Moselle, the natural next step is to consider how various economic variables evolved in Alsace-Moselle relative to France in

⁵21 instead of 22 regions were accounted because Corsica has no regional code standing in the Enquete Emploi.

the period 2001-2002. If it evolves positively, that is if we obtain a positive coefficient for the variable (Alsace-Moselle)*(2001-2002)*(Treatment Group), this means that the RTT had a negative impact on that variable, by an order of magnitude of 10 times the coefficient since the reform was 90 percent less effective. A negative coefficient implies a positive RWT effect on that variable, whereas insignificant coefficients imply that the effects of the reform are inexistent, or at least not strong enough to be detected in the data.

6.1 The (individual) employment effect

Employment rates in Alsace-Moselle are compared to those in the rest of France, in 2001-2002 compared to 1996-1998. While the 2003 *Enquete Emploi* provides information concerning workers' *départements*, a difficulty arises in that we know only the regions (groupings of three to four *départements*) in which unemployed individuals live and not their particular *départements*. This is why, exceptionally in this section, we must consider Alsace-Lorraine and in addition to Alsace-Moselle. Note that results are similar if we use Alsace as the only unit of treatment.

Table 5 examines the relationship between the milder reform in Alsace-Moselle in 2000 and employment. The dependent variable in all columns is an active dummy (1 if active, 0 if inactive). In Column (1), the sample is restricted to occupations affected by the 35-hour reform⁶. In Column (2), the sample is restricted to occupations unaffected by the 35-hour reform (farmers, craftspeople, merchants and assimilated, business owners of ten or more employees, the liberal professions). In Column (3), the interest coefficient is (Alsace-Moselle)*(2001-2002)*(Occupations affected), a difference-in-difference-in-difference coefficient. We know the job category of 91408 inactive individuals, this is why a triple difference strategy is possible⁷.

The coefficient of interest is not significantly different from zero. This means that there are no differences in local employment relative to France owing to the milder version of the 35-hour reform.

A consideration of regional employment data rather than individual data to detect the (absence of) employment effect may have been desirable, but this approach is not possible

⁶These are: civil service cadres, university professors, scientists, information and entertainment workers, administrative and commercial business cadres, engineers and technical business cadres, teachers and others, mid-level health professionals and social workers, mid-level administrative civil servants, mid-level administrative and commercial business professionals, technicians, supervisors or foremen, civil servants and public service agents, police and military officers, administrative business employees, commercial enterprise employees, qualified industrial workers, qualified craftspeople, chauffeurs or taxi drivers, qualified industrial goods handlers and retail and transport workers, unqualified industrial workers, unqualified craftspeople, and agricultural workers.

⁷Note that other triple difference approaches based on firm size or activity sector were impossible because we do not know the firm size or activity sector of unemployed individuals.

here since it amounts to a difference-in-differences approach, with the obvious above-mentioned caveat: Alsace suffered disproportionately from the effects of the German recession during that exact 2001-2002 period: regional data are typically not available by type of firms or by sector. If they were, they would in any case be based on the same labor force survey used here.

6.2 The (individual) unemployment probability

Another outcome of interest is unemployment. Table 6 examines the relationship between the milder 2000 reform in Alsace-Moselle and unemployment. The dependent variable in all columns is an unemployment dummy (1 if unemployed, 0 if active). In Column (1), the sample is restricted to occupations affected by the 35-hour reform. In Column (2), the sample is restricted to occupations unaffected by the 35-hour reform (farmers, craftspeople, merchants and assimilated, business owners of ten or more employees, the liberal professions). In Column (3), the coefficient of interest is (Alsace-Moselle)*(2001-2002)*(Occupations affected), a difference-in-difference-in-difference coefficient. We know the job category of 91408 inactive individuals; this is why a triple difference strategy is possible⁸. The coefficient of interest is again not significantly different from zero.

6.3 Hourly wage effects

We can now consider wages. Our prior is that hours worked decreased but hourly wages increased with an ambiguous effect on total wages. Given the milder application of the reform in Alsace-Moselle, we expect a relative decrease in hourly wages there over the relevant time period. Table 7 investigates hourly wage effects. The dependent variable in Columns (1), (2), (3), (4) and (5) is monthly wage divided by hours worked the previous week (and divided by 4.5 to obtain the hourly wage). Triple differences results using the three methods (size of the enterprise, sectors affected and occupations affected are shown). Column (1) shows a negative and significant coefficient for Alsace-Lorraine in 2001-2002 using a triple difference comparing employees of both big and small firms. The coefficient here implies that the hourly wage increased by 2 French Francs, or a 3.7% increase⁹. This is less than the increase in number of hours worked in Alsace-Lorraine (10%). This result is robust to using a tobit specification¹⁰ in column (2) or including 30 interaction dummies between Occupations and the +20 employees dummy in column (3). However, using a DDD approach based on sectors or occupations affected, we could

⁸A triple difference involving firm size or activity sector is not possible since we do not know firm size or activity sector in cases of unemployed individuals.

⁹Average hourly wage is 54 French Francs.

¹⁰There is top and bottom coding in the wage data (more than 15000 Francs and less than 2500 Francs). We top coded the data at 83 Francs per hour (15000/4.5/40) and 16 Francs (2500/4.5/35).

not confirm the hourly wage increase: no significant result appears in columns (4) and (5).

7 What we may conclude

Our paper had three aims. The first was to verify, from a purely descriptive standpoint, that earlier works by lawyers (Grisey-Martinez 2005) would be confirmed by the data. These works are legal analyses of the process of working time reduction in Alsace-Moselle and how the national Aubry laws interfered with local laws of German origin. These works indicate, as a matter of fact, that the 2001-2002 was an ambiguous period in what concerns the application of the Aubry laws, an ambiguity favorable to employers. We did in fact find in Section 5 that weekly hours worked increased relative to the rest of France by 0.35 hours on average, which represents 16 hours (two days) per year.

The second more ambitious aim was to verify whether the 35-hour reform had a significant impact on employment growth, as claimed by its proponents. Our only claim here is that a milder application of the 35-hour reform in Alsace-Moselle had no impact on relative employment in that region. We cannot conclude with certainty that the aggregate impact of the 35-hour reform was close to zero. However, our results are certainly consistent with this interpretation.

A last comment is more methodological: we have seen that there are interesting identification strategies based on local specificities in France, despite the prior that most legal changes typically apply on a nationwide level. In reality, France is a rather interesting and somehow surprising aggregation of regional disparities. The example used in the present paper sheds light on one prominent instance of regional disparity, and researchers may be well served to explore other such geographic disparities.

Table 1: Identification Strategy
Differential impact by firm size of the 35 hours reform in Alsace Moselle

Dependent variable	(1)	(2)	(3)	(4)	(5)
	hours usually worked per week				
Method	+20 employees	-20 employees	DDD	DDD	DDD
			Cluster (department)	Cluster (department)	Cluster (department)
(Alsace-Moselle)*(2003)	-0.4124 (0.89)	-0.2407 (0.88)	-0.2738 (0.91)	-0.2738 (0.88)	-0.2552 (0.91)
(Alsace-Moselle)*(2001-2002)	0.3796 (2.22)**	0.0881 (0.45)	0.1130 (0.50)	0.1130 (0.50)	0.0658 (0.30)
(Alsace-Moselle)*(1999-2000)	0.0413 (0.23)	0.0000 (.)	0.0000 (.)	0.0000 (.)	0.0000 (.)
(Alsace-Moselle)*(2003)*(+20 employees)			-0.1433 (0.22)	-0.1433 (0.26)	-0.1549 (0.31)
(Alsace-Moselle)*(2001-2002)*(+20 employees)			0.2657 (2.27)**	0.2657 (2.00)**	0.3139 (2.65)***
(Alsace-Moselle)*(1999-2000)*(+20 employees)			0.0426 (0.24)	0.0426 (0.18)	0.0423 (0.18)
Department Fixed Effects (95)	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects (7)	Yes	Yes	Yes	Yes	Yes
Control Variables (14)	Yes	Yes	Yes	Yes	Yes
Occupations Fixed Effects (30)	Yes	Yes	Yes	Yes	Yes
Year*(+20 employees dummy) Fixed Effects	No	No	Yes	Yes	Yes
Dep.*(+20 employees dummy) Fixed Effects	No	No	Yes	Yes	Yes
Occupations*(+20 employees dummy) Fixed Effects	No	No	No	No	Yes
Observations	387794	70759	458553	458553	458553
R-squared	0.34	0.39	0.36	0.36	0.36

OLS results. Robust t statistics in parentheses, clustered at the level of region. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable in columns (1), (2), (3), (4) and (5) is the number of hours usually worked per week. In column (1), the sample is restricted to individuals working in firms with more than 20 employees. In column (2), the sample is restricted to individuals working in firms with less than 20 employees. In column (3), the coefficient of interest is (Alsace-Moselle)*(2001-2002)*(+20 employees), a difference-in-difference-in-difference coefficient. In all columns, 95 department fixed effects, 8 year fixed effects, 14 control variables (5 age dummies, sex, size of household and 7 diploma dummies) and 30 Occupations fixed effects are included. Additionally, in column (3), 95 interaction dummies between departments and the +20 employees dummy are included, as well as 7 interaction dummies between year dummies and the +20 employees dummy. In column (4), standard errors are clustered at the level of department. In column (5), 30 interaction dummies between Occupations and the +20 employees dummy are added.

Table 2: Identification Strategy
Differential impact by sectors of the 35 hours reform in Alsace Moselle

Dependent variable	hours usually worked per week		
	(1)	(2)	(3)
Method	Affected sectors	Unaffected sectors	DDD
(Alsace-Moselle)*(2003)	-0.2962 (0.64)	-0.5597 (1.77)*	-0.5545 (1.89)*
(Alsace-Moselle)*(2001-2002)	0.5519 (1.88)*	0.0952 (0.81)	0.1052 (0.89)
(Alsace-Moselle)*(1999-2000)	0.2426 (1.25)	0.0341 (0.19)	0.0141 (0.08)
(Alsace-Moselle)*(2003)*(Affected sectors)			0.4322 (1.70)
(Alsace-Moselle)*(2001-2002)*(Affected sectors)			0.5269 (1.87)*
(Alsace-Moselle)*(1999-2000)*(Affected sectors)			0.1804 (1.79)*
Department Fixed Effects (95)	Yes	Yes	Yes
Year Fixed Effects (7)	Yes	Yes	Yes
Control Variables (14)	Yes	Yes	Yes
Occupations Fixed Effects (30)	Yes	Yes	Yes
Year*(Affected sectors dummy) Fixed Effects	No	No	Yes
Dep.*(Affected sectors dummy) Fixed Effects	No	No	Yes
Occupations*(Affected sectors dummy) Fixed Effects	No	No	Yes
Observations	86283	372270	458553
R-squared	0.43	0.33	0.36

OLS results. Robust t statistics in parentheses, clustered at the level of region. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable in columns (1), (2) and (3) is the number of hours usually worked per week. In column (1), the sample is restricted to individuals working in sectors affected by the deduction of the 2 extra public holidays (Commerce de détail, réparations; Métallurgie et transformation des métaux; Construction; Hôtels et restaurants). In column (2), the sample is restricted to individuals working in all other sectors. In column (3), the coefficient of interest is (Alsace-Moselle)*(2001-2002)*(Affected sectors), a difference-in-difference coefficient. In all columns, 95 department fixed effects, 8 year fixed effects, 14 control variables (5 age dummies, sex, size of household and 7 diploma dummies) and 30 Occupations fixed effects are included. Additionally, in column (3), 95 interaction dummies between departments and the Affected sectors dummy, 7 interaction dummies between year dummies and the Affected sectors dummy and 30 interaction dummies between Occupations and the Affected sectors dummy are included.

Table 3: Identification Strategy
Differential impact by occupations of the 35 hours reform in Alsace Moselle

Dependent variable	(1)	(2)	(3)
	hours usually worked per week		
Method	Occupations affected	Occupations unaffected	DDD
(Alsace-Moselle)*(2003)	-0.3857 (1.66)	-0.7850 (1.39)	-0.7192 (1.40)
(Alsace-Moselle)*(2001-2002)	0.3616 (1.90)*	-1.1599 (1.55)	-1.1081 (1.50)
(Alsace-Moselle)*(1999-2000)	0.0904 (0.53)	-0.0852 (0.10)	-0.0567 (0.06)
(Alsace-Moselle)*(2003)*(Occupations affected)			0.3073 (0.47)
(Alsace-Moselle)*(2001-2002)*(Occupations affected)			1.4700 (2.03)**
(Alsace-Moselle)*(1999-2000)*(Occupations affected)			0.1309 (0.16)
Department Fixed Effects (95)	Yes	Yes	Yes
Year Fixed Effects (7)	Yes	Yes	Yes
Control Variables (14)	Yes	Yes	Yes
Occupations Fixed Effects (30)	Yes	Yes	Yes
Year*(Occupations affected dummy) Fixed Effects	No	No	Yes
Dep.*(Occupations affected dummy) Fixed Effects	No	No	Yes
Observations	401022	57531	458553
R-squared	0.17	0.22	0.36

OLS results. Robust t statistics in parentheses, clustered at the level of region. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable in columns (1), (2) and (3) is the number of hours usually worked per week. In column (1), the sample is restricted to Occupations affected by the 35 hours reform (Cadres de la fonction publique, Professeurs, professions scientifiques, Professions de l'information, des arts et des spectacles, Cadres administratifs et commerciaux d'entreprises, Ingénieurs et cadres techniques d'entreprises, Instituteurs et assimilés, Professions intermédiaires de la santé et du travail social, Professions intermédiaires administratives de la fonction publique, Professions intermédiaires administratives et commerciales des entreprises, Techniciens, Contremaîtres, agents de maîtrise, Employés civils et agents de service de la fonction publique, Policiers et militaires, Employés administratifs d'entreprises, Employés de commerce, Ouvriers qualifiés de type artisanal, Chauffeurs, Ouvriers qualifiés de la manutention, du magasinage et du transport, Ouvriers non qualifiés de type industriel, Ouvriers non qualifiés de type artisanal, Ouvriers agricoles). In column (2), the sample is restricted to Occupations unaffected by the 35 hour reform (Agriculteurs, Artisans, Commerçants et assimilés, Chefs d'entreprise de 10 salariés ou plus, Professions libérales). In column (3), the coefficient of interest is (Alsace-Moselle)*(2001-2002)*(Occupations affected), a difference-in-difference-in-difference coefficient. In all columns, 95 department fixed effects, 8 year fixed effects, 14 control variables (5 age dummies, sex, size of household and 7 diploma dummies) and 30 Occupations fixed effects are included. Additionally, in column (3), 95 interaction dummies between departments and the Occupations affected dummy are included, as well as 7 interaction dummies between year dummies and the Occupations affected dummy.

Table 4: Impact of the milder version of the 35 hours reform in Alsace in 2000 on leisure

Data from “Enquêtes permanentes sur les conditions de vie, Indicateurs sociaux d’octobre”

	(1)	(2)	(3)	(4)
	national newspapers read per month?	exhibitions per month?	books per month?	times watch TV per day?
alsacemoselle*(2001-2002)	-5.2186	-0.4270	-1.2102	-0.0194
*(Occupations affected)	(4.41)***	(4.97)***	(1.37)	(0.30)
alsacemoselle*(other years)	Yes	Yes	Yes	Yes
*(Occupations affected)				
Control Variables	Yes	Yes	Yes	Yes
Job Category Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Department Fixed Effects	Yes	Yes	Yes	Yes
Year*Job Fixed Effects	Yes	Yes	Yes	Yes
Dep.*Job Fixed Effects	Yes	Yes	Yes	Yes
Observations	6759	6759	6759	6759
R-squared	0.23	0.13	0.16	0.12

OLS results. Robust t statistics in parentheses, clustered at the level of region. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5: Impact of the 35 hours reform on employment

Method	(1)		(2)		(3)	
	Occupations affected	Occupations unaffected	Occupations affected	Occupations unaffected	DDD	DDD
(Alsace-Lorraine)*(2003)	-0.0304 (3.22)***	-0.0036	-0.0036	-0.0058	-0.0058	-0.0058
(Alsace-Lorraine)*(2001-2002)	-0.0007	0.0025	0.0025	0.0059	0.0059	0.0059
(Alsace-Lorraine)*(1999-2000)	-0.1	-0.35	-0.35	-0.58	-0.58	-0.58
(Alsace-Lorraine)*(2003)*(Occupations affected)	0.0008	-0.0029	-0.0029	-0.0001	-0.0001	-0.0001
(Alsace-Lorraine)*(2003)*(Occupations affected)	-0.77	-0.24	-0.24	0	0	0
(Alsace-Lorraine)*(2001-2002)*(Occupations affected)				-0.0225	-0.0225	-0.0225
(Alsace-Lorraine)*(2001-2002)*(Occupations affected)				(2.43)**	(2.43)**	(2.43)**
(Alsace-Lorraine)*(1999-2000)*(Occupations affected)				-0.0069	-0.0069	-0.0069
(Alsace-Lorraine)*(1999-2000)*(Occupations affected)				-0.41	-0.41	-0.41
(Alsace-Lorraine)*(1999-2000)*(Occupations affected)				0.0009	0.0009	0.0009
(Alsace-Lorraine)*(1999-2000)*(Occupations affected)				-0.06	-0.06	-0.06
Region Fixed Effects (21)	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects (7)	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables (14)	Yes	Yes	Yes	Yes	Yes	Yes
Job category Fixed Effects (30)	Yes	Yes	Yes	Yes	Yes	Yes
Year*(Occupations affected dummy) Fixed Effects	No	No	No	No	No	No
Reg.*(Occupations affected dummy) Fixed Effects	No	No	No	No	No	No
Observations	659956	136716	136716	796672	796672	796672

Probit results with marginal effects at the mean. Robust z statistics in parentheses, clustered at the level of region. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable in all columns is an active dummy (1 if active, 0 if inactive). In column (1), the sample is restricted to occupations affected by the 35 hours reform (Cadres de la fonction publique, Professeurs, professions scientifiques, Professions de l'information, des arts et des spectacles, Cadres administratifs et commerciaux d'entreprises, Ingénieurs et cadres techniques d'entreprises, Instituteurs et assimilés, Professions intermédiaires de la santé et du travail social, Professions intermédiaires administratives de la fonction publique, Professions intermédiaires administratives et commerciales des entreprises, Techniciens, Contremaîtres, agents de maîtrise, Employés civils et agents de service de la fonction publique, Policiers et militaires, Employés administratifs d'entreprises, Employés de commerce, Ouvriers qualifiés de type artisanal, Chauffeurs, Ouvriers qualifiés de la manutention, du magasinage et du transport, Ouvriers non qualifiés de type industriel, Ouvriers non qualifiés de type artisanal, Ouvriers agricoles). In column (2), the sample is restricted to occupations unaffected by the 35 hour reform (Agriculteurs, Artisans, Commerçants et assimilés, Chefs d'entreprise de 10 salariés ou plus, Professions libérales). In column (3), the coefficient of interest is (Alsace-Moselle)*(2001-2002)*(Job categories affected), a difference-in-difference-in-difference coefficient. In all columns, 21 region fixed effects, 8 year fixed effects, 14 control variables (5 age dummies, sex, size of household and 7 diploma dummies) and 30 occupation fixed effects are included. Additionally, in column (3), 21 interaction dummies between regions and the occupations affected dummy are included, as well as 7 interaction dummies between year dummies and the occupations affected dummy. We know the occupation of 91408 inactive individuals, this is why a triple difference strategy is possible.

Table 6: Impact of the 35 hours reform on unemployment

Method	(1)		(2)		(3)	
	Occupations affected	Occupations unaffected	Occupations affected	Occupations unaffected	DDD	DDD
(Alsace-Lorraine)*(2003)	0.0102 (1.99)**	0.0011 (0.23)			0.0015 (0.18)	0.0015 (0.18)
(Alsace-Lorraine)*(2001-2002)	0.0003 (0.04)	0.0039 (0.83)			0.0063 (0.79)	0.0063 (0.79)
(Alsace-Lorraine)*(1999-2000)	-0.0001 (0.08)	-0.0005 (0.05)			-0.0016 (0.12)	-0.0016 (0.12)
(Alsace-Lorraine)*(2003)*(Occupations affected)					0.0076 (1.13)	0.0076 (1.13)
(Alsace-Lorraine)*(2001-2002)*(Occupations affected)					-0.0056 (0.40)	-0.0056 (0.40)
(Alsace-Lorraine)*(1999-2000)*(Occupations affected)					0.0015 (0.10)	0.0015 (0.10)
Region Fixed Effects (21)	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects (7)	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables (14)	Yes	Yes	Yes	Yes	Yes	Yes
Job category Fixed Effects (30)	Yes	Yes	Yes	Yes	Yes	Yes
Year*(Occupations affected dummy) Fixed Effects	No	No	No	No	No	No
Reg.*(Occupations affected dummy) Fixed Effects	No	No	No	No	No	No
Observations	572401	118556	572401	118556	690985	690985

Probit results with marginal effects at the mean. Robust z statistics in parentheses, clustered at the level of region. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable in all columns is an unemployment dummy (1 if unemployed, 0 if active). In column (1), the sample is restricted to occupations affected by the 35 hours reform (Cadres de la fonction publique, Professeurs, professions scientifiques, Professions de l'information, des arts et des spectacles, Cadres administratifs et commerciaux d'entreprises, Ingénieurs et cadres techniques d'entreprises, Instituteurs et assimilés, Professions intermédiaires de la santé et du travail social, Professions intermédiaires administratives de la fonction publique, Professions intermédiaires administratives et commerciales des entreprises, Techniciens, Contremaîtres, agents de maîtrise, Employés civils et agents de service de la fonction publique, Policiers et militaires, Employés administratifs d'entreprises, Employés de commerce, Ouvriers qualifiés de type industriel, Ouvriers qualifiés de type artisanal, Chauffeurs, Ouvriers qualifiés de la manutention, du magasinage et du transport, Ouvriers non qualifiés de type industriel, Ouvriers non qualifiés de type artisanal, Ouvriers agricoles). In column (2), the sample is restricted to occupations unaffected by the 35 hour reform (Agriculteurs, Artisans, Commerçants et assimilés, Chefs d'entreprise de 10 salariés ou plus, Professions libérales). In column (3), the coefficient of interest is (Alsace-Moselle)*(2001-2002)*(Job categories affected), a difference-in-difference coefficient. In all columns, 21 region fixed effects, 8 year fixed effects, 14 control variables (5 age dummies, sex, size of household and 7 diploma dummies) and 30 occupations fixed effects are included. Additionally, in column (3), 21 interaction dummies between regions and the occupations affected dummy are included, as well as 7 interaction dummies between year dummies and the occupations affected dummy. We know the occupation of 91408 inactive individuals, this is why a triple difference strategy is possible.

Table 7: Impact of the 35 hours reform on hourly wage

Method	(1)		(2)		(3)		(4)		(5)	
	DDD +20 employees		DDD Tobit +20 employees		DDD +20 employees		DDD Sectors		DDD Occupations	
(Alsace-Lorraine)*(2003)	-1.0641 (0.84)		0.9118 (0.73)		-0.8383 (0.64)		-1.9995 (1.19)		-1.6536 (0.86)	
(Alsace-Lorraine)*(2001-2002)	2.4731 (4.59)***		2.5875 (3.11)***		2.4961 (3.96)***		0.1154 (0.21)		-1.2331 (0.64)	
(Alsace-Lorraine)*(1999-2000)	0.0000 (.)				0.0000 (.)		0.0793 (0.18)		-0.9502 (0.39)	
(Alsace-Lorraine)*(2003)* (+20 employees/sectors affected/Occupations affected)	0.6074 (0.44)		-2.1730 (1.61)		0.3098 (0.20)		4.8069 (1.25)		0.6732 (0.24)	
(Alsace-Lorraine)*(2001-2002)* (+20 employees/sectors affected/Occupations affected)	-2.0460 (2.17)**		-1.5609 (1.77)*		-2.0644 (1.94)*		1.0264 (1.04)		1.6893 (0.94)	
(Alsace-Lorraine)*(1999-2000)* (+20 employees/sectors affected/Occupations affected)	-0.3542 (0.99)		-0.0582 (0.21)		-0.3610 (0.99)		-1.4411 (1.95)*		0.7789 (0.34)	
Department Fixed Effects (95)	Yes		Yes		Yes		Yes		Yes	
Year Fixed Effects (7)	Yes		Yes		Yes		Yes		Yes	
Control Variables (14)	Yes		Yes		Yes		Yes		Yes	
Job category Fixed Effects (30)	Yes		Yes		Yes		Yes		Yes	
Year*(+20 employees dummy) Fixed Effects	Yes		Yes		Yes		No		No	
Dep.*(+20 employees dummy) Fixed Effects	Yes		Yes		Yes		No		No	
Year*(Affected sectors dummy) Fixed Effects	No		No		No		Yes		No	
Dep.*(Affected sectors dummy) Fixed Effects	No		No		No		Yes		No	
Year*(Occupations affected dummy) Fixed Effects	No		No		No		No		Yes	
Dep.*(Occupations affected dummy) Fixed Effects	No		No		No		No		Yes	
Occupations*(+20 employees dummy) Fixed Effects	No		No		Yes		Yes		No	
Observations	318137		318137		318137		318137		318137	
R-squared	0.20				0.20		0.20		0.20	

OLS results are presented (tobit in column (2)). Robust t statistics in parentheses, clustered at the level of region. * significant at 10%; ** significant at 5%; *** significant at 1%. The dependent variable in all columns is monthly wage divided by hours worked last week (and divided by 4.5 to get the hourly wage). Triple differences results using the three methods (size of the enterprise, sectors affected and occupations affected) are shown. In column (2), tobit results are shown as there is bottom coding at 16FR/hour and 83FR/hour.

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