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Overtime Hours and Bonuses : A Story of Fiscal Optimization

Master Thesis

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Overtime Hours and Bonuses
A story of fiscal optimization

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Abstract

Between October 2007 and September 2012, France experienced a massive tax-cut policy, where social contributions and income-tax on overtime hours were exempted. The main goal of this law was to increase the number of hours worked. This article investigates the channel between overtime hours and bonuses and analyses the consequences of removing such tax-cut policy. Similarly to Cahuc and Carcillo (2014), this paper reports a positive impact on paid overtime hours for workers whose hours are difficult to verify and no impact on hours worked. It also shows evidence of a large decrease of unpaid overtime hours and bonuses after the reform, attesting to the large fiscal optimization that the policy induced. Finally, it appears that if removing the policy in 2012 negatively impacted the number of paid overtime hours, it did not increased bonuses, which are not more attractive than before.

Keywords: overtime hours, bonuses, labor policy, fiscal policy, entropy-balancing

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1 Introduction

The Policy

During the 2007 presidential campaign, Nicolas Sarkozy, winning candidate of the right-wing French party, often used the "Work more to earn more" ("Travailler plus pour gagner plus") political slogan to denounce a too heavy fiscal pressure on French workers. Therefore on October 1st 2007, the TEPA law, a set of fiscal measures aiming to stimulate employment and activity, known also as the French fiscal package law, was implemented. Following this idea of a greater remuneration for work, among many measures the TEPA law changed how overtime hours were taxed to help firms and workers that wished to work more. The main consequence of the TEPA law was not to simplify the relatively complex regulation of work and of overtime hours, but to reduce taxes, and then the cost, on overtime hours. Before the TEPA law, the extra-remuneration rate that comes with doing overtime hours was quite heterogeneous depending on collective agreements and on how large a firm was, with for instance a rate of only 10% of extra-pay for firms with less than 21 employees. The TEPA law harmonized the situation by setting an uniform rate of 25%, not matter what is the size of the firm. However since this would increase the cost of overtime hours for small firms, the French government decided to introduce a tax-exemption of 1.5/overtime hours for firms under 20 employees, and of 0.5/overtime hours for firms above this threshold. In order to encourage individuals to do more overtime hours, workers benefited from an exemption of social security contributions and income tax on the remuneration received from these hours. Even if a maximal tax-cut of 21.5% of the gross wage was decided, the after-tax income that doing overtime hours provides increased by 30% to 50% thanks to the TEPA law. Workers were then strongly encouraged to work more overtime. For firms, the impact was more heterogeneous depending on the number of employees and wages, but overall, their marginal rate of taxation decreased strongly.

However since the TEPA law was applying to individuals working on the French territory, transborders who were commuting everyday to work in a neighboring

country could benefit from the TEPA law. Therefore, in 2010, the TEPA law was even extended in order to include trans-border workers. Starting January 2010, transborders could benefit from the tax-cut on their income declaration for the the extra-income they would get from doing overtime hours. This extension only applied to transborders' income sheet since, by working outside of France, transborders are paying social contributions and labor taxes in the country where they work.

Nevertheless due to a political turnover, the part of the TEPA law on overtime hours was almost completely abrogated on September 2012. Indeed, starting August 2012, individuals who were working overtime could not benefit anymore of any tax-reduction on their income sheet, and starting September 2012 this also applied to employees and firms social contributions. The following socialist government only kept a marginal tax-deduction for small firms with less than 20 employees. This tax-deduction was of 1.5 per hours on the social contribution of employers only. Since this tax-cut is very small and limited to a very small sample of firms, after September 2012 one could consider that the incentives to do more overtime hours were strongly reduced.

Previous Findings

Similar policies have been introduced in other European countries. One can find examples of policies aiming to boost the number of hours worked in Austria, Belgium, Luxembourg and even in the United States. For instance since 2005 Belgium has reduced social contributions and taxes on the extra-rate at which overtime hours are paid. In Austria, since 1996, this extra-rate is exempted from tax income, in the limit of 10 hours per month,. In 2008, the Luxembourg also implemented a similar tax-exemption policy of social contributions and tax income for hours beyond the legal limit. It seems then that the detaxation of overtime hours spread across public policy makers of developed countries, believing that it can increase the duration of work. For instance in 2016 the US Department of Labor tried to implement a law that would have qualified workers for overtime remuneration after their 40th hours of worked, but the law has been blocked by the Trump administration in

October 2017. Again, the main idea behind this policy conceived under the Obama administration, was to help workers have their overtime hours paid, and therefore to encourage them to increase the duration of work. However, there is no example of a tax-cut policy on overtime hours as large in magnitude and scale than the one introduced in France by the TEPA law.

Only few studies look at the effects of the TEPA law. For instance, Heyer (2011) tries to shade light on the macroeconomic impact of the detaxation of overtime hours. His main conclusion was that the economic cycle matters a lot when assessing the effect of the policy on employment, GDP and government deficit. In a more recent work (Heyer, 2017), Heyer presents an overview of the recent years regarding the volume of overtime hours in France and how it changed with the TEPA law. By looking at the impact of the law on overtime hours, hours worked, income gains for households and employment, this paper provides a good statistical description and potential estimated effects of the impact of the TEPA law. Using administrative data from ACOSS, the French social security administration, Heyer finds that overtime hours first increased by 50% during the year after the introduction of the TEPA law and then increased again by 12% between 2010 and 2012. Heyer estimates that on a macroeconomic perspective the TEPA law had a small negative impact on employment, when the reduced cost of labor will be counterbalanced by the increasing duration of working time. This effect is consistent with previous findings from Cochard et al. (2010) which finds that, with the TEPA law, increasing the volume of overtime hours by 1% would destroy around 6000 jobs of commercial sector, with these 6000 jobs being mainly temporary jobs.

However Heyer (2017) focuses mostly on employment and income gains and gives only little explanation of why overtime hours and hours worked could have changed with the TEPA law. Another work, Cahuc and Carcillo (2014), closer to what this paper is aiming to do, gives much more explanation of the underlying mechanisms between hours worked and overtime hours. To the best of my knowledge it is the only work that studies the impact of the TEPA law on hours worked and overtime

hours. Authors find no significant impact on hours worked but a positive effect on the number of overtime hours declared by highly-skilled workers whose hours are less verifiable. They argue that these workers are then more able than their counter-peers to manipulate their labor declaration and to use of fiscal optimization to maximize their income. One of the main explanation they provide is that prior to the reform highly-skilled individuals were receiving bonuses for their overtime time work that were transformed in less-taxed overtime hours when the TEPA law was introduced. This is a very important policy matter for labor policy, especially since authors estimate that the cost of the TEPA law was 4.4 billion of euros in 2008, which represents 40 % of the French state budget for employment. This estimation is consistent with macroeconomic estimations of Heyer (4.5 billion in 2011), which are even bigger when taking into account the small negative effects on employment (up to 6.8 billion of euros). However Cahuc and Carcillo did not fully explored the channel between bonuses and overtime hours because of a lack of observations that came with the chosen research design. By using a different identification strategy, this paper aims to contribute by filling this gap and exploring the impact of the abolition of the TEPA law on overtime hours, bonuses and hours worked.

Contribution

This work aims to contribute to the literature of labor policy in three ways. First it confirms previous findings on the effect of the TEPA law. Especially, by using the same identification strategy, with transborders commuting everyday to work in a neighbouring country as a control group and French work near the border as a treatment group, it confirms results and narrative from Cahuc and Carcillo (2014). Using the same Diff-in-Diff design, I find a positive impact of the TEPA law on overtime hours for individuals whose hours are less verifiable, such as managers and highly skilled workers. However, whereas Cahuc et al. find a positive general effect on all kind of employees, I did not found any statistically significant impact. Moreover, authors do not find any significant impact on hours worked, whereas I observe some negative effect on the number of hours that these high-skilled employees are doing. Overall, the narrative does not change and previous findings are corroborated: the

TEPA law did not induced an increase in hours worked, but only led managers to declare more overtime hours. Cahuc et al. explained this result by saying that since for this category of worker, hours are less verifiable, instead of formerly attributing bonuses, firms used the TEPA law as a way to do fiscal optimization and declare more overtime hours that were less costly than before.

This leads me to my second contribution. I investigate the channel between bonuses and overtime hours, in order to determine the validity of this narrative. Since the first identification strategy does not provide enough observation to look at the impact of the law on bonuses, I use an alternative one. I compare individuals that did not receive bonuses prior to the reform (control group) to individuals that did (treatment group). Indeed, one will think that if the TEPA law had a negative impact on bonuses, workers that were not receiving bonuses prior to it should not be impact. On the contrary, only individuals that were being paid for overtime work with bonuses should experience changes. Therefore, if the TEPA law involved a transfer from bonuses to newly detaxed overtime hours, one should expect a strong negative effect on bonuses. My results validates this narrative, with huge negative effects on bonuses after the law was implemented. I also look at the effect on unpaid overtime hours and find results that reinforce this idea: once the tax-cut policy was implemented, the number of unpaid overtime hours decreased while the number of overtime hours increased. This result strongly supports the idea that, instead of inducing new work and making individuals work more, the TEPA law might just help workers to declare the overtime hours they were already doing, and therefore, led to fiscal optimization. I tried to look at potential effects on income, but I did not find rigorous results, due to the misreporting in the French Labor Survey of the income variable, which mainly leads to a lack of observations.

Finally, since the tax-cut policy was removed in 2012, I decide to investigate what would be the effect of removing such policy on overtime hours, hours worked or bonuses. Indeed it is not straightforward that one can expect symmetrical effects from those which appeared when the policy was put in place, and actually nothing

supports this claim. To test this hypothesis, I use a third identifications strategy, close to the second one. Using again a Diff-in-Diff design, I compare workers that did not use overtime hours prior to October 2012 (control group) to workers who did (treatment group). One should expect that workers who did work overtime when overtime hours were detaxed, do not have more incentives to do it when overtime hours are taxed at a normal rate. Therefore, only individuals who worked overtime when it was detaxed should be impacted by the abolition of the TEPA law. However I find very mixed evidence when the policy was removed. It seems that if overall overtime hours decreased once the tax-cut ended, laborers were even more impacted than managers. Regarding bonuses, I do not see evidence of bigger bonuses after the removal of the policy. This might be explained by the fact that removing the tax-deduction on overtime hours did not make bonuses less costly or more attractive to firms, and therefore it seems quite rational to not see a clear increase in bonuses. Overall, the effects found for the removal in 2012 seem to corroborate this narrative where overtime hours replaced bonuses while the tax-cut being effective. On a more general perspective, these results are very instructive of the potential effects of removing a labor and tax-cut policy, and broaden the public policy literature. Especially, the detaxation of overtime hours recently can back in the French political debate as a way for president Emmanuel Macron and his government to answer to the social crisis of the Yellow Vests. Since January 2019, workers who are doing overtime hours are exempted of income-tax[1] (up to 5000/year) and of social contributions related to pension (up to a reduction of 11.5%).[2]. Even if different – the 2019 detaxation has no impact on the firm side – I hope this study will contribute to further analysis of the 2019 reform and help public policy makers to have a better understanding on the underlying mechanisms of the detaxation of overtime hours.

This paper is organized as follows. First I will briefly discuss the work regulation prior to the TEPA law and which effects one can expect from the implementation of

[1] Article 2 of the law n° 2018-121, December 24th 2018

[2] Article 7 of the 2019 social security funding law

a tax-cut policy on overtime hours. Then I present theoretical remarks regarding the fiscal optimization process that might be induced by the TEPA law. I will especially focus on the distinction between laborers and managers. Then in section 4 I will describe the chosen research design, data and identification strategy. In particular, I will present the three selected identification strategies to assess the impact of the TEPA law and its abolition. Section 5 will report the estimates found for paid and unpaid overtime hours, hours worked, bonuses, probability of doing overtime hours and probability of receiving a bonus. Finally section 6 will provide robustness checks in order to prove the validity of these results.

2 The regulation of overtime hours

2.1 Institutional Background

In order to fully understand how the TEPA law could have impacted the duration of work and how many overtime hours workers do, one might want to know what was the former French work regulation. Since 2000, every hour worked beyond 35 hours per week is considered as an overtime hour. By working overtime, employees were qualified to a hourly extra-remuneration from 10% to 50% of the normal hourly wage. This extra pay rate was subject to the size of firms and collective agreements, with smaller firms (under 20 employees) giving a lower extra-remuneration than bigger firms. In order to prevent from abusive use of overtime hours, the hourly extra-remuneration rate was automatically set to 50% for employees doing more than 8 overtime hours per week. However some employees might trigger how overtime hours are measured, by being supervised by a modulation agreement where hours of work are not counted per week but per year. In this case, the duration work might vary week by week and employees qualify for overtime hours if they work more than 1607 hours per year. Before the TEPA law, firms and workers had very low incentives to declare overtime hours, mostly due to a very complex legislation. Indeed the work regulation is quite restrictive, with a maximum duration of work of 10 hours per day (12 maximum if there is a collective agreement), 48 hours a week (with an upper limit of 44 hours on average for 12 weeks) and an annual quota

of 220 overtime hours. Even if the limit on overtime hours can be modified by a sector or a firm agreement (upon the approval of the labor administration), all these mechanisms might limit the use of overtime hours. Moreover, employees that were doing overtime hours were eligible for extra holidays, which sometimes was complex to understand. For instance, if a sectoral agreement was existing, instead of paying for this extra work it would automatically translate into a rest period of the same length of hours, without being counted in the annual quota of 220 hours. However, if there was no agreement, once the quota of 220 hours exceeded, an obligatory rest period of between 50% (firms under 20 employees) to 100% (above 20 employees) of the length of overtime work was automatically added. With this complex system, most of the firms preferred paying overtime hours with bonuses and premiums, making the labor administration unable to properly verify the number of overtime hours.

2.2 Expected Results

However by introducing a tax-cut on overtime hours, the TEPA law reduced the cost of overtime hours and induce both firms and employees to use more overtime hours and less bonuses. Therefore, overall, one should expect a negative impact of the law on bonuses and a positive impact on overtime hours. In the same way, if this narrative is valid, one might think that removing the policy will decrease overtime hours and increase bonuses.

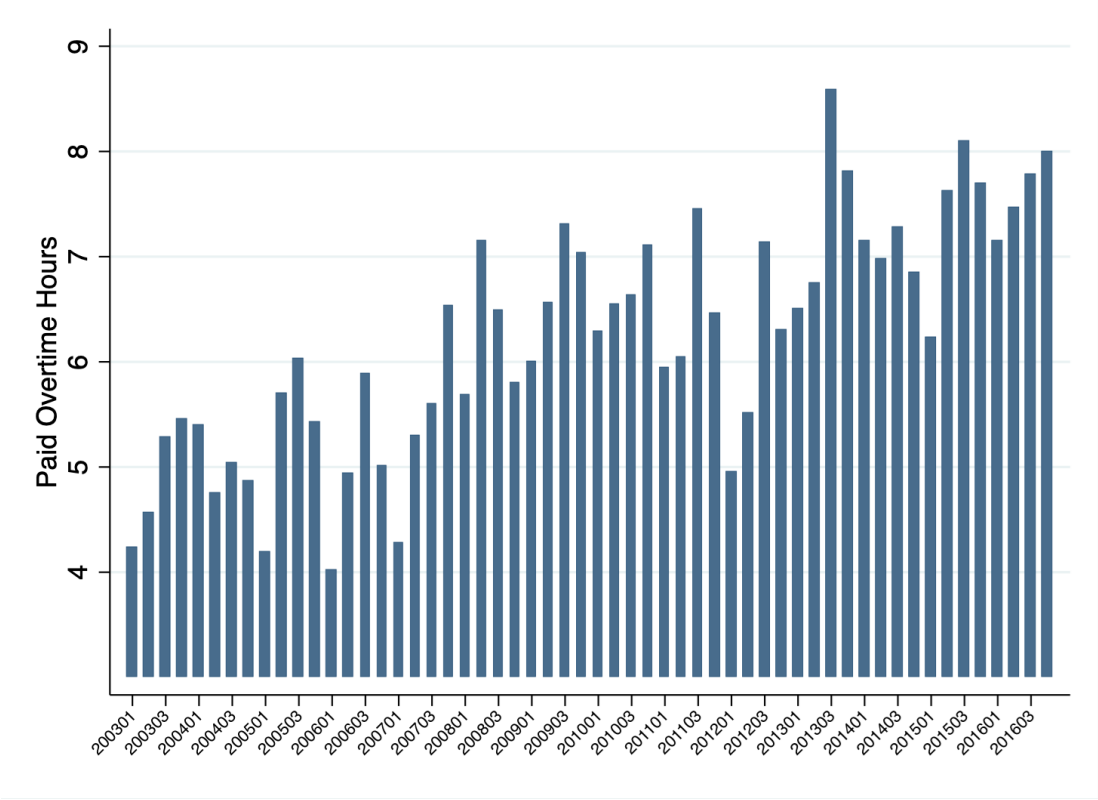

Figure 1: Average amount per quarter of paid overtime hours for full-time employees working in France in the non-agricultural for-profit sector. Sources: French Labor Survey (Enquête Emploi)

Figure 1 reports the evolution of paid overtime hours between 2003 and 2017. As one might notice, paid overtime hours started increasing in 2007 and continued to increase even if France is hit by the financial crisis in late-2008. However I do not see a reciprocal movement after the abolition of the law in 2012. Regarding the number of hours worked, due to this transfer between bonuses and overtime hours, it might be possible that the TEPA law increased the number of hours declared without changing the effectively work time. Indeed in the past literature, studies such as Costa (2000) and Trejo (2003) showed that increasing the overtime hours extra pay have almost no effect on the number of hours worked. Their main explanation was that both firms and workers care only about the sum of total work and the total remuneration and not about the way overtime work is paid. Another explanation might be related to fiscal optimization. Since both firms and employees have incentives to declare more overtime hours than declaring regular hours, one might observe an increase in overtime hours while no impact on the total number of hours

worked. For instance individuals might take advantage of the law to declare more detaxed overtime hours to the fiscal administration while declaring less normally-taxed hours worked. In order to observe these fiscal optimization behaviors, I create a "gap" variable that captures the difference between hours worked and overtime hours. If this variable decreases, this might indicate some fiscal optimization techniques, since hours worked increase less than overtime hours. Regarding potential explanations from Cahuc and Carcillo (2014), and especially how bonuses interplay with the TEPA law, I investigate the channel between bonuses and overtime hours. Since the TEPA law reduced the cost of overtime hours, one should expect workers to declare less unpaid overtime hours, since it is now easier to pay overtime hours that workers are doing. Moreover, if the channel between bonuses and overtime hours is true, I should observe a strong negative effect of the detaxation on bonuses.

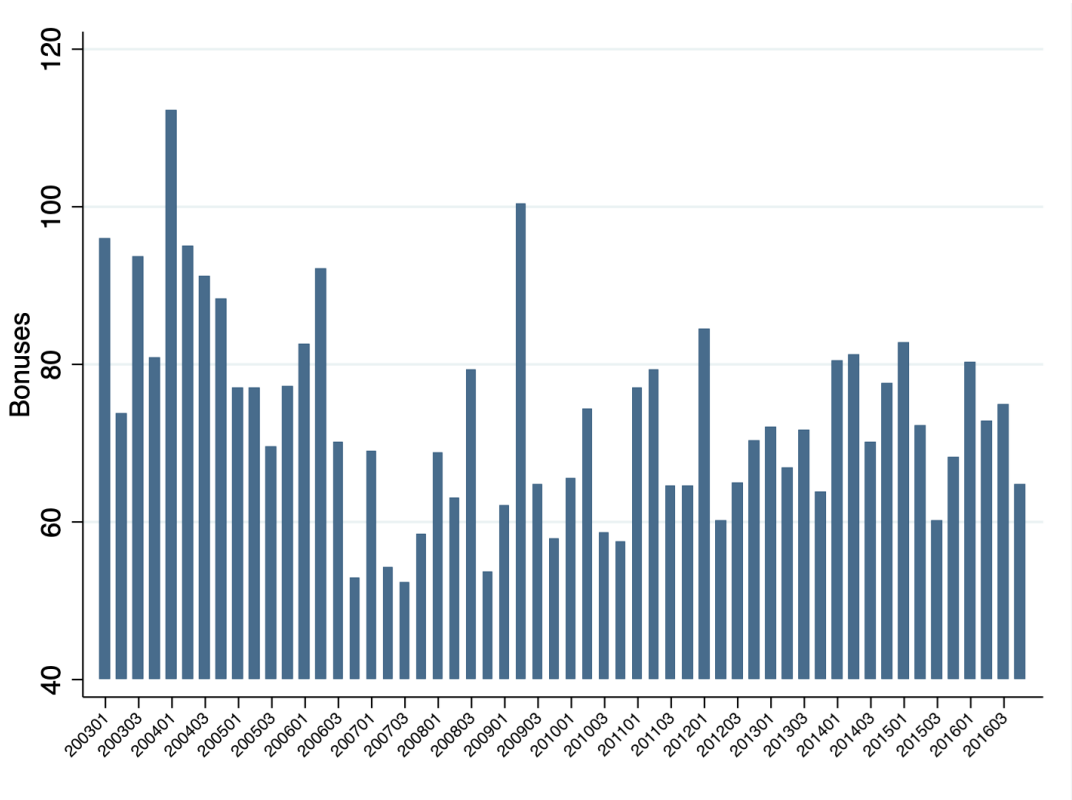

Figure 2: Average amount per quarter of Bonuses (All types) for full-time employees working in France in the non-agricultural for-profit sector. Sources: French Labor Survey (Enquête Emploi)

Figure 2 represents the evolution of all kind of bonuses received by a worker. One might observe that on average bonuses are lower between October 2007 and September 2012 than before or after the period. If bonuses decreased when the law was implemented, and started increasing again after its abolition, one should notice that after 2012 bonuses did not come back to their original level. Figure 2.2 and 2.3 (in appendix) show similar patterns for the different types of bonuses provided by the French Labor Survey: "Bonus of type 1", which includes bonuses that are received at the end of the month such as 13th-month bonuses, regular productivity bonuses or some type of seniority bonuses; and "Bonus of type 2" for bonuses paid throughout the year, such as profit-sharing bonuses or some seniority bonuses. This decrease of bonuses is even more clear for bonuses of type 2. Then, as the law might have caused important fiscal techniques, the degree of fiscal optimization induced by the detaxation strongly depends on the ability of the fiscal administration to observe the number of hours that a worker is doing. In this case the degree of verifiability, i.e if it can be easily checked, is an important matter for my study. Then the following section will help understanding how this would interplay with the tax-cut policy.

3 Theoretical Background

To have a better understanding of how the fact that hours are verifiable could impact my results, I present the following theoretical remarks, based on Cahuc and Carcillo (2014) previous work. Their following model is based on a labor market with an heterogeneous level of productivity θ across workers. The parameter θ satisfies the condition $\theta > 0$ and a individual of type θ, working H hours, will produce a quantity $\theta f(H)$, with the function f having the following properties: $f(0) = 0$, $f' > 0$ and $f'' < 0$. I assume identical preferences across workers, with the quasi-concave and strictly increasing utility function U(C, L). C and L stand for consumption and leisure, which together equal to L_0, the disposable time minus the number of hours worked ($L = L_0 - H$). The taxable income R_t is taxed at a constant rate $t(0, 1)$ and is equal to R, the gross income, minus the deduction induced by the compensation of overtime hours. Since I first consider the case with

flexible wages and a competitive labor market, it does not make any difference if it is firms or workers that are paying taxes. For each overtime hour, this deduction is called σ such that $R_t = R - \sigma \max(H - \bar{H}, 0)$ with $\bar{H}$ being the legal duration of work. Consumption, which is equal to the disposable income, is also equivalent to $R - tR_t$. Overtime hours are paid to the worker at a rate $(1+p)w$, with p, the extra proportional increase in the hourly overtime rate of pay, being at least equal to 0. I decided to look only at partial equilibrium effects, avoiding the question of how the TEPA law is financed, and what would be the impact of the source of funding.

I assume a labor market where firms compete and offer contracts indicating the hourly wage and the work duration. At the equilibrium, working contracts maximize the utility of workers under a constraint of null profit for employers, making the allocation Pareto-optimum. In order to show how the verifiability of hours can change the effect of the TEPA law I will take two extreme cases. First, the case where hours are perfectly verifiable by the fiscal administration, and then the case where they are completely unverifiable. For the second case, I follow the optimal taxation literature such as work from Mirrlees (1971), where workers' remuneration remains verifiable but the number of hours worked does not, making the productivity θ a private information known by the firm and the worker, but not by the administration.

For verifiable hours worked

If hours are verifiable, the labor cost formula, with w for the hourly wage, is:

$$wH + pw \max(H - \bar{H}, 0)$$

I assume that workers' income is equal to total wages net of taxes. I also assume that workers consume all their income:

$$wH + pw \max(H - \bar{H}, 0) - t[wH + (pw)\sigma) \max(H - \bar{H}, 0)]$$

Depending on the productivity type θ, the equilibrium wage and the number of hours worked maximize utility under the following constraint, called the null profit constraint:

$$\theta f(H) = wH + pw \max(H - \bar{H}, 0)$$

By using the null profit constraint and the income equation, one can re-write the consumption of a worker of type θ as:

$$C(\theta, H) = \theta f(H) - t[\theta f(H) - \sigma \max(H - \bar{H}, 0)]$$

Therefore, in equilibrium the number of hours worked for an individual of type θ maximizes:

$$U[C(\theta, H), L_0 - H]$$

As a tax-cut policy will reduce the tax rate on marginal hours when workers exceed the legal duration of work, the TEPA law might increase the number of hours worked. Here I am cautious because the effect of the tax exemption on hours worked is still ambiguous, balancing between an income effect (overtime hours are less taxed so I have more interest to work more) and a substitution effect (since I am paid more for overtime hours, I might want to work less for the same former income). However, since the volume of overtime hours is usually low compared to the number of hours worked, the income effect should be weak. Therefore, one should expect the substitution effect to be bigger, and see a positive impact on hours worked. However I also need to take into account wage flexibility. Here I assumed that wages are flexible, but in the case wages are rigid, the number of hours worked will be determined by the labor demand. If wages are rigid, hours worked will increase if and only if the tax-cut policy reduces taxes paid by firms. Therefore, overall, the TEPA law should have a positive impact on the number of hours worked.

For unverifiable hours worked

Assuming that workers' remuneration is known but not the number of hours worked, I introduce $\tilde{H}$, the number of hours declared by workers at the fiscal administration. Since hours are now unverifiable, $\tilde{H}$ can be different from H, the actual number of hours worked. Then the verifiable labor cost is now:

$$w\tilde{H} + pw \max(\tilde{H} - \bar{H}, 0)$$

One get also a new null profit condition:

$$\theta f(H) = w\tilde{H} + pw \max(\tilde{H} - \bar{H}, 0)$$

Hence, a workers' consumption of type θ is equal to the total wage net of taxes:

$$C(\theta, H) = \theta f(H) - t[\theta f(H) - \sigma \max(\tilde{H} - \bar{H}, 0)]$$

One can see that if the number of hours declared above the legal duration increases, workers will pay less taxes. Therefore, both firms and workers will state the highest number of overtime hours possible, depending on the maximum number of hours that the law allows. In France, since every worker can only work 220 hours overtime per year, on average no worker could declare more than 4 fictive overtime hours per week. Therefore increasing the tax-cut for overtime hours is equivalent to increasing the part of the income which is not related to the wage, and thus to the number of hours worked. Its impact on the number of hours worked is then negative under the condition that demand for leisure increases when income increases (normal good), which is usually the case. As a consequence, if hours are unverifiable, one should expect a negative impact on the number of hours worked. Also, regarding the "gap" variable, when overtime hours are detaxed, it should not decrease for workers whose hours are verifiable (since they cannot use fiscal optimization) but strongly decrease for workers whose hours are unverifiable and who are then able to take advantage of the law to do fiscal optimization. Regarding wages, this reasoning remains true when a minimum wage exists. However for workers that are paid at the minimum wage, there is no possibility for fiscal optimization, since, for an income corresponding to the minimum wage income, if workers try to declare more hours than they are actually doing, fiscal administration will observe a hourly wage below the minimum wage, which is by essence illegal. Then a hourly minimum wage limits the possibilities of fiscal optimization when hours are not verifiable. This is exactly what I described above, where hours are verifiable and the minimum wage is binding. Overall, these theoretical remarks show the importance of verifiability, combined with wage rigidity, on the effect of the tax-cut policy on the number of hours worked. When the degree of wage rigidity depends on the wage level, the degree of verifiability usually depends on categories of workers.

Therefore, following Cahuc and Carcillo (2014) I will estimate the effects of the TEPA law on three different groups: the all subset of workers, workers whose hours are verifiable (called "laborers" here) and workers whose hours are less verifiable (called "managers" here). In order to determine which kind of workers will be considered as a "laborer" or a "manager", one should look at each worker's level of autonomy in the way he organizes his schedule. Since the labor inspectors checks documents accessing the number of hours worked at the workplace of each worker, laborers, whose hours are verifiable, should mainly work at a given place. Their schedule should be closely regulated, registered on a daily basis on books or recorded by time clocks. Therefore the "laborers" group includes qualified and non qualified blue-collars working in the manufacturing industry, the retail and stocking industry, transportation or the craft industry. This group of workers includes individuals that are usually paid at the minimum wage and whose hours worked are verifiable. On the contrary, the second group, the "managers", whose hours are much less verifiable and wages above the minimum wage, can work in diverse places, and even sometimes at home. It includes intellectual and scientific professions, individuals working in the art and the entertainment industry, teachers, administrative and business managers, engineers and technical managers, foremen, supervisors and intermediate occupations in the private sector. According to surveys conducted by the labor ministry [3] in 2016 around 70 % on average of workers of the first group are said to have a working time controlled and reported by their supervisors, whereas only 30 % of the hours of workers from the categories of the second group are verified and registered. These proportions (two third vs one third) seem to be quite consistent across time, insuring the good composition of the two groups.

4 Research Design

4.1 Data Selection

Therefore in order to evaluate the impact of the policy I decided to use the French Labor Survey ("Enquête Emploi"), issued by INSEE (French National Institute of

[3] "Enquetes sur les conditions de travail" , 2016, DARES

statistics) for three main reasons. First it is a very large data-set, with more than 5 millions of observations for the period 2003 - 2017, that includes many information on workers, firms, income, hours worked, bonuses, employment status, and many more. Other administrative sources provide information on workers, such as annual declarations of company (DADS) or statement of social security contributions (BRC) but they do not cover the period prior to 2007. The French Labor Survey (FLS) is therefore more appropriate to assess the effect of the reform on overtime hours, income, hours worked, probability of doing overtime hours and bonuses.

But more than being a rich data-set, the French Labor Survey provides panel data, that follows the same individuals at a different time and can therefore clearly identify if individuals changed their behavior around the threshold where the policy was implemented. In the FLS, individuals are followed for a consecutive period of 6 trimester and continuously selected based on how much they are representative of the whole population. Every person older than 15years old and living in the selected residence is queried. can be selected It is then both representative and available at a very detailed level of information (one can known for instance the exact day on which someone has been interviewed and when the first took place). Therefore this database is more appropriate and representative than surveys such as the Acemo or the Ecmoss, that select only firms with more than 10 employees. Finally since overtime hours and hours worked are often hardly verifiable, using administrative data such as DADS would not be interesting since workers might work more than what they are actually telling to the fiscal administration. Using survey data is then more interesting than a study based on administrative data, because one can know how many hours individuals are working, without the fiscal or legal concerns that would exist with administrative data issued by the fiscal administration

The data selection process used here follows closely Cahuc and Carcillo (2014). In order to be selected, individuals have to work in the non-agricultural for-profit sector, full-time, between 35 and 70 hours per week. I excluded workers whose work schedules have been interrupted by various events: maternity, partial unemployment,

business closure, strike, illness and training. Also, since they are mostly entitled to work a number of hours per year and not a number of hours per week I also eliminated workers whom work duration is under a modulation agreement, a lump sum of days regime or an annualized working time. Indeed due to these legal arrangements, these categories of workers might exceed temporarily the legal amount of hours without using overtime hours. Unemployed and retired workers, that might sometimes work occasionally are also excluded. Finally, seasonal workers, interns, salaried executives and working contracts that fall under very specific conditions (jobs supported by an employment policy for instance) are also excluded. It is also important to note that, that the French Labor Survey changed through time. Indeed starting 2009 the sample covered has been gradually increased by 50% such that if in 2007 around 70 000 persons among 45 000 residences were queried (with a sampling rate of residences of 1/600th), more than 67 000 residences were selected in 2010. Also, in order to be more consistent with the European Labor Force Survey, the questionnaire has been slightly reviewed in 2012, especially regarding to the different situation of unemployment. Even if marginal, INSEE stated that these changes might have had on average a -0.3 hours impact on how hours worked were reported. Knowing this, and since the survey is ongoing only since 2003, I have decided to select only the period 2003-2016. Finally, I restrict this study on the metropolitan France, since the distinction between metropolitan France and France was only introduced recently in the French Labor Survey.

4.2 Identification Strategy

Three main identification strategy will be used here, all using a Difference-in-Difference design where I compare how outcomes changed before and after the reform, both for workers that benefited from the reform (treatment group) and workers that could not benefit from it (control group). Not matter what is the size, the sector or the type of the firm in which they were working, any individual working on the French territory was impacted by the TEPA law, making the range of the policy really large and the possibilities to find a non-treated group for identification, limited. Following Cahuc and Carcillo (2014), I am first interested in several outcome variables:

overtime hours, hours worked, probability of doing overtime hours and difference between hours worked and overtime hours. However, since I also investigate the channel between bonuses and overtime hours, in the second part of this study I will also look at the effects on variables such as the amount of bonuses, the probability of receiving a bonus or the number of unpaid overtime hours.

2007

The first strategy follows closely Cahuc and Carcillo (2014). In 2007 trans-border workers, that were living near the border but not working in France, did not benefit neither from the tax cut on social contributions nor from the tax cut on earnings. Therefore as they were not impacted by the TEPA law, they can be used as a control group. On the opposite, for matter of homogeneity the treatment group includes only workers that were living near the border but also working in France. Since they are both living in the same area, to a certain extent one can assume homogeneity of the two groups. I reduce the sample by only selecting individuals commuting to Germany, Switzerland, Luxembourg and Belgium, because they are sufficiently enough to be compared to individuals living near these countries (which is not the case for Spain or Italy for instance). Later, I will also present results regarding the impact of the TEPA law on unpaid overtime hours and the total number of overtime hours (paid and unpaid) using the same identification strategy. The baseline specification follows a classic DiD model:

$$Y_{ict} = \beta_0 + \beta_1(D_t * F_i) + \beta_2 D_t + \beta_3 X_{ct} + \nu_i + \epsilon_{it} \qquad (1)$$

with Y_{ict} being one of the outcome of individual i working in country c on date t. D_t stands for a dummy variable that takes the value 1 if the date is after October 1st 2007 and 0 otherwise; F_i for a dummy taking the value 0 if the individual is a trans-border, 1 otherwise; and X_{ct} being a set of variables representing the quarterly economic situation measured either by a business climate or by the share of exports of goods and services in the GDP of the country c at date t (indicators of the OECD). Finally ν_i represents a fixed individual effect and ϵ_{it} the error term.

Depending on the specification, a time trend capturing the potential pre-trend, is added and interacted with the interaction term. In the specific case where I evaluate the probability of doing overtime hours, Y_{ict} takes the value 1 if the worker declared paid overtime hours, 0 otherwise. In order to identify the effect of the policy, I am interested in the value of β_1, the coefficient of the interacted term, that represents the evolution of the differences in outcome between the treatment and the control group.

In order to have a better understanding of who benefited the most from the policy and how fiscal optimization could occur, I improve the specification by distinguishing between two groups: laborers (blue-collars) and managers (white-collars). The modified model is then:

$$Y_{ict} = \beta_0 + \beta_1(D_t * F_i) + \beta_2 D_t + \beta_3 X_{ct} + \beta_4(D_t * O_i) + \beta_5(D_t * F_i * O_i) + \nu_i + \epsilon_{it} \quad (2)$$

Equation (2) takes now into account O_i, a dummy variable equal to one for technicians, supervisors, professionals and managers and every worker employed in the artistic and intellectual professions, and to zero for laborers. While this model is estimated, all other types of workers are excluded from the sample. Therefore the triple-differences coefficient β_5 captures the difference in effect of the treatment between managers and laborers. Also, in order to preserve the panel data analysis one needs to select only individuals that are present at least one trimester before or after October 1st 2007. Since in the Labor Force Survey individuals are followed for 18 months, to be sure that one is following the same individuals, this paper focuses on the period between the third quarter of 2006 and the final quarter of 2008.

Bonuses

Nevertheless, with this identification strategy, only a small number of individuals used bonuses prior to the reform and the number of observations is too small to provide a rigorous analysis of the impact of the TEPA law on bonuses. Therefore I decide to use another identification strategy, based on the huge literature of the

policy evaluation of the minimum wage, which provides many examples of evaluation of large-scale labor policy that impact most if not all the workers nationally[4]. This literature focuses especially on the position of an employee in the wage distribution, to define control and treatment groups. For instance, to measure changes in employment probabilities after the introduction of minimum wage, Currie and Fallick (1996) create a binary variable that takes the value zero if a worker is not affected by the minimum wage increase, and one otherwise. Others studies with the same design can be found for other geographic or time framework, such as Campolieti, Fang, and Gunderson (2005), Stewart(2004) or Yuen (2003). In the same way, Abowd et al. (2000) use the a very similar design, but they decide to put in the control group only individuals close to the minimum wage, in order to avoid wage heterogeneity between the two groups. Caliendo et al. (2017) also provides a similar technique by computing a local index of workers being paid under the minimum wage, and use it to compare localities to each other, in order to determine the impact of the introduction of a minimum wage in Germany. Identification strategy of this literature is based on the following reasoning: if prior to the minimum wage implementation, a firm was not hiring workers below the minimum wage, the firm should not be impacted by the new legislation. Conversely, workers that are hired at a rate below the new minimum rate will be impacted by the reform, and so does their employer. Then regarding bonuses and the TEPA law, the identification strategy focuses on the proportion of individuals that were using bonuses prior to the reform. The reasoning is as follows: if one did not received any bonuses prior to October 2007, since one should expect bonuses to fall with the newly-detaxed, and more attractive, overtime hours, these workers should not be impacted by the TEPA law. On the opposite, only workers that used bonuses prior to the reform should see their bonuses decrease after October 2007. The control group is then based on individuals that did not received any bonuses between the third quarter of 2006 and October 2007, and the treatment group of workers that did receive bonuses between the third quarter of 2006 and October 2007. Since transborders were not

[4]I am particularly thankful to Denis Fougere for his help with this literature and to former classmate Johannes Seebauer for his work on the German minimum wage

impacted by the TEPA law in 2007, I restrict the sample to individuals working in metropolitan France. The baseline specification follows a classic DiD model:

$$Y_{it} = \beta_0 + \beta_1(D_t * F_i) + \beta_2 D_t + \beta_3 X_t + \nu_i + \epsilon_{it} \quad (3)$$

with Y_{it} being either the amount either the probability of individual i of receiving a bonus on date t. For the probability variable, Y_{it} takes the value 1 if the worker received a bonus and 0 otherwise. D_t stands for a dummy variable that takes the value 1 if the date is after October 1st 2007 and 0 otherwise; F_i for a dummy taking the value 0 if the individual is in the control group, 1 otherwise; and X_t being a set of variables representing the quarterly economic situation measured either by a business climate or by the share of exports of goods and services in the GDP of the country c at date t (indicators of the OECD). Finally ν_i represents a fixed individual effect and ϵ_{it} the error term. Depending on the specification, a time trend capturing the potential pre-trend, is added and interacted with the interaction term . In order to identify the effect of the policy, I am interested in the value of β_1, the coefficient of the interacted term, that represents the evolution of the differences in outcome between the treatment and the control group.

As for overtime hours, I distinguish between managers and laborers, in order to have a better understanding of the fiscal optimization mechanisms. I follow exactly the same modifications than in previous section (period, individuals queried every 18 months, exclusion of non-laborers or non-managers workers, ...). Again O_i is a dummy variable taking the value one for managers and 0 for laborers, and the matter of interest is the triple-differences coefficient β_5 that captures the difference between the two groups:

$$Y_{it} = \beta_0 + \beta_1(D_t * F_i) + \beta_2 D_t + \beta_3 X_t + \beta_4(D_t * O_i) + \beta_5(D_t * F_i * O_i) + \nu_i + \epsilon_{it} \quad (4)$$

2012

However as I said, in 2010 the TEPA law was enlarged in order to make trans-borders workers benefit from it. Since the control group was also part of the treatment, one cannot use this identification strategy to evaluate what have been the effect of removing this tax cut policy in 2012. Therefore I develop a new identification strategy, very similar to the one used for bonuses in 2007. In the same way, when the policy was removed in 2012, one can think that if a firm did not used overtime hours when a tax-cut was offered, and then when using overtime hours was less costly, this firm has no rational reason to use it when the tax-cut disappeared. On the opposite, a firm that used overtime hours while the tax-cut was still effective, would be negatively impacted by the 2012 removal and then by the increased cost of overtime hours. Therefore, one can use pre-treatment overtime hours values as a way to distinguish between control and treatment group. Here, a worker that has not done any overtime hours between February 2011 and March 2013 would be assigned to the control group, whereas someone who has declared even one overtime hour between February 2011 and March 2013 would be assigned to the treatment group. I use this research design both for overtime hours and bonuses, since one might expect individuals that decreased overtime hours to be the one that also experienced a change in the amount or probability of receiving a bonus. The econometric specification is now:

$$Y_{it} = \beta_0 + \beta_1(D_t * F_i) + \beta_2 D_t + \beta_3 X_t + \nu_i + \epsilon_{it} \qquad (5)$$

with Y_{it} being the outcome variable of individual i on date t. Individuals can be of two groups: either they did overtime hours before 2012 (treatment group), and then F_i, a dummy that takes the value 1, either they did not worked overtime prior 2012, and then the value of F_i is 0. D_t is still the time dummy that takes now the value 1 if the date is after September 1st 2012 and 0 otherwise. Finally ν_i represents a fixed individual effect and ϵ_{it} the error term. For a question of homogeneity I focus on individuals working in France, and therefore there was no incentives to use previous co-variates for the economic situation. However I kept the time trend, summarized

by X_t, and, like in equation (1), interacted it with the interaction term. Like in the 2007 model, for the probability of doing overtime hours (or receiving a bonus), Y_{it} takes the value 1 if the individual worked overtime (received a bonus), and 0 otherwise. Again, I am interested in the value of β_1, the coefficient of the interacted term. Also, I distinguish between laborers and managers, leading to the following specification:

$$Y_{it} = \beta_0 + \beta_1(D_t * F_i) + \beta_2 D_t + \beta_3 X_t + \beta_4(D_t * O_i) + \beta_5(D_t * F_i * O_i) + \nu_i + \epsilon_{it} \quad (6)$$

Like for equations (2) and (4) O_i stands for a dummy being one if managers and 0 for laborers. All other types of workers while estimating these equations, and the matter of interest here is the β_5 coefficient. As for 2007, I select a time frame of 16 months around the policy change. Then I focus on individuals present both before and after September 1st 2012, and select only observations between February 2011 and March 2013.

5 Policy Evaluation

5.1 The Reform in 2007

I first estimate my DiD model for overtime hours and hours worked. Then I report my results on bonuses and unpaid overtime hours, arguing for fiscal optimization.

Overtime Hours and Hours Worked

Appendix 1 reports the difference in outcome between trans-borders and individuals working in France near the border after 2007 (coefficient β_1 of equation 1) for the first four outcome variables: overtime hours, hours worked, difference between the number of hours worked and overtime hours and the probability of doing overtime hours. Columns (1), (3) and (5) show three different model specifications: baseline, business climate and export. With the baseline model does not control for anything, the others account for differences in economic situation. While climate uses the

business climate indicator provided by the OECD, export integrates the share of exports in the GDP of each bordering country. Columns (2), (4) and (6) follow the same logic, instead that I am adding a time trend control for each of the specification. As one can see, I do not found any significant impact of the TEPA law on the whole sample of employees.

Table 1: Impact of the Policy - 2007 - Only Managers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours (a)	0.930*	0.620	0.927*	0.619	0.887*	0.567
	(0.522)	(0.438)	(0.510)	(0.426)	(0.504)	(0.424)
Hours Worked (b)	-2.415*	-2.074	-2.422*	-2.078	-2.491*	-2.189
	(1.403)	(1.997)	(1.370)	(1.974)	(1.372)	(2.009)
Gap (b - a)	-3.345***	-2.695	-3.350***	-2.697	-3.378***	-2.756
	(0.892)	(1.792)	(0.872)	(1.781)	(0.882)	(1.807)
Probability of overtime	0.284	0.179	0.283*	0.178	0.277	0.170
	(0.174)	(0.144)	(0.170)	(0.141)	(0.170)	(0.142)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes
N	1976	1976	1976	1976	1976	1976

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees whose hours are less verifiable (managers). Control group is transborder employees and treatment group is individuals working in France near the border after 2007. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

However as I highlighted in the theoretical part, one might observe differences in the treatment effect, depending on how much verifiable hours worked are. Therefore I performed the same regression on two different categories: managers, whose hours are less verifiable, and laborers. Table 1 shows the coefficient β_1 of equation 2, where I estimate the evolution of the difference between treatment and control, depending on being one of the two type of workers. Now, one can see a positive effect of the detaxation on overtime hours for managers, at the 10% level of significance. On the opposite, Table 2 reports a strong negative impact on the number of hours worked, with on average around 2 hours less per week, in comparison with non-treated

individuals. Both effects persist through the three different model specifications. However these effects seem to be sensitive to the trend control, since they disappear in columns 2, 4 and 6. One can also observe some positive effect on the probability of doing overtime hours, for the third specification (climate, no trend). As Appendix 2 shows, running the same analysis for laborers gives different results. Indeed I do not find any significant effect of the detaxation of overtime hours on one of the four outcome variable. This strongly supports the idea that workers whose are less verifiable are the first to benefit from this tax-cut policy. In the following section, I will try to have a better understanding of how the TEPA changed how many paid overtime hours workers did.

Unpaid Overtime Hours

In this subsection, I decided to take a closer look to the composition of overtime hours. In the French Labor Survey, workers are asked both how many overtime hours they worked and how many of them were paid. Since I have access to the total number of overtime hours that an employee did during the week, I can easily determine how many of these hours were unpaid. The first row of Appendix 3 reports differences in unpaid overtime hours between trans-borders and individuals working in France near the border after 2007 (coefficient β_1 of equation 1). The second and third rows reports respectively effects on the total number of overtime hours declared (unpaid and paid) and on paid overtime hours. Like in the former subsection, model specification does not changed. The two first columns represent the baseline model (with or without a time trend), columns 3-4 the model with a business climate control (with or without a time trend), and columns 5-6 with the share of exports in the GDP of each bordering country. As one can see, when taking the whole sample, I do not find any significant effect of the reform on my dependent variables. However, one might expect different effects depending on how much hours are verifiable for a worker.

Indeed when looking at the impact of the reform on managers (Table 2), I find a significant impact on all types of overtime hours (total, paid, unpaid). As one can

Table 2: Unpaid Overtime Hours - Only Managers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours - Unpaid (b-a)	-3.761***	-4.034**	-3.771***	-4.039***	-3.816***	-4.126***
	(0.893)	(1.596)	(0.846)	(1.560)	(0.872)	(1.579)
Overtime Hours - Total (b)	-2.831**	-3.414*	-2.843**	-3.420*	-2.929**	-3.560*
	(1.404)	(1.879)	(1.344)	(1.828)	(1.362)	(1.846)
Overtime Hours - Paid (b)	0.930*	0.620	0.927*	0.619	0.887*	0.567
	(0.552)	(0.438)	(0.510)	(0.426)	(0.504)	(0.424)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes
N	1976	1976	1976	1976	1976	1976

Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees whose hours are less verifiable (managers). Control group is transborder employees and treatment group is individuals working in France near the border after 2007. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment. (b) represents the total number of overtime hours (paid and unpaid) declared. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

observe, if the TEPA law implied some positive effect for managers on the number of paid overtime hours, effects are 4 times bigger regarding unpaid overtime hours. It seems that the TEPA law induced a strong negative effect on unpaid overtime hours, significant at the 1% level of confidence. This decrease made the total number of overtime hours decreased, whereas the number of paid overtime hours was increasing, but not enough to counter-balance this impact. These effects seem stable across specifications. Therefore it seems that one of the main consequence of the TEPA law was to transform unpaid overtime hours in paid overtime hours for workers whose hours are hardly verifiable. Indeed I do not find similar results for laborers (table 3), whose hours are much more verifiable. These evidence might explain why I find small, but positive and significant, effects on paid overtime hours for managers. It also confirms previous findings from that insist on the importance of how hours are verifiable to explain the impact of the TEPA law on overtime hours. The main reason given by Cahuc and Carcillo (2014) was a transfer from bonuses to newly defiscalized overtime hours for managers. I then investigate this channel.

Table 3: Unpaid Overtime Hours - 2007 - Only Laborers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours - Unpaid (b-a)	0.655	-0.200	0.655	-0.201	0.640	-0.218
	(1.160)	(1.379)	(1.159)	(1.380)	(1.154)	(1.376)
Overtime Hours - Total (b)	0.138	-1.141	0.127	-1.136	0.150	-1.115
	(1.020)	(1.437)	(1.020)	(1.437)	(1.020)	(1.433)
Overtime Hours - Paid (b)	-0.517	-0.941	-0.528	-0.935	-0.489	-0.896
	(1.328)	(1.599)	(1.329)	(1.602)	(1.318)	(1.583)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes
N	3908	3908	3908	3908	3908	3908

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees, whose hours are verifiable (laborers). Control group is transborder employees and treatment group is individuals working in France near the border after 2007. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment. (b) represents the total number of overtime hours (paid and unpaid) declared. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Bonuses

As I explained in section 4.2, since the former identification strategy contains too little observations to study the effect on bonuses, I use here my second identification strategy, based on a DiD between workers that declared bonuses prior to the reform (treatment) and those who did not (control). My main hypothesis is that, if because of the policy a transfer from bonuses to overtime hours occurred, it should have not impacted workers that did not received any kind of bonuses prior to the reform. In the French Labor Survey a distinction is made between "bonuses" and "other bonuses". The first category (type 1) includes bonuses that are received at the end of the month such as 13th-month bonuses, regular productivity bonuses or some type of seniority bonuses. The second type (type 2) refers to bonuses paid throughout the year, such as profit-sharing bonuses or some seniority bonuses. As I cannot know precisely what is behind these definitions and individuals understood it, I decided to evaluate the impact of the policy on both of them and on a "total bonuses" variable, sum of the two. I also create three dummy variables, representing the probability of receiving one of the three kind of bonuses (type 1, type 2 or any kind of bonuses)

Appendix 4 reports the difference in outcome between control group and treatment group after October 2007 (coefficient β_1 of equation 3) for the six outcome variables: amount of bonus (type 1), probability of receiving a bonus of type 1, amount of bonus (type 2), probability of receiving a bonus of type 2, amount of any kind of bonuses and probability of receiving any kind of bonuses. As one might be expecting, I see a negative impact of the policy on the amount and the probability of receiving a bonus, at the 1% level of significance. These results are particularly stable across specification and across types of bonuses. Like for previous section, columns 1-2 corresponds to the baseline model, with or (without a time trend), columns 3-4 to the model with business climate controls (with or without a time trend), and columns 5-6 to the model with the share of exports included (with or without a time trend). The two first rows (a) reports effects for bonuses of type 1 ("bonuses"), the rows 3-4 (b) for bonuses of type 2 ("others bonuses") and the two last (c) for any kind of bonuses.

Table 4: Bonuses - 2007 - Only Managers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Amount (a)	-37.841*	-37.447*	-37.942*	-37.639*	-37.807*	-37.327*
	(20.010)	(19.892)	(20.002)	(19.880)	(20.055)	(19.932)
Probability (a)	-0.238***	-0.238***	-0.238***	-0.238***	-0.238***	-0.238***
	(0.021)	(0.021)	(0.020)	(0.020)	(0.021)	(0.021)
Amount (b)	-457.955***	-458.523***	-458.158***	-458.973***	-458.761***	-459.932***
	(142.898)	(143.590)	(142.726)	(142.726)	(143.304)	(144.646)
Probability (b)	-0.109***	-0.108***	-0.109***	-0.109***	-0.109***	-0.108***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Amount (c)	-92.488***	-92.119***	-92.566***	-92.263***	-92.558***	-92.167***
	(29.725)	(29.646)	(29.711)	(29.629)	(29.712)	(29.612)
Probability (c)	-0.302***	-0.301***	-0.302***	-0.302***	-0.302***	-0.301***
	(0.021)	(0.022)	(0.021)	(0.021)	(0.021)	(0.022)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees working in France and whose hours are less verifiable (managers). Control group is individuals who did not received any type of bonuses prior to October 2007. Treatment are those who did. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment.(a) stands for bonus of type 1 (13th-month bonuses, regular productivity bonuses or some type of seniority bonuses), (b) for bonus of type 2 (paid throughout the year, such as profit-sharing bonuses or some seniority bonuses) and (c) for all kind of bonuses. Observations are 9,488 with 1,781 for the control group and 7,707 for the treatment. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Again I estimate the previous model for managers (table 4) and laborers (table 5)

only. Following the theory explained in section 3, one should expect greater effects for individuals whose hours are less verifiable, since they are the most able to benefit from a transfer from bonuses to overtime hours. As one can observe in table 3, in the path of the whole sample, I find strong negative effect for bonuses of type 1, of type 2 and of any kind, at the 1% level of significance. On the opposite, even if I find similar effects for laborers (table 4), laborers' bonuses were less impacted by the policy. Effects of the policy on probabilities of receiving a bonus of type 1 or of any kind of bonuses are lower for laborers than managers, and for any kind of bonuses, bonuses of type 1 and bonuses of type 2, managers experienced a decrease of the amount of bonus from 2 (type 1) to 4.5 (type 2) times bigger than laborers. Effects on the amount of bonus that laborers received even disappear when pulled together (any kind of bonuses). Overall, these evidence on bonuses strongly support the idea of a transfer from bonuses to defiscalized overtime hours. It also confirms previous findings (Cahuc and Carcillo, 2014) showing that the TEPA law had a differentiated impact on workers, depending on how many hours worked were verifiable.

Table 5: Bonuses - 2007 - Only Laborers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Amount (a)	-21.324***	-21.141***	-21.274***	-21.123***	-21.338***	-21.159***
	(5.147)	(5.136)	(5.145)	(5.135)	(5.145)	(5.132)
Probability (a)	-0.171***	-0.170***	-0.170***	-0.170***	-0.171***	-0.170***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Amount (b)	-100.261***	-100.073***	-99.689***	-99.798***	-100.369***	-100.356***
	(24.344)	(24.305)	(24.279)	(24.243)	(24.339)	(24.303)
Probability (b)	-0.121***	-0.120***	-0.121***	-0.120***	-0.121***	-0.120***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Amount (c)	-14.785	-14.508	-14.496	-14.373	-14.807	-14.541
	(17.142)	(17.098)	(17.115)	(17.077)	(17.143)	(17.098)
Probability (c)	-0.256***	-0.255***	-0.255***	-0.255***	-0.256***	-0.255***
	(0.018)	(0.018)	(0.017)	(0.018)	(0.018)	(0.018)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees working in France and whose hours are verifiable (laborers). Control group is individuals who did not received any type of bonuses prior to October 2007. Treatment are those who did. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment.(a) stands for bonus of type 1 (13th-month bonuses, regular productivity bonuses or some type of seniority bonuses), (b) for bonus of type 2 (paid throughout the year, such as profit-sharing bonuses or some seniority bonuses) and (c) for all kind of bonuses. Observations are 13,578 with 3,814 for the control group and 9,764 for the treatment. Level of significance : $***p < 0.01$, $**p < 0.05$, $*p < 0.1$; Robust standard deviations in parentheses

5.2 What happened in 2012 ?

As I explained at the very beginning of this paper, in 2012, the political transition from the right to the socialist party, led to the abolition of the TEPA law. Only a very small and limited tax-deduction of 1.5/hour was kept for firm's owner with less than 20 employees. Then, the following section will investigate the potential effects of removing the tax-cut policy in 2012. As explained in section 2.1, one should expect a negative effect on the number of paid overtime hours and a positive impact on unpaid overtime hours and bonuses, especially for workers whose hours are less verifiable, as they seem to be more impacted by the reform. As explained in section 4.2, my identification strategy is based on the pre-treatment use of overtime hours. If a worker did not work overtime prior to October 2012, he should work overtime when the tax-cut policy ends. On the contrary, as overtime hours are now more costly, firms that were using it should decrease the number of paid overtime hours. Therefore, I use the first set of workers as a control group, and compare it to the second group, the treated group. Like in section 5.1, I proceed as following: first I estimate my DiD model for paid overtime hours and hours worked. Than I report the results on unpaid overtime hours and bonuses.

Overtime Hours and Hours Worked

Table 7 reports the difference (Coefficient β_1 of equation 4) between workers whose worked overtime prior to October 2012 and workers whose did not for my four outcome variables: paid overtime hours, hours worked, the difference between hours worked and paid overtime hours, and the probability of doing overtime hours. Columns (1) and (2) show results for the whole sample, with or without a time trend, columns (3)-(4) for workers whose hours are less verifiable (with or without a time trend), and columns (5)-(6) for workers whose hours are verifiable (with or without a time trend). As one can observe, I find strong negative effects of removing the TEPA law on paid overtime hours and on the probability of doing overtime, at the 1% level of significance. I also find a negative impact of the abolition on the number of hours worked. Since this variable reports the total number of hours that employees worked over the week, overtime hours included, it seems that a part of the

reduction in overtime hours directly translates into a reduction in effective hours. Consequently, as overtime hours decreased more than hours worked, I find a positive impact on the "gap" variable. These effects are stable across types of workers and specification. However now I found also a negative impact on how many overtime hours workers whose hours are verifiable did. The main explanation would be that, if in 2007, the tax-cut policy encourage firms to pay overtime hours to "managers", removing the policy increased the cost of overtime hours for every type of workers, and led to reduce the number of hours worked. Therefore removing the policy did not only erase the effect of tax-cut policy, but also impacted those who were already doing overtime hours not matter if a tax-cut policy was there or not. Then 2012 does not show the reverse image of what happened in 2007, mainly because if the policy was a motivation to do more overtime hours, the cost of overtime was not null, and if it might led workers do start doing overtime hours or to work more overtime, for some others firms that were already using overtime hours prior to the reform it might have just been a cost reduction. On the opposite, in 2012 the cost of overtime hours increased for everyone. In the following section I will look at the effects on unpaid overtime hours.

Table 6: Impact of the Policy - 2012

Variables	All		Managers		Laborers	
	(1)	(2)	(3)	(4)	(5)	(6)
Overtime Hours (a)	-1.054***	-0.856***	-0.923***	-0.701***	-1.178***	-0.978***
	(0.089)	(0.097)	(0.168)	(0.176)	(0.106)	(0.118)
Hours Worked (b)	-0.554***	-0.574***	-0.923***	-0.701***	-0.604***	-0.591***
	(0.114)	(0.123)	(0.168)	(0.176)	(0.128)	(0.138)
Gap (b - a)	0.500***	0.281**	0.463**	0.252	0.574***	0.387***
	(0.118)	(0.128)	(0.223)	(0.249)	(0.137)	(0.145)
Probability of Overtime	-0.273***	-0.232***	-0.234***	-0.174***	-0.305***	-0.268***
	(0.019)	(0.022)	(0.039)	(0.042)	(0.023)	(0.026)
Time Trend	No	Yes	No	Yes	No	Yes

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees. Control group is individuals who did worked overtime prior to September 2012. Treatment are those who did. Columns show estimates for the baseline model without (1, 3, 5) or with a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. All: 10,044 for the control group and 5,272 for the treatment. Managers: 5,733 for the control group and 1,473 for the treatment. Laborers: 4,311 for the control group and 3,799 for the treatment. Level of significance : ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$; Robust standard deviations in parentheses

Unpaid Overtime Hours

Previously I found that the TEPA law helped managers to be paid for the overtime hours they were doing. As explained in 2.1, since doing overtime hours is more costly now, one should expect unpaid overtime hours to increase with the abolition of the TEPA law. Table 8 reports the difference in unpaid overtime, paid overtime and total overtime between workers who did some prior to 2012 and those who did not ((Coefficient β_1 of equation 4). I see a strong negative effect of the abolition on the total number of overtime hours (paid and unpaid), at the 1% level of significance. This result is stable across specification (with or without a time trend) and across types of workers. The effect is even stronger for workers whose hours are verifiable (laborers) than for those who hours are less verifiable (managers). This comes from the fact that in 2012 unpaid overtime hours increased for managers but not for laborers. Indeed I report a positive effect on unpaid overtime hours for all types of workers and managers, quite stable over specification (respectively at the 5% and 10% level of significance).

Table 7: Unpaid Overtime Hours - 2012

Variables	All		Managers		Laborers	
	(1)	(2)	(3)	(4)	(5)	(6)
Overtime Hours - Unpaid (b-a)	-3.761***	-4.034**	-3.771***	-4.039***	-3.816***	-4.126***
	(0.893)	(1.596)	(0.846)	(1.560)	(0.872)	(1.579)
Overtime Hours - Total (b)	-2.831**	-3.414*	-2.843**	-3.420*	-2.929**	-3.560*
	(1.404)	(1.879)	(1.344)	(1.828)	(1.362)	(1.846)
Overtime Hours - Paid (b)	0.930*	0.620	0.927*	0.619	0.887*	0.567
	(0.552)	(0.438)	(0.510)	(0.426)	(0.504)	(0.424)
Time Trend	No	Yes	No	Yes	No	Yes

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees. Control group is individuals who did worked overtime prior to September 2012. Treatment are those who did. Columns show estimates for the baseline model without (1, 3, 5) or with a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. All: 9,902 for the control group and 5,617 for the treatment. Managers: 5,600 for the control group and 1,558 for the treatment. Laborers: 4,302 for the control group and 4,059 for the treatment. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

However I do not find any significant effect for laborers, whose reduction in total overtime hours seems completely driven by the reduction in paid overtime hours. These results confirm that the TEPA law, more than motivating managers to do

more overtime hours, helped them to get paid for the overtime hours they were already doing but which were paid as bonuses. Therefore one should expect in 2012 to see a reverse transfer from overtime hours to bonuses. Next section, I will investigate the impact of the abolition of the TEPA law on bonuses.

Bonuses

Table 9 reports the difference between workers whose worked overtime prior to 2012 and those who did not for the six outcome variables: bonus type 1, probability of receiving a bonus of type 1, bonus of type 2, probability of receiving a bonus of type 2, all kind of bonuses, probability of receiving any bonuses. Distinction between bonus of type 1 and bonus of type 2 was previously explained in the 4.1 section.

Table 8: Bonuses - 2012

Variables	All		Managers		Laborers	
	(1)	(2)	(3)	(4)	(5)	(6)
Amount (a)	44.220	-36.345	80.403	2.244	27.867	-51.756
	(32.282)	(34.012)	(68.644)	(35.684)	(36.852)	(8.952)
Probability (a)	-0.005	-0.028*	-0.005	-0.015	0.004	-0.028
	(0.014)	(0.015)	(0.019)	(0.019)	(0.020)	(0.013)
Amount (b)	0.177	-1.494	0.529	0.252	0.555	-2.143
	(1.956)	(2.011)	(2.572)	(2.614)	(2.663)	(55.305)
Probability (b)	0.014	-0.053**	0.027	-0.041	0.013	-0.052*
	(0.021)	(0.023)	(0.042)	(0.026)	(0.027)	(0.009)
Amount (c)	-2.638	-11.533	0.010	-0.061	-1.387	-16.728
	(7.299)	(7.361)	(0.044)	(0.049)	(10.212)	(10.464)
Probability (c)	0.012	-0.063**	-5.017	-2.680	0.022	-0.054*
	(0.023)	(0.025)	(10.176)	(10.311)	(0.028)	(0.031)
Time Trend	No	Yes	No	Yes	No	Yes

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees. Control group is individuals who did worked overtime prior to September 2012. Treatment are those who did. Columns show estimates for the baseline model without (1, 3, 5) or with a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. All: 9,743 for the control group and 5,752 for the treatment. Managers: 5,516 for the control group and 1,601 for the treatment. Laborers: 4,227 for the control group and 4,151 for the treatment. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

How surprising it is I see almost no significant effect of the abrogation of the TEPA law on bonuses. I even found some negative effect of removing the tax-cut policy for the probability of receiving a bonus (type 1, type 2 and all types) for the whole

sample. This effect seems to be mainly driven by laborers. I do not find similar effects for managers. However these effects are very unstable through specification, and appear only when a time trend dummy is added. Also, I do not find any effect on the amount of bonuses received. It is then quite hard to get a clear meaning of what drive these negative effects. One should note also that even if negative, coefficient are quite low (around -5%). One potential explanation could be that by increasing the cost of overtime hours, the 2012 reform increased the total cost of labor. In order to adapt firms decreased the number of overtime but also might have been less inclined to give bonuses to their employees. Especially, one remembers than in the previous section laborers' overtime hours strongly decreased after 2012. It is then possible than firms saw laborers' paid overtime hours as the more costly, or the least necessary, and decided to first limiting the cost of paying for their extra work, before doing the same for white-collars. For instance management techniques might have pressure laborers more than managers, in order to limit the cost. Apart from this, I do not find any significant effect. The absence of effect is not irrational. In fact, if cutting taxes on overtime hours, induce firms to transfer bonuses into overtime, abolishing the law did not make bonuses more attractive in comparison with taxed overtime hours. Therefore in 2012 overtime hours did not automatically translated into new bonuses, and as a consequence, I do not see any significant impact here.

This section showed multiple evidence of the impact of the TEPA law on paid and unpaid overtime hours, hours worked and bonuses. Several elements tend to make someone think that the TEPA law mainly translated into fiscal optimization for firms that were now able to pay overtime work at a lower cost. This induced a transfer from bonuses to overtime and a decreased number of unpaid overtime hours, especially for workers whose hours are less verifiable ("managers"). In 2012, when the policy was removed I saw similar patterns for overtime hours and but quite different effects for bonuses and unpaid overtime hours. It seems that removing a labor fiscal policy do not completely translate into the reverse effects of putting it in place. The following section will provide robustness checks in order to prove the

validity of my results.

6 Robustness Checks and Developments

The following section will prove the validity of my results in two ways. First, as one could think that use of overtime hours is strongly related to the state of the labor market, I present a new specification that controls for the unemployment rate and show that the results are consistent. Then I will use entropy-balancing to match the pre-treatment moments of my outcome variables between the control and the treatment group. It will help to confirm the common trend assumption that is essential to a Diff-in-Diff design.

6.1 Unemployment and Non-Linear Trend

Table 9: 2007 - Overtime Hours, controlling for unemployment changes and non-linear time trend - All

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours (a)	-0.305	-0.681	-0.310	-0.690	-0.681	-0.681
	(1.143)	(1.249)	(1.142)	(1.248)	(1.249)	(1.249)
Hours Worked (b)	0.108	0.040	0.101	0.025	0.040	0.040
	(1.024)	(1.271)	(1.027)	(1.271)	(1.271)	(1.271)
Gap (b - a)	0.413	0.721	0.411	0.714	0.721	0.721
	(1.149)	(1.300)	(1.151)	(1.301)	(1.300)	(1.300)
Probability of Overtime	0.032	0.031	0.031	0.030	0.031	0.031
	(0.136)	(0.132)	(0.136)	(0.132)	(0.132)	(0.132)
Time Trend	No	Linear	No	Linear	Quadratic	Squared
N	5884	5884	5884	5884	5884	5884

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees. Control group is transborder employees and treatment group is individuals working in France near the border after 2007. Specifications are as follows: baseline with (1) or without (2) a time trend, controlling for the unemployment rate with (3) or without a time trend (4), baseline with a quadratic time trend (5) and baseline with a squared time trend (6). Columns 2, 4, 5 and 6 includes a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

As a first robustness check, I decide to test my DiD design with another specification controlling for the unemployment rate. For matters of consistency, using the data from the French Labor Survey, I compute a quarterly unemployment rate that I include in my baseline specification as a control variable. Indeed, one might think that utilization of overtime hours is strongly related to the current unemployment rate and the labor market state, as Heyer (2017) suggested. Firms production capacities, labor market flexibility and unemployment will then be determinant in the effect of the TEPA law on the use of overtime hours. Therefore, in the new model specification a term C_t is added in order to control for the unemployment rate. Another way to improve the model specification is related to the time trend added previously. In former specifications, I used a linear time-trend to control for time fixed effects. However, as the evolution of overtime hours suggests, one might think that the detaxation biggest impact took place in the first year of implementation, while following years showed smaller effects. A non-linear time trend might be more relevant here. Therefore I provide a final model specification where X_t, the set of covariates representing the different time trends, includes now either a squared trend either a quadratic trend. As before, I interact these time trends with the treatment.

Tables 10 and 11 reports estimates of the detaxation on overtime hours, hours worked, "gap" variable and probability of doing overtime, for respectively 2007 and 2012. Columns (1) and (2) show the baseline model, with or without a linear time trend added. Columns (3) and (4) represent my augmented-model, where I control for the unemployment rate, with or without a linear time trend. Finally the last two columns, columns 5 and 6, show estimates for the baseline model with either a quadratic (5) either a squared (6) time trend. As one might see, neither including the unemployment rate in the regression nor using a non-linear time trend changed my estimates. Finally, I test this new specification for my two sub-samples (managers only and laborers only). Again, using an non-linear time trend or controlling for the unemployment rate do not change my estimators. Tables regarding these sub-samples can be found in Appendix (5, 6, 7 and 8).

Table 10: 2012 - Overtime Hours, controlling for unemployment changes and non-linear time trend - All

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours (a)	-1.054***	-0.856***	-1.055***	-0.856***	-0.856***	-0.856***
	(0.089)	(0.097)	(0.089)	(0.097)	(0.097)	(0.097)
Hours Worked (b)	-0.554***	-0.574***	-0.555***	-0.577***	-0.574***	-0.574***
	(0.114)	(0.123)	(0.114)	(0.123)	(0.123)	(0.123)
Gap (b - a)	0.500***	0.281**	0.500***	0.279**	0.281**	0.282**
	(0.118)	(0.128)	(0.118)	(0.128)	(0.128)	(0.128)
Probability of Overtime	-0.273***	-0.232***	-0.273***	-0.232***	-0.232***	-0.232***
	(0.019)	(0.022)	(0.019)	(0.022)	(0.022)	(0.022)
Time Trend	No	Linear	No	Linear	Quadratic	Squared
N	36677	36677	36677	36677	36677	36677

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees. Control group is individuals who did worked overtime prior to September 2012. Treatment are those who did. Specifications are as follows: baseline with (1) or without (2) a time trend, controlling for the unemployment rate with (3) or without a time trend (4), baseline with a quadratic time trend (5) and baseline with a squared time trend (6). Columns 2, 4, 5 and 6 includes a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. Observations are 15,316 with for 10,044 the control group and 5,272 for the treatment. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

6.2 Entropy Balancing

Finally I decide to use entropy-balancing as a second robustness check. Introduced by Hainmueller (2012), entropy-balancing is a multivariate re-weighting method used usually on covariates, in order to certify that the control and the treatment group share the same characteristics. Since Hainmueller work, several econometric studies on entropy-balancing such as Reshetnyak(2017), Parish et al. (2018) or Zhao (2019) have been published, assessing its reliability and comparing it to propensity score methods. However here, I use entropy-balancing to match the first and the second moments of my outcome variables before the reform. By making the distribution (mean and variance here) of my pre-treatment outcomes exactly equal between the treatment and the control group, entropy-balancing will guarantee that this work satisfies the common trend assumption. This re-weighting process create weights that I will use in the following regression, instead of those provided by the French Labor Survey. In This section I first use it in order to match the moments of my first four outcome variables (number of hours worked, number of paid overtime hours, difference between hours worked and overtime and the probability of doing overtime

hours). Then I apply this technique to bonuses and unpaid overtime hours.

Overtime Hours

Table 11: Robustness Checks - 2007 - Managers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours (a)	10.258**	10.269**	10.257**	10.258**	10.247**	10.262**
	(4.258)	(4.301)	(4.267)	(4.309)	(4.259)	(4.301)
Hours Worked (b)	0.429	4.380**	0.425	4.335**	0.998	4.426***
	(0.714)	(1.701)	(0.751)	(1.704)	(0.956)	(1.632)
Gap (b - a)	-9.828***	-5.890	-9.831***	-5.923	-9.249**	-5.836
	(3.612)	(4.151)	(3.581)	(4.133)	(3.703)	(4.123)
Probability of overtime	0.812***	0.802***	0.812***	0.801***	0.815***	0.803***
	(0.161)	(0.175)	(0.162)	(0.176)	(0.162)	(0.174)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes
N	1984	1984	1984	1984	1984	1984

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees whose hours are less verifiable and using entropy-balancing. Control group is transborder employees and treatment group is individuals working in France near the border after 2007. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Table 11 (managers) reports results for my four outcome variables using entropy-balancing on paid overtime hours, hours worked and probability of doing overtime. Since it would have created a collinearity issue, I do not include the gap variable as it is already a combination of paid overtime hours and hours worked. By controlling for pre-trend moments of the outcome variables, one can now observe very strong and positive effects of the TEPA law on overtime hours. These effects are also consistent across our 6 model specification, baseline (1-2), business climate (3-4), export (5-6), with (2,4,6) or without trend (1,3,5). One will also notice the very strong and positive coefficients for the probability of doing overtime hours. However, taking into account a time trend, one will also see that the TEPA law had some positive effect on the number of hours worked. It seems then, that if most of the increased number of overtime hours are a pure fiscal optimization strategy, some of

it was also the consequence of an higher number of hours worked. Regarding all types of workers (Appendix 9) and laborers (Appendix 10) one will observe another interesting result. It seems that laborers tend to work less and do less overtime hours after the implementation of the law. Even surprising, this result might imply that with the TEPA law, firms reduced the extra-work of laborers and favored workers whose hours are less verifiable since they are the most able of using the reform as a way to fiscally optimize their extra-work pay. However since the effects disappear when a time trend is added, one should be cautious with these results.

Table 12: Robustness Checks - Impact of the Policy - 2012

Variables	All		Managers		Laborers	
	(1)	(2)	(3)	(4)	(5)	(6)
Overtime Hours (a)	-1.599***	-1.439***	-1.301***	-1.093***	-1.755***	-1.755***
	(0.129)	(0.142)	(0.213)	(0.220)	(0.200)	(0.200)
Hours Worked (b)	-0.666***	-0.662***	-0.554**	-0.517**	-0.724***	-0.724***
	(0.128)	(0.142)	(0.232)	(0.255)	(0.177)	(0.177)
Gap (b - a)	0.933***	0.776***	0.747***	0.576**	1.031***	1.031***
	(0.146)	(0.158)	(0.247)	(0.273)	(0.212)	(0.212)
Probability of Overtime	-0.408***	-0.375***	-0.318***	-0.256***	-0.467***	-0.467***
	(0.029)	(0.032)	(0.049)	(0.052)	(0.044)	(0.044)
Time Trend	No	Yes	No	Yes	No	Yes

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees, using entropy-balancing. Control group is individuals who did worked overtime prior to September 2012. Treatment are those who did. Columns show estimates for the baseline model without (1, 3, 5) or with a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. All: 10,044 for the control group and 5,272 for the treatment. Managers: 5,733 for the control group and 1,473 for the treatment. Laborers: 4,311 for the control group and 3,799 for the treatment. Level of significance : $***p < 0.01$, $**p < 0.05$, $*p < 0.1$; Robust standard deviations in parentheses

However results for 2012 might confirm this narrative. Table 12 shows the results on overtime hours and hours worked, using entropy balancing, and confirms our previous findings. First, one will notice that all type of workers declared less overtime hours after the abolition of the reform. These effects are consistent across specifications, and, as previously seen, seem to be stronger for laborers than for managers. This might confirm that first in comparison with laborers, managers' number of overtime hours seem to be a priority for firm which prefer to increase it when the cost of overtime is reduced, but which are also reluctant to decrease it when it gets

higher. One would note that managers and laborers might not be observed in the same sector or in the same type of firms, firms that might have a more or less sensible to an increased cost of overtime hours. Moreover the second conclusion is that workers indeed worked more thanks to the TEPA law. After the abolition, I observe a decrease in the number of hours worked consistent across type and specification. However this decrease is lower that the drop in overtime hours, meaning that part of the former increase in overtime hours was purely fictive and resulted from fiscal optimization. Table 13, which reports the results of entropy-balancing for unpaid, paid and all types of overtime hours in 2012, confirms this idea. One should see that, as found previously, the number of unpaid overtime hours increased for managers but not for laborers, attesting to the importance of having unverifiable hours in this optimization process.

Table 13: Robustness Checks - Unpaid Overtime Hours - 2012

Variables	All		Managers		Laborers	
	(1)	(2)	(3)	(4)	(5)	(6)
Overtime Hours - Unpaid (b-a)	0.257***	0.242***	0.440**	0.398**	0.152	0.152
	(0.077)	(0.083)	(0.173)	(0.169)	(0.095)	(0.095)
Overtime Hours - Total (b)	-1.672***	-1.495***	-1.334***	-1.212***	-1.862***	-1.862***
	(0.152)	(0.167)	(0.265)	(0.289)	(0.222)	(0.222)
Overtime Hours - Paid (b)	-1.930***	-1.737***	-1.774***	-1.610***	-2.015***	-2.015***
	(0.142)	(0.162)	(0.251)	(0.283)	(0.217)	(0.217)
Time Trend	No	Yes	No	Yes	No	Yes

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees, using entropy-balancing. Control group is individuals who did worked overtime prior to September 2012. Treatment are those who did. Columns show estimates for the baseline model without (1, 3, 5) or with a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. All: 9,902 for the control group and 5,617 for the treatment. Managers: 5,600 for the control group and 1,558 for the treatment. Laborers: 4,302 for the control group and 4,059 for the treatment. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Bonuses

Finally, I decide to use this technique for bonuses. Appendix 6 reports the estimates for bonuses of all types of full type employees (equation 1 β_1), using entropy-balancing. One should observe that these results are really similar to what I find in 5.1. Appendix 11 reports very significant results regarding all type of bonuses (amount and probability) and corroborates previous findings. Again, like in 5.1,

Table 14: Robustness Check - Bonuses - 2007 - Managers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Amount (a)	-51.525***	-51.157***	-51.336***	-51.076***	-51.528***	-51.158***
	(18.499)	(18.094)	(18.446)	(18.110)	(18.443)	(18.092)
Probability (a)	-0.311***	-0.312***	-0.315***	-0.314***	-0.310***	-0.312***
	(0.024)	(0.024)	(0.025)	(0.025)	(0.024)	(0.024)
Amount (b)	-806.621***	-812.618***	-816.122***	-818.186***	-803.756***	-812.420***
	(243.877)	(244.206)	(244.393)	(244.610)	(242.726)	(243.645)
Probability (b)	-0.125***	-0.125***	-0.126***	-0.125***	-0.125***	-0.125***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Amount (c)	-127.270***	-127.438***	-128.467***	-128.213***	-127.128***	-127.428***
	(36.619)	(36.348)	(36.676)	(36.422)	(36.687)	(36.353)
Probability (c)	-0.381***	-0.382***	-0.385***	-0.384***	-0.380***	-0.382***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees working in France, whose hours are less verifiable (managers) and using entropy-balancing. Control group is individuals who did not received any type of bonuses prior to October 2007. Treatment are those who did. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment.(a) stands for bonus of type 1 (13th-month bonuses, regular productivity bonuses or some type of seniority bonuses), (b) for bonus of type 2 (paid throughout the year, such as profit-sharing bonuses or some seniority bonuses) and (c) for all kind of bonuses. Observations are 9,488 with 1,781 for the control group and 7,707 for the treatment. Level of significance : $***p < 0.01$, $**p < 0.05$, $*p < 0.1$; Robust standard deviations in parentheses

columns 1 and 2 are for the baseline model (with or without a time trend), columns 3 and 4 for a model with a business climate index (with or without a time trend) and columns 5 and 6 for a model with the share of export included (with or without a time trend). I find a very negative impact of the TEPA law for all kind of employees, consistent with what one could observe previously. By decomposing the effect between managers (table 14) and laborers (table 15), one should observe that if the negative impact on the probability of receiving a bonus is quite similar between the two groups, managers experienced a decrease in the amount received from 2 to 4 times bigger than laborers. This result confirms that managers, whose hours are less verifiable, might have used more the TEPA law as a way to fiscally optimize how extra-work was paid.

Regarding bonuses when the law was abolished, table 16 reports quite similar results from those previously found. One do not observe a big increase of bonuses after 2012, even if the detaxation of overtime hours was removed. However, even if this narrative seems to hold, I find stronger effects when the sample is split between managers

Table 15: Robustness Check - Bonuses - 2007 - Laborers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Amount (a)	-29.005***	-29.123***	-29.675***	-29.571***	-28.977***	-29.233***
	(5.393)	(5.353)	(5.397)	(5.367)	(5.392)	(5.344)
Probability (a)	-0.266***	-0.266***	-0.271***	-0.270***	-0.266***	-0.268***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Amount (b)	-212.702***	-214.897***	-219.048***	-218.975***	-212.316***	-216.435***
	(30.718)	(30.515)	(31.055)	(30.845)	(30.568)	(30.413)
Probability (b)	-0.158***	-0.158***	-0.160***	-0.160***	-0.158***	-0.159***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Amount (c)	-50.798**	-51.691**	-52.047**	-52.425**	-50.713**	-52.055**
	(21.828)	(21.613)	(21.806)	(21.636)	(21.803)	(21.620)
Probability (c)	-0.359***	-0.361***	-0.365***	-0.365***	-0.359***	-0.362***
	(0.020)	(0.020)	(0.021)	(0.021)	(0.020)	(0.020)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees working in France, whose hours are verifiable (laborers) and using entropy-balancing. Control group is individuals who did not received any type of bonuses prior to October 2007. Treatment are those who did. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment.(a) stands for bonus of type 1 (13th-month bonuses, regular productivity bonuses or some type of seniority bonuses), (b) for bonus of type 2 (paid throughout the year, such as profit-sharing bonuses or some seniority bonuses) and (c) for all kind of bonuses. Observations are 13,578 with 3,814 for the control group and 9,764 for the treatment. Level of significance : $***p < 0.01$, $**p < 0.05$, $*p < 0.1$; Robust standard deviations in parentheses

and laborers. Indeed, as one might have expected, managers experienced a small increase of their bonuses while laborers experienced a small decrease. However these effects are really volatile, by appearing or disappearing depending on if a time trend is added. Effects are more significant for laborers, which, if one controls for the trend, are negative and significant for all kind of bonuses (amount and probability). Regarding managers, I only reports a positive effect on the amount of bonuses received, which tends to be consistent for bonuses of type 2 only. Overall, these results help having a better understanding of how firms reacted to the increased cost of overtime hours. Thanks to entropy-balancing, it seems that the abolition of the TEPA law had much more impact that I initially found. After 2012, part of workers whose hours are less verifiable (managers) came back to receiving bonuses as a way to be paid for overtime hours, but this transfer was not massive as in 2007, mainly because bonuses were not more attractive in 2012. However one might think that, with an increased cost of overtime hours, and with more bonuses to pay to managers, firms compensate these extra-cost by reducing laborers' bonuses. This would indicate that laborers were the first to pay from the abolition of the TEPA law

in 2012. However, as I said one should be cautious regarding these results and their consistency and it might be necessary to wait for further analysis before drawing strong conclusion on this particular concern.

Table 16: Robustness Checks - Bonuses - 2012

Variables	All		Managers		Laborers	
	(1)	(2)	(3)	(4)	(5)	(6)
Amount (a)	-1.047	-7.120	27.585**	20.459*	-22.382**	-22.382**
	(6.748)	(7.033)	(11.562)	(12.120)	(8.798)	(8.798)
Probability (a)	0.037	-0.087***	0.074	-0.026	-0.108***	-0.108***
	(0.025)	(0.028)	(0.048)	(0.053)	(0.035)	(0.035)
Amount (b)	113.821**	-42.922	293.735***	146.782	-125.964**	-125.964**
	(51.808)	(56.000)	(111.813)	(119.704)	(59.805)	(59.805)
Probability (b)	-0.009	-0.058***	0.002	-0.014	-0.077***	-0.077***
	(0.020)	(0.022)	(0.030)	(0.032)	(0.029)	(0.029)
Amount (c)	-22.072	-65.988*	51.425	40.946	-118.286**	-118.286**
	(37.239)	(38.723)	(65.340)	(66.151)	(46.431)	(46.431)
Probability (c)	0.041	-0.095***	0.061	-0.043	-0.113***	-0.113***
	(0.027)	(0.032)	(0.052)	(0.057)	(0.040)	(0.040)
Time Trend	No	Yes	No	Yes	No	Yes

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees, using entropy-balancing. Control group is individuals who did worked overtime prior to September 2012. Treatment are those who did. Columns show estimates for the baseline model without (1, 3, 5) or with a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. All: 9,743 for the control group and 5,752 for the treatment. Managers: 5,516 for the control group and 1,601 for the treatment. Laborers: 4,227 for the control group and 4,151 for the treatment. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

6.3 Which workers benefited from the reform ?

In this subsection I try to provide some development to my analysis by looking at which workers benefited the most from the TEPA law. In the first time I will provide an analysis based on the intensity of use of overtime hours. Then I will look at potential effect on income.

Use of Overtime Hours

One could think for instance that, due to their production organization, firms that are using more overtime hours need to. On the opposite, workers who used a lot of overtime hours prior to the TEPA law or prior to its abolition might be more sensitive to these policy changes. This section will try to provide evidence regarding this hypothesis, in order to go beyond the average treatment effect implied by the

Diff-in-Diff design. To do so, depending on the median number of overtime hours done prior to the policy change, I split the treatment group in two, with a "high" group and a "low" group. As the identification strategy for overtime hours in 2007 only gives a small number of observation, I analyze the results of the removing the policy in 2012, depending on being of one or the other group.

Table 17: High and Low Use of Overtime Hours prior 2012, using entropy-balancing

Variables	High		Low	
	(1)	(2)	(3)	(4)
Overtime Hours (a)	-1.130***	-0.880***	-0.335***	-0.200
	(0.112)	(0.127)	(0.115)	(0.124)
Hours Worked (b)	-0.665***	-0.612***	-0.111	-0.269
	(0.135)	(0.145)	(0.185)	(0.206)
Gap (b - a)	0.465***	0.268*	0.224	-0.069
	(0.138)	(0.149)	(0.202)	(0.221)
Probability of overtime	-0.251***	-0.213***	-0.192***	-0.143***
	(0.024)	(0.027)	(0.032)	(0.035)
Time Trend	No	Yes	No	Yes
N	13298	13298	12062	12062

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees, using entropy-balancing. Control group is individuals who did not worked overtime prior to September 2012. Treatment are those who did. The treatment group is divided into two subsample, high and low, using the median number of overtime hours prior to September 2012. Columns show estimates for the baseline model without (1, 3, 5) or with a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. For the low group, observations are 120626 and for the high group 13298 .Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Table 17 reports the results of differentiated analysis for overtime hours and hours worked. The first two columns show estimates for individuals that have done more than the median number of hours prior to September 2012. The two last columns for workers that have done less than the median number of hours prior to the policy change. I find a stronger and more consistent decrease of overtime hours for

individuals that used a lot of overtime hours prior to the re-taxation of overtime hours. Since these individuals were using a lot of overtime hours, they were the first impacted by the increasing cost of doing overtime. This translated into a decrease in the number of overtime hours As one might notice that I find negative but smaller and less consistent effects for workers who did less overtime prior to the abolition.

Income

Finally I decided to look at the potential impact on income. Table 18 reports the effect of the policy on workers' income. As the French Labor Survey only provide an overall income variable, including bonuses, I decide to investigate the overall impact of the reform on workers' income. It is important to note that as the smaller number of observations shows, a big proportion of workers do not give any information about their income, which question the relevance of the French Labor Survey to measure effects on income. Then, in order to assess the overall impact of the TEPA law on income, more investigation using fiscal administrative data for instance might be needed. For instance, I was not able to evaluate the impact of the TEPA law on income in 2007, due to an identification strategy that was providing too less observations.

Table 18: 2012 - Income, including bonuses, using entropy-balancing

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Income	6.188	18.973	169.547	169.547	11.816	11.816
	(30.817)	(104.944)	(295.246)	(295.246)	(82.459)	(82.459)
Time Trend	No	Linear	No	Linear	No	Linear

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees, using entropy-balancing. Control group is individuals who did worked overtime prior to September 2012. Treatment are those who did. Columns show estimates for the baseline model without (1, 3, 5) or with a time trend, interacted with the treatment. All: 3,216 for the control group and 2,005 for the treatment. Managers: 1,817 for the control group and 552 for the treatment. Laborers: 1,399 for the control group and 1,453 for the treatment. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Instead, I decide to evaluate the impact of the abolition of the tax-cut policy. I proceed following the identification strategies for bonuses in 2012. Model specifications follow the previous configuration, with (2,4,6) or without a time trend (1,3,5), for the baseline model (1,2) or taking into account the business climate (3,4) or the share of export (5,6). In order to control for the common trend, I directly report results using entropy-balancing. I find no significant impact of abolishing the reform on the overall income of workers.

Conclusion

In this work, I evaluate both the impact and the abolition of the TEPA law, a tax-cut policy on overtime hours, and investigate the channel between bonuses and paid overtime hours. My results corroborate previous findings from Cahuc and Carcillo (2014). Three main conclusions can be drawn from my study. First, the TEPA law indeed impacted the number of paid overtime hours. I show several evidence of an increase of overtime hours for managers when the law was implemented, and evidence of a strong decrease for all type of workers once it was removed. Reciprocal effects can be observed for unpaid overtime hours of workers whose hours are less verifiable, meaning that the TEPA law pushed workers and firms to declare extra hours of work. Controlling for the pre-treatment common trend with entropy-balancing, I also find a small positive impact on the number of hours worked of managers. It seems then that the TEPA law encouraged some type of workers to work, or at least declare, more hours worked. However these effects are less consistent and smaller than those for overtime hours.

This leads me to my second conclusion regarding fiscal optimization. These findings on hours worked and overtime hours have to be put in perspective with the massive fiscal optimization that the tax-cut policy induced. Indeed, I find a very negative impact of the law on bonuses. This evidence, and the fact that in 2007 (2012) overtime hours increase (decrease) more than hours worked for workers whose hours are less verifiable, supports the claim of a massive fiscal optimization process. In 2012

when the law was removed, bonuses went up for workers whose hours are less verifiable, but nothing to compare with the decrease of 2007. The main reason for this is that in 2012 removing the tax deduction did not make bonuses more attractive to firms.

Finally, my results support the idea of a differentiated impact of the policy depending on how much hours are verifiable. It seems that bonuses and number of overtime hours of workers whose hours are verifiable were even negatively impacted by both the TEPA law and its abolition. If for 2007, this negative effect is not very consistent across specification, I show strong evidence that when the law was abolished this type of workers saw both overtime hours and bonuses decrease more than workers whose hours are less verifiable. Few elements could explain why workers whose hours are less verifiable are the first to lose in this situation. It might be that firms favour workers whose hours are less verifiable, which usually hold better jobs and higher positions. Also, it is possible that these two types of workers do not work in the firms or sector, and therefore do not respond to the same constraints. Finally, one last explanation came from the composition of these two groups. It seems that workers who use more overtime hours were more impacted by the policy and its abolition. In order to provide a better understanding of this topic, possible extensions of this work could investigate this channel and decompose even more the presented effects.

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Appendix

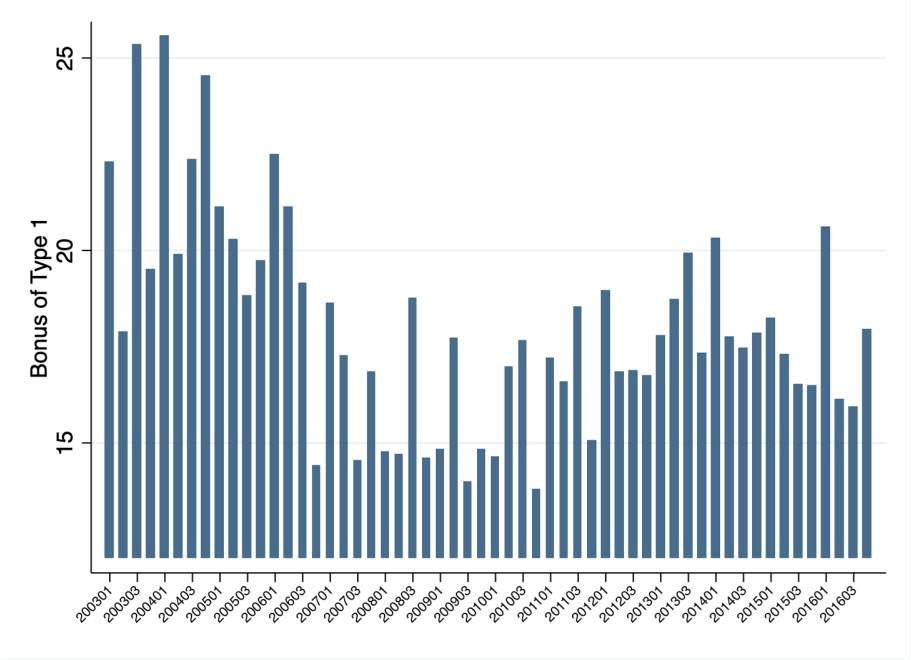

Figure 2.2: Average amount per quarter of Bonuses (Type 1) for full-time employees working in France in the non-agricultural for-profit sector Sources: (Enquête Emploi)

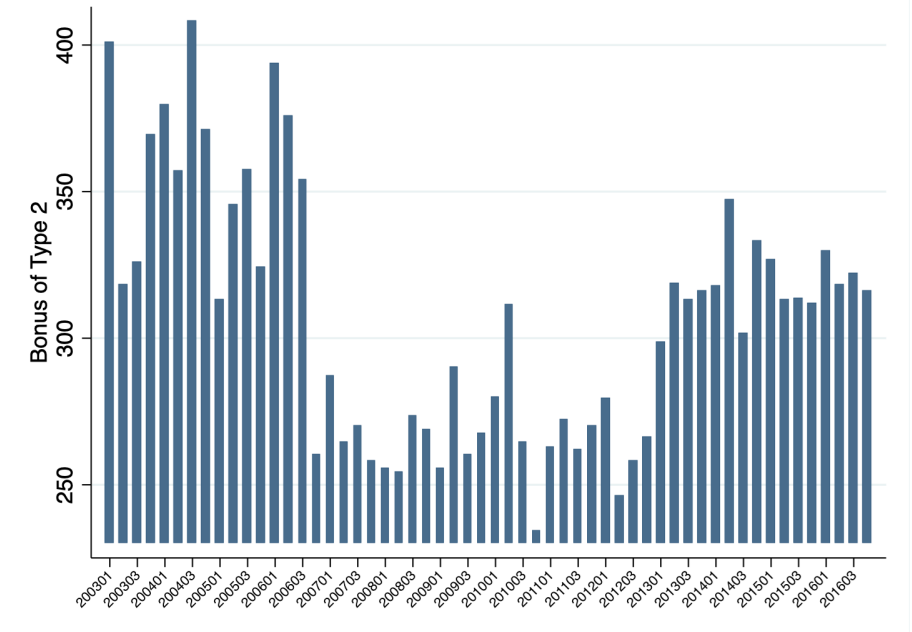

Figure 2.3: Average amount per quarter of Bonuses (Type 2) for full-time employees working in France in the non-agricultural for-profit sector Sources: (Enquête Emploi)

Appendix 1 -Impact of the Policy - 2007 - All FTE employees

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours (a)	-0.341	-1.194	-0.350	-1.196	-0.344	-1.189
	(0.883)	(1.107)	(0.885)	(1.109)	(0.880)	(1.100)
Hours Worked (b)	-0.532	-0.369	-0.547	-0.373	-0.533	-0.364
	(1.115)	(1.140)	(1.122)	(1.142)	(1.118)	(1.149)
Gap (b - a)	-0.191	0.825	-0.197	0.824	-0.189	0.825
	(1.193)	(1.266)	(1.193)	(1.265)	(1.189)	(1.264)
Probability of overtime	0.014	-0.033	0.012	-0.034	0.013	-0.032
	(0.114)	(0.130)	(0.114)	(0.131)	(0.113)	(0.129)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes
N	5884	5884	5884	5884	5884	5884

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees. Control group is transborder employees and treatment group is individuals working in France near the border after 2007. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Appendix 2 - Impact of the Policy - 2007 - Only Laborers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours (a)	-0.341	-1.194	-0.350	-1.196	-0.344	-1.189
	(0.883)	(1.107)	(0.885)	(1.109)	(0.880)	(1.100)
Hours Worked (b)	-0.532	-0.369	-0.547	-0.373	-0.533	-0.364
	(1.115)	(1.140)	(1.122)	(1.142)	(1.118)	(1.149)
Gap (b - a)	-0.191	0.825	-0.197	0.824	-0.189	0.825
	(1.193)	(1.266)	(1.193)	(1.265)	(1.189)	(1.264)
Probability of overtime	0.014	-0.033	0.012	-0.034	0.013	-0.032
	(0.114)	(0.130)	(0.114)	(0.131)	(0.113)	(0.129)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes
N	3908	3908	3908	3908	3908	3908

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees whose hours are verifiable (laborers). Control group is transborder employees and treatment group is individuals working in France near the border after 2007. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise.
Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Appendix 3 - Unpaid Overtime Hours - All - 2007

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours - Unpaid (b-a)	-0.023	-0.674	-0.032	-0.673	-0.025	-0.674
	(1.079)	(1.119)	(1.078)	(1.117)	(1.077)	(1.119)
Overtime Hours - Total (b)	-0.327	-1.355	-0.346	-1.353	-0.320	-1.340
	(0.938)	(1.160)	(0.938)	(1.160)	(0.938)	(1.156)
Overtime Hours - Paid (b)	-0.305	-0.681	-0.314	-0.680	-0.295	-0.666
	(1.143)	(1.249)	(1.143)	(1.251)	(1.133)	(1.237)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes
N	5884	5884	5884	5884	5884	5884

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees. Control group is transborder employees and treatment group is individuals working in France near the border after 2007. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment. (b) represents the total number of overtime hours (paid and unpaid) declared. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Appendix 4 - Bonuses - 2007 - All

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Amount (a)	-27.692***	-27.518***	-27.575***	-27.481***	-27.693***	-27.481***
	(9.013)	(8.937)	(9.008)	(8.935)	(9.025)	(8.952)
Probability (a)	-0.198***	-0.198***	-0.198***	-0.198***	-0.198***	-0.198***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Amount (b)	-235.885***	-236.035***	-235.489***	-235.888***	-236.204***	-236.772***
	(54.504)	(54.915)	(54.610)	(54.929)	(54.644)	(55.305)
Probability (b)	-0.117***	-0.116***	-0.117***	-0.116***	-0.117***	-0.116***
	(0.010)	(0.010)	(0.009)	(0.009)	(0.010)	(0.009)
Amount (c)	-47.852***	-47.533***	-47.673***	-47.473***	-47.890***	-47.574***
	(15.887)	(15.850)	(15.875)	(15.840)	(15.885)	(15.840)
Probability (c)	-0.275***	-0.275***	-0.275***	-0.274***	-0.276***	-0.275***
	(0.014)	(0.014)	(0.013)	(0.013)	(0.014)	(0.014)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees. Control group is individuals who did not received any type of bonuses prior to October 2007. Treatment are those who did. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment.(a) stands for bonus of type 1 (13th-month bonuses, regular productivity bonuses or some type of seniority bonuses), (b) for bonus of type 2 (paid throughout the year, such as profit-sharing bonuses or some seniority bonuses) and (c) for all kind of bonuses. Observations are 23,066 with 5,595 for the control group and 17,471 for the treatment. Level of significance : ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$; Robust standard deviations in parentheses

Appendix 5: 2007 - Overtime Hours, controlling for unemployment changes and non-linear time trend - Managers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours (a)	0.930*	0.620	0.921*	0.596	0.620	0.620
	(0.522)	(0.438)	(0.509)	(0.427)	(0.438)	(0.438)
Hours Worked (b)	-2.415*	-2.074	-2.416*	-2.099	-2.074	-2.074
	(1.403)	(1.997)	(1.402)	(1.992)	(1.996)	(1.996)
Gap (b - a)	-3.345***	-2.695	-3.338***	-2.695	-2.695	-2.695
	(0.892)	(1.792)	(0.904)	(1.794)	(1.791)	(1.792)
Probability of Overtime	0.284	0.179	0.283*	0.175	0.179	0.179
	(0.174)	(0.144)	(0.171)	(0.143)	(0.144)	(0.144)
Time Trend	No	Linear	No	Linear	Quadratic	Squared
N	1976	1976	1976	1976	1976	1976

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees whose hours are less verifiable (managers). Control group is transborder employees and treatment group is individuals working in France near the border after 2007. Specifications are as follows: baseline with (1) or without (2) a time trend, controlling for the unemployment rate with (3) or without a time trend (4), baseline with a quadratic time trend (5) and baseline with a squared time trend (6). Columns 2, 4, 5 and 6 includes a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. Level of significance : ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$; Robust standard deviations in parentheses

Appendix 6: 2007 - Overtime Hours, controlling for unemployment changes and non-linear time trend - Laborers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours (a)	-0.517	-0.941	-0.522	-0.939	-0.941	-0.941
	(1.328)	(1.599)	(1.327)	(1.597)	(1.599)	(1.599)
Hours Worked (b)	0.522	0.210	0.514	0.215	0.210	0.210
	(1.121)	(1.454)	(1.128)	(1.447)	(1.454)	(1.454)
Gap (b - a)	1.039	1.151	1.035	1.154	1.151	1.152
	(1.239)	(1.503)	(1.243)	(1.503)	(1.503)	(1.503)
Probability of Overtime	-0.009	0.056	-0.009	0.057	0.056	0.056
	(0.152)	(0.162)	(0.152)	(0.162)	(0.162)	(0.162)
Time Trend	No	Linear	No	Linear	Quadratic	Squared
N	3908	3908	3908	3908	3908	3908

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees whose hours are verifiable (laborers). Control group is transborder employees and treatment group is individuals working in France near the border after 2007. Specifications are as follows: baseline with (1) or without (2) a time trend, controlling for the unemployment rate with (3) or without a time trend (4), baseline with a quadratic time trend (5) and baseline with a squared time trend (6). Columns 2, 4, 5 and 6 includes a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Appendix 7 - 2012 - Overtime Hours, controlling for unemployment changes and non-linear time trend - Managers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours (a)	-0.923***	-0.701***	-0.923***	-0.700***	-0.701***	-0.701***
	(0.168)	(0.176)	(0.168)	(0.176)	(0.176)	(0.176)
Hours Worked (b)	-0.460**	-0.449*	-0.459**	-0.445*	-0.449*	-0.449*
	(0.218)	(0.241)	(0.218)	(0.241)	(0.241)	(0.241)
Gap (b - a)	0.463**	0.252	0.464**	0.255	0.252	0.252
	(0.223)	(0.249)	(0.223)	(0.249)	(0.249)	(0.249)
Probability of Overtime	-0.234***	-0.174***	-0.234***	-0.173***	-0.173***	-0.174***
	(0.039)	(0.042)	(0.039)	(0.042)	(0.042)	(0.042)
Time Trend	No	Linear	No	Linear	Quadratic	Squared
N	19208	19208	19208	19208	19208	19208

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees whose hours are less verifiable (managers). Control group is individuals who did worked overtime prior to September 2012. Treatment are those who did. Specifications are as follows: baseline with (1) or without (2) a time trend, controlling for the unemployment rate with (3) or without a time trend (4), baseline with a quadratic time trend (5) and baseline with a squared time trend (6). Columns 2, 4, 5 and 6 includes a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. Observations are 7,206 with for 5,733 the control group and 1,473 for the treatment. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Appendix 8 - 2012 - Overtime Hours, controlling for unemployment changes and non-linear time trend - Laborers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours (a)	-1.178***	-0.978***	-1.178***	-0.978***	-0.978***	-0.978***
	(0.106)	(0.118)	(0.106)	(0.118)	(0.118)	(0.118)
Hours Worked (b)	-0.604***	-0.591***	-0.604***	-0.600***	-0.591***	-0.591***
	(0.128)	(0.138)	(0.128)	(0.138)	(0.138)	(0.138)
Gap (b - a)	0.574***	0.387***	0.574***	0.378***	0.387***	0.387***
	(0.137)	(0.145)	(0.137)	(0.144)	(0.145)	(0.145)
Probability of Overtime	-0.305***	-0.268***	-0.305***	-0.268***	-0.268***	-0.268***
	(0.023)	(0.026)	(0.023)	(0.026)	(0.026)	(0.026)
Time Trend	No	Linear	No	Linear	Quadratic	Squared
N	17469	17469	17469	17469	17469	17469

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees whose hours are verifiable (laborers). Control group is individuals who did worked overtime prior to September 2012. Treatment are those who did. Specifications are as follows: baseline with (1) or without (2) a time trend, controlling for the unemployment rate with (3) or without a time trend (4), baseline with a quadratic time trend (5) and baseline with a squared time trend (6). Columns 2, 4, 5 and 6 includes a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. Observations are 8,110 with for 4,311 the control group and 3,799 for the treatment. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Appendix 9: Robustness Checks - 2007 - All FTE employees

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours (a)	-1.176*	-0.744	-1.070	-0.695	-1.211*	-0.686
	(0.633)	(1.097)	(0.671)	(1.117)	(0.635)	(1.119)
Hours Worked (b)	-7.083***	0.158	-6.334***	0.431	-7.157***	0.408
	(1.243)	(2.308)	(1.146)	(2.392)	(1.254)	(2.548)
Gap (b - a)	-5.907***	0.902	-5.265***	1.126	-5.946***	1.093
	(1.047)	(2.425)	(0.997)	(2.500)	(1.060)	(2.619)
Probability of overtime	0.029	0.060	0.018	0.056	0.026	0.065
	(0.044)	(0.064)	(0.048)	(0.066)	(0.045)	(0.064)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes
N	5884	5884	5884	5884	5884	5884

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees, using entropy-balancing. Control group is transborder employees and treatment group is individuals working in France near the border after 2007. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. Level of significance : $***p < 0.01$, $**p < 0.05$, $*p < 0.1$; Robust standard deviations in parentheses

Appendix 10: Robustness Checks - 2007 - Laborers

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Overtime Hours (a)	-1.733***	-1.732	-1.613***	-1.927	-1.772***	-1.570
	(0.326)	(1.564)	(0.409)	(1.392)	(0.326)	(1.736)
Hours Worked (b)	-7.473***	0.137	-6.391***	-1.109	-7.615***	1.059
	(0.995)	(4.514)	(0.922)	(3.190)	(1.014)	(5.815)
Gap (b - a)	-5.739***	1.869	-4.778***	0.818	-5.843***	2.629
	(1.208)	(3.746)	(1.102)	(2.550)	(1.223)	(4.985)
Probability of overtime	-0.007	0.049	-0.022	0.071	-0.011	0.067
	(0.038)	(0.058)	(0.039)	(0.061)	(0.039)	(0.060)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes
N	1984	1984	1984	1984	1984	1984

NOTE – Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees whose hours are verifiable and using entropy-balancing. Control group is trans-border employees and treatment group is individuals working in France near the border after 2007. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment. While gap stands for the difference between hours worked and overtime hours, the probability of overtime equals one if the individual reports overtime hours, and 0 otherwise. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses

Appendix 11 -Robustness Check - Bonuses - 2007 - All

Dependent	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Amount (a)	-37.863***	-37.842***	-38.125***	-38.046***	-37.833***	-37.875***
	(8.498)	(8.302)	(8.474)	(8.316)	(8.487)	(8.308)
Probability (a)	-0.284***	-0.285***	-0.289***	-0.288***	-0.284***	-0.286***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Amount (b)	-450.667***	-454.633***	-459.220***	-460.075***	-449.606***	-456.056***
	(99.443)	(99.563)	(99.605)	(99.692)	(99.140)	(99.593)
Probability (b)	-0.145***	-0.145***	-0.147***	-0.146***	-0.145***	-0.145***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Amount (c)	-85.854***	-86.106***	-87.089***	-86.897***	-85.730***	-86.274***
	(20.173)	(19.955)	(20.187)	(19.995)	(20.174)	(19.936)
Probability (c)	-0.368***	-0.369***	-0.373***	-0.373***	-0.368***	-0.370***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.015)	(0.016)
Economic Situation	No	No	Climate	Climate	Export	Export
Time Trend	No	Yes	No	Yes	No	Yes

Shown are regressions with individual fixed effects, on non-agricultural for-profit full time employees, using entropy-balancing. Control group is individuals who did not received any type of bonuses prior to October 2007. Treatment are those who did. Specifications are as follows: baseline (1,2), including a business climate index (3,4) or including the share of exports in the GDP of each bordering country (5,6). Columns 2, 4 and 6 includes a time trend, interacted with the treatment.(a) stands for bonus of type 1 (13th-month bonuses, regular productivity bonuses or some type of seniority bonuses), (b) for bonus of type 2 (paid throughout the year, such as profit-sharing bonuses or some seniority bonuses) and (c) for all kind of bonuses. Observations are 23,066 with 5,595 for the control group and 17,471 for the treatment. Level of significance : $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$; Robust standard deviations in parentheses