# Tax Exemption of Overtime Income and the Motivation to Work: A Lesson from France

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May 2025

**Abstract**

This study evaluates the impact of the 2007 TEPA Law – which exempted overtime compensation from income tax and social security contributions – on individuals' desired hours of work and work hours mismatch. The work hours mismatch is a largely understudied indicator in the context of France, and is defined as the difference between desired hours and actual hours of work. Using data from the nationally representative Labor Force Survey, I document four stylized facts on the work hours mismatch in France. First, the mismatch is positive across the majority of the working population, the French are underworked. Second, the positive mismatch is robust to socio-demographic heterogeneity. Third, there is a U-shaped relationship between wages and underemployment. Fourth, the mismatch tends to be null in the 45-50 working hour bracket. To estimate the effect of the reform on desired hours and the working hours mismatch, I implement a difference-in-differences strategy. I find that the reform led to a decrease in individuals' desired working hours, a reduction in the mismatch, and a lower probability of being underworked. These effects are concentrated among men, manufacturing sector workers, and mid- to high-wage earners. The results suggest that the reform may have inadvertently reduced motivation to work more, possibly due to strategic adjustment of hours or compensation channels, as suggested in related literature. Overall, this study raises broader questions about the effectiveness of labor supply-side incentives alone.

*I thank Pr. Pierre Cahuc for his supervision and support, as well as Dr. Stéphane Carcillo for accepting to serve on my master thesis defense jury.

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# 1 Introduction

In France, from October 2007 to January 2012, compensation for overtime work was exempt from income tax and partially exempt from social security contributions for both employees and employers. This was part of a major tax reform ratified by the president elect, which was later abrogated by his successor. The aim of the policy was to incentivize workers to work more. It came at a time of moderate economic growth and persistent unemployment. The Aubry Laws of 1998 and 2000 had attempted to address these challenges through demand-side interventions, primarily by reducing statutory working hours to encourage job creation. In contrast, the 2007 reform marked a shift toward supply-side incentives, seeking to stimulate individual labor supply by making overtime work more financially attractive.

France is not the first country to have experimented with the tax exemption of overtime hours. Since 1996, Austria has provided an income tax exemption on the premium portion of overtime pay, up to a maximum of 10 hours per month. In Belgium, reductions in income tax and social security contributions on overtime pay have been in place since 2005, with the annual ceiling on eligible hours having progressively increased over time. Initially set at 65 hours in 2005, the ceiling was raised to 100 in 2009 and 130 in 2010. Under the *"Jobs Deal"*, the ceiling was raised to 180 hours, initially intended to apply only to the 2020 and 2021 fiscal years. Since then, the measure has been extended on an annual basis. Italy also implemented a similar policy in 2008 but had to suspend it the same year due to rising unemployment. In Luxembourg, additional income made from overtime hours has been subject to various tax exemptions since 2008. Very recently, in January 2025, the Trump government passed the *"Overtime Pay Tax Relief Act"*[1], which allows a tax deduction on overtime income of up to 20% of regular wages from the same employer. This policy applies to individuals with an adjusted gross income of under $100,000, until the year 2029. Clearly, the tax exemption on overtime hours remains in active use to incentive higher working hours, thus warranting careful examination of its economic and social impacts. An important consideration in evaluating such policies, yet one that is often overlooked, is whether the affected population actually wants to work more.

Understanding the factors influencing one's desire to work is a central question for effective labor market policymaking. Traditional indicators such as employment rates, labor force participation, or number of hours worked fail to answer one important question: are individuals working as much as they want to? The work hours mismatch answers this question, it is defined as the difference between an individual's desired hours of work and the number of hours they currently work. This mismatch is a compelling indicator, its sign and value offer two distinct pieces of information. A positive mismatch reflects underemployment, it means an individual is motivated to work more hours than they currently do. Conversely, a negative mismatch indicates overemployment, meaning an individual would like to work less hours than they currently do. The magnitude of the mismatch informs on the degree of constraint or excess in the labor supply.

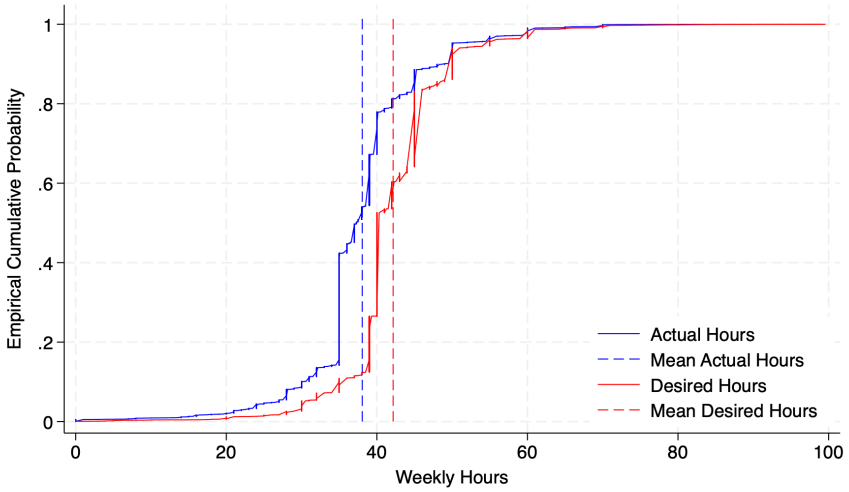
Public discourse often characterizes the French labor force as not motivated to work when this is in fact not the case. From 2003 to 2007, approximately 82% of the full-time working population[2] reported higher

[1] It is the 561st bill introduced in the House of Representatives during the 119th Congress.

[2] working in the for-profit non-agricultural sector over the 2003-2007 period, earning at least the minimum wage and working between 35 and 70 hours per week, on average.

desired hours than actual hours. Figure 1 clearly illustrates this positive mismatch: the empirical cumulative distribution function (CDF) of desired hours lies to the right of actual hours. This raises a key question: did the TEPA reform reduce the work hours mismatch? Given the literature finds no significant change in actual hours worked (Cahuc and Carcillo, 2014), this question effectively boils down to whether individuals were motivated to work more following the overtime tax exemption.

**Figure 1:** Empirical CDF's for Desired and Actual Hours (2003-2007)




NOTE: Empirical CDF's of the desired and actual hours for full-time workers in the for-profit non-agricultural sector over the 2003-2007 period, earning at least the minimum wage and working between 35 and 70 hours per week, on average. SOURCE: *Enquête Emploi (Insee)*

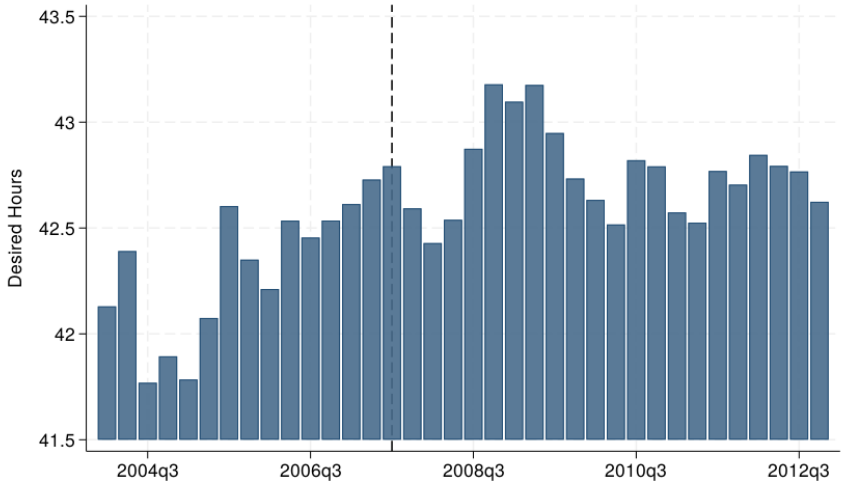
A common first thought may be that, yes, the policy should motivate workers to work more, thus increasing the mismatch for underworked individuals. This reasoning can be motivated by traditional models of labor supply which often assume individuals freely choose their hours, but this assumption often fails to hold in practice. Empirical studies have shown that working hours are frequently determined by institutional norms, employer practices, and contract rigidities rather than by individual preferences alone (Lewis, 1969; Kahn and Lang, 1991; Oettinger, 1999). For many workers, especially those in lower-skilled or non-unionized sectors, the opportunity to increase hours may simply not exist, regardless of financial incentives (Golden, 2001). Implicit workplace norms can also constrain employees' ability to respond to work incentive policies (Van Echtelt et al., 2006). As a result, when the ability to adjust one's labor supply is limited or unavailable, individuals may not express a desire to work more in the first place. This uneven availability of adjustment opportunities likely shapes reported preferences, and leads to a more nuanced answer to the question of the reform's effect: it depends.

Before evaluating the impact of the 2007 TEPA Law on individuals' work hours mismatch, I document 4 stylized facts on the work hours mismatch in France between 2003 and 2007. These facts serve to fill a gap in the literature; the work hours mismatch remains a largely undocumented and understudied indicator, for the case of France. First, the work mismatch is positive across the majority of the working population, the French are underworked. Second, while the magnitude of the mismatch varies across socio-demographic

groups, the positive mismatch is robust to group heterogeneity. Third, there is a U-shaped relationship between wages and underemployment. Fourth, the positive mismatch decreases with actual hours worked, and tends to be null in the 40-45 weekly working hour bracket. Documenting these facts also outlines one important discrepancy in the data. By construction, the design of the dataset used in my analysis does not include wage observations for every round of interrogations. As put forward by Kahn and Lang (1991), being able to control for an individual's wage is extremely important when analyzing his desired hours of work. Omitting this variable can lead to biased estimates of labor supply preferences. Fortunately there still remains a structure to the data, the observations are provided at every first and last round. This allows me to build a cohort level, synthetic wage dataset, from which I extract the variation to impute the unobserved wage values for individuals in the cohort.

Figure 2 displays the average quarterly desired hours per week for the period 2003-2012. The data reveal a steady upward trend in desired hours in the years following the implementation of the Aubry Laws, which appears to plateau in the aftermath of the 2007 TEPA reform (I attribute the temporary spike in desired hours from 2008Q3 to the deteriorated economic conditions caused by stock market crash). That said, the stabilization of employees' previously rising desired working hours is not necessarily linked to the reform.

**Figure 2:** Desired Amount of Weekly Hours (2003-2012)




NOTE: Average quarterly desired hours per week, for full-time workers in the for-profit non-agricultural sector over the 2003-2007 period, earning at least the minimum wage and working between 35 and 70 hours per week, on average. SOURCE: *Enquête Emploi (Insee)*

To evaluate the impact of the 2007 TEPA Law on the work hours mismatch, I conduct a difference-in-differences analysis. My treatment group is composed of workers on hours contracts, as they are subject to overtime regulations and thus eligible for the associated tax-exempt overtime. My control group consists of workers on days contracts, who are neither subject to overtime hours, nor its regulation on compensation. To mitigate concerns that the control group's work schedule flexibility may itself influence desired hours, I explicitly control for work-schedule autonomy by identifying "work-schedule optimizers" in the data and incorporate this dimension into a triple-differences specification.

I study several dependent variables throughout the analysis: desired hours, actual hours, the distance between the two, and the probability of being underworked. Focusing on the distance between desired and actual hours allows me to interpret the direction and magnitude of the estimated effects more clearly. Since the mismatch variable can take both positive and negative values, its raw form makes coefficient signs difficult to interpret. To address this, I use the absolute value of the mismatch to capture general changes in the magnitude of the gap, regardless of direction. Additionally, I use the squared value to detect whether the reform had differential effects on individuals experiencing particularly large mismatches. I focus on the indicator for being underworked because this is the dominant form of mismatch in the French labor market.

My results suggest that the 2007 TEPA Law's tax exemption on overtime hours led to a decrease in an individual's motivation to work, in the distance between their desired and actual hours, and in their probability of being underworked. I verify the robustness of these results by restricting my sample to individuals having undergone no changes in their employment status throughout the period of study, in order to control for workers switching to jobs or positions allowing them to benefit from the reform. I then conduct a series of placebo tests which remain limited by the amount of pre-treatment data available. I also verify the credibility of my identification strategy by carefully detailing the institutional context, and ensuring that none of the other tax policies included in the TEPA reform may have had confounding effects. Following these checks, I move to heterogeneity analysis. I find that the negative effect is concentrated among men and workers in the manufacturing sector, whereas women and workers in specialized industries, in the information communications and services industries, or in the financial and real estate industry are the least effected. Surprisingly, the results tentatively simply that workers in the manufacturing industry benefited from the reform the most. Lastly, I find that medium- and high-wage earners benefited most from the reform, as opposed to low-wage individuals who constitute approximately half of the sample and report negative insignificant effects.

Overall, this work contributes to the literature by presenting 4 facts on the work hours mismatch in France, previously undocumented in the literature. It also provides empirical evidence on the impact of overtime tax exemptions on desired hours and work-hour mismatches in France, using nationally representative survey data and a difference-in-differences identification strategy.

Section 2 reviews the related literature and Section 3 outlines the institutional context before and after the TEPA Law. Section 4 introduces a simple theoretical framework to motivate the concept of work hours mismatch. Section 5 describes the data, presents the stylized facts, and describes the imputation exercise to control for individual's monthly income. Section 6 details the empirical strategy and Section 7 presents the main results. Finally, Section 8 concludes.

# 2 Literature

## 2.1 The Work Hours Mismatch

A large literature in economics documents the persistence of mismatches between desired and actual hours worked. In the US, this mismatch is predominantly negative and has remained stable over time, particu-

larly among full-time workers in inflexible job structures, higher-income men, and dual-earner households (Reynolds, 2003; Golden and Gebreselassie, 2007). Cross-national evidence shows that positive mismatches are negatively correlated with GDP, but positively correlated with both unemployment and income inequality Otterbach (2010). Analyzing the components of mismatch separately, desired hours have been shown to be counter-cyclical (Tuda, 2020), while actual hours are substantially higher in low-income countries, highlighting a global pattern of leisure poverty (Bick et al., 2018). Together, these studies show that mismatches are a persistent, measurable outcome of both individual and macroeconomic forces.

A subsequent line of research investigates how mismatches between actual and preferred work hours affect individual well-being. A consistent finding across both cross-sectional and panel data is that work hours mismatch is negatively associated with subjective well-being, with overemployment emerging as more consequential than underemployment (Otterbach et al., 2016; Wooden et al., 2009). The magnitude and nature of this effect, has been shown to vary by country, gender, and extent of the mismatch (Wunder and Heineck, 2013; Wunder, 2016). Surprisingly, while having children can affect preferred hours (particularly for women), they are not the main driver of mismatch nor its impact on well-being (Reynolds and Johnson, 2012).

Work hour mismatches are also shaped by job structures and the design of labor market institutions. Job switching has been shown to only have a marginal impact on reducing a mismatch. In fact, workers tend to either stay or switch into overemployment (Knaus and Otterbach, 2019). Moreover, implicit norms of availability in the workplace exacerbate work hour mismatches which in turn carry unequal repercussions across groups. Women face much steeper wage penalties than men when deviating from the norm (Männasoo, 2022), and even part-time workers are pushed towards persistent overemployment (Van Echtelt et al., 2006). Studies quantifying the aggregate welfare costs of work hour mismatches include Lachowska et al. (2023) and Jarosch et al. (2025), and there is a growing theoretical literature to show that mismatches are not merely a friction, but a structured outcome of labor market institutions and job design contributing to welfare loss and reinforcing inequalities (Bick et al., 2022; Lachowska et al., 2023; Lo, 2023; Jarosch et al., 2025).

## 2.2 The 2007 TEPA Law

The specific effects of the TEPA Law on worker motivation and work-hour mismatches have received limited empirical attention, representing a notable gap in the literature. Existing research on the reform can be broadly categorized into studies addressing its macroeconomic and microeconomic effects, respectively. The former category consists primarily of work conducted by Heyer and colleagues, who first claim the policy has the potential to boost purchasing power and economic activity, while also widening the government deficit and negatively impacting on aggregate employment (Heyer, 2007). The work is later built on in Heyer (2011), which shows that tax reductions on overtime hours are pro-cyclical. A related perspective is offered by Cochard et al. (2010), who examine the tax exemption's effects in the context of the 2008 crisis and estimate that a 1% increase in overtime would destroy about 6,500 jobs in the commercial sector, three-quarters of which would be temporary. The issue of tax-exempt overtime is then revisited in Heyer (2017), as it constituted a central policy proposal in Emmanuel Macron's 2017 presidential campaign. The analysis suggests that the negative impact, in terms of increased working hours, would slightly outweigh the positive effect of enhanced purchasing power, while also estimating a financial cost of 0.1% of GDP and an employment

cost of 38,000 to 44,000 job losses by 2022[3]. While these studies offer important macro-level insights, they fail to account for heterogeneity in policy impacts across income levels, sectors, or socio-demographic groups.

Cahuc and Carcillo (2014) are the first to empirically analyze the ex-post effects of the 2007 TEPA Law at a microeconomic level. They offer a key theoretical framework demonstrating that the impact of overtime tax exemptions on hours worked is highly contingent on the verifiability of those hours – a factor that varies significantly across worker types. This theoretical result is confirmed by extending the initial difference-in-differences (DiD) design to triple differences (TD), differentiating between workers with verifiable and unverifiable amounts of overtime hours. In doing so, the authors find the reform had unequal effects across workers. While there was no significant effect on hours worked for all workers, those with less verifiable hours declared more overtime as a way to optimize their fiscal position. This work is later built on by Ghio (2019), who cleverly leverages an unaddressed channel in the Cahuc and Carcillo (2014) study: bonuses[4]. The greater flexibility and less stringent oversight of bonuses make them a particularly responsive channel to policy changes affecting the highly regulated domain of working hours. Ghio (2019) finds the 2007 policy induced a transfer from bonuses to overtime hours and a decrease in number of unpaid overtime hours, especially for workers with unverifiable hours. By extending the analysis to the 2012 abrogation, Ghio shows the policy triggered a decrease in number of hours worked which was smaller than the decrease in number of overtime hours. These asymmetric effects are also confirmed in Tuda (2022), who finds the tax exemption of overtime had little positive effect on hours worked, while reimposing it had a large negative effect.

Beyond the French context, Trejo (1991)'s foundational study analyzes how U.S. overtime pay regulations influence total worker compensation, suggesting that employers may adjust base wages downward in response to mandatory overtime premiums, potentially offsetting the intended income effects of the regulation. Lastly, there is a substantial body of literature estimating labor supply responses to tax reforms[5]. Several empirical studies emphasize the importance of accounting for overtime and secondary jobs when modeling labor supply. Notably, Tazhitdinova (2022) shows that exempting secondary jobs from taxation led to a substantial rise in moonlighting among constrained workers, particularly among low-income earners and women, and Tortarolo et al. (2020) finds that high-wage earners exhibit negligible labor supply responses to income tax holidays, with more flexible components like overtime showing only modest elasticities. Theoretically, incorporating these factors into the budget constraint has been shown to significantly affect estimates of income and substitution effects, particularly for women (Ashworth and Ulph, 1981). Other research highlights the importance of distinguishing between standard and overtime labor supply, even when analyzing how unions influence individual labor supply decisions (Oswald and Walker, 1994). Similarly, including data on overtime wages and secondary jobs has been found to raise estimated labor supply elasticities (Frederiksen et al., 2001).

[3]Insee's 2023 indicators go against these predictions. They report a higher growth in total paid employment compared to pre-COVID: 343 thousand paid jobs are created in 2022 as opposed to 324 and 147 thousand in 2017 and 2018, respectively (Insee, 2023).

[4]Cahuc and Carcillo (2014) explicitly cite bonuses as an unexplored affected channel (p.365, p.368).

[5]See Meghir and Phillips (2010), Keane (2011), and chapter 1.3.2 of Cahuc et al. (2014) for an extensive review. Notably, the work of Jerry Hausman in the 1980's, integrating piecewise linear budget constraints into labor supply analysis, made this a well studied theme in the late 20th century.

# 3 Institutional Background

A clear assessment of the 2007 TEPA Law requires a comprehensive understanding of the regulatory framework preceding it. The effects of the reform cannot be evaluated in isolation, as they were shaped by pre-existing labor market institutions, including working time regulations, tax-benefit structures, and employment protection legislation. For this reason, I first provide a detailed overview of French work hours regulation prior to the reform, followed by an account of the institutional changes introduced by the TEPA Law.

## 3.1 Work Hours Regulation Before the TEPA Law

Prior to October 2007, the regulatory framework governing the French labor market was primarily shaped by the Aubry Laws of 1998 and 2000, which were later amended by the Fillon Law of 2003. The first Aubry Law, adopted in June 1998, was a framework measure that encouraged firms to reduce working hours through negotiated agreements and financial incentives[6], without making the 35-hour workweek a statutory requirement. It was specifically targeted at companies with more than 20 employees and offered subsidies to those that voluntarily implemented working time reductions before the second Aubry Law of January 2000, which made the 35-hour workweek compulsory[7]. While the reduction in statutory working hours may seem straightforward, the change disrupted a densely layered regulatory framework, requiring adjustments across the tightly interwoven structure of French labor law. Following the Aubry laws of 1998 and 2000, the legal workweek was set at 35 hours, with the first 8 hours of overtime compensated at a 25% premium and any additional hours at 50%. These provisions were designed to ensure that maintaining longer work schedules would impose higher labor costs on employers, thereby incentivizing compliance with the new standard. The laws also capped annual overtime at 130 hours, limited the workday to a maximum of 10 hours, and set the total annual work limit at 1,607 hours. While the daily limit of 10 hours was rigid, the annualization of hours allowed for some flexibility in scheduling, enabling employers to vary weekly working hours across the year as long as the annual threshold was not exceeded. In keeping with the shift towards flexible scheduling, the Aubry Laws introduced the *forfait jours* system, which allows employees with a high degree of autonomy to calculate working time in days rather than hours, through a combination of collective agreements and individual contracts[8]. Workers under the *forfait jours* scheme are subject to an annual cap of 218 working days. Moreover, the reduction in working hours introduced the concept of compensatory time off, known in French as *Réduction du Temps de Travail* (RTT). Under this system, employees who work more than 35 hours per week without receiving overtime pay are entitled to take half-days or full days off in compensation. Under a sector-wide, company-wide, or establishment-level collective agreement, overtime compensation may be fully or partially replaced by compensatory rest time. As such, the RTT system became a central instrument for reconciling organizational flexibility with the legal constraints of reduced working time, allowing firms to adjust labor input without breaching statutory limits.

[6]Firms who adopted the 35 hour workweek (and signed agreements to reduce working time) were eligible for reductions in employer social security contributions, called *aides structurelles*.

[7]Companies with less than 20 employees were only bound by the 35 hour workweek starting January 2002, as set out in article L. 3121-10 of the French Labor Code, introduced by Law n° 2000-37.

[8]Initially restricted to managerial staff, *forfait jours* eligibility was extended to non-managerial employees with autonomous work schedules by Law n° 2005-296 of 31 March 2005, which amended Article L. 212-15-3 of the French Labor Code.

The purpose of the Aubry Laws was twofold. First, they aimed to address the persistently high unemployment that had affected France throughout the 1990s. Although such a policy was shown to be potentially problematic in neighboring Germany (Bauer and Zimmermann, 1999), the French government nonetheless reduced the statutory workweek to 35 hours, believing it would redistribute available labor and stimulate job creation. Second, the laws aimed to enhance labor market flexibility by promoting collective bargaining, particularly around working time. RTTs served as the main tool for implementing these negotiated reductions in hours. However, implementation of the Aubry Laws revealed several limitations. Chemin and Wasmer (2009) find no significant effect on employment in the Alsace-Moselle region, and as noted in Askenazy (2000), the Laws failed to account for the organizational changes triggered by the 35-hour reform, which he argues may have led to a deterioration in working conditions. This concern, along with broader questions about the reform's effects on employment and firm behavior, is a central focus of the special issue of *Économie et Statistique*, no. 376–377 (2004)[9]. What stands out is the complexity in assessing the precise impacts of the Aubry laws. Indeed, while Gubian et al. (2004) estimate the reform led to the creation of 350,000 jobs, Askenazy et al. (2004) maintain that such evaluation should be conducted ex-post, beyond the transitional period, and highlight heterogeneous effects across the workforce. Importantly, Cahuc (2004) emphasizes that the multifaceted nature of the Aubry Laws makes it very difficult to disentangle their effects from broader labor market dynamics[10]. In his comment, he calls for simple public policy measures, initially piloted at microeconomic level, with evaluation protocols allowing for the creation of reliable control groups. Still, well-identified labor market rigidities persisted in the aftermath of the Aubry Laws. The new framework was often perceived by employers as administratively burdensome and insufficiently adaptable, especially for smaller firms with variable labor demand. Moreover, the expected job creation effects proved uneven and difficult to measure, while some firms responded by intensifying workloads rather than expanding staff. These shortcomings laid the foundation for the Fillon Law of 2003, which reasserted the role of employer flexibility within the 35-hour regime [11].

In January 2003, the Fillon Law was signed. With it, the annual quota of overtime hours increased from 130 to 220 hours, thus allowing companies to work their employees 39 hours a week. To limit the additional cost for small businesses, the first four weekly overtime hours were compensated with a 10% premium instead of the standard 25%. Hours exceeding the eight-hour weekly threshold, however, continued to be subject to the 50% rate. Overall, the goal of the Fillon Law was to further relax working time rigidities left unaddressed by the Aubry Laws. Under the new provisions, the maximum daily working time could be extended to 12 hours through a collective agreement, and the 220-hour annual overtime limit could be exceeded with authorization from the labor administration[12]. Lastly, the 2003 Fillon Law decoupled employer social contribution reductions from working time, making all firms eligible regardless of their adoption of the 35-hour week. Structural aid above 1.6 times the minimum wage (SMIC) was also eliminated, concentrating support on low-wage employment.

[9]The journal *Économie et Statistique* is published by the French national institute of statistics (INSEE).

[10]For a survey of this literature, see section 3.3.1.4 and 3.3.1.5 of Artus et al. (2007).

[11]The 35-hour reform in France remains an active field of study, with notable ongoing research being conducted by Carry et. al.

[12]Approval from the labor administration was no longer needed starting August 2008, upon the adoption of Law n° 2008-789 which introduced Article L. 3121-11 to the French Labor Code

### 3.2 The 2007 TEPA Law

By the mid-2000s, France continued to struggle with high unemployment and sluggish growth, largely due to structural labor market rigidities and disincentives such as heavy labor taxation and constraints on working hours. The previous Aubry reforms on the 35-hour workweek had emphasized work-time reduction as a means of redistributing employment, but their effects on growth and competitiveness remained contested (Doisy et al., 2004; Jamet, 2006; Estevão and Sá, 2008). Nicolas Sarkozy leveraged these conditions during his campaign for the 2007 presidential election. His slogan, "Work more to earn more", denounced the heavy fiscal pressure felt by French workers and framed labor market reform as a central political priority. Following his election in May 2007, Sarkozy swiftly enacted the *Loi en faveur du Travail, de l'Emploi et du Pouvoir d'Achat* (TEPA), a law aimed at promoting work, employment, and purchasing power. The TEPA Law was signed into effect in August 2007, with its key provisions coming into force on October 1st of the same year.

Prior to October 2007, the French labor market was defined by a 35 hour work week and stringent regulation on the use of overtime. The intention of the TEPA law was not to alter such regulation, but rather to diminish the associated costs. Starting October 2007, overtime hours were made exempt from income tax and wage-based social security contributions (up to a limit of 21.5% of the employees gross wage) for private- and public-sector employees. The added compensation for overtime hours was standardized at 25% of the employee's wage, regardless of firm size (absent of firm- or sector-level agreements). All overtime hours exceeding the 8 hour weekly threshold remain subject to a 50% increase in compensation. To compensate for the increased costs this would incur on small firms who had previously been subject to an overtime premium of 10%, social security contributions paid by employers were reduced by flat rates of €1.5 per overtime hour for firms with less than 20 employees and €0.5 per overtime hour for the rest. Workers were strongly incentivized to work more; after the reform, overtime work would yield an additional 30% to 50% of post-tax income. For firms, the impact varied depending on their employment levels and wage structures. Nonetheless, their marginal tax rates decreased sharply. Lastly, the TEPA Law introduced additional tax provisions extending beyond labor income. These measures are summarized in Appendix A.

The transition from the Aubry and Fillon laws to the 2007 TEPA law represented a substantial reorientation of French labor policy. Whereas earlier reforms emphasized the reduction of working hours through state regulation and collective bargaining, the TEPA law adopted a more market-liberal framework, encouraging extended individual working time through fiscal incentives. This shift reflected a broader policy movement away from solidarity-based employment strategies toward supply-side labor market activation.

## 4 Theoretical Framework

I present a simple theoretical framework to motivate the existence of a work hours mismatch. Its purpose is to show, through three toy models representing the three canonical extremes of labor market allocation, that an employer and employee do not desire the same hours of work. I begin with a standard competitive labor supply model, then study demand-side market power via monopsony, and finally study the more realistic case of collective bargaining which also incorporates heterogeneous wage and hours preferences.

## 4.1 The Basic Competitive Model

In this perfectly competitive environment, both the Worker and Employer take the hourly wage, $w$, to be exogenously determined by the market. I keep the environment as simple as possible, hence define it as static, with no uncertainty or capital accumulation. The Employer chooses hours, $h$, to maximize profits based on a strictly increasing, strictly concave production function, $f(h)$, respecting the Inada Conditions. The Worker chooses hours to maximize utility, $u$, given a strictly decreasing and strictly convex disutility-of effort, $\phi(h)$. The Employer's desired hours of work, $h_E$, are defined as

$$h_E = \arg\max_h \{f(h) - wh\} \iff w = f'(h_E) \tag{1}$$

where the Employer's desired hours of work are such that the Worker's marginal production exactly offsets his wage. The Worker's desired hours of work, $h_W$, are defined as

$$h_W = \arg\max_h \{wh - \phi(h)\} \iff w = \phi'(h_W) \tag{2}$$

where the Worker's desired hours of work are such that his wage exactly offsets his marginal disutility of working. Under the perfectly competitive market assumption, it should be that wages adjust such that at equilibrium, the Employer and Worker desire the same hours, $h^*$, where

$$w = f'(h^*) = \phi'(h^*) \iff h^* = h_E = h_W \tag{3}$$

However, this condition is neither economically robust nor mathematically reliable. Economically, it requires the wage to align exactly with both the firm's marginal product of labor and the worker's marginal disutility of labor. In practice, such alignment is implausible: firms do not observe individual preferences, wages are not perfectly flexible, and frictions such as hours constraints, taxes, and bargaining distort both sides of the market. Mathematically, I assign standard functional forms to the production and disutility functions,

$$f(h) = Ah^\alpha, \quad \phi(h) = \lambda \frac{h^{1+\frac{1}{\chi}}}{1+\frac{1}{\chi}} \tag{4}$$

On the Employer's side, $A$ is a productivity parameter and $\alpha \in (0,1)$ denotes the output elasticity of hours. On the Worker's side, $\lambda > 0$ scales the disutility of labor (interpretable as the cost of one additional hour of work), and $\chi > 0$ represents the Frisch elasticity of labor supply. Solving the Employer and Worker's optimization problems yields,

$$\begin{cases} w = \alpha A h_E^{\alpha-1} \\ w = \lambda h_W^{\frac{1}{\chi}} \end{cases} \iff \begin{cases} h_E = \left(\frac{w}{\alpha A}\right)^{\frac{1}{\alpha-1}} \\ h_W = \left(\frac{w}{\lambda}\right)^{\chi} \end{cases} \tag{5}$$

Under the assumption of perfect competition, a market-clearing wage $w^*$ equates the Worker's and Employer's optimal hours, such that

$$h_E = h_W \iff \left(\frac{w^*}{\alpha A}\right)^{\frac{1}{\alpha-1}} = \left(\frac{w^*}{\lambda}\right)^{\chi} \iff w^* = \left(\frac{\lambda^\chi}{\alpha A^{\frac{1}{1-\alpha}}}\right)^{\frac{1}{\chi - \frac{1}{1-\alpha}}} \tag{6}$$

The equilibrium wage $w^*$ depends jointly on the worker's parameters $\lambda$ and $\chi$, and the firm's parameters $A$ and $\alpha$. However, this wage only aligns worker and employer incentives under highly specific conditions which cannot be reconciled empirically. To show this, I calibrate $w^*$ for known values of $\alpha$, $A$, and $\chi$ reported in the literature: I take $\alpha = 0.65$ from the Syverson (2011) survey which finds that output elasticity of labor supply falls in the 0.6 to 0.7 range; I take $A = 3.98$ from Ben Hassine (2019) who computes the average TFP value for French firms between 2000-2007; and I take $\chi = 0.54$ from the Chetty et al. (2011) meta analyses of existing micro and macro evidence. I find that for $w^*$ to at least match the minimum wage of 8.44€ in 2007 a lambda of approximately 0.0712 is required. Considering the inverse relationship between $\lambda$ and $w^*$ in Equation (6), this is an upper bound value. It is unrealistically low.

This basic model highlights that the condition $f'(h) = w = \phi'(h)$, which underpins competitive efficiency in the labor market, is a knife-edge case with no practical generality. This points to the existence of a mismatch between the number of hours desired by the Worker and the amount of hours desired by the Employer.

## 4.2 Monopsony Power

I extend the analysis to include monopsony power. In this case, the firm recognizes that the number of workers it can hire depends on the utility each worker receives. Hence, it maximizes profits $\Pi$, by choosing hours per worker $h$, subject to the labor supply function $L(u)$, increasing in $u$, where $u = wh - \phi(h)$ is the net utility offered to each worker. The Employer faces a positive elasticity of labor supply and does not internalize the Worker's disutility of work $\phi(h)$ when setting the optimal hours. He only internalizes how total utility $u$ affects aggregate labor supply $L(u)$. This extension introduces asymmetry by allowing the Employer to exert market power over the Worker. I show that in this case, the mismatch between the hours of work desired by the Worker and those desired by the Employer, persists.

The monopsonistic firm solves the following problem

$$\max_{h,w} \Pi = [f(h) - wh] \cdot L(u) \quad s.t. \quad u = wh - \phi(h) \tag{7}$$

The first-order condition for hours yields two important results,

$$f'(h) = w - \frac{L'(u)}{L(u)}(f(h) - wh)(w - \phi'(h)) \iff \phi'(h) = w + \underbrace{\frac{(f'(h) - w)}{f(h) - wh} \cdot \frac{u}{\varepsilon_u^L}}_{> 0} \tag{8}$$

$$\iff f'(h) = w - \underbrace{\frac{\varepsilon_u^L}{u}(f(h) - wh)(w - \phi'(h))}_{< 0} \tag{9}$$

Equations (8) and (9) characterize the marginal conditions of the monopsony model. These results capture core mechanisms of monopsony and illustrate the persistent mismatch between desired hours of work between the Worker and Employer. To start with, equation (8) shows that in monopsony, the Worker is overworked at the margin; his marginal disutility from working outweighs his wage, $w < \phi'(h)$[13]. This clearly outlines the mismatch between the hours of work desired by the Employer, and those desired by the Worker. While

[13] One could equally argue that the Worker is underpaid.

the Worker still wishes his optimal amount of hours, $h_W$ such that $\phi'(h) = w$, the Employer wishes $h_E$ such as defined by Equation (8). The positive sign of its second right hand side term follows from the standard monopsony assumptions: the Employer faces a positive elasticity of labor supply and produces at a strictly positive total and marginal surplus. Next, equation (9) shows that in monopsony, a worker is paid below his marginal productivity, $f'(h) > w$. The negative sign of its second right hand sign term also follows from the standard monopsony assumptions: the Employer faces a positive elasticity of labor supply, produces at a positive total surplus, and overworks the Worker at the margin. We know from Section 4.1 that in a perfectly competitive case, $w = f'(h) = \phi'(h)$. However, in monopsony, we see there exists a distortion between $w$, $f'(h)$, and $\phi'(h)$. It arises from the demand-side market power enabling the Employer to overwork the Worker at the margin, such that $\phi'(h) > w$. Moreover, notice the distortion is decreasing in the Worker's elasticity of labor supply $\varepsilon_u^L$. In other words, the more inelastic the Worker's labor supply, the more the monopsonistic Employer can extract marginal surplus from him.

Taking the first order condition on wages, I find

$$f(h) - wh = \frac{L(u)}{L'(u)} \iff f(h) - wh = \frac{u}{\varepsilon_L^u} \tag{10}$$

Equation (10) characterizes the level conditions of the monopsony model. The result shows Employer's total surplus per worker is inversely related to the Worker's elasticity of labor supply: a more inelastic labor supply allows the firm to extract more total surplus from its workforce.

Next, I solve for the equilibrium allocation of hours and wages, and find that this brings us back to the perfectly competitive case.

$$\begin{cases} f(h) - wh = \dfrac{L(u)}{L'(u)} \\ f'(h) = w - \dfrac{L'(u)}{L(u)}(f(h) - wh)(w - \phi'(h)) \end{cases} \iff \quad f'(h) = \phi'(h) \tag{11}$$

This final condition ensures that effort is chosen efficiently, as in the perfectly competitive benchmark. However, unlike the competitive case where the wage equals the marginal product, here the wage is determined endogenously as part of a surplus-maximizing contract. Thus, although the allocation of effort is first-best, the wage may deviate from marginal productivity. The frictionless outcome is achieved because the Employer has full control over both wage and hours and can design a contract that perfectly balances surplus extraction and the Worker's participation. In practice, however, employers rarely have such control, which leads us away from this ideal benchmark and into settings of constrained or distorted allocations. In the next toy model, I move the case most relevant to France.

### 4.3 A Collective Bargaining Model with Heterogeneous Preferences

A single firm employs a continuum of workers, indexed by $i \in [0, 1]$, with heterogeneous preferences over hours and wages such that $u_i = \theta_i w - \lambda_i \phi(h)$, where $\theta_i$ and $\lambda_i$ are the marginal utility of income and marginal disutility of hours worked, respectively. Each worker $i$ is characterized by a preference pair $(\theta_i, \lambda_i)$, drawn

from a joint, continuous distribution $F(\theta, \lambda)$ with density $f(\theta, \lambda)$ and a strictly positive support such that $(\theta_i, \lambda_i) \in \mathbb{R}^2_{++}$. I assume both parameters have finite expectations such that $\mathbb{E}[\theta] < \infty$, $\mathbb{E}[\lambda] < \infty$, and that $f$ is bounded and differentiable on its support. It follows that the aggregate worker utility equals

$$u = \int_{\theta,\lambda} \theta w - \lambda\phi(h)\ dF(\theta, \lambda) = \mathbb{E}[\theta]w - \mathbb{E}[\lambda]\phi(h).$$

In this model, a representative labor union bargains with the firm over hours and wages for all workers in the firm. At the end of bargaining, a single wage and amount of hours worked is agreed upon for all workers. The bargaining problem takes the form

$$\max_{w,h} \mathcal{O}(w, h) = [(f(h) - wh) \cdot L(u)]^{1-\gamma} \cdot [u]^{\gamma}$$

$$s.t. \quad u = \mathbb{E}[\theta]w - \mathbb{E}[\lambda]\phi(h), \quad w \geq \underline{w}, \quad h \geq \underline{h},$$

where $\mathcal{O}(w, h)$ is the objective function, $\underline{w}$ is the minimum wage, and $\underline{h}$ is the minimum legal weekly working hours for full time jobs. Taking the first-order condition on wage yields

$$\frac{\partial \mathcal{O}(w, h)}{\partial w} = 0 \iff (1 - \gamma)h = \mathbb{E}[\theta]\frac{f(h) - wh}{u}[(1 - \gamma)\varepsilon^L_u + \gamma]. \tag{12}$$

Equation (12) characterizes the wage outcome from the bargaining process between the firm and union. It is such that the marginal cost of raising the wage is exactly offset by the marginal gain in Nash product from attracting more labor and increasing average worker utility. Rearranging the terms yields the implicit wage equation, from which we can derive an interpretable expression of $w$. It's definition remains implicit, as the wage, $w$, remains nested inside the elasticity, $\varepsilon^L_u$. Rearranging Equation (12) ,

$$w = \frac{f(h)}{h} - \frac{(1 - \gamma)u}{\mathbb{E}[\theta][(1 - \gamma)\varepsilon^L_u + \gamma]}, \quad s.t. \quad u = \mathbb{E}[\theta]w - \mathbb{E}[\lambda]\phi(h)$$

$$\iff \quad w = \frac{f(h)[(1 - \gamma)\varepsilon^L_u + \gamma]}{h[1 + (1 - \gamma)\varepsilon^L_u]} + \frac{\mathbb{E}[\lambda]}{\mathbb{E}[\theta]}\frac{(1 - \gamma)\phi(h)}{[1 + (1 - \gamma)\varepsilon^L_u]}. \tag{13}$$

Equation (13) shows the bargained wage consists of two components, both adjusted for bargaining power $\gamma$ and the elasticity of labor supply with respect to utility, $\varepsilon^L_u$. The first term reflects the effective marginal revenue product of labor; it is the share of average output per hour that the worker captures. This share increases with bargaining power, as more surplus is shifted toward utility, but is inversely related to labor supply elasticity, since utility gains now attract more workers and diminish the individual surplus. The second term compensates the worker for the disutility of working hours. This compensating differential is scaled by the average tradeoff between income and leisure, captured by the shadow price $\mathbb{E}[\lambda]/\mathbb{E}[\theta]$ which represents the marginal wage required to offset the utility loss from longer hours. Overall, bargaining power allocates weight between the worker's direct utility and the firm's interest in labor force participation. As $\gamma \to 1$, the union fully internalizes utility, and the wage converges to the full average product, $w \to f(h)/h$. As $\gamma \to 0$, the firm dominates the bargain and sets the wage just high enough to secure labor participation. In which case the wage embeds disutility and labor supply elasticity, with little relation to the worker's average product.

Before turning to the hours condition, note that the wage depends on the average preference tradeoff $\mathbb{E}[\lambda]/\mathbb{E}[\theta]$. While this determines the equilibrium wage for the representative worker, individuals with $\lambda_i/\theta_i$ above or below this value would prefer a different wage–hour allocation, implying a generally suboptimal outcome at the individual level. Consequently, there exists a mismatch between the equilibrium wage and desired wage.

Next, to find the optimal number of hours, I solve the first-order condition on hours.

$$\frac{\partial \mathcal{O}}{\partial h} = 0 \iff (1-\gamma)(f'(h)-w)u = \mathbb{E}[\lambda]\phi'(h)(f(h)-wh)[\gamma + (1-\gamma)\varepsilon_u^L] \tag{14}$$

Equation (14) implicitly defines the equilibrium number of hours bargained between the Employer and labor union. It equates the gain in marginal surplus from increasing hours (LHS) to the marginal utility cost of longer hours (RHS). The LHS reflects the firm's net gain from an additional hour of work, the gap between marginal productivity and the wage, scaled not only by its bargaining power but also by the worker's utility level. This reflects the structure of the Nash product, where utility multiplicatively enters the objective function. As Worker bargaining power grows, the firm's net benefit from increasing hours diminishes. The RHS represents the disutility burden of longer hours and is composed of three terms. The first, $\mathbb{E}[\lambda]\phi'(h)$, reflects the average marginal disutility from additional hours. The second, $(f(h)-wh)$, is the surplus generated by each worker. Its size determines what is at stake in the bargaining process. Seeing as utility enters the Nash product multiplicatively, the higher the surplus, the more important the role played by utility. The last term, $[\gamma + (1-\gamma)\varepsilon_u^L]$, exhibits both the direct value of utility in bargaining and the firm's gain from increased labor force participation. Together, the three terms show the cost of raising hours not only depends on worker utility and bargaining power, but also has knock-on effects on aggregate labor supply.

Importantly, $\mathbb{E}[\lambda]$ is the marginal disutility from hours used in the bargaining process. However, individuals may have $\lambda_i \gtrless \mathbb{E}[\lambda]$. Therefore, the bargained number of hours will be too high for individuals with $\lambda_i > \mathbb{E}[\lambda]$ and too low for individuals with $\lambda_i < \mathbb{E}[\lambda]$, thus introducing a mismatch between the bargained hours and individual optimal hours.

Lastly, I solve the system of first-order conditions to find the equilibrium allocation of hours and wages.

$$\begin{cases} (1-\gamma)h = \mathbb{E}[\theta]\dfrac{f(h)-wh}{u}[(1-\gamma)\varepsilon_u^L + \gamma] \\ (1-\gamma)(f'(h)-w)u = \mathbb{E}[\lambda]\phi'(h)(f(h)-wh)[\gamma + (1-\gamma)\varepsilon_u^L] \end{cases} \implies f'(h) - w = \frac{\mathbb{E}[\lambda]}{\mathbb{E}[\theta]} h\phi'(h) \tag{15}$$

It shows that the gap between the marginal product of labor and the wage is equal to the average marginal disutility from longer hours, scaled by the representative worker's tradeoff between leisure and income. Unlike earlier conditions, utility cancels out in this final expression, implying that, at equilibrium, the wage and hours decision is governed solely by marginal production, $f'(h)$, marginal disutility of work, $\phi'(h)$ , and average preference parameters, $\mathbb{E}[\theta]$ and $\mathbb{E}[\lambda]$. Although utility enters the Nash product and intermediate steps of the bargaining problem, it does not directly influence the marginal conditions that determine the final allocation. This highlights that the negotiated outcome, while Nash-optimal at the representative level,

is ultimately shaped by average preference ratios rather than utility levels per se. Be that as it may, the equilibrium is still not optimal for the continuum of workers. Individual workers differ in their idiosyncratic preference ratios $\lambda_i/\theta_i$. As a result, the uniform allocation of hours may be inefficient at the individual level. Agents with $\lambda_i/\theta_i > \mathbb{E}[\lambda]/\mathbb{E}[\theta]$ bear a higher marginal disutility of effort and are overworked relative to their private optimum, while those with lower ratios are underworked. This divergence illustrates how centralized bargaining in the presence of preference heterogeneity induces a mismatch between actual and desired hours and wages, even when the aggregate outcome is Nash-optimal.

This bargaining model is especially relevant to France, where structural features of the labor market—such as widespread collective bargaining coverage and strict working time regulations—shape employment conditions in rigid ways. While these institutions offer important protections, they also tend to standardize working hours, limiting individual flexibility and contributing to mismatches between the hours employees want to work and the hours they actually work. These structural characteristics highlight the model's usefulness in explaining the persistent gap between labor supply and demand in the French context.

# 5 Data

## 5.1 Source and Sample Selection

To study the effect of the 2007 TEPA law on the work hours mismatch, I use the Labor Force Survey (*Enquête Emploi en Continu*), EEC henceforth, carried out by INSEE (the French national institute of statistics). The EEC is an ongoing survey, structured as a rolling panel in which each unit is followed for 6 consecutive quarters. The units of observation are individuals above the age of 15 from selected households. Approximately 45,000 households and 70,000 individuals are queried each quarter. Each interview includes questions referring specifically to the week preceding the interview, known as the *reference week*. It is important to note the EEC has been subject to multiple reforms. Notably, the survey was made continuous in 2003 and began a gradual expansion of 50% in 2009. The questionnaire was then redesigned in 2013 to better capture evolving labor market dynamics, and was once more redesigned in 2021 to adopt the Integrated European Social Statistics (IESS) regulation. While these reforms do not impact my study, any researcher looking to leverage the EEC should bear them in mind.

The EEC is the most reliable data source to study the work hours mismatch. Not only is it an incredibly rich dataset, providing detailed information on individuals' personal and employment characteristics, but it is the only source providing a measure of activity, unemployment and employment as defined by the International Labor Office (ILO). Moreover, respondents of the EEC are specifically selected to ensure the sample is nationally representative across a wide range of demographic and socioeconomic groups, making it particularly well suited for analyzing patterns that vary by age, gender, region, or education. Other administrative sources provide detailed data on individuals' hours of work. These include the annual declaration of company data (DADS) and the recapitulatory statement of social security contributions (BRC). However, both of these datasets are maintained by the employer and have only been compiled starting the fourth quarter of 2007. Therefore, neither of them include any information on an individual's desired hours of work, nor do they provide data before the ratification of the TEPA Law.

My sample selection process follows closely from that of Cahuc and Carcillo (2014). I study individuals working full-time jobs in the non-agricultural for profit sector and keep only those working between 35 and 70 hours per week, on average[14]. To ensure consistency, I drop individuals whose weekly work schedules have been interrupted by a strike, time off for training, illness, a period of partial unemployment, a business closure, or maternity, and individuals under a modulation agreement. I also restrict the sample to individuals with permanent work contracts, as workers on temporary contracts may exhibit stronger variation in their desired working hours over the course of their employment spells. Lastly, I restrict the study to Metropolitan France, as the distinction between Metropolitan France and France's overseas departments and territories was only officially recognized by the EEC in 2014. This sample contains data from December 2002 to December 2010. I call it the "Trimmed Total Sample" and build two sub-samples from it: the "Descriptive Sample" which includes all individual responses prior to the 2007 TEPA reform, and the "TEPA Sample" which includes all individuals interviewed before and after the reform. The former yields 153,846 observations between December 2002 and September 2007, I use it to empirically document the work hours mismatch in France. The latter holds 44,429 observations between July 2006 and December 2008, I use it for my empirical analysis.

## 5.2 Stylized Facts

As shown in Section 2.1, the existing literature provides extensive analysis of the work hours mismatch. However, France is rarely studied in isolation; at best, it is included as one among many countries in large cross-national comparisons. To fill this gap, I present 4 stylized facts on the structure of the work hours mismatch in France. In parallel, I replicate the analysis for the components of mismatch, desired and actual hours, and report results in Appendix D.

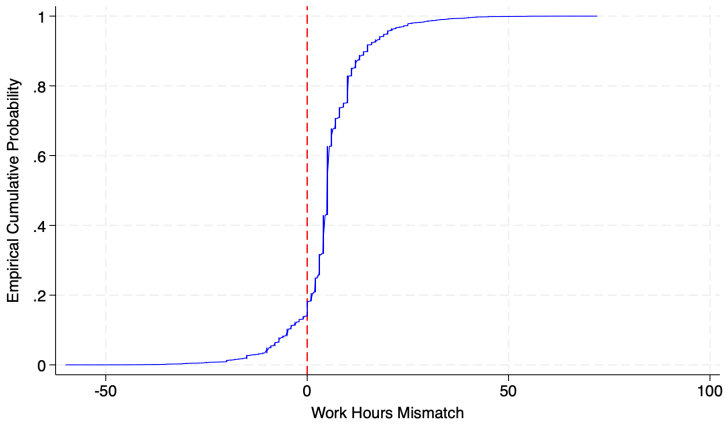
To construct the stylized facts, I estimate regression models using the Descriptive Sample, conditioning on a set of socio-demographic covariates of interest. I then compute post-estimation marginal predictions to obtain adjusted outcome values. This approach enables me to isolate the association between each covariate and the outcome variable, holding other factors constant.

**Fact 1: The French are Reportedly Underworked**

Figure 1 already displays this fact quite well; the empirical cumulative distribution function for desired hours consistently lies to the right of that for actual hours. I supplement with Figure 3 which shows the majority of reported work hour mismatches are positive. More specifically, during the 2003–2007 period in France, 82.78% of full-time workers in the non-agricultural, for-profit sector who earned at least the minimum wage reported wanting to work more hours than they actually did, while 18.22% wanted to work fewer hours.

[14] I follow Chemin and Wasmer (2009) in using the "usual" weekly hours to trim my sample.

**Figure 3:** Empirical Cumulative Probability of the Work Hours Mismatch




NOTE: This figure is the empirical cumulative probability density function of the work hours mismatch for workers in the Descriptive Sample. A robustness check is conducted in Appendix F.

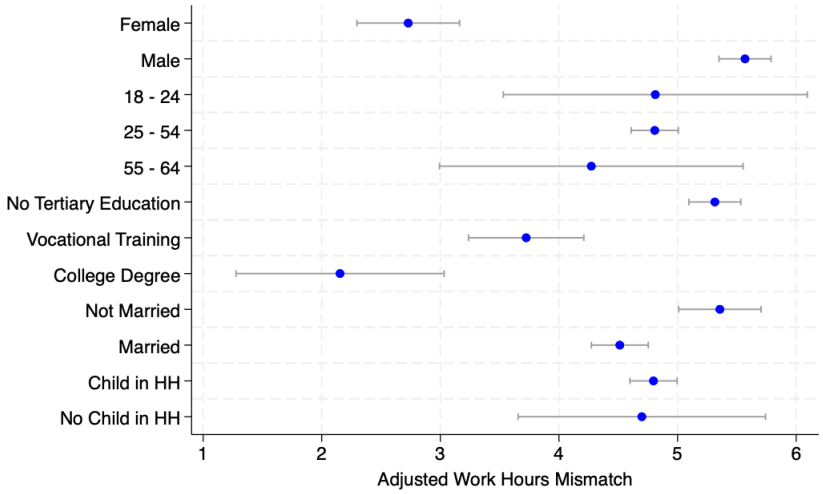
**Fact 2: The Work Hours Mismatch Varies across Groups**

I choose to study values of the work hours mismatch across gender, age category, level of education, marital status, and the presence of children in the household. Hence I estimate the following linear regression model,

$$Y_{it} = \alpha + \beta_1\ Gender_{it} + \beta_2\ Age\ Group_{it} + \beta_3\ Education_{it} + \beta_4\ Married_{it} + \beta_5\ Child_{it} + \gamma_t + \varepsilon_{it} \tag{16}$$

where $Y_{it}$ varies between individual $i$'s mismatch, desired hours, and actual hours at time $t$. I include time fixed effects to control for year-specific shocks and aggregate trends that could confound group-level differences. Individual fixed effects are not included, as the goal is to describe between-group variation; including them would absorb all time-invariant characteristics and eliminate meaningful cross-sectional comparisons. I exclude the wage bracket from my covariates to avoid over controlling for a variable which is likely endogenous to the covariates. Including wage, which may lie on the causal pathway between variables such as education or gender and work hours mismatch, would risk attenuating the very group-level differences I look to characterize. To account for within-individual correlation over time and avoid overstated statistical significance, I cluster standard errors at the individual level.

**Figure 4:** The Adjusted Work Hours Mismatch Across Socio-Demographic Groups




NOTE: This figure illustrates the adjusted work hour mismatch across different socio-demographic groups, for individuals working full-time jobs, between 35 and 70 hours a week, on average, in the non-agricultural, for profit sector, earning at least the minimum wage, between 2003 and 2007 (the Descriptive Sample). The above coefficients are the estimated marginal effects from having estimated Equation (16) using OLS. A robustness check is conducted in Appendix F.

Figure 4 reveals systematic differences in work hours mismatch across socio-demographic groups:

- I find that women tend to be less under worked than men, as opposed to Wunder and Heineck (2013) and Wunder (2016) who find women to be marginally more underworked in Germany and Australia. However, it is difficult to reconcile this fact with the literature because the existing literature looks at countries where the majority of individuals are overworked rather than underworked. Figure D1 in Appendix D illustrates that this difference is driven primarily by disparities in desired hours. While women report working fewer actual hours than men, the gender gap in desired hours is substantially larger.

- An individual's positive mismatch tends to decrease with age. Figure D1 in Appendix D shows this is mainly driven by actual hours increasing, as desired hours are relatively similar across age groups.

- A positive mismatch is negatively associated with individuals' level of education. Figure D1 in Appendix D shows that this difference does not come from the desired hours but actual hours worked. Higher-educated individuals are more likely to work longer hours.

- A married individual tends to have a lower positive mismatch. From Appendix D, we can see this is mainly driven by married individuals desiring lower working hours than non-married individuals, as both groups have very similar actual working hours.

- Lastly, individuals with and without children have very similar mismatches. This is in line with the findings from Reynolds and Johnson (2012) who study the US case.

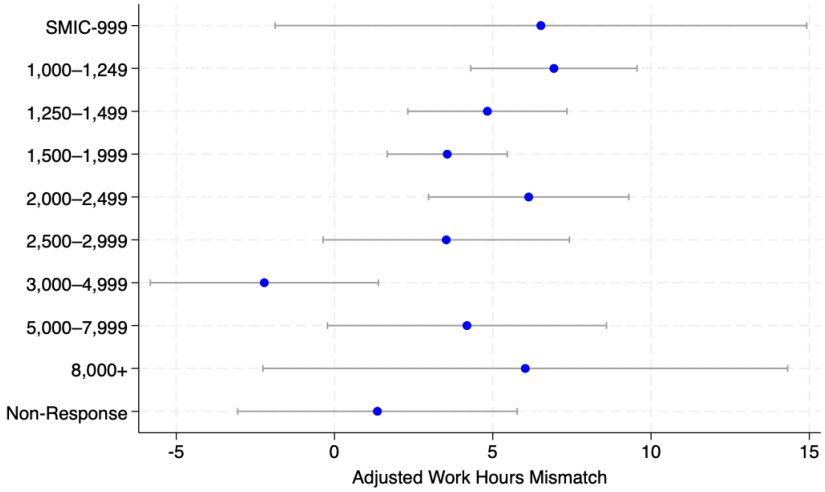
**Fact 3: There is a U-Shaped Relationship Between Wages and Underemployment**

To study the adjusted work Hours mismatch across the wage distribution, I build on the baseline model from Equation (16) by adding the wage bracket as a covariate. Hence, the specified Equation becomes,

$$Y_{it} = \alpha + \beta_1\ Gender_{it} + \beta_2\ Age\ Group_{it} + \beta_3\ Education_{it} + \beta_4\ Married_{it} + \beta_5\ Child_{it} + \beta_6\ wage\ bracket_{it} + \gamma_t + \varepsilon_{it} \tag{17}$$

where $Y_{it}$ still varies between the working hours mismatch, desired hours, and actual hours. Unlike in the previous specification, where wage was excluded to avoid over controlling, here, wage bracket is the primary variable of interest. The goal is not to estimate causal effects of demographics, but to descriptively characterize the association between wage levels and underemployment. Time fixed effects are included to account for common shocks and aggregate trends, while individual fixed effects are omitted for the same reasons discussed in Fact 2.

**Figure 5:** The Adjusted Work Hours Mismatch Across Wage Brackets




NOTE: This figure illustrates the adjusted work hours mismatch across the different wage brackets for individuals working full-time jobs (35–70 hours per week), in the non-agricultural, for-profit sector, earning at least the minimum wage, between 2003 and 2007 (Descriptive Sample). The coefficients reflect marginal effects estimated from OLS using Equation (17).

Figure 5 reveals an interesting fact about the work hours mismatch in France:

- The U-shaped relationship between wage brackets and underemployment suggests that the mismatch is most pronounced at the lower end of the wage distribution, declines among mid-wage earners, and rises again at higher income levels. This pattern likely reflects a shift from involuntary underemployment among low-wage workers, driven by limited hours and low bargaining power, to preference-driven or structurally constrained underemployment among high earners.

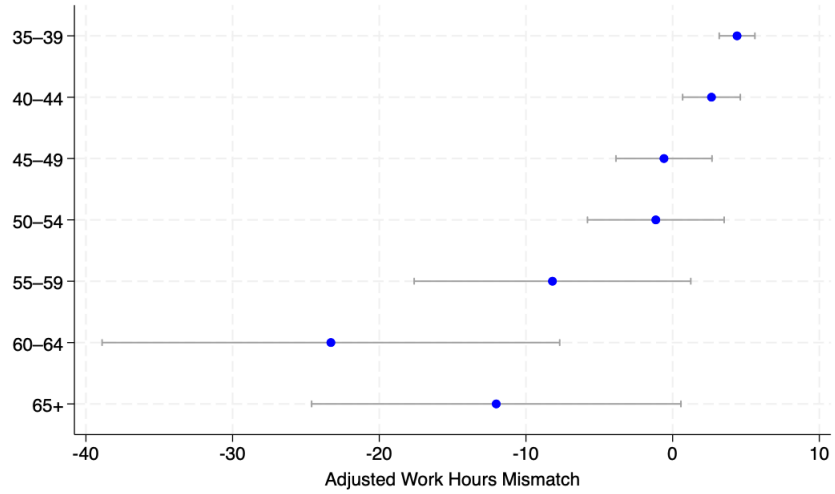
**Fact 4: The Positive Mismatch Decreases with Actual Hours Worked**

To study the adjusted work Hours mismatch across the actual hours worked distribution, I categorize the continuous hours worked variable into 5 hour bins, and add this categorical variable to Equation (17). This yields,

$$Y_{it} = \alpha + \beta_1\ Gender_{it} + \beta_2\ Age\ Group_{it} + \beta_3\ Education_{it} + \beta_4\ Married_{it} + \beta_5\ Child_{it} + \beta_6\ wage\ bracket_{it} + \beta_7\ hours\ bin_{it} + \gamma_t + \varepsilon_{it} \tag{18}$$

where $Y_{it}$ still varies between the working hours mismatch, desired hours, and actual hours. Time fixed effects are included to account for common shocks and aggregate trends, while individual fixed effects are omitted for the same reasons discussed in Facts 2 and 3.

**Figure 6:** The Work Hours Mismatch Across Actual Working Hour Brackets




NOTE: This figure illustrates the work hour mismatch, computed as *desired hours* − *actual hours*, across the different actual working hours brackets for individuals working full-time jobs, between 35 and 70 hours a week, on average, in the non-agricultural, for profit sector, earning at least the minimum wage, between 2003 and 2007 (the Descriptive Sample). The above coefficients are the estimated marginal effects from having estimated Equation (18) using OLS. A robustness check is conducted in Appendix F.

Figure 6 presents my fourth and final fact on the working hours mismatch in France:

- The positive mismatch decreases with actual hours worked. Considering Fact 1 (the majority of the population is underworked) this may seem intuitive; as an underworked individual works more, he gets closer to his desired hours of work.
- According the model estimated from Equation (18), the work hours mismatch tends to be null between the 40-44 and 45-49 weekly working hour brackets.

**Limitations**

A first concern may be that these facts are based on the Descriptive Sample, which has been heavily trimmed. Indeed, there is a selection effect. However, while not representative of the entire population, the sample

captures a key segment of the labor force where working time is most formalized and policy-relevant.

A second potential limitation relates to the large time window of the Descriptive Sample which ranges from 2003 to 2007, a period long enough to potentially encompass unobserved exogenous shocks that could affect the stability of observed patterns. I argue the period from 2003 to 2007 provides a valid empirical window to construct stylized facts, as it was marked by relative macroeconomic and institutional stability in the French labor market, with no major policy reforms, cyclical shocks, or structural disruptions that would confound the patterns under investigation.

A last important limitation is the size of the confidence intervals reported in Figures 4, 5, and 6. Large confidence intervals indicate substantial estimation uncertainty, which weakens the precision and reliability of my group-level comparisons. In fact, overlapping confidence intervals between two marginal estimates suggest that the difference between them is unlikely to be statistically significant in a $t$-test. This raises concerns about statistical power, model specification, or data sparsity within categories. Indeed, there is a data sparsity issue to deal with, I address it in Section 5.3 below.

### 5.3 Non-Response

The EEC is the only data source providing panel data on workers' desired hours of work. Although this question is asked at every interview, individuals do not consistently respond; the response rate to the desired hours variable is only 16.63% (17.24%) in the Descriptive Sample (TEPA Sample). Wages, by design, are also not reported at every observation; individuals are only asked about their wages during the first and last interviews of their panel spell. The response rate to the wage question is 31.38% (30.57%) in the Descriptive Sample (TEPA Sample). I provide more detailed statistics on the response rates in Table 1. While the missing desired hours data may seem more concerning, I consider the sparse wage data to be the main challenge for my analysis: classic labor supply theory posits an individual's wage is a key determinant of his desired hours of work[15]. As such, controlling for wages is critical to avoid omitted variable bias and to ensure a theoretically consistent specification when estimating the determinants of desired hours. To robustly overcome this data challenge, I impute missing values for both wages and desired hours using a variety of methods, and provide a detailed explanation below. I run this imputation exercise on the Original Trimmed sample from which the Descriptive and TEPA Samples are drawn.

**Table 1:** Summarizing Non-Response Across Samples

| | **TEPA** | | | **Descriptive** | | | **Original Trimmed** | | |
|---|---|---|---|---|---|---|---|---|---|
| | # Missing | Total | % Missing | # Missing | Total | % Missing | # Missing | Total | % Missing |
| Mismatch | 36,782 | 44,429 | 82.76 | 153,737 | 184,480 | 83.37 | 290,156 | 342,604 | 84.69 |
| Desired Hours | 36,782 | 44,429 | 82.76 | 153,737 | 184,480 | 83.37 | 290,156 | 342,604 | 84.69 |
| Actual Hours | 0 | 44,429 | 0 | 1 | 184,480 | 0 | 2 | 342,604 | 0 |
| Wage | 30,841 | 44,429 | 69.43 | 126,591 | 184,480 | 68.62 | 234,952 | 342,604 | 68.60 |

NOTE: This table summarizes non-response for variables of interest Mismatch, Desired Hours, Actual Hours and Wage in all three samples used. The TEPA Sample is used for empirical analysis, the Descriptive Sample is used to document my stylized facts, and the Original Trimmed sample, from which the 2 former samples are made, is used for the imputation exercise.

[15]See chapter 2 of Cahuc et al. (2014) for a comprehensive review of labor supply theory.

### 5.3.1 Wages

**Method 1: Taking Averages**

I start out as simply as possible, and assign an individual his average wage throughout. If the individual provides only one of the two wage observations, than that value is spread throughout. If the individual provides no wage observation, then they have no wage data throughout.

**Method 2: Building a Synthetic Panel**

The fact that wages are reported only in the first and last interviews provides a useful structure for analysis. Due to the rolling panel design of the survey, new individuals enter each quarter, generating fresh wage observations over time. By grouping individuals into unique cohorts based on characteristics known to affect wages, I aggregate these observations to construct a synthetic wage panel. This panel captures variation in wages across time and groups, which I then use to impute missing wage values. I summarize the process in Figure 7.

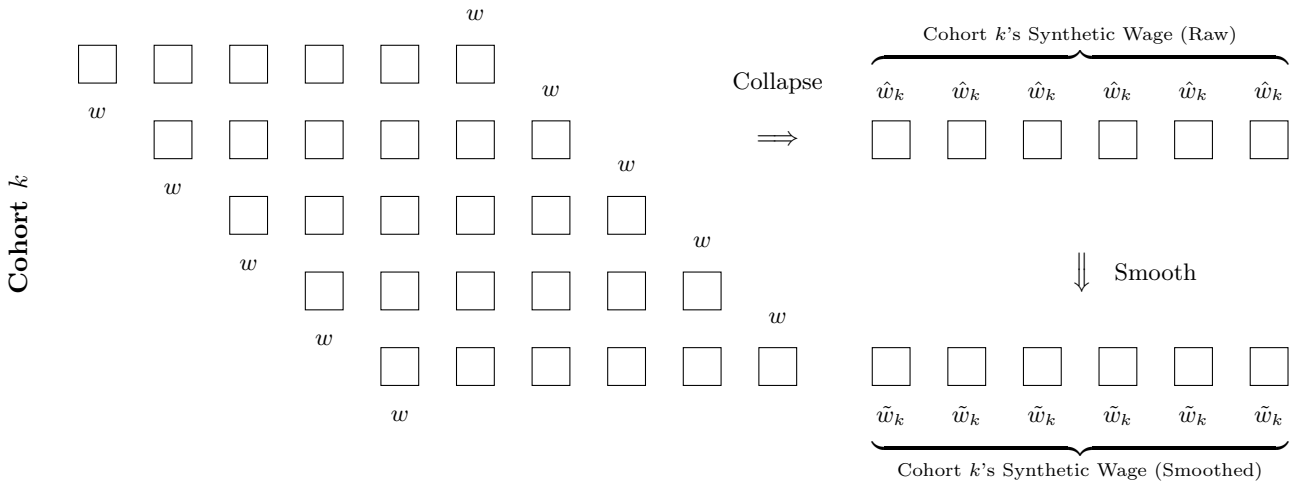



**Figure 7:** Simplified Example of the Synthetic Wage Panel Process

When selecting characteristics to define cohorts, there is a tradeoff between granularity and sample size. Including more variables can better capture wage-relevant heterogeneity, but it also results in smaller cohort sizes, which may reduce the reliability of the estimated wage patterns. For this reason, I follow from Mincer (1974) and define my cohorts according to level of education, age group, and also extend to include gender. I define my level of education and age group variables more specifically than those used for my stylized facts. There are now 14 categories for level of education, as defined by the variable *NIVET* in the EEC[16]. Moreover, there are now 5 age categories: 18–24, 25–34, 35–44, 45–54, and 55–64, corresponding to key stages in the working life cycle and capturing the full age distribution in the sample[17]. The education variable has 4 missing observations. The gender and age group variables have no missing observations.

[16] I previously categorized education level into College, Vocational, and No Tertiary Education, to capture meaningful differences in post-secondary pathways while avoiding excessive fragmentation. I summarize the variable's different categories in Appendix C.

[17] I previously categorized age into 15-25, 25-54, and 55-64, for the same reason mentioned in the footnote above. I chose 25-54 as the second cohort because the OECD defines this as the "prime working age".

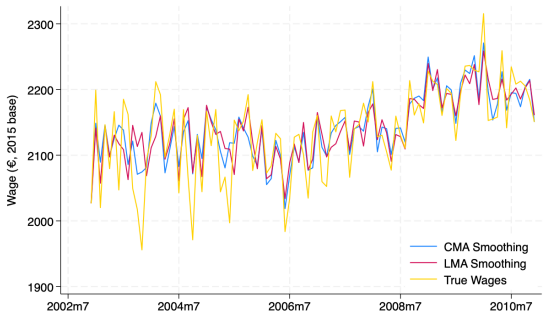
The final cohort structure consists of 142 unique combinations, of which 4 contain fewer than 10 individuals. None of these small cohorts are represented in the TEPA sample, mitigating concerns about estimation instability in the subsequent analysis. Rather than relying directly on the raw cohort-level wage series, which can be highly volatile and subject to outliers, I apply smoothing techniques to extract underlying trends. To ensure robustness and avoid cherry-picking, I employ four widely-used smoothing approaches: Lagged Moving Average (LMA), Centered Moving Average (CMA), Locally Weighted Scatterplot Smoothing (LOWESS), and Basis Spline (B-spline) smoothing. The former two are moving average smoothers, while the latter two are non-parametric regression smoothers. I intentionally include both types of methods to provide variety in smoothing approaches and ensure robustness of the stylized patterns.

Looking data, there are three cases for individuals with missing wage data:

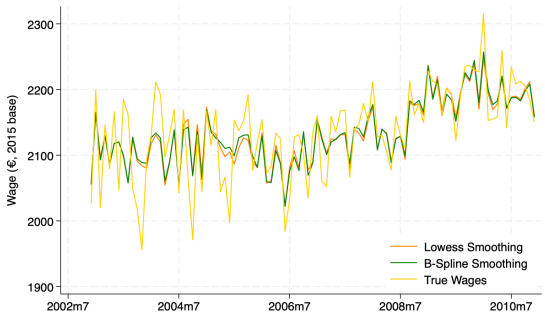
- **Case 1:** The individual has provided no true wages. In this case, I assign the individual his smoothed synthetic cohort wage.
- **Case 2:** The individual has provided 1 true value. In this case, I apply the growth rate of $\tilde{w}_k$ to the individual's true value.
- **Case 3:** The individual has provided 2 true wage observations. In this case, I apply proportional normalization. I do this in two steps. First, I normalize the cohort smoothed wage trend so that it ranges from 0 to 1 over the individual's observed time window. Second, I apply this normalized trend to interpolate a smooth path between the individual's two real wage observations, treating them as anchors. This means that the synthetic cohort wage determines the timing and slope of wage growth, while the individual's actual values set the scale and level.

After this imputation exercise, I am left with four synthetic wage series, which I re-base to 2015 values and plot in Figure 8 in order to compare to the original, more sparse, wage series. While both moving average techniques (CMA and LMA) produce a basic trend, they remain more sensitive to short-term fluctuations. In contrast, nonparametric smoothing methods (Lowess and B-splines) generate smoother trend lines, more effectively filtering noise and capturing underlying structural patterns in the data. This aligns with prior literature suggesting that moving averages, due to their fixed-window and equal-weight structure, tend to under-perform in trend extraction relative to adaptive smoothing methods (Cleveland, 1979; Čampulová, 2018). That said, in examining the impact of the 2007 TEPA Law on the hours–wage mismatch, I am concerned with capturing both short-run fluctuations and long-term trends in wage covariates, as both may influence labor supply responses.

**Figure 8:** Monthly and Quarterly Evolution of True and Synthetic Wages (2015 Base)




**(a)** Monthly Evolution: CMA & LMA




**(b)** Monthly Evolution: Lowess & B-Spline


**(c)** Quarterly Evolution: CMA & LMA


**(d)** Quarterly Evolution: Lowess & B-Spline

NOTE: This figure presents quarterly and monthly evolution for 5 different wages series: the "true" series, which are observed values, and four additional series which are imputed using the variation of a synthetic wage panel. The synthetic wage panel is computed as described in Section 5.3, and smoothed using 4 different methods. These 4 variations in method are what yield the 4 additional wage series.

### 5.3.2 Desired Hours

**Method 1: The Preference Update Assumption**

The question on desired weekly wages is asked every wave. I assume that if individuals do not answer, their previous answer applies. In other words, when individuals do not answer consistently, they only answer to update their preferences.

**Method 2: Building A Synthetic Panel**

I proceed as for the wages. However, desired hours differ from wages in two respects. Firstly, desired hours are influence by different covariates. Motivated by the empirical patterns identified in my stylized facts, I define unique desired hours cohorts according to gender, age group[18], level of education[19], marital status, number of hours worked in the reference week[20], and a binary indicating if the individual earns over €5,000. I am left with 486 unique cohorts, of which 91 contain fewer than 10 individuals. I make sure to flag indi-

[18] In this case, I keep with the definition of age group from the stylized facts. There are three categories: 18-24, 25-54, and 55-64.

[19] In this case, I keep with the definition of level of education from the stylized facts. There are three categories: college, vocational, and no tertiary training.

[20] I categorize this variabke into 5 hour bins ranging from 35 to 60+.

viduals belonging to these cohorts and who are in the TEPA Sample, there are 39 of them.

The desired hours observations also differ from the wage observations in that they are not reported only in the first and last rounds, but more evenly throughout. I summarize the response rates in Table 2, and also provide descriptive statistics on the individuals who do answer the desired hours question, as non-response behavior can lead to selection-bias. These statistics are presented in Appendix E, and indicate that there are no notable differences between respondents and non-respondents across the Original Trimmed Sample, the Descriptive Sample, and the TEPA Sample.

**Table 2:** Desired Hours Response Rate by Interview Round

| Interview | Frequency | Percentage (%) |
|---|---|---|
| 1 | 14,802 | 28.22 |
| 2 | 9,903 | 18.88 |
| 3 | 8,592 | 16.38 |
| 4 | 7,376 | 14.06 |
| 5 | 6,287 | 11.99 |
| 6 | 5,488 | 10.46 |
| Total | 52,448 | 100.00 |

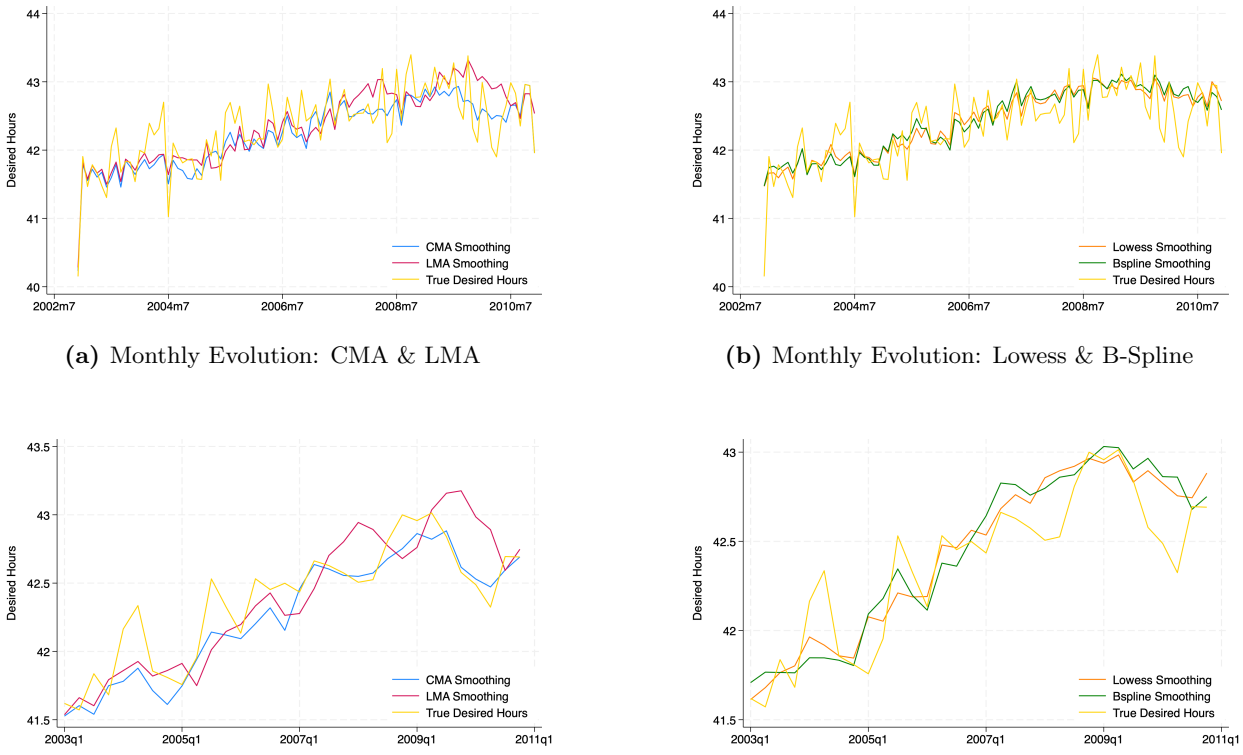
NOTE: This table reports the frequency and percentage of responses to the question on desired working hours, disaggregated by interview round.

The structure of non-response in the desired hours variable leads to a larger set of cases to address compared to those with missing wage observations. There are now 5 cases for individuals with missing desired hours observations, I summarize them below. The first 3 are identical to that of wages.

- **Case 1:** The individual has provided no true desired hours. In this case, I assign the individual his smoothed synthetic cohort desired hours.
- **Case 2:** The individual has provided 1 true desired hours observation. In this case, I apply the growth rate of $\tilde{h}_k$ to the individual's true value.
- **Case 3:** The individual has provided 2 true desired hours observations in the first and last interview rounds. In this case, I apply proportional normalization. I do this in two steps. First, I normalize the cohort smoothed desired hours trend so that it ranges from 0 to 1 over the individual's observed time window. Second, I apply this normalized trend to interpolate a smooth path between the individual's two real desired hours observations, treating them as anchors. This means that the synthetic cohort desired hours determines the timing and slope of changes in desired hours, while the individual's actual values set the scale and level.
- **Case 4:** An alternative of Case 3. The interval of observations defined by the two true values does not capture the individuals entire series: there are missing values outside the interval. In which case, I proceed as in Case 2 and apply the corresponding growth rate to missing values outside this interval.
- **Case 5:** More than 2 true desired hours values are reported, they define a custom normalization window. I treat this as having multiple applications of Case 4.

Figure 9 presents the synthetically imputed desired hours series, plotted against the original desired hours series. Compared to the wage series, the synthetic desired hours series exhibits a less consistent fit to the true data. I attribute this to several factors. First, the desired hours cohorts are more numerous and often sparsely populated, leading to greater volatility in cohort-level averages. Second, desired hours are collected more frequently than wages, introducing short-run fluctuations that are difficult to capture with smoothers optimized for long-run trend extraction. In addition to these technical considerations, the intrinsic nature of the two variables plays a role: wages are largely determined by structural, market-driven factors and follow more stable and predictable patterns, whereas desired hours reflect individual preferences which are inherently more abstract, heterogeneous, and context-dependent. For these reasons, I make sure to use different combinations of both observed and synthetic series for wages and desired hours in my empirical analysis, so as to ensure that the results are not artifacts of how the underlying data are constructed.

**Figure 9:** Monthly and Quarterly Evolution of True and Synthetic Desired Hours




**(a)** Monthly Evolution: CMA & LMA

**(b)** Monthly Evolution: Lowess & B-Spline

**(c)** Quarterly Evolution: CMA & LMA

**(d)** Quarterly Evolution: Lowess & B-Spline

NOTE: This figure presents quarterly and monthly evolution for 5 different desired hours series: the "true" series, which are observed values, and four additional series which are imputed using the variation of a synthetic desired hours panel. The synthetic desired hours panel is computed as described in section 5.3, and smoothed using 4 different methods. These 4 variations in method are what yield the 4 additional desired hours series.

### 5.3.3 Robustness of the Stylized Facts

The stylized facts presented in Section 5.2 are limited mainly by the sparsity of data used which yields high standard errors and raises concerns on the credibility of the stated facts. To assess robustness, I replicate the analysis using the newly imputed data. However, I do not employ the synthetically imputed series,

as they (particularly for desired hours) are partially generated from results in the stylized facts. I would risk validating them by construction. Instead, I rely on the first imputation method for both wages and desired hours: assigning each individual their average observed wage, and applying the preference updating assumption whereby the most recently reported preference is carried forward in the absence of a new response. This strategy avoids circular reasoning and offers a more neutral benchmark for evaluating the persistence and validity of the stylized facts. The results of this robustness analysis, presented in Appendix F, confirm my original findings.

# 6 Empirical Framework

The mismatch variable captures an individual's motivation to work more or fewer hours. A positive mismatch indicates that an individual is underworked, as they would prefer to work more hours than they currently do; conversely, a negative mismatch reflects being overworked, with a preference for fewer hours. In October 2007, the French government introduced a reform that exempted overtime hours from income tax and wage-based social security contributions, up to a limit of 21.5% of the employee's gross wage. This policy change increased the financial return to working overtime, potentially altering individual labor supply decisions. In this context, I conduct a difference-in-differences (DiD) analysis on the TEPA Sample to extract the effect of the reform on workers' work hours mismatch. However, the raw value of the mismatch variable is not straightforward to interpret as a dependent variable. Since it can be either positive or negative, the sign of the coefficient estimate does not clearly reflect an increase or decrease in work hours mismatch. Instead, I redefine the mismatch as a distance variable, by taking both its absolute and squared values. Taking the absolute value serves study general changes in the magnitude of the gap, while squaring the mismatch serves to detect whether the reform had differential effects on individuals experiencing particularly large mismatches. Additionally, more than 80% of the mismatch observations before the reform are positive: workers are underworked. To study the evolution of this outcome, I generate a dummy variable indicating whether the mismatch is strictly positive or negative.

My dependent variables of interest are desired hours, actual hours, the absolute value of the mismatch, the squared value of the mismatch, and the dummy variable indicating a positive mismatch.

## 6.1 Identification

The 2007 TEPA reform applied to all workers in both public and private sectors working in France, making it very difficult to establish credible identification strategy. Chemin and Wasmer (2009) make a methodological contribution by pointing to France's aggregation of regional disparities as an asset for cross-border identification strategies. Indeed, as confirmed by Cahuc and Carcillo (2014) and Ghio (2019), workers living in France but crossing the border to work serve as a credible control group when evaluating the effects of labor market policies impacting the entire French labor force, before 2010[21]. However, I show in Appendix G that domestic and cross-border workers are not comparable groups to conduct analysis of the work hours mismatch. This can also be argued intuitively; two workers' desired hours may not be comparable when one

[21] On June 3 2009, as part of an "oral questions without debate" session at the French National Assembly, Francis Hillmeyer (MP for the Haut-Rhin department) inquired under question n°707 whether cross-border workers were eligible to the tax exemption. The answer was positive, and legally enforced starting January 2010.

of them needs to cross a national border to go to work.

My identification strategy compares workers on days contracts to workers on hours contracts. Workers on day contracts have an annual work limit of 218 days. These contracts are not subject to the maximum daily and weekly work hours regulation[22], detailed in Section 3.1. Instead, they are subject to minimum rest time requirements which state the worker must have a daily rest time of at least 11 hours between 2 work days[23]. While workers under a days contract may claim compensation for overtime hours if they successfully challenge the employer in court for failing to comply with the terms of the contract (Cfdt, 2022), this falls outside the scope of my TEPA Sample Definition. As such, workers on day contracts are not eligible to work overtime hours, making them unaffected by the 2007 TEPA Law and a worthy control group. On the other hand, workers employed under hours-based contracts are subject to statutory limits on daily and weekly working hours. They are eligible for overtime compensation and thus, directly affected by the 2007 TEPA Law. These workers constitute the treatment group in my analysis.

**Parallel Trends**

The Difference-in-Differences approach relies on the crucial assumption that, without treatment, the treated and control groups would have followed similar trends over time. The EEC is a rolling panel of 6 quarterly observations. Therefore, I can observe a survey response at a year's interval only once, at best. As a result, I cannot use yearly values of my dependent variables to conduct visual analysis of the parallel trends assumption. One may suggest conducting the test using available quarterly observations. However, the panel structure only gives me a maximum of 6 observations per individual, which limits me in my number of pre-treatment data. Moreover, my dependent variables exhibit high levels of volatility. I consider them too high to be able to compare the variables over such short time periods.

**Table 3:** Dependent Variable Volatility and Pre-Treatment Observations

| **Dependent Variable** | SD | CV | Pre-Treat Obs |
|---|---|---|---|
| Desired Hours | 7.14 | 16.73% | 1.97 |
| Actual Hours | 8.03 | 20.98% | 2.86 |
| $\lvert Mismatch \rvert$ | 6.64 | 87.26% | 1.97 |
| $Mismatch^2$ | 211.17 | 206.46% | 1.97 |
| $\Pr(Mismatch > 0)$ | 0.38 | 46.32% | 1.97 |

NOTE: Standard deviation, coefficient of variation, and average number of pre-treatment observations for each dependent variable. The coefficient of variation is computed as $(\sigma_y/\mu_y) \times 100$.

Nonetheless, to ensure comparability, I proceed as in Cahuc and Carcillo (2014): I provide descriptive statistics on both treatment and control groups to ensure similarity of both groups in their covariates, these can be found in the Appendix G; I conduct subsequent robustness tests; and I rely on the institutional context which ensures the control group is not affected by the treatment.

**Structural Differences**

[22]Source: https://www.service-public.fr/particuliers/vosdroits/F19261
[23]Source: https://www.service-public.fr/particuliers/vosdroits/F990

There remains a clear concern that structural differences between the treatment and control groups could bias the estimated treatment effects. In France, days contracts are typically reserved for two types of workers: *travailleurs cadres*, who are higher-level employees with generally greater autonomy over their working hours, and employees whose working hours cannot be predetermined and who have the autonomy to organize their own schedules [24]. This increased flexibility may limit the comparability of their desired hours to those of other workers and introduce bias in a standard DiD framework. To address this issue, I also estimate a triple-difference (TD) model that explicitly controls for work-schedule optimizers, following the definition used in Cahuc and Carcillo (2014). Descriptive statistics and further details on these workers are provided in Appendix H. The TD specification is designed to account for potential bias arising from differences in schedule flexibility that could otherwise confound the interpretation of treatment effects.

**External Validity**

Before presenting the models, I make a point of acknowledging the issue of external validity. Indeed, the external validity of the results is limited to full-time, permanently employed individuals in the non-agricultural, for-profit sector in Metropolitan France. The exclusion of temporary workers, those with disrupted schedules, and individuals under modulation agreements ensures internal consistency but may limit generalization to more precarious or flexible forms of employment. In other words I cannot pick, at random, an individual from the French population and assume that any identified treatment effect also applies to them.

## 6.2 Models

To estimate the effect of the 2007 TEPA Law on my dependent variables of interest, my baseline specification follows a classic DiD model,

$$Y_{it} = \alpha + \beta_1(F_i \times D_t) + \beta_2 F_i + \beta_3 D_t + X_{it} + C_t + \nu_i + \gamma_t + \varepsilon_{it} \tag{19}$$

where $Y_{it}$ is the dependent variable for individual $i$ at time $t$, $F_i$ is an indicator for the individual being in the treatment group; and $D_t$ is an indicator for whether treatment has passed. Following the heterogeneity analysis in Section 5.2, I define $X_{it}$ as the set of individual-level controls including gender, marital status, the presence of children in the household, net monthly income, age, job tenure, and job industry, given that these characteristics are likely to confound the relationship between treatment and outcome if omitted. As discussed in Otterbach (2010), Bick et al. (2018), and Tuda (2020), the work hours mismatch is sensitive to a country's aggregate economic conditions. $C_t$ therefore controls for the quarterly economic situation in France measured either by the business climate or by the share of exports of goods and services in the GDP of the country. $\nu_i$ and $\gamma_t$ are individual and time fixed effects, respectively, which I include to ensure that the estimated treatment effect reflects within-individual changes, net of time-invariant heterogeneity and common shocks. I also take the squared age and squared income as controls, as these variables have a non linear relationship with the dependent variables. The dependent variables are desired hours, actual hours, the absolute mismatch, the squared mismatch, and an indicator variable for whether the mismatch is positive.

To control for the potential structural differences between workers under a days and hours contract, I extend

[24] https://www.service-public.fr/particuliers/vosdroits/F19261

the above DiD model to the following triple differences specification,

$$Y_{it} = \alpha + \beta_1(F_i \times D_t \times O_i) + \beta_2(D_t \times F_i) + \beta_3(D_t \times O_i) + \beta_4 F_i + \beta_5 O_i + \beta_6 X_{it} + \beta_7 C_t + \nu_i + \gamma_t + \varepsilon_{it} \quad (20)$$

where all variables are the same as in specified Equation (1), apart from $O_i$ which is a dummy for work schedule optimizers. In this case, coefficient $\beta_2$ is the DiD coefficient estimating the impact of the 2007 reform on the treatment group, and $\beta_1$ is the TD coefficient, estimating the potential differential impact of the reform on work-hour optimizers compared to non-work hour optimizers. I remind that the ECC is a rolling panel of 6 quarterly observations. Hence, my period of analysis is 18 months.

At this stage, I have 6 different sets of data series to conduct analysis: the original "true" data, and 5 subsequent series which each use different methods to impute non-answered observations for wage and desired hours. Hence, I estimate estimate 6 different versions of Equations (19) and (20). These different models will be numbered as different columns in the regression tables. I summarize them below:

- **Model (1)**: This is the original model. It has no imputed values of desired hours nor wages.
- **Model (2)**: This model implements the first set of assumptions on desired hours and wages. Wages are equal to their average value, and the preference update assumption is applied on desired hours: individuals only respond to update their preferences. If a desired hours question is unanswered, the last given response applies.
- **Model (3)**: This model includes imputed values of wages. The cohort values are smoothed using the Centered Moving Average method.
- **Model (4)**: This model includes imputed values of wages. The cohort values are smoothed using the Lagged Moving Average method.
- **Model (5)**: This model includes imputed values of wages. The cohort values are smoothed using the Lowess method.
- **Model (6)**: This model includes imputed values of wages. The cohort values are smoothed using the B-Spline method.

As stated in Section 5.3, while missing desired hours data may seem more concerning, I consider the sparse wage data to be the main challenge. Therefore, throughout the analysis, I prioritize the "true" desired hours series. Importantly, the interpretation of any result found using an imputed wage series, is conditional on the assumption that the individual's wage follows the same trend as that of his cohort.

# 7 Results

## 7.1 Baseline

I start by studying the impact of the 2007 TEPA law by comparing workers on hours and days contracts, and include the different imputed wage series as controls, in models (2) to (6), to account for the problem

of non-observed wage values. Results are presented in Table 4, and suggest significant negative effects on a worker's absolute mismatch, squared mismatch, and probability of being underworked. The latter results follows intuitively from the former two: given that 82.3% of the sample is underworked before the reform, a reduction in the intensity of under work naturally leads to a lower probability of being underworked at all. However, the significant decrease in absolute and squared mismatch is more puzzling. The distance between a worker's desired and actual hours should only change if either desired hours or actual hours also change. While there seems be a significant negative effect on the desired hours of work in model (3), which corroborates the decrease in absolute and squared mismatch, the robustness of this result is not confirmed by any of the other models. Also, the negative coefficients on the squared mismatch are more significant than those of the absolute mismatch. On the one hand, this captures the policy's disproportionate effect on reducing large deviations between desired and actual hours, suggesting that the reform was particularly effective in alleviating severe mismatches rather than minor ones. On the other hand, variation in underlying worker characteristics may mask policy effects among those with smaller deviations from their desired hours.

**Table 4:** Effect of the TEPA Law on Workers under Hours Contracts, Interrogated before and after the Reform

| **Dependent Variable** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** |
|---|---|---|---|---|---|---|
| Desired Hours | -0.514 | -0.568 | -1.011** | -0.684 | -0.651 | -0.643 |
| | (1.433) | (0.399) | (0.419) | (0.416) | (0.408) | (0.410) |
| | [344] | [2916] | [2630] | [2893] | [2895] | [2895] |
| Actual Hours | 0.315 | 0.0471 | 0.123 | 0.0164 | 0.0158 | 0.0159 |
| | (1.163) | (0.209) | (0.212) | (0.206) | (0.206) | (0.206) |
| | [4902] | [24219] | [22299] | [24175] | [24194] | [24194] |
| Absolute Mismatch | -3.944 | -0.830 | -1.410** | -0.967* | -0.921* | -0.955* |
| | (3.371) | (0.542) | (0.557) | (0.546) | (0.543) | (0.544) |
| | [344] | [2916] | [2630] | [2893] | [2895] | [2895] |
| Mismatch Squared | -111.9 | -31.60* | -43.65*** | -34.75** | -33.35** | -34.25** |
| | (101.2) | (16.59) | (16.63) | (16.66) | (16.51) | (16.56) |
| | [344] | [2916] | [2630] | [2893] | [2895] | [2895] |
| Pr(Mismatch > 0) | 0.0816 | -0.0529 | -0.0701** | -0.0565* | -0.0570* | -0.0537 |
| | (0.266) | (0.0328) | (0.0354) | (0.0338) | (0.0337) | (0.0336) |
| | [344] | [2916] | [2630] | [2893] | [2895] | [2895] |

NOTE: This table presents estimates for the Difference-in-Differences coefficient $\beta_1$ from the specified Equation (19). Only the imputed wage series is used throughout the table. All models include individual and time fixed effects. Robust standard errors are in parentheses and clustered at the individual level. The number of observations for the respective regression is shown in brackets.
*p<0.10, **p<0.05, ***p<0.01.

Previous studies of the 2007 TEPA Law have shown the importance of accounting for individuals who can and cannot flexibly optimize their work schedules (Cahuc and Carcillo, 2014; Ghio, 2019). To account for these structural differences, I estimate the triple differences equation (20), which controls for such characteristics. Results, presented in Table 5, confirm the those from Table 4 in addition to the validity of these concerns. After controlling for work schedule autonomy, the treatment effects on the absolute and squared mismatch

become similarly significant. This contrasts with the baseline DiD results, where the squared mismatch effect appeared stronger. The convergence in significance suggests that the weaker effect on absolute mismatch in the DiD model was likely driven by dilution from work-schedule optimizers who, due to greater control over their hours, were less affected by the reform and thus attenuated the average treatment effect. These dilution effects are further evidenced in the estimates for desired hours and the probability of under work. The positive and statistically significant triple-difference coefficients offset, and in some cases outweigh, the negative effects identified in the DiD specifications, underscoring the extent to which work-schedule optimizers dilute the average treatment effect.

**Table 5:** Effect of the TEPA Reform on Workers under Hours Contracts — DiD vs TD Estimates

| **Dependent Variable** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** |
|---|---|---|---|---|---|---|
| **Desired Hours** | | | | | | |
| DiD Coefficient | -1.161 | -1.162** | -1.565** | -1.263** | -1.216** | -1.220** |
| | (4.958) | (0.548) | (0.654) | (0.602) | (0.591) | (0.591) |
| TD Coefficient | 0.536 | 1.487*** | 2.132*** | 1.645*** | 1.643*** | 1.650*** |
| | (2.342) | (0.535) | (0.618) | (0.566) | (0.562) | (0.562) |
| Observations | [174] | [1779] | [1605] | [1757] | [1759] | [1759] |
| **Actual Hours** | | | | | | |
| DiD Coefficient | 0.689 | -0.0745 | -0.0710 | -0.136 | -0.128 | -0.128 |
| | (1.472) | (0.287) | (0.300) | (0.287) | (0.287) | (0.287) |
| TD Coefficient | 0.330 | -0.0719 | 0.147 | -0.0242 | -0.0301 | -0.0297 |
| | (0.610) | (0.310) | (0.315) | (0.313) | (0.313) | (0.313) |
| Observations | [3180] | [15759] | [14420] | [15641] | [15649] | [15649] |
| **Absolute Mismatch** | | | | | | |
| DiD Coefficient | -3.217 | -1.720** | -1.978** | -1.773** | -1.677** | -1.707** |
| | (2.971) | (0.781) | (0.821) | (0.821) | (0.808) | (0.812) |
| TD Coefficient | 2.073 | 0.389 | 0.669 | 0.486 | 0.474 | 0.460 |
| | (2.461) | (0.971) | (1.011) | (0.983) | (0.978) | (0.974) |
| Observations | [174] | [1779] | [1605] | [1757] | [1759] | [1759] |
| **Mismatch Squared** | | | | | | |
| DiD Coefficient | -95.83 | -58.48** | -55.05** | -60.19** | -57.23** | -58.52** |
| | (63.85) | (25.72) | (25.00) | (27.28) | (26.92) | (27.03) |
| TD Coefficient | 40.05 | 18.71 | 13.09 | 21.24 | 20.90 | 20.68 |
| | (51.03) | (31.65) | (32.70) | (32.29) | (32.22) | (32.01) |
| Observations | [174] | [1779] | [1605] | [1757] | [1759] | [1759] |
| **Pr(Mismatch > 0)** | | | | | | |
| DiD Coefficient | -0.319** | -0.0947** | -0.107** | -0.0958** | -0.0965** | -0.0928** |
| | (0.140) | (0.0415) | (0.0477) | (0.0436) | (0.0430) | (0.0431) |
| TD Coefficient | 0.393* | 0.110** | 0.138** | 0.114** | 0.115** | 0.116** |
| | (0.228) | (0.0478) | (0.0534) | (0.0482) | (0.0481) | (0.0479) |
| Observations | [174] | [1779] | [1605] | [1757] | [1759] | [1759] |

NOTE: This table presents estimates for the Difference-in-Differences coefficient ($\beta_2$) and the Triple Differences coefficient ($\beta_1$) from the specified Equation (20). Only the imputed wage series is used throughout the table. All models include individual and time fixed effects. Robust standard errors are in parentheses and clustered at the individual level. The number of observations for the respective regression is shown in brackets.
*p<0.10, **p<0.05, ***p<0.01.

The dilution effects introduced by the inclusion of work-schedule optimizers have implications beyond a mere reduction in statistical significance. I note that the DiD coefficients from the TD model, reported in Table 5, are are significantly higher in magnitude than those reported in the DiD model from table 4. This is because estimated treatment effects may be attenuated due to dilution from unaffected individuals, a common issue in settings with heterogeneous treatment exposure. As discussed in Angrist and Pischke (2009) and De Chaisemartin and d'Haultfoeuille (2020), when only a subset of the treated group is responsive to the intervention, the average treatment effect will be biased toward zero. This is especially relevant in my setting, where the desired hours of work-schedule optimizers, are unlikely to be as affected by the policy. To estimate the local average treatment effect of the 2007 TEPA reform on the work hours mismatch among work-schedule non-optimizers, I estimate Equation (19) once more, this time dropping optimizers from the sample. Results are presented in Table 6.

**Table 6:** Effect of the TEPA Law on Workers under Hours Contracts (Non-Work-Schedule Optimizers), Interrogated before and after the Reform

| **Dependent Variable** | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** |
|---|---|---|---|---|---|---|
| Desired Hours | -6.977*** | -1.225* | -1.581* | -1.325* | -1.252* | -1.245* |
| | (1.012) | (0.702) | (0.823) | (0.758) | (0.749) | (0.745) |
| | [86] | [1106] | [988] | [1084] | [1086] | [1086] |
| Actual Hours | 5.733 | 0.227 | 0.194 | 0.170 | 0.178 | 0.175 |
| | (4.122) | (0.337) | (0.354) | (0.338) | (0.337) | (0.337) |
| | [1412] | [7218] | [6579] | [7127] | [7134] | [7134] |
| Absolute Mismatch | -3.548 | -2.163** | -2.161** | -2.041** | -1.939* | -1.939* |
| | (2.387) | (0.963) | (1.012) | (1.008) | (1.002) | (1.001) |
| | [86] | [1106] | [988] | [1084] | [1086] | [1086] |
| Mismatch Squared | -107.7 | -72.05** | -61.76** | -70.86** | -68.26** | -68.28** |
| | (70.93) | (31.97) | (30.25) | (33.65) | (33.43) | (33.41) |
| | [86] | [1106] | [988] | [1084] | [1086] | [1086] |
| Pr(Mismatch > 0) | -0.426*** | -0.110** | -0.121** | -0.113** | -0.113** | -0.112** |
| | (0.0945) | (0.0479) | (0.0532) | (0.0495) | (0.0476) | (0.0479) |
| | [86] | [1106] | [988] | [1084] | [1086] | [1086] |

NOTE: This table presents estimates for the Difference-in-Differences coefficient $\beta_1$ from the specified Equation (19). The estimated effect is the LATE for non-work-schedule optimizers. Each column corresponds to a different model. Only the imputed wage series is used throughout the table. All models include individual and time fixed effects. Robust standard errors are in parentheses and clustered at the individual level. The number of observations for the respective regression is shown in brackets.
*p<0.10, **p<0.05, ***p<0.01.

Overall, the baseline results indicate that the tax exemption on overtime hours led to a reduction in both the mismatch between actual and desired work hours and the motivation to work among individuals who do not optimize their work schedules. This finding is somewhat counterintuitive. As shown in Tables 4 and 5, and consistent with the findings of Cahuc and Carcillo (2014), the 2007 reform did not significantly affect actual hours worked. Consequently, the observed decline in mismatch among underworked individuals must be attributed to a reduction in their desired hours. This is confirmed in the tables. However, from the

perspective of standard labor supply theory, a decrease in desired hours is difficult to reconcile in the short run. The increase in marginal income is expected to induce a substitution effect, whereby individuals reduce leisure and increase hours worked to take advantage of higher marginal returns. Only in the longer run, through the income effect, might workers reduce their desired labor supply while maintaining or exceeding their prior income levels by working fewer hours. I conduct robustness checks to confirm these results, which then motivate my heterogeneity analysis where I compare effects across genders, industry, and across the different terciles of the wage distribution.

## 7.2 Robustness

**Composition Effects**

The tax exemption on overtime hours introduced by the TEPA Law applied exclusively to individuals employed under hours-based contracts in France. This provision thereby created a fiscal incentive to obtain or retain employment under this specific contractual arrangement. It is also possible that, even when employed under an hours-based contract, individuals may hold positions with limited scope for working overtime hours. Together, these mechanisms risk introducing composition effects into the analysis. To control for workers who potentially switched jobs in order to benefit from the reform, I drop all individuals have answered "no" to the question on whether their employment status is identical to the previous interview. This restriction reduces the sample size by 403 observations. I then re-estimate the models from Table 6. The results, which remain consistent with the baseline findings, are presented in Table 7.

**Table 7:** Effect of the TEPA Law on Workers under Hours Contracts (Non-Work-Schedule Optimizers)

| **Dependent Variable** | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Desired Hours | -6.977*** | -1.239* | -1.581* | -1.328* | -1.256* | -1.249* |
| | (1.012) | (0.709) | (0.832) | (0.767) | (0.756) | (0.753) |
| | [86] | [1100] | [982] | [1078] | [1080] | [1080] |
| Actual Hours | 5.739 | 0.235 | 0.202 | 0.179 | 0.186 | 0.183 |
| | (4.127) | (0.338) | (0.356) | (0.339) | (0.338) | (0.338) |
| | [1410] | [7175] | [6538] | [7083] | [7090] | [7090] |
| Absolute Mismatch | -3.548 | -2.098** | -2.128** | -1.956* | -1.855* | -1.856* |
| | (2.387) | (0.963) | (1.023) | (1.009) | (1.003) | (1.001) |
| | [86] | [1100] | [982] | [1078] | [1080] | [1080] |
| Mismatch Squared | -107.700 | -68.990** | -61.030** | -67.230** | -64.620** | -64.650** |
| | (70.930) | (31.270) | (30.550) | (32.960) | (32.750) | (32.720) |
| | [86] | [1100] | [982] | [1078] | [1080] | [1080] |
| Pr(Mismatch > 0) | -0.426*** | -0.108** | -0.119** | -0.110** | -0.111** | -0.110** |
| | (0.094) | (0.049) | (0.054) | (0.050) | (0.048) | (0.049) |
| | [86] | [1100] | [982] | [1078] | [1080] | [1080] |

NOTE: This table presents estimates for the Difference-in-Differences coefficient $\beta_1$ from the specified Equation (19). Individuals having experienced a change in their employment situation since the previous interview have been dropped. All models include individual and time fixed effects. Robust standard errors are in parentheses, clustered at the individual level. Sample sizes are in brackets.
*p<0.10, **p<0.05, ***p<0.01.

### Anticipation Effects

As an additional robustness check, I implement a placebo test to assess whether the estimated effects can plausibly be attributed to the TEPA reform rather than to pre-existing trends or unobserved shocks. Specifically, I re-estimate the main specification using two fictitious treatment dates preceding the actual implementation of the reform: 2006Q4 and 2007Q1. My period of study starts at 2006Q3 hence I cannot condut a placebo test for that date. Also, although the policy came into effect in October 2007, it was officially announced in August, thus limiting the scope for a placebo in 2007Q2. If the estimated treatment effects in this placebo period are statistically insignificant and close to zero, it supports the validity of the identification strategy and strengthens confidence in the baseline results. The results from this exercise are reported in Table 8. While the balance regressions confirm slight variation in the distribution of treated individuals across these placebo periods, the placebo DiD estimates remain unchanged and statistically insignificant, suggesting no evidence of pre-trend bias and supporting the validity of the parallel trends assumption. I note the very high and statistically significant coefficients in models (1) and (7); however, these estimates are based on models with only six observations. Given the extremely limited sample size, the results are unlikely to be reliable and should not be taken as credible evidence against the identification strategy. In such small samples, large coefficients with understated standard errors can arise due to random variation rather than systematic effects.

**Table 8:** Placebo Tests: Effect of the TEPA Law (2006Q4 vs. 2007Q1)

| **Dependent Variable** | **2006Q4 Placebo** | | | | | | **2007Q1 Placebo** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Desired Hours | 84.290*** | 1.484 | 1.361 | 1.464 | 1.461 | 1.436 | 84.290*** | 1.484 | 1.361 | 1.464 | 1.461 | 1.436 |
| | (6.98e-13) | (0.963) | (1.025) | (0.968) | (0.977) | (0.986) | (6.98e-13) | (0.963) | (1.025) | (0.968) | (0.977) | (0.986) |
| | [6] | [1174] | [1048] | [1160] | [1162] | [1162] | [6] | [1174] | [1048] | [1160] | [1162] | [1162] |
| Actual Hours | -4.886 | -0.533 | 0.036 | -0.201 | -0.201 | -0.200 | -4.886 | -0.533 | 0.036 | -0.201 | -0.201 | -0.200 |
| | (5.274) | (0.886) | (0.889) | (0.833) | (0.832) | (0.830) | (5.274) | (0.886) | (0.889) | (0.833) | (0.832) | (0.830) |
| | [62] | [10410] | [9469] | [10312] | [10329] | [10329] | [62] | [10410] | [9469] | [10312] | [10329] | [10329] |
| Absolute Mismatch | 78.290*** | 1.855 | 1.546 | 1.710 | 1.587 | 1.611 | 78.290*** | 1.855 | 1.546 | 1.710 | 1.587 | 1.611 |
| | (6.49e-13) | (1.656) | (1.737) | (1.705) | (1.669) | (1.673) | (6.49e-13) | (1.656) | (1.737) | (1.705) | (1.669) | (1.673) |
| | [6] | [1174] | [1048] | [1160] | [1162] | [1162] | [6] | [1174] | [1048] | [1160] | [1162] | [1162] |
| Mismatch Squared | 1352.300*** | 57.870 | 50.190 | 54.160 | 53.110 | 54.380 | 1352.300*** | 57.870 | 50.190 | 54.160 | 53.110 | 54.380 |
| | (1.11e-11) | (52.660) | (55.130) | (53.700) | (52.840) | (53.420) | (1.11e-11) | (52.660) | (55.130) | (53.700) | (52.840) | (53.420) |
| | [6] | [1174] | [1048] | [1160] | [1162] | [1162] | [6] | [1174] | [1048] | [1160] | [1162] | [1162] |
| Pr(Mismatch > 0) | 6.729*** | -0.211 | -0.214 | -0.203 | -0.203 | -0.208 | 6.729*** | -0.211 | -0.214 | -0.203 | -0.203 | -0.208 |
| | (6.58e-14) | (0.137) | (0.140) | (0.140) | (0.143) | (0.140) | (6.58e-14) | (0.137) | (0.140) | (0.140) | (0.143) | (0.140) |
| | [6] | [1174] | [1048] | [1160] | [1162] | [1162] | [6] | [1174] | [1048] | [1160] | [1162] | [1162] |

NOTE: This table presents placebo estimates for the DiD coefficient $\beta_1$ assuming the TEPA Law was implemented either in 2006Q4 or 2007Q1. All models include individual and time fixed effects. Robust standard errors are in parentheses, clustered at the individual level. Sample sizes are in brackets.
*p<0.10, **p<0.05, ***p<0.01.

### Other Tax Measures of the TEPA Law

The 2007 reform included several other tax measures which may be argued as having impacted individuals' desired hours. Notably, an income tax credit on mortgage interest, a relief from inheritance tax, a decrease in the French wealth tax, and a lower tax shield. These additional measures may have incentivized workers to work less, thus decreasing their motivation to work and confounding the results. These policies may also be problematic if they have differential effects across individuals in the sample. Fortunately, this issue is

thoroughly scrutinized in Cahuc and Carcillo (2014), who show that this cannot be the case for three main reasons: First, the additional measures applied equally to all working individuals in France; Second, the policies only concerned a very small fraction of the population with wages well above the median, whereas the tax exemption of overtime mainly concerns individuals around or below the median; Third, the probability of buying a property did not change for their treatment or control group throughout the study period. I conduct a similar test by estimating the DiD model from equation (19) for a dependent variable indicating home ownership. I present results in Table 9 and conclude that the probability of buying property did not change for the treatment group, relative to the control.

**Table 9:** Effect of the TEPA Law on Probability of Home Ownership

| **Dependent Variable** | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Home Ownership | 0.0287 | 0.00664 | 0.00784 | 0.00595 | 0.00648 | 0.00669 |
| | (0.0289) | (0.0109) | (0.0114) | (0.0110) | (0.0110) | (0.0110) |
| N | [7831] | [24826] | [23333] | [24858] | [24879] | [24879] |

NOTE: This table presents coefficients from regressions estimating the effect of the TEPA reform on the probability of being a homeowner. Each column corresponds to a different model specification. Standard errors are in parentheses and are robust to heteroskedasticity. Sample sizes are reported in brackets. $^{*}$p<0.10, $^{**}$p<0.05, $^{***}$p<0.01.

## 7.3 Heterogeneity Analysis

Motivated by the dilution effects identified in the baseline result, I conduct heterogeneity analysis to verify whether the tax exemption of overtime hours had differential effects according to an individual's gender, work industry, and wage bracket. All tables can be found in Appendix J.

**Gender**

A robust empirical literature documents that women, particularly married women, exhibit higher labor supply elasticities than men (Blundell and MaCurdy, 1999; Blau and Kahn, 2007; Caldwell and Oehlsen, 2023), to cite a few. This implies that women are more responsive to changes in wages and policy incentives. While this gap has narrowed over time, as female labor market attachment has strengthened, gender differences in labor supply behavior remain a salient feature of labor market dynamics. For these reasons, I compare the effect of the TEPA Law on both men and women. To ensure the effect of the TEPA reform across genders was not diluted by the presence of work-schedule non-optimizers, I conducted the analysis with and without these types of workers. Table J1 reports results which do not include work-schedule non-optimizers. The analysis including these types of workers yields similar results.

I find the negative impact of the reform on workers' desired hours and work hours mismatch is concentrated among men rather than women. While model (7) does report that women's motivation to work increased and their absolute mismatch decreased, the robustness of this result is not confirmed in any of the other models and is limited by its low amount of observations, 38. The results in Table J1 may be inconclusive. The idea that men's labor supply may be more sensitive than women to the TEPA reform, goes against a large literature. Also, women are under-represented in the sample, accounting for only 31.75%, which

contributes to the smaller sample sizes in models (7) through (12). This likely limits the statistical power needed to detect significant effects among female workers.

**Industry**

It is particularly relevant to verify the heterogeneity of the TEPA reform's effects across industry sectors, as empirical research indicates that labor supply elasticities vary significantly across industry sectors, influenced by factors such as wage structures, working conditions, and institutional settings. For example, Bassier et al. (2022) find, in Oregon, that that labor supply elasticities are lower in low-wage, high-turnover sectors like accommodation and food services, and higher in professional and financial services sectors. Cross-sector differences in labor supply-elasticity have implications for how workers' desired hours respond to changes in incentives such as tax exemptions. For this reason, I examine the heterogeneous effects of the TEPA Law across broad industry groups.

I find heterogeneous effects of the 2007 reform across different industry sectors and present results in Tables J2, J3, and J4. The negative effects on desired hours and the absolute mismatch are largely concentrated among workers in the manufacturing sector, the second-largest group in the sample, accounting for 27.5% of all observations. In contrast, individual's working in the construction industry (13.8%) seem to have experienced a decrease in desired hours, with no associated movement in their absolute mismatch. Results also suggest that individuals working in a specialized industry (12.25%), in information, communications and services (8%), or working in the the financial and real estate industry (5.5%) are the least affected by the tax exemption of overtime hours. Lastly, the results may imply that individuals working in the commercial sector (32.7%) benefited from the reform through increased actual hours and a decrease in desired hours. However, considering 85.13% of individuals in that sector are underworked, this should translate to a decrease in the absolute mismatch, which is only identified in model (4) with a 10% significance level. Hence, I do not interpret the result as robust.

**Wage**

A substantial body of economic research has shown that labor supply elasticities vary systematically with income. Seminal findings show that lower-income individuals tend to have more elastic labor supply, particularly at the extensive margin (Meghir and Phillips, 2010; Blundell et al., 2015). Similarly, Saez (2002) and Piketty et al. (2014) underscore the importance of accounting for heterogeneity in behavioral responses across the earnings distribution when evaluating policy impacts such as tax reforms. Moreover, recent work by Bozio et al. (2018) using French administrative data shows that wage earners in the lower half of the distribution respond more strongly to marginal tax incentives than top earners. These findings suggest that the effect of the TEPA Law on desired hours may differ significantly across wage groups, especially since the law provided tax exemptions that altered net-of-tax wages. For these reasons, I investigate how the reform's effects differ across the wage distribution. Specifically, I divide workers into wage terciles and estimate the effects of the TEPA Law separately for each group.

When dis-aggregating by wage group in Table J5, I find positive and statistically significant effects of the reform on desired hours among medium- and high-income workers. In contrast, the estimated effect for low-income workers is negative and not statistically significant. Because the low-income group comprises

47.1% of the sample, its influence likely dominates the pooled estimates from Table 6. As a result, the aggregate model yields a negative coefficient. This pattern illustrates how heterogeneity in treatment effects, combined with uneven group sizes, can lead to misleading conclusions in aggregate analyses. Following this reasoning, it may be the case that the TEPA reform did, in fact, increase desired hours, particularly among medium- and high-income earners, while leaving low-income workers unaffected. The lack of responsiveness among the latter group may reflect more rigid labor demand conditions or limited scope for hour adjustments, consistent with findings that low-wage sectors often offer less flexibility in scheduling and fewer opportunities for overtime work. Such a result raises questions on demand side effects of the 2007 TEPA Reform, for which I unfortunately do not have data.

# 8 Conclusion

This study investigates the impact of the 2007 TEPA Law, which exempted overtime compensation from income tax and social security contributions, on workers' motivation to supply labor, measured through their desired hours and work hours mismatch. Using nationally representative data from the French Labor Force Survey and a difference-in-differences design that exploits variation in contract type, I find that the reform led to a reduction in desired hours, a narrowing of the mismatch between desired and actual hours, and a lower probability of underemployment. These effects are concentrated among men, manufacturing sector workers, and mid- to high-wage earners.

The findings suggest that the reform, rather than incentivizing workers to increase their labor supply as intended, may have inadvertently reduced their expressed willingness to work more. This result is consistent with strategic behavioral responses, including adjustments in reported hours or shifts between compensation channels such as bonuses and overtime pay. It also aligns with existing evidence that financial incentives alone are insufficient to shift labor supply in the presence of rigidities in hours choice, institutional constraints, and implicit norms around work-time arrangements.

By introducing the concept of the work hours mismatch into the evaluation of a major fiscal reform, this paper contributes to the broader literature on labor supply responsiveness and tax policy design. It highlights the importance of incorporating preference-based indicators, such as desired hours, alongside observed labor market outcomes. The finding that the reform led to a decline in underemployment without an increase in actual hours worked underscores the relevance of distinguishing between willingness and ability to supply labor.

More broadly, these results raise questions about the efficacy of supply-side labor market policies when adjustment on the intensive margin is constrained. As tax-based incentives targeting hours become increasingly prevalent across OECD countries, understanding their heterogeneous and sometimes unintended consequences remains critical. Future research should examine the persistence of these effects beyond the reform's repeal in 2012 and include data from both the supply and demand side of the labor market. In doing so, subsequent work may shed light on whether these patterns persist depending on the extent of institutional flexibility.

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# Appendix A: Additional Measures Introduced by the TEPA Law

**1. Income Tax Credit on Mortgage Interest**

The TEPA Law established a tax credit for interest paid on mortgage loans contracted for the acquisition or construction of a primary residence. The measure allowed a deduction of 40% of interest paid in the first year, followed by 20% annually for the next four years, subject to ceilings: €3,750 per year for single individuals, €7,500 for couples, with an additional €500 per dependent child. Its effectiveness was limited by a ruling from the *Conseil Constitutionnel*, which prohibited retroactive application to loans contracted before the law's enactment. The policy benefited 1.3% of households in 2008 and 3.5% cumulated in 2009. It was abolished January 1, 2011[25].

**2. Relief from Inheritance Tax**

Aiming to facilitate inter generational wealth transfers, the TEPA Law extended the inheritance tax relief to the surviving spouse or partner in civil unions (PACS), while also increasing the tax-free allowance for direct descendants (children) from €50,000 to €150,000, with proportionate increases for other heirs. With this reduction, the number of exempted inheritances would rise from 85% to 95% and would benefit approximately 100,000 households each year among the wealthiest only (0.4% of all households). In 2007, the affected individuals represented 2% of households, 50% of which were classed as independent workers, farmers, and CEOs. This measure responded to longstanding criticisms that French inheritance tax rules were overly punitive and discouraged wealth preservation within families. Supporters argued that it restored fairness, while detractors viewed it as disproportionately advantageous to wealthy households and as undermining fiscal equity[26].

**3. Lower Tax on Wealth (ISF)**

The TEPA Law modified the *Impôt de Solidarité sur la Fortune* (ISF), France's wealth tax. It implemented a 75% tax reduction, capped at €50,000, for individuals investing in small and medium-sized enterprises (SMEs). This provision was later scaled back to 50%. in the primary residence deduction from 20% to 30%, reducing the taxable base of the ISF[27].

**4. Lowering the Tax Shield**

The TEPA Law lowered the cap on the total amount of direct taxes a taxpayer could be legally required to pay. Previously set at 60% of total income, the TEPA reform reduced this cap to 50%, effectively limiting the aggregate tax burden on high-income individuals. This policy was abolished starting January 1st 2013. Approximately 0.05% of tax payers benefited form it every year[28].

[25]Source: https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000000278649
[26]Source: https://www.economie.gouv.fr/files/finances/presse/dossiers_de_presse/080723_lme_dossierde-presse.pdf
[27]Source: https://bofip.impots.gouv.fr/bofip/3534-PGP.html/identifiant%3DBOI-PAT-ISF-40-30-10-30-20140616
[28]Source: https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000000278649

# Appendix B: Derivations for the Representative Bargaining Model

For simplicity, I rewrite the maximization problem.

$$\max_{w,h} \mathcal{O}(w,h) = [(f(h) - wh) \cdot L(u)]^{1-\gamma} \cdot [u]^{\gamma}$$

$$s.t. \quad u = \int_{\theta,\lambda} \theta w - \lambda\phi(h)\ dF(\theta,\lambda) = \mathbb{E}[\theta]w - \mathbb{E}[\lambda]\phi(h)$$

**Deriving Equation (12)**

To alleviate notation, I define $A = (f(h) - wh) \cdot L(u)$.

$$\begin{aligned} \frac{\partial \mathcal{O}(w,h)}{\partial w} = 0 \quad &\iff (1-\gamma)A^{-\gamma} \cdot \frac{\partial A}{\partial w} \cdot u^{\gamma} + A^{1-\gamma} \cdot \gamma u^{\gamma-1} \cdot \frac{\partial u}{\partial w} = 0 \\ &\iff (1-\gamma)\frac{\partial A}{\partial w} + \gamma \cdot \frac{A}{u} \cdot \frac{\partial u}{\partial w} = 0 \end{aligned} \tag{21}$$

Now,

$$\frac{\partial A}{\partial w} = -hL(u) + (f(h) - wh) \cdot L'(u) \cdot \mathbb{E}[\theta] \tag{22}$$

$$\frac{\partial u}{\partial w} = \mathbb{E}[\theta] \tag{23}$$

To further alleviate notation, I define $\Pi = f(h) - wh$, and plug Equations (22) and (23) into Equation (21).

$$\begin{aligned} \frac{\partial \mathcal{O}(w,h)}{\partial w} = 0 \quad &\iff (1-\gamma)\left[\Pi \cdot L'(u) \cdot \mathbb{E}[\theta] - hL(u)\right] + \gamma \cdot \frac{\Pi \cdot L(u)}{u} \cdot \mathbb{E}[\theta] = 0 \\ &\iff (1-\gamma)hL(u) = \Pi \cdot \mathbb{E}[\theta] \cdot \frac{L(u)}{u}\left[(1-\gamma)\varepsilon_u^L + \gamma\right] \\ &\iff (1-\gamma)h = \mathbb{E}[\theta] \cdot \frac{\Pi}{u}[(1-\gamma)\varepsilon_u^L + \gamma] \end{aligned} \tag{24}$$

**Deriving Equation (13)**

I start by rearranging Equation (24).

$$\begin{aligned} \frac{\partial \mathcal{O}(w,h)}{\partial w} = 0 \quad &\iff (1-\gamma)h = \mathbb{E}[\theta] \cdot \frac{(f(h) - wh)}{u}[(1-\gamma)\varepsilon_u^L + \gamma] \\ &\iff \mathbb{E}[\theta]wh \cdot [(1-\gamma)\varepsilon_u^L + \gamma] + (1-\gamma)hu = \mathbb{E}[\theta] \cdot f(h)[(1-\gamma)\varepsilon_u^L + \gamma] \\ &\iff \mathbb{E}[\theta]w \cdot [(1-\gamma)\varepsilon_u^L + \gamma] + (1-\gamma)u = \mathbb{E}[\theta] \cdot \frac{f(h)}{h}[(1-\gamma)\varepsilon_u^L + \gamma] \\ &\iff w = \frac{f(h)}{h} - \frac{(1-\gamma)u}{\mathbb{E}[\theta]\left[(1-\gamma)\varepsilon_u^L + \gamma\right]} \end{aligned}$$

Then, I plug the definition of $u$ and rearrange.

$$\begin{aligned}
\frac{\partial \mathcal{O}(w,h)}{\partial w} = 0 \quad &\iff w = \frac{f(h)}{h} - \frac{(1-\gamma)\left[\mathbb{E}[\theta]w - \mathbb{E}[\lambda]\phi(h)\right]}{\mathbb{E}[\theta]\left[(1-\gamma)\varepsilon_u^L + \gamma\right]} \\
&\iff w\left[1 + \frac{(1-\gamma)}{(1-\gamma)\varepsilon_u^L + \gamma}\right] = \frac{f(h)}{h} + \frac{(1-\gamma)\,\mathbb{E}[\lambda]\phi(h)}{\mathbb{E}[\theta]\left[(1-\gamma)\varepsilon_u^L + \gamma\right]} \\
&\iff w = \frac{f(h)\left[(1-\gamma)\varepsilon_u^L + \gamma\right]}{h\left[1 + (1-\gamma)\varepsilon_u^L\right]} + \frac{\mathbb{E}[\lambda]}{\mathbb{E}[\theta]}\frac{(1-\gamma)\,\phi(h)}{\left[1 + (1-\gamma)\varepsilon_u^L\right]}
\end{aligned}$$

This is the wage equation.

**Deriving Equation** (14)

$$\begin{aligned}
\frac{\partial \mathcal{O}(w,h)}{\partial h} = 0 \quad &\iff (1-\gamma)A^{-\gamma}\cdot\frac{\partial A}{\partial h}\cdot u^{\gamma} + A^{1-\gamma}\cdot\gamma u^{\gamma-1}\cdot\frac{\partial u}{\partial h} = 0 \\
&\iff (1-\gamma)\frac{\partial A}{\partial h} + \gamma\cdot\frac{A}{u}\cdot\frac{\partial u}{\partial h} = 0 \qquad (25)
\end{aligned}$$

Now,

$$\frac{\partial A}{\partial h} = \left(f'(h) - w\right)L(u) - \Pi\, L'(u)\,\mathbb{E}[\lambda]\,\phi'(h) \qquad (26)$$

$$\frac{\partial u}{\partial h} = -\mathbb{E}[\lambda]\,\phi(h) \qquad (27)$$

I plug equations (26) and (27) into Equation (25) and multiply by $u/L(u)$.

$$\begin{aligned}
\frac{\partial \mathcal{O}(w,h)}{\partial h} = 0 \quad &\iff (1-\gamma)\left[\left(f'(h) - w\right)L(u) - \Pi\, L'(u)\,\mathbb{E}[\lambda]\,\phi'(h)\right] = \gamma\,\frac{\Pi\cdot L(u)}{u}\mathbb{E}[\lambda]\,\phi(h) \\
&\iff (1-\gamma)(f'(h) - w)L(u) = \mathbb{E}[\lambda]\,\phi'(h)\,\Pi\left[\gamma\,\frac{L(u)}{u} + (1-\gamma)L'(u)\right] \\
&\iff (1-\gamma)(f'(h) - w)u = \mathbb{E}[\lambda]\,\phi'(h)\,\Pi\left[\gamma + (1-\gamma)\,\varepsilon_u^L\right]
\end{aligned}$$

**Deriving Equation** (15)

To find the equilibrium allocation of wage and hours, I take the ratio of both first order conditions.

$$\begin{cases}
(1-\gamma)h = \mathbb{E}[\theta]\dfrac{f(h) - wh}{u}\left[(1-\gamma)\varepsilon_u^L + \gamma\right] \\
(1-\gamma)(f'(h) - w)u = \mathbb{E}[\lambda]\phi'(h)(f(h) - wh)\left[\gamma + (1-\gamma)\varepsilon_u^L\right]
\end{cases} \implies f'(h) - w = \frac{\mathbb{E}[\lambda]}{\mathbb{E}[\theta]}h\phi'(h)$$

# Appendix C: Questions Relating to Employment in the *Enquête Emploi en Continu*

*Question B21a (Variable CONTRA)*: "What is the type of your employment contract (or: of this contract)?" [several possible answers]

1. Permanent contract
2. Fixed-term contract
3. Seasonal Contract
4. Temporary agency or ficed-term employment contract
5. Apprenticeship contract

*Question B33a (Variable TPP)*: "In your main job (occupation, name of main employer), do you (or did you) work?" [several possible answers]

1. Full-time
2. Part-time
3. Not applicable (for self-employed individuals who consider this question does not apply to them)

*Question B40 (Variable REDIC)*: "In your main job, is your working time subject to a modulation or annualization agreement (reduction of working hours during certain periods, increase during others)?"

*Question B43 (Variable HPLUS)*:"How many hours of work would you ideally like to work in total?"

*Question B47a (Variable EMPAFF)*: "Was your schedule affected by the following causes?" [several possible answers]

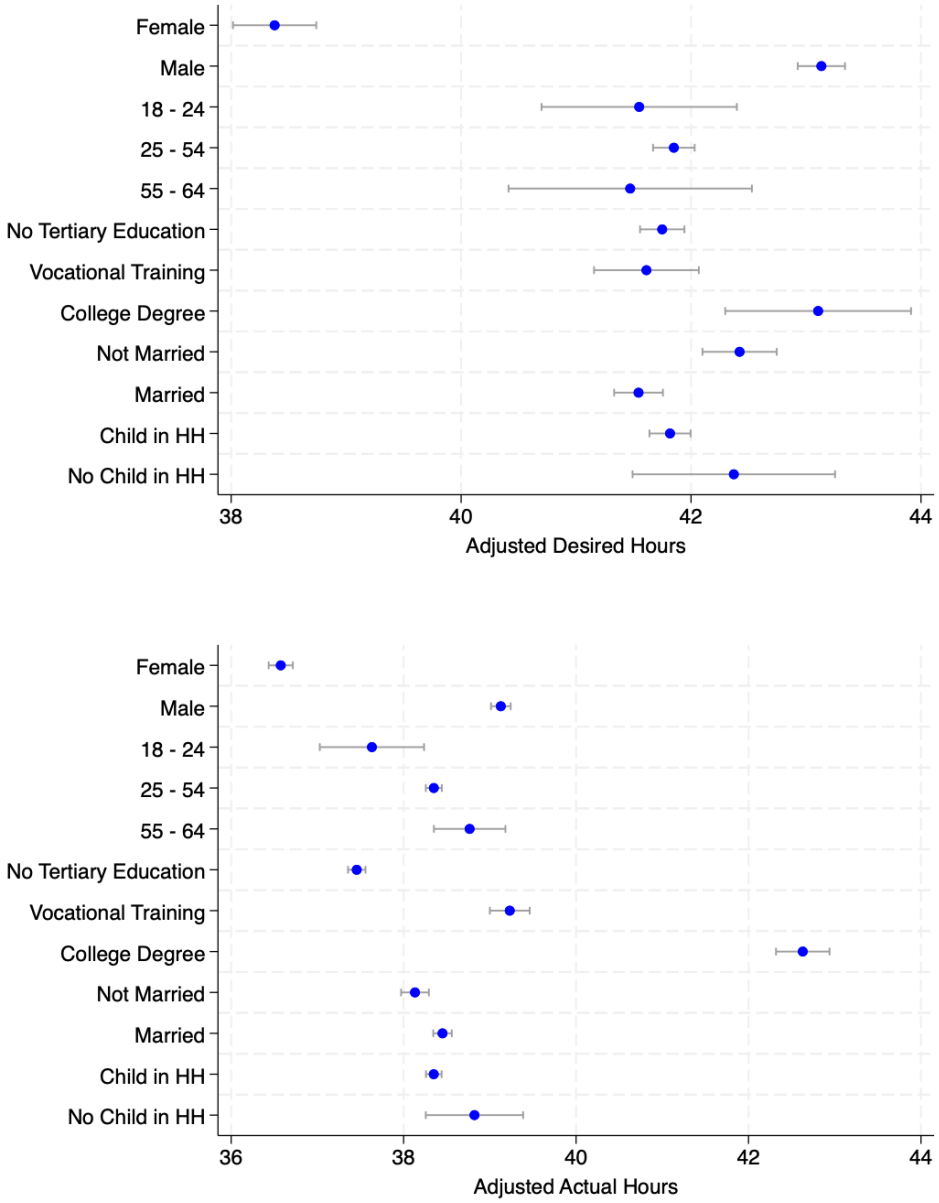
1. Partial unemployment, bad weather?
2. Time spent on training?
3. Strike, labor conflict?
4. No, by none of the above factors.

*Question B48a (Variable EMPNBH)*: "During the week Monday to Sunday (dates), how many hours did you put in at your principal job (not counting ordinary hours or days off, or exceptional ones, or legal holidays, bridges, make-up time, personal unpaid time off, partial unemployment, training, strike, labor conflict)?"

Interview *Questions F1-F8* are used to determine the answer to the *Variable NIVET*: "Niveau d'étude le plus élevé ". The categories are: Troisième cycle universitaire, grande école, Deuxième cycle universitaire, Premier cycle universitaire, DUT, BTS, Paramédical et social niveau bac+2, Terminale générale, Terminale technologique, Terminale bac pro, Seconde ou première, Terminale CAP, BEP, Troisième seule, CAP-BEP avant l'année terminale, Sixième, cinquième, quatrième; enseignement spécialisé, Classes primaires, Autres cas

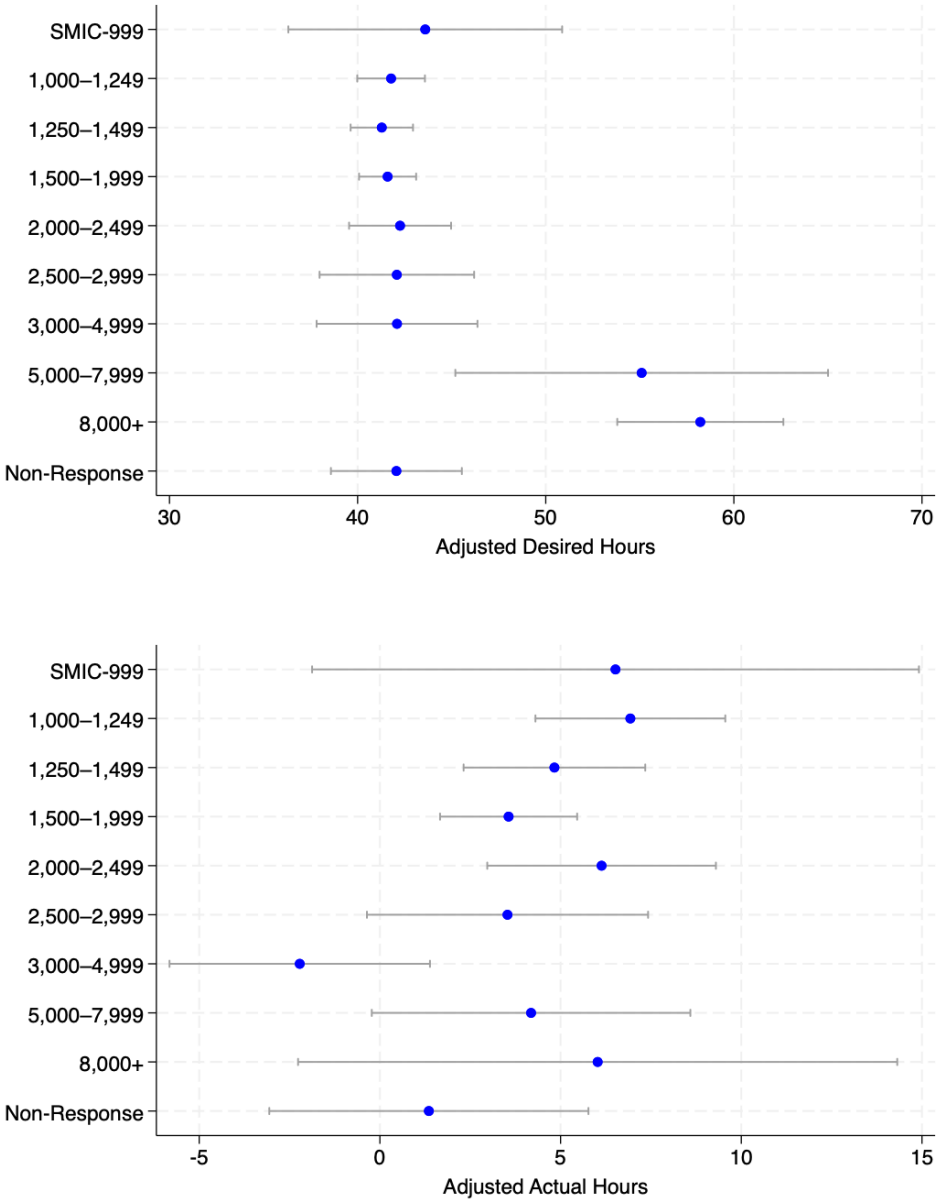
# Appendix D: Stylized Facts - Additional Figures for Desired and Actual Hours

**Figure D1:** Comparing the Adjusted Desired and Actual Hours of Work Across Socio-Demographic Groups



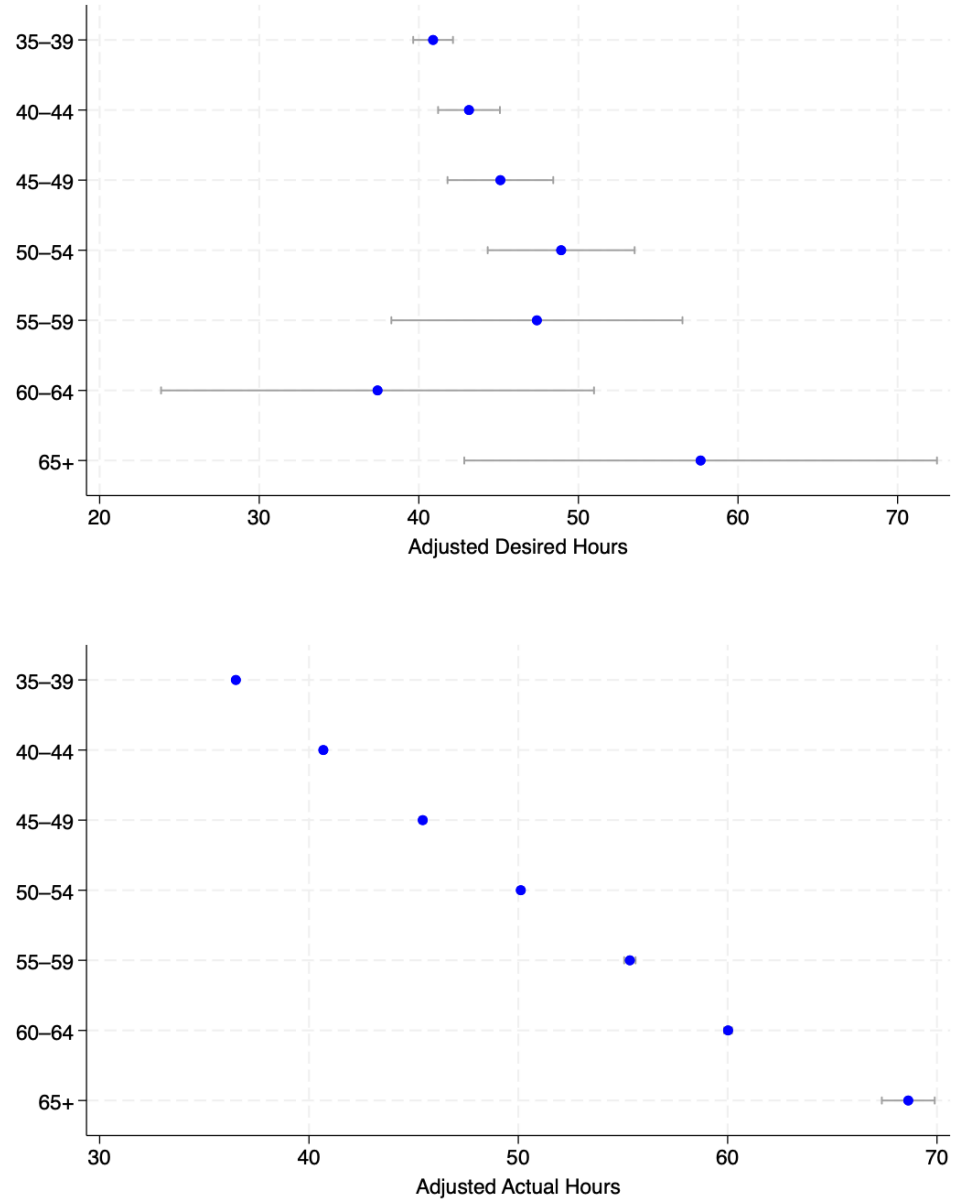

NOTE: This figure compares the adjusted desired and actual hours across the different wage brackets for individuals working full-time jobs, between 35 and 70 hours a week, on average, in the non-agricultural, for profit sector, earning at least the minimum wage, between 2003 and 2007 (the Descriptive Sample). The above coefficients are the estimated marginal effects from having estimated Equation (16) using OLS.

**Figure D2:** Comparing the Adjusted Desired and Actual Hours of Work Across Wage Brackets




NOTE: This figure compares the adjusted desired and actual hours across the different wage brackets for individuals working full-time jobs, between 35 and 70 hours a week, on average, in the non-agricultural, for profit sector, earning at least the minimum wage, between 2003 and 2007 (the Descriptive Sample). The above coefficients are the estimated marginal effects from having estimated Equation (17) using OLS.

**Figure D3:** Comparing the Adjusted Desired and Actual Hours of Work Across Brackets of Actual Hours Worked




NOTE: This figure compares the adjusted desired and actual hours across the different actual working hours brackets for individuals working full-time jobs, between 35 and 70 hours a week, on average, in the non-agricultural, for profit sector, earning at least the minimum wage, between 2003 and 2007 (the Descriptive Sample). The above coefficients are the estimated marginal effects from having estimated Equation (18) using OLS.

# Appendix E: Statistics on Individuals Having (not) Responded to the Desired Hours Question

**Table E1:** Socio-Demographic Statistics For Individuals Having (not) Reported their Desired Hours, by Sample

| | **Has Not Reported** | | | **Has Reported** | | | **p-value** | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Descriptive | TEPA | Total | Descriptive | TEPA | Total | Descriptive | TEPA |
| Gender | 0.70 | 0.71 | 0.69 | 0.68 | 0.69 | 0.68 | 0.000 | 0.000 | 0.129 |
| | (0.46) | (0.45) | (0.46) | (0.47) | (0.46) | (0.46) | | | |
| Age | 36.98 | 36.76 | 37.63 | 40.65 | 40.34 | 41.36 | 0.000 | 0.000 | 0.000 |
| | (9.92) | (9.83) | (9.96) | (10.43) | (10.34) | (10.27) | | | |
| Years of Study | 13.47 | 13.36 | 13.54 | 13.42 | 13.20 | 13.39 | 0.000 | 0.000 | 0.000 |
| | (3.02) | (3.06) | (2.93) | (3.28) | (3.30) | (3.20) | | | |
| Has a Child | 1.03 | 1.03 | 1.03 | 1.03 | 1.03 | 1.03 | 0.000 | 0.021 | 0.156 |
| | (0.18) | (0.17) | (0.17) | (0.17) | (0.16) | (0.16) | | | |
| Number of Children | 1.05 | 1.06 | 1.08 | 1.14 | 1.16 | 1.17 | 0.000 | 0.000 | 0.000 |
| | (1.13) | (1.14) | (1.13) | (1.12) | (1.12) | (1.11) | | | |
| Marital Status | 0.48 | 0.50 | 0.48 | 0.60 | 0.62 | 0.61 | 0.000 | 0.000 | 0.000 |
| | (0.50) | (0.50) | (0.49) | (0.49) | (0.49) | (0.49) | | | |
| Job Tenure (months) | 107.77 | 108.26 | 112.32 | 141.52 | 141.63 | 148.06 | 0.000 | 0.000 | 0.000 |
| | (106.83) | (107.23) | (107.28) | (125.68) | (125.85) | (126.30) | | | |
| Hours Worked (Ref. Week) | 37.10 | 36.98 | 37.20 | 38.46 | 38.28 | 38.59 | 0.000 | 0.000 | 0.000 |
| | (7.51) | (7.51) | (7.40) | (8.44) | (8.43) | (8.29) | | | |
| Compensated Overtime Hours | 2.61 | 2.31 | 2.63 | 2.67 | 2.25 | 2.68 | 0.278 | 0.439 | 0.641 |
| | (4.06) | (4.03) | (3.87) | (4.40) | (4.29) | (4.29) | | | |
| Observations | 342,604 | 184,480 | 44,429 | 342,604 | 184,480 | 44,429 | | | |

NOTE: This table presents socio-demographic statistics for individuals who have (not) answered the desired hours question. Its purpose is to show that while there is non-response for this key dependent variable, no socio-demographic groups stand out as having abstained more than others. While this does not rule out all forms of selection bias, it supports the assumption that non-response is conditionally random with respect to observable characteristics. Values are means with standard deviations in parentheses. p-values correspond to two-sample t-tests comparing means between individuals who reported and did not report their desired hours, within each sample group (Total, Descriptive, TEPA). The Total Sample is the one used for the imputation exercise, the Descriptive Sample is the one used for the facts, and the TEPA sample is the one used for the Empirical analysis.

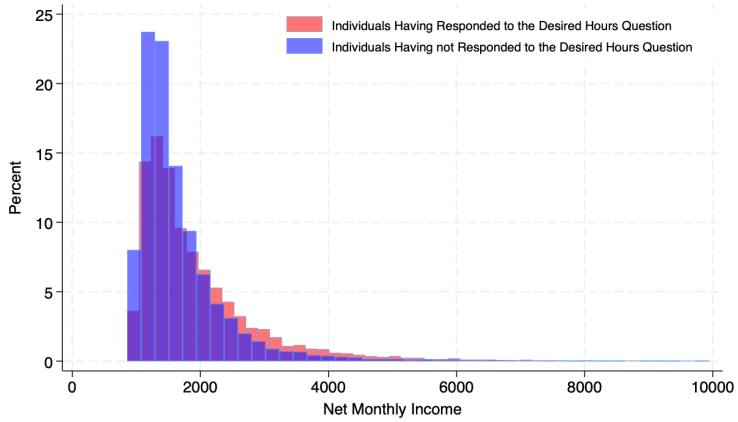
**Table E2:** Distribution of Desired Hours Non-Response by Industry and Sample

| | **Has Not Reported Desired Hours** | | | **Has Reported Desired Hours** | | |
|---|---|---|---|---|---|---|
| | Total | Descriptive | TEPA | Total | Descriptive | TEPA |
| Not reported | 0.22% | 0.22% | 0.22% | 0.37% | 0.36% | 0.30% |
| | (117) | (69) | (17) | (1,072) | (552) | (112) |
| Manufacturing, extractive, and | 27.47% | 28.48% | 27.57% | 26.90% | 27.84% | 26.17% |
| other industries | (14,407) | (8,756) | (2,108) | (78,046) | (42,806) | (9,627) |
| Construction | 10.89% | 10.45% | 11.00% | 11.01% | 10.69% | 10.98% |
| | (5,713) | (3,213) | (841) | (31,949) | (16,433) | (4,038) |
| Wholesale and retail trade, transportation, | 32.85% | 31.32% | 33.59% | 30.37% | 28.64% | 31.36% |
| accommodation and food service | (17,228) | (9,630) | (2,569) | (88,120) | (44,024) | (11,534) |
| Information and communication | 1.45% | – | 0.82% | 2.18% | – | 1.46% |
| | (761) | (–) | (63) | (6,326) | (–) | (538) |
| Financial and insurance activities | 4.91% | 4.91% | 4.62% | 6.26% | 5.95% | 6.85% |
| | (2,577) | (1,509) | (353) | (18,156) | (9,146) | (2,518) |
| Real estate activities | 1.69% | 1.64% | 1.80% | 2.08% | 2.17% | 2.35% |
| | (885) | (505) | (138) | (6,025) | (3,330) | (864) |
| Professional, scientific, technical, and | 14.21% | 15.36% | 14.29% | 14.38% | 16.58% | 14.50% |
| administrative support activities | (7,453) | (4,722) | (1,093) | (41,738) | (25,485) | (5,334) |
| Other service activities | 6.31% | 7.61% | 6.08% | 6.45% | 7.78% | 6.03% |
| | (3,307) | (2,339) | (465) | (18,724) | (11,961) | (2,217) |
| Observations | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| | (52,448) | (30,743) | (7,647) | (290,156) | (153,737) | (36,782) |

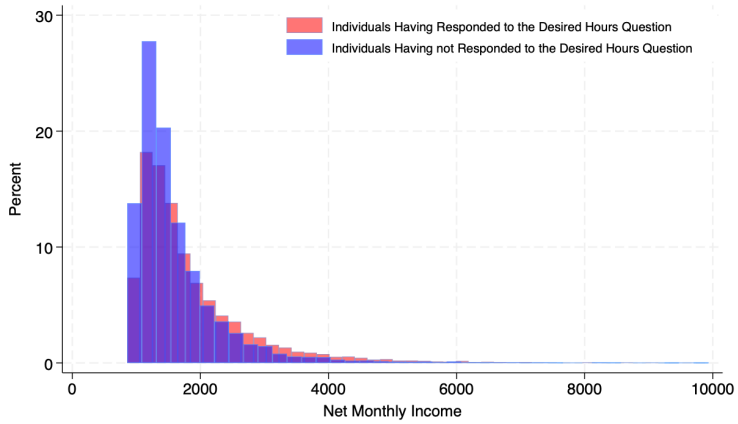
NOTE: This table presents the percentages of individuals who hhave (not) answered the desired hours question, by industry. Its purpose is to show that while there is non-response for this key dependent variable, no socio-demographic groups stand out as having abstained more than others. While this does not rule out all forms of selection bias, it supports the assumption that non-response is conditionally random with respect to observable characteristics. Percentages are shown with raw frequencies in parentheses. The "Information and communication category enters the *Enquête Emploi*" in 2008. Seeing as the Descriptive Sample spans December 2002 to October 2007, it does not hold a statistic for that industry category.

**Figure E1:** Wage distributions for individuals having (not) responded to the desired hours question

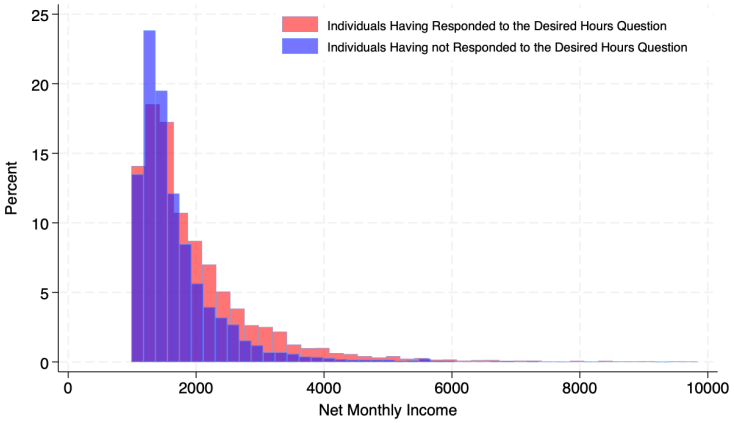
**(a)** Total Sample




**(b)** Descriptive Sample

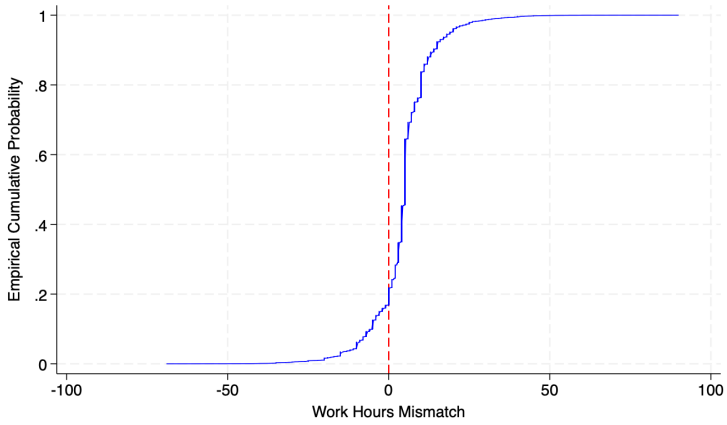



**(c)** TEPA Sample

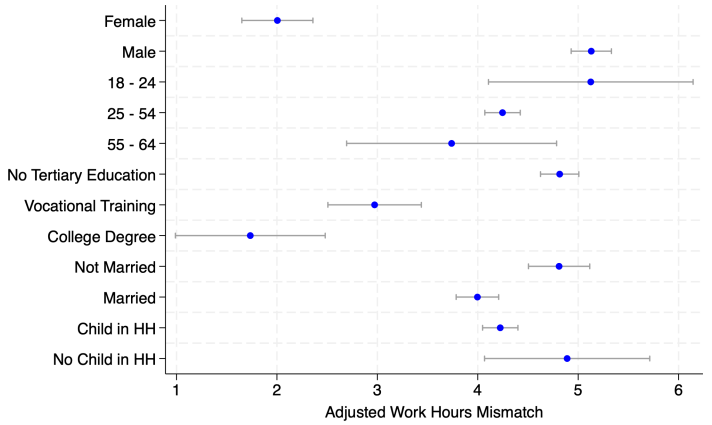


# Appendix F: Robustness of the Stylized Facts

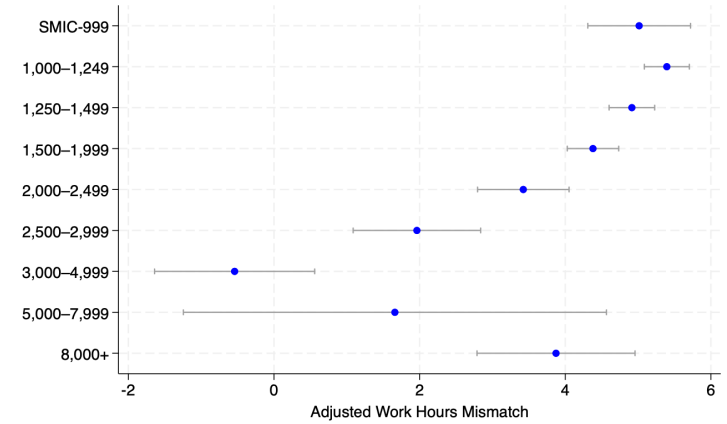
**Figure F:** Robustness Check of the Stylized Facts



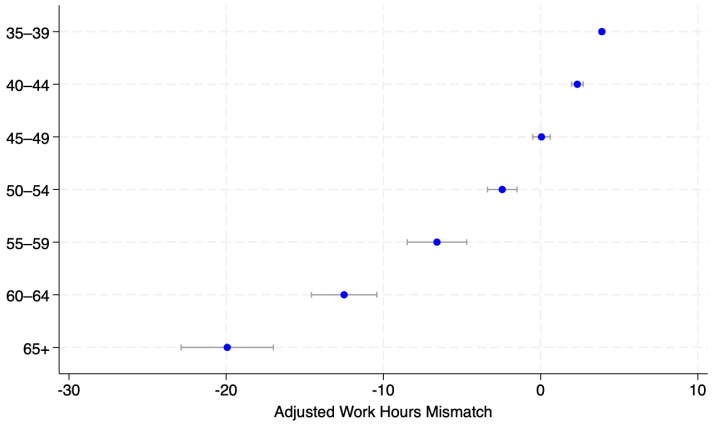

**(a)** FACT 1




**(b)** FACT 2




**(c)** FACT 3




**(d)** FACT 4

NOTE: This figure reproduces Figures 3, 4, 5, and 6 from Section 5.2. In these figures, an individual is given his average wage value. If he has only reported that value, that value is spread through his observations. If he has reported no value, no value is spread. The preference updating assumption is also applied. I assume an individual only answers the desired hours question to update his preferences. If an individual does not answer, his previous answer applies. If there is no previous answer, then no value applies.

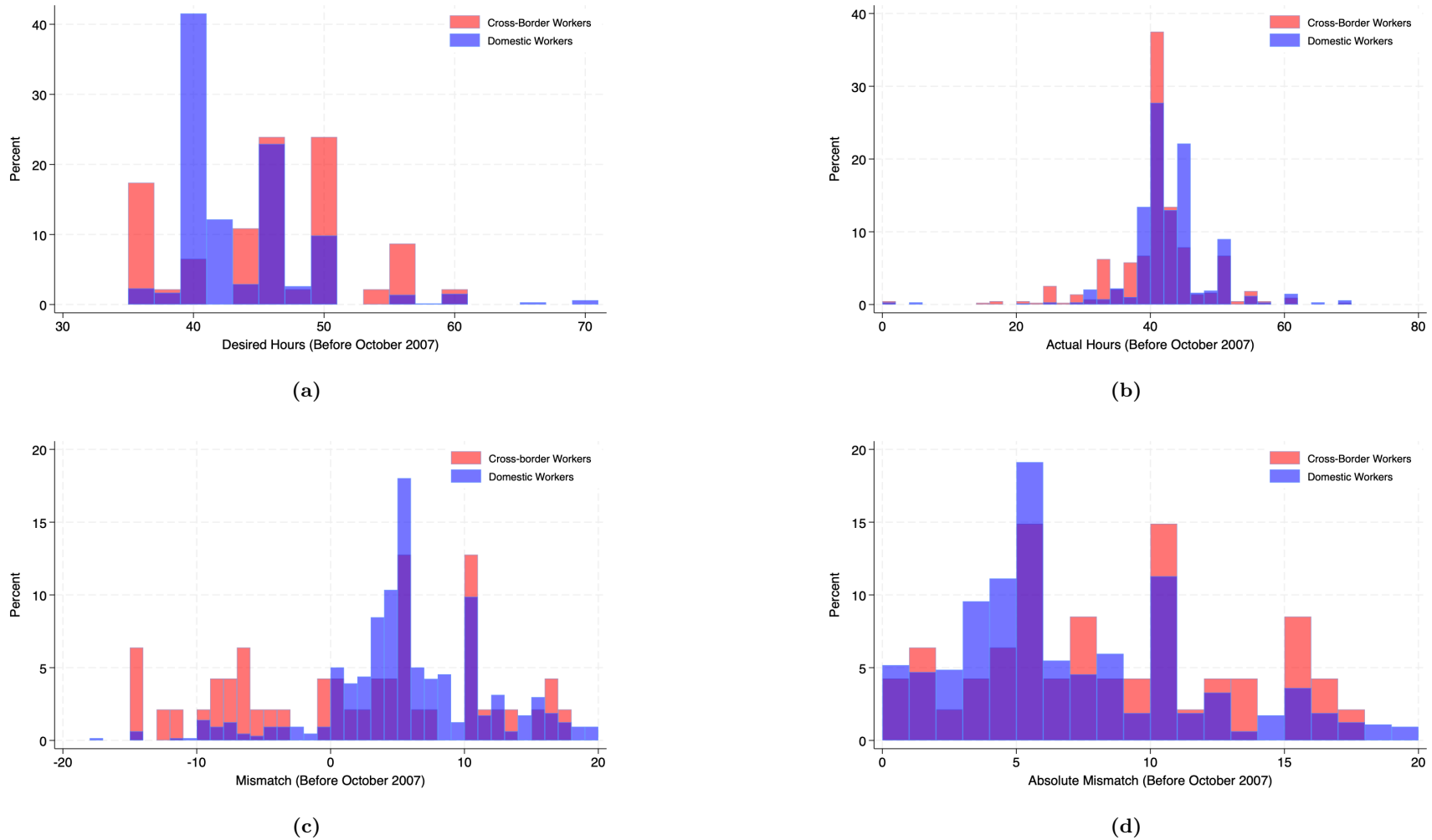
# Appendix G: Statistics on Domestic and Cross-Border Workers, as well as Workers on Hours and Days Contracts, Before October 2007

**Table G:** Descriptive Statistics by Contract Type and Worker Type, Before October 2007

| | **By Contract Type** | | | **By Worker Type** | | | |
|---|---|---|---|---|---|---|---|
| | Hours | Days | p-value | Cross-Border | Domestic | Rest of France | p-value |
| Gender | 0.672 | 0.737 | 0.000 | 0.792 | 0.695 | 0.686 | 0.000 |
| | (0.469) | (0.441) | | (0.407) | (0.460) | (0.464) | |
| Age | 39.84 | 40.39 | 0.123 | 40.59 | 40.27 | 40.60 | 0.548 |
| | (10.54) | (10.11) | | (10.46) | (10.34) | (10.22) | |
| Years of Study | 13.32 | 15.12 | 0.000 | 12.89 | 13.21 | 13.46 | 0.037 |
| | (3.09) | (3.31) | | (3.00) | (3.03) | (3.17) | |
| Has a Child | 1.027 | 1.020 | 0.350 | 1.028 | 1.031 | 1.031 | 0.822 |
| | (0.162) | (0.140) | | (0.166) | (0.174) | (0.172) | |
| Number of Children | 1.122 | 1.007 | 0.003 | 1.083 | 1.206 | 1.151 | 0.035 |
| | (1.122) | (1.116) | | (1.177) | (1.126) | (1.118) | |
| Marital Status | 0.566 | 0.533 | 0.050 | 0.641 | 0.604 | 0.581 | 0.139 |
| | (0.496) | (0.499) | | (0.480) | (0.489) | (0.493) | |
| Job Tenure (months) | 130.93 | 143.24 | 0.003 | 128.13 | 146.67 | 140.68 | 0.004 |
| | (123.22) | (127.67) | | (125.24) | (126.12) | (123.13) | |
| Desired Hours | 42.88 | 44.82 | 0.001 | 43.49 | 42.45 | 42.68 | 0.263 |
| | (7.20) | (9.29) | | (7.72) | (6.40) | (7.27) | |
| Hours Worked in Ref. Week | 38.12 | 41.28 | 0.000 | 40.23 | 37.76 | 38.31 | 0.000 |
| | (7.92) | (9.60) | | (7.17) | (7.92) | (8.05) | |
| Mismatch | 5.72 | 4.67 | 0.135 | 4.83 | 5.66 | 5.30 | 0.512 |
| | (8.45) | (10.41) | | (13.43) | (8.40) | (8.48) | |
| Absolute Mismatch | 7.71 | 8.57 | 0.119 | 10.57 | 7.79 | 7.52 | 0.004 |
| | (6.68) | (7.50) | | (9.51) | (6.47) | (6.59) | |
| Comp. Overtime Hours | 2.34 | 0.63 | 0.000 | 2.71 | 2.90 | 2.27 | 0.756 |
| | (3.74) | (1.85) | | (4.23) | (4.27) | (3.80) | |
| Pr(Mismatch $>$ 0) | 0.963 | 0.958 | 0.445 | 0.954 | 0.965 | 0.966 | 0.265 |
| | (0.189) | (0.201) | | (0.210) | (0.185) | (0.182) | |

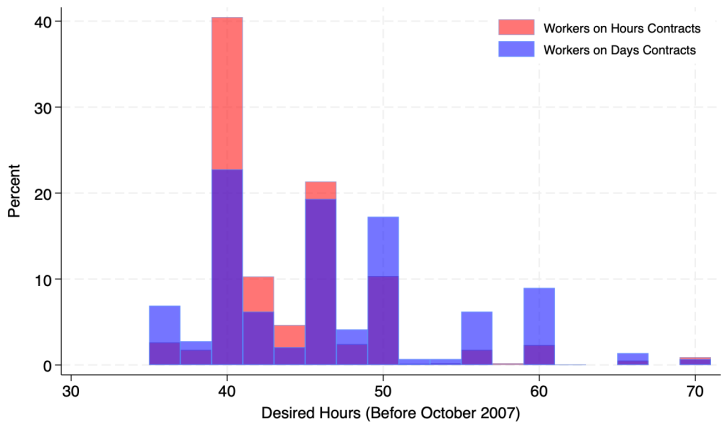
NOTE: Values are means with standard deviations in parentheses. p-values correspond to two-sample t-tests. The Contract Type p-values compare workers on hours vs. days contracts. The Worker Type p-values compare cross-border vs. domestic workers.

**Figure G1:** Comparing the Desired Hour, Actual Hour, Mismatch, and Absolute Mismatch Distributions between Cross-Border and Domestic Workers, before October 2007

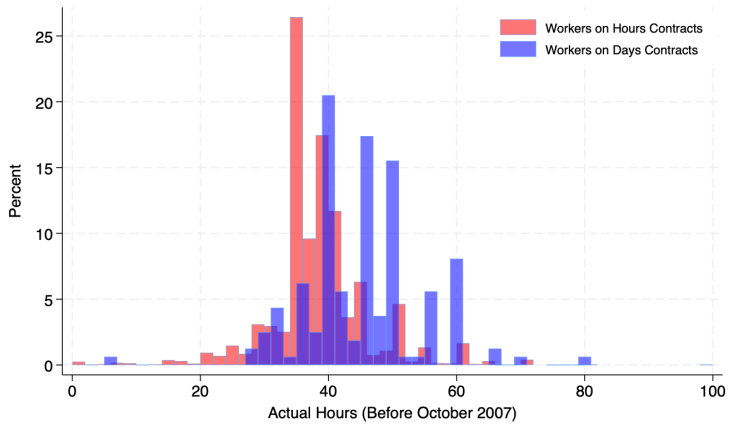



NOTE: This figure compares the desired hour actual hour, mismatch, and absolute mismatch distributions between cross-border and domestic workers. Three of these four variables are a dependent variable of interest in my empirical analysis. Complemented by the descriptive statistics presented in Table G, this shows the cross-border worker strategy is not valid for identification of the 2007 TEPA Law on the work hours mismatch.

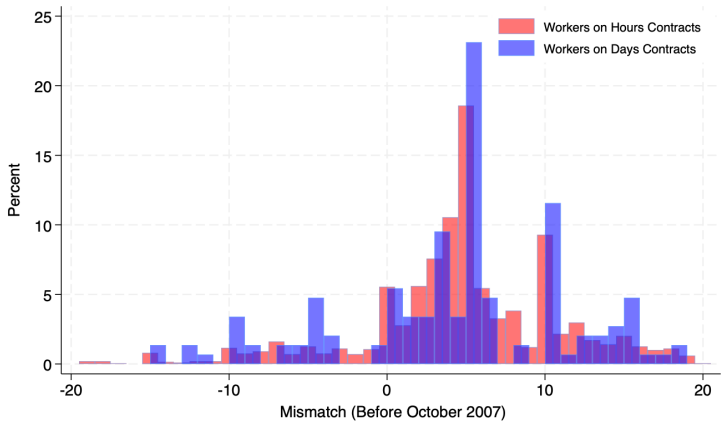
**Figure G2:** Comparing the Desired Hour, Actual Hour, Mismatch, and Absolute Mismatch Distributions between Workers on Hours and Days Contracts, before October 2007



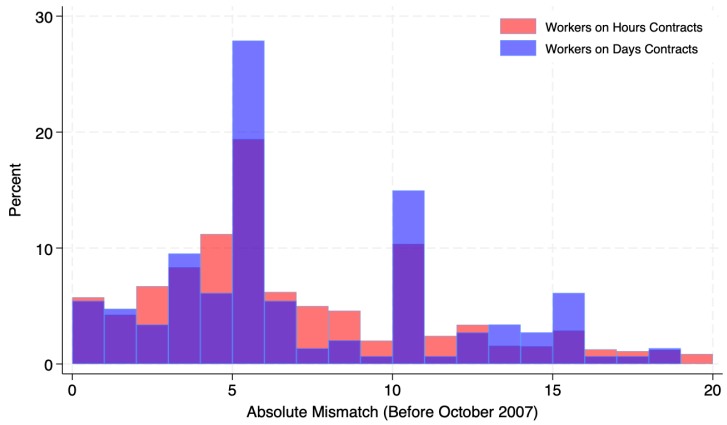

**(a)**




**(b)**




**(c)**




**(d)**

NOTE: This figure compares the desired hour actual hour, mismatch, and absolute mismatch distributions between workers on hours and days contracts. Three of these four variables are a dependent variable of interest in my empirical analysis. Complemented by the descriptive statistics presented in Table G, this argues in favor of the days and hours contracts identification strategy.

# Appendix H: Statistics on Work-Schedule Optimizers and non-Optimizers

**Table H1:** Classification of Socio-Professional Categories by Work Schedule Flexibility

| **Work Schedule Optimizers** | **Work Schedule Non-Optimizers** |
|---|---|
| Professors, scientific professions | Skilled industrial workers |
| Information, arts, and entertainment professionals | Skilled craft workers |
| Corporate admin & commercial execs | Skilled handlers, warehouse & transport |
| Engineers and technical executives | Unskilled industrial workers |
| Intermediate admin & commercial professionals | Unskilled craft workers |
| Supervisors, foremen | |

**Table H2:** Descriptive Statistics by Work-Schedule Optimizer Status

| | Optimizers | Non-Optimizers | p-value |
|---|---|---|---|
| Gender | 0.675 | 0.866 | 0.000 |
| | (0.468) | (0.340) | |
| Age | 41.44 | 40.38 | 0.000 |
| | (9.90) | (10.60) | |
| Years of Study | 15.04 | 11.78 | 0.000 |
| | (3.15) | (2.55) | |
| Has a Child | 1.023 | 1.035 | 0.000 |
| | (0.148) | (0.185) | |
| Number of Children | 1.088 | 1.285 | 0.000 |
| | (1.059) | (1.201) | |
| Marital Status | 0.593 | 0.613 | 0.000 |
| | (0.491) | (0.487) | |
| Job Tenure (months) | 148.22 | 139.70 | 0.000 |
| | (126.17) | (120.75) | |
| Desired Hours | 43.70 | 42.42 | 0.000 |
| | (8.39) | (5.50) | |
| Hours Worked in Ref. Week | 41.05 | 36.30 | 0.000 |
| | (9.44) | (6.26) | |
| Mismatch | 4.34 | 6.24 | 0.000 |
| | (10.15) | (7.20) | |
| Absolute Mismatch | 8.26 | 7.22 | 0.000 |
| | (7.32) | (6.23) | |
| Comp. Overtime Hours | 1.28 | 3.85 | 0.000 |
| | (3.27) | (3.89) | |
| Pr(Mismatch $>$ 0) | 0.966 | 0.978 | 0.000 |
| | (0.182) | (0.146) | |

NOTE: Values are means with standard deviations in parentheses. p-values correspond to two-sample t-tests comparing Work-Schedule Optimizers and Non-Optimizers.

# Appendix I: Mismatch Statistics for Individuals Queried Before and After the TEPA Law

**Table I1:** Mismatch Statistics, by Gender

| | Men | Women | Total | p-value |
|---|---|---|---|---|
| Desired Hours | 43.52 | 40.33 | 42.53 | 0.000 |
| | (7.07) | (6.63) | (7.09) | |
| Actual Hours | 39.02 | 36.92 | 38.35 | 0.000 |
| | (8.49) | (7.19) | (8.16) | |
| Mismatch | 5.84 | 4.20 | 5.33 | 0.000 |
| | (8.59) | (8.48) | (8.59) | |
| Observations | 5,275 | 2,372 | 7,647 | |

NOTE: Standard deviations in parentheses. p-values correspond to two-sample t-tests comparing men and women. The null can be rejected at the 1% level for all comparisons. Observations vary by variable, there are 7647 observations for the mismatch and desired hours, and 44429 observations for the mismatch.

**Table I2:** Mismatch Statistics, by Age Group

| | 18–29 | 30–39 | 40–49 | 50–59 | 60+ | Total |
|---|---|---|---|---|---|---|
| Desired Hours | 42.98 | 43.16 | 42.00 | 41.31 | 42.91 | 42.53 |
| | (6.86) | (6.97) | (6.86) | (7.94) | (7.13) | (7.09) |
| Actual Hours | 37.67 | 38.30 | 38.61 | 38.52 | 39.79 | 38.35 |
| | (7.23) | (8.08) | (8.37) | (8.57) | (9.06) | (8.16) |
| Mismatch | 6.12 | 5.81 | 4.67 | 4.08 | 5.06 | 5.33 |
| | (8.31) | (8.23) | (8.77) | (9.30) | (7.91) | (8.59) |
| p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Observations | 2,039 | 2,392 | 2,070 | 1,111 | 35 | 7,647 |

NOTE: Standard deviations in parentheses. p-values correspond to t-tests of the hypothesis that `desired hours - actual hours = 0` within each age group. The null can be rejected at the 1% level for all groups. Observations vary by variable, there are 7647 observations for the mismatch and desired hours, and 44429 observations for the mismatch.

**Table I3:** Mismatch Statistics, by Education Level

| | No Tertiary | Vocational | Higher Ed | Total |
|---|---|---|---|---|
| Desired Hours | 42.41 | 42.15 | 44.14 | 42.53 |
| | (7.01) | (6.62) | (8.28) | (7.09) |
| Actual Hours | 37.54 | 38.75 | 41.97 | 38.35 |
| | (7.59) | (8.35) | (9.58) | (8.16) |
| Mismatch | 5.58 | 5.14 | 4.07 | 5.33 |
| | (8.35) | (8.42) | (10.28) | (8.59) |
| p-value | 0.000 | 0.000 | 0.000 | 0.000 |
| Observations | 5,222 | 1,643 | 782 | 7,647 |

NOTE: Standard deviations in parentheses. p-values correspond to t-tests of the hypothesis that `desired hours - actual hours = 0` within each education group. Educational categories are self-reported and mutually exclusive. Observations vary by variable, there are 7647 observations for the mismatch and desired hours, and 44429 observations for the mismatch.

**Table I4:** Mismatch Statistics, by Salary Bracket

| | 0.5–1k | 1–1.25k | 1.25–1.5k | 1.5–2k | 2–2.5k | 2.5–3k | 3–5k | 5–8k | 8k+ |
|---|---|---|---|---|---|---|---|---|---|
| Desired Hours | 40.59 | 41.68 | 42.20 | 42.40 | 43.14 | 45.23 | 44.72 | 48.28 | 45.51 |
| | (5.77) | (5.66) | (5.92) | (7.29) | (8.09) | (10.29) | (9.72) | (10.32) | (8.99) |
| Actual Hours | 36.69 | 35.93 | 36.39 | 37.62 | 39.43 | 41.52 | 43.65 | 48.53 | 44.02 |
| | (8.37) | (5.81) | (6.22) | (7.58) | (8.47) | (9.25) | (10.00) | (11.20) | (10.64) |
| Mismatch | 6.22 | 5.75 | 6.01 | 5.33 | 4.57 | 4.10 | 2.30 | -2.55 | 5.00 |
| | (7.36) | (6.92) | (7.78) | (8.87) | (9.54) | (10.92) | (11.71) | (13.61) | (10.39) |
| p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.145 | 0.261 | 0.253 | 0.877 | 0.020 |
| Observations | 152 | 1,711 | 2,023 | 2,161 | 790 | 312 | 307 | 40 | 145 |

NOTE: Standard deviations in parentheses. p-values correspond to two-sample t-tests comparing desired and actual hours within each salary bracket. An individual's wage values were averaged and spread in order to capture more desired and actual hours observations per wage category. Without this, each category would've had 2, 61, 96, 57, 36, 12, 10, 6, 2, and 32 observations, respectively. The null cannot be rejected at the 1% level for all brackets. I attribute this to the number of available observations.

**Table I5:** Mismatch Statistics, by Industry

| Industry | Desired Hours | Actual Hours | Mismatch | p-value |
|---|---|---|---|---|
| Not Reported | 42.06 | 39.92 | 3.62 | 0.344 |
| | (11.73) | (9.91) | (15.28) | |
| Manufacturing, extractive, and other industries | 42.03 | 37.75 | 5.46 | 0.000 |
| | (6.23) | (8.02) | (8.28) | |
| Construction | 42.66 | 37.92 | 5.67 | 0.000 |
| | (5.34) | (7.27) | (7.41) | |
| Trade, transport, accommodation and food services | 42.57 | 38.71 | 5.11 | 0.000 |
| | (7.52) | (8.49) | (8.57) | |
| Information and communication | 42.27 | 38.95 | 6.01 | 0.000 |
| | (6.85) | (7.83) | (6.73) | |
| Financial and insurance activities | 41.36 | 38.38 | 4.27 | 0.000 |
| | (7.59) | (8.55) | (10.07) | |
| Real estate activities | 42.99 | 38.87 | 7.09 | 0.000 |
| | (7.31) | (8.27) | (8.22) | |
| Professional, scientific, technical, and admin. support | 43.16 | 38.60 | 5.47 | 0.000 |
| | (7.76) | (8.03) | (8.97) | |
| Other service activities | 43.60 | 38.80 | 5.28 | 0.000 |
| | (8.44) | (8.16) | (9.82) | |
| Total | 42.53 | 38.35 | 5.33 | 0.000 |
| | (7.09) | (8.16) | (8.59) | |

NOTE: Standard deviations in parentheses. p-values correspond to two-sample t-tests comparing desired and actual hours within each industry. The null can be rejected at the 1% level for all groups. Observations vary by variable: there are 7,647 observations for mismatch and desired hours, and 44,429 observations for actual hours.

# Appendix J: Heterogeneity Analysis

## Gender

**Table J1:** Effect of the TEPA Law on Workers under Hours Contracts (Non-Work-Schedule Optimizers), Interrogated before and after the Reform - Men vs. Women

| **Dependent Variable** | **Men** | | | | | | **Women** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Desired Hours | -1.27 | -1.19$^{*}$ | -1.88$^{***}$ | -1.42$^{**}$ | -1.36$^{**}$ | -1.35$^{**}$ | 4.73$^{***}$ | -0.01 | -0.60 | -0.10 | -0.24 | -0.21 |
| | (4.43) | (0.63) | (0.64) | (0.64) | (0.64) | (0.65) | (1.37) | (0.74) | (0.89) | (0.83) | (0.80) | (0.79) |
| | [160] | [1582] | [1445] | [1587] | [1589] | [1589] | [38] | [634] | [540] | [607] | [607] | [607] |
| Actual Hours | -0.28 | 0.18 | 0.23 | 0.22 | 0.22 | 0.22 | 1.76 | 0.46 | 0.38 | 0.36 | 0.33 | 0.33 |
| | (1.90) | (0.28) | (0.29) | (0.28) | (0.28) | (0.28) | (1.69) | (0.41) | (0.43) | (0.40) | (0.40) | (0.40) |
| | [2184] | [10819] | [10213] | [10928] | [10937] | [10937] | [888] | [4811] | [4196] | [4684] | [4693] | [4693] |
| Absolute Mismatch | 4.40 | -1.22 | -2.13$^{***}$ | -1.54$^{*}$ | -1.45$^{*}$ | -1.45$^{*}$ | -6.81$^{***}$ | -0.28 | 1.08 | 0.15 | 0.03 | 0.05 |
| | (4.72) | (0.82) | (0.80) | (0.80) | (0.80) | (0.80) | (0.87) | (1.26) | (1.17) | (1.35) | (1.29) | (1.28) |
| | [160] | [1582] | [1445] | [1587] | [1589] | [1589] | [38] | [634] | [540] | [607] | [607] | [607] |
| Mismatch Squared | 120.60 | -43.68$^{*}$ | -63.91$^{***}$ | -51.35$^{**}$ | -49.27$^{**}$ | -49.32$^{**}$ | -92.42$^{***}$ | -31.67 | 19.03 | -24.03 | -24.60 | -23.37 |
| | (119.10) | (24.45) | (24.14) | (23.77) | (23.83) | (23.84) | (7.79) | (37.88) | (28.80) | (41.61) | (39.56) | (38.87) |
| | [160] | [1582] | [1445] | [1587] | [1589] | [1589] | [38] | [634] | [540] | [607] | [607] | [607] |
| Pr(Mismatch $>$ 0) | 0.76$^{*}$ | -0.10$^{**}$ | -0.14$^{***}$ | -0.11$^{***}$ | -0.11$^{***}$ | -0.11$^{***}$ | -0.09 | -0.12 | -0.10 | -0.09 | -0.12 | -0.11 |
| | (0.45) | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | (0.24) | (0.09) | (0.11) | (0.10) | (0.10) | (0.10) |
| | [160] | [1582] | [1445] | [1587] | [1589] | [1589] | [38] | [634] | [540] | [607] | [607] | [607] |

NOTE: This table presents estimates for the Difference-in-Differences coefficient $\beta_1$ from the specified Equation (19). The estimated effect is the LATE for non-work-schedule optimizers. The coefficients distinguish between the average treatment effect which the 2007 TEPA reform had on the corresponding dependent variables for male and female workers on hours contracts, respectively. Each column corresponds to a different model. Only the imputed wage series is used throughout the table. All models include individual and time fixed effects. Robust standard errors are in parentheses and clustered at the individual level. The number of observations for the respective regression is shown in brackets.
$^{*}$p<0.10, $^{**}$p<0.05, $^{***}$p<0.01.

## Industry

**Table J2:** Effect of the TEPA Law on Workers under Hours Contracts (Non-Work-Schedule Optimizers), by Industry

| **Dependent Variable** | **Manufacturing** | | | | | | **Construction** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Desired Hours | -13.64*** | -0.333*** | -0.214* | -0.371*** | -0.413*** | 0.115 | 0.00 | 0.724 | -0.337*** | -0.835*** | -0.335*** | -0.408** |
| | (3.538) | (0.102) | (0.116) | (0.0726) | (0.101) | (0.414) | (.) | (0.687) | (0.117) | (0.304) | (0.125) | (0.170) |
| | [54] | [4062] | [4387] | [4397] | [4397] | [1735] | [.] | [868] | [1989] | [2168] | [2168] | [2168] |
| Actual Hours | 4.353 | 0.450 | 0.478 | 0.493 | 0.469 | 0.504 | -5.097 | -0.682 | -0.542 | -0.646 | -0.622 | -0.623 |
| | (3.637) | (0.471) | (0.461) | (0.460) | (0.461) | (0.462) | (4.267) | (0.595) | (0.632) | (0.597) | (0.596) | (0.594) |
| | [820] | [4154] | [4438] | [4443] | [4443] | [4446] | [390] | [2176] | [2028] | [2188] | [2188] | [2188] |
| Absolute Mismatch | -15.64*** | -1.003** | -1.012** | -1.055** | -1.085** | -1.334* | 0.00 | 0.751 | 0.127 | -0.203 | 0.0675 | 0.0593 |
| | (2.613) | (0.450) | (0.440) | (0.442) | (0.440) | (0.726) | (.) | (1.047) | (0.618) | (0.590) | (0.572) | (0.594) |
| | [54] | [4065] | [4385] | [4395] | [4395] | [1735] | [.] | [868] | [1991] | [2168] | [2168] | [2168] |
| Mismatch Squared | -238.5*** | -43.44*** | -43.88*** | -44.02*** | -43.92*** | -48.81* | 0.00 | 18.60 | 3.761 | 0.691 | 2.730 | -0.594 |
| | (66.50) | (15.04) | (15.38) | (15.29) | (15.15) | (26.41) | (.) | (31.47) | (20.89) | (18.69) | (18.02) | (18.35) |
| | [54] | [4065] | [4385] | [4395] | [4395] | [1735] | [.] | [868] | [1991] | [2168] | [2168] | [2168] |
| Pr(Mismatch > 0) | 0.377 | -0.00760 | 0.0106 | -0.0115 | -0.0109 | 0.0113 | 0.00 | -0.00771 | 0.00459 | 0.00424 | -0.0121 | -0.00692 |
| | (0.424) | (0.0207) | (0.0207) | (0.0207) | (0.0207) | (0.0320) | (.) | (0.0476) | (0.0292) | (0.0265) | (0.0210) | (0.0247) |
| | [54] | [4065] | [4385] | [4395] | [4395] | [1735] | [.] | [868] | [1991] | [2168] | [2168] | [2168] |

NOTE: This table presents estimates for the Difference-in-Differences coefficient $\beta_1$ from Equation (19) across industry categories. Work-schedule non-optimizers have been dropped from the sample to avoid dilution effects. All models include individual and time fixed effects. Standard errors are robust and clustered at the individual level. Sample sizes in brackets.
*p<0.10, **p<0.05, ***p<0.01.

**Table J3:** Effect of the TEPA Law on Workers under Hours Contracts (Non-Work-Schedule Optimizers), by Industry

| **Dependent Variable** | **Commercial** | | | | | | **Specialized** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Desired Hours | 0.00 | 0.00169 | -0.247*** | -0.541** | -0.321*** | -0.357*** | 0.00 | -0.216 | -0.266 | -0.518* | -0.525*** | -0.493** |
| | (.) | (0.380) | (0.0946) | (0.214) | (0.0830) | (0.117) | (.) | (0.572) | (0.169) | (0.277) | (0.152) | (0.209) |
| | [58] | [2008] | [4470] | [4975] | [4989] | [4992] | [.] | [635] | [1519] | [1727] | [1726] | [1727] |
| Actual Hours | -0.625 | 0.809** | 0.847** | 0.871** | 0.875** | 0.868** | -7.064 | -0.246 | -0.983 | -0.476 | -0.487 | -0.461 |
| | (1.515) | (0.401) | (0.426) | (0.401) | (0.399) | (0.400) | (4.424) | (0.642) | (0.704) | (0.656) | (0.656) | (0.657) |
| | [968] | [5128] | [4718] | [5124] | [5126] | [5126] | [200] | [1750] | [1594] | [1770] | [1770] | [1770] |
| Absolute Mismatch | 0.00 | -0.689 | -0.453 | -0.692* | -0.536 | -0.627 | 0.00 | -0.341 | 0.519 | 0.0735 | 0.276 | 0.316 |
| | (.) | (0.658) | (0.415) | (0.402) | (0.378) | (0.382) | (.) | (1.490) | (0.690) | (0.648) | (0.637) | (0.653) |
| | [58] | [2008] | [4490] | [4974] | [4986] | [4987] | [.] | [635] | [1524] | [1724] | [1724] | [1724] |
| Mismatch Squared | 0.00 | -27.38 | -15.24 | -21.44* | -16.80 | -16.97 | 0.00 | -37.97 | 3.544 | -7.924 | 0.850 | 3.563 |
| | (.) | (21.62) | (12.43) | (11.92) | (11.35) | (11.37) | (.) | (52.47) | (25.03) | (21.93) | (22.03) | (22.48) |
| | [58] | [2008] | [4490] | [4974] | [4986] | [4987] | [.] | [635] | [1524] | [1724] | [1724] | [1724] |
| Pr(Mismatch > 0) | 0.00 | -0.0733* | 0.00812 | -0.0285 | -0.0220 | -0.0183 | 0.00 | 0.0200 | 0.0503* | 0.0222 | 0.00179 | 0.0250 |
| | (.) | (0.0418) | (0.0241) | (0.0264) | (0.0254) | (0.0298) | (.) | (0.0530) | (0.0261) | (0.0292) | (0.0259) | (0.0270) |
| | [58] | [2008] | [4490] | [4974] | [4986] | [4987] | [.] | [635] | [1524] | [1724] | [1724] | [1724] |

NOTE: This table presents estimates for the Difference-in-Differences coefficient $\beta_1$ from Equation (19) across industry categories. Work-schedule non-optimizers have been dropped from the sample to avoid dilution effects. All models include individual and time fixed effects. Standard errors are robust and clustered at the individual level. Sample sizes in brackets.
*p<0.10, **p<0.05, ***p<0.01.

**Table J4:** Effect of the TEPA Law on Workers under Hours Contracts (Non-Work-Schedule Optimizers), by Industry

| **Dependent Variable** | **Financial & Real Estate** | | | | | | **Information, Communication & Services** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Desired Hours | 0.00 | -0.379 | 0.253 | -0.667 | -0.169 | -0.0534 | 0.00 | 1.231 | -0.153 | -0.0759 | -0.149 | -0.258 |
| | (.) | (0.508) | (0.384) | (0.461) | (0.252) | (0.356) | (.) | (1.552) | (0.303) | (0.321) | (0.190) | (0.235) |
| | [58] | [236] | [655] | [733] | [735] | [735] | [.] | [310] | [854] | [986] | [997] | [997] |
| Actual Hours | -12.33* | 0.285 | 0.358 | 0.270 | 0.258 | 0.160 | -5.701 | -1.971* | -1.375 | -1.287 | -1.321 | -1.288 |
| | (6.561) | (0.838) | (0.883) | (0.844) | (0.850) | (0.850) | (5.182) | (1.084) | (1.163) | (1.139) | (1.116) | (1.122) |
| | [86] | [791] | [718] | [774] | [775] | [775] | [42] | [1056] | [904] | [1021] | [1033] | [1033] |
| Absolute Mismatch | 0.00 | 0.434 | 0.382 | 0.373 | 0.590 | 0.875 | 0.00 | -1.783 | -0.547 | -0.579 | -0.861 | -0.964 |
| | (.) | (1.785) | (0.824) | (0.768) | (0.811) | (0.818) | (.) | (2.195) | (1.035) | (1.035) | (0.987) | (0.989) |
| | [58] | [236] | [659] | [733] | [735] | [735] | [.] | [310] | [855] | [986] | [997] | [997] |
| Mismatch Squared | 0.00 | 9.868 | 15.55 | 9.420 | 17.15 | 21.30 | 0.00 | -93.07 | -31.40 | -38.69 | -41.50 | -43.43 |
| | (.) | (37.42) | (18.76) | (17.67) | (17.86) | (17.55) | (.) | (65.49) | (31.16) | (30.95) | (30.15) | (29.79) |
| | [58] | [236] | [659] | [733] | [735] | [735] | [.] | [310] | [855] | [986] | [997] | [997] |
| Pr(Mismatch > 0) | 0.00 | 0.0744 | 0.00158 | -0.0652 | -0.0132 | -0.00923 | 0.00 | 0.228** | 0.167** | 0.141** | 0.105* | -0.00527 |
| | (.) | (0.0829) | (0.0658) | (0.0771) | (0.0712) | (0.0707) | (.) | (0.105) | (0.0713) | (0.0668) | (0.0537) | (0.0690) |
| | [58] | [236] | [659] | [733] | [735] | [735] | [.] | [310] | [855] | [986] | [997] | [997] |

NOTE: This table presents estimates for the Difference-in-Differences coefficient $\beta_1$ from Equation (19) across industry categories. Work-schedule non-optimizers have been dropped from the sample to avoid dilution effects. All models include individual and time fixed effects. Standard errors are robust and clustered at the individual level. Sample sizes in brackets.
*p<0.10, **p<0.05, ***p<0.01.

## Wage

**Table J5:** Effect of the TEPA Law on Workers under Hours Contracts (Non-Work-Schedule Optimizers), by Wage Tertile

| **Dependent Variable** | **Low Wage Tercile** | | | | | | **High Wage Tercile** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| Desired Hours | 12.56*** | -1.15 | -1.60* | -0.83 | -0.64 | -0.50 | -68.77 | 0.70 | 2.27** | -1.04 | 7.45*** | 4.74* |
| | (2.45) | (0.71) | (0.83) | (1.25) | (1.08) | (1.05) | (.) | (0.71) | (0.91) | (2.35) | (1.38) | (2.77) |
| | [106] | [1265] | [1064] | [377] | [408] | [403] | [22] | [618] | [510] | [66] | [89] | [71] |
| Actual Hours | 0.25 | 0.18 | 0.34 | 0.48 | 0.46 | 0.76* | -0.41 | -0.29 | -0.11 | 0.01 | 0.06 | -0.07 |
| | (1.67) | (0.30) | (0.32) | (0.44) | (0.41) | (0.42) | (1.70) | (0.39) | (0.42) | (0.94) | (0.92) | (0.99) |
| | [1054] | [7275] | [6514] | [3050] | [3107] | [3094] | [1508] | [8793] | [7785] | [1664] | [1741] | [1708] |
| Absolute Mismatch | 0.00 | -0.50 | -1.11 | 1.28 | 0.60 | 1.11 | 15.60*** | -0.70 | -1.83 | -0.11 | 6.45* | 12.63*** |
| | (.) | (0.81) | (0.86) | (1.17) | (1.14) | (1.11) | (0.00) | (1.32) | (1.55) | (1.10) | (3.65) | (3.11) |
| | [32] | [1265] | [1064] | [377] | [408] | [403] | [8] | [618] | [510] | [851] | [89] | [71] |
| Mismatch Squared | -160.70 | -11.92 | -25.30 | 27.99 | 21.03 | 34.68 | -485.30 | -28.36 | -52.74 | 99.70 | 72.89 | 234.70*** |
| | (295.00) | (25.62) | (28.54) | (29.60) | (28.67) | (28.27) | (.) | (43.11) | (53.23) | (74.42) | (97.89) | (44.33) |
| | [106] | [1265] | [1064] | [377] | [408] | [403] | [22] | [618] | [510] | [66] | [89] | [71] |
| Pr(Mismatch > 0) | 1.66* | -0.09** | -0.10* | -0.07 | -0.09 | -0.08 | 6.37 | 0.03 | 0.07 | -0.92** | 0.22 | -0.08 |
| | (0.86) | (0.04) | (0.05) | (0.12) | (0.12) | (0.11) | (.) | (0.09) | (0.10) | (0.38) | (0.61) | (0.70) |
| | [106] | [1265] | [1064] | [377] | [408] | [403] | [22] | [618] | [510] | [66] | [89] | [71] |

| **Dependent Variable** | **Medium Wage Tercile** | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Desired Hours | 22.69*** | -0.36 | -0.37 | 3.12** | 3.54*** | 2.94** |
| | (4.18) | (0.59) | (0.86) | (1.28) | (0.96) | (1.31) |
| | [30] | [997] | [785] | [177] | [200] | [167] |
| Actual Hours | 2.38* | 0.38 | 0.17 | -0.19 | -0.09 | -0.63 |
| | (1.41) | (0.35) | (0.39) | (0.82) | (0.78) | (0.72) |
| | [1052] | [8151] | [6928] | [2015] | [2156] | [2096] |
| Absolute Mismatch | -114.30 | -1.71* | -0.72 | -12.56** | -5.11 | -4.04 |
| | (.) | (0.94) | (1.35) | (5.96) | (4.61) | (5.96) |
| | [22] | [997] | [785] | [177] | [200] | [167] |
| Mismatch Squared | -120.60*** | -63.65** | -29.51 | -469.40** | -175.50 | -181.00 |
| | (5.96) | (26.55) | (30.83) | (232.70) | (181.30) | (242.70) |
| | [30] | [997] | [785] | [177] | [200] | [167] |
| Pr(Mismatch > 0) | 5.75*** | -0.10 | -0.09 | -0.58*** | -0.37** | -0.38* |
| | (0.02) | (0.07) | (0.10) | (0.18) | (0.16) | (0.22) |
| | [30] | [997] | [785] | [177] | [200] | [167] |

NOTE: The tables above present estimates for the Difference-in-Differences coefficient $\beta_1$ from Equation (19), across the three income terciles. Work-schedule non-optimizers are included in the sample to avoid insufficient observations. All models include individual and time fixed effects. Standard errors are robust and clustered at the individual level. Sample sizes in brackets.
*p<0.10, **p<0.05, ***p<0.01.