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The Micro and Macro of Labor Market Policies

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1   Introduction

The employment contract characterizes a relationship between an employer and an employee. The contract defines several parameters of the job such as the compensation, the working time, the tasks to be executed, and the conditions to terminate the job. Policymakers introduce institutions that affect these dimensions of the contract. Labor market institutions change over time in response to evolving employment norms, and the scope of these regulations determines the flexibility of the labor market. Countries differ substantially in their degree of labor market flexibility, and the role of labor market institutions is often debated.

This dissertation analyzes the effects of labor market institutions on workers, firms, and the labor market. In particular, the dissertation focuses on labor market regulations introduced to improve the quality of jobs. First, the impact of labor market regulations is studied at the microeconomic level. For instance, how does firm-level employment vary in response to a labor reform? Second, the dissertation provides evidence about the aggregate effects of these policies. What is the impact on aggregate employment and on the unemployment rate? Third, the dissertation focuses on the relationship between the effects at the micro level (on firms and workers) and the macroeconomic impact (on the labor market).

My dissertation is composed of two main papers, studying two types of employment regulations. First, I study working time regulations. Working time policies determine what is allowed for the number and distribution of working hours. Second, I consider the effects of employment protection legislation, which refers to the rules affecting the termination of employment contracts, such as firing costs and restrictions.

2   The Effects of the Legal Minimum Working Time on Workers, Firms, and the Labor Market

Part-time jobs are a sizable share of employment in many countries. On average in OECD countries, 16.7% of workers worked less than 30 hours per week in 2020.[1] These jobs are becoming more and

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[1] This share was equal to 18.0% in Canada, 13.1% in France, 22.5% in Germany, 17.9% in Italy, 26.7% in Switzerland, 22.4% in the United Kingdom and 11.7% in the United States (OECD Employment Database).

more prevalent as this share has been increasing over the past decades in most countries. Both labor supply and labor demand factors can explain the existence of part-time jobs. Some workers want to work part time because of their constraints or preferences. Firms may rely on low-hour jobs because of their production technologies. For example, in the retail and service industries, hours worked must coincide with the timing of consumption. It is unclear, however, whether the employees working part time are the ones who want to work low hours. Employers may exert their market power to impose low-hour jobs. Restricting these jobs has been debated in several countries, for instance, in Germany with Minijobs and in the United Kingdom with Zero Hour Contracts. Yet, very little is known about the potential effects of restricting low-hour jobs.

This paper exploits a unique reform implementing a minimum workweek in France to provide new evidence on how the labor market adjusts to a restriction of low-hour jobs. The reform consists of a minimal legal working time of 24 hours per week, targeting new hires starting in 2014. The policy shock was sizable as 15% of jobs had a workweek below 24 hours before that date. To the best of my knowledge, this is the first paper on the effects of a minimum workweek. I provide evidence on the effects within firms, between firms, and at the aggregate level. I first quantify these effects for all workers and then decompose them between men and women. I offer a comprehensive assessment by combining administrative data, reduced-form methods and a structural general equilibrium model. This allows me to document the effects of a minimum working time on employment (in terms of jobs and hours), welfare, and gender inequality. Beyond the causal effects, my analysis provides a better understanding of (i) the labor demand determinants of hours, especially the degree of substitutability between hours and workers; (ii) labor supply behaviors, namely heterogeneous preferences in working time; and (iii) sorting and the allocation of workers between firms. My analysis proceeds in four steps.

First, I rely on French linked employer-employee data and an event study design in order to estimate the impact of the minimum workweek at the firm level. My empirical strategy leverages firm-level differences in the pre-reform share of jobs with a workweek below 24 hours. Identification assumes that firms with different shares of affected jobs would have had the same evolution in employment had the reform not been implemented. I show that this assumption is credible over the pre-reform period.

I find that the minimum workweek decreased the number of workers employed in the firm. This negative extensive margin effect is driven by a reduction in low-hour jobs. Meanwhile, there is a positive effect on average hours per job (intensive margin effect), driven by an increase in the number of full-time workers. Overall, total hours worked in the firm decrease, indicating that the negative extensive margin effect dominates. An initial share of jobs below 24 hours higher by 1 percentage point is associated with a 0.2% decrease in hours. This result suggests that firms cannot flexibly substitute between hours and workers.

Importantly, the minimum workweek has heterogeneous effects between men and women. The firm-level decrease in total hours worked is mostly driven by a reduction in female employment. Two channels explain these differences. First, the negative impact on the number of jobs is stronger for women, which is consistent with the fact that women were more likely to have a workweek below 24

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hours before the reform. Second, the increase in the number of full-time jobs is stronger for men. Hence, women are more affected by the negative effect on the extensive margin and benefit less from the positive effect on the intensive one. These results hold within industries and occupations and are driven by the hiring margin. These findings suggest that full-time men have replaced part-time women for the same jobs.

Second, I analyze the potential reallocation of workers between firms. Since firms more exposed to the policy are shrinking, the unemployment pool becomes larger, making it easier for firms less exposed to hire new workers. Firm-level reduced-form evidence does not take into account these potential between-firm reallocation effects. To investigate indirect effects, I consider simultaneously the effects of the own firm-level exposure and the leave-one-out average exposure at the market level on firm's employment. I find that the number of jobs increased in firms operating in a market where other firms were more exposed to the policy. The reallocation of workers between firms has two important implications. First, firm-level reduced-form results are potentially biased since the Stable Unit Treatment Value Assumption (SUTVA) does not hold. Second, the aggregate impact of the minimum workweek can be very different from firm-level reduced-form estimates.[2] A structural general equilibrium model allows me to take into account both the firm-level effects as well as indirect reallocation.

Third, to quantify the aggregate impact of the minimum workweek, I build a search and matching model with two-sided heterogeneity. The framework is a random search model with large firms and bargaining of hours and wages. Men and women differ ex ante with respect to their distributions of labor disutility, as suggested by differences in preferred working time in the French Labor Force Survey. Firms differ in their production technologies, characterized by two components: productivity and the distribution of tasks duration. I compare the equilibrium with no minimum workweek and the one with the restriction.

The model predicts firm-level and general equilibrium effects of the minimum workweek. First, the firm-level effects in partial equilibrium are in line with reduced-form results: employment decreases, especially for women, while average hours increase. Second, these direct negative employment effects induce indirect positive feedback effects in general equilibrium. Since there are more unemployed workers, for whom the value of the outside option decreases, it becomes more profitable to open vacant jobs. While the direct partial equilibrium effects are more important in firms highly exposed to the minimum workweek, the indirect positive effects might dominate in firms with low exposure. Since women are more affected by the direct effects, they contribute more to these general equilibrium effects, which will also benefit men.

Fourth, I estimate the structural parameters of the model over the period before the introduction of the minimum workweek and then simulate the policy shock. I develop an estimation strategy allowing me to separately identify labor supply and labor demand parameters, in independent steps. I combine data from the Labor Force Survey, informative about labor supply for men and women, with data from job ads, informative about firms' need of hours, and administrative data on actual

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[2]While it is possible to show evidence of some reallocation in reduced-form, they cannot all be quantified.

hours worked in the economy.[3] Conditional on estimated values for the structural parameters, I estimate the parameter characterizing the policy shock using my reduced-form results. I estimate a simulated regression in the model, which is the direct counterpart of the difference-in-differences specification in the reduced-form strategy.

Taking into account both firm-level and general equilibrium adjustments, I estimate that the minimum workweek destroyed 1% of all jobs in the economy. The unemployment rate increased by 9% (a 0.85 percentage point increase), with women being more affected. Importantly, the model uncovers new results for the total number of hours worked: The aggregate change is very close to zero. While firm-level effects are negative for total hours, reallocation compensates these effects. This is due to the fact that workers reallocate to firms less affected and hence offering more hours. This result indicates that, after the policy, almost the same number of hours of work is concentrated among fewer workers. These workers are more likely to be men.

I estimate that firms offering more hours, to which workers reallocate, are also more productive. Consequently, aggregate gross market production increases with the reform. The policy, however, induces additional aggregate costs, mostly due to the cost of having more workers unemployed and red tape costs directly due to the regulation, so that total net output decreases by 1.15%. Finally, I find an increase in the welfare of employed workers, because the average quality of jobs is higher after the policy. However, workers are more likely to be unemployed and the welfare is lower in that state. For men, the two effects offset each other and welfare is unchanged. Welfare decreases for women since they are more affected by the increase in unemployment. The gender gap in welfare increases by 3% due to the minimum workweek.

A large literature seeks to identify the determinants of hours worked and part-time jobs (Altonji & Paxson (1988), Aaronson & French (2004), Hirsch (2005), Blundell et al. (2008), Prescott et al. (2009), Booth & Ours (2013), Devicienti et al. (2018), Devicienti et al. (2020), Kopytov et al. (2020), Borowczyk-Martins & Lalé (2019), Bick et al. (2020), Labanca & Pozzoli (2022)). These studies usually consider labor supply and labor demand factors separately. Exploiting the introduction of the French minimum workweek as a shock, combined with rich data on both workers and firms, I provide new evidence about firms' demand for part-time jobs and workers' preferences. I am able to study two channels simultaneously explaining the existence of low-hour jobs. First, some firms structurally demand jobs with low hours, as shown by the imperfect substitutability between hours and jobs. Second, some workers are not available to work long hours, as suggested by gender differences in preferences.

The literature on working time regulations has focused on reductions of the full-time workweek (Hunt (1999), Marimon & Zilibotti (2000), Crepon & Kramarz (2002), Rocheteau (2002), Chemin & Wasmer (2009), Raposo & van Ours (2010)) or atypical types of contracts (Scarfe (2019) and Dolado et al. (2021)) for zero hours contracts in the United Kingdom and Carrillo-Tudela et al. (2021) for mini-jobs in Germany). This paper studies a new type of regulation, minimum working hours, by exploiting a unique reform. I uncover two types of effects that have not been documented

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[3]Jobs ads correspond to vacant jobs posted on the platform administered by the French unemployment service (*Pôle Emploi*).

before in this literature: reallocation of workers between firms and gender heterogeneity. The former is not accounted for in reduced-form evaluations of working time regulations. The second reveals that the average effects of such policies can cover up sizable composition effects. These effects are relevant for other types of working time regulations.

This paper also makes methodological contributions. I add to the search and matching literature, and especially models with hours of work. I depart from Bloemen (2008) and Frazier (2018) by including both intensive and extensive margin adjustments in a general equilibrium framework. My model features two-sided heterogeneity and hence differs from Cooper et al. (2007), Cooper et al. (2017), Dossche et al. (2019), and Kudoh et al. (2019). In my framework, firms do not only differ with respect to their productivity. They also have different needs in terms of hours of work. I flexibly estimate the relationship between firm productivity and the distribution of firms' needs of hours. I develop a new empirical strategy in order to identify labor demand and labor supply parameters in a framework with large firms and two-sided heterogeneity, making use of rich data on workers and firms.

This paper documents sizable reallocation effects of a national working time regulation and contributes to the literature on general equilibrium effects (Auclert et al. (2019), Berger et al. (2021), Hagedorn et al. (2013), Nakamura & Steinsson (2014)). Reallocation effects of labor reforms have been documented in the literature on minimum wage (Dustmann et al. 2021) and short-time work (Giupponi & Landais 2022). I especially show that the aggregate impact of the minimum workweek cannot be deduced from reduced-form estimates at the microeconomic level and relate to Crépon et al. (2013) and Gautier et al. (2018).

3   Spillover Effects of Employment Protection

The second chapter of my dissertation is a paper jointly written with Pierre Cahuc, Franck Malherbet, and Pedro Martins.

A large literature has evaluated the effects of employment protection legislation (EPL) by comparing firms targeted by the regulation with those not targeted.[4] Firm size has been extensively used as the stringency of EPL is size dependent in many countries.[5] These evaluations assume that firms not targeted by EPL are not affected by the policy evaluated, so they can be a valid counterfactual for the firms directly targeted.

In this paper, we examine this widely held assumption of no spillover. We provide evidence

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[4]See, for instance, Boeri & Jimeno (2005), Kugler & Pica (2008), Schivardi & Torrini (2008), Martins (2009), Olsson (2009), Centeno & Novo (2012), Gal et al. (2012), Berton et al. (2017), Bornhäll et al. (2016), Hijzen et al. (2017), Olsson (2017), Bjuggren (2018), Ardito et al. (2021), De Paola et al. (2021), Butschek & Jan Sauermann (2022). There is also a complementary literature that considers other types of firm-size differences in regulation. See, for instance, Gourio & Roys (2014), Garcia-Santana & Pijoan-Mas (2014), Garicano et al. (2016), Bachas et al. (2019), Kaplow (2019), Harju et al. (2019), Martins (2019), Ando (2021).

[5]Among OECD countries, this is the case in Australia, Austria, Belgium, the Czech Republic, Denmark, France, Germany, Hungary, Iceland, Korea, Portugal, Spain, Switzerland and Turkey (OECD 2020).

that spillovers on firms not targeted by EPL can be large at the aggregate level. Our analysis is based on a reform strengthening employment protection for large firms in Portugal. Although the proportion of workers directly impacted by the reform is small, at about 15% of all employees, we show that the spillovers towards firms for which the reform does not apply are significant. We first quantify the impact of the policy on treated firms using reduced-form methods. These estimates indicate a reduction in total employment by about 1.5%. However, the estimation of a structural model accounting for spillovers shows that the overall employment effects are in fact 13 times smaller.

The reform we examine sought to lower job insecurity by reducing the range of circumstances under which fixed-term contracts (FTCs) could be used by large firms that employed at least 750 workers. Before the policy, it was possible to hire under FTC in new establishments (younger than 2 years) launched by firms, without any restriction. From February 2009, large firms could no longer benefit from exemptions that allow hiring with FTCs without justification in new establishments. The hope of the policymakers was that this reform would encourage large firms to substitute permanent jobs for temporary ones.

We have selected this reform for the following reasons. First, the share of workers directly affected by the reform, around 15%, is small, which allows us to show that the effects of spillovers can be significant even in a context where the treated population is of limited size. More precisely, in this context, we show that spillovers induce very small biases on reduced-form estimators, because each firm not directly impacted by the reform is only slightly affected by spillovers. But as these firms employ a large part of the population, spillovers have a significant impact at the macroeconomic level. This highlights our finding that spillovers that cannot be detected with sufficient statistical power with reduced-form estimators, because the treated group is too limited in size, may actually exert a significant effect at the macroeconomic level. Secondly, the choice of Portugal allows us to use rich administrative data, covering all employees, establishments, and firms, at different points in time. Third, several countries have recently tried to reduce job insecurity by imposing constraints on fixed-term hiring.[6] It is important to better understand the consequences of these reforms, which are little explored. From this point of view, Portugal, which like France, Italy, Japan, Poland, and Spain has tried to reduce its high proportion of FTCs, is a relevant field for analysis. In addition, we believe that our novel theoretical framework, based on a structural model that describes the consequences of this type of reform on FTCs, open-ended contracts (OECs), establishment creation, unemployment and welfare, is particularly suitable for this analysis.

Specifically, we start by drawing on linked employer-employee longitudinal data (including information on establishments and employment contract types) and regression discontinuity evaluation methods, to examine the causal effects of the reform on the number of new establishments launched by firms of different sizes and, more importantly, firms' hirings under FTCs and OECs.

We find that the reform was successful in reducing the number of FTCs in the new establishments of large firms. However, the number of permanent contracts in these establishments did not increase and, in some of our specifications, even decreased. This is partly because the number of new

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[6]Denmark in 2013, France in 2013, Japan in 2013, Poland in 2016, Italy in 2018 (see OECD 2020). Interestingly, in 2019, Portugal extended the reform we analyze here by reducing the 750 threshold to 250.

establishments also declined in large firms. When considering both FTCs and permanent contracts together, we find that they declined significantly. Our results indicate that the FTC restriction did not encourage large firms to hire under permanent contracts instead. These results therefore indicate that there is a limited degree of substitutability between FTCs and permanent contracts when the regulation of FTCs becomes more stringent. Some jobs that may be created under FTCs will not necessarily emerge if the FTC legal framework is not available, at least when the alternative involving permanent contracts may have undesirable properties from the perspective of firms.

However, reduced form estimates also show evidence of spillovers to smaller firms, which were not directly targeted by the reform: small firms more exposed to large firms (because of their common geographical and or sectoral location) tend to benefit more from the reduced hiring of FTCs of the latter, as such small firms end up hiring more workers. This suggests that firms used as a control group in our reduced-form analysis are indirectly affected by the reform.

In order to quantify these spillovers and their impact at the aggregate level, we build and estimate a directed search and matching model in which firms of different sizes create establishments that hire temporary and permanent workers. To create establishments, firms look for production opportunities that arrive randomly. Small firms and large firms draw production opportunities in different distributions. Once establishments are created, firms hire workers either on temporary or on permanent contracts, complying with employment protection legislation. Permanent job destruction and conversion of temporary into permanent jobs are endogenous. The model accounts for the direct effects of the regulation of temporary jobs on large firms, the indirect effects on small firms not targeted by the regulation, and feedback effects on large firms induced by the behavior of small firms. The model shows that the reform induces large firms to raise the share of permanent contracts, which lowers job destruction. But the more stringent regulation also reduces the creation of jobs and establishments by large firms. Small firms indirectly benefit from the reform: they create more jobs and more establishments. The presence of small firms competing with large firms to hire workers amplifies the negative impact of the reform on the employment of large firms.

Beyond these qualitative results, the model is used to evaluate the bias in the reduced-form estimates induced by the overlook of spillover effects. We estimate the structural parameters of the model and simulate the policy shock. To identify the impact of the reform in line with the reduced form estimates, we use the structural model to calculate the creation and destruction of jobs during the two years following the reform. We then simulate the effect of the reform on total, permanent, and temporary steady-state employment. We find that spillover effects have a small impact on the firm-level employment of small firms. To the extent that reduced-form estimates rely on the comparison of firm-level employment of small and large firms, this implies that the bias in the reduced-form estimates of the impact of the reform on the employment of young establishments of large firms is small, around 1% of the effect, in our context. However, since small firms account for 85% of total employment, their reaction has a sizable effect on the changes in total employment induced by the reform: estimates of the impact of the reform on total employment, which take into account the general equilibrium effects, are about 13 times lower than those computed from reduced form estimates, which assume that small firms are not impacted.

The structural model is also useful to simulate the impact of the expansion of the FTC regulation to all firms. We find that the employment of all firms is negatively impacted, but to a smaller extent for large firms than when the reform is targeted to them only because small firms lose a competitive advantage when they have to comply with the stringent regulation. Another interest of the structural model is to provide insights on welfare. Note that the directed search model implies that the decentralized equilibrium is efficient conditional on the regulation of employment protection. In this context, welfare is maximum in the absence of layoff costs and regulation of temporary contracts. Nevertheless, the reforms that modify certain parameters of these complex regulations, when they already exist, have non-trivial consequences. Our approach makes it possible to analyze these consequences. We find that the restrictions on FTC creation are detrimental to the welfare of unemployed workers because they have fewer opportunities to find jobs when these restrictions are implemented. The drop in the welfare of unemployed workers reduces the outside option of all employees and consequently their welfare.

This paper contributes to three strands of the literature. First, we add to the literature on the effects of job protection cited above in Footnote 4. We contribute to this literature by estimating the impact of a reform of FTCs relying on micro-data combined with a structural model that allows us to estimate the macroeconomic impact of the reform. More specifically, we evaluate the effects of increases in the stringency of the regulation targeted to large firms. This approach allows us to rely on a regression discontinuity design to evaluate the direct impact of the reform on large firms and its spillover effects on other firms. Although theoretical models predict that employment protection has equilibrium effects, these effects have not been empirically evaluated before, as far as we know. We do find that the reform had significant effects on firms whose regulation of temporary contracts remained unchanged. From a methodological perspective, our results point to the importance of accounting for spillover effects to evaluate employment protection legislation, whether it applies to all firms or to a subset of firms. This means, in particular, that it is unlikely that reduced-form estimates of the effects of employment protection legislation that rely on different groups of firms or workers and on SUTVA (Stable Unit Treatment Value Assumption) yield reliable evaluations.

The second strand of the literature comprises contributions that deal with partial employment protection reforms targeted at FTCs (Booth et al. 2002, Blanchard & Landier 2002, Cahuc & Postel-Vinay 2002, Boeri & Garibaldi 2007, Boeri 2011, Bentolila et al. 2012, García-Pérez et al. 2018, Cahuc et al. 2016, Martins 2021, Hijzen et al. 2017, Cahuc et al. 2020). We elaborate and estimate a model with firms and establishments that comprises temporary and permanent jobs. In the process, we also shed light on the role of establishment creation within firms (a form of 'intrapreneurship') in job creation and worker flows (Haltiwanger et al. 2013). This model is useful to evaluate the effects of employment protection legislation on temporary and permanent contracts that apply differently according to firm and/or establishment size. Insofar as these features are found in the regulations of many countries (OECD 2020), this model can be used to analyze the consequences of employment laws in many different empirically relevant contexts.

Our analysis of spillover effects contributes to the literature that combines reduced form (experimental or quasi-experimental) and structural modeling approaches (see the survey of Todd &

Wolpin (2021)). Most of this literature is focused on the analysis of selection problems in the program evaluation approach (Heckman 2010). We contribute to the analysis of spillover effects, which is much less developed in this literature (Wise 1985, Wolpin & Todd 2006, Cahuc & Le Barbanchon 2010, Attanasio et al. 2012, Ferrall 2012, Galiani et al. 2015, Lise et al. 2015, Garicano et al. 2016, Gautier et al. 2018, Berger et al. 2021) and non-existent in the literature on employment protection legislation. We relate the outcomes of the structural model to the reduced form estimates to simulate the general equilibrium effects of the reform. We show that spillover effects induce small biases in the estimates of the average effects of the reform on new establishments of large firms (the Average Treatment effects on Treated firms, in the program evaluation approach terminology) because the reform has small spillover effects on the average outcomes of small firms in our context. However, as small firms are numerous and account for a large share of total employment, their reaction has a sizable effect on the changes in overall employment induced by the reform. Hence, small spillover effects, induced by a small subset of the population, which are difficult to evaluate with reduced form strategies, thus may significantly change the overall impact of reforms because they diffuse to the whole population.

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