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IZA DP No. 14942

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Sofía Fernández
Université Libre de Bruxelles

Guerricoa Ilan Tojerow
Université Libre de Bruxelles and IZA

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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Flexible Wages and the Costs of Job Displacement

This paper investigates whether flexible pay increases the wage costs of job displacement. We use quasi-exogenous variation in the timing of job loss due to mass layoffs spanning over an institutional reform that restricted single-employer bargaining, the Belgian Wage Norm in 1996. We find that average earnings losses over a ten-year period after displacement are 10 percentage points larger under flexible pay. Workers displaced from jobs with higher employer-specific wage premiums—service sector and white-collar—benefit the most from restricted single-employer bargaining as their earnings fully converge to non-displaced workers' earnings within three years. We show that the differences in earnings losses across wage-setting systems are not driven by fluctuations in the business cycle. Finally, the wage-setting reform had similar effects on female workers, though it did not narrow the gender gap in pre-layoff wages. Our results suggest that reduced pay flexibility may help displaced workers catch up faster to non-displaced workers' pay premium ladder conditional on re-employment.

JEL Classification: J31, J51, J63

Keywords: job displacement, wage flexibility, bargaining

Corresponding author:
Ilan Tojerow
Solvay Brussels School of Economics and Management
Avenue F.D. Roosevelt, 50
1050 Brussels
Belgium

E-mail: ilan.tojerow@ulb.ac.be

1 Introduction

How to ease the burden of layoffs and unemployment on displaced workers and their families is a central topic of policy discussion. Extensive research shows that the earnings losses for displaced workers are severe, long lasting, and countercyclical (Jacobson et al., 1993; Couch and Placzek, 2010; Schmieder and Von Wachter, 2010). Similarly, young adults entering the labor market during a recession suffer persistent earnings losses (Kahn, 2010; Oreopoulos et al., 2012, 2021; Schwandt and Von Wachter, 2019). While short-term consequences of unemployment can be often successfully addressed with policies such as unemployment insurance benefits, designing government policies that reduce the costs of long-term adjustment remains challenging.

There is a growing literature exploring what drives the large costs of job loss, and the role of labor market forces versus institutions in shaping the employment trajectories of affected workers. On the market forces side, a common hypothesis is that displaced workers lose firm, industry, or occupation specific skills (Lachowska et al., 2020; Huckfeldt, 2021; Raposo et al., 2021). For young workers, initial labor market economic conditions impact the most active period in their career in terms of job mobility and wage growth (Haltiwanger et al., 2018a; von Wachter, 2020). On the institutions side, recently re-emerged literature highlights the role of unions and collective bargaining in reducing inequality (Farber et al., 2021; Biasi and Sarsons, 2021) vis-à-vis recent research documenting persistent firm-level wage differentials as determinants of the cost of job loss (Schmieder et al., 2020; Fackler et al., 2021). Some evidence points to country-specific differences in institutions to explain larger costs of job loss in the U.S. compared to European countries, where sectoral bargaining agreements are more common. However, causal evidence on the effect of institutional changes in the wage-setting process on the costs of job loss is scant.

This paper uses the passage of Belgium's Wage Norm (*norme salariale*), a nationwide reform to the wage-setting process that fixed the maximum permitted nominal wage cost increase margin, to explore the relationship between flexible pay and the wage costs of job loss. The reform is ideal to study this relationship because it restricted single-employer bargaining, which complements the national- and sectoral-level bargaining of Belgium's multi-level wage system. The Belgian social security data we use covers two decades of job displacements with detailed information about employment transitions, wages, and firm and worker characteristics. We focus our analysis on

early-career workers, a group with high job mobility and wage growth for whom interruptions in the job-to-job ladder towards better quality and higher-paying jobs has potentially dire consequences in their career trajectories. We use quasi-exogenous variation in the timing of job loss due to mass layoffs spanning over an institutional reform that restricted employer-specific wage premiums, to compare earnings and employment losses of displaced workers under different wage-setting systems.

Using a sample of early-career male workers, we obtain several key findings. First, we find that displaced workers lose on average 24 percent of earnings the first year after displacement. While the initial drop in earnings is similar among workers displaced across wage-setting systems, the decreasing trend in earnings losses diverges thereafter. Workers displaced under flexible pay (i.e., before the passage of the Belgian Wage Norm) lost on average 18 percent of their annual earnings over a ten-year period after displacement, while those who were laid off under the Wage Norm (i.e., after the reform) lost on average 10 percent of their annual earnings. Our results imply that job loss under flexible pay leads to long-lasting earnings losses that have not faded ten years after job displacement, whereas under the Wage Norm earnings losses fade after five years. Moreover, while in the short run earnings losses are driven by employment losses and are similar across wage-setting systems, in the long run earnings losses are driven by wage reductions conditional on re-employment and are larger under flexible pay.

Second, we examine whether these differences in earnings losses are heterogeneous across sectors of employment. We find that displaced manufacturing sector workers experienced a 25 percent loss in earnings during the first few years after displacement compared to non-displaced manufacturing sector workers. This loss in earnings remains at 15 percent on average in the long run and is similar regardless of the timing of the mass layoff with respect to the wage-setting reform. However, service sector workers displaced during mass layoffs under a flexible pay system suffer a strong and persistent 20 percent loss in annual earnings, while under the Wage Norm displaced workers' earnings fully converge to non-displaced workers' earnings within three years.

Third, we show that the larger earnings losses we find among displaced workers under the flexible pay system are not driven by the business cycle. The cyclical pattern of earnings losses is concentrated in the short term, while the pace at which earnings losses fall is driven by the degree of flexibility in the wage-setting system. Finally, we examine gender gap in pre-layoff level of earnings and its implications for interpreting the gender gap in earnings losses after displacement. When we

replicate the baseline analysis for female workers, we find that the wage-setting reform had similar effects on these group of workers. However, in the case of women, earnings losses are also driven by higher unemployment rates after displacement and a higher likelihood of switching from full-time to part-time employment than men.

This paper makes two main contributions. First, we identify the effect of job displacement on subsequent labor outcomes of early-career workers. Thus, we provide evidence on a new dimension of the relationship between adverse labor market conditions for young workers and their career trajectories. Distinct from previous work, which focuses on the consequences of graduating from college during a recession and transitioning to full-employment, our approach focuses on mass layoffs as disruptions to young workers' career trajectories over their first ten years in the labor market.[1] We extend the literature that focuses on college graduates by also studying the effect of job loss for less-educated groups in the labor market (Schwandt and Von Wachter, 2019). By relying on mass-layoff events as a source of exogenous variation to young workers' job ladder, our results also contribute to the empirical evidence on job-to-job transitions as determinants of wage growth and job mobility into better quality jobs (Topel and Ward, 1992; Haltiwanger et al., 2018b; Forsythe, 2020).

Second, we provide empirical evidence that displaced workers' wage losses are larger under a flexible wage-setting system. The recent job displacement literature has made great strides in documenting the sources behind costs of job displacement. However, studies often struggle to reconcile their findings with those of contemporary studies. While recent evidence from Germany points to persistent firm-level wage differentials as the main source of wage losses (Fackler et al., 2021; Schmieder et al., 2020), several contemporary studies in the U.S. find that establishment wage effects play a moderate role in explaining the average cost of job loss (Lachowska et al., 2020; Moore and Scott-clayton, 2019). A common explanation is that countries where collective bargaining is less common usually have higher firm-specific pay premiums, and hence higher wage inequality. However, a direct comparison of estimates on the effects of job loss on earnings from studies across countries with different institutional settings is challenging due to the other country-specific characteristics possibly explaining the opposite results in these studies. Our findings extend

[1] See von Wachter (2020) for a summary of the findings of the growing empirical literature on the persistent effects of initial labor market conditions for young adults and their sources.

our understanding of the role of employers in wage setting, by exploiting a national reform that restricted employer-specific wage premiums to compare earnings and employment losses of displaced workers under different wage-setting systems in Belgium.[2]

The most closely related paper is Janssen (2018) which leverages a reform to the wage bargaining system in the Danish manufacturing sector and finds that displaced workers experience larger income losses under decentralized wage bargaining. Our empirical setting allows us to explore whether displaced workers' earnings losses vary across sectors of employment given the variation in ex-ante heterogeneity in firm-level wage premiums bargained across sectors. We find that while manufacturing workers suffer similar earnings losses compared to non-displaced workers regardless of the year when the mass layoff takes place, service sector workers displaced under flexible pay suffer a severe long-term impact compared to those laid off under the Wage Norm. Another related paper is Biasi and Sarsons (2021) which exploits substantial restrictions on collective bargaining for public school teachers, and finds that flexible pay lowered the salaries of women compared to men with the same credentials. By exploring whether changes in the wage-setting process affect the gender gap in the costs of job loss, we connect the longstanding literature of job displacement, which focuses mainly on male workers, with the growing literature on the impact of flexible pay on the gender wage gap (Card et al., 2016; Illing et al., 2021).

More broadly, our analysis relates to an extensive body of work on the short- and long-term effects of job displacement on an array of socio-economic outcomes such as couples' fertility decisions (Huttunen and Kellokumpu, 2016), regional mobility (Huttunen et al., 2018), spousal labor supply (Halla et al., 2020), health (Black et al., 2015; Schaller and Stevens, 2015), mortality (Sullivan and Wachter, 2009), crime (Rege et al., 2019), retirement (Chan and Stevens, 2001) and the children of displaced workers (Fradkin et al., 2019; Lindo, 2011). Here, our results contribute to a better understanding of the implications of job loss for younger workers over a period of high job mobility, in contrast to the more mature workers studied in those papers whose average mobility is lower and cyclical downgrading may be permanent.

Finally, we contribute to the re-emerging literature on the determinants of wage inequality.

[2]Earlier work by Card et al. (2013) argue that a potential explanation for the increasing dispersion of the wage premiums at new German establishments in the mid-nineties was a rise in the fraction of plants that opted out of the traditional collective bargaining system. However, the authors acknowledge that it is difficult to assign a causal role to collective bargaining, because firms in Germany could choose whether to adopt some form of collective bargaining.

Previous work documents a negative relationship between unionization and income inequality in the U.S. (Card, 1996; DiNardo et al., 1996; Farber et al., 2021). Although the U.S. has experienced a stronger and more persistent increase in inequality than many continental European countries, recent work incorporates firms as important determinants of wage inequality both in the U.S. (Song et al., 2019; Bonhomme et al., 2019; Autor et al., 2020) and Europe (Card et al., 2013; Card and Cardoso, 2021).[3] Here, we use quasi-exogenous variation in the timing of job loss due to mass layoffs around a national wage-setting reform that reduced pay flexibility. Combining these two sources of variation in job loss and wage setting allows us to identify the role of firm wage premiums and collective bargaining in the costs of job displacement.

This paper proceeds as follows. In the next section we provide background on Belgium's institutional setting. Section 3 describes the data. In Section 4, we describe our empirical strategy. Section 5 presents the results. Section 6 concludes.

2 Institutional setting

In this section, we provide background information on the Belgian wage-setting system.

2.1 Wage-setting system in Belgium

Wage bargaining in Belgium occurs at national-, sectoral-, and firm-level. First, the national collective agreement is adopted by the National Labour Council and defines minimum wages that cover the entire country. Second, sectoral-level agreements are negotiated within Joint Committees, which are permanent bodies at the industry level in which employer's associations and trade unions are represented. While 54 percent of employees are members of a union, 96 percent are covered by a collective agreement (Garnero et al., 2020). The Ministry of Employment, Labour and Social Dialogue decides to which Joint Committee a firm belongs to based on the main economic activity of the firm. These Joint Committees set sector-wide standards for all workers covered by them, including minimum wages by category of workers.[4] Third, multi-employer bargaining (at the

[3] While some studies emphasize to role employer specific pay-premiums (Card et al., 2013), other studies focus on sorting patterns between workers and firms (Bonhomme et al., 2019; Song et al., 2019; Raposo et al., 2021) while analyzing the contribution of firms to inequality.

[4] The provisions of collective agreements made compulsory by Royal Decree are concluded under the Act on collective agreements of 5 December 1968. Most Joint Committees are responsible for one occupation in each sector. In Joint Committees for blue-collar workers, pay scales are primarily defined in relation to the job description. For

national and/or sectoral level) can be complemented with single-employer bargaining. The wages bargained at the firm level can only be greater or equal to the wage set at the sectoral level (i.e., the "favourability principle").[5]

Belgium also has an extensive automatic index-linking for setting wages, that is, pay and social security benefits are linked to the consumer price index. In practice, this automatic indexation mechanism imposes a floor for wage increases.[6]

2.2 The 1996 Wage Norm

In July 1996, Belgium introduced a law enabling the national collective agreement to define a margin of wage increases that may be bargained at lower levels.[7] This margin depends essentially on forecast pay trends in the three reference countries—France, Germany, and the Netherlands. The law requires that the growth of nominal hourly labour costs for enterprises in a period of two years should not exceed a "Wage Norm" (*norme salariale*): a weighted average of the projected increases in labour costs in Belgium's three major trading partners.[8]

The law aimed at increasing coordination among social partners when bargaining the national collective agreement to avoid excessive wage increases. In practice, the 1996 legislation enabled the government to monitor the wage bargaining process more closely. In addition to the minimum wages, the national collective agreement was enabled to set an upper limit for wage negotiations at all levels.[9]

After 1996, the scope for firm-level wage bargaining was reduced with the national collective agreement's increased ability to set wage ceilings within the purview of the legislation. This reform in the wage-setting system in Belgium allows us to exploit the substantial restrictions on collective bargaining at sector- and firm-level to study the relationship between wage flexibility and the costs

white-collar workers, the pay scale also varies by tenure (Rusinek and Tojerow, 2014).

[5]The wage premium associated with a firm-level collective agreements (with respect to higher-level agreements) is generally estimated at between 3 and 7 percent (Garnero et al., 2020).

[6]In 1989 the state tried to balance this automatic indexing of wages with a Competitiveness Law, which authorized government intervention if the average overall wage increases result in an upsurge of labour costs potentially deteriorating external performance of the private sector.

[7]"Loi relative à la promotion de l'emploi et à la sauvegarde préventive de la compétitivité" (Moniteur Belge, 1996)

[8]The Central Economic Council (CCE/CRB) estimates the nominal wage norm as the weighted average of the expected increase in nominal labour costs in Germany, France, and the Netherlands, according to projections published by the OECD's Economic Outlook and corrected for average working hours.

[9]The wage norm has been largely adhered to. During the period 1997-2006, the accumulated increase in the Belgian labour costs (24.7%) was broadly in line with the accumulated increase by the wage norm (24.4%) (Van Gyes, 2009).

of job displacement.

3 Data

Our empirical analysis is based on combined data from several administrative registers collected by the Belgian Crossroad Bank for Social Security (CBSS). This is a linked employer-employee database that covers the universe of Belgian workers in the private sector from 1990 onward; we have access to a 10 percent representative sample.[10] This data consists of complete information on earnings and days work in each employment spell along with an employer identifier. In addition, the data includes information on basic demographic characteristics including age, gender, marital status, household composition, and place of birth provided by the National Registry. We use employer-employee data spans over twenty years from 1990-2010.

3.1 Measuring job displacement at mass layoffs

We make use of the linked employer-employee structure of the CBSS data to identify mass layoffs. We follow the existing literature and define job displacement as an event when a worker with at least one year of tenure leaves a job at its main employer in the course of a mass layoff.

We define a mass-layoff event by identifying large drops in firm size between the base year c and $c+1$, but exclude events in which a large number of employees moves to the same employer identifier. In our sample, we consider all mass layoffs between reference years 1992 and 1999, and we follow workers using the data covering 1990-2010.

3.2 Baseline restrictions on the sample of displaced workers

We denote the year prior to displacement the "baseline year" c and we choose for each baseline year all workers that satisfy a set of restrictions. The individual is male, between age 25 and 35, and has at least one year of tenure at their main job in a private sector establishment with 5 or more employees. We define an individual as displaced if the establishment has a mass layoff between

[10] Self-employment and civil servants (except contract workers) are not covered in this data. The lack of self-employment is common in the job displacement literature. We keep civil servants employment and earnings information to account potential for job transitions, but no mass-layoff event is defined using the public sector.

Table 1: Sample Characteristics of Displaced Workers Workers One Year Prior to Displacement - pre/post Wage Norm Reform

	Mass-layoff events before 1996		Mass-layoff events after 1996	
	Displaced Workers	Non-displaced Workers	Displaced Workers	Non-displaced Workers
	(1)	(2)	(3)	(4)
Age (yrs)	29.79	30.12	29.79	30.52
	(3.18)	(3.09)	(3.13)	(2.92)
Tenure (yrs)	2.44	2.77	3.65	4.61
	(1.16)	(1.21)	(2.46)	(2.54)
Experience in employment (yrs)	8.81	9.23	7.75	9.00
	(4.95)	(4.56)	(4.57)	(4.23)
Blue collar	0.63	0.58	0.57	0.57
	(0.48)	(0.49)	(0.50)	(0.49)
Employed full time	0.90	0.94	0.92	0.94
	(0.30)	(0.23)	(0.27)	(0.24)
Number of jobs	1.41	1.26	1.40	1.33
	(0.73)	(0.60)	(0.69)	(0.67)
Annual Earnings main job	19825.59	24344.81	21098.71	24250.15
	(11555.86)	(11065.26)	(11326.36)	(11673.21)
Annual Earnings second job	3060.48	3400.66	3185.98	3480.02
	(3433.42)	(3848.35)	(3508.44)	(4168.14)
Firm size				
1-19	0.03	0.04	0.04	0.04
	(0.18)	(0.19)	(0.19)	(0.20)
20-49	0.15	0.10	0.23	0.13
	(0.36)	(0.30)	(0.42)	(0.33)
50-99	0.22	0.12	0.27	0.13
	(0.41)	(0.32)	(0.44)	(0.34)
100-199	0.18	0.12	0.18	0.13
	(0.39)	(0.33)	(0.38)	(0.33)
200-499	0.17	0.17	0.16	0.16
	(0.38)	(0.37)	(0.36)	(0.37)
500-999	0.08	0.12	0.04	0.11
	(0.27)	(0.33)	(0.20)	(0.31)
1000 or more	0.16	0.34	0.09	0.30
	(0.37)	(0.47)	(0.29)	(0.46)
Industry				
Manufacturing	0.25	0.38	0.27	0.37
	(0.43)	(0.49)	(0.45)	(0.48)
Sales	0.12	0.09	0.10	0.08
	(0.33)	(0.28)	(0.30)	(0.28)
Services	0.43	0.37	0.45	0.40
	(0.50)	(0.48)	(0.50)	(0.49)
Transport	0.15	0.12	0.14	0.12
	(0.36)	(0.33)	(0.35)	(0.33)
Observations	1854	7603	1362	5444

Notes: Characteristics of displaced and non-displaced workers in year prior to displacement year. Workers satisfy the following restrictions: age 25 to 35, have at least one year of tenure, and establishment of at least 5 employees.

year c and $c+1$, and the individual leaves the establishment between year c and $c+1$ (and is no longer employed at the establishment in subsequent years).

We only consider the first displacement event for each worker, as subsequent outcomes might be influenced by the first displacement. Our main sample comprises 3,216 displaced workers and 13,047 non-displaced workers.

The construction of the sample allows us to use the information on the pre-displacement period to define an appropriate control group of workers who did not suffer job displacement. We focus on workers fulfilling the same baseline restrictions as our displaced sample. The comparison group contains workers employed at mass-layoff firms at the mass-layoff date who do not lose their jobs, and workers who are employed at any reference year from 1992 to 1999 at firms that do not experience a mass-layoff event. Because the latter is a large group, we draw a 10 percent random sample (Halla et al., 2020).

We focus our main analysis on men to facilitate comparisons with the recent literature investigating the sources of displaced workers earnings losses, which has typically focused on men because their higher labor force attachment leads to less selection issues between in and out of the labor force (Schmieder et al., 2020; Fackler et al., 2021; Janssen, 2018). However, in Section 5.4 we add a sample of women that satisfy the same baseline restrictions to explore the gender gap in the costs of job loss (Illing et al., 2021).

3.3 Outcome variables and sample characteristics

The main outcome variables considered in our analysis are employment and earnings. We organize individual observations at yearly level and define employment by an indicator equal to one if the individual is employed at least some portion of each calendar year. Earnings refer to the annual real earnings in euros (2004 prices) with the main employer. The data does not provide information on working hours, but we have information on worked days over the year for each employer-employee pair. We can also distinguish between part-time and full-time employment. For each individual, we collect yearly observations in the three years before and ten years after the displacement. We define reference year c by the year in which the individual is last employed before the mass-layoff event. In further analysis, we also investigate the effect of job loss on days worked, flexible employment (part-time), and the length of unemployment spells.

In our sample, we consider all mass layoff events between 1992 and 1999, which allows us to have at least two years of pre-displacement data and at least ten years of post-displacement information about workers labor market trajectories. In addition to examining the dynamic effects of job displacement, we are interested in understanding whether and how flexible pay affects the costs of job displacement. To examine heterogeneous effects of job loss under different wage-setting systems, we study the effect of job loss across groups of workers who were displaced between 1992 and 1995 (i.e., pre-reform years) and groups of workers who were displaced between 1996 and 1999 (i.e., post-reform years). Table 1 presents the pre-layoff summary statistics of displaced and non-displaced workers. Columns 1-2 and 3-4 list the pre-reform sample (i.e., mass layoffs between 1992 and 1995) and post-reform sample (i.e., mass layoffs between 1996 and 1999), respectively.

4 Empirical Strategy

We use variation in the timing of job loss due to mass layoffs spanning over an institutional reform that restricted single-employer bargaining, the passage of the Belgian Wage Norm in 1996. We measure the effects of job displacement by comparing outcome variables at the individual level for the displaced and control workers in the years before and after the reference date. To examine heterogeneous effects of job loss under different wage-setting systems, we study the effect of job loss across groups of workers who were displaced under flexible pay (i.e., 1992-1995) and under the Wage Norm (i.e., 1996-1999). We provide estimates of the effect of job loss on a variety of outcomes using an event study analysis. Following the job displacement literature (e.g., Schmieder et al. (2020)), we estimate the following regression model:

$$Y_{itc} = \sum_{k=-3;k\neq-1}^{10} \delta_k I(t = c+1+k) * Disp_i + \sum_{k=-3}^{10} \gamma_k I(t = c+1+k) + \pi_t + \alpha_i + X_{it}\beta + \epsilon_{itc} \quad (1)$$

where Y_{itc} is the labor market outcome of worker i, with baseline year c observed in calendar year t. $Disp_i$ is an indicator variable for whether the worker was displaced between year c and $c+1$, or belongs to the control group. The coefficients of interest are δ_k, which measure the change in a labor market outcome (e.g., earnings) of displaced workers with respect to the baseline year (c), relative

to the evolution of the same outcome among non-displaced workers. The specification includes time-varying control variables X_{it} (e.g., age polynomials), individual fixed effects α_i, calendar year effects (π_t), and "year relative to baseline year" fixed effects, γ_k, where k=[-3,+10] measures the number of years relative to the reference year. I(.) is an indicator function that equals 1 when the argument is true. Standard errors are clustered at worker level to allow for the correlation of the error terms, ϵ_{itc}, across different time periods t and base years c for individual i.

Using a regression saturated in cohort c and relative period k indicators ensures that the comparison in outcomes of displaced and non-displaced workers in the same baseline-year c sample and with the same relative distance k to the baseline year. Also, due to the tenure restriction in the baseline year c both displaced and non-displaced workers might be on an upward earnings profile around the baseline year event that cannot be captured by the calendar year fixed effects alone.[11] To avoid collinearity, the specification omits δ_{-1} (i.e., normalizing relative to the period prior to treatment) and one of the year dummies.

To quantify the displacement effects, we also average the difference between displaced and non-displaced workers relative to the reference data over 10 years after displacement. We estimate the following regression model:

$$Y_{itc} = \delta^{post} * Disp_i I(t > c) + \sum_{k=-3}^{-1} \delta_k I(t = c+1+k) * Disp_i + \sum_{k=-3}^{10} \gamma_k I(t = c+1+k) + \pi_t + \alpha_i + \epsilon_{itc} \quad (2)$$

where $\delta^{post} * Disp_i$ is the difference between displaced and control workers relative to the reference date averaged over 10 years after displacement.

5 The Effect of Job Loss on Earnings and Employment

In this section, we provide estimates of the long-term effect of job displacement on labor market outcomes under flexible pay (i.e., pre-reform years) and under the Wage Norm (i.e, post reform years). We begin by investigating the overall effect of job loss on early-career male workers in

[11] Schmieder et al. (2020) show that the tenure restriction leads to hump-shaped earnings profiles in both displaced and non-displaced workers. After year c there is no restriction on labor force attachment; thus earnings might go down from the upward earnings profile they exhibit due to the tenure condition imposed for the baseline year.

section 5.1. In section 5.2, we turn to examining heterogeneous effects of job loss on earnings and employment based on the workers' sector of employment and job characteristics at the time of the mass layoff. In section 5.3, we examine the effect of job loss on earnings and employment over the business cycle. In section 5.4, we explore the gender gap in earnings and employment losses after job loss.

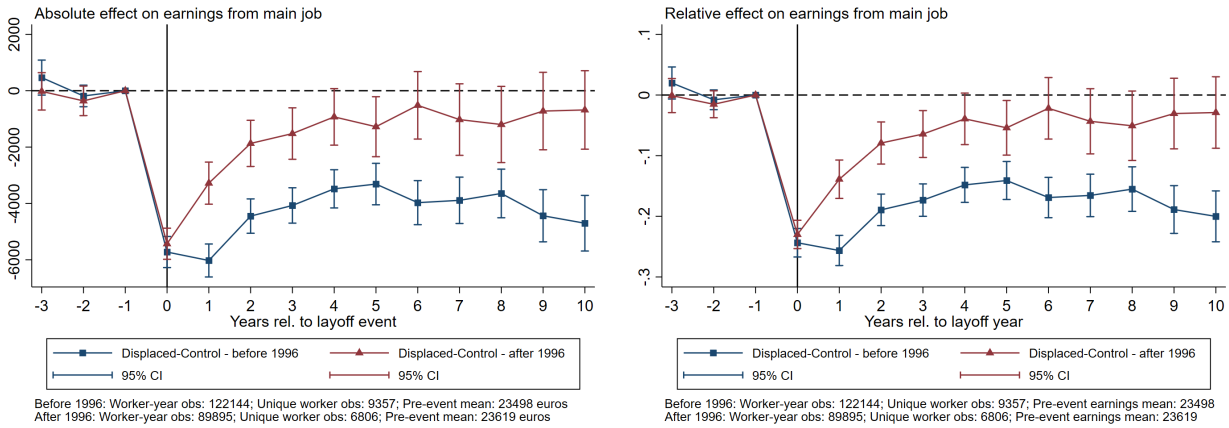
5.1 Labor market outcomes of displaced workers under different wage-setting systems

We start by investigating the overall effect of the job displacement on earnings and employment up to ten years after job loss under flexible pay (i.e., pre-reform years) and under the Wage Norm (i.e, post reform years). Our results imply that job displacement occurs under flexible pay lead to long-lasting earnings losses that have not faded ten years after job loss, whereas under a less flexible wage-setting system earnings losses fade after five years. Moreover, employment drops sharply initially, but also recovers faster than earnings under either wage-setting scheme. Thus, while in the short run earnings losses are largely driven by employment losses and are similar across wage-setting systems, in the long-run earnings losses are driven by wage reductions conditional on re-employment and are larger under a flexible pay system.

Figure 1 compares earnings profiles in the displaced group and in the control group. The left panel plots the treatment effect in absolute terms (i.e., in euros, 2004 prices), and the right panel provides a relative comparison to the corresponding pre-event level of individuals' earnings from their main job. The largest earnings losses occur in the year after displacement and are similar across workers displaced under different wage-setting systems. The initial drop in earnings in the year of the layoff event is 24 percent (6000 euros) compared to the pre-event earnings mean. However, the decreasing trend in earnings losses diverges thereafter. Workers displaced under flexible pay suffer a severe long-term impact compared to those laid off under the Wage Norm. The blue line (square) shows that displaced workers who lost their jobs between 1991 and 1995 experienced substantial earnings losses relative to their comparison group of non-displaced workers, ranging from 15 to 25 percent annually with respect to the pre-event mean earnings. The red line (triangle) shows that displaced workers who lost their jobs under the Wage Norm experienced earnings losses of around 10 percent compared to non-displaced workers in their control group.[12]

[12] In Table A-1, Columns 1 and 2 show the dynamic estimates plotted in Figure 1.

Figure 1: The Effect of Job Loss on Annual Earnings from Main Job



Panel (a) Panel (b)

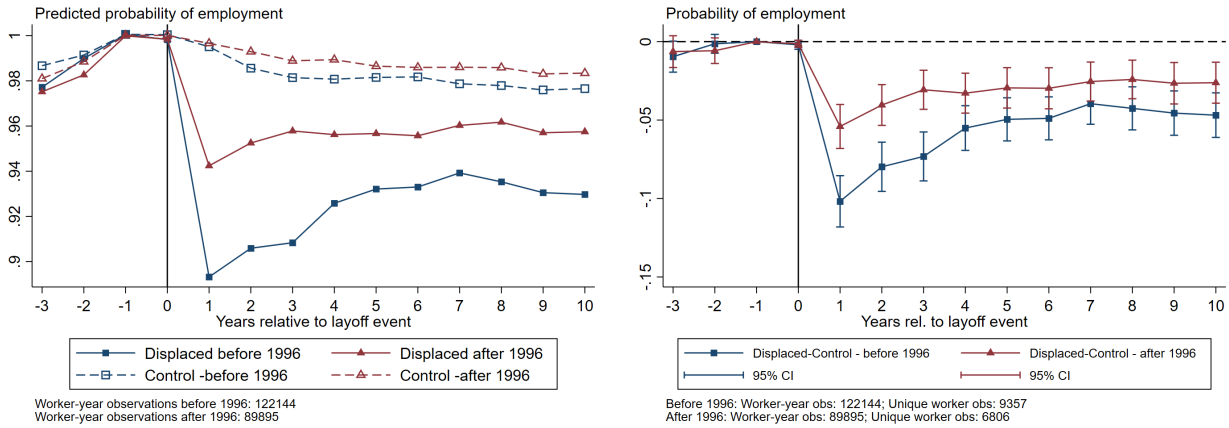
Notes: This figure shows the effect of displacement on yearly earnings (in euros, 2004 prices). The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The left panel plots the treatment effect in absolute terms, and the right panel provides a relative comparison to the corresponding pre-event level of earnings.

The relative magnitude of the earnings loss from job displacement only partially mirrors individuals' probability of re-employment after displacement, which indicates that employment rates are not the main driver of earnings drops. Employment drops sharply initially, by about 60 days in the displacement year, but also recovers faster than earnings. In the long run, displaced workers work around 20 days less per year than non-displaced workers, regardless of the wage-setting system. Earnings on the other hand drop by around 25 percent initially under both wage-setting systems, with the gap only very gradually shrinking to 17 percent under flexible pay and almost fully disappearing (i.e., not statistically different from zero after 5 years) under the Wage Norm.

Figure 2 compares annual employment rates before and after job displacement for workers in the displaced group and in the control group.[13] Although individuals displaced under flexible pay have almost double the non-employment compared to individuals displaced under the Wage Norm, the impact on the probability of re-employment is small in absolute terms. In the first year post-layoff, 10 percent of workers displaced under flexible pay are still not employed compared to 5 percent of those displaced under the Wage Norm. The gap in employment probabilities of those employed

[13] In Table A-2, Columns 1 and 2 show the dynamic estimates plotted in Figure 2.

Figure 2: The Effect of Job Loss on Employment Probability



Panel (a) Panel (b)

Notes: This figure plots event study coefficients from Equation 1 for mass-layoff events between 1992-1995 (blue, square) and between 1996-1999 (red, triangle). The left panel compares the probability to be employed of workers who are displaced (solid lines) to workers not displaced (dashed lines) by a mass layoff event at the reference date. The right panel plots the difference between the two lines with the corresponding 95 percent confidence interval.

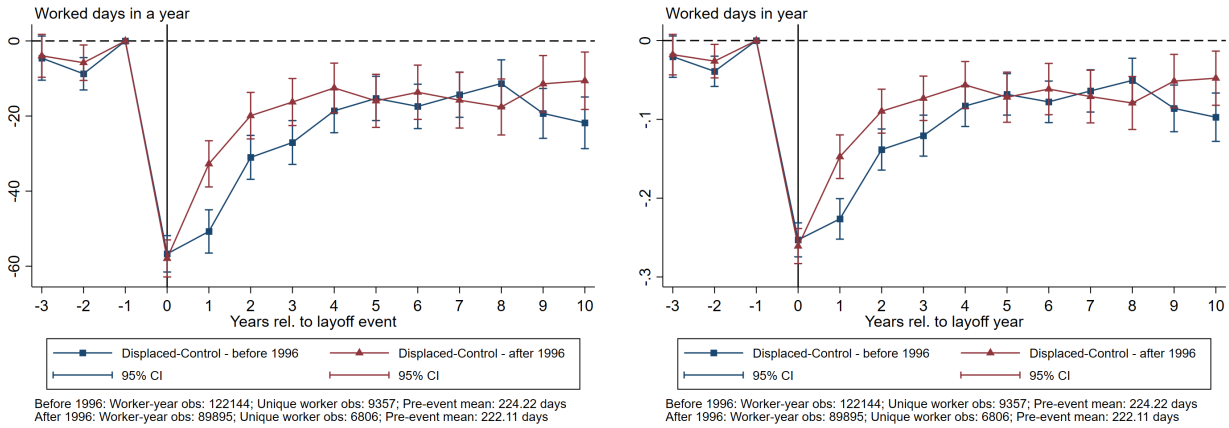
pre- and post-reform narrows 3 years after displacement.[14]

Given that we count workers employed at any point during the year as employed in a given year, the probability of employment may overstate individual annual employment status. In other words, workers who have some employment and unemployment spells over a year will have the same probability of employment than a worker with no unemployment spells at all. Thus examining the effect of job loss on days worked provides additional information on the extent to which individuals have employment during the year. Figure 3 shows that on the first year after job loss, displaced workers displaced under flexible pay (blue line, square) work 50 days less relative to non-displaced workers, while individuals displaced under the Wage Norm (red line, triangle) work 25 days less relative to their control group.[15] The gap between displaced workers before and after the reform narrows three years after the mass-layoff event. Yet, despite an initial recovery, the reduction in days work is permanent for both groups of displaced workers, who work on average 20 days less

[14]Figure B-1 confirms that the effects of job loss on employment rates are driven by early-career males who were employed full-time pre-layoff, which is evident given the at the reference year, 93.5% of the men in the sample worked full-time and 6.5% of the men worked part-time. Panels (a) and (b) shows predicted probability of full-time employment conditional on baseline full-time employment. Panels (c) and (d) show that conditional on being employed part-time at baseline, displaced and non-displaced workers show similar predicted probabilities of full-time employment.

[15]In Table A-3, Columns 1 and 2 show the dynamic estimates plotted in Figure 3.

Figure 3: The Effect of Job Loss on Days Worked in a Year



Panel (a) Panel (b)

Notes: This figure shows the effect of displacement on days worked in a year. The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The left panel plots the treatment effect in absolute terms, and the right panel provides a relative comparison to the corresponding pre-event number of days worked in a year.

per year compared to non-displaced workers.[16]

In columns 1 and 2 of Table 2, we summarize the estimation results for the mean effects on job displacement on annual earnings (Panel A), employment (Panel B), and days worked (Panel C) based on Equation 2. The estimated coefficients of *Displaced* x *Post* report the difference between displaced and control individuals relative to the reference date averaged over ten years after displacement. Workers who lost their jobs before the 1996 wage-setting reform lost on average 17 percent of their annual earnings over a 10-year period after displacement, while those who were laid off afterwards lost 10 percent of their pre-displacement mean earnings. Panel B shows that the differences in employment probabilities between displaced and non-displaced workers, though small in magnitude, remain statistically significant over a 10-year period after displacement. Panel C shows that displaced workers work between 22 and 28 days less per year than non-displaced workers.

The set of results presented in this section indicates that while re-employment rates of workers displaced before and after the Belgian wage-setting reform evolve similarly in the long term com-

[16]Similarly, Figure B-2 shows the effect of job loss on unemployment spell duration (assimilated days), and Table A-4, Columns 1 and 2 show the dynamic estimates plotted in Figure B-2.

pared to non-displaced workers of their respective control groups, displaced workers' earnings losses are much more pronounced for workers displaced before the reform compared to those displaced afterwards. If persistent earnings losses among displaced workers arise from substantial firm wage premiums that the average displaced worker cannot recoup in the next-best job, reduced wage flexibility may help workers catch up.

In the next sections, we investigate whether these differences in earnings losses are heterogeneous across sectors of employment and job characteristics, how losses vary over the business cycle, and whether there is a gender gap in losses after job displacement.

5.2 Heterogeneous effects by sector of employment

Our results thus far imply that wage flexibility is associated with larger earnings losses after job displacement. This evidence is in line with the increasing literature documenting the existence of firm-specific wage components (Card et al., 2013; Song et al., 2019) and their role in explaining the long-term costs of job loss (Schmieder et al., 2020; Fackler et al., 2021).

Reduced flexibility in wages bargained at firm level could result in declines in wage dispersion between and within sectors. The effect of flexible pay on within-sector wage dispersion and income losses after job displacement has been recently documented among public school teachers in the U.S. (Biasi and Sarsons, 2021) and the manufacturing sector in Germany (Janssen, 2018), respectively. Yet, to the best of our knowledge, there are no previous studies directly analyzing whether displaced workers experience larger income losses under flexible pay across all sectors in the economy.

Our empirical approach allows us to exploit a nation-wide reform to the ability of firms to provide wage premiums together with variation in the ex-ante heterogeneity in firm-level wage premiums bargained across sectors. The objective of the 1996 wage-setting law was to preserve the international competitiveness of the Belgian economy virtually anchoring domestic wage growth to Belgium's main trade partners. Consequently, given the objective of the reform, we would expect to observe a larger impact of the reform in sectors with less ex-ante constraints to set wage premiums. For example, Du Caju et al. (2012) show that Belgian industries with higher exposure to import competition are more constraint in setting wage premiums, hence reducing wage dispersion. Thus, a priori, we would expect the earnings losses of displaced workers to be lower after the 1996 reform in sectors with previously higher firm-level wage premiums and facing lower international competition.

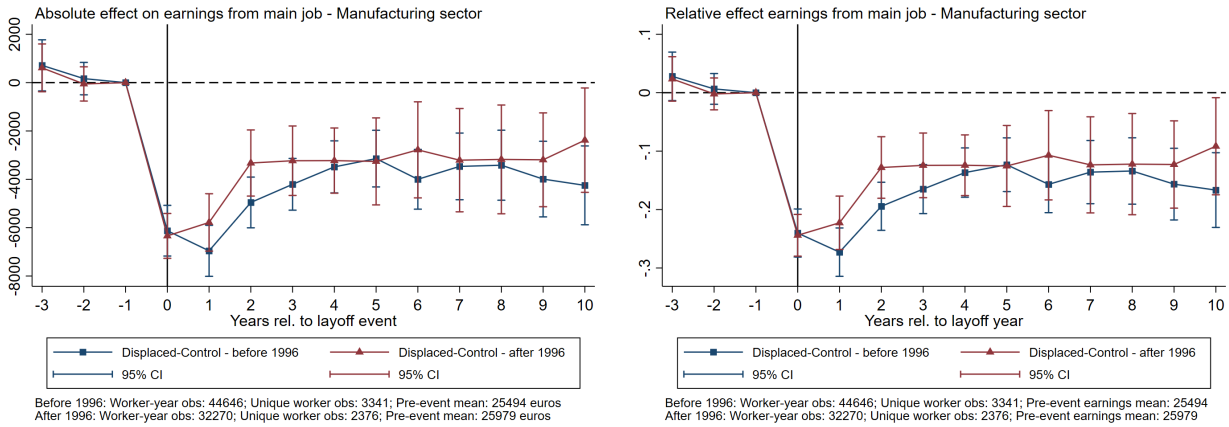
Table 2: Average Effect of Job Loss on Earnings, Employment, and Days Worked

	Overall		**Manufacturing**		**Service**	
	Pre-96	Post-96	Pre-96	Post-96	Pre-96	Post-96
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Annual earnings (1000 euros)						
Displaced x Post	-4.428***	-1.912***	-4.455***	-3.754***	-4.934***	-0.779
	(0.294)	(0.422)	(0.500)	(0.689)	(0.515)	(0.735)
Mean t-1	23.5	23.6	25.5	26.0	22.6	22.7
Panel B: Probability of Employment						
Displaced x Post	-0.052***	-0.028***	-0.055***	-0.043***	-0.053***	-0.017***
	(0.005)	(0.004)	(0.009)	(0.009)	(0.007)	(0.006)
Mean t-1	1.0	1.0	1.0	1.0	1.0	1.0
Panel C: Days worked in a year						
Displaced x Post	-27.771***	-22.657***	-26.388***	-30.241***	-29.252***	-19.475***
	(2.368)	(2.607)	(3.709)	(4.907)	(4.329)	(4.212)
Mean t-1	224.2	222.1	228.4	227.7	227.1	219.8
Panel D: Unemployment spell duration in a year						
Displaced x Post	20.141***	12.585***	21.209***	12.865***	18.871***	10.194***
	(2.287)	(2.215)	(4.070)	(4.310)	(3.935)	(3.150)
Mean t-1	24.2	21.0	22.1	18.1	23.1	20.8
Worker-year Obs	122,144	89,895	44,646	32,270	45,585	35,553

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: This table displays the impact of job displacement on worker's labor market outcomes based on Equation 2. We present estimation results for workers who at the reference date are employed in any sector (columns 1-2), in the manufacturing sector (columns 3-4), and in the service sector (5-6). Odd [even] columns present the estimation results using the sample of displaced and non-displaced workers during events that occur before [after] the wage-setting reform. In Panel A, the dependent variable is the yearly earnings in thousands of euros (2004 prices), with zeros for those not employed. In Panel B, it equals to one if the individual is employed at a given year. The outcome is the number of days worked in Panel C and the number of days unemployed in Panel D. Displaced x Post measures the average difference in the outcome variable between the displaced and the control group relative to the reference date in the ten years after the reference year. The bottom row of each panel shows the pre-event mean, which refers to the mean of the dependent variable in the year before the reference date.

Figure 4: The Effect of Job Loss on Annual Earnings: Manufacturing Sector and Service Sector

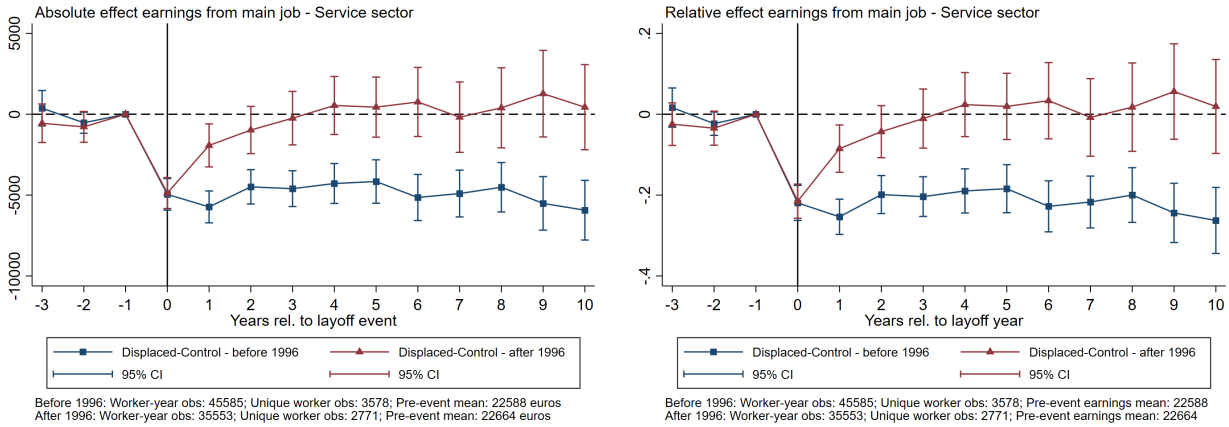


Before 1996: Worker-year obs: 44646; Unique worker obs: 3341; Pre-event mean: 25494 euros
After 1996: Worker-year obs: 32270; Unique worker obs: 2376; Pre-event mean: 25979 euros

Panel (a)

Before 1996: Worker-year obs: 44646; Unique worker obs: 3341; Pre-event earnings mean: 25494
After 1996: Worker-year obs: 32270; Unique worker obs: 2376; Pre-event earnings mean: 25979

Panel (b)



Before 1996: Worker-year obs: 45585; Unique worker obs: 3578; Pre-event mean: 22588 euros
After 1996: Worker-year obs: 35553; Unique worker obs: 2771; Pre-event mean: 22664 euros

Panel (c)

Before 1996: Worker-year obs: 45585; Unique worker obs: 3578; Pre-event earnings mean: 22588
After 1996: Worker-year obs: 35553; Unique worker obs: 2771; Pre-event earnings mean: 22664

Panel (d)

Notes: This figure shows the effect of displacement on yearly earnings (in euros, 2004 prices) for workers who are employed in the manufacturing sector (top panels) and the service sector (bottom panels) at the reference date. The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The left panel plots the treatment effect in absolute terms, and the right panel provides a relative comparison to the corresponding pre-event level of earnings.

Figure 4 shows the earnings profiles of displaced and non-displaced workers across two main sectors of employment in Belgium: the manufacturing sector (top) and the service sector (bottom).[17] While manufacturing workers suffer similar earnings losses compared to non-displaced workers regardless of the year when the mass layoff takes place, service sector workers displaced under flexible pay (i.e., pre-reform) suffer a severe long-term impact compared to those laid off under the Wage Norm (i.e., post-reform).

Panels (a) and (b) show that displaced manufacturing sector workers experienced a 25 percent loss in earnings from their main job during the first few years after displacement compared to non-displaced manufacturing sector workers. This loss in earnings remains at 15 percent on average in the long run and is similar regardless of the timing of the mass layoff event with respect to the wage-setting reform. On the contrary, blue lines (square) in Panels (c) and (d) show that service sector workers displaced under a flexible pay system suffer a strong and persistent 20 percent loss in annual earnings. The red lines (triangle) show that displaced workers' earnings catch up to those of the non-displaced group in about three years after a mass layoff event taking place under the Wage Norm. These results imply that under flexible pay, job displacement led to a large and persistent drop in service sector workers' earnings, while under the Wage Norm displaced workers' earnings fully converge to non-displaced workers' earnings within three years.[18]

Since firm-level wage premiums are set by the employer, rather than by sectoral bargain agreements, they may introduce an important source of wage flexibility to the cross-section wage distribution at a given time, and to changes in wages over time (Card and Cardoso, 2021). Our results are also in line with Bormans and Theodorakopoulos (2020) who document larger increases in wage dispersion in the service sector compared to manufacturing in 14 European economies.[19] Moreover, using micro data from 16 countries, Berlingieri et al. (2017) find that manufacturing- and service-sector wages at the 90th percentile of the wage distribution, were on average 3.4 and

[17] We focus our cross-sectoral analysis on the manufacturing sector and the services sector because these comprise 75 percent of the workers in our sample. Nevertheless, for completeness, in Appendix Figure B-3 we show the effect of job displacement on earnings for workers employed in other sectors at baseline, i.e., Sales in panels (a) and (b), Transportation in panels (c) and (d), and the rest in panels (e) and (f). With the caveat of reduced sample size affecting the precision of our estimates in mind, the figure confirms the expected pattern: losses on earnings in the sales sector follow a similar pattern to that of the service sector, while the other sectors follow a pattern similar to manufacturing (the estimates are imprecisely estimated).

[18] In Tables A-1-A-3, Columns 3-6 show the dynamic estimates plotted in Figures 4-6.

[19] Bormans and Theodorakopoulos (2020) find that firms in industries with limited product market competition pass on fewer productivity gains to wages compared to more competitive industries.

5.8 times higher than those at the bottom decile, respectively.

From the results on employment rates presented in Figure 5, it is clear that the great short-term drop in earnings is driven by a initially sharp but ultimately recovering decline in employment in both sectors. This result is consistent with findings in Schmieder et al. (2020) and in Lachowska et al. (2020) for Germany and Washington State, respectively, who show that long-term earnings losses are to an important extent driven by losses in wages. However, in the long term, employment rates respond differently across sectors. In the manufacturing sector (Panels (a) and (b)), displaced workers' employment rates stay 5 percent lower every observed year after the job loss, and the wage-setting reform does not have any heterogeneous impact. In the service sector (Panels (c) and (d)), employment rates have a similar pattern to the manufacturing sector under flexible pay, but under the Wage Norm, employment rates in the service sector fully converge after 3 years.

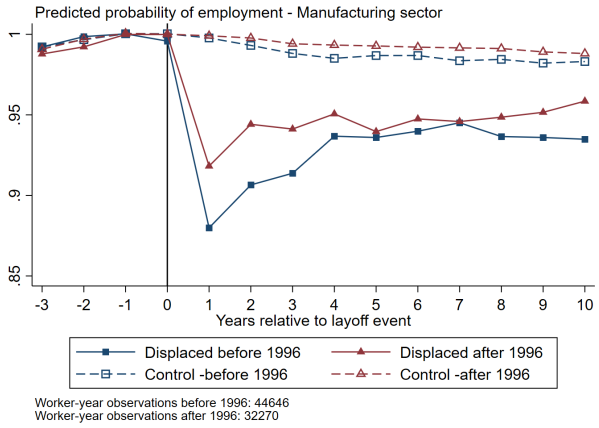
Finally, Figure 6 shows similar patterns in days worked across sectors and wage-setting systems. The initial drop in days worked is larger in the manufacturing sector (i.e., about 80 days or 30 percent with respect to the pre-event mean) than in the service sector (i.e., about 50 days or 20 percent with respect to the pre-event mean), gradually recovering and stalling at 20 to 30 days per year in both sectors.[20] Thus, while the short-term earnings losses are largely driven by employment losses, in the long-run wage losses play a larger role under the flexible pay system.

The effect of job loss on earnings: within- or between-sector losses?

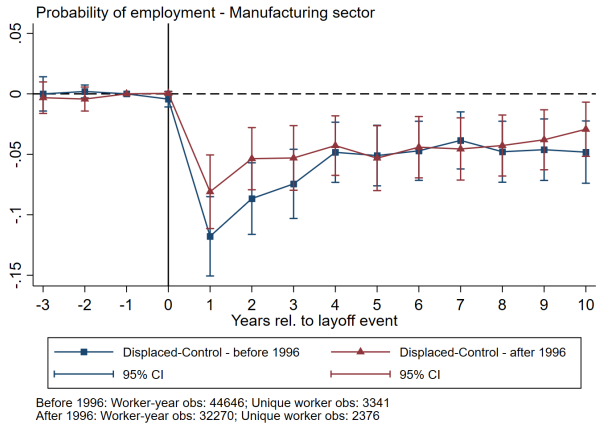
There are some potential reasons behind this heterogeneous earnings response across sectors. First, reduced wage flexibility could help workers displaced from jobs that have substantial wage premiums catch up to non-displaced workers' earnings faster when switching employers conditional on re-employment within the same sector. Recent studies in the job displacement literature suggest that the reason for permanent earnings losses among displaced workers lies in the loss of firm wage premiums following job displacement, since the premium loss is permanent unless displaced workers are able to climb up the pay premium ladder again by switching employers. At the same time, non-displaced workers rarely lose wage premiums over time. For example, Fackler et al. (2021) find that displaced workers indeed show a higher probability of switching employers conditional on re-employment after displacement but that gains in premiums are small.

[20] Similarly, Figure B-4 shows the effect of job loss on unemployment spell duration by sector of employment.

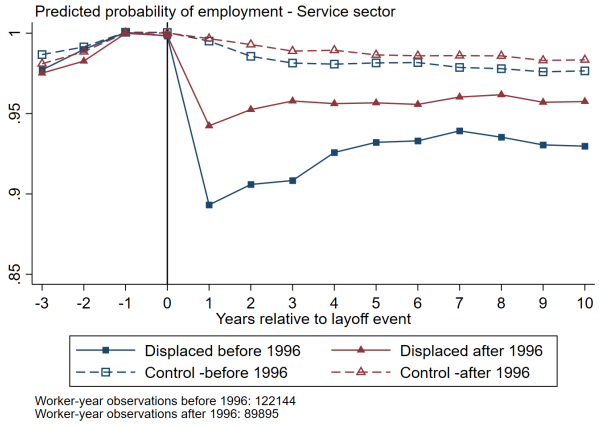
Figure 5: The Effect of Job Loss on Employment Probability: Manufacturing Sector and Service Sector



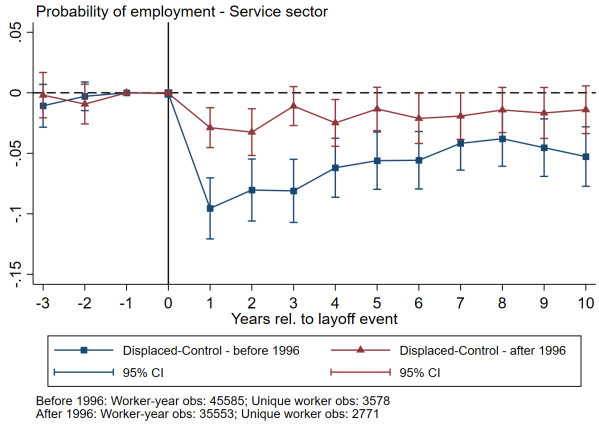
Panel (a)



Panel (b)



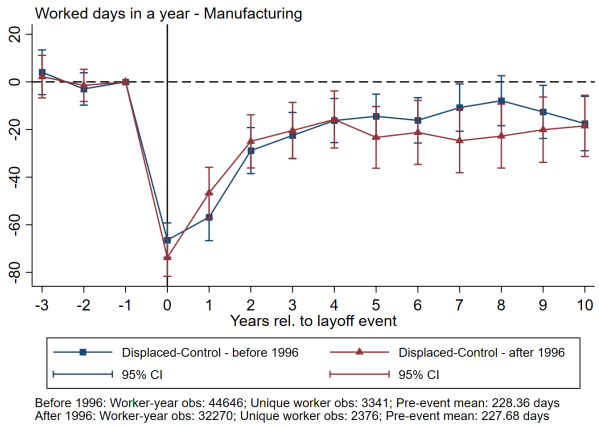
Panel (c)



Panel (d)

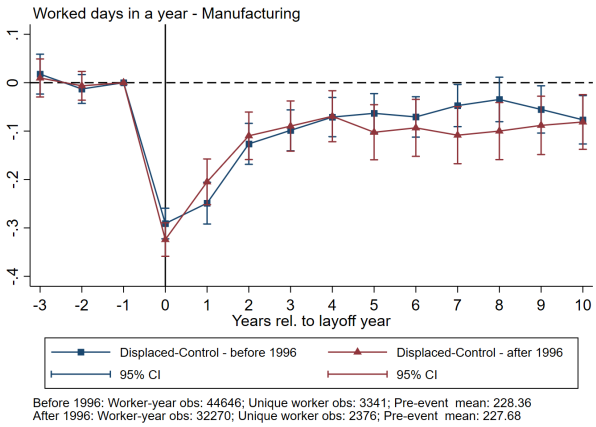
Notes: This figure plots event study coefficients from Equation 1 for workers who are employed in the manufacturing sector (top panels) and the service sector (bottom panels) at the reference date, which is given by mass-layoff events that occur *before* the wage-setting reform (blue, square) and *after* the wage-setting reform (red, triangle). The left panels compare the probability to be employed of workers who are displaced (solid lines) to workers not displaced (dashed lines) by a mass layoff event at the reference date. The right panels plot the difference between the two lines with the corresponding 95 percent confidence interval.

Figure 6: The Effect of Job Loss on Days Worked: Manufacturing Sector and Service Sector



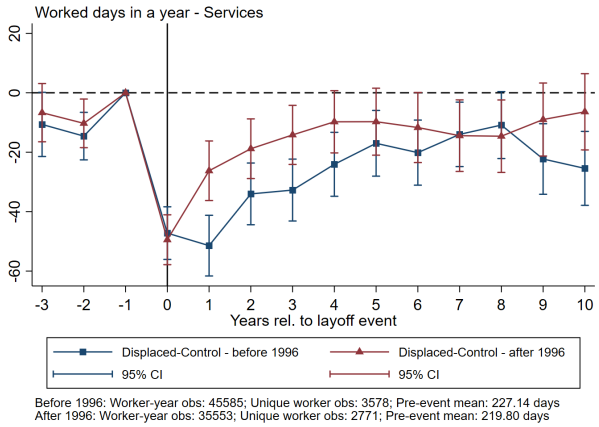
Before 1996: Worker-year obs: 44646; Unique worker obs: 3341; Pre-event mean: 228.36 days
After 1996: Worker-year obs: 32270; Unique worker obs: 2376; Pre-event mean: 227.68 days

Panel (a)



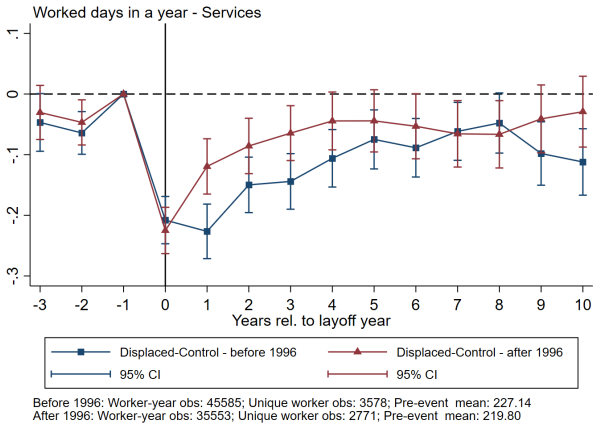
Before 1996: Worker-year obs: 44646; Unique worker obs: 3341; Pre-event mean: 228.36
After 1996: Worker-year obs: 32270; Unique worker obs: 2376; Pre-event mean: 227.68

Panel (b)



Before 1996: Worker-year obs: 45585; Unique worker obs: 3578; Pre-event mean: 227.14 days
After 1996: Worker-year obs: 35553; Unique worker obs: 2771; Pre-event mean: 219.80 days

Panel (c)



Before 1996: Worker-year obs: 45585; Unique worker obs: 3578; Pre-event mean: 227.14
After 1996: Worker-year obs: 35553; Unique worker obs: 2771; Pre-event mean: 219.80

Panel (d)

Notes: This figure shows the effect of displacement on days worked in a year for workers who are employed in the manufacturing sector (top panels) and the service sector (bottom panels) at the reference date. The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The left panel plots the treatment effect in absolute terms, and the right panel provides a relative comparison to the corresponding pre-event level of days worked.

Another possibility is that the magnitude of the earnings losses arises from switching sectors conditional on re-employment after displacement. Under that hypothesis, earnings losses could be the consequence of lower re-employment wages due to changes in within-sector wage premium losses, between-sector wage premium losses, or a combination of both. For example, manufacturing job loss could imply a move to the service sector, for which a worker is not skilled at first and accepts a low-skill wage (Novta and Pugacheva, 2019). Thus, we investigate whether career trajectories of displaced early career workers who remain in the same sector are different from those who switch to a different sector, conditional on re-employment. In Figure B-5 we plot the coefficient obtained from estimating Equation 1 for the subset of displaced and non-displaced workers who do not switch to a different sector of employment within five years of a displacement event. The estimation results for workers in the manufacturing sector Panel (a) and the service sector in Panel (b) confirm that the effect of job loss on earnings we discussed above is not driven by workers who switch sectors. We conclude that earnings losses are the consequence of lower re-employment wages due to changes in within-sector wage premium losses.

Our finding that industry switches play no role in explaining earnings losses is consistent with a large empirical literature showing that reallocation between industries or occupations does not appear to be a major source of employment fluctuation over the business cycle (Abraham and Katz, 1986; Aaronson and Christopher, 2004; Rothstein, 2017).

The effect of job loss on earnings: white-collar or blue-collar losses?

Within sectors, heterogeneous effects of job loss on earnings might also reflect other job characteristics. While our data does not contain detailed information on occupation, it allows us to organize employment records measuring the number of blue- and white-collar employees. Figure B-6 shows that the year of displacement the loss in earnings in levels is around 5 thousand euros for blue-collar workers (in Panel (a)) and 6 to 7 thousand euros for white-collar workers (in Panel (c)). At the reference year, both types of workers experience a similar drop in earnings relative to their pre-event mean earnings across periods (in Panels (b) and (d)) of about 20 percent. Panels (c) and (d) show that the wage-setting reform does not have any heterogeneous impact on the earnings losses of blue-collar workers. After the initial 20 percent drop, blue-collar displaced workers earnings stay 10 percent lower than non-displaced counterparts.

Panels (a) and (b), show a different story for white-collar workers. Under flexible pay (i.e. before the reform) earnings losses for white-collar displaced workers stall at 6000 euros yearly over the ten-year period following the mass layoff compared to non-displaced white-collar workers. However, under the Wage Norm, the difference between white-collar displaced and non-displaced workers is not statistically significant two years after displacement.

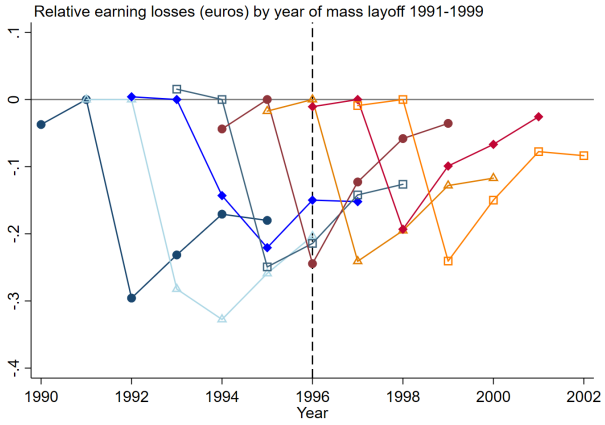
5.3 The effect of job loss over the business cycle

We next examine whether the effects of job loss on earnings are driven by fluctuations over the business cycle. Displaced workers in our sample are likely to be affected by the Belgian 1993 recession. While the early job displacement literature documents that workers who are displaced during recessions face even higher earnings losses (Davis and von Wachter, 2011; Couch and Placzek, 2010), recent work focuses on the sources behind the larger losses during economic downturns. For example, Schmieder et al. (2020) show that the strong cyclical pattern of wages during the 1982, 1993, and 2003 recessions is driven by losses in days worked, which indicates that an important part of the cyclicality of earnings losses at displacement are driven by employment losses. Alternatively, Fackler et al. (2021) show that German workers displaced in the 2008-2009 crisis lose more wage premiums because they come from larger employers paying higher premiums and not because of the limited availability of high-paying employers after displacement.

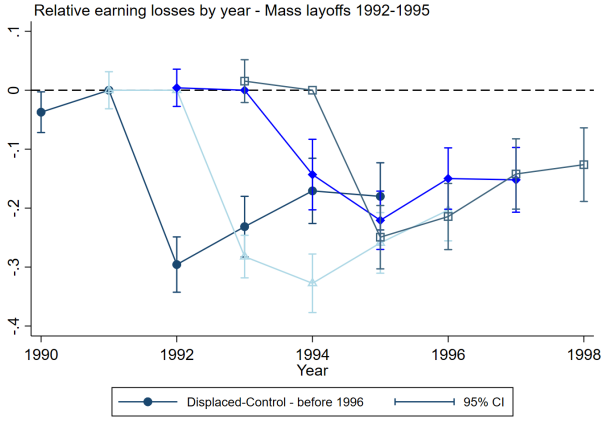
Our sample comprises the Belgian recession of 1993 (defined as a year of negative GDP growth), thus we are able to test whether earnings and employment losses were different during the economic downturn. Figure 7 shows the effect of job loss on earnings over the business cycle. Panel (a) shows earnings losses of displaced workers separately by year of displacement obtained by replicating the regression in Equation 1 for each displacement year between 1992 and 1999. For presentation purposes, we only show the first four years after job displacement. To facilitate the visualization of the effects adding 95% confidence intervals, we plot the same estimates separately for mass-layoff events that take place before the Wage Norm went into effect (i.e., 1992-1995) in Panel (b) and after the reform (i.e., 1996-1999) in Panel (c).

The figure reveals some cyclicality in the loss of annual earnings from job loss in the year of displacement and in the following year. The annual earnings losses are about 7000 euros in the displacement year (i.e., a 30 percent loss with respect to mean pre-displacement earnings) and

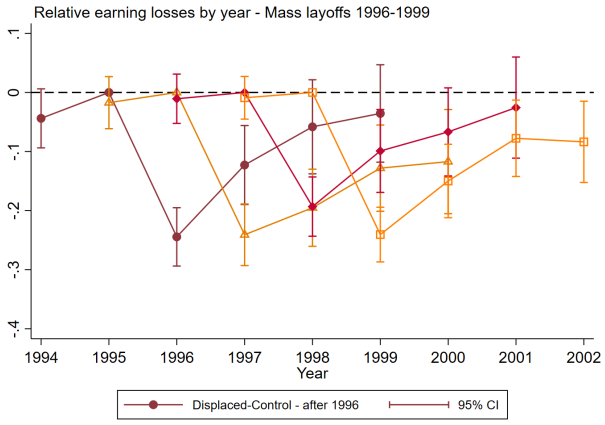
Figure 7: The Effects of Job Loss on Earnings by Year of Job Loss



Panel (a)



Panel (b)



Panel (c)

Notes: This figure shows earnings losses of displaced workers separately by year of displacement obtained by estimating equation 1 for each displacement year (i.e., 1992-1999). The three panels provide a relative comparison to the corresponding pre-event level of earnings. The blue lines plot the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red lines plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. For presentation purposes, we only show four years after job displacement, in panel (a) we show all displacement years, and in Panels (b) and (c) we show the effect of displacement on earnings losses pre- and post-reform, respectively, adding 95% confidence intervals.

about 8000 euros in the year that follows for workers displaced during mass layoffs that take place in 1993. Earnings losses are between 5000 and 6000 euros in the displacement year for non-recession years in our sample. However, the cyclical pattern in earnings losses is concentrated in the short term, whereas the wage losses fall rapidly from the second or third year after displacement across all years.[21] To further confirm that the effect of job loss on earnings before the 1996 reform is not driven by business cycle, in Figure B-7 we estimate equation 1 for different mass-layoff event years. In Panel (e) and Panel (f) we show the absolute and relative effect of job loss on earnings removing from the sample workers who were displaced during mass-layoff events in 1993, respectively. Comparing these estimates to those in Figure 1 allays concerns on the business cycle driving our main results.[22]

Turning to employment losses, Figure 8 shows a cyclical pattern for the probability of employment in Panel (a), days worked in Panel (b), and unemployment spell duration in Panel (c). The largest short-term losses are for workers who lose their jobs during the 1993 recession, which indicates that an important part of the cyclicality of earnings losses at displacement during recession years are driven by employment losses. However, while employment opportunities recover fast, earnings losses fall sluggishly. As before, we show that our main results on the effects of job loss on employment probabilities pre- and post-reform are not driven by the business cycle in Figure B-8; Panels (e) and (f) show predicted probabilities of employment changing event years removing events that took place during the 1993 recession.[23]

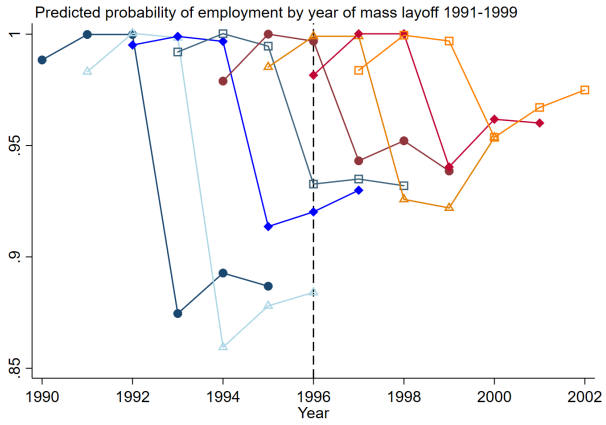
Thus far, using a sample of early-career male workers, we have documented large and persistent earnings losses after job displacement. While in the short term, we observe a sharp drop in earnings and employment across sectors, job characteristics, and year of displacement regardless of the wage-setting system, in the long run displaced workers earnings losses are larger under flexible

[21] Schmieder et al. (2020) find that there is a high degree of cyclicality in earnings losses in Germany, with losses in recessions more than double the losses in booms (i.e., losses were 10000 euros during non-recession years compared to 5000 euros for workers displaced in a recession year). Similarly, Davis and von Wachter (2011) shows that although life-time earnings losses after job displacement are substantial during times of economic growth, the losses nearly double during recessions.

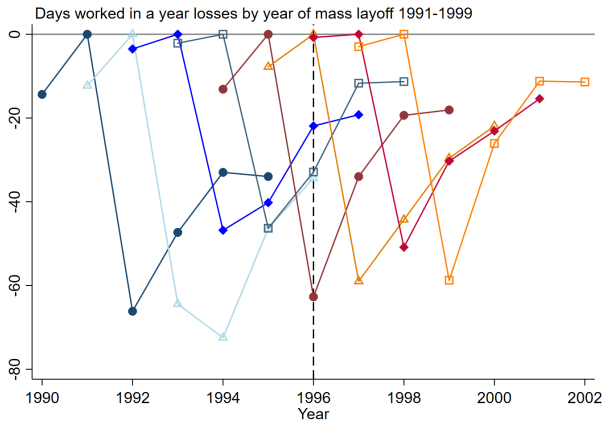
[22] Figure B-7 Panels (a) and (b) estimate equation 1 adding mass layoffs that take place in 2000, which allows us to compare pre- and post-reform samples with similar number of unique worker observations. In Panels (c) and (d) add mass layoffs in year 1991, which allows us to have additional non-recession years in the pre-reform period, with the caveat that we have only one year pre-event information from workers displaced that early in our sample. All in all, the estimation results remain similar across samples.

[23] Figure B-8 Panels (a) and (b) estimate equation 1 adding mass-layoff events that take place in 2000, and Panels (c) and (d) add mass layoffs in year 1991. All in all, the estimation results remain similar across samples.

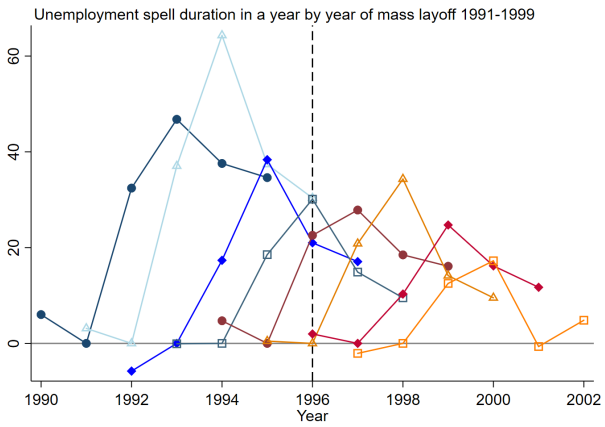
Figure 8: The Effects of Job Loss on Employment Status, Days Worked, and Unemployment Spells Duration by Year of Job Loss



Panel (a)



Panel (b)



Panel (c)

Notes: This figure shows the effect of job loss on employment probability (Panel (a)), days worked (Panel (b)), and unemployment spell duration (Panel (c)) separately by year of displacement obtained by estimating equation 1 for each displacement year (i.e., 1992-1999). The blue lines plot the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red lines plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. For presentation purposes, we only show four years after job displacement.

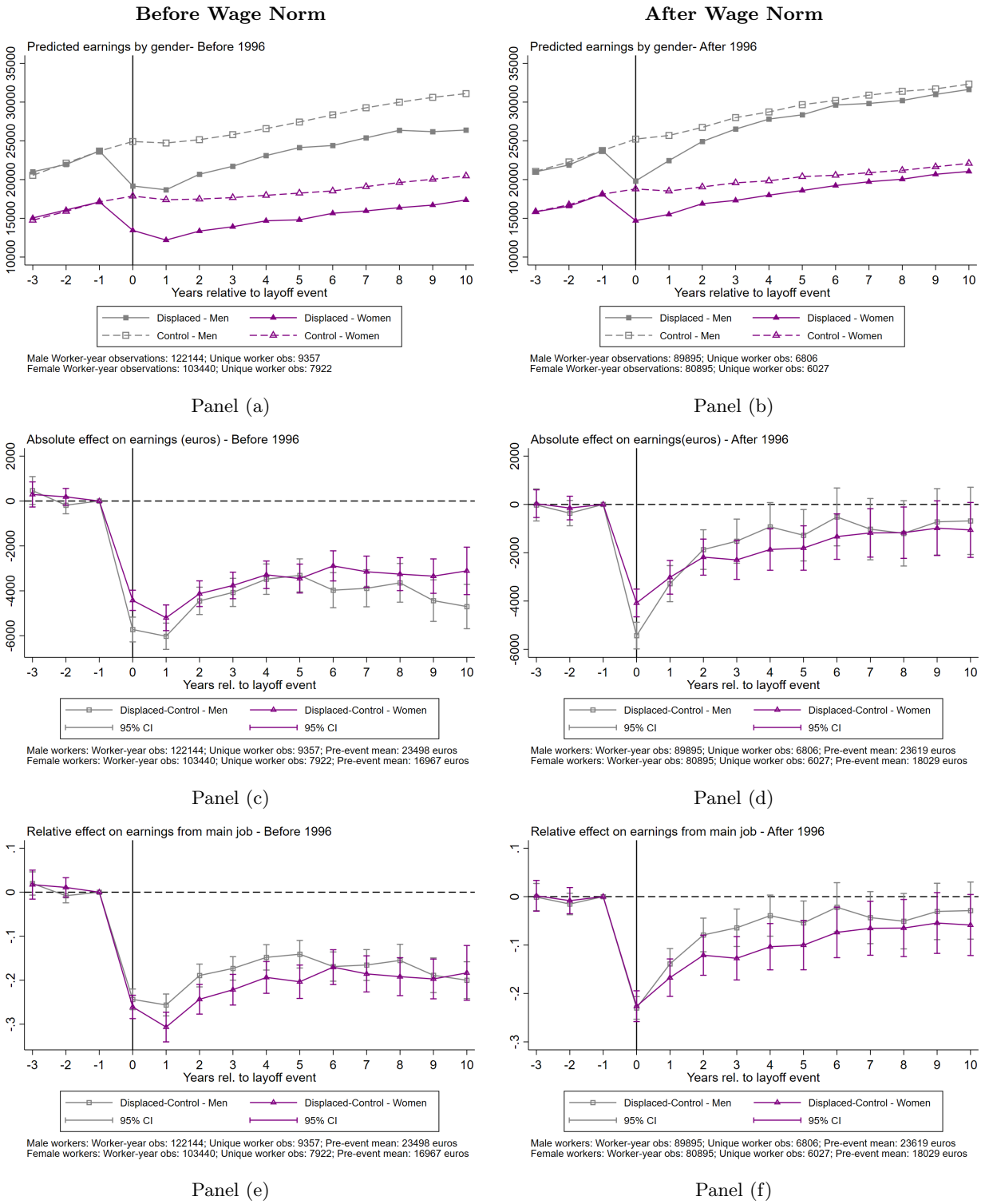
pay. Conversely, after the passage of Wage Norm, displaced workers' earnings gradually converge to those of non-displaced workers. These results are driven by sectors and occupations that had higher wage premiums pre-reform, such as the service sector and white-collar workers. We also show that the differences we find across wage-setting systems are not driven by fluctuations in the business cycle. In the next section, we examine if female early-career workers' labor market outcomes evolve in similarly to male workers after displacement and we investigate if the reform had any effect on the gender pay gap.

5.4 Gender gap in earnings losses and employment after displacement

Although we focus our main analysis on male workers to facilitate comparisons with the earlier literature that typically focuses on men, in this section we extend our analysis to female workers to examine the gender gap in earnings losses after displacement. While in Appendix C we replicate the analysis presented in the previous sections using only a sample of female workers, here we plot the event study coefficients from Equation 1 for men and women to investigate whether there is a gender gap in earnings and employment losses. Figure 9 shows earnings profiles, and the absolute and relative effect of job loss on earnings for displaced male workers (gray line, square) and displaced female workers (purple line, triangle) relative to non-displaced workers in each gender group. The panels on the left show the difference between displaced and controls for mass-layoff events taking place before the passage of the Wage Norm, while the panels on the right do the same for mass layoffs that happen after the reform.

Panels (a) and (b) show total yearly earnings for displaced and non-displaced men (gray line, square) and women (purple line, triangle). The solid lines correspond to workers who are displaced by a mass layoff event at the reference date. Within each gender, pre-trends for treatment and control groups line up very well up to the year before the mass-layoff event. The pre-displacement gender gap in earnings is around 6500 euros before the reform and 5600 euros afterwards. In contrast to Panel (a), where we observe a sharp drop in earnings at displacement that does not converge to back to non-displaced workers' earnings profiles, Panel (b) shows that after an initial drop at the reference date, displaced workers' earnings recover rapidly and converge to the non-displaced workers' earnings trajectory after the passage of the Wage Norm in 1996, especially for men.

Figure 9: Effects of Job Loss on Earnings by Gender



Notes: This figure shows the effect of displacement on yearly earnings (in euros, 2004 prices) of women (purple lines) and men (gray lines). Plots corresponding to event study coefficients from Equation 1 for mass-layoff events between 1992-1995 are on the left and between 1996-1999 are on the right. Panels (a) and (b) compare the earnings profiles of workers who are displaced (solid lines) to workers not displaced (dashed lines) by a mass layoff event at the reference date. Panels (c) and (d) plot the difference between the two lines for each gender (i.e., treatment effect in absolute terms) with the corresponding 95 percent confidence interval. Panels (e) and (f) provide a relative comparison to the corresponding pre-event level of earnings.

The reform does not affect the initial loss in earnings that occurs the year of displacement, which is around 20 to 25 percent relative to pre-displacement mean earnings. Men experience larger earnings losses both in levels (around 6000 euros) compared to women (around 4500 euros), but both genders experience a similar loss in relative earnings at the reference date. After the initial drop in earnings at displacement, the wage setting reform allows a rapid convergence of the displaced workers earnings profiles to those of non-displaced workers, especially for men. Yearly earnings losses are 2000 euros higher under the flexible wage-setting system before the Wage Norm was passed in 1996. However, the wage setting reform does not seem to have an effect on the earnings gender gap.

Regardless of the wage-setting system, in levels, women have smaller earnings losses of around 4500 euros in the year of displacement and the first post-displacement year, while men lose around 6000 euros. The recovery paths of both men a women look similar, but they differ across wage-setting systems. Panel (c) shows that under flexible pay earnings losses are about 4000 for both from the second year after the job loss and these losses do not fade over time. However, Panel (d) shows that under the Wage Norm, earnings losses fall to around 3000 euros yearly for both genders the year after displacement, stay at 2000 euros until five years out, and disappear after five years for men.

Earnings losses relative to pre-displacement mean levels of earnings mimic the recovery path described in levels for both genders, as shown in Panels (e) and (f). It is worth stressing that the event studies plot estimates of the difference in earnings losses between displaced and non-displaced workers within each gender. For example, under flexible pay long-term earnings losses are 4000 euros for men and women, and this value represents about 20 percent of each gender's mean level of pre-displacement earnings. However, there is a large gender gap in pre-displacement earnings across genders: male pre-displacement earnings (around 23.5 thousand euros) are higher than female earnings (around 17 thousand euros). Thus, although displaced workers relative earning losses within their gender are similar, female earnings losses are larger than male earnings losses.

Overall, under flexible pay, there are large and persistent earnings losses for both male and female displaced workers. The gender gap in earnings losses is comparable to that find in Illing et al. (2021) in Germany.[24] Under the Wage Norm, both male and female earnings losses follow a

[24] Illing et al. (2021) show that in levels, women have substantially smaller losses of around 9,000 euros in the first

similar recovery pattern, though women have slightly higher relative losses, and the difference in earnings between displaced and non-displaced workers is not statistically significant after five years post-displacement for men.

The gap in earnings might be explained to a certain extent by the fact that women are more likely than men to be employed in part-time, white-collar, and service-sector jobs compared to men. The challenge when interpreting findings related to earnings losses across genders is that displaced men and women, who satisfy the same baseline restrictions, nevertheless show important differences in labor market variables prior to displacement.[25] Moreover, even when examining the effect of job displacement in more comparable samples of women and men (e.g., full-time, white-collar, service-sector workers), we still observe an heterogeneous response to job displacement across genders. We examine the heterogeneous response in overall employment rates, as well as full-time and part-time employment across genders next.

Figure 10 compares yearly employment rates before and after job displacement for men (gray line, square) and women (purple line, triangle) in the displaced group and in the control group. Panels (a) and (b) present employment profiles in the displaced group (solid lines) and the control group (dashed lines). Panels (c) and (d) show the absolute difference between displaced and controls along with the corresponding 95 percent confidence intervals. The graphs on the left, i.e. before the Wage Norm passage, show that immediately after the mass-layoff event, the employment rate in the displaced groups drops by 10 percent for men and almost 20 percent for women. We see a small recovery which stalls over the 10-year period we observe in our data.

Panels (a) and (c) show that, under flexible pay, employment rates among displaced women fall almost 20 percent the year after a mass layoff, while displaced male workers employment rates only fall 10 percent, compared to non-displaced workers. Turning to the effects of displacement under the Wage Norm (i.e., after the wage-setting reform), Panels (b) and (d) show much lower declines in employment rates for both genders. The year after the mass layoff, the employment rate for

post-displacement year, while men lose around 13,000 euros. While in levels women's earnings losses are smaller, earnings losses relative to pre-displacement earnings are virtually identical recovery paths across genders: in the first year, earnings decline by almost 40% relative to pre-displacement earnings. In the following years, there is some recovery, but 5 years out earnings are still about 20% lower relative to the pre-displacement year.

[25] To calculate the composition adjusted gender gap, work in progress by Illing et al. (2021) combine propensity score matching and a reweighting technique to reweight displaced women to displaced men. For example, they upweight women in the industries where they are underrepresented to address substantial industry differences between men and women. Compared to the overall sample of displaced women, the reweighted women have much higher earnings, work mostly full-time, commute longer and work in smaller establishments that pay higher wage premia.

Figure 10: Effects of Job Loss on Employment by Gender

Notes: This figure shows the effect of job loss on employment probabilities of women (purple lines) and men (gray lines). Plots of event study coefficients from Equation 1 for mass-layoff events between 1992-1995 are on the left, and between 1996-1999 are on the right. Panels (a) and (b) compare the probability to be employed of workers who are displaced (solid lines) to workers not displaced (dashed lines) by a mass layoff event at the reference date. Panels (c) and (d) plot the difference between the two lines with the corresponding 95 percent confidence interval.

displaced women is 10 percent lower compared to non-displaced women, whereas displaced men are only 5 percent less likely to be employed compared to non-displaced men.

One of the reasons the job displacement literature focuses on men is that this group has higher labor force attachment which leads to less selection issues between in and out of the labor force simplifying the interpretation of results. While our data does not allow us to distinguish between women who leave the labor force and women who become self-employed, next we examine whether full-time or part-time employment status is an important driver of the gender gap in pre-displacement earnings and in earnings losses after displacement. One difference to the previous literature (with the exception of Illing et al. (2021)) is that our baseline restrictions allow for part-time employment before displacement, which makes the baseline sample more representative of women in Belgium, where 30 to 40 percent of women were employed part-time over our period of analysis (StatBel, 2021).

Part-time and Full-time employment

One key driver for the differences in pre-displacement earnings might be that men in our sample rarely work part-time compared to women. At the reference year, 64% of the women in the sample worked full-time and 36% worked part-time. At the reference year, 93.5% of the men in the sample worked full-time and 6.5% of the men worked part-time.

Figure B-9 compares yearly employment rates before and after job displacement for men (gray line, square) and women (purple lines) in the displaced group and in the control group. The graphs on the top present the probability of being employed in a full-time job in the displaced group (solid lines) and the control group (dashed lines), adding full-time employment as a baseline restriction. The graphs on the bottom present the probability of being employed in a part-time job, for workers who were employed in a full-time job pre-displacement.

Looking at the gray lines (square) in Panel (a) and (b) we see that the main results discussed above for men are driven by full-time workers (as expected given that 93.5% of our male sample is employed in a full-time job before the mass-layoff event). Displaced male workers are 10-20% less likely to be employed in a full-time job after displacement, while the probability of working part-time both displaced and non-displaced male workers remains close to null. The employment profiles of both displaced and non-displaced women look different than those of men. Women displaced

from a full-time job, are 30 percent less likely to be employed in a full-time job and 10 percent more likely to be employed in a part-time job the year after the event, relative to non-displaced women.

The difference in the employment profiles of displaced and non-displaced women shrinks over time driven by the fact that non-displaced women full-time employment rates decline over the ten years post-displacement.[26]

6 Conclusion

This paper uses administrative data from Belgium covering two decades to explore the relationship between flexible pay and the wage costs of job loss. We use variation in the timing of job loss due to mass layoffs spanning over an institutional reform that limited the increase of employer-specific wage premiums, to compare the earnings losses of displaced workers under different wage-setting systems. Our data allows us to distinguish between losses in employment and losses in wages over a ten-year period after a mass-layoff event. We focus our analysis on early-career workers, a group with high job mobility and wage growth for whom interruptions in the job-to-job ladder towards better quality and higher-paying jobs has potentially dire consequences in their career trajectories.

We obtain several key findings. First, we find that displaced workers lose on average 24 percent of earnings the first year after displacement. While the initial drop in earnings is similar across workers displaced before and after the wage setting-reform, the decreasing trend in earnings losses diverges thereafter. Workers displaced before the Belgian Wage Norm went into effect lost on average 17 percent of their annual earnings over a 10-year period after displacement, while those who were laid off after the passage of the law lost on average 10 percent.

Second, we examine whether these differences in earnings losses are heterogeneous across sectors of employment. We find that displaced manufacturing sector workers experienced a 25 percent loss in earnings during the first few years after displacement compared to non-displaced manufacturing sector workers. This loss in earnings remains at 15 percent on average in the long run and is similar regardless of the timing of the mass layoff event with respect to the wage-setting reform. However,

[26] In Figures B-10 and B-11 we show the earnings profiles of pre-displacement full-time and part-time workers, respectively. Figure B-10 confirms that our main results are driven by workers pre-displacement full-time workers. Figure B-11 shows almost no differences in earnings between part-time displaced and non-displaced workers; these estimates are noisily estimated because restricting the sample to workers with part-time jobs at baseline reduces the sample size considerably, especially for men.

service sector workers displaced during mass layoff events under a flexible pay system suffer a strong and persistent 20 percent loss in annual earnings, while after the reform displaced workers' earnings fully converge to non-displaced workers' earnings within three years.

Third, we show that the larger earnings losses we find among displaced workers under the flexible pay system are not driven by the business cycle. The cyclical pattern of earnings losses is concentrated in the short term, while the pace at which earnings losses fall is driven by the degree of flexibility in the wage-setting system.

Finally, we examine gender gap in pre-layoff level of earnings and its implications for interpreting the gender gap in earnings losses after displacement. When we replicate the baseline analysis for female workers, we find that the wage-setting reform had similar effects on these group of workers. However, in the case of women, earnings losses are also driven by higher unemployment rates after displacement and a higher likelihood of switching from full-time to part-time employment than men.

Our findings are consistent with the increasing literature documenting the existence of firm-specific wage components and their role in explaining career trajectories of young workers. While losses in employment play a role in the short term, reduced wages play a larger role in long-term earnings losses. This result implies that large part of wage losses can be explained by the reduction of average wage levels of new employers.

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A Additional Tables

Table A-1: The Effects of Job Loss on Earnigns (in thousands of euros, 2004 prices)

Dependent variable: Annual earnings from main job (1000 euros)						
	Overall		**Manufacturing**		**Service**	
	Pre-96	Post-96	Pre-96	Post-96	Pre-96	Post-96
	(1)	(2)	(3)	(4)	(5)	(6)
Pre-event						
δ_{-3}	0.466	-0.022	0.714	0.611	0.373	-0.557
	(0.317)	(0.338)	(0.539)	(0.504)	(0.558)	(0.608)
δ_{-2}	-0.185	-0.360	0.166	-0.054	-0.527	-0.782
	(0.195)	(0.268)	(0.342)	(0.362)	(0.332)	(0.487)
Year of mass-layoff event						
δ_0	-5.724***	-5.430***	-6.125***	-6.340***	-4.954***	-4.874***
	(0.281)	(0.282)	(0.535)	(0.474)	(0.498)	(0.488)
Post-event						
δ_1	-6.024***	-3.279***	-6.958***	-5.784***	-5.730***	-1.927***
	(0.298)	(0.381)	(0.538)	(0.606)	(0.502)	(0.678)
δ_2	-4.448***	-1.869***	-4.957***	-3.325***	-4.488***	-0.976
	(0.311)	(0.418)	(0.535)	(0.698)	(0.542)	(0.744)
δ_3	-4.071***	-1.520***	-4.206***	-3.231***	-4.602***	-0.242
	(0.320)	(0.466)	(0.546)	(0.733)	(0.565)	(0.844)
δ_4	-3.481***	-0.928*	-3.485***	-3.226***	-4.283***	0.540
	(0.346)	(0.512)	(0.549)	(0.688)	(0.629)	(0.915)
δ_5	-3.312***	-1.277**	-3.143***	-3.259***	-4.160***	0.439
	(0.375)	(0.543)	(0.598)	(0.918)	(0.685)	(0.947)
δ_6	-3.972***	-0.518	-3.999***	-2.781***	-5.145***	0.759
	(0.399)	(0.611)	(0.630)	(1.014)	(0.727)	(1.090)
δ_7	-3.889***	-1.024	-3.466***	-3.209***	-4.902***	-0.180
	(0.420)	(0.647)	(0.703)	(1.090)	(0.738)	(1.110)
δ_8	-3.645***	-1.198*	-3.416***	-3.176***	-4.514***	0.397
	(0.440)	(0.690)	(0.739)	(1.148)	(0.780)	(1.264)
δ_9	-4.437***	-0.721	-3.990***	-3.192***	-5.512***	1.272
	(0.472)	(0.701)	(0.798)	(0.990)	(0.844)	(1.365)
δ_{10}	-4.701***	-0.682	-4.250***	-2.380**	-5.933***	0.435
	(0.503)	(0.710)	(0.832)	(1.101)	(0.941)	(1.343)
Mean t-1	23	24	25	26	23	23
Worker-year Obs	122,144	89,895	44,646	32,270	45,585	35,553

Notes: This table shows the effect of job loss on displaced workers' earnings (in thousands of euros, 2004 prices) at a yearly level based on Equation 1. The coefficient δ_k measures the average difference in earnings between displaced and non-displaced workers. We present estimation results for workers who at the reference date are employed in any sector (columns 1-2), in the manufacturing sector (columns 3-4), and in the service sector (5-6). Odd [even] columns present the estimation results using the sample of displaced and non-displaced workers during events that occur before [after] the wage-setting reform. The second to last row shows the pre-event mean, which refers to the mean of the dependent variable in the year before the reference date.

Table A-2: The Effects of Job Loss on Employment

Dependent variable: Probability of Employment						
	Overall		**Manufacturing**		**Service**	
	Pre-96	Post-96	Pre-96	Post-96	Pre-96	Post-96
	(1)	(2)	(3)	(4)	(5)	(6)
Pre-event						
δ_{-3}	-0.010*	-0.006	-0.000	-0.003	-0.011	-0.002
	(0.005)	(0.005)	(0.007)	(0.007)	(0.009)	(0.010)
δ_{-2}	-0.001	-0.006	0.002	-0.004	-0.003	-0.009
	(0.003)	(0.004)	(0.003)	(0.005)	(0.006)	(0.008)
Year of mass-layoff event						
δ_0	-0.002	-0.001	-0.004	0.000	-0.001	-0.000
	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)
Post-event						
δ_1	-0.102***	-0.054***	-0.118***	-0.081***	-0.096***	-0.029***
	(0.008)	(0.007)	(0.017)	(0.016)	(0.013)	(0.008)
δ_2	-0.080***	-0.040***	-0.087***	-0.054***	-0.080***	-0.032***
	(0.008)	(0.007)	(0.015)	(0.013)	(0.013)	(0.010)
δ_3	-0.073***	-0.031***	-0.074***	-0.053***	-0.081***	-0.011
	(0.008)	(0.006)	(0.015)	(0.014)	(0.013)	(0.008)
δ_4	-0.055***	-0.033***	-0.048***	-0.043***	-0.062***	-0.025**
	(0.007)	(0.006)	(0.013)	(0.013)	(0.012)	(0.010)
δ_5	-0.050***	-0.029***	-0.051***	-0.053***	-0.056***	-0.013
	(0.007)	(0.007)	(0.013)	(0.014)	(0.012)	(0.009)
δ_6	-0.049***	-0.030***	-0.047***	-0.044***	-0.056***	-0.021**
	(0.007)	(0.007)	(0.012)	(0.013)	(0.012)	(0.011)
δ_7	-0.040***	-0.025***	-0.039***	-0.046***	-0.042***	-0.019*
	(0.007)	(0.006)	(0.012)	(0.013)	(0.011)	(0.010)
δ_8	-0.043***	-0.024***	-0.048***	-0.043***	-0.038***	-0.014
	(0.007)	(0.006)	(0.013)	(0.013)	(0.012)	(0.010)
δ_9	-0.046***	-0.027***	-0.046***	-0.038***	-0.045***	-0.017
	(0.007)	(0.007)	(0.013)	(0.013)	(0.012)	(0.011)
δ_{10}	-0.047***	-0.026***	-0.048***	-0.029**	-0.053***	-0.014
	(0.007)	(0.007)	(0.013)	(0.011)	(0.013)	(0.010)
Mean t-1	1	1	1	1	1	1
Worker-year Obs	122,144	89,895	44,646	32,270	45,585	35,553

Notes: This table shows the effect of job loss on employment rates at a yearly level based on Equation 1. The coefficient δ_k measures the average difference in employment probabilities between displaced and non-displaced workers. We present estimation results for workers who at the reference date are employed in any sector (columns 1-2), in the manufacturing sector (columns 3-4), and in the service sector (5-6). Odd [even] columns present the estimation results using the sample of displaced and non-displaced workers during events that occur before [after] the wage-setting reform. The second to last row shows the pre-event mean, which refers to the mean of the dependent variable in the year before the reference date.

Table A-3: The Effects of Job Loss on Days Worked in a Year

Dependent variable: days worked in a year						
	Overall		**Manufacturing**		**Service**	
	Pre-96	Post-96	Pre-96	Post-96	Pre-96	Post-96
	(1)	(2)	(3)	(4)	(5)	(6)
Pre-event						
δ_{-3}	-4.577	-3.962	4.039	2.212	-10.642*	-6.683
	(2.999)	(2.915)	(4.794)	(4.562)	(5.511)	(5.001)
δ_{-2}	-8.748***	-5.795**	-2.967	-1.474	-14.576***	-10.285**
	(2.198)	(2.409)	(3.466)	(3.447)	(4.078)	(4.175)
Year of mass-layoff event						
δ_0	-56.707***	-57.927***	-66.434***	-73.774***	-47.224***	-49.451***
	(2.470)	(2.519)	(3.681)	(4.023)	(4.518)	(4.281)
Post-event						
δ_1	-50.739***	-32.735***	-56.824***	-46.637***	-51.436***	-26.236***
	(2.940)	(3.138)	(5.025)	(5.483)	(5.210)	(5.113)
δ_2	-31.008***	-19.897***	-28.848***	-24.975***	-34.023***	-18.821***
	(2.984)	(3.160)	(4.930)	(5.696)	(5.298)	(5.121)
δ_3	-27.054***	-16.272***	-22.480***	-20.414***	-32.735***	-14.170***
	(2.977)	(3.193)	(4.922)	(6.026)	(5.312)	(5.073)
δ_4	-18.604***	-12.517***	-16.233***	-15.785***	-24.075***	-9.758*
	(2.980)	(3.372)	(4.724)	(6.116)	(5.489)	(5.346)
δ_5	-15.305***	-15.961***	-14.449***	-23.310***	-16.999***	-9.722*
	(3.009)	(3.605)	(4.742)	(6.608)	(5.639)	(5.751)
δ_6	-17.435***	-13.667***	-16.152***	-21.239***	-20.133***	-11.683*
	(3.016)	(3.688)	(4.860)	(6.837)	(5.588)	(6.014)
δ_7	-14.321***	-15.781***	-10.800**	-24.693***	-13.988**	-14.429**
	(3.071)	(3.786)	(5.065)	(6.851)	(5.531)	(6.140)
δ_8	-11.339***	-17.591***	-7.909	-22.756***	-10.861*	-14.604**
	(3.220)	(3.805)	(5.356)	(6.853)	(5.745)	(6.222)
δ_9	-19.296***	-11.425***	-12.618**	-20.078***	-22.282***	-8.998
	(3.388)	(3.845)	(5.687)	(7.001)	(6.057)	(6.270)
δ_{10}	-21.807***	-10.604***	-17.509***	-18.480***	-25.443***	-6.397
	(3.511)	(3.897)	(5.818)	(6.566)	(6.346)	(6.548)
Observations	122,144	89,895	44,646	32,270	45,585	35,553
Mean t-1	224	222	228	228	227	220

Notes: This table shows the effect of job loss on days worked at a yearly level based on Equation 1. The coefficient δ_k measures the average difference between displaced and non-displaced workers. We present estimation results for workers who at the reference date are employed in any sector (columns 1-2), in the manufacturing sector (columns 3-4), and in the service sector (5-6). Odd [even] columns present the estimation results using the sample of displaced and non-displaced workers during events that occur before [after] the wage-setting reform. The second to last row shows the pre-event mean, which refers to the mean of the dependent variable in the year before the reference date.

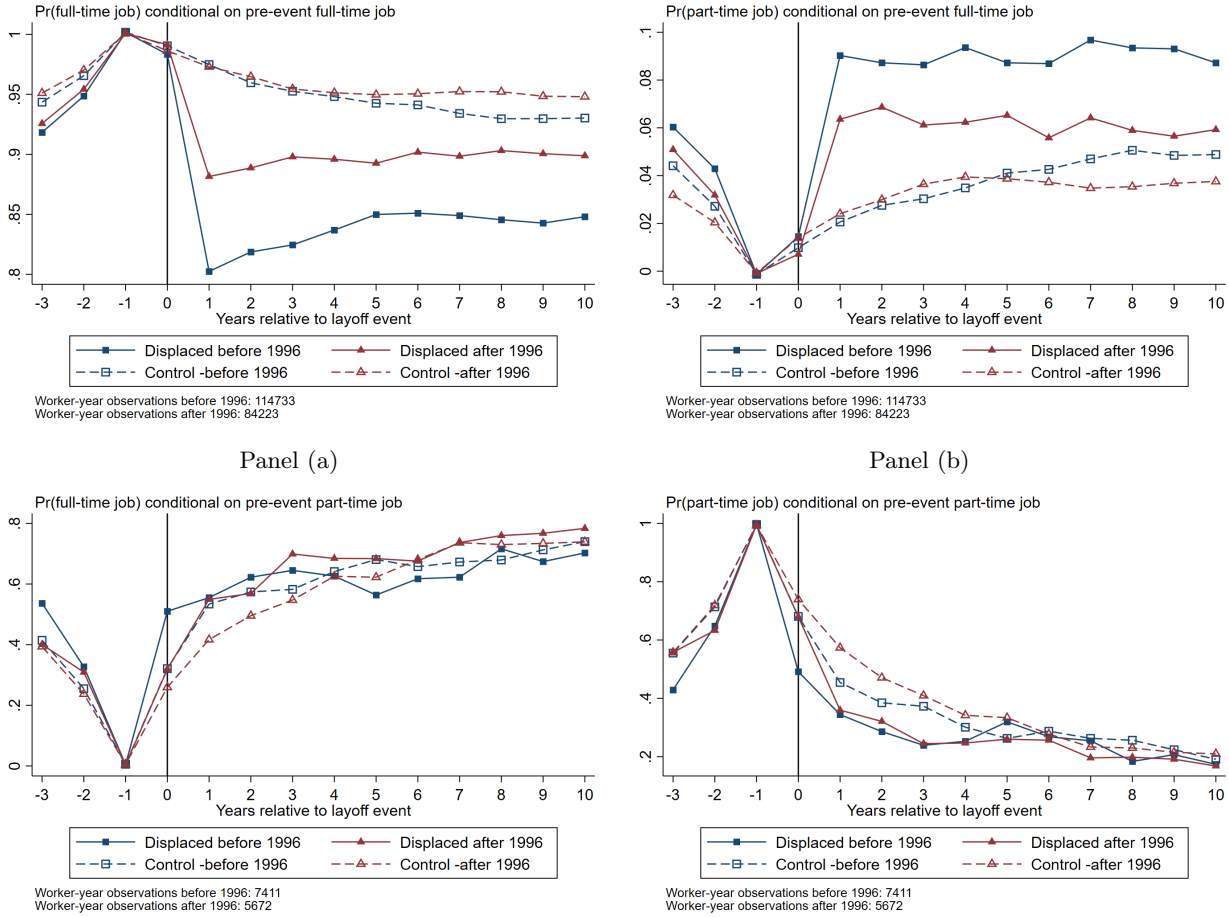
Table A-4: The Effects of Job Loss on Unemployment Spells Duration

Dependent variable: days not worked in a year						
	Overall		**Manufacturing**		**Service**	
	Pre-96	Post-96	Pre-96	Post-96	Pre-96	Post-96
	(1)	(2)	(3)	(4)	(5)	(6)
Pre-event						
δ_{-3}	-1.221	0.051	-8.728**	-8.884**	4.018	2.596
	(2.522)	(2.504)	(4.143)	(4.258)	(4.438)	(4.190)
δ_{-2}	0.787	1.964	-3.743	-3.072	3.188	4.410
	(1.701)	(1.741)	(2.943)	(3.165)	(2.956)	(2.852)
Year of mass-layoff event						
δ_0	31.435***	19.972***	47.922***	31.688***	18.888***	9.381***
	(2.210)	(2.093)	(4.036)	(4.301)	(3.445)	(2.886)
Post-event						
δ_1	49.568***	28.898***	65.758***	37.429***	39.733***	20.843***
	(3.182)	(2.997)	(6.160)	(5.845)	(5.294)	(4.299)
δ_2	31.540***	14.043***	32.159***	18.934***	32.642***	11.618***
	(3.170)	(2.915)	(5.721)	(5.988)	(5.221)	(4.294)
δ_3	24.283***	12.236***	23.386***	13.299**	28.865***	8.585**
	(3.157)	(2.951)	(5.874)	(6.008)	(5.493)	(4.093)
δ_4	17.887***	8.398***	12.024**	9.156	22.702***	6.667
	(3.148)	(2.927)	(5.539)	(5.792)	(5.680)	(4.147)
δ_5	12.110***	10.034***	12.634**	6.005	12.295**	9.526**
	(3.100)	(3.095)	(5.693)	(5.772)	(5.486)	(4.514)
δ_6	10.755***	9.678***	9.430*	5.066	9.875*	11.046**
	(3.146)	(3.111)	(5.516)	(5.549)	(5.492)	(4.722)
δ_7	8.200***	10.469***	7.349	6.746	8.927	10.474**
	(3.148)	(3.133)	(5.876)	(5.762)	(5.507)	(4.515)
δ_8	7.572**	8.796***	4.720	2.542	6.185	10.347**
	(3.090)	(3.142)	(5.506)	(5.528)	(5.337)	(4.601)
δ_9	6.197**	4.264	-0.597	1.549	7.855	4.558
	(3.142)	(3.171)	(5.237)	(5.685)	(5.488)	(4.729)
δ_{10}	8.345***	3.052	1.136	-3.577	11.726**	6.854
	(3.236)	(3.309)	(5.292)	(5.529)	(5.757)	(5.338)
Mean t-1	24	21	22	18	23	21
Worker-year Obs	122,144	89,895	44,646	32,270	45,585	35,553

Notes: This table shows the effect of job loss on unemployment spells duration at a yearly level based on Equation 1. The coefficient δ_k measures the average difference between displaced and non-displaced workers. We present estimation results for workers who at the reference date are employed in any sector (columns 1-2), in the manufacturing sector (columns 3-4), and in the service sector (5-6). Odd [even] columns present the estimation results using the sample of displaced and non-displaced workers during events that occur before [after] the wage-setting reform. The second to last row shows the pre-event mean, which refers to the mean of the dependent variable in the year before the reference date.

B Additional Figures

Figure B-1: The Effect of Job Loss on the Probability of Full-time and Part-time Employment

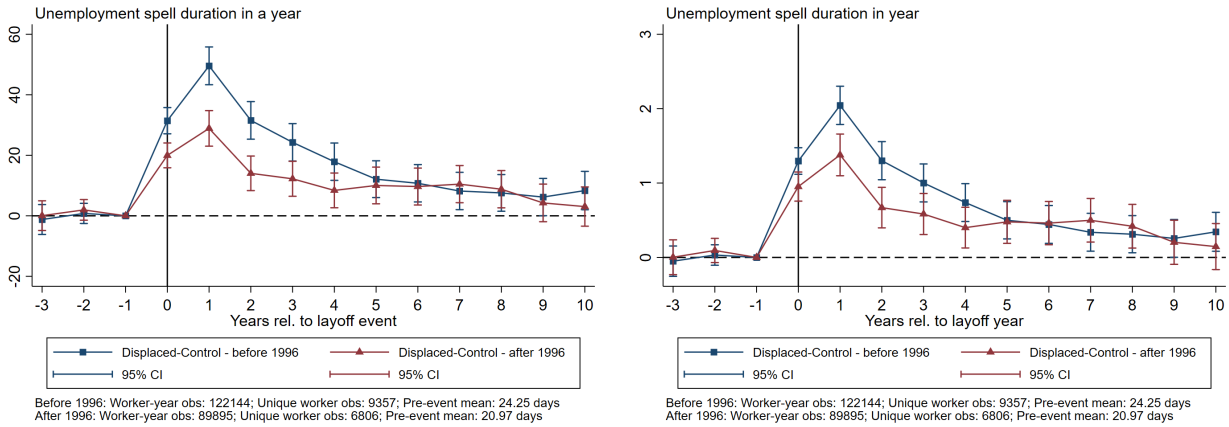


Panel (a) Panel (b)

Panel (c) Panel (d)

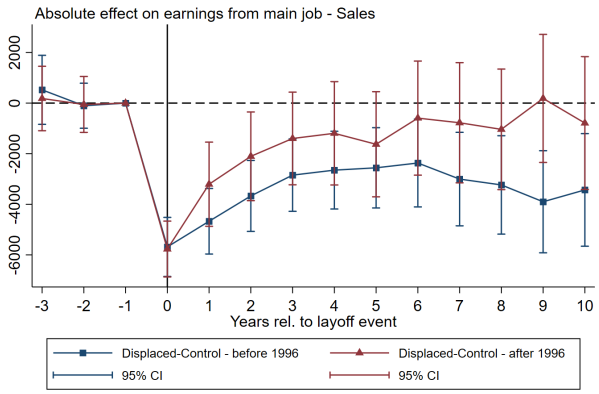
Notes: This figure shows the effect of job displacement on the probability of full-time [part-time] employment, adding having a full-time [part-time] job at the reference date as a baseline condition. For each combination of full- and part-time employment pre- and post-displacement, the graphs compare the probability of full-time or part-time employment of workers displaced (solid lines) to workers not displaced (dashed lines) by a mass layoff event at the reference date, conditional on their full- and part-time pre-event employment status.

Figure B-2: The Effect of Job Loss on Unemployment Spells Duration



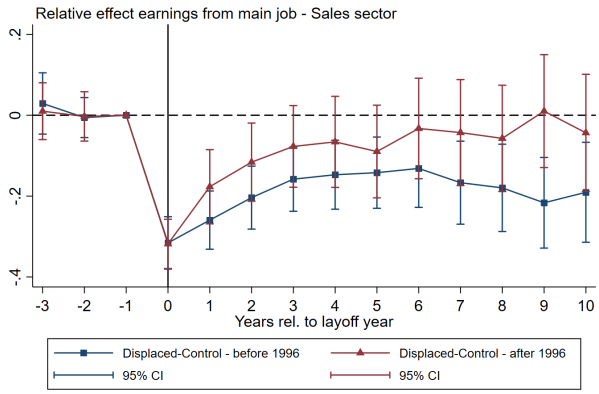
Notes: This figure shows the effect of displacement on unemployment spells duration in a year. The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The left panel plots the treatment effect in absolute terms, and the right panel provides a relative comparison to the corresponding pre-event mean days without employment.

Figure B-3: The Effect of Job Loss on Earnings - By Other Sectors of Employment



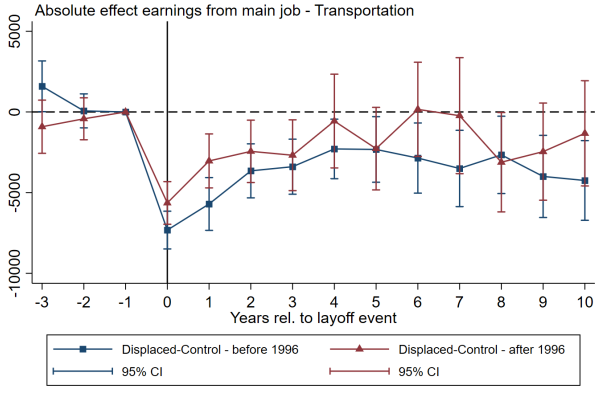
Before 1996: Worker-year obs: 11388; Unique worker obs: 874; Pre-event mean: 18006 euros
After 1996: Worker-year obs: 7759; Unique worker obs: 584; Pre-event mean: 18130 euros

Panel (a)



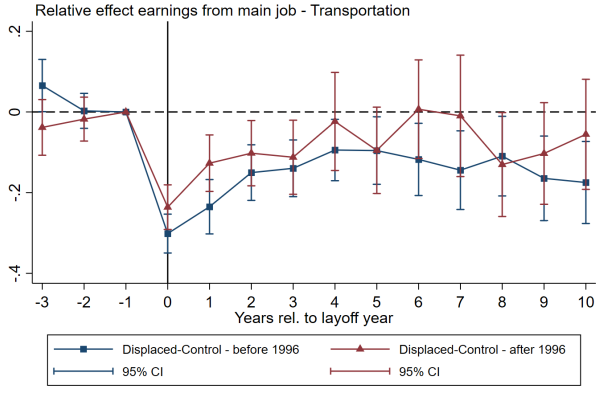
Before 1996: Worker-year obs: 11388; Unique worker obs: 874; Pre-event earnings mean: 18006
After 1996: Worker-year obs: 7759; Unique worker obs: 584; Pre-event earnings mean: 18130

Panel (b)



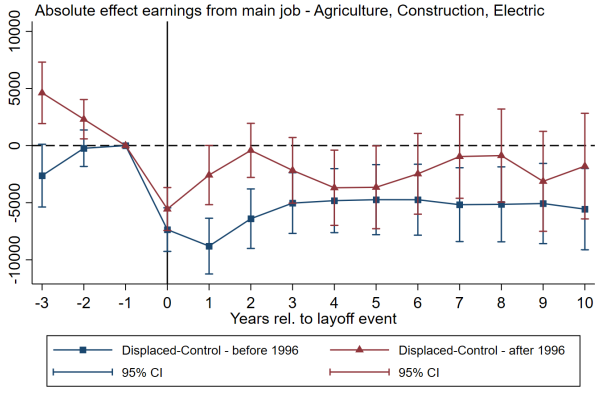
Before 1996: Worker-year obs: 15750; Unique worker obs: 1203; Pre-event mean: 24277 euros
After 1996: Worker-year obs: 11591; Unique worker obs: 872; Pre-event mean: 23892 euros

Panel (c)



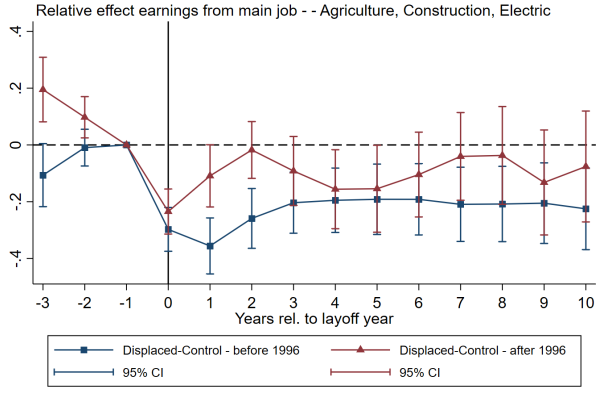
Before 1996: Worker-year obs: 15750; Unique worker obs: 1203; Pre-event earnings mean: 24277
After 1996: Worker-year obs: 11591; Unique worker obs: 872; Pre-event earnings mean: 23892

Panel (d)



Before 1996: Worker-year obs: 4775; Unique worker obs: 361; Pre-event mean: 24732 euros
After 1996: Worker-year obs: 2722; Unique worker obs: 203; Pre-event mean: 23671 euros

Panel (e)

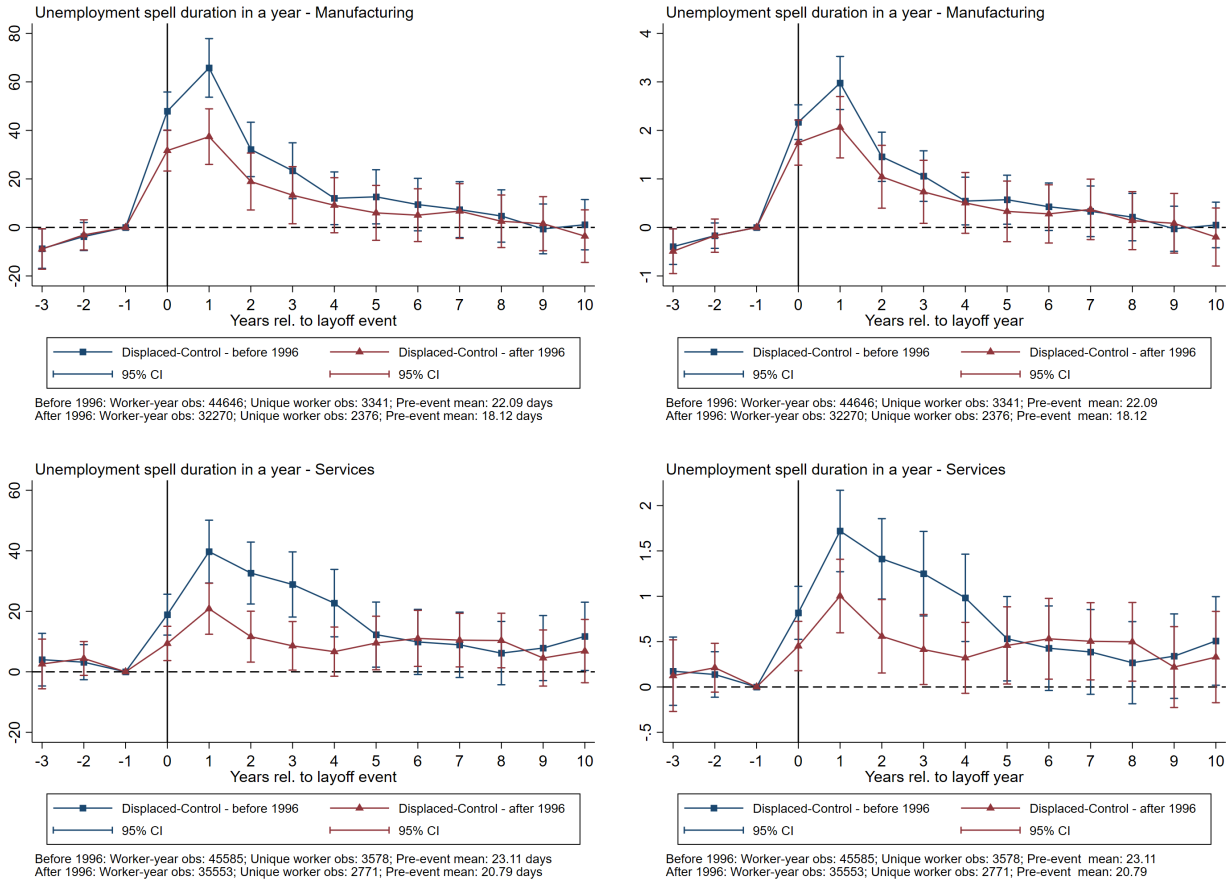


Before 1996: Worker-year obs: 4775; Unique worker obs: 361; Pre-event earnings mean: 24732
After 1996: Worker-year obs: 2722; Unique worker obs: 203; Pre-event earnings mean: 23671

Panel (f)

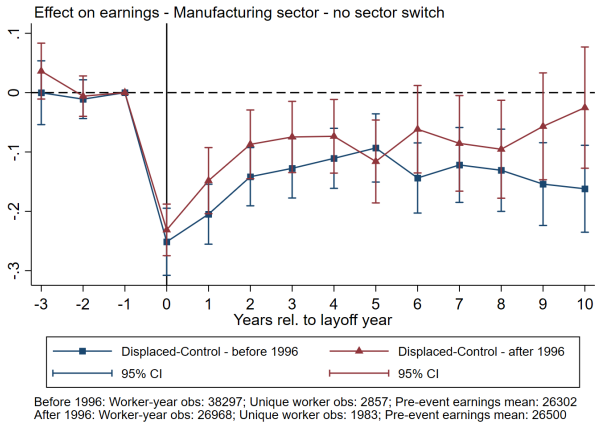
Notes: This figure shows the effect of displacement on yearly earnings (in euros, 2004 prices) for workers who are employed in the Sales sector (top panels), Transportation section (middle panels), and other sectors (bottom panels) at the reference date. The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The left panel plots the treatment effect in absolute terms, and the right panel provides a relative comparison to the corresponding pre-event level of earnings.

Figure B-4: The Effect of Job Loss on Unemployment Spells Duration: Manufacturing Sector and Service Sector

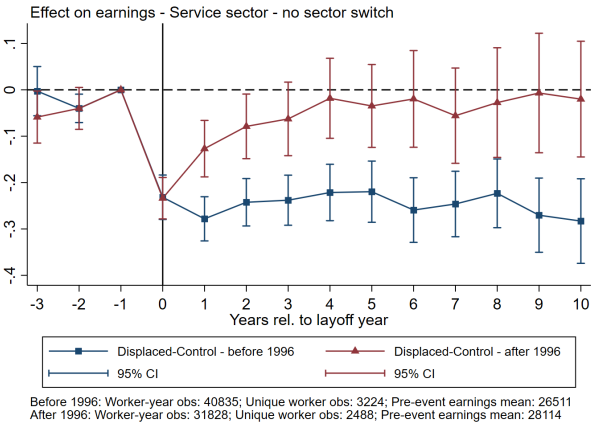


Notes: This figure shows the effect of displacement on unemployment spells duration in a year for workers who are employed in the manufacturing sector (top panels) and the service sector (bottom panels) at the reference date. The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The left panel plots the treatment effect in absolute terms, and the right panel provides a relative comparison to the corresponding pre-event number of days without employment.

Figure B-5: The Effects of Job Loss on Earnings for Non-Switchers: Manufacturing and Services



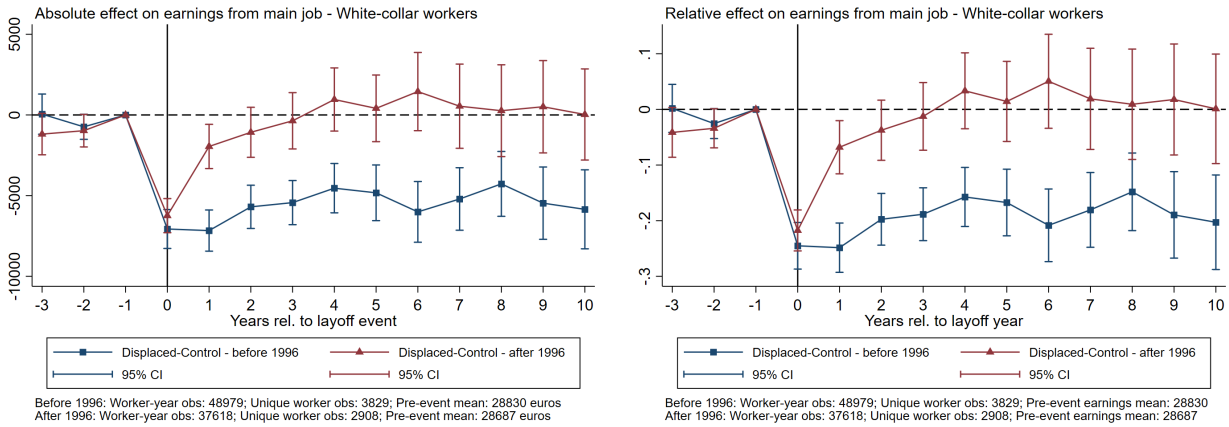
Panel (a)



Panel (b)

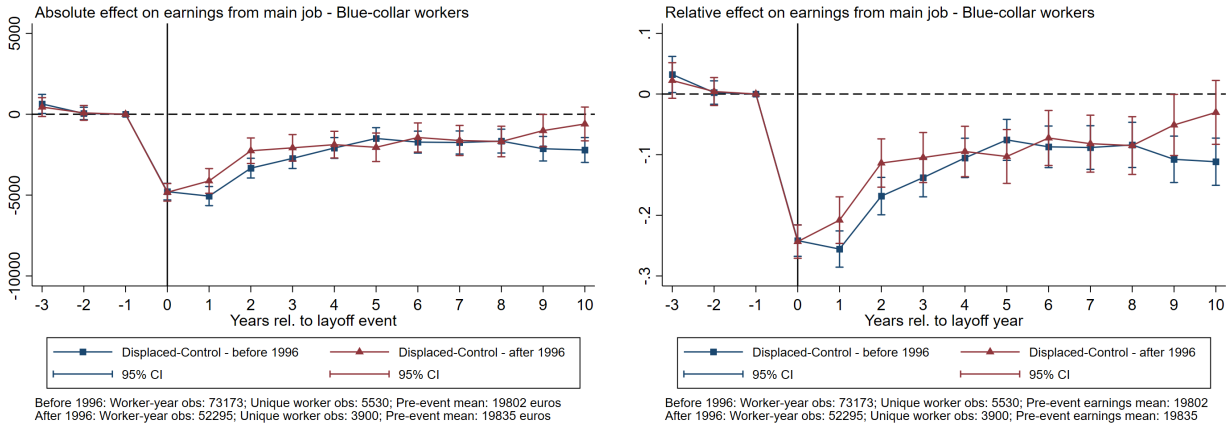
Notes: This figure shows the effect of displacement on yearly earnings (in euros, 2004 prices) for workers who at the reference date are employed in the manufacturing sector (Panel a) and the service sector (Panel b), and who do not switch sectors after displacement conditional on re-employment. The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The graphs provide a relative comparison to the corresponding pre-event level of earnings.

Figure B-6: The Effects of Job Loss on Earnings: White-collar and Blue-collar Employees



Panel (a)

Panel (b)

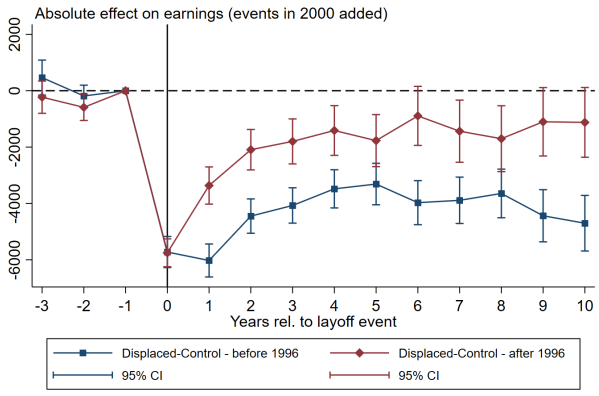


Panel (c)

Panel (d)

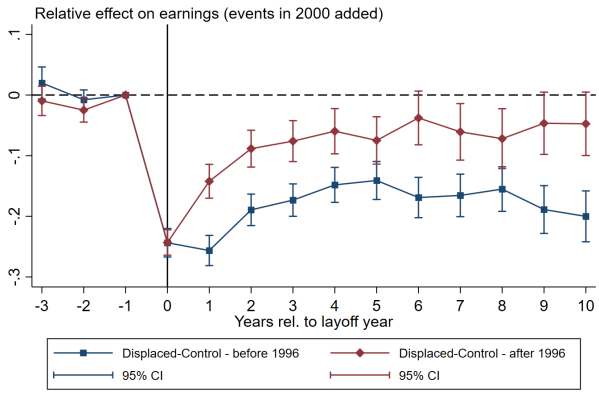
Notes: This figure shows the effect of displacement on yearly earnings (in euros, 2004 prices) for workers who are employed in white-collar jobs (top panels) and blue-collar jobs (bottom panels) at the reference date. The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The left panel plots the treatment effect in absolute terms, and the right panel provides a relative comparison to the corresponding pre-event level of earnings.

Figure B-7: The Effect of Job Loss on Earnings - Changing Event Years Considered



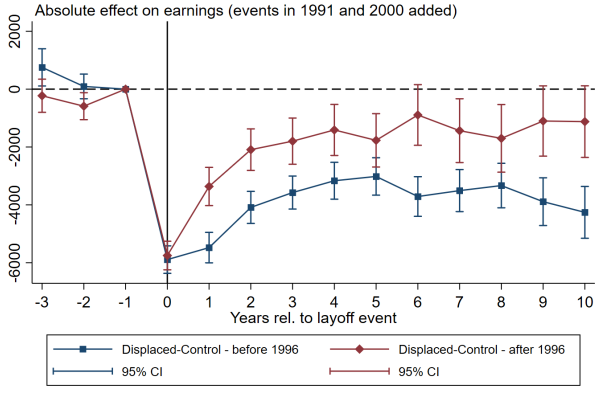
Before 1996: Worker-year obs: 122144; Unique worker obs: 9357; Pre-event mean: 23498
After 1996: Worker-year obs: 108835; Unique worker obs: 8313; Pre-event mean: 23651

Panel (a)



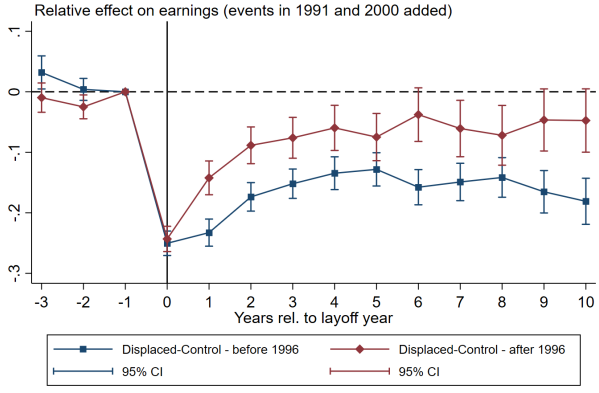
Before 1996: Worker-year obs: 122144; Unique worker obs: 9357; Pre-event earnings mean: 23498
After 1996: Worker-year obs: 108835; Unique worker obs: 8313; Pre-event earnings mean: 23651

Panel (b)



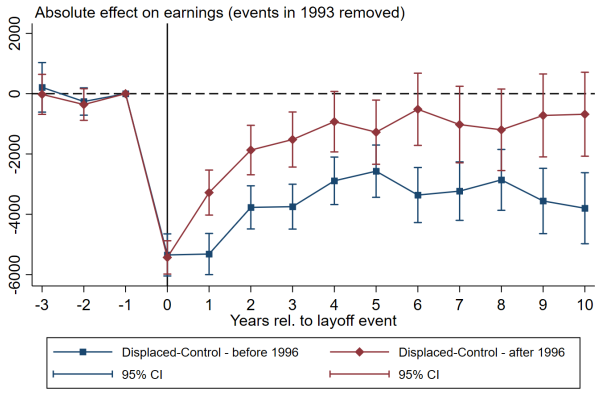
Before 1996: Worker-year obs: 152109; Unique worker obs: 11957; Pre-event mean: 23537
After 1996: Worker-year obs: 108835; Unique worker obs: 8313; Pre-event mean: 23651

Panel (c)



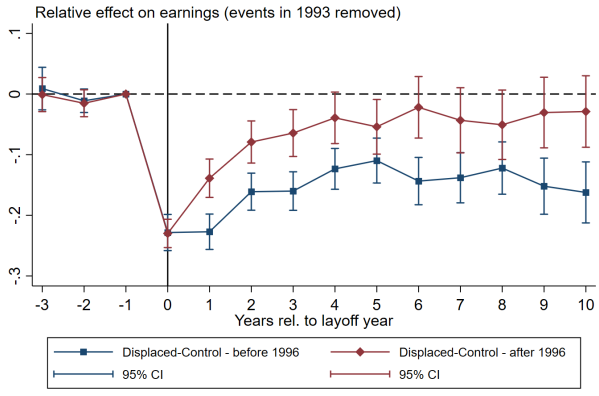
Before 1996: Worker-year obs: 152109; Unique worker obs: 11957; Pre-event earnings mean: 23537
After 1996: Worker-year obs: 108835; Unique worker obs: 8313; Pre-event earnings mean: 23651

Panel (d)



Before 1996: Worker-year obs: 89314; Unique worker obs: 6867; Pre-event mean: 23414
After 1996: Worker-year obs: 89895; Unique worker obs: 6806; Pre-event mean: 23619

Panel (e)

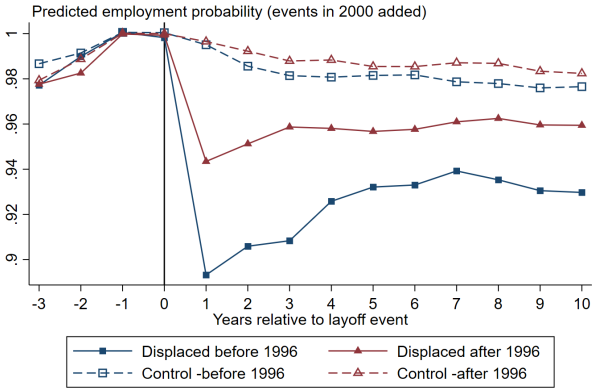


Before 1996: Worker-year obs: 89314; Unique worker obs: 6867; Pre-event earnings mean: 23414
After 1996: Worker-year obs: 89895; Unique worker obs: 6806; Pre-event earnings mean: 23619

Panel (f)

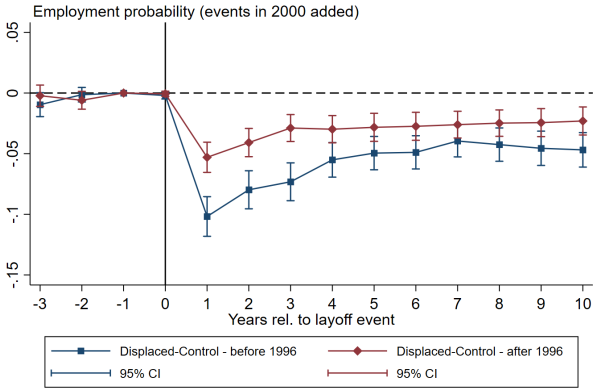
Notes: This figure show event study plots obtained estimating equation 1 on different samples as a robustness check to the main results (see Figure 1 notes). Panels (a) and (b) estimate equation 1 adding mass layoff that occur in year 2000, Panels (c) and (d) add mass layoffs in year 1991, Panels (e) and (f) remove year 1993.

Figure B-8: The Effect of Job Loss on Employment - Changing Event Years Considered



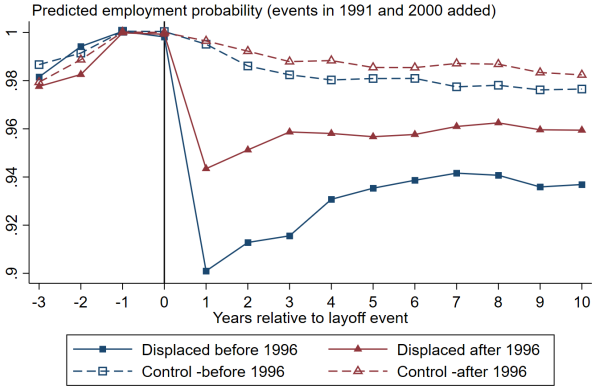
Before 1996: Worker-year obs: 122144; Unique worker obs: 9357
After 1996: Worker-year obs: 108835; Unique worker obs: 8313

Panel (a)



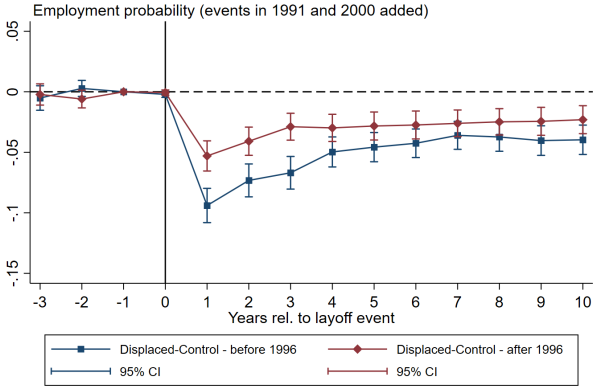
Before 1996: Worker-year obs: 122144; Unique worker obs: 9357
After 1996: Worker-year obs: 108835; Unique worker obs: 8313

Panel (b)



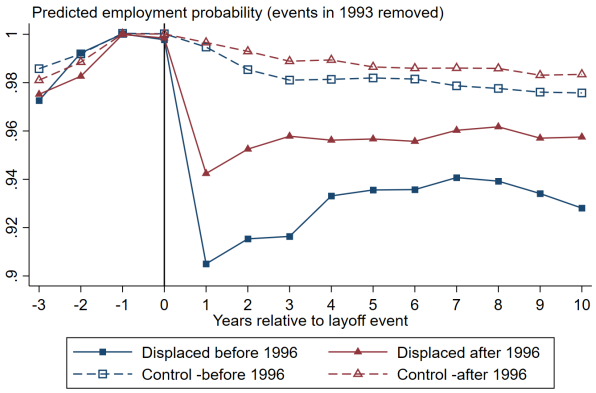
Before 1996: Worker-year obs: 152109; Unique worker obs: 11957
After 1996: Worker-year obs: 108835; Unique worker obs: 8313

Panel (c)



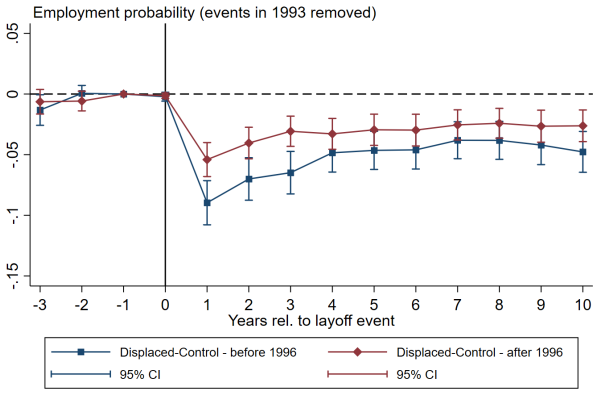
Before 1996: Worker-year obs: 152109; Unique worker obs: 11957
After 1996: Worker-year obs: 108835; Unique worker obs: 8313

Panel (d)



Before 1996: Worker-year obs: 89314; Unique worker obs: 6867
After 1996: Worker-year obs: 89895; Unique worker obs: 6806

Panel (e)

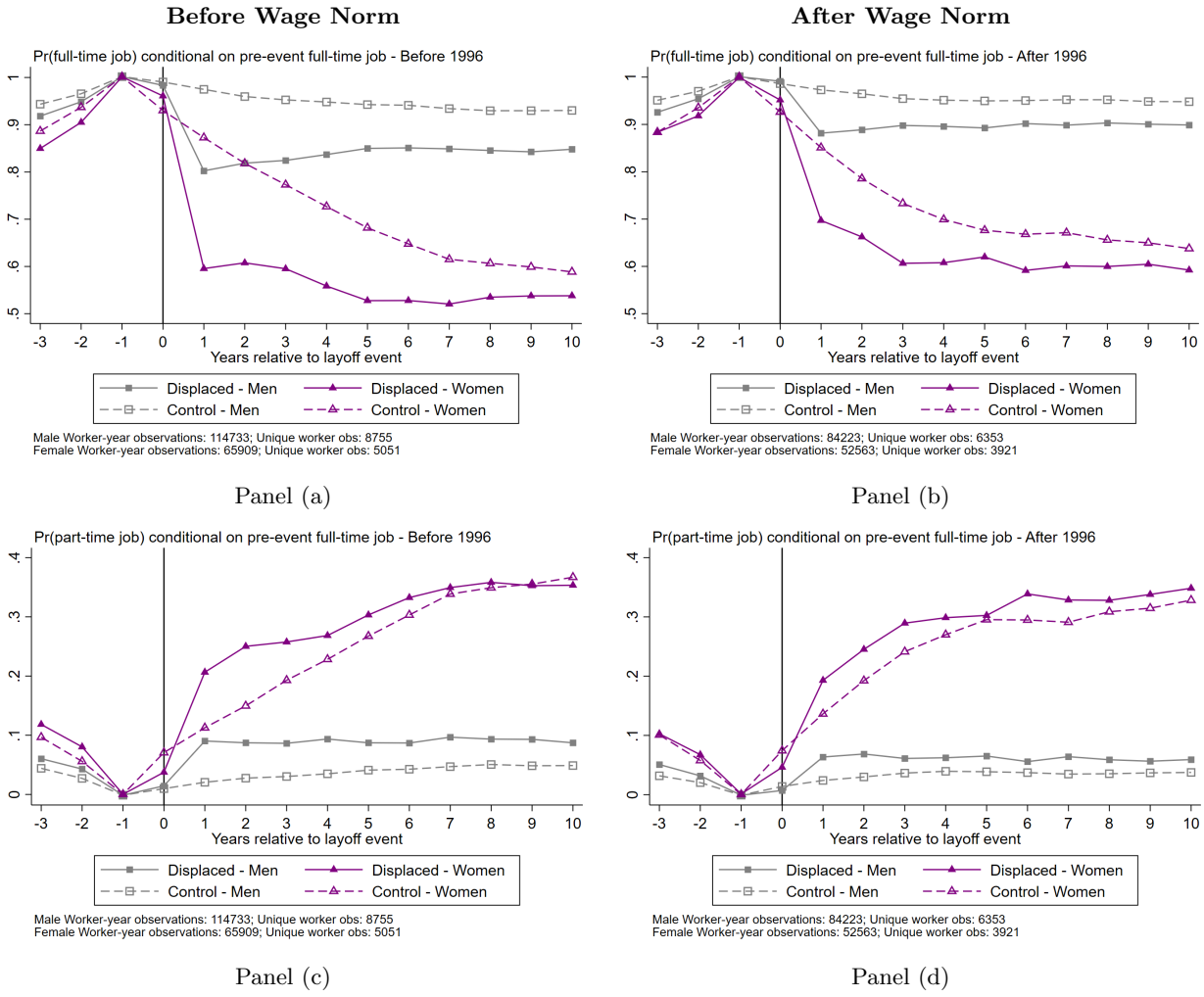


Before 1996: Worker-year obs: 89314; Unique worker obs: 6867
After 1996: Worker-year obs: 89895; Unique worker obs: 6806

Panel (f)

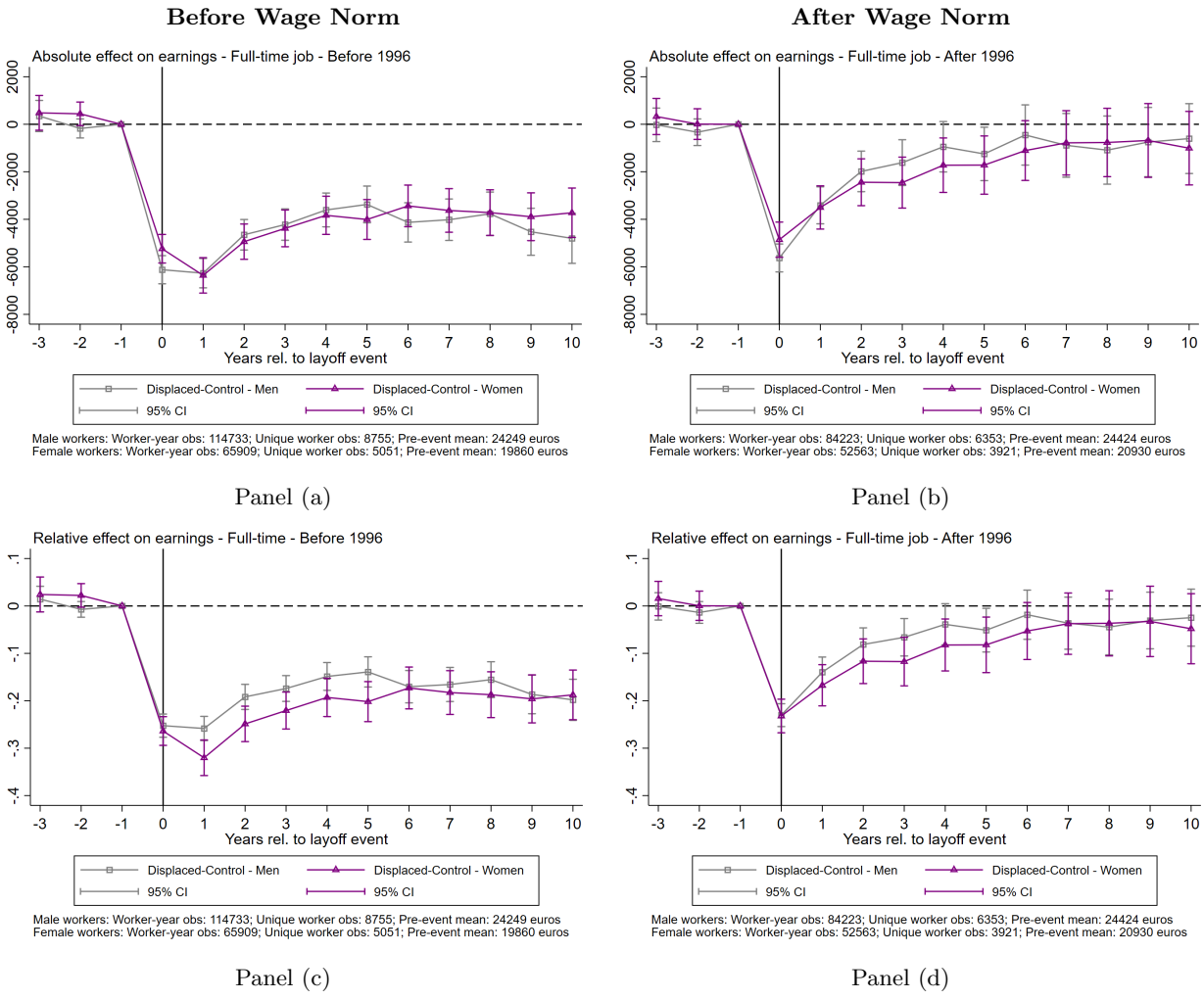
Notes: This figure show event study plots obtained estimating equation 1 on different samples as a robustness check to the main results (see Figure 2 notes). Panels (a) and (b) estimate equation 1 adding mass layoff that occur in year 2000, Panels (c) and (d) add mass layoffs in year 1991, Panels (e) and (f) remove year 1993.

Figure B-9: The Effect of Job Loss on the Probability of Full-time and Part-time Employment by Gender



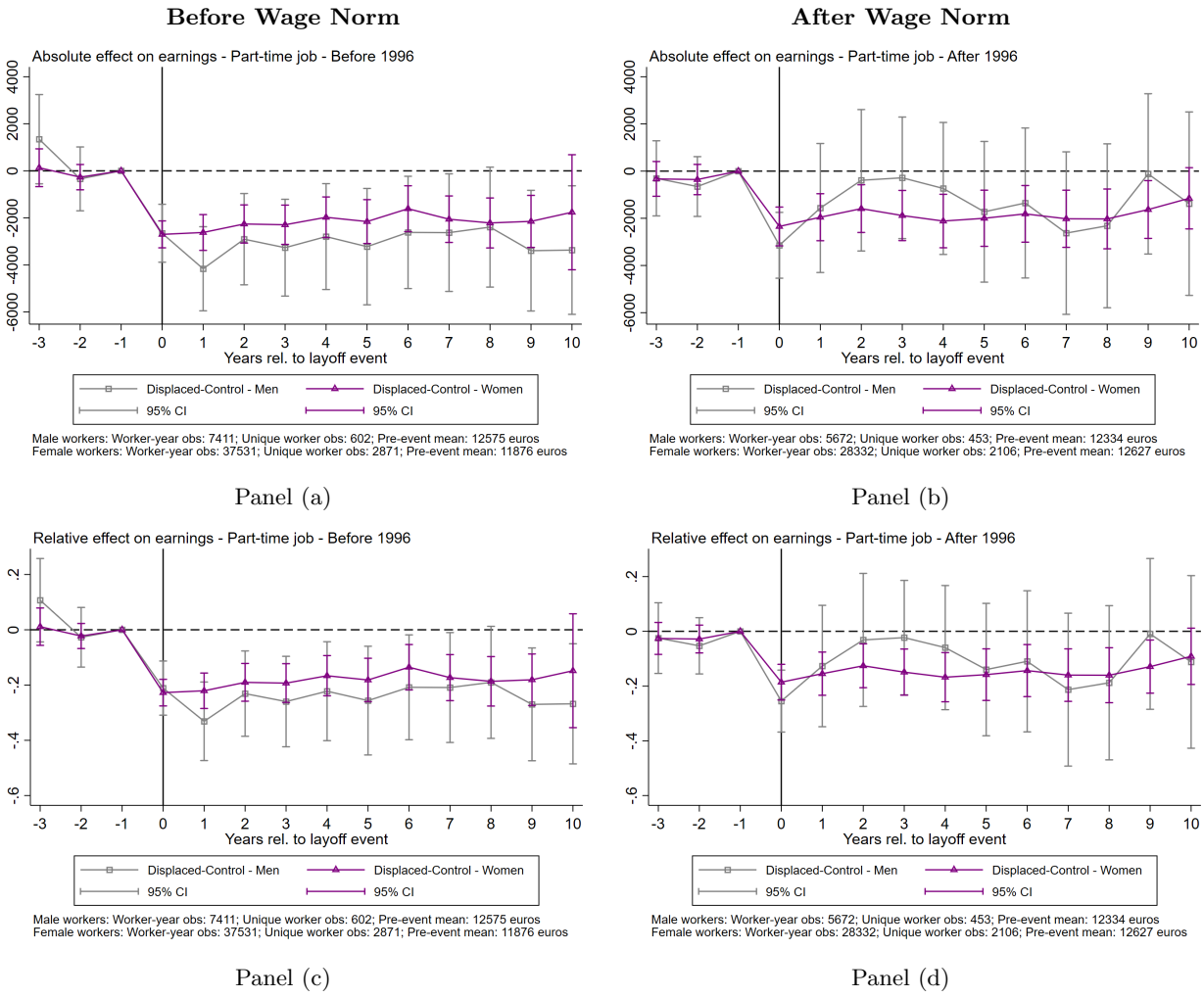
Notes: This figure shows the effect of job loss on full-time (top) and part-time (bottom) employment probabilities of women (purple lines) and men (gray lines), adding full-time employment as a baseline restriction (pre-displacement). Plots of event study coefficients from Equation 1 for mass-layoff events between 1992-1995 are on the left, and between 1996-1999 are on the right. Panels (a) and (b) compare the probability to be employed full-time of workers who are displaced (solid lines) to workers not displaced (dashed lines) by a mass layoff event at the reference date. Panels (c) and (d) compare the probability to be employed part-time of workers who are displaced (solid lines) to workers not displaced (dashed lines) by a mass layoff event at the reference date.

Figure B-10: Effects of Job Loss on Earnings by Gender - Full-time workers



Notes: This figure shows the effect of displacement on yearly earnings (in euros, 2004 prices) of women (purple lines) and men (gray lines), adding full-time employment at the reference date as a baseline restriction. Plots corresponding to event study coefficients from Equation 1 for mass-layoff events between 1992-1995 are on the left and between 1996-1999 are on the right. Panels (a) and (b) plot the treatment effect in absolute terms, and Panels (c) and (d) provide a relative comparison to the corresponding pre-event level of earnings.

Figure B-11: Effects of Job Loss on Earnings by Gender - Part-time workers

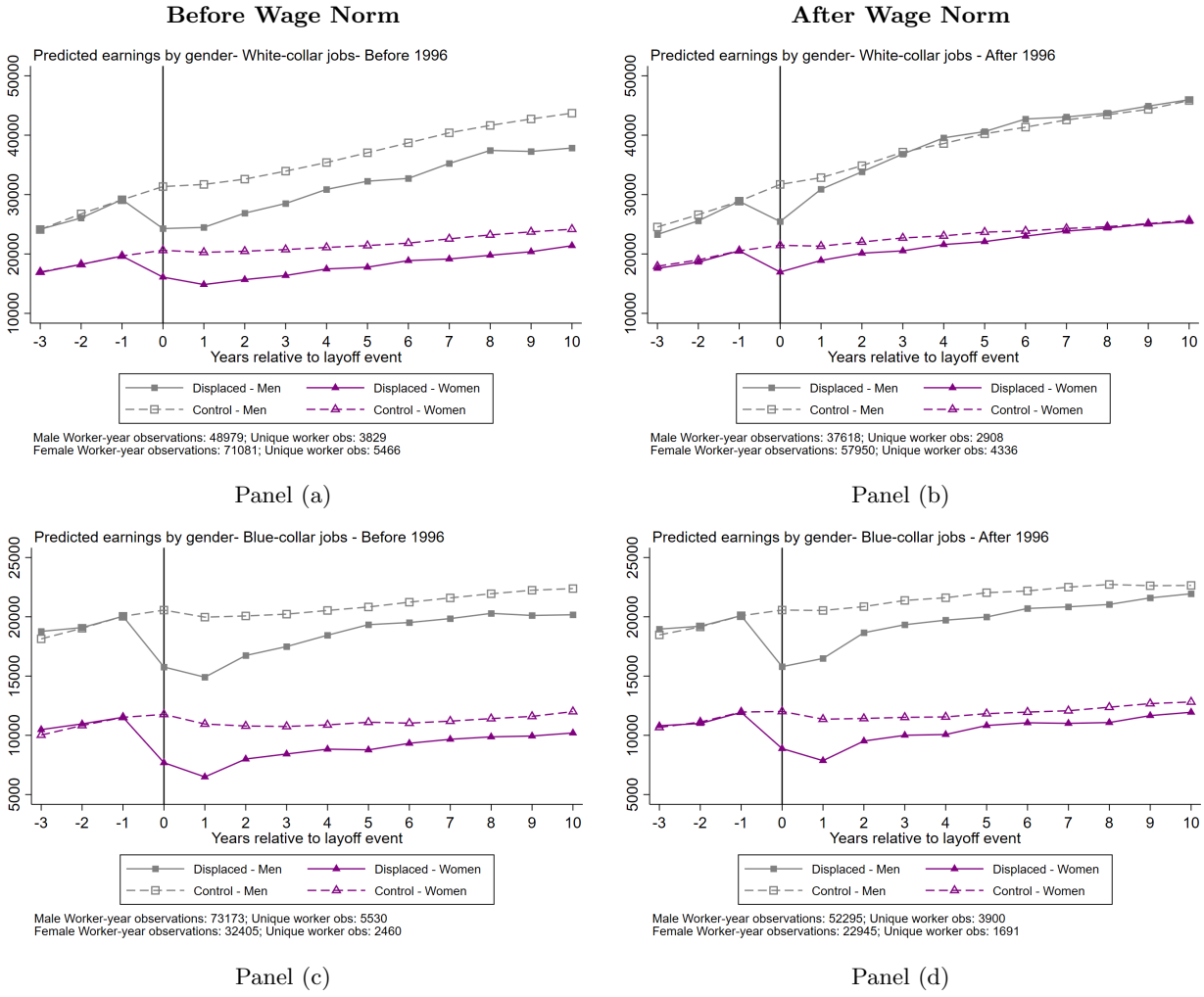


Panel (a) Panel (b)

Panel (c) Panel (d)

Notes: This figure shows the effect of displacement on yearly earnings (in euros, 2004 prices) of women (purple lines) and men (gray lines), adding part-time employment at the reference date as a baseline restriction. Plots corresponding to event study coefficients from Equation 1 for mass-layoff events between 1992-1995 are on the left and between 1996-1999 are on the right. Panels (a) and (b) plot the treatment effect in absolute terms, and Panels (c) and (d) provide a relative comparison to the corresponding pre-event level of earnings.

Figure B-12: Effects of Job Loss on Earnings by Gender - Blue- and White-collar Workers



Panel (a)

Panel (b)

Panel (c)

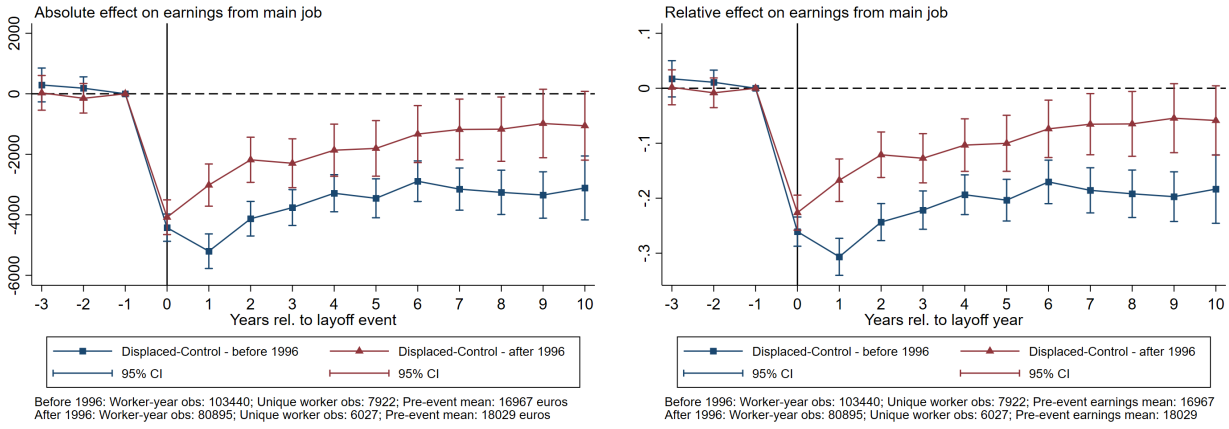
Panel (d)

Notes: This figure shows the effect of displacement on yearly earnings (in euros, 2004 prices) of women (purple lines) and men (gray lines). Plots corresponding to event study coefficients from Equation 1 for mass-layoff events between 1992-1995 are on the left and between 1996-1999 are on the right. The plots compare the earnings profiles of workers at baseline who are displaced (solid lines) to workers not displaced (dashed lines) by a mass layoff event at the reference date. Panels (a) and (b) show the results for white-collar workers at the reference date, and Panels (c) and (d) show results for blue-collar workers at baseline.

C The effects of job loss on earnings and employment for displaced female workers

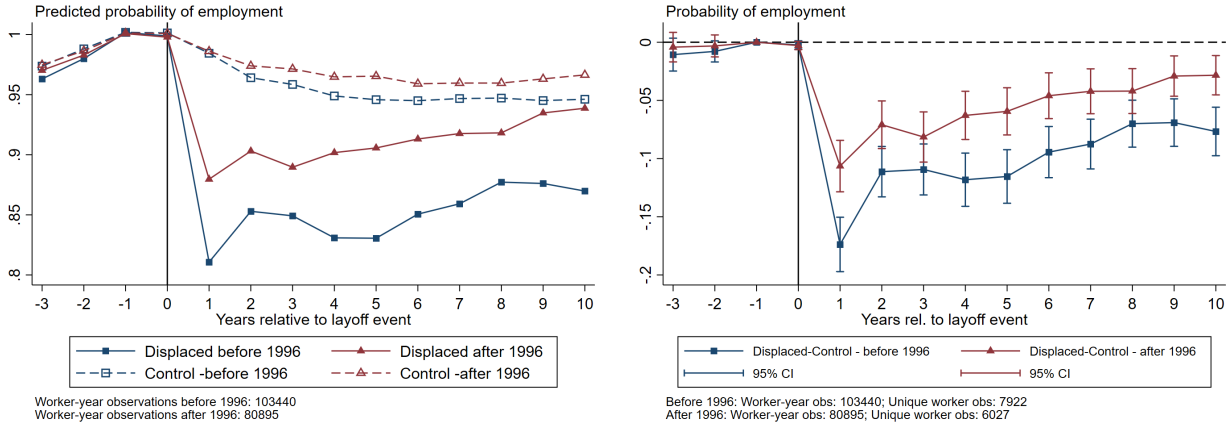
- Figure C-1 shows the effect of job loss on female workers' earnings.
- Figure C-2 shows the effect of job loss on female employment rates.
- Figure C-3 shows the effect of job loss on female workers' earnings by sector of employment at baseline.
- Figure C-4 shows the effect of job loss on female workers' days worked.
- Figure C-5 shows the effect of job loss on female workers' full-time and part-time employment rates.
- Figure C-6 shows the effect of job loss on female workers' earnings by job characteristics at baseline (i.e., white-collar vs blue-collar jobs).

Figure C-1: The Effect of Job Loss on Annual Earnings from Main Job - Female Workers



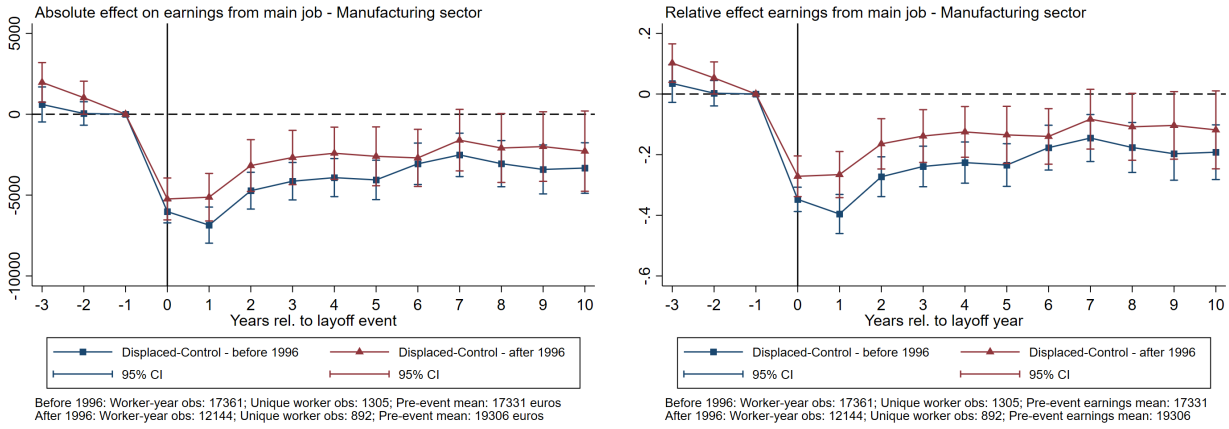
Notes: This figure shows the effect of displacement on yearly earnings (in euros, 2004 prices). The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The left panel plots the treatment effect in absolute terms, and the right panel provides a relative comparison to the corresponding pre-event level of earnings.

Figure C-2: The Effect of Job Loss on Employment Probability - Female Workers



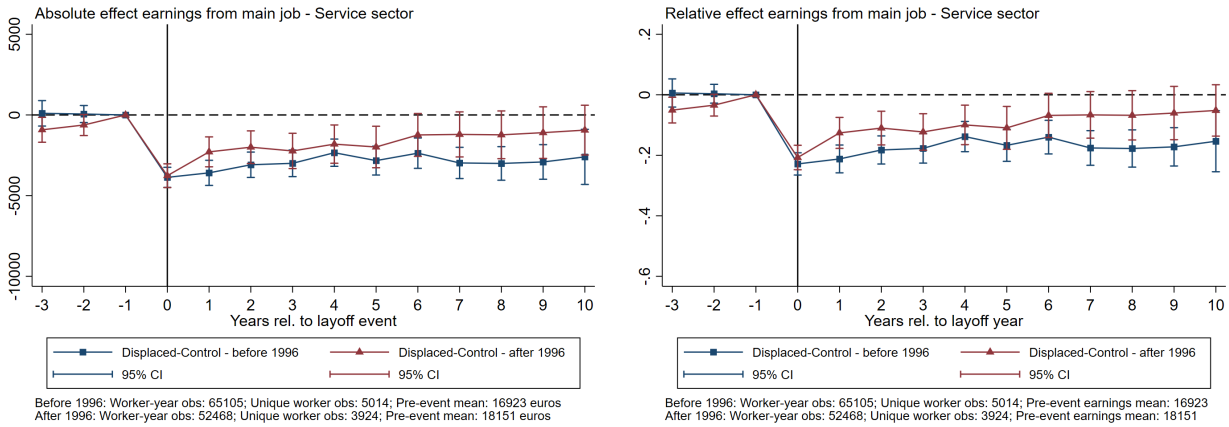
Notes: This figure plots event study coefficients from Equation 1 for mass-layoff events between 1992-1995 (blue, square) and between 1996-1999 (red, triangle). The left panel compares the probability to be employed of workers who are displaced (solid lines) to workers not displaced (dashed lines) by a mass layoff event at the reference date. The right panel plots the difference between the two lines with the corresponding 95 percent confidence interval.

Figure C-3: The Effect of Job Loss on Annual Earnings: Manufacturing Sector and Service Sector - Female Workers



Panel A

Panel B

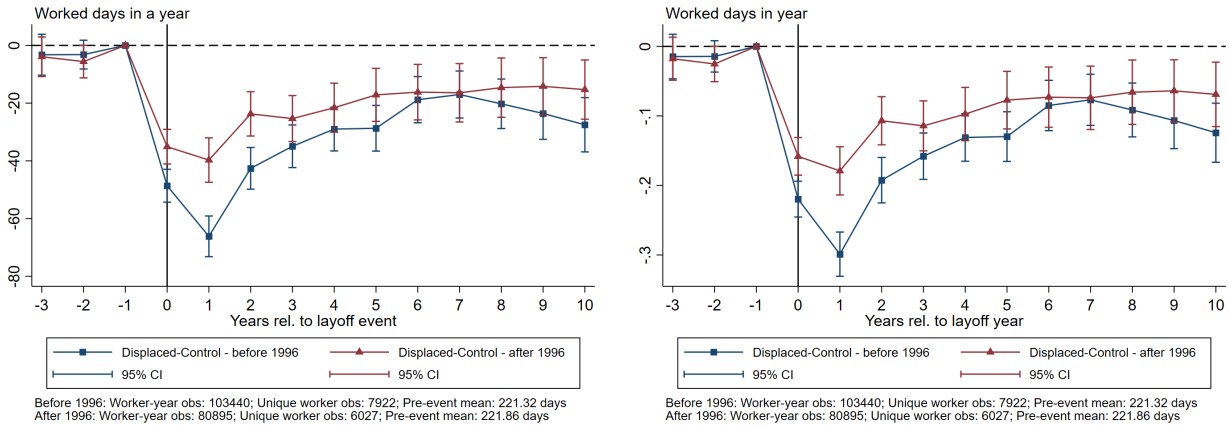


Panel C

Panel D

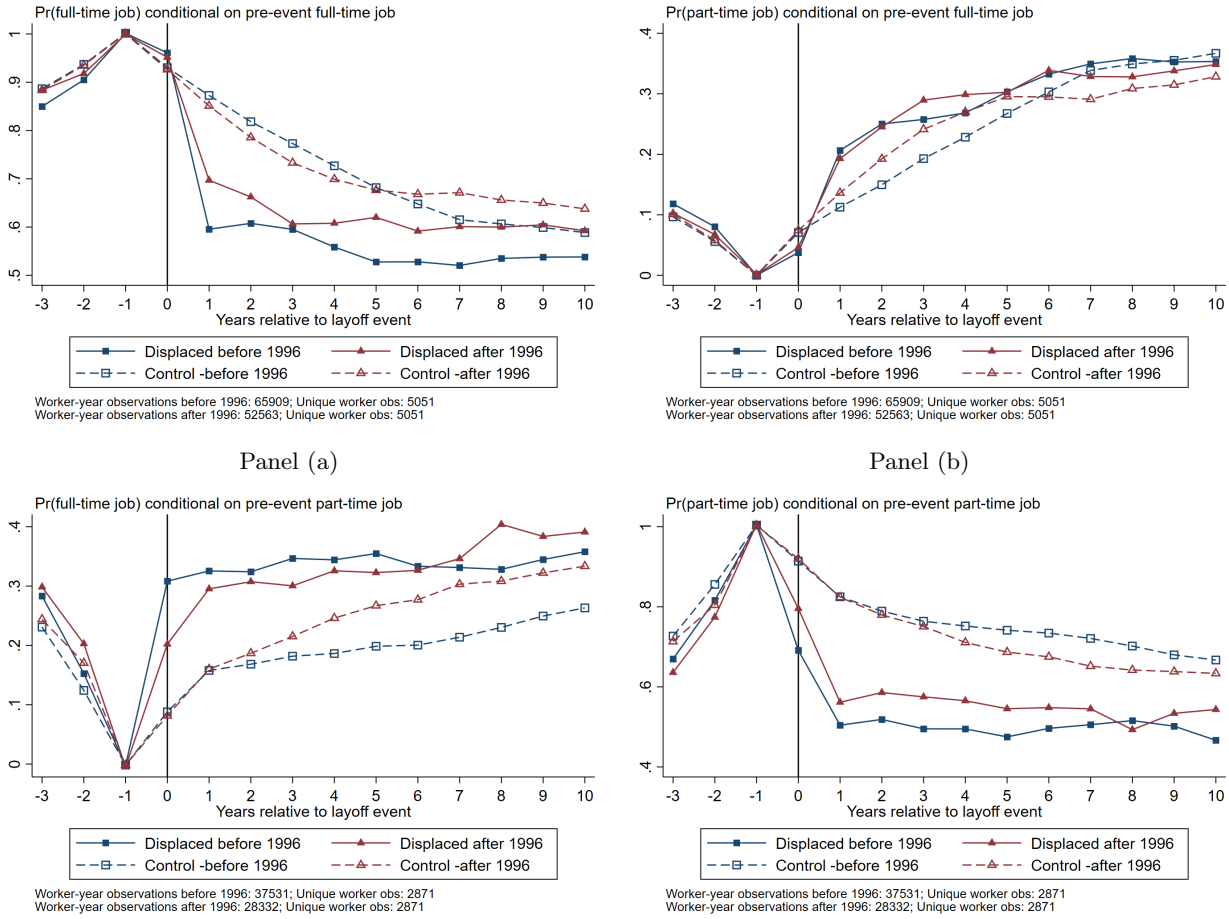
Notes: This figure shows the effect of displacement on yearly earnings (in euros, 2004 prices) for workers who are employed in the manufacturing sector (top panels) and the service sector (bottom panels) at the reference date. The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The left panel plots the treatment effect in absolute terms, and the right panel provides a relative comparison to the corresponding pre-event level of earnings.

Figure C-4: The Effect of Job Loss on Days Worked in a Year - Female Workers



Notes: This figure shows the effect of displacement on days worked in a year. The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The left panel plots the treatment effect in absolute terms, and the right panel provides a relative comparison to the corresponding pre-event number of days worked in a year.

Figure C-5: The Effect of Job Loss on the Probability of Full-time and Part-time employment - Female Workers

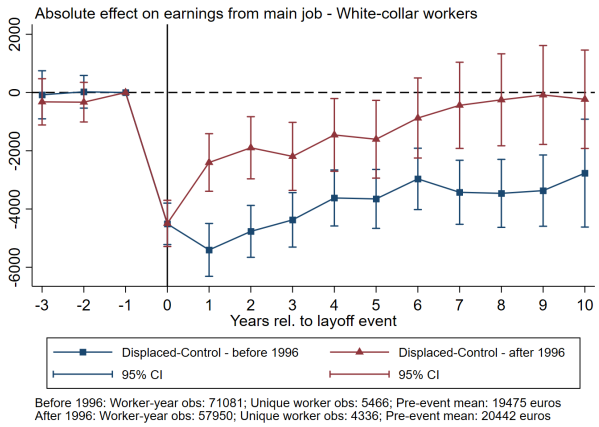


Panel (a) Panel (b)

Panel (c) Panel (d)

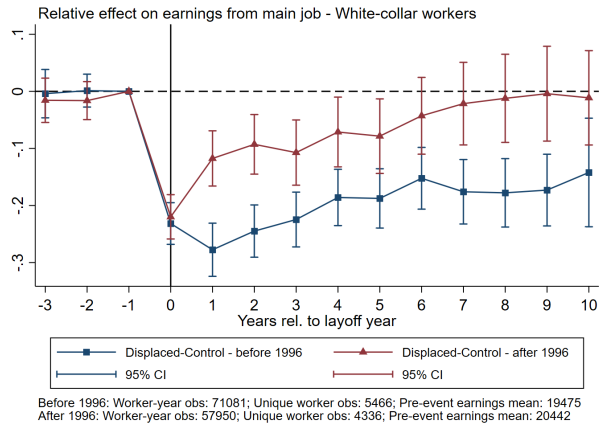
Notes: This figure shows the effect of job displacement on the probability of full-time [part-time] employment, adding having a full-time [part-time] job at the reference date as a baseline condition. For each combination of full- and part-time employment pre- and post-displacement, the graphs compare the probability of full-time or part-time employment of workers displaced (solid lines) to workers not displaced (dashed lines) by a mass layoff event at the reference date, conditional on their full- and part-time pre-event employment status.

Figure C-6: The Effects of Job Loss on Earnings: White-collar and Blue-collar - Female Workers



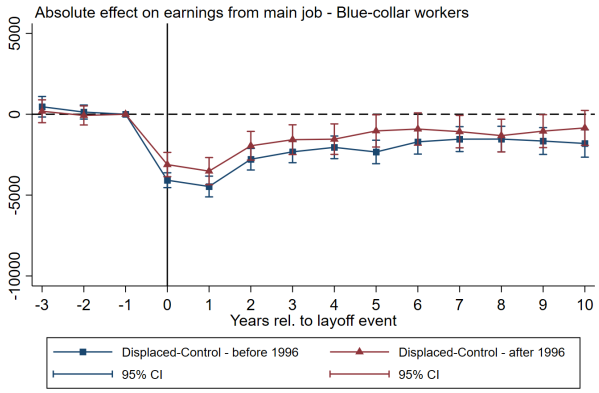
Before 1996: Worker-year obs: 71081; Unique worker obs: 5466; Pre-event mean: 19475 euros
After 1996: Worker-year obs: 57950; Unique worker obs: 4336; Pre-event mean: 20442 euros

Panel (a)



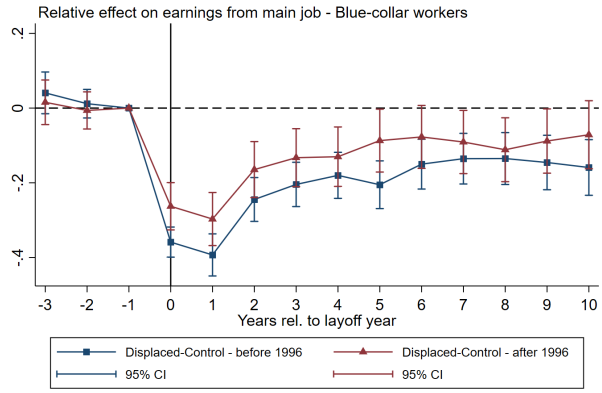
Before 1996: Worker-year obs: 71081; Unique worker obs: 5466; Pre-event earnings mean: 19475
After 1996: Worker-year obs: 57950; Unique worker obs: 4336; Pre-event earnings mean: 20442

Panel (b)



Before 1996: Worker-year obs: 32405; Unique worker obs: 2460; Pre-event mean: 11369 euros
After 1996: Worker-year obs: 22945; Unique worker obs: 1691; Pre-event mean: 11843 euros

Panel (c)



Before 1996: Worker-year obs: 32405; Unique worker obs: 2460; Pre-event earnings mean: 11369
After 1996: Worker-year obs: 22945; Unique worker obs: 1691; Pre-event earnings mean: 11843

Panel (d)

Notes: This figure shows the effect of displacement on yearly earnings (in euros, 2004 prices) for workers who are employed in white-collar jobs (top panels) and blue-collar jobs (bottom panels) at the reference date. The blue line (square) plots the effect given by the difference between displaced and non-displaced workers *before* the passage of the Wage Norm. The red line (triangle) plots the effect given by the difference between displaced and non-displaced workers *after* the wage-setting reform. The left panel plots the treatment effect in absolute terms, and the right panel provides a relative comparison to the corresponding pre-event level of earnings.