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IZA DP No. 15105

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ABSTRACT

Understanding the Reallocation of Displaced Workers to Firms*

We study job displacement in France. In the medium run, losses in firm-specific wage premium account for a substantial share of the overall cost of displacement. However, and despite the positive correlation between premium and productivity in the cross-section of firms, we find that workers are reemployed by high productivity, low labor share firms. The observed reallocation is therefore productivity-enhancing, yet costly for workers. We show that destination firms are less likely to conclude collective wage agreements and have lower participation rates at professional elections. Overall, our results point to a loss in bargaining power.

JEL Classification: J63, J31

Keywords: displaced workers, wage, reallocation, productivity, labor share

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1 Introduction

Since Jacobson et al. (1993) and Farber (1993), the literature on job displacement has documented long-run earnings losses following layoffs. This empirical regularity highlights the costs associated with the reallocation of factors of production. While this reallocation process is at the core of productivity growth in modern economies (Foster et al., 2001; Hsieh and Klenow, 2009), it can entail substantial private costs.

Recent contributions on job displacement emphasize the role of firms in explaining the private cost of this reallocation. In particular, these studies show that displaced workers reallocate to firms with lower wage premium—where premia are measured *à la* Abowd et al. (1999) (henceforth AKM). Yet, little is known regarding the productivity and the labor share of those (destination) firms. Productivity and wage premium being positively related across firms (e.g. Card et al., 2016), the reallocation of displaced workers to lower-wage firms appears likely to reflect movements toward lower productivity firms. But it could instead be driven by reemployment at low labor share, high productivity firms (Autor et al., 2020; Aghion et al., 2022). Both possibilities are compatible with the documented earnings losses but have different implications regarding *i)* the "productivity-enhancing" nature of labor reallocation in the wake of downsizing events (Foster et al., 2016), and *ii)* whether earnings losses reflect a decline in workers' negotiation power or reallocation to firms generating less surplus per worker.[1]

In this paper, we shed new light on both of these implications by studying jointly the wage policy and productive performance of the firms in which displaced workers are re-employed. We rely on rich administrative data from France. We proceed in three steps. First, studying a large set of workers laid-off for economic reasons, we find evidence of large and persistent earnings losses—about a third of pre-displacement earnings 6 years post-displacement. Using detailed administrative data on hours worked, we find that working time explains almost all of the short run losses (1 to 2 years post-displacement), but tends to recover in the medium run (5 years post-displacement). By contrast, losses in hourly wage rate, while initially smaller, show no sign of recovery. These persistent losses in hourly wage are explained to a very large extent (80.5%) by loss in firm wage premium. Our findings add to an active literature assessing the importance of lost wage premium in shaping the cost of dis-

[1]Here, we simply define loss in negociation power as being re-employed by firms with unfavorable wage policy *given*, as opposed to *because* of, their productivity.

placement (Gulyas and Pytka, 2019; Lachowska et al., 2019; Moore and Scott-Clayton, 2019; Schmieder et al., 2020; Fackler et al., 2021; Bertheau et al., 2022).[2] In a second step, we show that the reallocation of workers to lower wage premium firms does not reflect a reallocation towards low productivity firms. Instead, and despite the positive correlation between productivity and wage premium in the cross-section of firms, we find that destination firms tend to be more productive but pay lower premium. Those firms consequently have much lower labor share. We further show that these reallocations are almost entirely driven by within-3 digit-sector dynamics and not by transitions across sectors with systematic differences. Overall, we view this pattern as suggesting that losses in premium reflect a decline in bargaining power as opposed to difficulties to access jobs in productive firms. Finally, we strengthen the case for a loss in bargaining power by examining two additional qualitative outcomes that capture the state of labor relations at the firm level. We show that destination firms *i)* are less likely to reach collective firm-level wage agreements and *ii)* have lower turnout in professional elections.

We contribute to the literature in three main ways. First, thanks to an administrative definition of economic layoffs, we are able to focus on a larger set of involuntary labor market separations for economic reasons than what is captured relying on mass layoffs (defined as episodes of large employment contraction—typically in excess of 30% of the initial workforce e.g. Jacobson et al. (1993); Kletzer (1998)).[3] Second, taking advantage of the possibility offered by French data to link matched employer-employee data with exhaustive accounting data on firm performance, we contrast losses in wage premium with measures of productivity, surplus per worker and labor share of the destination firms. To the best of our knowledge, we are the first to carry out this exercise in the job displacement context.[4] It reveals that destination firms are both more productive and lower labor share firms. This finding has potentially important implications for job-ladder models (Moscarini and Postel-Vinay,

[2]Whether the loss of firm-level wage premium represents a sizable contribution to the overall earnings and wage rate losses of displaced workers is a topic of active research. Gulyas and Pytka (2019) and Schmieder et al. (2020) find that firm premium play an important role in shaping earnings losses, consistent with the work of Goldschmidt and Schmieder (2017) on outsourced workers. Conversely, Lachowska et al. (2020) find this source of loss to be of modest quantitative importance. Bertheau et al. (2022) provide cross-country evidence. We discuss the literature further when presenting our results in section 3.

[3]However, our results are robust to using a sample of workers displaced from mass layoffs defined as in rest of the literature.

[4]Haltiwanger et al. (2018) study workers flows and firm productivity but focus on the reallocation of workers through job-to-job moves and do not study AKM-type wage premium.

2018) which structurally estimate the cost of job loss (Krolikowski, 2017) and in which wage and productivity ladders are typically colinear. It shows that losses in premia are driven by reemployment in firms featuring unfavorable wage policy given their productivity. Finally, we assemble new data to corroborate the idea that earnings losses associated with displacement reflect a loss in collective bargaining. We build original firm-level indicators capturing the state of labor relations in each employer. The use of firm-level data (as opposed to sector-level proxies for collective bargaining) is crucial as we show that our effects are driven by within-sector dynamics. We provide evidence that displaced workers are reallocated to employers that are less likely to successfully conclude firm-level collective wage agreements (prior the firm's downsizing event) and where workers have a lower participation rate during professional elections—arguably reflecting a lower degree of organization of the workforce.

2 Data, sample construction and institutional setting

2.1 Data

Throughout the paper, we rely on a variety of French administrative sources at both worker and firm levels. We first use matched employer-employee datasets (Panel DADS and FH-DADS) to identify workers, their job (wage, hours, employer) and layoff. Importantly, we observe firm's unique, time-invariant identifier (SIREN code), which allows us to retrieve firms' balance-sheet and income statement from the FICUS-FARE datasets. All details about data are presented in Appendix Table A1.

2.2 Displaced workers

In our main sample of interest we follow workers laid-off for economic reasons (*licenciés économiques*, LE hereafter) between 2002 and 2012 and a control group (the LE panel). To identify LE workers we rely on the FH-DADS data, which results from a match between: *i)* a panel of workers for whom we observe variables such as wages, hours and employer (panel DADS) and *ii)* unemployment insurance data that provide information about any unemployment spell, such as date of registration, duration and level of unemployment benefits. Crucially, this dataset enables us to precisely identify LE workers as it documents the administrative reason for registration at the French employment agency (e.g. layoff for personal *vs* economic reasons).

Economic layoffs require the firm to justify facing economic difficulties, as detailed in appendix B. Considering the very strict legal definition and associated conditions, firms are unlikely to be able to strategically misclassify layoff for personal reasons as an economic layoff—despite the potential incentive to do so as dismissals for personal reasons are more often contested in court than economic layoffs (Fraisse et al., 2015).[5]

Focusing on a sample of LE workers has two main advantages. First, it minimizes the risk of studying individuals who voluntarily left their firm and whose employment trajectory is highly endogenous. Moreover, law requires firms (not workers) to report the reason for dismissal, thus reflecting actual circumstances rather than worker's subjective perception. A second advantage is to allow us to rely on a more representative set of employers than does the literature focusing on mass layoffs. In the absence of direct information distinguishing voluntary from involuntary separations, studies often define events that can be suspected of being a mass layoff as an episode where firms see their labor force decline significantly—typically 30% or more (e.g. Jacobson et al., 1993; Gathmann et al., 2020; Gulyas and Pytka, 2019; Lachowska et al., 2019; Schmieder et al., 2020). Such approach requires some restrictions on the minimal size of employers, so that the employment decline would not merely reflect small number variability. This results in focusing on fairly large firms. Relying on the administrative definition of economic layoffs enables us to avoid these caveats.[6]

To ensure that our sample definition is not the single driver of our results and that comparisons with the litterature remain relevant, we build a second sample, based on mass layoffs (the MLO sample): we follow the standard approach adopted in the literature although we restrict ourselves to studying plants that (most likely) shut down, losing at least 90% of their employees at a given time. This high threshold further limits the risk of selection. Appendix D.1 provides details on this second sample (construction and summary statistics).

Construction of the treated group (LE workers). The year of layoff, denoted t^D, is defined as the year where the individual registers for unemployment following an economic layoff. We define a LE worker's previous job as the position whose end date

[5] In line with the notion that strategic misclassification is not widespread, Signoretto and Valentin (2019) find that economic dismissals are overwhelmingly explained by the economic conditions of firms whereas personal layoffs are predicted by variables capturing the management style of firms.

[6] For instance, Schmieder et al. (2020) focus on employers with at least 50 employees which is typical in the literature. In contrast, LE covers a wider range of firms: bottom quartile, median size and top quartile in sample are 6, 34 and 324 respectively. Figure A8 further shows that our sample is less skewed toward high premium firms than other papers in the literature.

is the closest to the end of contract date recorded by the unemployment agency. In line with the literature, we are interested in individuals losing a stable job. We therefore select workers aged between 25 and 60 at the time of their layoff, who worked more than 1800 hours in the previous job in years $t^D - 1$ and $t^D - 2$, and who are not employed in the same firm on June 30, $t^D + 1$. A given individual is included in the sample only when he is first registered as LE and complies to the aforementioned selection rules. Overall, we observe 16,706 individuals one year before their layoff, displaced in 13,733 events (i.e. firm times year layoffs). The LE panel (LE workers and their control group) is described in Section 2.5.

Construction of the control group. We use propensity score matching to construct a control group for the LE workers. We perform the matching on all workers found in DADS (excluding those belonging to the LE panel) and who meet the criteria applied to the displaced workers in terms of job tenure and hours worked. We then perform the matching within year and sector-size cells. The sector-size cell is the intersection of 10 industries (i.e. 1-digit sector) and 4 quartiles of firm size (based on the empirical distribution of firm size at $t^D - 1$ among the LE). We use the following variables to match pairs of workers: age in t^D, firm size in $t^D - 1$ and hourly wage and number of hours worked in the main job in $t^D - 1$ and $t^D - 2$.We estimate a probit to predict the propensity score and keep the nearest neighbor, with replacement.

2.3 Firm premium

We compute firm wage premium relying on the exhaustive version of the matched employer-employee data (DADS *postes*; cf. details in appendix Table A1). This version of DADS allows us to estimate firm fixed-effects for a larger set of firms compared to studies focusing on the worker-level panel (e.g. Abowd et al., 1999; Bertheau et al., 2022) which is a 1/12th sample of the exhaustive file. The connected set we use here represents about 90% of total employment over the period. This exhaustive firm-level panel can be used to fit an AKM-type model. A drawback of this dataset is that worker identifier is renewed at each vintage. For any vintage t, we can track individuals across jobs within year t as well as between years t and $t - 1$.[7] A given individual, however, cannot be tracked beyond a $[t - 1, t]$ period.

[7]Because any vintage t of DADS *postes* contains information on jobs at time t and $t - 1$.

Accordingly, we estimate the AKM model on a set of stacked overlapping 2-year panels (see Appendix C for more details). This implies that the worker fixed effects is effectively allowed to vary overtime as they will be specific to a given worker-panel combination. This flexibility is a byproduct of the structure of our data, but mirrors specifications of recent papers on displacement and firm premium which aim to absorb potential depreciation in worker human capital by allowing for worker fixed effects that vary before and after displacement (Fackler et al., 2021). While we cannot however retrieve the worker fixed-effects and use them with the worker-level panel,[8] we view this limitation as innocuous as we are primarily interested in the role of firms characteristics in explaining the cost of displacement.[9]

We estimate the following model to compute firm premium in a standard AKM framework:

$$\ln(w_{it}) = \psi_{J(i,t)} + \alpha_i + \lambda_t + \mathbf{x}'_{it}\beta + \epsilon_{it}, \tag{1}$$

where $\psi_{J(i,t)}$ is the firm fixed effect associated with firm $J(i,t)$ where worker i was employed at period t; α_i is an individual fixed effect and λ_t a set of time fixed effects. The vector $\mathbf{x}_{it}$ includes quadratic age controls. Finally, the dependent variable w_{it} refers to worker i's hourly wage in year t. In keeping with the job displacement literature, we use as long a period as possible to estimate the fixed effects, covering years 2001 to 2015.

Firm and worker fixed effects have been shown to suffer from limited mobility bias (Andrews et al., 2008), which implies an upward bias on the estimate of the variance of firm fixed-effect and a downward bias regarding the covariance between worker and firm fixed-effects. Our use of the near universe of across-firms movement tempers this risk. Moreover, this type of bias is particularly relevant when studying assortative matching (Bonhomme et al., 2019) or the contribution of firm to wage dispersion (Song et al., 2019). Recent contributions have proposed either alternative estimation framework to the AKM two-way fixed-effect approach (Bonhomme et al., 2019, 2020) or corrections applied to the variance and covariance estimator (Kline et al., 2020). In this paper, we are interested in the first moment of these firm fixed effects. Accordingly, measurement error occurs in our dependent variable and is likely to affect the precision of our estimates but not to bias them in any systematic

[8] Note that the individual-level unique identifier from the exhaustive DADS *postes* presented here and from the panel DADS are different, so that we cannot merge the exhaustive and panel datasets at the worker-level.

[9] We are not, for instance, interested in how this effect varies with workers fixed effects (Helm et al., 2022).

way.

2.4 Other firm characteristics

We measure labor productivity and the labor share using the FICUS/FARE database (cf. details in appendix Table A1). We build two measures of labor productivity: value added per worker, and a measure that accounts for differences in capital intensity. The latter is obtained as the residual of a regression of value-added onto tangible, intangible capital and employment allowing the coefficients to be sector (2-digit) specific. More sophisticated measures of total factor productivity accounting for the endogeneity of input choice would in principle be feasible. In practice however, they tend to be highly correlated with simple OLS-based estimates (Van Beveren, 2012) and unlikely to change our results, so we prefer the simplest option. We further compute firms' labor share as the ratio of total labor costs over the value added.

Our main analysis relies on measures taken over the period preceding the layoffs under study (2001-2004). Alternatively, we compute the average of firm characteristics over a three-year period, centered around five years before displacement ($t^D - 5$). That is, for a worker laid-off in 2011, we measure the characteristics of the firm that fired him and of the firms where he is re-employed as the 2005 to 2007 averages of the variables at hand. These rolling-window measures of firms' characteristics are used to test the robustness of our results in section 4.

2.5 Descriptive statistics on the estimating sample

Our main sample consists of 33,412 individuals equally distributed among treated and control individuals. Table 1 reports the mean and standard deviation of the six quantitative variables measured at baseline and used to match displaced individuals to suitable controls. The average displaced individual is almost 45 years old, works in a firm employing around 1,900 employees (with a median of 34 and a very large variance, reflecting the wide coverage of firms provided by this sample) and earned 17.52 euros per hour in year $t^D - 1$, over which he worked 1,916 hours. As expected given the matching procedure described above, these variables are well balanced across groups: the Imbens and Rubin normalized difference (a scale-free measure used to compare two distributions) reported in column (3) never exceeds 0.25, in line with Imbens and Rubin (2015) rule of thumb.

Table 1 also reports the distribution of quantitative variables that were not used in the matching process. About two thirds of the sample are males, who earned about 35,500 euros in $t^D - 1$ when considering all their contracts, that is when taking into account that they worked in about 1.05 firms on average. We also verify that the two groups were, on average, employed in similar type of firms in terms of the 2001-2015 wage premium of the pre-layoff firm. In these dimensions as well, both treated and control groups look similar according to the Imbens and Rubin normalized difference.

Figure A1 finally displays the distribution of treated and control individuals by categories of sector of employment (A1a), occupation (A1b) and highest diploma (A1c). The distribution is not only balanced across sectors (matching variable) but also for the two other qualitative variables. One year before layoff, displaced and control workers mainly worked in manufacturing and extraction or the retail sectors and a large share were blue collars or clerical workers. The information about diploma is missing for a large part of the sample (and we exclude it from further analysis) but the balance among observed individual remains (with the highest observed share being vocational basic training).

3 Earnings losses and the role of firm premium

3.1 Empirical specification

We analyze the cost of job displacement by estimating the following equation:

$$Y_{it} = \sum_{d=-3}^{6} \beta_d \times \mathbb{1}\{t_i^D + d = t\} \times \mathbb{1}\{D_i = 1\} + \sum_{d=-3}^{6} \delta_d \times \mathbb{1}\{t_i^D + d = t\} + \alpha_i + \delta_t + \epsilon_i, \tag{2}$$

where Y_{it} is an outcome of interest measured in year t for individual i, displaced in year t_i^D. β_d measures the change in Y for displaced workers (indicated by $D = 1$) compared to the control group, d periods after displacement. The model includes worker (α_i) and year (δ_t) fixed effects. Standard errors are clustered at the individual level.[10]

[10]We use a matching procedure with replacement: non-displaced individuals may enter the control group multiple times if they are the best match for several displaced workers. In this case they will appear under different "worker" identities. We cluster standard errors at the true "individual" level however to account for the dependence between observations that this may introduce. This concerns 1.2% of the control individuals.

3.2 Total earnings and employment

Table 2 reports the coefficients β_d from different estimations of equation (2). In columns (1) and (2), the outcome variable is employment status and overall earnings, respectively. The results show the well-known losses following displacement: employment probability falls by about 44 percentage points at $t^D + 1$ (relative to the control group), then progressively attenuates over time up to reaching -20 percentage points after five years. This fall drives a decline in annual earnings that culminates one year following displacement at about €19,300 (54% of the baseline annual earnings of Table 1) and attenuates to about €12,000 (34% of baseline earnings) at $t^D + 5$. Appendix Figure A2 display those results and associated pre-trends.

3.3 Decomposition of earnings losses

We now decompose earnings losses into several components: hours, hourly wage and wage premium.[11] Results are displayed in Figure 1. Earnings and hours (both in log) follow the well-known drop and slow recovery pattern. Interestingly however, the effect on (log) hourly wage stabilizes in the medium run at around -0.10, so its contribution to overall loss in earnings grows over time.[12] This finding is in line with recent research on displacement in other countries or over different periods, such as Lachowska et al. (2019) or Gulyas and Pytka (2019). While Schmieder et al. (2020) show evidence of a recovery in *daily* wage rate, they also find that the contribution of wage rate decline to overall earnings loss grows over time.

Contribution of employer premium to losses in wage rate. We assess the importance of the loss in firm-specific wage premium using the firm fixed effect as a dependent variable in our main model (equation 2). We report the associated coefficients in column (6) of Table 2, and represent them in Figure 1. As in the literature, we find that displaced workers re-employ in (relatively) worse-paying firms. By $t^D + 5$ the average loss in premium reaches -0.076.

To give a sense of the contribution of firm premia in explaining the loss in hourly wages, Lachowska et al. (2020) (Table 2) report the loss in log premium at $t^D + 5$ to

[11] As is standard in the literature, we focus on re-employed workers.

[12] We also observe a counter intuitive yet familiar bump immediately after the layoff, driven by severance payment, delayed pay and potential measurement error in hours worked.

the total loss in log hourly wage at $t^D + 5$, finding that firm premium loss explains 17% of the total loss in hourly wage at $t^D + 5$. We replicate this exercise in column (7) of Table 2: loss in premia explains 80.5% of hourly wage loss at $t^D + 5$. Although our estimates of total hourly wage loss at $t^D + 5$ are roughly comparable in both studies (around -10%), we find that the loss in firm premium contributes to a much greater extent to hourly wage loss in our context. As we also happen to find much larger earnings loss than Lachowska et al. (2020), the contribution of premium loss to earnings loss at $t^D + 5$ that we obtain for the LE sample (19%) is closer to theirs (12%).[13] Our findings are closer to Schmieder et al. (2020) who find a contribution of firm premia to daily wage losses of 76%.[14] In contemporaneous and independent work, Bertheau et al. (2022) follow the same strategy and find that, across 7 European countries, premia contribute for 37 to 95% of the wage loss.[15]

Robustness tests and further results. We replicate our analysis using our mass-layoff sample (MLO)— see Figure A3. We find qualitatively similar patterns in terms of earnings and hourly wage rate losses. At $t^D + 5$, losses in hourly wage rate are at -0.067 versus -0.094 in the economic dismissals sample. Loss in firm-specific wage premia explains around 100% of hourly wage loss at $t^D + 5$—although the loss is in absolute value smaller relative to the LE sample. This result confirms the importance of firm premium in explaining long-run losses for displaced workers. The MLO sample also provides us with a longer period of observation, allowing us to verify that the premium loss effect persists up to $t^D + 8$.

Take-away. Overall, this analysis shows that losses in firm premium are a major driver of decline in hourly wage in the wake of job displacement, and that reallocation to low-wage firms appears more quantitatively relevant in our setting than alternative explanations such as either employer-employee match effects or human

[13] We find much stronger (log) total earnings and hours effect than Lachowska et al. (2020). At $t^D + 5$, log earnings in the LE sample (respectively, MLO) decrease by -0.396 (-0.195) and log hours by -0.302 (-0.097) as compared to -0.164 and -0.047 in Lachowska et al. (2020).

[14] Table 3 of Schmieder et al. (2020) provides estimates of losses in log daily wage and firm premium: 76.3% (6.94/9.09) in recessions and 75.5% (3.91/5.16) in booms. Interestingly, although wage losses differ between booms and recessions, the contribution of firm premia (our main object of interest) appears stable over the cycle.

[15] Bertheau et al. (2022) also provide estimates for France which slightly differ from ours. This could be for a variety of reasons, including differences in wage concepts (daily versus hourly), in job loss definition (economic versus mass layoffs), or in data source (exhaustive versus 1/12 sample for premium computation). They discuss differences with our paper in their appendix C3.

capital depreciation (Lachowska et al., 2020).

4 Patterns of reallocation: firm productivity and bargaining

4.1 Dynamics of productivity and labor share following reallocation

Displaced workers experience a steep decline in firm wage premium. This finding could reflect reallocation toward low-productivity firms but is also compatible with reemployment by productive firms with unfavorable wage policies (given their productivity).

The possibility that displaced workers would reallocate towards low-productivity firms, which tend to pay lower premium is plausible in many respects. Theoretically, in workhorse job-ladder models of the labor market (Moscarini and Postel-Vinay, 2018) the productivity and wage ladders are co-linear so that a fall along the productivity ladder should be commensurate to a fall along the wage ladder. Empirically, we find a strong positive relationship between firm fixed-effects and various measures of productivity in the cross-section of firms, in line with Card et al. (2016) or Coudin et al. (2019): appendix Figure A7 shows the corresponding binned scatter plots, and Table A5 shows that productivity is among the strongest predictors of firm wage premium, even after controlling for firm size and sector fixed-effects. Accordingly, one could expect to see declines in wage premium and firm productivity to go hand-in-hand.

We test this hypothesis and trace out the productivity of firms in which displaced workers are re-employed in Figure 2. Table 2 reports corresponding numbers. Figure 2a shows the impact of displacement on the average productivity (adjusted for capital intensity) of the subsequent employers. Firm-level productivity is measured over the 2001-2004 period and is held fixed, so that the event study coefficients solely reflect the displacement-induced reallocation of workers toward firms with different initial productivity. Displaced workers reallocate on average toward significantly more productive firms than their counterfactual (about +15%).[16] As expected given the average loss in firm premium, we further find that destination firms also feature a lower labor share of value-added (-15.5% at $t^D + 5$, Figure 2b), in line with the notion that

[16]The same qualitative conclusion holds when using value-added per worker as an outcome (Table 2,column 2, panel b).

displaced workers reallocate towards high-productivity but low-paying firms.[17]

This inability to extract a larger share of value-added could be explained by a loss in workers' negotiation power, that we explore in section 4.2.

We assess the robustness of these findings in two ways. We first show that the same reallocation towards high-productivity, low-labor share applies to the MLO sample (appendix Figure A4). Second, we compute the average of productivity and labor share over the $t^D - 7$ to $t^D - 5$ period, rather than at a fixed point in time (2001-2004) and show that the same pattern holds. The corresponding "rolling-window" results are reported in appendix Figures A5 and A6 for the LE and MLO samples respectively.

Within versus between sector reallocations. Some studies highlighted the role played by structural change in explaining loss in wage premium (Helm et al., 2022). To assess the importance of inter-sectoral transitions in driving our results, we decompose our three main outcomes $Y_{J(i,t)}$ for firm J in sector s where individual i is employed in t (productivity, labor share and firm wage premium) into a 3-digit sector fixed-effect $\bar{Y}_s$ and a residual $R_{J(i,t)} \equiv Y_{J(i,t)} - \bar{Y}_s$. Results are displayed in lighter colors in Figure 2. While between-sector effects appear to play an important role in the short-run (sometimes working in the opposite sign than the overall effect) the overall effect is overwhelmingly driven by the within-sector component after $t^D + 3$, especially in the case of the wage premium (Figure 2c). This implies that, to the extent that inter-sectoral transitions contribute to the pattern of rising productivity and lower premium, this is due to transitions to firms with higher productivity and lower wage with respect to their sector and not by transitions between sectors with systematic (average) differences.

4.2 Firm-level measures of collective bargaining

Our findings on productivity dismiss the idea that workers would, on average, be re-employed in "bad" (low productivity, low pay) firms. Instead, the pattern of reallocation we find is consistent with wage rate cost of job displacement being driven by a loss in negotiation power, which would prevent workers re-employed in high productivity firms to claim a larger share of value-added. We explore this idea by studying collective bargaining in destination firms. In that aim, we rely on two qualitative

[17] This finding is consistent with the idea that market shares reallocation contributes to overall change in the labor share (Autor et al., 2020; Aghion et al., 2022).

measures capturing the state of firm-level labor relations. We collect administrative data on the negotiation activity, relating to collective agreements signed by firms on the one hand, and to elections of workers' representatives on the other. The fact that within-sector dynamics drive our overall results (Figure 2) calls for using firm-level rather than sector-level variables to investigate the idea of loss in bargaining power.

We construct two main outcomes: *i)* a variable indicating whether or not a firm signed at least one collective agreement relating to wages between 2005 and 2007; *ii)* the firm-level average turnout at workers' representatives elections (2009-2012). Carluccio et al. (2015) show that firms with a higher propensity to sign collective agreements engage more often in rent-sharing. Higher participation at professional elections are likely to reflect a better quality of in-house labor relations. Appendix Table A6 shows that these two measures are positively correlated with firm-premium.

We then estimate our main model (equation 2) using these negotiation indices as outcomes. When considering the collective agreement indicator, we restrict our sample to individuals displaced from 2008 onward in order to measure firms' collective agreement before the layoff (2005-2007), thereby limiting the risk of reverse causality. When considering elections turnout, we simply take the contemporary measurement of the outcome (2009-2012) but we show in appendix E.4 that our results are robust to considering layoffs that are of limited size for the firm, thereby hindering the risk of reverse causality. Appendix E discusses those aspects in detail.

Figure 3 displays the corresponding results. Figure 3a reveals that destination firms are less likely to sign wage-related collective agreements. For instance, at $t^D + 4$, re-employed displaced workers work in a firm that is on average 8 percentage points less likely to have signed a wage agreement (relative to their counterfactual employer had they not been displaced). In appendix E.4 we show that destination firms are more generally less likely to sign agreements on questions related to pay and working conditions. Interestingly, those firms are also more likely to conduct negotiations where no agreement is reached. Our main result is robust when controlling for firm size (and including four size categories defined by legally-relevant thresholds).

Turning to professional elections, Figure 3b shows that destination firms have a lower average turnout. At $t^D + 5$, the average worker faces a reduction in average turnout of 14 percentage points. Similarly, we show in appendix E.4 that destination firms are more likely to face failed election (i.e. where no trade union was present). Further, we find that the loss in average turnout is quantitatively close when focusing on small downsizing events where laid-off workers represented less than 6% of the

workforce, suggesting that the effect on turnout does not simply reflect a response to the layoff itself.

Take-away. Our results show productivity-enhancing reallocation and directly point to a reduction in firms' labor-relation quality for displaced individuals.[18] Overall, the destination firms appear to be more able to constrain their labor costs, which can reconcile our findings of loss in firm wage premium together with the gains in firm productivity.

5 Conclusion

In this paper, we show that displaced workers in France experience large and persistent earnings losses. Lower hourly wage rates after re-employment account for a larger share of earnings losses over time. In turn, losses in employer specific wage premium account for a substantial share of the decline in hourly wage rate. Contrasting these losses in wage premium with measures of productivity, we show that displaced workers tend to be reemployed by more productive firms with a lower labor share of value-added. These findings thus suggest that the loss in firm wage premium is not driven by a reallocation toward low-surplus firms but instead that re-employment occurs in firms that have unfavorable wage-policies given their productivity. This is suggestive of a loss in negotiation power which is confirmed by direct evidence on qualitative variables capturing the quality of labor relations at the firm-level.

Overall, our results show that job displacements can contribute to reallocate workers to more productive firms but that this process is costly for workers, in part due to the fact that destination firms have across-the-board less favorable wage policy. From a positive and normative standpoint, understanding the origin of these firms' ability to constrain labor compensation would be important.[19] On the policy side, as

[18] Our measure of productivity captures average firm productivity as opposed to individual marginal productivity. By contrast, Lachowska et al. (2020) estimate match-effects in order to capture more finely the productivity of jobs. However their approach relies on wages which reflect both marginal productivity and mark-downs. Our approach complements theirs as we use more aggregated indicators of productivity that are not directly affected by the wage setting process.

[19] This could derive from greater monopsonistic power. This could be measured by firm-specific markdowns in the spirit of Hershbein et al. (2021). However, this methodology is best suited to the manufacturing sector which would be an issue in our context where a large fraction of our sample transitions inside and outside the manufacturing sector. Moreover, the question of how these markdowns come about would remain.

reallocations seem to provide a social good, it would be useful to explore ways of mitigating the private cost they impose on workers, for instance through wage insurance. While beyond the scope of this paper, we view both questions as interesting avenue for further research.

Figures and Tables

Table 1: Descriptive statistics: LE sample

	(1) LE	(2) Control	(3) Norm. Diff.
Matching variables			
Age	44.88	45.14	-0.02
	(9.88)	(9.46)	
Wage rate $t^D - 1$	17.52	17.54	-0.00
	(10.54)	(9.79)	
Wage rate $t^D - 2$	17.42	17.39	0.00
	(10.47)	(9.88)	
Hours worked $t^D - 1$	1916.29	1917.39	-0.01
	(131.12)	(129.29)	
Hours worked $t^D - 2$	1916.15	1916.80	-0.00
	(129.53)	(129.93)	
# employees at firm $t^D - 1$	1936.69	1916.80	-0.00
	(9673.92)	(8892.44)	
Variables not included in matching algorithm			
Gender: Male	0.65	0.69	-0.06
	(0.48)	(0.46)	
Gross earnings $t^D - 1$	35509.55	36235.10	-0.01
	(34218.14)	(81440.69)	
# of employers $t^D - 1$	1.05	1.04	0.03
	(0.34)	(0.25)	
Firm wage premium 01-15: $\widehat{\psi}_{J(i,t)}$	3.39	3.33	0.19
	(0.23)	(0.21)	
Obs	16706	16706	33412
Events	13733		

NOTES: This table presents the average of several variables for individuals dismissed for economic reasons (LE) and their matched control workers. Standard deviations are presented between brackets. The last column reports Imbens-Rubin normalized difference; a scale-free measure we use to assess balance in observables. All the variables are observed in the DADS panel, except for $\widehat{\psi}_{J(i,t)}$ which refers to AKM firm-fixed effects (see Section 2.3 for details on their estimations). Table A2 summarizes variables' definition.

Table 2: Event-Study Estimates

(a) Worker-level outcomes

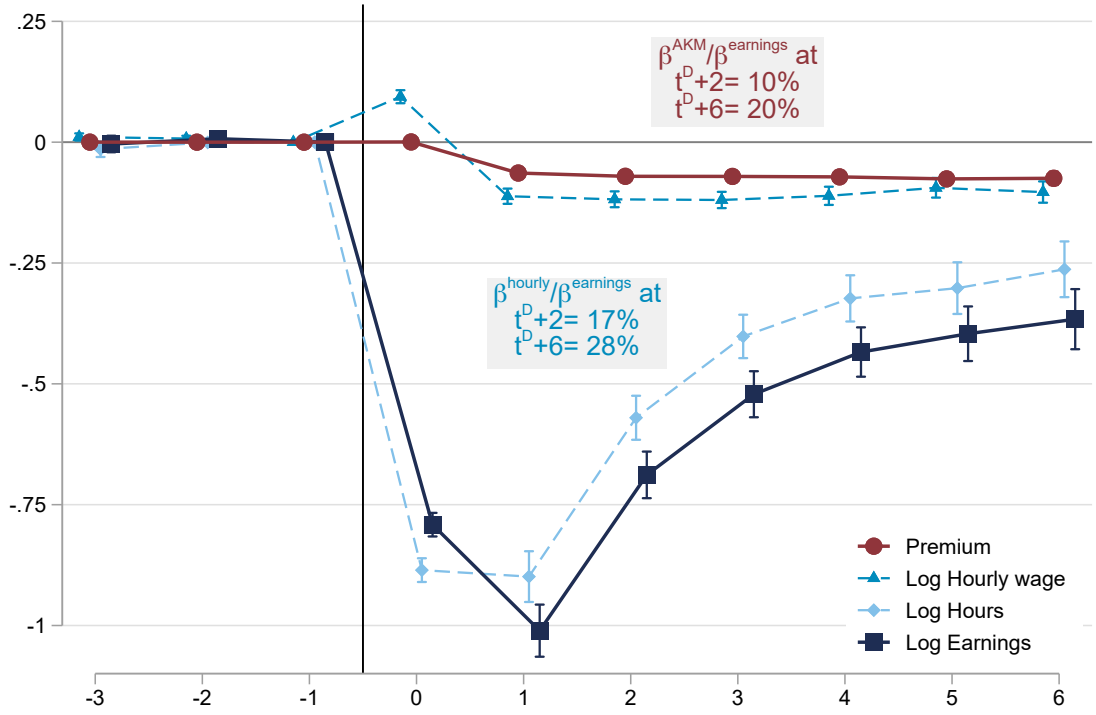
	Outcome in levels		Outcomes in log				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Time to displ.	Employed	Earnings	Earnings	Hours	Hourly wage	Premium	Ratio
$d = 0$	-0.148	-16,687	-0.791	-0.885	0.094	0.000	0.005
	(0.003)	(0.142)	(0.009)	(0.010)	(0.005)	(0.001)	
$d = 1$	-0.444	-19,334	-1.011	-0.899	-0.112	-0.064	0.571
	(0.004)	(0.186)	(0.021)	(0.020)	(0.006)	(0.004)	
$d = 2$	-0.347	-18,687	-0.688	-0.570	-0.118	-0.071	0.597
	(0.005)	(0.229)	(0.019)	(0.018)	(0.006)	(0.004)	
$d = 3$	-0.270	-15,664	-0.522	-0.402	-0.120	-0.071	0.592
	(0.005)	(0.249)	(0.018)	(0.017)	(0.007)	(0.004)	
$d = 4$	-0.226	-13,545	-0.434	-0.323	-0.111	-0.072	0.647
	(0.006)	(0.278)	(0.020)	(0.019)	(0.007)	(0.005)	
$d = 5$	-0.199	-12,085	-0.396	-0.302	-0.094	-0.076	0.805
	(0.007)	(0.308)	(0.022)	(0.021)	(0.008)	(0.005)	

(b) Firm-level outcomes

	Firm outcomes			Negotiation variables	
	(1)	(2)	(3)	(4)	(5)
Time to displ.	Productivity	VA / Worker	Labor share	Wage Agreement	Election turnout
$d = 0$	0.021	0.010	-0.011	0.006	-0.012
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
$d = 1$	0.140	0.002	-0.066	-0.098	-0.207
	(0.014)	(0.013)	(0.010)	(0.009)	(0.011)
$d = 2$	0.152	0.039	-0.092	-0.094	-0.188
	(0.014)	(0.014)	(0.011)	(0.010)	(0.011)
$d = 3$	0.171	0.085	-0.125	-0.084	-0.171
	(0.015)	(0.014)	(0.011)	(0.011)	(0.012)
$d = 4$	0.178	0.105	-0.134	-0.080	-0.149
	(0.015)	(0.015)	(0.012)	(0.016)	(0.012)
$d = 5$	0.178	0.121	-0.155		-0.143
	(0.017)	(0.017)	(0.013)		(0.013)

NOTES: This table presents event-study estimates of the cost of job displacement for a sample of workers dismissed for economic reasons from equation 2. Worker-level outcomes are presented in panel (a) and firm-level outcomes are presented in panel (b). Firm outcomes are computed as averages over the 2001-2004 period while displacements occurs from 2005 to 2012. Accordingly, event-study coefficients reflect the movement of displaced workers across initially different firms and *not* within-firm changes. **Worker-level outcomes**: *employed* is an indicator taking value 1 if individual has positive hours and earnings at time t. *Earnings* are gross earnings in year t. *Hourly wage* is the ratio of earnings over hours worked. Column (3) to (5) are built on logarithmic transformation of those outcomes. Wage *premium* are estimated as firm-fixed effects in a two-way regression of log-hourly wage on firm and worker fixed effects, following the AKM framework (see section 2.3 for more details). *Ratio* is the ratio of the coefficients of premium over hourly wage. **Firm outcomes**: *Productivity* is obtained as the residual of an OLS regression of value-added on the book value of tangible capital, intangible capital and labor, allowing for 2-digit sector-specific coefficients. *Value-added per worker* is computed as value-added over reported employment. *Labor share* is computed as total labor cost over value-added. **Negotiation variables**: *Wage agreement* refers to collective wage agreement and is an indicator equal to 1 when firms signed at least one agreement related to wages over the period 2005 to 2007. *Election turnout* captures each firm's average turnout at 2009 workplace elections. **Additional information**: Table A2 provides more details on variables' definition. Appendix Table A3 and A4 provide more complete versions including pre-trends, R^2, sample size and coefficients at $d = +6$ for both worker and firm outcomes respectively.

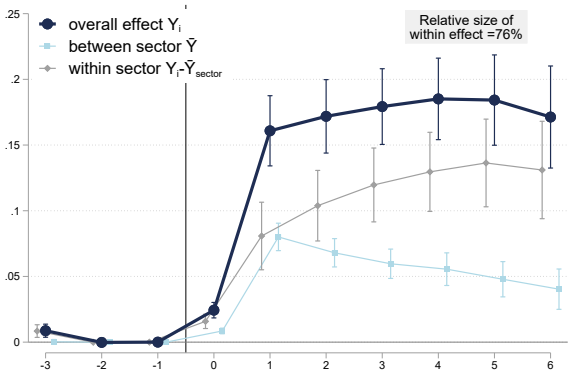
Figure 1: Decomposition of the cost of job displacement



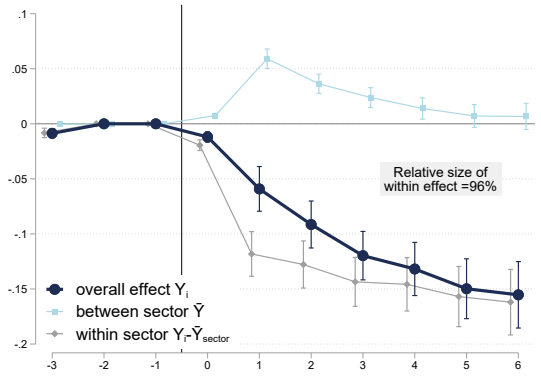
NOTES: This figure reports event-study estimates of the effect of job displacement on log hourly wage, log hours, log earnings and firm-specific wage premium for a sample of workers dismissed for economic reasons (LE)—see equation (2) and associated text for more details on the specification. In the text, the ratios $\beta^{\text{AKM}}/\beta^{\text{earnings}}$ and $\beta^{\text{hourly}}/\beta^{\text{earnings}}$ are equal to the effect on firm-specific premium and hourly wage respectively divided by the effect on overall earnings and represents the fraction (expressed in percents) of total earnings losses due to each effect at $d = 2, 6$. **Sample**: The sample contains 9,081 individuals laid-off for economic reasons who end-up being re-employed post-displacement. **Outcomes**: Table A2 provides more details on variables' definition. Wage premia are estimated, following the AKM framework, as firm-fixed effects in a two-way regression of log-hourly wage on firm and worker fixed effects—see section 2.3 for more details. **Additional information**: Table 2 reports coefficients' value. Appendix Table A3 provides more details. **Standard errors**: robust standard errors clustered at the worker-level; displayed confidence intervals at the 99% level.

Figure 2: Productivity and labor share of current employers

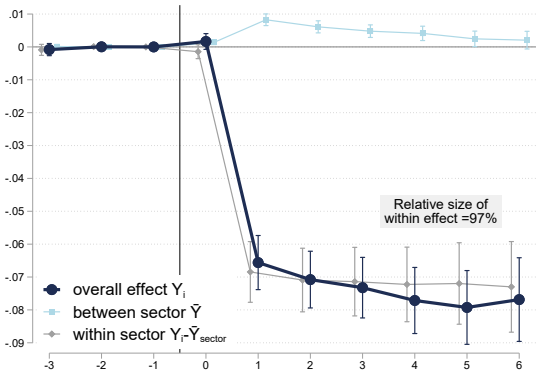
(a) Productivity



(b) Labor share of value-added



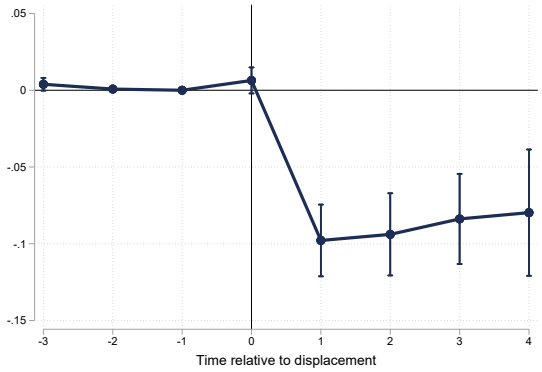
(c) Firm Wage Premium



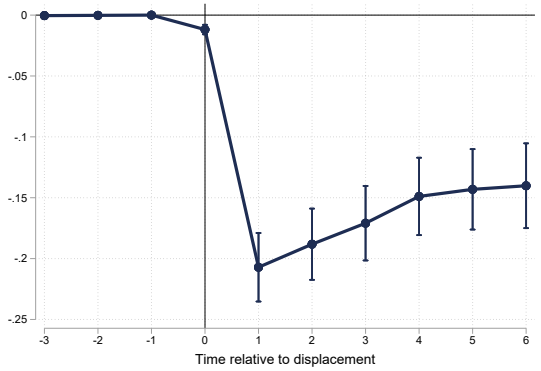
NOTES: This figure reports event-study estimates of the effect of job displacement on the reallocation of workers towards firms with varying levels of productivity, value added per workers and labor share. Coefficients are obtained by estimating the specification of equation 2 where the dependent variable is sequentially productivity, value added per worker and labor share. **Sample**: The sample contains 8,341 individuals laid-off for economic reasons who end-up being re-employed post-displacement. Productivty can be estimated for only 7,524 of those. **Comment on timing**: Firm-level outcomes are computed as average over the 2001-2004 period while displacements occurs from 2005 to 2012. Accordingly, event-study coefficients reflect the movement of workers to firms with different initial characteristics and *not* within-firm changes. **Definition of firm-level outcomes**: See Table A2 for details. Productivity is the residual of an OLS regression of value-added on tangible capital, intangible capital and labor, allowing for 2-digit sector-specific coefficients. The labor share is computed as total labor cost over value-added. In lighter shade, we display the coefficients using a decomposition each of these variables as well as the AKM fixed-effect into a sectoral average at the 3-digit level (between sector $\bar{y}_s$) and a deviation from the sectoral average (within sector $R_i = y_i - \bar{y}_s$). The relative size of the within effect is computed as the absolute value of the within effect divided by the sum of the absolute value of the two effects $|\beta_{\text{within}}|/(|\beta_{\text{within}}| + |\beta_{\text{between}}|)$ in period +6. **Additional information**: Table 2 reports coefficients' value. Appendix Table A4 provides more details. **Standard errors**: robust standard errors clustered at the worker-level; displayed confidence intervals at the 99% level.

Figure 3: Quality of labor relations: firm-level measures

(a) Indicator of wage agreement (2005-2007)



(b) Election turnout



NOTES: This figure reports event-study estimates of the effect of job displacement the reallocation of workers towards with varying propensities to conclude collective agreements (panel 3a) and turnouts at professional elections (panel 3b)—see equation (2) and associated text for more details on the specification. **Definition of the outcomes:** The dependent variable pertaining to collective agreements is an indicator equal to 1 when firms signed at least one agreement related to wages over the period 2005 to 2007. Because we restrict the focus to LE laid-off post 2007, we do not observe individuals after $t^D + 4$. The variable on firm's average turnout at workplace election is computed based on elections taking place over 2009-2012. More details are provided in Section 4.2, and Table A2 provides more details on variables' definition. **Comment on timing:** Each firm is associated with a single value of each outcome, so that event-study coefficients reflect reallocation of workers between firms and not within-firm changes in such outcomes. **Additional information**: Appendix Tables A14 and A16 provide detailed results. **Standard errors**: robust standard errors clustered at the worker level; displayed confidence intervals at the 99% level.

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Online Appendix to: Understanding the Reallocation of Displaced Workers to Firms

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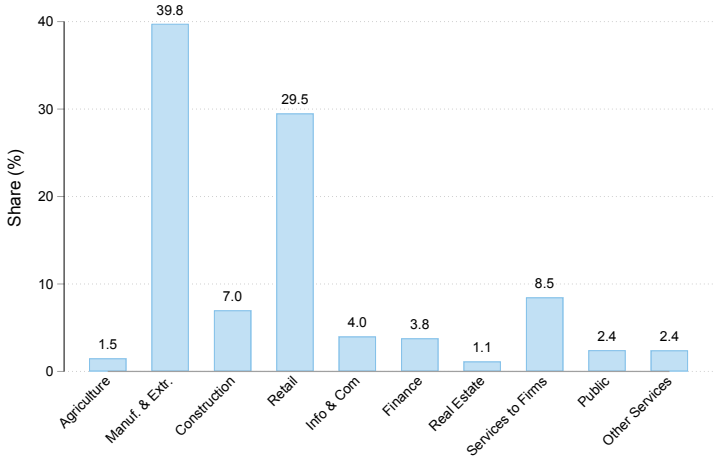
September 2021

A Additional Tables and Figures

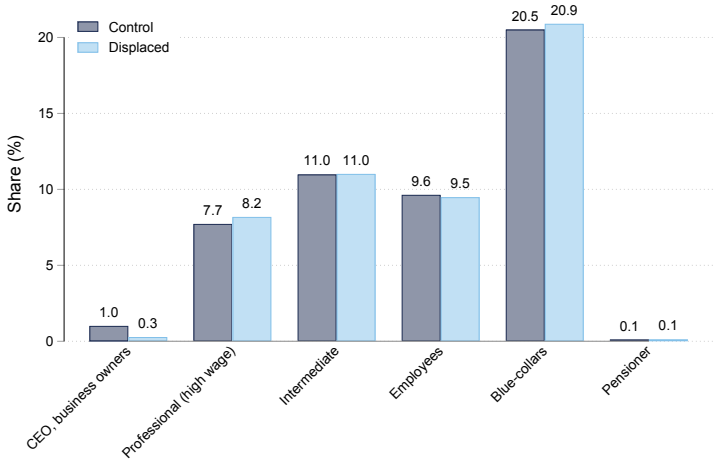
A.1 Figures

Figure A1: LE Sample, baseline characteristics

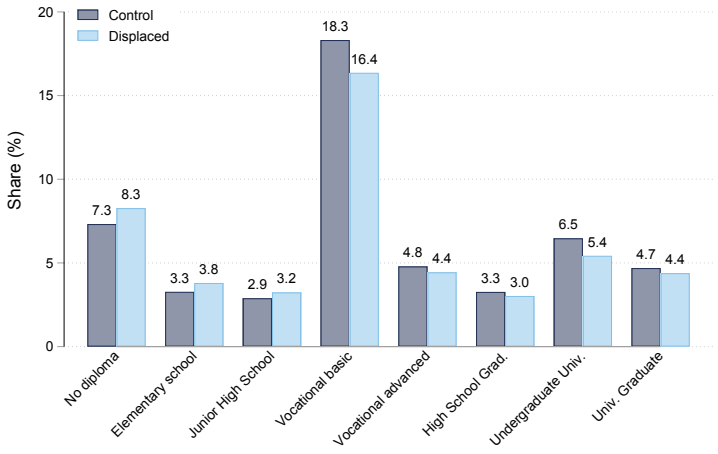
(a) Sector, 2-digit (matching variable)



(b) Occupation



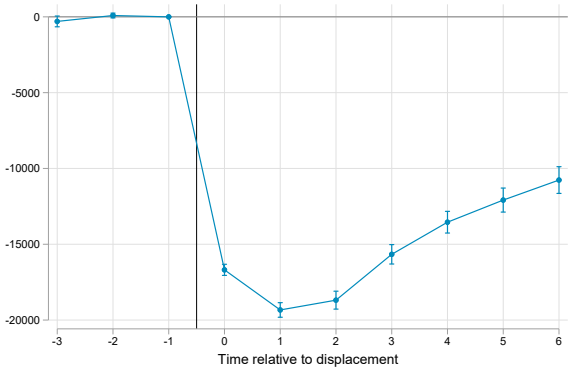
(c) Educational attainment



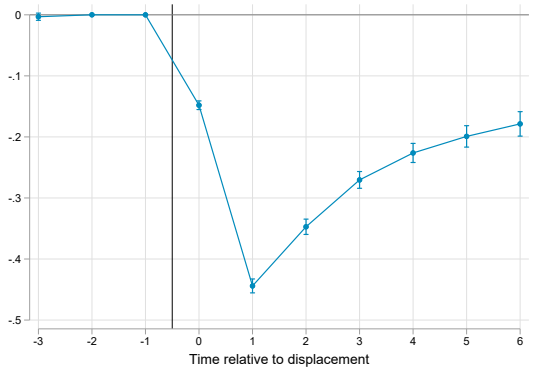
NOTES: This figure presents descriptive statistics about the sample of 16,706 individuals displaced for economic reasons (LE) and their respective control. Data is observed at $t^D - 1$. Panel (a) is the distribution of workers across 2-digit sectors. This variable is used as matching condition so that the distribution in the two groups is similar. Panels (b) and (c) display the distribution of workers across occupations and educational attainment. Educational attainment is only observed for a sub-sample. These two variables were not used in the matching algorithm. In both cases, the sample appears to be balanced across treatment and controls.

Figure A2: Displacement Effects in Level: Earnings, Employment and Hours

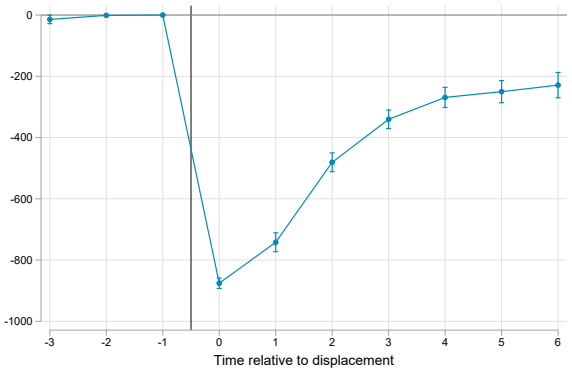
(a) Annual Earnings (in level)



(b) Employment Probability

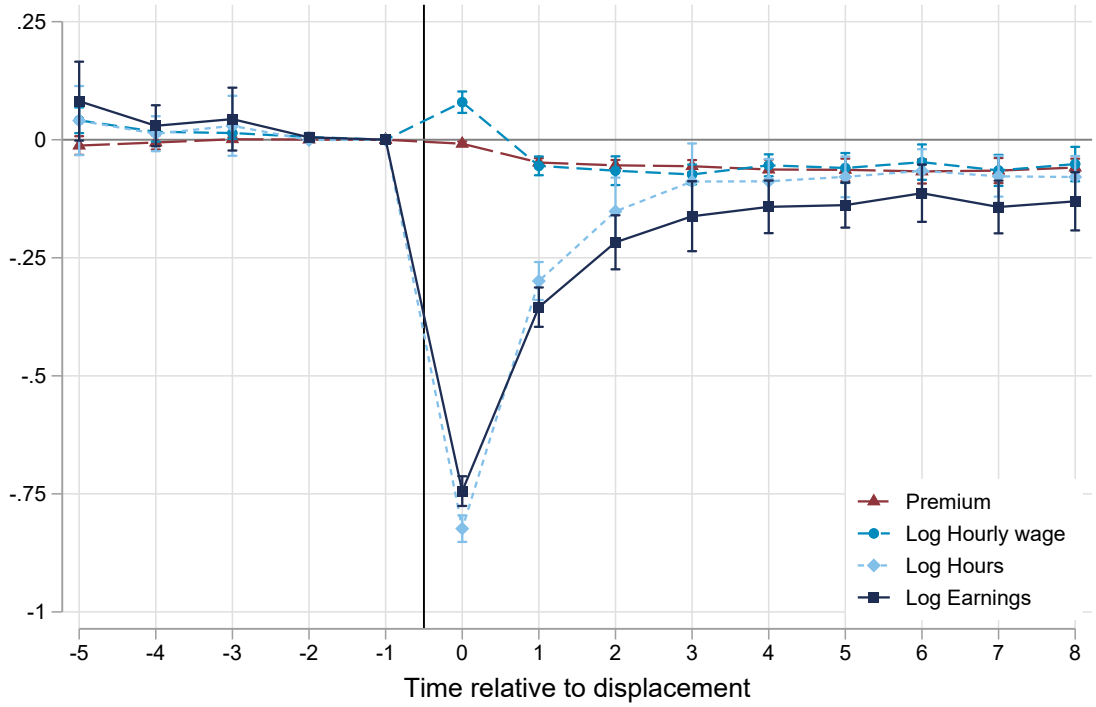


(c) Hours Worked



Notes: This figure reports event-study estimates of the cost of job displacement for a sample of workers dismissed for economic reasons (LE) —see equation (2) and associated text for more details on the specification. **Samples**: The sample contains 16,706 individuals laid-off for economic reasons. The estimation sample in Panels (a) and (b) contain all workers; panel (c) is restricted to re-employed workers who have a well-defined hourly wage (9,081 workers). **Definition of the outcomes:** Table A2 summarizes variables' definition. **Additional information**: Appendix Table A3 provides more details. For brievty, effect on hours is only displayed when using log. **Standard errors**: robust standard errors clustered at the worker-level; displayed confidence intervals at the 99% level.

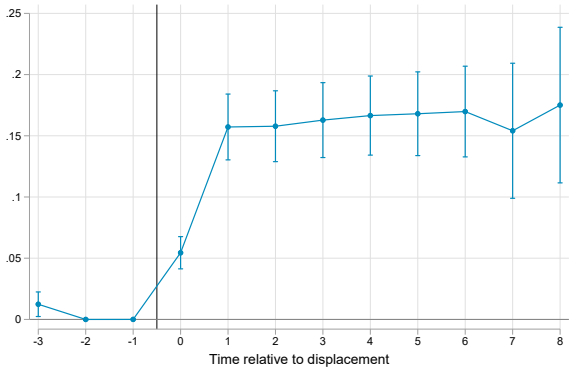
Figure A3: Loss in wage premium: Mass-layoff (MLO) sample



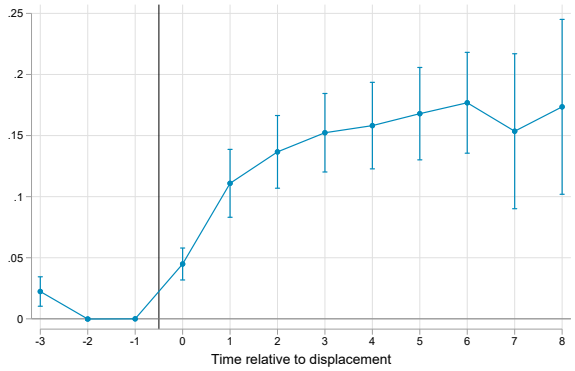
Notes: This figure reports event-study estimates of the effect of job displacement on log hourly wage, log hours, log earnings and loss in firm-specific wage premium for a sample of workers who worked in a mass-layoff plant (MLO) —see equation (2) and associated text for more details on the specification. **Outcomes**: Table A2 summarizes variables' definition. Wage premia are estimated, following the AKM framework, as firm-fixed effects in a two-way regression of log-hourly wage on firm and worker fixed effects—see section 2.3 for more details. **Sample**: The sample contains 4,952 individuals displaced in a mass-layoff and who end-up being re-employed post-displacement. Details on the contruction of the sample are provided in Appendix D.1. **Additional information**: Table A7 provides more details. **Standard errors**: robust standard errors clustered at the worker-level; displayed confidence intervals at the 99% level.

Figure A4: Firms characteristics over 2001-2004, MLO sample

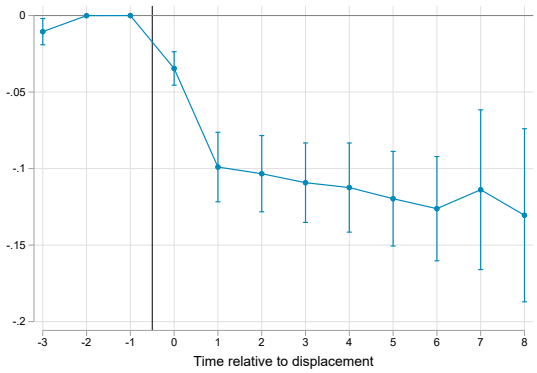
(a) Productivity



(b) Log of value-added per worker



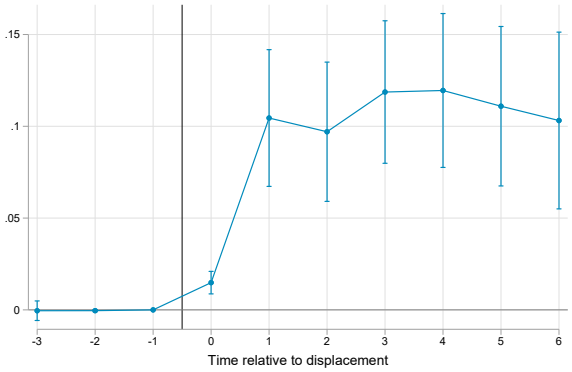
(c) Log of labor share of value-added



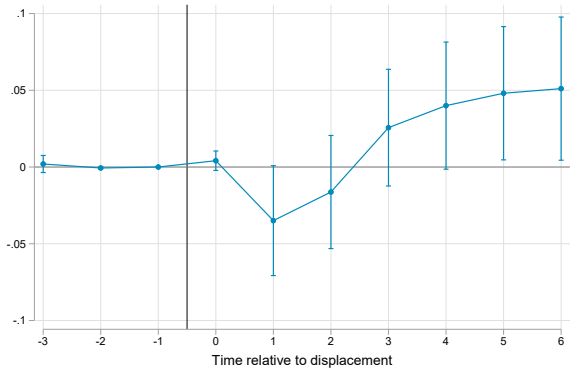
NOTES: This figure reports event-study estimates of the effect of job displacement on the reallocation of workers towards firms with varying levels of productivity, value added per workers and labor share. Coefficients are obtained by estimating the specification of equation 2 where the dependent variable is sequentially productivity, value added per worker and labor share. **Sample**: The sample contains 4,772 individuals displaced in a mass layoff (MLO) and who end-up being re-employed post-displacement. Productivity (panel (a)) can only be estimated for 4,130 of these. **Definition of firm-level outcomes**: Table A2 summarizes variables' definition. Value added per worker is computed as value added over reported employment. Productivity is obtained as the residual of an OLS regression of value-added on the book value of tangible capital, intangible capital and labor, allowing for 2-digit sector-specific coefficients, where value-added is deflated using 2-digit value added deflator (*Indice de prix de la valeur ajoutée brute par branche*). The labor share is computed as total labor cost over value-added during the period 2001-2004. **Additional information**:Appendix Table A8 provides more details.**Standard errors**: robust standard errors clustered at the worker-level; displayed confidence intervals at the 99% level.

Figure A5: Firms characteristics in rolling-windows $[t^D - 7, t^D - 5]$, LE sample

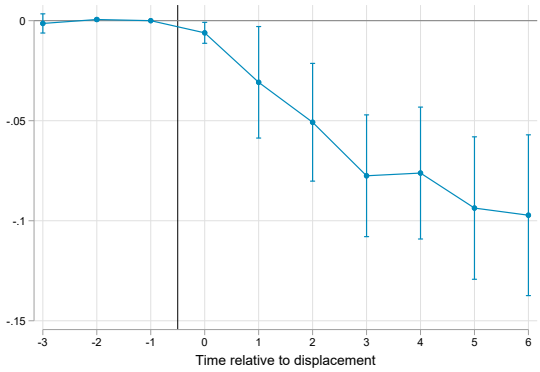
(a) Productivity



(b) Log of value-added per worker



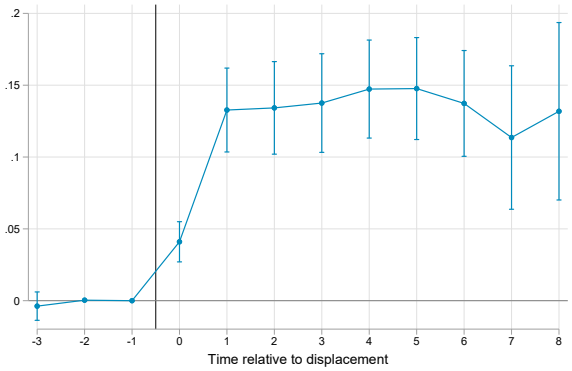
(c) Log of labor share of value-added



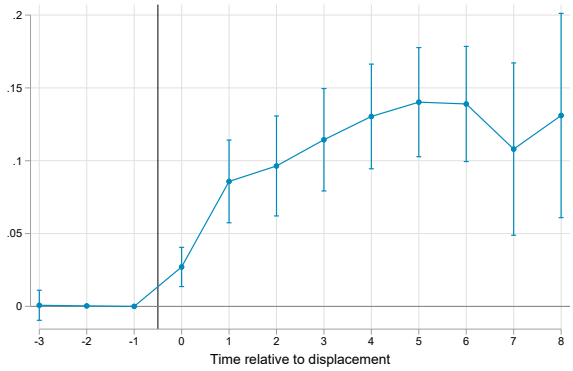
NOTES: This figure reports event-study estimates of the effect of job displacement on the reallocation of workers towards firms with varying levels of productivity, value added per workers and labor share. Coefficients are obtained by estimating the specification of equation 2 where the dependent variable is sequentially productivity, value added per worker and labor share. **Sample**: The sample contains 8,341 individuals laid-off for economic reasons who end-up being re-employed post-displacement. Productivty can be estimated for only 7,524 of those. **Comment on timing**: Firm-level outcomes are computed as average over a period defined as $[t^D - 7; t^D - 5]$ (rolling window), while displacements occurs at t^D (with t^D between 2005 and 2012). Accordingly, event-study coefficients reflect the movement of displaced workers to firms with different pre-layoff characteristics and *not* changes within-firm in such characteristics. **Definition of firm-level outcomes**: Table A2 summarizes variables' definition. Value added per worker is computed as value added over reported employment. Productivity is obtained as the residual of an OLS regression of value-added on the book value of tangible capital, intangible capital and labor, allowing for 2-digit sector-specific coefficients, where value-added is deflated using 2-digit value added deflator (*Indice de prix de la valeur ajoutée brute par branche*). The labor share is computed as total labor cost over value-added during the period 2001-2004. **Standard errors**: robust standard errors clustered at the worker-level; displayed confidence intervals at the 99% level.

Figure A6: Firms characteristics in rolling-windows over $[t^D - 7, t^D - 5]$, MLO sample

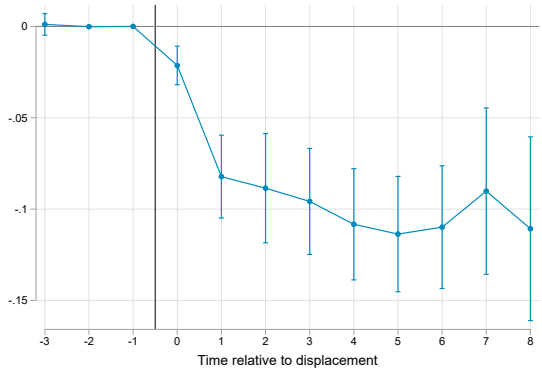
(a) Productivity



(b) Log of value-added per worker

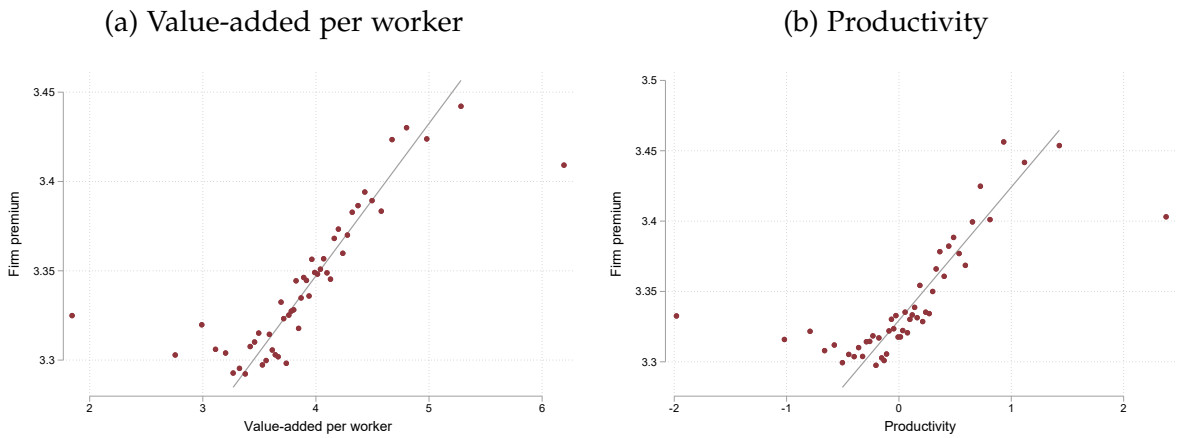


(c) Log of labor share of value-added



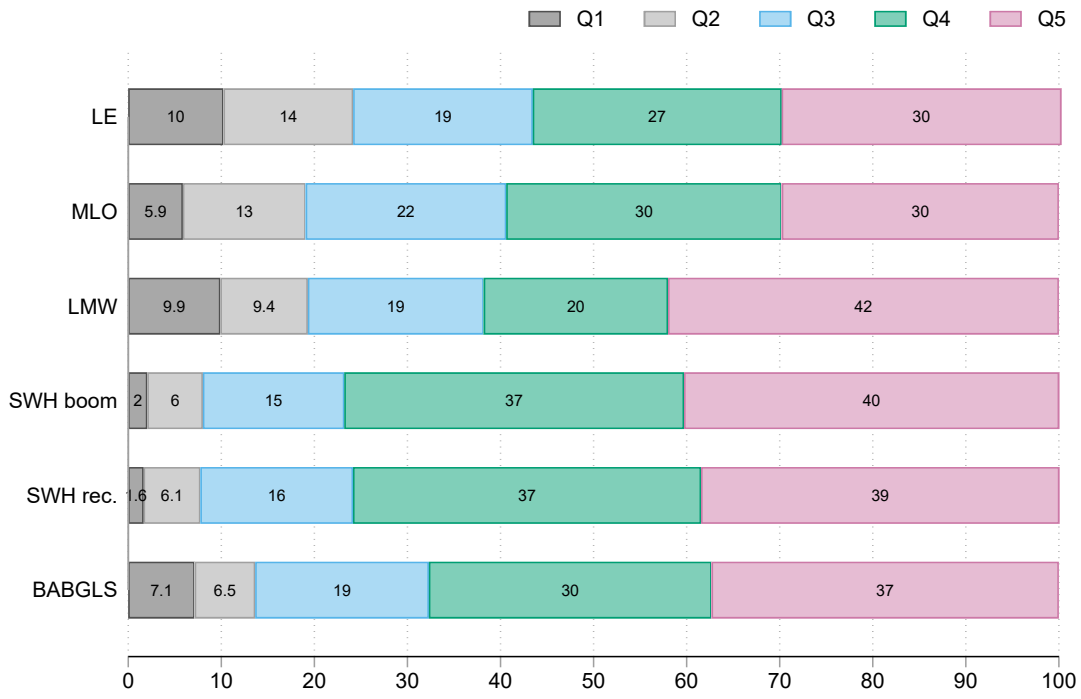
NOTES: This figure reports event-study estimates of the effect of job displacement on the reallocation of workers towards firms with varying levels of productivity, value added per workers and labor share. Coefficients are obtained by estimating the specification of equation 2 where the dependent variable is sequentially productivity, value added per worker and labor share. **Sample**: The sample contains 4,772 individuals laid-off for economic reasons who end-up being re-employed post-displacement. Productivty can be estimated for only 4,130 of those. **Comment on timing**: Firm-level outcomes are computed as average over a period defined as $[t^D - 7; t^D - 5]$ (rolling window), while displacements occurs at t^D (with t^D between 2005 and 2012). Accordingly, event-study coefficients reflect the movement of displaced workers to firms with different pre-layoff characteristics and *not* changes within-firm in such characteristics. **Definition of firm-level outcomes**: Table A2 summarizes variables' definition. Value added per worker is computed as value added over reported employment. Productivity is obtained as the residual of an OLS regression of value-added on the book value of tangible capital, intangible capital and labor, allowing for 2-digit sector-specific coefficients, where value-added is deflated using 2-digit value added deflator (*Indice de prix de la valeur ajoutée brute par branche*). The labor share is computed as total labor cost over value-added during the period 2001-2004. **Standard errors**: robust standard errors clustered at the worker-level; displayed confidence intervals at the 99% level.

Figure A7: Firm-specific wage premium and productivity



NOTES: This figure displays the binned scatter plot of firm-premia with respect to (log) value-added per worker (left panel) and productivity (right panel). 50 quantiles are used. The linear fit (light gray line) is estimated on a sample excluding the bottom 5 and the top 1 quantiles. As in the Portuguese data (Card et al., 2016, see in particular Figure IV, page 663), the firm AKM fixed-effects and value-added per worker (or productivity) are strongly positively associated outside of the bottom of the distribution. Fitted slope=0.085 (left) and 0.095 (right). **Definition of variables**: Table A2 summarizes variables' definition. Value-added per worker is computed as value-added over reported employment. Productivity is obtained as the residual of an OLS regression of value-added on the book value of tangible capital, intangible capital and labor, allowing for 2-digit sector-specific coefficients, where value-added is deflated using 2-digit value added deflator (*Indice de prix de la valeur ajoutée brute par branche*).

Figure A8: Distribution of firm fixed effects in the sample of displaceed workers: comparison with previous work



Notes: This figure displays the distribution of the firm AKM fixed-effects in the estimating sample. It presents the share of observations which falls into each of the 5 quintiles of the AKM distribution (computed based on the population of firms) for the economic layoff (LE) sample and the mass layoffs sample (MLO). For comparison with provide the corresponding figures for the previous leader papers which displays comparable information: LMW (Lachowska et al., 2020), SHW (Schmieder et al., 2020) for we distinguish their number for boom and recession as well as BABGLS (Bertheau et al., 2022). In the first row (LE), we see that our estimating puts more weight on high wage premium firms : 57% of firms proceeding to economic layoffs belong to the two top quintile (instead of 40% if the sample was fully representative). The next row shows that the MLO approach is slightly more skewed toward large premium firms. The 4 next rows show put these numbers in perspective and suggest that while large premium firms are overrepresented in our LE sample, this degree of over-representation is somewhat lower than in other papers of the literature on job displacement.

A.2 Tables

Table A1: Definition of datasets

Dataset	Description	Period	Main use
DADS postes	(*Déclaration Annuelle des Données Sociales*) is a matched employer-employee dataset covering the universe of the private salaried sector. It comes from the administrative declaration that all employers report annually to social security authorities and tax administration, and contains information on firms and establishments (unique identifier; size; industry) as well as on each employees' job (occupation, wage, hours worked, start and end date, type of contract, etc.). Firm (SIREN) unique id.	]2001-2015[	Compute firm premium
Panel DADS	Is a panel version of DADS (cf. above) containing a random sample of 1/12 of the universe of workers. Firm (SIREN) and worker unique id.	]2001-2015[	Workers' trajectories. Samples construction.
FH-DADS	Matches the Panel DADS (cf. above) to the FH (Fichier Historique) data, an historical administrative file pro- duced by the national unemployment agency (*Pôle Emploi*) which records individuals' unemployment spells. Any job seeker claiming unemployment benefits appears in the FH, which contains information about date of registration, duration and level of unemployment benefits. Firm (SIREN) and worker unique id.	[2002-2012]	Identify workers laid-off for economic reasons
FICUS-FARE	Is a nearly exhaustive administrative dataset built from the corporate tax returns and the social security declaration of the universe of firms in the non-financial corporate sector. Firm (SIREN) unique id.	]2001-2015[	Firms' productivity, value-added, etc.
D@ccord	D@ccord data reports information about firms' negotiations regarding collective agreement. In France, firms are required by the labor law to report any negotiation (successfull or not). The Ministry of Labor then builds this data set. Useful information contains: the matter of negotiation (wages, hours, etc.), the parties negotiating or signing (trade union, etc.), outcome, date of signature. Firm (SIREN) unique id.	[2005-2007[	Collective agreements.
Workplace election	Data reports the results of all workplace election held in France over 2009-2012. The election is characterized by its electoral college and its outcome (share of voters, vote by trade union, etc.) Firm (SIREN) unique id.	[2009-2012]	Workplace election turnout and failure.

NOTES: This table provides a summary of the main datasets.

Table A2: Definition of main variables (1/2)

Outcome	Definition	Period	Source
Worker			
Employed	Indicator taking value 1 if the workers has worked (positive hours and earning).	t	DADS panel
Earnings	Total of gross wages earned by the worker. Missing data is coded 0.	t	DADS panel
Hours worked	Total hours worked by the worker. Missing data is coded 0.	t	DADS panel
Hourly wage (or wage rate)	Earnings over Hours.	t	DADS panel
(log) Earnings	Log of: Earnings (cf. above)	t	DADS panel
(log) Hours	Log of: Hours (cf. above)	t	DADS panel
(log) Hourly wage	Log of: Hourly wage (cf. above)	t	DADS panel
# employees	Number of workers in the firm on December 31st.	t	DADS panel
Premium $\widehat{\psi}_{J(i,t)}$	Firm fixed effect associated with the firm in an AKM framework presented in equation 1.	2001-2015[a]	DADS
Firm			
Productivity	Residual of an OLS regression of value-added on the book value of tangible capital, intangible capital and labor, allowing for 2-digit sector-specific coefficients. Value-added is deflated using 2-digit value added deflator (*Indice de prix de la valeur ajoutée brute par branche*).	2001-2004[a,b]	FICUS-FARE
VA / Worker	Computed as value-added over reported employment.	2001-2004[a,b]	FICUS-FARE
Labor share	Total labor cost over value-added.	2001-2004[a,b]	FICUS-FARE
Manufacturing	Indicator for firms whose sector is (at least once over the period) manufacturing.	2001-2004[a,b]	FICUS-FARE

Definition of main variables (2/2)

Outcome	Definition	Period	Source
Collective agreements (more in E.1)			
Wage agreement indicator	Indicator taking value 1 if the firm has signed (at least) one agreement relative to wages, and 0 otherwise.	2005-2007[a]	D@ccord
# Wage agreement	Number of wages agreement signed by the firm.	2005-2007[a]	D@ccord
Wage failure indicator	Indicator taking value 1 if the firm has failed to conclude (at least) one negotiation relative to wages, and 0 otherwise.	2005-2007[a]	D@ccord
Extended wage agreement indicator	Indicator taking value 1 if the firm has signed (at least) one agreement relative to earnings (wages, bonuses, ranking, participation, etc.), and 0 otherwise.	2005-2007[a]	D@ccord
Hours agreement indicator	Indicator taking value 1 if the firm has signed (at least) one agreement relative to hours and working time, and 0 otherwise.	2005-2007[a]	D@ccord
Elections (more in E.2)			
Average turnout	Worker-weighted average participation of electors in firm-specific professional elections.	2009-2012[a]	Ministère du Travail
Failed (share workers)	Share of firm's workers who were electors of a failed election (i.e. no trade union ran).	2009-2012[a]	Ministère du Travail
CGT (share workers)	Share of firm's workers who were electors in an election were a CGT representative received more than 10%.	2009-2012[a]	Ministère du Travail

Notes: This table provides a summary of the main variables and their definition. Throughout the paper, variables' name can sometimes be abbreviated.
[a]Outcome for firm J is computed over the given period; in t, worker i is then assigned $J(i,t)$, the value of the firm he works in t.
[b]In robustness analysis we also use $[t^D-7; t^D-5]$. When considering the link with premium we use 2001-2015.

Table A3: Event-study estimates in the sample of workers dismissed for economic reasons: Worker-level outcomes

	Outcome in levels		Outcomes in log				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Time to displ.	Employed	Earnings	Earnings	Hours	Hourly wage	Premium	Ratio
$d = -3$	-0.003	-0.301	-0.004	-0.015	0.011	0.000	
	(0.002)	(0.138)	(0.007)	(0.006)	(0.003)	(0.001)	
$d = -2$	0.000	0.088	0.007	-0.001	0.008	0.000	
	(0.000)	(0.061)	(0.002)	(0.001)	(0.002)	(0.000)	
$d = -1$	REF	REF	REF	REF	REF	REF	
$d = 0$	-0.148	-16.687	-0.791	-0.885	0.094	0.000	0.005
	(0.003)	(0.142)	(0.009)	(0.010)	(0.005)	(0.001)	
$d = 1$	-0.444	-19.334	-1.011	-0.899	-0.112	-0.064	0.571
	(0.004)	(0.186)	(0.021)	(0.020)	(0.006)	(0.004)	
$d = 2$	-0.347	-18.687	-0.688	-0.570	-0.118	-0.071	0.597
	(0.005)	(0.229)	(0.019)	(0.018)	(0.006)	(0.004)	
$d = 3$	-0.270	-15.664	-0.522	-0.402	-0.120	-0.071	0.592
	(0.005)	(0.249)	(0.018)	(0.017)	(0.007)	(0.004)	
$d = 4$	-0.226	-13.545	-0.434	-0.323	-0.111	-0.072	0.647
	(0.006)	(0.278)	(0.020)	(0.019)	(0.007)	(0.005)	
$d = 5$	-0.199	-12.085	-0.396	-0.302	-0.094	-0.076	0.805
	(0.007)	(0.308)	(0.022)	(0.021)	(0.008)	(0.005)	
$d = 6$	-0.179	-10.765	-0.366	-0.263	-0.103	-0.075	0.724
	(0.008)	(0.342)	(0.024)	(0.022)	(0.009)	(0.005)	
N	261254	261208	138861	138861	138861	138861	
# treated	16706	16703	9081	9081	9081	9081	
R^2	0.522	0.741	0.658	0.476	0.843	0.872	

NOTES: This table presents event-study estimates of the cost of job displacement for a sample of workers dismissed for economic reasons (LE) —see equation (2) and associated text for more details on the specification. **Outcomes**: Table A2 summarizes variables' definition. **Worker-level**: employed is an indicator taking value 1 if individual has positive hours and earnings at time t. Earnings are gross earnings in year t. Hourly wage is the ratio of earnings over hours worked. Column (3) to (5) are built on logarithmic transformation of those outcomes. Wage premia are estimated, following the AKM framework, as firm-fixed effects in a two-way regression of log-hourly wage on firm and worker fixed effects—see section 2.3 for more details. Ratio is the ratio of (the coefficients of) premium over hourly wage. **Standard errors**: robust standard errors clustered at the worker-level.

Table A4: Event-study estimates in the sample of workers dismissed for economic reasons: Firm-level outcomes

	Firm outcomes			Negotiation variables	
	(1)	(2)	(3)	(4)	(5)
Time to displ.	Productivity	VA / Worker	Labor share	Wage Agr. ind.	Election turnout
$d = -3$	0.008	0.010	-0.007	0.004	-0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
$d = -2$	-0.000	-0.000	0.000	0.001	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$d = -1$	REF	REF	REF	REF	REF
$d = 0$	0.021	0.010	-0.011	0.006	-0.012
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
$d = 1$	0.140	0.002	-0.066	-0.098	-0.207
	(0.014)	(0.013)	(0.010)	(0.009)	(0.011)
$d = 2$	0.152	0.039	-0.092	-0.094	-0.188
	(0.014)	(0.014)	(0.011)	(0.010)	(0.011)
$d = 3$	0.171	0.085	-0.125	-0.084	-0.171
	(0.015)	(0.014)	(0.011)	(0.011)	(0.012)
$d = 4$	0.178	0.105	-0.134	-0.080	-0.149
	(0.015)	(0.015)	(0.012)	(0.016)	(0.012)
$d = 5$	0.178	0.121	-0.155		-0.143
	(0.017)	(0.017)	(0.013)		(0.013)
$d = 6$	0.172	0.124	-0.159		-0.140
	(0.018)	(0.018)	(0.014)		(0.014)
N	116499	128689	128689	78741	64798
# treated	7524	8341	8341	6751	4187
R^2	0.895	0.891	0.871	0.810	0.901

NOTES: This table presents event-study estimates of the cost of job displacement for a sample of workers dismissed for economic reasons (LE) —see equation (2) and associated text for more details on the specification. **Comment on timing**: Firm-level outcomes are computed as average over the 2001-2004 period while displacements occurs from 2005 to 2012. Accordingly, event-study coefficients reflect the movement of displaced workers to firms with different initial characteristics and *not* changes within-firm in such characteristics. **Outcomes**: Table A2 summarizes variables' definition. **Firm-level**: Value added per worker is computed as value added over reported employment. Productivity is obtained as the residual of an OLS regression of value-added on the book value of tangible capital, intangible capital and labor, allowing for 2-digit sector-specific coefficients, where value-added is deflated using 2-digit value added deflator (*Indice de prix de la valeur ajoutée brute par branche*). The labor share is computed as total labor cost over value-added during the period 2001-2004. **Definition of firm-level outcomes related to labor relations**: In column (4) the dependent variable Wage agreement indicator refers to collective wage agreement and is an indicator equal to 1 when firms signed at least one agreement related to wages over the period 2005 to 2007. The variable in column (5) Election turnout captures each firm's average turnout at 2009 workplace elections. More details are provided in Section 4.2. **Standard errors**: robust standard errors clustered at the worker-level.

Table A5: Firm-level correlates of firm wage premium

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Employees	0.015		0.013	0.013			0.013	0.013
	(0.001)		(0.001)	(0.001)			(0.001)	(0.001)
VA		0.017						
		(0.001)						
VA per worker			0.041					
			(0.002)					
Productivity				0.039			0.040	0.034
				(0.002)			(0.002)	(0.002)
Age $>$ 10 years					0.008		-0.003	-0.001
					(0.002)		(0.002)	(0.002)
Manufacturing						0.009	0.007	
						(0.003)	(0.003)	
Sector FE								✓
Observations	34536	34536	34536	34536	34536	34536	34536	34536
R^2	0.013	0.022	0.028	0.027	0.000	0.000	0.027	0.054
Adjusted R^2	0.013	0.022	0.028	0.027	0.000	0.000	0.027	0.052

NOTES: This table presents a cross-sectional regression of firm wage premium (estimated over the period 2001-2015 period) on firm-level characteristics over the same period (2001-2015). **Sample** This estimation sample comprises all firms that are present either in our LE or MLO analysis, either as a firm displacing workers or as a firm employing a matched control worker. **Outcomes**: Table A2 summarizes variables' definition. Productivity, size (employment), value-added and value-added per workers are expressed in logs and are averaged over the 2001-2015 period. Age is measured as of 2004. Manufacturing is the maximum over the period. Productivity is obtained as the residual of an OLS regression of value-added on the book value of tangible capital, intangible capital and labor, allowing for 2-digit sector-specific coefficients, where value-added is deflated using 2-digit value added deflator (*Indice de prix de la valeur ajoutée brute par branche*). Sectors fixed-effects are based on a 2-digit sectoral classification. Robust standard errors in parentheses.

Table A6: Firm

	(1)	(2)	(3)	(4)	(5)	(6)
Wage agreement ind.	0.035	-0.003	0.029			
	(0.003)	(0.004)	(0.003)			
Election turnout				0.015	0.016	0.015
				(0.006)	(0.006)	(0.006)
Employees		0.015			-0.001	
		(0.001)			(0.001)	
Sector FE			✓			✓
Observations	34536	34536	34536	8213	8213	8208
R^2	0.003	0.013	0.038	0.001	0.001	0.056
Adjusted R^2	0.003	0.013	0.036	0.001	0.001	0.047

NOTES: This table presents a cross-sectional regression of firm wage premium (estimated over the period 2001-2015 period) on firm-level negotiation characteristics over the period of observations (2005-2007 for collective agreements, 2009-2012 for professional elections). **Sample** This estimation sample comprises all firms that are present either in our LE or MLO analysis, either as a firm displacing workers or as a firm employing a matched control worker. **Outcomes**: Table A2 summarizes variables' definition. Wage agreement indicator is an indicator taking value 1 if the firm has signed at least one agreement relative to wages over the 2005-2007 period. Election turnout is the average turnout at professional elections in the firm over 2009-2012. Employees is the log of average number of workers in the firm over 2001-2015. Sectors fixed-effects are based on a 2-digit sectoral classification. Robust standard errors in parentheses.

Table A7: Event-study estimates in the mass-layoff sample: Worker-level outcomes

	Outcome in levels		Outcomes in log				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Time to displ.	Employed	Earnings	Earnings	Hours	Hourly wage	Premium	Ratio
$d = -3$	-0.003	0.579	0.044	0.030	0.013	0.001	
	(0.006)	(0.394)	(0.026)	(0.025)	(0.005)	(0.002)	
$d = -2$	0.001	0.115	0.006	0.000	0.006	0.000	
	(0.001)	(0.133)	(0.004)	(0.002)	(0.003)	(0.000)	
$d = -1$	REF	REF	REF	REF	REF	REF	
$d = 0$	-0.293	-19.948	-0.747	-0.826	0.079	-0.009	-0.108
	(0.004)	(0.362)	(0.012)	(0.011)	(0.009)	(0.002)	
$d = 1$	-0.254	-11.856	-0.362	-0.308	-0.055	-0.048	0.874
	(0.010)	(0.518)	(0.016)	(0.015)	(0.008)	(0.004)	
$d = 2$	-0.176	-9.188	-0.224	-0.160	-0.064	-0.054	0.834
	(0.011)	(0.573)	(0.021)	(0.027)	(0.011)	(0.004)	
$d = 3$	-0.137	-7.318	-0.165	-0.093	-0.071	-0.055	0.777
	(0.013)	(0.625)	(0.028)	(0.031)	(0.008)	(0.005)	
$d = 4$	-0.096	-5.955	-0.145	-0.090	-0.055	-0.063	1.146
	(0.015)	(0.644)	(0.022)	(0.019)	(0.009)	(0.008)	
$d = 5$	-0.087	-5.060	-0.143	-0.081	-0.062	-0.065	1.052
	(0.017)	(0.841)	(0.018)	(0.017)	(0.012)	(0.009)	
$d = 6$	-0.090	-5.057	-0.118	-0.069	-0.049	-0.067	1.375
	(0.016)	(0.743)	(0.024)	(0.018)	(0.015)	(0.010)	
$d = 7$	-0.073	-5.286	-0.148	-0.082	-0.066	-0.065	0.984
	(0.017)	(0.783)	(0.022)	(0.017)	(0.013)	(0.010)	
$d = 8$	-0.099	-4.982	-0.135	-0.082	-0.053	-0.059	1.128
	(0.016)	(0.841)	(0.024)	(0.017)	(0.015)	(0.007)	
N	259360	259360	139218	139218	139218	139218	
# treated	11747	11747	4952	4952	4952	4952	
R^2	0.489	0.676	0.680	0.394	0.830	0.816	

NOTES: This table presents event-study estimates of the cost of job displacement for a sample of workers displaced in a mass layoff (MLO) —see equation (2) and associated text for more details on the specification. **Outcomes**: Table A2 summarizes variables' definition. **Worker-level**: employed is an indicator taking value 1 if individual has positive hours and earnings at time t. Earnings are gross earnings in year t. Hourly wage is the ratio of earnings over hours worked. Column (3) to (5) are built on logarithmic transformation of those outcomes. Wage premia are estimated, following the AKM framework, as firm-fixed effects in a two-way regression of log-hourly wage on firm and worker fixed effects—see section 2.3 for more details. Ratio is the ratio of (the coefficients of) premium over hourly wage. **Standard errors**: robust standard errors clustered at the worker-level.

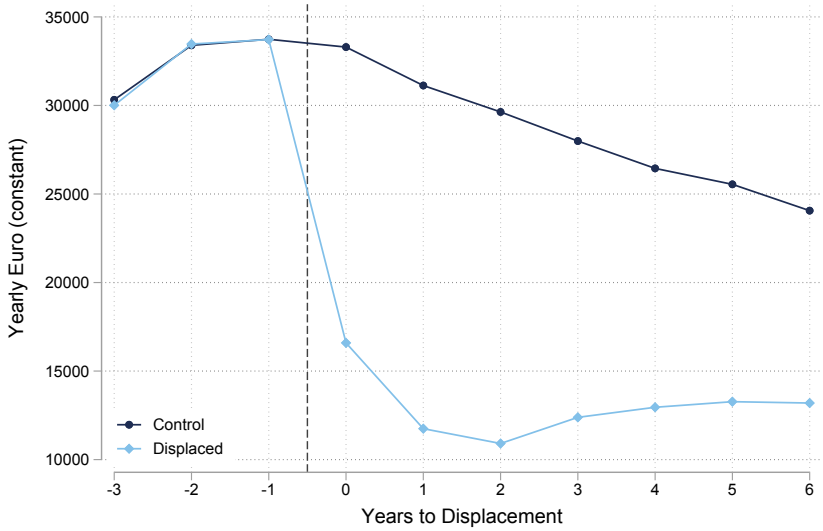
Table A8: Event-study estimates in the mass-layoff sample: Firm-level outcomes

	Firm outcomes			Negotiation variables	
	(1)	(2)	(3)	(4)	(5)
Time to displ.	Productivity	VA / Worker	Labor share	Wage Agr. ind.	Election turnout
$d = -3$	0.012	0.022	-0.011	0.009	-0.000
	(0.004)	(0.005)	(0.003)	(0.002)	(0.003)
$d = -2$	-0.000	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
$d = -1$	REF	REF	REF	REF	REF
$d = 0$	0.054	0.045	-0.035	0.010	-0.080
	(0.005)	(0.005)	(0.004)	(0.006)	(0.005)
$d = 1$	0.157	0.111	-0.099	-0.037	-0.124
	(0.010)	(0.011)	(0.009)	(0.010)	(0.009)
$d = 2$	0.158	0.136	-0.103	-0.035	-0.113
	(0.011)	(0.012)	(0.010)	(0.011)	(0.009)
$d = 3$	0.163	0.152	-0.109	-0.042	-0.111
	(0.012)	(0.012)	(0.010)	(0.013)	(0.009)
$d = 4$	0.167	0.158	-0.112	-0.041	-0.099
	(0.013)	(0.014)	(0.011)	(0.013)	(0.011)
$d = 5$	0.168	0.168	-0.120	-0.042	-0.094
	(0.013)	(0.015)	(0.012)	(0.014)	(0.009)
$d = 6$	0.170	0.177	-0.126	-0.044	-0.093
	(0.014)	(0.016)	(0.013)	(0.017)	(0.009)
$d = 7$	0.154	0.154	-0.114	-0.030	-0.094
	(0.021)	(0.025)	(0.020)	(0.019)	(0.010)
$d = 8$	0.175	0.173	-0.131	-0.030	-0.094
	(0.025)	(0.028)	(0.022)	(0.024)	(0.011)
N	121485	130444	130444	73190	83223
# treated	4130	4722	4722	4118	1792
R^2	0.865	0.865	0.826	0.739	0.889

NOTES: This table presents event-study estimates of the cost of job displacement for a sample of workers displaced in a mass layoff (MLO) —see equation (2) and associated text for more details on the specification. **Comment on timing**: Firm-level outcomes are computed as average over the 2001-2004 period while displacements occurs from 2005 to 2012. Accordingly, event-study coefficients reflect the movement of displaced workers to firms with different initial characteristics and *not* changes within-firm in such characteristics. **Outcomes**: Table A2 summarizes variables' definition. **Firm-level**: Value added per worker is computed as value added over reported employment. Productivity is obtained as the residual of an OLS regression of value-added on the book value of tangible capital, intangible capital and labor, allowing for 2-digit sector-specific coefficients, where value-added is deflated using 2-digit value added deflator (*Indice de prix de la valeur ajoutée brute par branche*). The labor share is computed as total labor cost over value-added during the period 2001-2004. **Definition of firm-level outcomes related to labor relations**: In column (4) the dependent variable Wage agreelement indicator refers to collective wage agreement and is an indicator equal to 1 when firms signed at least one agreement related to wages over the period 2005 to 2007. The variable in column (5) Election turnout captures each firm's average turnout at 2009 workplace elections. More details are provided in Section 4.2. **Standard errors**: robust standard errors clustered at the worker-level.

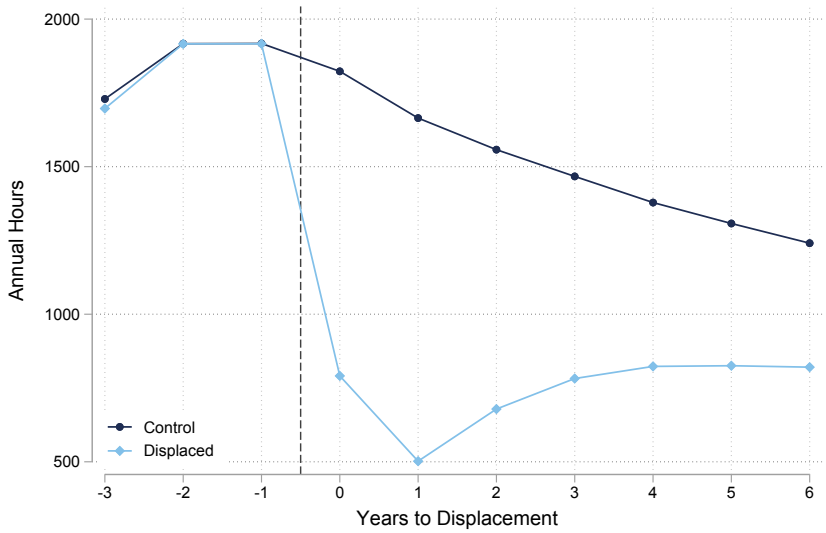
A.3 Raw means

Figure A9: Displacement Effects: Mean Overall Earnings in Control and Treatment Groups



NOTES: This figure displays the average annual gross wage in both displaced-workers and control groups. It shows the evolution of gross wage in our sample from $t^D - 3$ to $t^D + 6$. **Sample**: The sample contains 16,706 economic dismissals (LE) and as many controls. **Outcomes:** Table A2 summarizes variables' definition. **Specification**: The points displayed are computed as the simple average in annual gross wage by distance to displacement. Non working individuals have wage 0 (as long as they are under 65 and $t < 2013$).

Figure A10: Displacement Effects: Mean Hours Workers in Control and Treatment Groups



NOTES: This figure displays the average number of hours worked in both displaced-workers and control groups. It shows the evolution of hours in our sample from $t^D - 3$ to $t^D + 6$. **Sample**: The sample contains 16,706 economic dismissals (LE) and as many controls. **Outcomes:** Table A2 summarizes variables' definition. **Specification**: The points displayed are computed as the simple average in annual hours worked by distance to displacement. Non working individuals have hours 0 (as long as they are under 65 and $t < 2013$).

B Economic layoffs in France

In France, as in most OECD countries, separations and dismissals are classified into different types, depending on whether they are justified on economic or personal or disciplinary grounds. Given the scope of this paper, we focus on a panel of workers administratively registered as "laid-off for economic reason" (*licenciement économique*, or LE) at the French employment agency, between 2002 and 2012.

In France, dismissals for economic reasons require the employer to provide evidence of the existence of economic difficulties for the firm. Under French law, "economic reasons" entail four types of situations: (i) "difficulties" (persistent reduction of turnover, reduction of gross income, etc.), (ii) "technological transformation" (implying the need for different skills), (iii) "re-organisation" (in order to anticipate type-(i) issues, as opposed to improving performance) and (iv) "cessation of business". Economic dismissal can be individual or collective. During collective economic layoffs, the employer must also justify its choice of who remains employed and who is laid-off. French labor laws suggest employers to dismiss lower seniority workers first, as well as workers with lower family responsibility (Batut and Maurin, 2020).

The process for "licenciement économique" depends on the size of the firm and the number of affected workers, with more stringent conditions regarding retraining imposed upon larger employer (Bender et al., 2002). France being characterized by a high level of employee protection legislation (EPL)—in particular for permanent contracts (OECD, 2004)—terminating a contract (as LE or another type of layoff) has economic consequences not only for the worker but also for the firm. For instance, laying-off workers for economic reasons imply severance payments.

C Estimation of firm premiums

The exhaustive French administrative data features a worker id starting in 2001. The drawback of this dataset is that it is not a full panel at the worker level. Instead, workers can be tracked for 2 years only.[20]

In practice, we work on a set of two-year panels starting in 2001. A two-year panel allows us to track workers moves across firms. However, we cannot identify workers across these two-year panels. To estimate the model in equation (1), we stack the exhaustive data in a long form for a period of 15 years (2001-2015). A simple example allowing to compare the structure of a standard panel versus a stacked two-year panel is illustrated in table A9.

Table A9: Comparison of panel types

standard panel

worker id	year	firm id	wage
i	2001	a	$w_{i,a,2001}$
i	2002	a	$w_{i,a,2002}$
i	2003	b	$w_{i,b,2003}$

$\rightarrow$

stacked panel

worker id	year	firm id	wage
i	2001	a	$w_{i,a,2001}$
i	2002	a	$w_{i,a,2002}$
i'	2002	a	$w_{i',a,2002}$
i'	2003	b	$w_{i',b,2003}$

NOTES: The left table presents a standard panel where worker i is followed across 3 years (2001, 2002 and 2003). We observe a mobility from firm a to b in 2003. The right table presents the stacked panels we are working with. Worker i is presented as two different workers: i in the first period (2001-2002) and i' in the second period (2002-2003). This worker 2002 observation is duplicated. We can however track the mobility from a to b by worker i'. In the estimation based on our stacked panels, two sets of worker fixed effect will estimated (one for each 2-year dataset). Note that in practice this results in time-varying worker fixed effects, in the spirit of Fackler et al. (2021) who allow for workers' fixed-effect to evolve around displacement.

We fit equation (1) and retrieve firm fixed effect using the stacked data set over the period 2001 to 2015. The connected set accounts for about 90% of employment over the period.[21] The use of stacked overlapping panels implies that the worker fixed-effects is in fact allowed to vary overtime as they will be specific to a given worker-panel combination. This flexibility is a byproduct of the structure of our data, but mirror specifications of recent papers on displacement and firm premium which aim to absorb potential depreciation in worker human capital by allowing for worker

[20] A true panel exists, it is however solely a 1/24 sample as used in Abowd et al. (1999) (1/12 starting in 2002 as in Bertheau et al. (2022)) which could magnify concerns over limited mobility bias (Andrews et al., 2008). Note that firms however can be followed over the entire sample period.

[21] Concretely, we stack the datasets using the software R and determine the main component of the network using the package "lfe". The fixed-effects were then computed used the R command "feols" from the package "fixest".

fixed-effects that vary before and after displacement (Fackler et al., 2021). A limitation of the procedure we use is that we cannot match the worker fixed-effects estimated based on the stacked overlapping exhaustive data set with the long worker-level panel we use to study displacement as there is no common identifier between the two data sets. We cannot speak to worker skill proxied by the worker-fixed effect as in Helm et al. (2022). Naturally, this limitation is fairly innocuous as we are primarily interested in retrieving firm-level wage premium and assess how it contributes to explaining wage rate losses experienced by displaced workers. We are also unable to estimate match-effects as in Lachowska et al. (2020).

D Mass Layoff Sample

D.1 Construction and description of the mass-layoff sample

As mentioned in section 2.2, we build a second sample made of individuals working in closing plants that we qualify as mass-layoffs, closer to what most of the literature does. To build this sample we ignore unemployment insurance information and only rely on employer-employee data. The first advantage of this alternative process is that individuals suffering from a mass-layoff but who do not register into unemployment insurance will still be observed as long as they enter private employment again. Second, such process is closer to what most of the literature about displacement usually does and allows more direct comparisons. Third, an issue with the LE process is that firms may select the workers to be displaced among many; such selection process is problematic if the firms accesses and uses relevant characteristics unobserved to us. To circumvent this last issue, we adopt a restrictive definition of mass-layoff in which we only consider events where the whole plant virtually stops its activity. Such restriction is a departure from the literature but limits further the issue of selection by employers.[22] As compared to LE sample, the MLO sample has the disadvantages of: i) being constructed from the data (as opposed to administratively defined) and therefore allowing some measurement errors, ii) being restrictive and therefore smaller in size.

D.1.1 Defining mass-layoff and sample construction

We define the mass-layoff sample as all workers observed in DADS-Panel who were employed in year $t^D - 1$ by a plant that closed in year t^D. We follow Royer (2011)'s definition of a plant and use the exhaustive source of DADS Postes to identify closures affecting plants in the private sector.[23] We consider that plant p closes in year t^D if: the number of workers in December of year t^D, $t^D + 1$ and $t^D + 2$ is lesser than or equal to 10% of the number of workers in year $t^D - 1$. Based on the exhaustive record of movement of workers (an improvement as compared to much of the literature), we

[22] Articles in the literature often consider events where 30 to 50% of a plant workforce is laid-off; we set this threshold at 90% of a plant, ensuring that we observe a clear cut of an entire plant within a firm.

[23] Royer (2011) aggregates all the establishment units (identified by a unique 9+4 digits SIRET number) from a same firm (unique 9 digits SIREN number) that are located in the same commuting zone (Zone d'Emploi). Aggregating at SIREN*ZE instead of directly using SIRET is a way to smooth identifiers change over time and ignore the many irrelevant SIRET changes.

exclude closures where many workers keep on working in a common plant in year $t^D + 1$.[24] We next build our sample by selecting the workers found in a closing plant in year t^D by imposing that: the worker is aged 25 to 60 in year t^D; he worked more than 1800 hours in the closing plant in years $t^D - 1$ and $t^D - 2$; is not employed in the closing plant at the end of $t^D + 1$; there were at least 10 workers in plant p in $t^D - 1$.

As with the LE sample, we use propensity score matching to construct a control group. We perform the matching on all workers found in DADS and who meet the basic criteria (age, hours in years $t^D - 1$ and $t^D - 2$). Here again, we perform the match within year and sectors (2 digits-level, 99 sectors) and match in year t^D on age, plant size in $t^D - 1$, hourly wage in $t^D - 1$ and $t^D - 2$, number of hours worked in $t^D - 1$ and $t^D - 2$.

D.1.2 Sample description

The final sample consists of 23,494 individuals equally distributed among treated and control individuals. Table A10 reports the mean and standard deviation of the six quantitative variables measured at baseline and used to match displaced individuals to suitable controls (cf. above). The average displaced individuals is 41.5 years old, works in a firm employing 770 employees and earned 17.81 (respectively 17.69) euro per hour in year $t^D - 1$ ($t^D - 2$), over which he worked 1,927 hours (respectively 1,925). It comes at no surprise that these variables are well balanced across treatment groups. In column (3) we report the Imbens & Rubin "normalized difference" and all values are way under the critical value (0.25). Compared to the LE individuals, at baseline MLO displaced are slightly younger, receive a lower wage and work in smaller firms.

Table A11 and Figure A11 report the distribution of quantitative and qualitative variables, respectively, in dimensions that were not directly used in the matching process. In these dimensions as well, both treated and control groups look similar. Table A11 shows that about three quarters of the sample are males, they earned about 35,655 euros in $t^D - 1$ when considering all their contracts, that is when taking into account that (beyond their main job) they worked in about 1.05 firms on average. Finally, we also verify that the two groups were, on average, employed in similar type of firms, as measured by the pre-layoff firm wage premium—estimated using

[24] Here, we apply the same rule as in Gathmann et al. (2020) and exclude closures where either (i) 30% of the workers of plant p in year $t^D - 1$ work in the same plant p' in year $t^D + 1$ or (ii) 70% of workers of plant p in year $t^D - 1$ work in one of the same three plants p'_1, p'_2 and p'_3 in year $t^D + 1$.

the AKM framework (see section 2.3 for more details). Here again, none of the difference in distribution seem to exceed Rubin and Imbens rule of thumb. Figure A11 finally displays the distribution of treated and control individuals by categories of sector of employment (A11a) and occupation (A11b). These two qualitative variables seem balanced across treatment status. One year before layoff, displaced and control workers mainly worked in manufacturing and extraction or the retail sectors; a large share were blue collars, clerical (called "intermediate professions" in the French classification) or employees. As compared to the LE sample, a higher share of the MLO sample is made of males who, again, earn slightly less. The average firm-premium is also slightly lower in this sample than in the LE sample. Distribution across sectors and occupations remains similar.

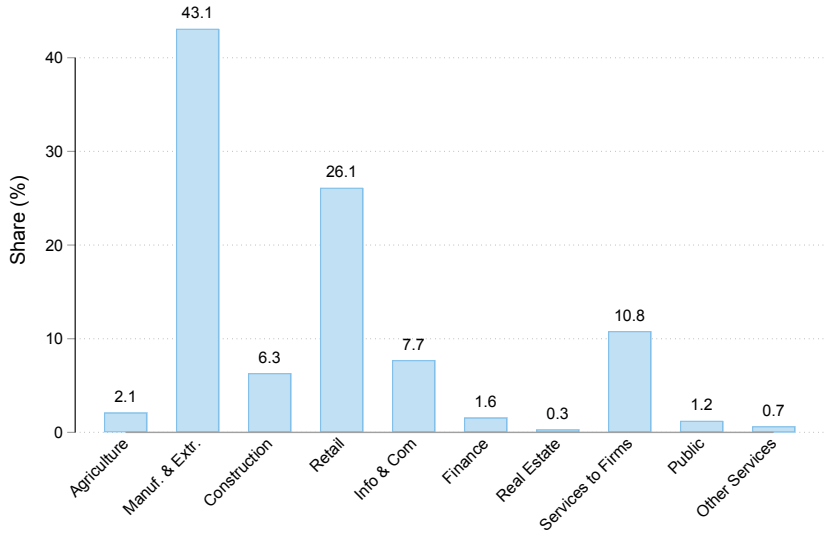
Table A10: Matching variables

	(1) MLO	(2) Control	(3) Norm. Diff.
Age	41.53	41.61	-0.01
	(9.00)	(9.42)	(0.00)
Wage rate $t_0^D - 1$	17.81	17.67	0.01
	(9.35)	(8.90)	(0.00)
age rate $t_0^D - 2$	17.69	17.46	0.02
	(9.43)	(8.94)	(0.00)
Hours worked $t_0^D - 1$	1926.81	1915.16	0.06
	(152.22)	(127.43)	(0.00)
Hours worked $t_0^D - 2$	1925.45	1913.44	0.06
	(149.50)	(137.99)	(0.00)
# employees at firm $t_0^D - 1$	768.43	557.32	0.05
	(2498.16)	(3218.58)	(0.00)
Obs	11747	11747	23494
Events	5319		

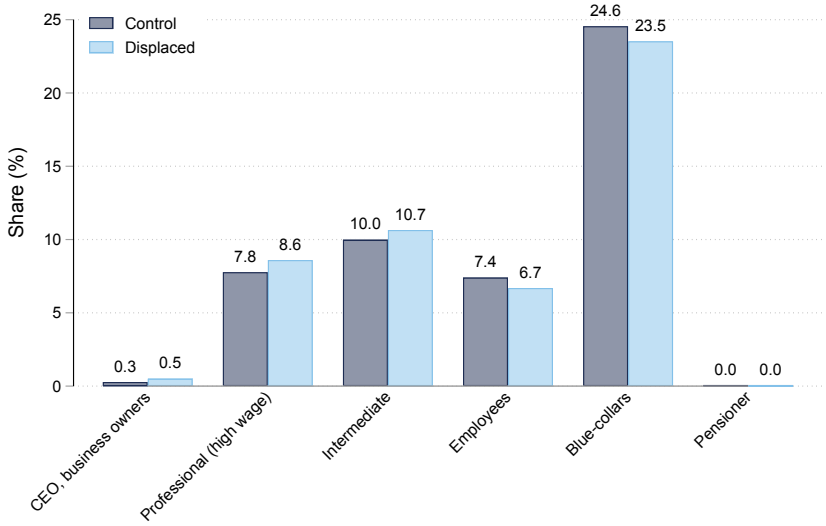
NOTES: This table presents the average of several variables for individuals displaced in mass layoff (MLO) and their matched control workers. Standard deviations are presented between brackets. The last column reports Imbens-Rubin normalized difference; a measure we use to assess balance in observables. All the variables are observed in DADS panel. Table A2 summarizes variables' definition.

Figure A11: MLO Sample, Baseline Characteristics

(a) MLO Sample: Sector



(b) MLO Sample: Occupation



NOTES: This figure presents descriptive statistics about the sample of 11,747 individuals displaced in a mass layoff (MLO) and their respective control. Data is observed at $t^D - 1$. Panel (a) is the distribution of workers across 2-digit sectors. This variable is used as matching condition so that the distribution in the two groups is similar. Panels (b) displays the distribution of workers across occupations. This variable was not used in the matching algorithm. The sample appears to be balanced across treatment and controls.

Table A11: Matched samples

	(1) MLO	(2) Control	(3) Norm. Diff.
Gender: Male	0.73	0.76	-0.05
	(0.44)	(0.43)	(0.00)
Gross earnings	35655.18	34378.15	0.04
	(24307.52)	(20629.93)	(0.00)
# of employers	1.05	1.01	0.15
	(0.25)	(0.11)	(0.00)
Firm-wage premium 01-15: $\widehat{\psi}_{J(i,t)}$	3.39	3.35	0.15
	(0.20)	(0.18)	(0.00)
Obs	11747	11747	23494
Events	5319		

NOTES: This table presents the average of several variables for individuals displaced in mass layoff (MLO) and their matched control workers. Standard deviations are presented between brackets. The last column reports Imbens-Rubin normalized difference; a measure we use to assess balance in observables. All the variables are observed in DADS panel, except for $\widehat{\psi}_{J(i,t)}$ which refers to AKM firm-fixed effects (see Section 2.3 for details on their estimations). Table A2 summarizes variables' definition.

E Negotiation

Our goal is to investigate the link between displacement and change in firm-level negotiations characteristics. In that aim, we make use of two administrative data sets that provide firm-level characteristics relative to workplace negotiations. The first data gives detailed information about collective agreements signed (or discussed) within firms. The second data measures turnout and results from workplace elections. Those two data sets provide a rare and direct insight about in-house bargaining, a potential mechanism behind the loss in firm-level premium affecting displaced workers. We first present the collective agreements data in subsection E.1 and the election data in subsection E.2. In subsection E.3 we show that the sample restrictions we make for this analysis do not affect our main conclusions. Finally, in subsection E.4 we display more detailed results, complementing the analysis presented in the main text.

E.1 Collective agreements

In order to document the number and type of collective agreements signed by firms, we use the "D@ccord" data set, produced by the Ministry of Labor research and statistics direction (DARES), and available since 2005. The French labor law requires firm-level collective agreements to be filed on a dedicated online platform. Each negotiation has to be reported, even when no agreement is reached. The D@ccord data thus contains information on the type of reported text, be it an actual firm-level collective agreement, or a report of disagreement. In addition this data provide information on the matter of the negotiations (e.g. wages, hours, layoffs, etc.), on the parties negotiating or signing the agreement, the date of signature of the agreement, and the firm identifier (SIREN), which we use to match this data with our main samples (LE or MLO).

The D@ccord data enables us to build several variables describing the type, number and subject of collective agreements signed each year in a given firm. We consider 3 main bargaining subjects: 1. agreements on wages and bonuses, 2. agreements related to earnings more generally (wages and bonuses, ranking,[25] profit-sharing and participation) and 3. agreements related to hours and working time.

We build our main measure of collective agreement as an indicator taking value 1

[25]Within a firm, a worker's ranking (*classification* in French) is used to determine the position, duties and minimum wage applicable to the employee.

if a firm has signed (at least) one agreement relative to earnings (i.e. type 1.) over the 2005-2007 period, and 0 otherwise. Importantly, we assign 0 to firm for which we do not observe any agreements (and further show that our results are robust to excluding those). Alternatively, we consider a continuous version of the outcome, summing all the observed agreements on earnings over the period (and assigning 0 to other firms). Next, we consider failed negotiations about the same topic; that is negotiations that yield no signed agreement. Finally, we also consider indicators for the signature of (at least) one agreement of each of the other types (2. or 3.) separately.

Table A12 provides simple descriptive statistics about the distribution of those outcomes in our sample of analysis. About 34.8% of firms employing individuals in our sample have signed (at least) one agreement about wages over 2005-2007. This leads to an average number of 1.5 agreements signed by those firms over the period. At the same time, 11.7% also failed to sign a wage agreement they had started to negotiate. Taking a wider definition of wages and earnings in general, the share of signing firms in our sample rises to 45%. Finally, 30.8% signed an agreements on working time and hours.

Table A12: Collective agreements outcomes, descriptive statistics

	Mean	sd	min	p75	max
Wage agreement indicator	0.349	0.477	0	1	1
# Wage agreement	1.490	3.197	0	2	20
Wage failure ind.	0.117	0.322	0	0	1
Extended wage agr. ind.	0.453	0.498	0	1	1
Hours agreement ind.	0.308	0.462	0	1	1
Observations	78741				
# Treated	6751				

NOTES: This table provides simple descriptive statistics about collective agreements outcomes. **Sample**: The sample of interest is all workers laid-off for economic reason (LE) after 2007, and their respective controls. **Outcomes**: Table A2 summarizes variables' definition. Wage agreement indicator takes value 1 if the firm has signed (at least) one agreement relative to wages, and 0 otherwise.# Wage agreement is the number of wages agreement signed by the firm. Wage failure indicator takes value 1 if the firm has failed to conclude (at least) one negotiation relative to wages. Extended wage agreement indicator takes value 1 if the firm has signed (at least) one agreement relative to earnings (wages, bonuses, ranking, participation, etc.). Hours agreement indicator takes value 1 if the firm has signed (at least) one agreement relative to hours and working time.

We use the collective agreements outcome to explore the evolution of firm-level characteristics (relative to negotiation) for displaced workers. Because the data starts in 2005 (i.e. after the first layoff we observe), one may worry about potential reverse

causality. This would be the case if firm-level negotiations happen right after a layoff and respond to it. To limit this risk as much as possible, we focus our analysis on a sub-sample of displaced workers for which we can measure firm-level negotiations strictly before the layoff. In practice, we only consider workers affected by a layoff after 2007 while, at the same time, we construct firm outcomes over the 2005-2007 period only. In subsection E.3 below, we show that this sub-sample resembles our main sample of analysis and that our main results hold true.

E.2 Workplace elections

We next observe workplace elections. Our data covers the 2009 to 2012 period and provides detailed measures on many elections (number of electors, number of voters, results by trade union, etc.). Workplace elections in France are very heterogeneous. This is because, within a common legal framework, each firm can set the exact format of its elections. Below, we briefly detail the main legal framework as well as the data we observe. In a nutshell, we use a firm-level measure of turnout at the elections as an indication of within-firm quality of negotiations.

Main legal framework In France (and over the period of interest), workers elect representatives at most every 4 years. Those representatives are elected for three distinct (but complementary) bodies:

- The DP (for "Délégué du Personnel") in firms with 11 employees or more.
- The CE (for "Comité d'Entreprise") in firms with 50 employees or more. In those firms, CE and DP elections take place at the same time. Elected representatives can be member of the two bodies at the same time.
- The DUP (for "Délégué Unique du Personnel") can be elected in firms with 50 to 299 employees. They are meant to ease the negotiation by merging the three main bodies of workers' representation (the aforementioned DP and CE, and the "CHSCT" a third committee in charge of health and safety and whose member are designated by DP or CE).

Elections in practice Within this main framework, each firm has the ability to decide about how the election is to be organized in practice. That is, prior to an election,

within-firm negotiation will decide about strata in which (sub-)elections are organized. The choices relate to:

- The body b of the election. As explained before, depending on firm size, elections may take place to elect either DP and/or CE and/or DUP.
- The year y of the election. Although every 4 years is legally binding, some firm may have to organize elections more often due to sector agreements or because a representative (and her substitute) has to be replaced in a partial elections. In our analysis, we ignore partial elections.[26]
- The level l which can be either the entire firm or its establishment separately.
- The occupation o meaning that different types of workers (e.g. blue collars, engineers, etc.) can decide to vote in distinct elections.

Importantly, each firm will decide of a stratum defined by $b \times y \times l \times o$. For instance, one firm may have only one single election for all its workers (regardless of their establishments and occupation) to elect representative in DP and CE body; whereas another firm may organize election at the establishment-level, with each establishment following its own calendar (e.g. 2009-2013 for one, 2010-2014 for another, etc.). Given the number of possible options, there is substantial heterogeneity in size and timing of elections.

Data cleaning and outcomes definition To ease the analysis, we collapse each election result at the firm times body (i.e. DP, CE, or DUP – b) level. That is, we ignore the divisions in l, o and y. Summing numbers across l and o is straightforward as those categories are exclusive (i.e. one worker belongs to one single establishment and one single occupation). We decide to ignore years y for two reasons. First because our data does not allow us to know whether different years simply reflect internal organization of the election (e.g. different establishments voting on different dates) or occurrence of main elections at less than 4 years interval. Second, over the 2009-2012 period, most firms (80%) are observed in only 1 year. To aggregate information at the firm times body level, we weight each stratum by its number of electors.

[26] Election can have more than one round, but we focus our analysis on first round only. This is because the second round only takes place when the election fails either because i) no trade union ran for the election or ii) less than 50% of electors voted. As explained below, we do take into account this type of failure.

This simplification allows us to construct three main outcomes. First, we observe the average election turnout for the observed firms over the 2009-2012 period. This outcome is the average participation across the different bodies b (i.e. between 1 and 3 distinct elections) of a given firm. We complement this main outcome with two others. The second outcome we compute is the share of workers who are covered by an election that failed;[27] where we think of election failure as an indication of a low quality of workplace negotiation. Finally, our third outcome is the share of workers who are covered by an election where a CGT representative received more than 10% of the votes;[28] where we think of CGT as indicating more conflictual negotiation. The CGT is one of the oldest (1895) and main trade union in France, traditionally seen as left-oriented (with marxist origins). A small literature also finds CGT union to be associated with higher wages (Abowd et al., 2012; Breda, 2015). This renders the meaning of the CGT outcome more complex and suggests cautious interpration.

Table A13 describes the empirical distribution of those outcomes in the firms of our sample of analysis (cf. below about the sample). The workers in our sample are employed by firms that had an average turnout of 64.3% at professional elections held over 2009-2012. On average in those firms, about 11.6% of the workers were affected by failed election. Finally, about 50% of the workers were involved in an election where a CGT candidate had received 10% or more of the votes.

Our data of workplace elections covers the end of our period of analysis (2009-2012). This timing is problematic because the majority of the layoffs we observe take place before. To limit the risk of reverse causality, we take advantage of our LE setting, where small (even individual) layoffs can be observed. In particular, we verify that our election results are robust to considering only a sub-sample of layoffs were the number of displaced workers is small, relative to the firm size. In our sample, this means considering layoffs affecting 6.7% of firms' employees or less (the lowest 25% in our sample).This robustness test addresses the risk that the relative decline in employers' average turnout result from an actual increase in previous employers' turnout (e.g. if workers vote more after a lay-off affected their colleagues) than a re-employment mechanism.

[27] An election fails if no trade union ran for the election.

[28] The 10% threshold is important as it allows a candidate to become "Délégué Syndicale" or DS – not DP –, who take part in negotiations about wages. This threshold is measured in the first round of the election.

Table A13: Elections outcomes, descriptive statistics

	Mean	sd	min	p50	max
Average turnout	0.643	0.258	0	0.725	1
Failed (% workers)	0.117	0.292	0	0.000	1
CGT (% workers)	0.497	0.382	0	0.614	1
Observations	64798				
# Treated	4187				

NOTES: This table provides simple descriptive statistics about professional election outcomes. **Sample**: The sample of interest is all workers laid-off for economic reason (LE), and their respective controls, whose firm have at least one election between 2009-2012 (observed in the data). **Outcomes**: Table A2 summarizes variables' definition. Average turnout is the worker-weighted average participation of electors in firm-specific professional elections. See details in E.2. Failed is the share of firm's workers who were electors for a (eventually) failed election (i.e. no trade union ran). CGT is the share of firm's workers who were electors in an election were a CGT representative received more than 10% of the votes.

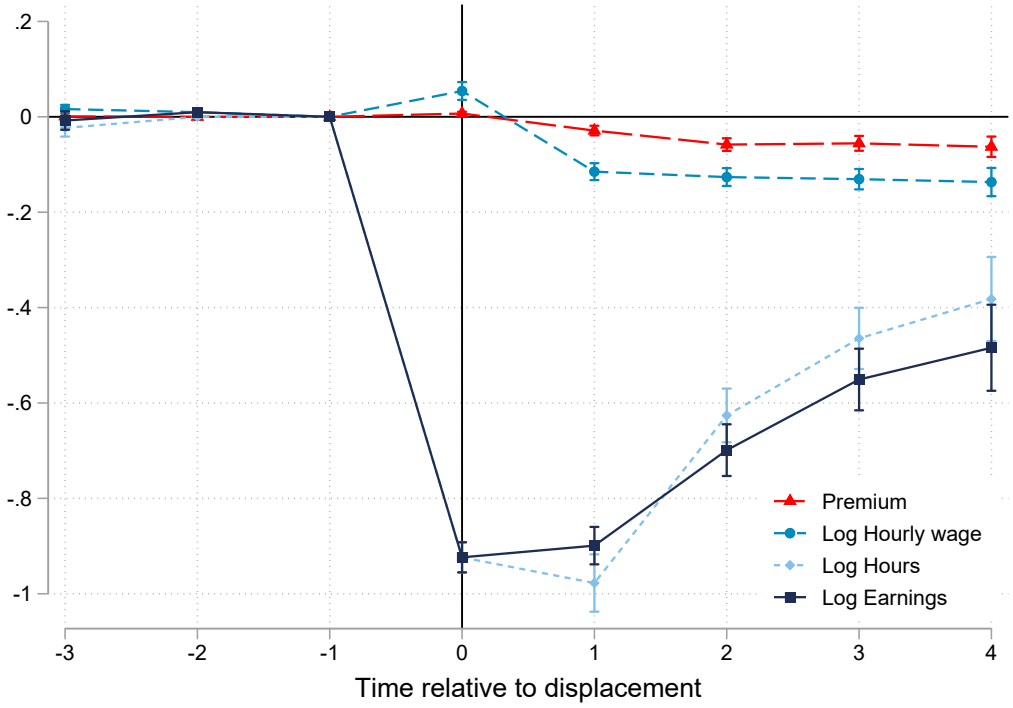
E.3 Robustness of the main results

The sample we use to perform analysis on collective agreements and elections differ from our main sample of analysis. In the case of collective agreements, this is because we consider only those workers who lost their job from 2008. In the case of electoral results, this is because we do not observe the universe of firms. Although we tried to follow transparent rules, nothing entirely prevents the selection of specific sub-samples. In this subsection, we show that these selections do not alter the sample observable characteristics too much and that our main results on labor (earnings, hours, wage rate and premium) holds across samples.

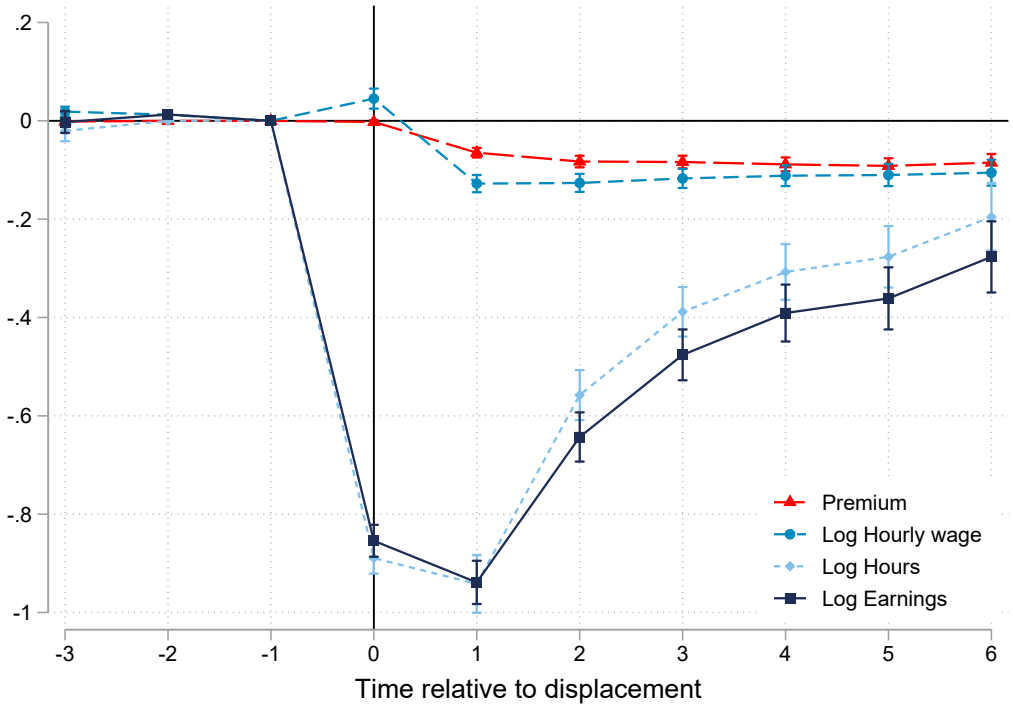
Figure A12 below reproduce Figure A3 for the two sample we use when estimating effects in accords and elections outcomes.

Figure A12: Loss in premium for accords and election samples

(a) Annual Earnings (in level)



(b) Election sample: loss in premium



NOTES: This figure reports event-study estimates of the cost of job displacement for a sample of workers dismissed for economic reasons (LE) —see equation (2) and associated text for more details on the specification. **Samples**: our data on collective agreements and professional elections require us to work on sub-samples. Panel (a) is estimated on workers that are laid-off after 2007 and we do not observe them after $t^D + 4$. Panel (b) is estimated on workers for which we obtain firm election data. **Definition of the outcomes:** Table A2 summarizes variables' definition. **Standard errors**: robust standard errors clustered at the worker-level; displayed confidence intervals at the 99% level.

E.4 Results on negotiation outcomes

Collective agreements Table A14 presents our main results on collective agreements outcomes. Destination firms were less likely to have signed any wage-related agreement over the 2005-2007 period (column (1)). By $t+4$ the average displaced worker finds himself in a firm that is 8 percentage points less likely (than his previous firm) to have signed a wage-setting agreement. One exception is $t+1$ however, where re-employed displaced workers find themselves in firms that are 0.6pp. more likely to have signed an agreement. Recall that the coefficient is estimated on re-employed individuals only, and laid-off individuals who find a job so fast are likely to be specific. Column (2) shows that a qualitatively similar finding when considering a continuous version of the same outcome (total number of agreements) instead of the indicator. Destinations firms are about 39pp. less likely than origin firms to have signed a wage-related agreement. Interestingly, column (3) shows that destination firms are also relatively more likely to fail to sign agreements. This result suggest that the difference between origin and destination firms is not merely quantitative but also has a qualitative component to it. Column (4) considers a broader definition of pay-related agreements and find a similar loss. Finally column (5) reports result for having at least one agreement related to working time (indicator). Although the loss also appears in that case, we also find an unexpected rise in this aspect in $t+1$ and $t+2$. Here again, this could be explained by a composition effect whereby the first people to be re-employed differ from the others. However the effect is somewhat small, and the pattern is absent in the MLO sample.

Firm size positively correlates with collective agreements. One could therefore fear that the main results on collective agreements only reflect the change in employer's size we found. Of course, if this was the case, the role of negotiation would still be meaningful in its own right. However, showing that the loss in negotiation holds even when controlling for employers' size is a stronger result as it suggest that size and negotiation have different (complementary) effects. In Table A15 we show that controlling for (log) size (column (2)) only increases the loss in employers' probability to have had an agreement signed. Further, in column (3) we also include fixed effects for four size categories (from 0 to 10, from 11 to 49, from 50 to 299 and above 299 employees) defined so as to follow legally relevant threshold (e.g. "DP" being elected above 10 employees; "CE" being required above 50, etc.). The results remain virtually the same.

Elections Table A16 presents our main results on elections outcomes. We observe that destination firms had lower average turnout over the 2009-2012 elections round (column (1)). By $t+5$, the displaced workers' new employer has a 14pp. lower turnout (relative to previous employer). Beyond turnout, we also find that hiring firms are also relatively more likely to have failed elections on the one hand (column (2)) or CGT candidates succeeding at the 10% threshold (column (3)). All three outcomes indicate that the hiring firm face more complicated in-house negotiations. In Table A17 we further show that the result on the turnout outcome remains true when assigning 0 to turnout to firms with missing information; when controlling for (log) size; or when considering a sub-sample of lay-offs that were small relative to the firm size. In all cases, the qualitative result holds; confirming that displaced individuals join firms with relatively lower turnout at workplace elections. The last result (column (4) of Table A17) also suggest that the observed turnout is not driven by an endogenous reply to lay-off (in former employers' turnout).

Table A14: Agreements results

	(1)	(2)	(3)	(4)	(5)
	Wage agree. ind.	# Wage agree.	Wage fail. ind.	Ext. wage a. ind.	Hours agree. ind.
$d = -3$	0.004	0.028	0.001	0.005	0.004
	(0.002)	(0.008)	(0.001)	(0.002)	(0.001)
$d = -2$	0.001	0.003	0.001	0.001	0.001
	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)
$d = -1$	REF	REF	REF	REF	REF
$d = 0$	0.006	-0.028	0.005	0.004	0.033
	(0.003)	(0.015)	(0.002)	(0.004)	(0.003)
$d = 1$	-0.098	-0.949	-0.021	-0.106	0.030
	(0.009)	(0.052)	(0.007)	(0.010)	(0.009)
$d = 2$	-0.094	-0.609	0.017	-0.078	-0.092
	(0.010)	(0.056)	(0.008)	(0.011)	(0.010)
$d = 3$	-0.084	-0.534	0.024	-0.061	-0.100
	(0.011)	(0.063)	(0.009)	(0.012)	(0.011)
$d = 4$	-0.080	-0.386	0.021	-0.052	-0.082
	(0.016)	(0.093)	(0.012)	(0.017)	(0.015)
Individuals	13509	13509	13509	13509	13509
# Treated	6751	6751	6751	6751	6751

NOTES: This table presents event-study estimates of the reallocation of workers displaced for economic reason (LE) across firms with different approach to collective agreement —see equation (2) and associated text for more details on the specification. **Comment on timing**: Firm-level outcomes are computed over the 2005-2007 period. To limit the risk of reverse causality we restrict our sample to individuals displaced after 2007. We thus do not observe individuals after $t^D + 4$. Accordingly, event-study coefficients reflect the movement of displaced workers to firms with different initial characteristics and *not* changes within-firm in such characteristics. **Outcomes**: Table A2 summarizes variables' definition. Wage agreement indicator is an indicator taking value 1 if the firm has signed (at least) one agreement relative to wages over the period. # Wage agreement is the number of wages agreement signed by the firm. Wage failure is an indicator taking value 1 if the firm has failed to conclude (at least) one negotiation relative to wages. Extended wage agreement indicator and Hours agreement indicator take value 1 if the firm as singed an agreement relative to earnings in general (wages but also bonuses, etc.) and hours or working time, respectively. Details about those outcomes are given in E.1. **Standard errors**: robust standard errors clustered at the worker-level.

Table A15: Agreements robustness

	(1)	(2)	(3)	(4)
	Wage agreement ind.	Wage agreement ind.	Wage agreement ind.	Wage agreement ind.
$d = -3$	0.004	-0.010	-0.010	0.001
	(0.002)	(0.001)	(0.002)	(0.002)
$d = -2$	0.001	-0.009	-0.009	0.000
	(0.000)	(0.001)	(0.001)	(0.000)
$d = -1$	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)
$d = 0$	0.006	0.023	0.019	-0.028
	(0.003)	(0.003)	(0.003)	(0.004)
$d = 1$	-0.098	-0.112	-0.114	-0.220
	(0.009)	(0.009)	(0.008)	(0.013)
$d = 2$	-0.094	-0.113	-0.114	-0.191
	(0.010)	(0.009)	(0.009)	(0.017)
$d = 3$	-0.084	-0.103	-0.103	-0.178
	(0.011)	(0.010)	(0.010)	(0.019)
$d = 4$	-0.080	-0.104	-0.104	-0.202
	(0.016)	(0.014)	(0.013)	(0.026)
lnsize		0.091	0.063	
		(0.002)	(0.003)	
Individuals	13509	13457	13457	8427
# Treated	6751	6723	6723	4032
Legal size bins (4)			✓	

NOTES: This table presents event-study estimates of the reallocation of workers displaced for economic reason (LE) across firms with different approach to collective agreement —see equation (2) and associated text for more details on the specification. **Comment on timing**: Firm-level outcomes are computed over the 2005-2007 period. To limit the risk of reverse causality we restrict our sample to individuals displaced after 2007. We thus do not observe individuals after $t^D + 4$. Accordingly, event-study coefficients reflect the movement of displaced workers to firms with different initial characteristics and *not* changes within-firm in such characteristics. **Specification**: Column (1) replicates the first column of Table A14. Column (2) adds a control for the logarithm of employers' number of employee to our main equation. Column (3) further adds a fixed effect for four size categories (from 0 to 10, from 11 to 49, from 50 to 299 and above 299 employees). Finally column (4) transforms the outcome of interest by ignoring those firms that are never observed in the agreement database. **Outcomes**: Table A2 summarizes variables' definition. Wage agreement indicator is an indicator taking value 1 if the firm has signed (at least) one agreement relative to wages over the period. Details are given in E.1. **Standard errors**: robust standard errors clustered at the worker-level.

Table A16: Election results

	(1) Average turnout	(2) Failed (% workers)	(3) CGT (% workers)
$d = -3$	-0.000	-0.001	0.001
	(0.001)	(0.001)	(0.001)
$d = -2$	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)
$d = -1$	REF	REF	REF
$d = 0$	-0.012	0.000	0.006
	(0.002)	(0.001)	(0.002)
$d = 1$	-0.207	0.021	0.075
	(0.011)	(0.011)	(0.015)
$d = 2$	-0.188	0.024	0.059
	(0.011)	(0.012)	(0.016)
$d = 3$	-0.171	0.024	0.046
	(0.012)	(0.012)	(0.016)
$d = 4$	-0.149	0.023	0.033
	(0.012)	(0.012)	(0.017)
$d = 5$	-0.143	0.028	0.029
	(0.013)	(0.013)	(0.018)
$d = 6$	-0.140	0.035	0.020
	(0.014)	(0.014)	(0.019)
Individuals	9503	9503	9503
# Treated	4187	4187	4187

NOTES: This table presents event-study estimates of the reallocation of workers displaced for economic reason (LE) across firms with different professional election turnout —see equation (2) and associated text for more details on the specification. **Comment on timing**: Firm-level outcomes are computed over the 2009-2012 period. Because of a risk of reverse causality, we perform robustness checks in Table A17. Because we fix firm-characteristics over time, event-study coefficients reflect the movement of displaced workers to firms with different initial characteristics and *not* changes within-firm in such characteristics. **Outcomes**: Table A2 summarizes variables' definition. Average turnout is at elections held by the firm between 2009-2012 (worker-weighted). Failed is share of workers covered by a failed election. CGT is the share of workers covered by a (potential) CGT DS representative. Details are given in E.2. **Standard errors**: robust standard errors clustered at the worker-level.

Table A17: Election robustness

	(1)	(2)	(3)	(4)
	Average turnout	Average turnout (missing to 0)	Average turnout	Average turnout
$d = -3$	-0.000	0.005	-0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.002)
$d = -2$	-0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
$d = -1$	REF	REF	REF	REF
$d = 0$	-0.012	0.003	-0.012	-0.009
	(0.002)	(0.001)	(0.002)	(0.002)
$d = 1$	-0.207	-0.122	-0.209	-0.179
	(0.011)	(0.004)	(0.011)	(0.016)
$d = 2$	-0.188	-0.056	-0.189	-0.158
	(0.011)	(0.005)	(0.011)	(0.016)
$d = 3$	-0.171	-0.034	-0.172	-0.130
	(0.012)	(0.005)	(0.012)	(0.017)
$d = 4$	-0.149	-0.016	-0.150	-0.105
	(0.012)	(0.006)	(0.012)	(0.018)
$d = 5$	-0.143	-0.018	-0.145	-0.096
	(0.013)	(0.006)	(0.013)	(0.018)
$d = 6$	-0.140	-0.014	-0.142	-0.103
	(0.014)	(0.007)	(0.014)	(0.020)
lnsize			0.002	
			(0.003)	
Individuals	9503	25273	9489	3940
# Treated	4187	12609	4187	1838

NOTES: This table presents event-study estimates of the reallocation of workers displaced for economic reason (LE) across firms with different professional election turnout —see equation (2) and associated text for more details on the specification. **Comment on timing**: Firm-level outcomes are computed over the 2009-2012 period. We perform robustness check in this table. Because we fix firm-characteristics over time, event-study coefficients reflect the movement of displaced workers to firms with different initial characteristics and *not* changes within-firm in such characteristics. **Outcomes**: Table A2 summarizes variables' definition. Average turnout is at elections held by the firm between 2009-2012 (worker-weighted). Failed is share of workers covered by a failed election. CGT is the share of workers covered by a (potential) CGT DS representative. Details are given in E.2. **Specifications**: Column (1) replicates the first column of Table A16. Column (2) considers the same outcome but infering a 0 turnout for firms with missing information. Column (3) replicates column (1) but controling for firm size. Finally, column (4) estimates the effect on a sub-sample made of the quarter of laid-off workers that were part of the smallest layoff (in number of laid-off individuals). **Standard errors**: robust standard errors clustered at the worker-level.