Private Equity and Pay Gaps Inside the Firm *

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PRELIMINARY DRAFT

Abstract

Exploiting a 20-year sample of leveraged buyouts matched to French administrative data, we document that, relative to a control group of firms, target firms experience after the buyout a reduction in pay gaps together with an increase in profitability. The wage difference between men and women reduces by 6.5%, that between managers and non-managers by 3.3% and that between senior (above 50 years old) and younger workers by 18.1%, relative to their respective means. Composition effects drive these results. Post-buyout, target firms separate from expensive employees in the high-pay categories (men, managers, older employees) and replace them with cheaper employees. At the same time, men, managers and young employees who stay at the firm experience small pay increases. Together, the results are consistent with the notion that, in seeking to improve target firms' efficiency, private equity investors reduce wage inequalities inside target firms by cutting highly-paid employees' rents and fostering their separation from the firm.

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1 Introduction

Between 2012 and 2019, private equity funds invested nearly five trillion dollars in firms worldwide. Private equity buyouts are generally associated with substantial improvements in operational efficiency and intense labor reallocation at target firms (Davis et al., 2014). A number of recent studies examine the net effect of these intense reallocations on employee outcomes (Morris and Phalippou, 2020), focusing for example on employment counts at target firms (Boucly et al., 2011, Antoni et al., 2019), on the medium-term earnings of employees affected by the deal (Antoni et al., 2019), on the career paths of these employees (Agrawal and Tambe, 2016), or on changes in work injuries (Cohn, Nestoriak and Wardlaw, 2020).

Yet, the debate about the labor effects of private equity buyouts has so far dedicated little attention to the interplay between the efficiency-increasing labor reallocations at target firms and possible changes to the wage distribution inside these firms. This is surprising because an active body of research in labor economics documents the role of firms for understanding pay inequalities (Card et al., 2016). In fostering target firms' efficiency, private equity investors, typically owning a controlling stake in the companies they invest in, may affect pay differences either by adjusting the earnings of individual workers or by changing the composition of workers at the firm. As private equity remains a pervasive – and controversial – form of corporate ownership and as within-firm pay inequality has become a salient labor outcome closely tracked by policymakers and increasingly studied by academics (Mueller et al., 2017; Song et al., 2018), understanding the role that private equity buyouts play in within-firm inequalities calls for thorough empirical evidence.

In this paper, we exploit matched employee-employer administrative data on the universe of French firms and employees to examine the evolution of pay differences between men and women, managers and non-managers, young and older employees at target firms around private equity buyouts. Beyond the availability of detailed data, France presents several advantages for such a study. First, as Boucly et al. (2011) document, France is a country with many family-managed businesses that have substantial scope

for buyout restructuring. Second, the French labor market is notoriously rigid and labor reallocations particularly difficult, which raises the bar for finding evidence of any reallocation effect. At the same time, average pay gaps between categories of employees in France are in line with those in other major developed countries. For example, between 2000 and 2016 (the most recent data available), the OECD estimate of the gender pay gap at the median of the wage distribution was 13.8 in France against an OECD average of 14.5.[1] Finally, previous research documents that French buyouts are not associated with net employment losses (Boucly et al., 2011), which allows us to study the evolution of firm inequalities when firms are not downsizing.

We find that, relative to a control group of firms, target firms after the buyouts experience increased profitability, increased employment and a reduction in pay gaps. Employment increases by 3.5%, relative to a mean of 200 employees, the gender pay gap declines by 6.5%, relative to an average gender gap in hourly wage of 20%, while the difference in pay between managers and non-managers decreases by 3.3% and that between young employees and those above 50 years old by 18.1% relative to their respective mean. These declines materialize one year after the buyout closing and remain significant three years after the deal closing. The decline in each pay gap is also robust to controlling for changes in the other two pay gaps, suggesting that the three results do not merely reflect overlapping sources of variation.

Next, we examine the drivers of these reductions in pay gaps. At the firm-level we find that the declines in pay gaps are entirely driven by post-buyout reductions in the average wages of employees in the "high-pay" categories, that is men, managers and older employees. Relative to control firms, average wages at target firms for these employees decline by 2.2%, 5.0% and 5.7%. In contrast, the average wages of women, non-managers and young employees are little affected by the buyout.

The reduction in firm average pay gaps could be the result of a greater decline in the wages of employees in high-pay (vs. low-pay) categories among employees staying at the

[1] https://stats.oecd.org

target firm after the buyout, or by changes in the composition of employees within these categories. To disentangle these explanations, we leverage data on a random sample of French employees that we can track over time. We find little support for the idea that a reduction in the wages of staying men and managers explain the reductions in firm-level gender and occupation pay gaps that we find. In fact, men and managers staying at the target firm experience small pay *increases* of 1.5% and 2.8% after the buyout, relative to control firms. The reduction in age pay gap is partly driven by an increase in the wages of staying young employees (1.7%) and the stagnation of the wages of old employees.

Turning to possible composition effects, we find particularly high separation likelihoods for men, managers, and old employees at buyout firms relative to the control group, in the year of the buyout and the three following years. To better understand how these separations affect pay gaps, we then compare the pre-buyout wages of employees who end up leaving the target firm (whom we will call leavers), to those who end up staying (whom we will call stayers). We find that the men, managers and old employees who end up being the leavers are significantly more expensive than stayers. In the year before the buyout, men, managers and old leavers are paid 8.7%, 6.9% and 16.8% more than stayers. In contrast, leaving women and young employees are not paid significantly differently than staying women and young employees, and leaving non-managers are paid 6.7% *less* than staying non-managers. In addition, expensive employees in the high-pay categories are replaced with cheaper employees. Newly hired men and managers are on average paid 13% and 12% less than previous employees in these categories (i.e., both leavers and stayers). Finally, firms hire few old employees to replace those who separated from the firm, and, relative to control firms, the share of old employees at target firms after the buyout declines by 6% from the pre-buyout mean.

Together, these results are consistent with the notion that, in seeking to improve target firms' efficiency, private equity investors reduce pay inequalities inside target firms by cutting highly-paid employees' rents and fostering their separation from the firm.

This paper contributes to the literature on the impact of private equity buyouts on firm

and employee outcomes. As an increasingly prevalent form of ownership, private equity has attracted intense academic and media debate. It is well documented that private equity buyouts tend to increase the efficiency and profitability of target firms (Kaplan, 1989 ; Guo et al., 2011 ; Boucly et al., 2011 ; Cohn, Hotchkiss and Towery, 2020), and our results are consistent with these findings. Recent research has also examined the consequences of private equity buyouts for target firms' employees. At the firm and establishment levels, Davis et al. (2014) show that buyouts are associated with substantial increases in both hiring and firm-employee separations. Olsson and Tåg (2017) also focus on separations, and document that private equity buyouts accelerate offshoring and job polarization, as measured by unemployment incidence and employee shares across categories. Agrawal and Tambe (2016) and Antoni et al. (2019) examine how different types of individual workers affected by a buyout fare in the medium-term, often after these workers left the buyout target. Agrawal and Tambe (2016) report particularly positive effects on workers exposed to information technology, while Antoni et al. (2019) document particularly adverse effects on older employees. In contrast to these studies, we study the effect of buyouts on changes to the within-firm distribution of income. We show that buyouts materially affect within-firm income inequality, an outcome of increased interest to policymakers (Mueller et al., 2017) that contributes to wider income inequality in the economy (Song et al., 2018). Overall, our study offers uniquely granular evidence on pay gaps for private equity controlled firms, indicating the possibility that private equity can improve efficiency and simultaneously reduce income inequality.

2 Data and Empirical Strategy

2.1 Data Sources

We obtain information on leverage buyouts on French target firms between 1997 and 2014 from Capital IQ.[2] To extract these transactions from the database, we apply the same selection criteria as Davis et al. (2014). We select deals featured as "going private", "leveraged buyout", "management buyout" or "platform", and for which the buyer is an investment firm. As Davis et al. (2014) note, this approach excludes growth investments of minority stakes with little or no leverage.

Capital IQ does not provide national firm identifiers. We thus hand-match buyout targets to the French corporate registry by name and address. We then use firms' national identifier (called SIREN) to link target firms to the tax and labor files described below. We find at least one suitable SIREN with a non-zero number of employees, financial information and sales over 1 million euros for 66% of the raw transactions, which is comparable to the match rates obtained by Davis et al. (2014) in US data. When a buyout occurs in a holding company, we treat, in our firm analyses, the operating subsidiaries as the target firms.[3] For each firm, we record the year of the first private equity transaction that we observe as the buyout year.

Information on firms and their employees comes from INSEE, France's national statistics bureau. Firm financial information are from the tax files (called FICUS until 2007 and FARE from 2008), as in, for example, the study of Garicano et al. (2016). We merge these data with matched employer-employee registers (DADS Postes data). These data give us information at the firm level on each job (earnings, number of days of work, number of hours, type of contract, gender, age and occupation of the worker). We define "old" em-

[2]The sample period is driven by data availability. Consistent administrative firm and employee data are available from 1994 to 2017, and we study outcomes from three years before to three years after a buyout.

[3]We can identify holding companies by their industry code, their name, and their small number of employees. To ensure that we capture the main operating entities, we exclude the 71 buyouts for which we identify more than three subsidiaries recorded under the target name at the target's address. As we show in the appendix, the results are little affected by removing this restriction.

ployees as those over 50 years old and the managers as workers with occupation codes starting with either "23" and "3" (*"chefs d'entreprises", "cadres et professions intellectuelles supérieures"*). FICUS/FARE and DADS Postes data cover the universe of firms every year.

We complement these firm-level datasets with the DADS Panel which allows us to follow a subset of workers from 1994 to 2017. It provides information on the firm in which they are employed as well as their earnings and other administrative data on their employment. The sampling rate is 1/24th of the total population until 2001, and 1/12th afterwards.

To take account of the fact that different categories of employees work different hours, we base our outcomes variables on the hourly wage (computed as gross earnings over number of hours worked), but our results are robust to using gross earnings. As standard in wage gap analyses, we calculate the (relative) wage gap between two categories of employees as the average wage of employees in the high-pay minus that of the low-pay category, divided by the average wage of employees in the high-pay category.[4]

2.2 Forming the Control Group

Our main empirical strategy compares outcomes at target firms from three years before a buyout to three years after, relative to a set of matched control firms. We restrict the analysis to firms with more than 1 million euros in sales and at least 1 employee in each of the categories we study (male, female, managers, non-managers, old, and young). We then sort target firms into cells defined by the cross-product of the following characteristics: 2-digit industry, industry-specific terciles of size, profitability, employment growth and gender pay gap. For each target firm, we take as control firms the firms not bought by a private equity investor and that fall into the same cell than the target in the year preceding the buyout. We focus the analysis on treated firms that exist in the three years

[4]For example, the gender pay gap is calculated as $(\text{Wage}_{men} - \text{Wage}_{women})/\text{Wage}_{men}$.

before and after the transaction year and impose the same requirement on control firms.[5] To quantitatively associate each treated firm to a given control firm, we weight, in our regressions, each control firm by the number of treated firms in the matching cell divided by the number of control firms in the cell.

We adopt a similar approach in our employee-level analyses based on the DADS Panel. We identify individuals working at a private equity target one year before a buy-out, and match them to control individuals of the same gender, in the same 5-year age bracket, hourly wage bracket (10 brackets), 2-digit occupation code (36 categories), full-time/part-time status, and who are working at a firm in the same 2-digit industry and in the same size category (3 categories). We focus on individuals aged between 20 and 70 and exclude individuals that work at more than 4 jobs in a given year. In instances where an individual works in more than one job in a given year, we aggregate their earnings and hours at the firm level, and keep the record with the highest earnings in the year. To associate each treated employee to a given control employee and ensure that large firms are not over-represented in the analysis, we weight each treated employee by $1/N$, and each control employee by $n_t/(n_c \times N)$ where n_t is the number of treated employees in the matching cell, n_c is the number of control employees in the matching cell, and N the number of employees at the firm.

The final main sample contains 843 target firms. Figure 1 plots the number of target firms in the sample in each year. Consistent with aggregate worldwide buyout activity, the number of deals in the sample increases between 2004 and 2008, and stabilizes at the 2005-06 level after 2009.

[Figure 1 here]

Table 1 presents summary statistics for the characteristics of sample firms. We report the means of characteristics for target firms and their matched control firms. The means of sales, leverage, return on assets (RoA) and employment growth are remarkably similar

[5] Studying the balanced sample of firms increases the precision of some estimates but does not qualitatively affect of our results. We present the main results from the unbalanced sample in the appendix Table A.1.

across buyout and control firms, as are wages, wage gaps, earnings, and earnings gaps across all employee categories. The distribution of employees across the categories (men, managers, old) is also very similar between target firms and control firms. Target firms tend to be somewhat larger than control firms in terms of total employment, but, as shown in Figure 2 panel (c), the two groups of firms follow similar trends in employment before the buyout, which is what matter for the validity our empirical methodology. At the employee-level, our panel of individuals contains 14,403 employees working at a target firm in the year before a buyout. As shown in Table 2, 63% are men, 39% managers, and 17% aged over 50. The observable characteristics of individuals are again very similar across target and control groups.

[Tables 1 and 2 here]

2.3 Empirical Strategy

Our main empirical analysis uses a difference-in-differences approach to compare outcomes in the years around a buyout at target units (firms or employees) relative their control group. Specifically, we estimate the following regression:

$$Y_{it} = \beta(LBO_i \times Post_t) + \eta_t + \alpha_i + \epsilon_{it} \tag{1}$$

where i indexes a firm or an employee and t indexes time in event-years. Y_{it} represents the firm or employee outcomes that we study (e.g., a firm pay gap or an employee's wage). LBO is a dummy variable that equals one if unit i is affected by a leveraged buyout. $Post$ is a dummy variable that equals one for the years after the buyout. α_i are firm or employee fixed effects that control for time-invariant characteristics, and η_t are the event-time fixed effects. The coefficient of interest is β, the difference-in-differences estimator. Since the events that we study occur at the firm level, we cluster standard errors at that level in both the firm and the employee analyses.

We also examine the dynamics of the outcomes we study, paying particular attention

to potential trends before the event. We do this by estimating the following event-study specification:

$$Y_{it} = \sum_{k=-3}^{3} \beta_k D_{it}^k \times LBO_i + \sum_{k=-3}^{3} \gamma_k D_{it}^k + \alpha_i + \epsilon_{it} \tag{2}$$

In our dynamic analyses, we then collect and plot the β_k coefficients. D^k are dummy variables indicating that unit i underwent a buyout (or placebo buyout if it is a control) k periods ago. We take the year preceding the buyout as benchmark year and omit the associated dummy variable in the regression ($D^{-1} = 0$). Thus, the β_k coefficients estimate the difference in outcome between buyout and control units, in event-year k, relative to the year before the buyout.

3 Results

3.1 Firm Leverage, Profitability and Employment Growth

We start by examining the effect of the buyouts on target firms' leverage, growth, and profitability. Table 3 reports the results from estimating equation 1 on these outcomes.

We first validate our empirical setting by examining firms' financial leverage, as we expect leveraged buyouts to ease targets' access to debt financing (Boucly et al., 2011).[6] The coefficient in column 1 is significant and suggests that, relative to control firms, target firms' leverage ratio increases in the three years after after the transaction. This increase in debt financing is economically meaningful as it represents a 13% (18%) increase from the average (median) treated firm leverage before the transaction.

The buyouts in this sample are also associated with improvements in firms' operational profitability. The estimate in column 2 indicates that, on average, target firms' re-

[6] Boucly et al. (2011) note that the debt raised for the LBO itself is typically borne by a holding company and therefore does not appear in the unconsolidated accounts on which the tax files are based. Thus, the leverage ratio that we calculate indicates the target firm's ability to raise debt beyond what has been raised by the private equity firm to finance the LBO.

turn on assets increases significantly by 3.4 percentage points after the transaction, which represents a 16% increase relative to the median. This finding is consistent with the previously documented efficiency focus of private equity investors, and with their ability at restructuring firms. In column 3, we turn to firm growth and examine the evolution of target firms' employment count. We find a 3.6% post-LBO net increase in employment.

[Table 3 and Figure 2 here]

Figure 2 displays the year-by-year effects for these outcomes, estimated from equation 2. For the three outcomes the coefficients on the years before the buyout are generally close to zero and insignificant, suggesting that the parallel trend assumption on which our estimation strategy is based is likely met. Leverage starts increasing the year after the buyout and continues to increase steadily in the following two years. Three years after the deal, target firms' leverage is approximately 3 percentage points higher than control firms'. The increase in RoA starts in the year of the buyout and stays at that level in the following years, indicating that most of the operational reallocation is implemented rapidly after the deal closing. Employment starts expanding significantly two years after the deal closing.

Overall, the buyouts are associated with measurable increases in debt financing, operating profitability, and employment. The patterns are consistent with those documented by Boucly et al. (2011) in their earlier sample of French transactions, though the magnitudes here are generally smaller than those reported in the earlier sample. Importantly for the context of the pay gap analyses that follow, the results of Table 3 indicate that the buyouts and their associated operational changes are not associated with firm downsizing or net mass layoffs.

3.2 Average Pay Gaps Inside the Firm after a Buyout

In this section, we present our main results that examine the evolution of pay gaps at target firms around a buyout for several employee categories. We focus on gender, oc-

cupation and age pay gaps, as men, managers, older employees fall in categories of employees that are better positioned for extracting high wages relative to their women, non-managers and young employees counterparts.

Table 4 presents these results. For the three types of pay gap that we study (gender, occupation, and age), we first present the estimates of wage regressions for the two relevant employee categories (e.g., men and women). These regressions separately assess the evolution of the average wage of employees in that category at target firms relative to control firms. Then, we estimate a wage gap regression with the relative wage gap between the two preceding categories as dependent variable (e.g., the relative gender wage gap).

Starting with gender, the estimate in column 1 indicates the average wage for men at a target firm declines by a statistically significant 2.2% after a buyout, relative to the average men wage at control firms. In contrast, the estimate in column 2, suggests that the average wage for women at target firms stays broadly unchanged. The -0.1% point estimate is small in magnitude and statistically insignificant at conventional levels. In column 3, we find that the average relative pay gap between men and women declines by 1.3 percentage points, which represents a 6.5% reduction relative to the mean.

We find similar results for the occupation and age pay gaps. Columns 4 and 7 indicate that the average wage for managers and old employees decline by 5% and 6% after the buyout, while, columns 5 and 8 show that the wage of their non-managers and young counterparts is little affected. The point estimate for the wage of non-managers and young employees is small (-0.3%) and statistically insignificant. In terms of wage gaps, relative to control firms, target firms' occupation and age pay gaps decline respectively by 1.8 and 3.8 percentage points, i.e. a 3.3% and 18.1% decline relative to the mean.

[Table 4 and Figure 3 here]

Figure 3 illustrates these results and plots the year-by-year coefficients in event-time for the wage regressions for the 6 employee categories that we study. Sub-figures (a), (c) and (e) in the first column display the event study coefficients for the high-pay categories

(men, managers, old employees). In the years before the buyout, these difference-in-differences estimates are all insignificant and almost exactly zero. Then, starting the year after the buyout, they exhibit a sharp decline that reaches about 6 percentage points for managers and old employees and 2.5 percentage points for men. In contrast, sub-figures (b), (d), and (f) in the second column plot the coefficients for the low-pay categories (women, non-managers, young employees). There, the small and statistically insignificant coefficients oscillate around zero throughout the plots.

The three pay gaps that we study are positively correlated. To assess each pay gap independently of the other two, in Table 5, we re-estimate each pay gap regression while controlling for contemporaneous changes in the other two pay gaps. Including these controls tend to slightly reduce the point estimates (to 0.9, 1.4 and 3.3 percentage points) but they all remain statistically significant at the 1% level, suggesting that the significant declines in these three pay gaps mostly capture non-overlapping sources of variation.

[Table 5 here]

These results point to measurable reductions in pay gaps at target firms after a buyout. The reductions in pay gaps could reflect the implementation of broad individual pay cuts affecting employees in high-pay categories, or substantial labor reallocation and changes in employee composition in these categories.

3.3 What Drives the Reduction in Pay Gaps? Employee-Level Analyses

In this section, we analyze the drivers of the post-buyout reductions in firm-level pay gaps. To do so, we take advantage of the DADS Panel, which contains information of a random sample of employees tracked over time.

3.3.1 Stayers' Earnings

We start by analyzing the wages of employees who stay employed at the firm in the three years after the buyout. If across-the-board pay cuts for existing employees drive

the reduction in the average wages of men, managers and old employees at target firms, we would expect to find, at the individual level, particularly large wage reductions for individuals in these employee categories.

Table 6 presents the results of wage regressions that track the individuals staying employed at the firm from three years before a transaction to three years after. Starting with gender, the results in column 1 indicate that men staying at the firm experience a small but statistically significant wage *increase* of 1.5% after a buyout. In column 2, we find a comparable though smaller and more imprecise effect for staying women, with a wage increase of 1.1% (statistically insignificant at the 10% level). These results suggest that the reduction in the gender pay gap at target firms is likely not due to the adjustment of staying men and women wages. Similarly, the reduction in the occupation pay gap is not driven by widespread reduction of the wages of managers staying at the target firm. The estimate in column 3 suggests that these managers also experience a 2.8% pay *increase* relative to comparable managers in the control group. The wage of staying non-managers is weakly affected by the buyout: we find a small 0.6% increase in wage in column 4. If anything, these pay trajectories alone would increase the occupational pay gap after the buyout.

In sum, while the firm-level results of Table 4 display clear declines in the average wages of men and managers, we do not find corroborating evidence at the individual level. At the individual level, men and managers staying at the firm tend to experience small pay increases.

Moving to the age pay gap, in columns 5 and 6 we do find evidence of an adjustment of stayers' wages that is in line with a reduction in the age pay gap. While the wage of staying old employees is little affected by the buyout (the point estimate in column 5 is about 0), young employee wages increase, on average, by a statistically significant 1.7% relative to the control group.

Overall, while a wage increase for staying young employees relative to older ones partly explain the post-buyout reduction in age pay gap at target firms, stayers' wage

trajectories cannot explain the reduction in gender and occupation pay gaps. Next, we examine composition effects and the reallocation of labor within the different categories of employees.

[Table 6 here]

3.3.2 Firm-Employee Separations

Table 7 displays the results of cross-sectional regressions comparing the probability that individuals employed at the target firm in the year before the buyout leave the firm in the year of the transaction or in the following three years, relative to their control group.

Across gender, occupation and age groupings, employees in high-pay categories display a particularly high probability, relative to their control group, of separating from the firm after the buyout. The estimate in column 1 indicates that men at target firms are 5.7 percentage points more likely than their control group to separate from the firm after the transaction, which represents a 15.3% increase from the mean separation rate for men. For women the effect is a 4.1 percentage point higher likelihood (column 2), a 9.6% increase from the mean. Managers and old employees at target firms are 7.9 and 10.5 percentage points more likely than the control group to separate from the firm after the transaction (columns 3 and 5), while non-managers and young employees are only 3.0 and 4.0 percentage points more likely to separate. These reflect a 20.4% and 28.0% increase in separation rate from the mean for managers and old employees, against an 7.6% and 10.1% increase for non-managers and young employees.

Thus, overall, separations at target firms predominantly affect the high-pay categories of employees. To understand how these labor reallocations affect the pay gaps, we next examine the wages of employees that leave and join the firm after the buyout.

[Table 7 here]

3.3.3 Leavers' and Joiners' Earnings

Table 8 compares one year before the buyout, the wage of employees who will leave the target firm after the buyout to those who will stay at the firm. We find that, one year before the transaction, target firm leavers in high-pay categories (men, managers, old employees) are on average paid significantly more than the target firm's stayers in the same category. In the year before the buyout, men, managers and old employees that will separate from the firm are, on average, paid 8.7%, 6.9%, and 16.8% more than stayers. In contrast, separating women and young employees are not are paid statistically differently than other women and young employees at the target firms (the 1.5% and 1.8% point estimates in columns 2 and 6 are statistically insignificant). Finally, separating non-managers are paid 4.1% *less* than those that will stay at the firm.

[Table 8 here]

On average, total employment grows at private equity targets. Thus, the wages of newly hired employees also affect post-buyout pay gaps. In Table 9, we compare the wage of new joiners to that of employees working at the firm the year before the buyout. In each employee category other than old employees, we find that, private equity targets replace expensive separated workers with cheaper new joiners. For men and managers, the magnitude of the "discount" on new hire wages is higher than "premium" associated with the leavers, which we estimated in Table 8. Newly hired men and managers are paid 13% and 12% less than incumbents peers (a number of whom will leave the firm). We do not find that newly hired old employees are paid statistically differently than incumbent old employees.

In sum, in the reallocation phase that follows a buyout, target firms are particularly likely to separate from highly paid employees in the high-pay categories of employees, and hire more cost-effective new employees in the men and managers (high-pay) categories. These adjustments reduce disparities in pay within the target firm.

[Table 9 here]

3.4 Employee Shares

The results from the previous sections are consistent with target firms reducing pay inequalities inside target firms by catalyzing the separation of highly paid men, managers and old employees from the firm. Our analyses focused on pay gaps within employee groupings by gender, occupation and age. In a last test, we examine whether the composition of employees across categories changes after the buyout. Specifically, we re-estimate equation 1 at the firm-level to compare the evolution of the share of men, managers and old employees at target and control firms around the buyout.

Table 10 reports these results. In columns 1 and 2, we find that the labor reallocation that we document in the gender and occupation groupings mostly occur within employee categories (i.e., within men, women, managers, or non-managers). The share of men (and women) and the share of managers (and non-managers) at target firms do not significantly change after the buyout. The point estimates of -0.001 and 0.004 are small relative to the sample averages for the share of men (0.66) and the share of managers (0.21) and statistically insignificant. In contrast, the estimate in column 3 indicates that the share of old employees significantly declines by 1.1 percentage points after a buyout, which represents a 6% decline from the average share of old employees at target firms pre-buyout (0.19). Together, the results suggest that when target firms separate from expensive men and managers they replace them at the same rate as their women and non-managers counterparts; but when target firms separate from expensive old employees, they tend to replace them with younger (and also less expensive) employees.

[Table 10 here]

4 Conclusion

Over the past thirty years, private equity has become an increasingly mainstream ownership type globally. Much academic research and popular debate have focused on the efficiency gains and the shareholder value creation or destruction associated with these

transactions. Our study focuses on the labor outcomes of workers in private-equity controlled firms, with a particular focus on the income distribution effects of private equity ownership. We provide granular evidence about the evolution of gender, skill, and age-related pay gaps.

We find that relative to carefully constructed control group of firms, firms under private equity ownership experience significant and sustained reductions in all three types of wage gaps, and the reduction of these wage gaps come primarily from the job separations of the most expensive employees in the high-paid category (men, managers, and older workers). Instead of across-the-board wage reductions, men and managers who stay experience moderate wage increases. Expensive men and managers are replaced with new employees of the same category but who are cheaper. Expensive old employees are replaced by younger (and hence cheaper) employees. Overall these composition effects explain the reduction in wage gaps. The fact that separations of expensive employees drive the reduction in pay gaps is consistent with the notion that private equity owners reduce the rent of expensive workers, and in doing so, they not only increase the labor efficiency in the target firms but at the same time also reduce income inequalities. We believe these findings contributes to the understanding of the effect of private equity on labor market outcomes and highlight that growth and efficiency gains can go hand in hand with a more compressed wage distribution.

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Tables and Figures

Figure 1: Number of Target Firms in the Sample by Buyout Year

The figure shows the number of target firms in the final sample, by buyout closing year.

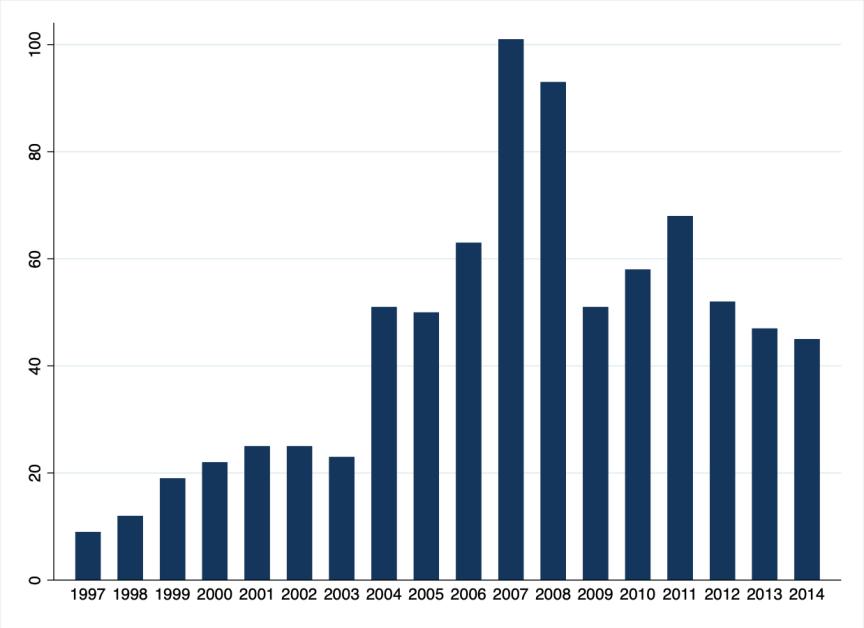
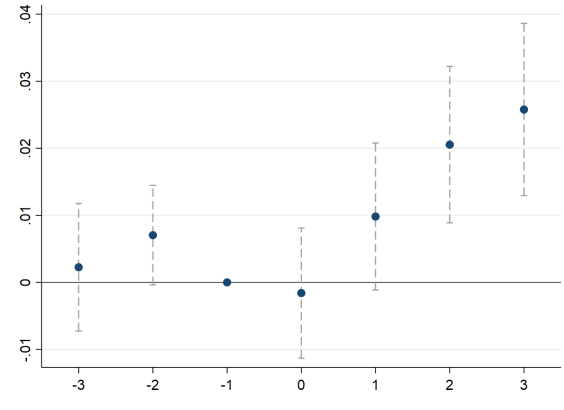


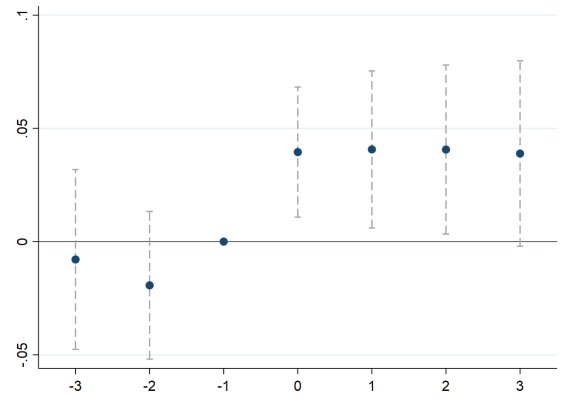
Figure 2: Leverage, Growth, and Profitability around LBOs

This figure shows the event study plot for firm leverage, return on assets, and the logarithm of employment around a buyout for target firms, relative to the control group. The figure is constructed by plotting the coefficients on event-time fixed effect interacted with the buyout indicator in a regression estimating equation 2. The X-axis displays the years relative to the buyout closing year. The regression includes firm and event-time fixed effects. The dotted bar indicate the 95% confidence intervals, based on standard errors clustered at the firm level.

(a) Leverage



(b) RoA



(c) ln(Employment)

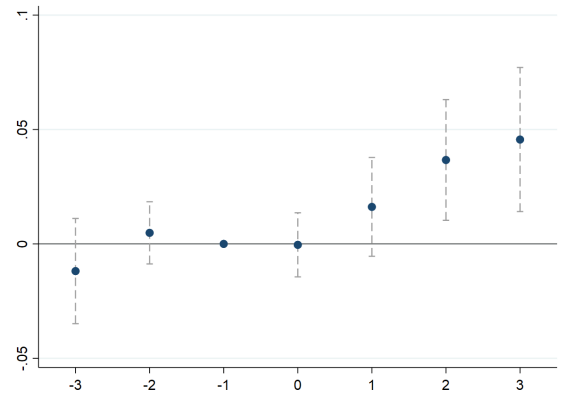
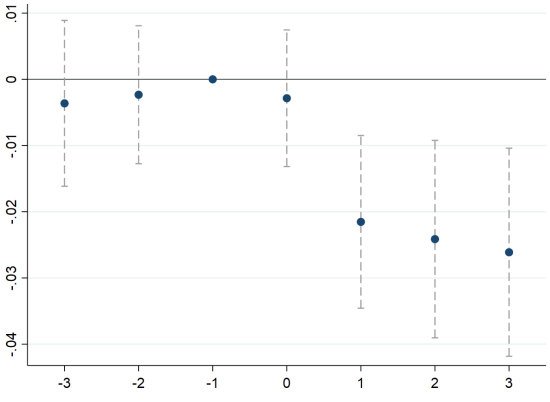


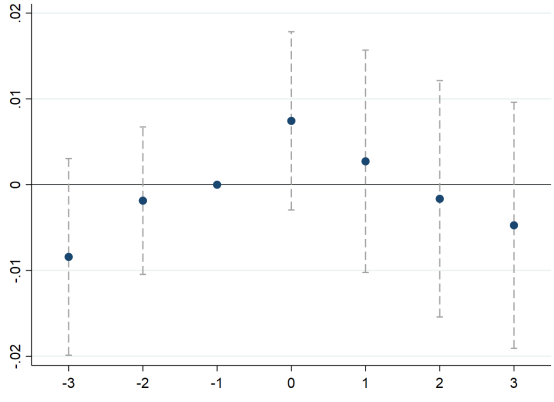
Figure 3: Firm-Level Average Wage by Employee Category

This figure shows the event study plot for the logarithm of hourly wage of men, women, managers, non-managers, old, and young employees around a buyout at target firms, relative to the control group. The figure is constructed by plotting the coefficients on event-time fixed effect interacted with the buyout indicator in a regression estimating equation 2. The X-axis displays the years relative to the buyout closing year. The regression includes firm and event-time fixed effects. The dotted bar indicate the 95% confidence intervals, based on standard errors clustered at the firm level.

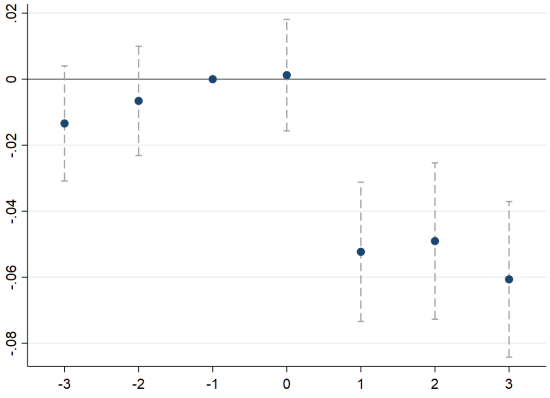
(a) Men



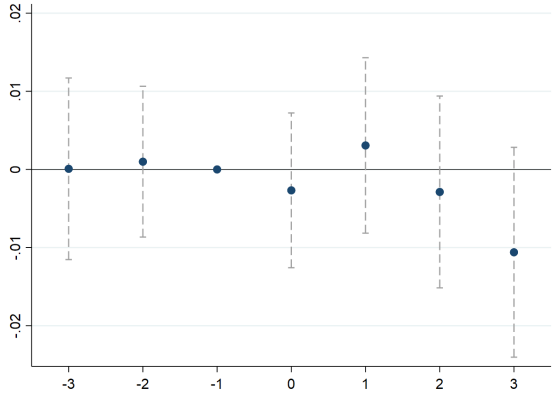
(b) Women



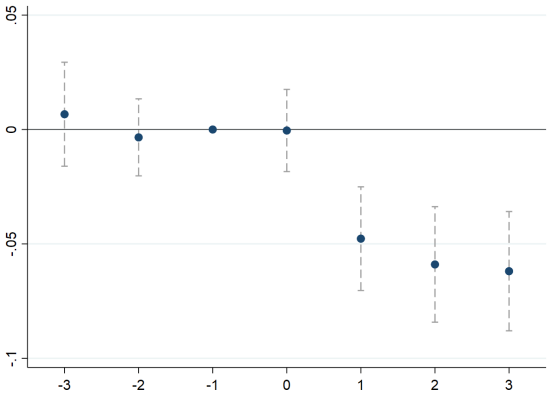
(c) Managers



(d) Non-Managers



(e) Employees Aged over 50 (Old)



(f) Employees Aged less than 50 (Young))

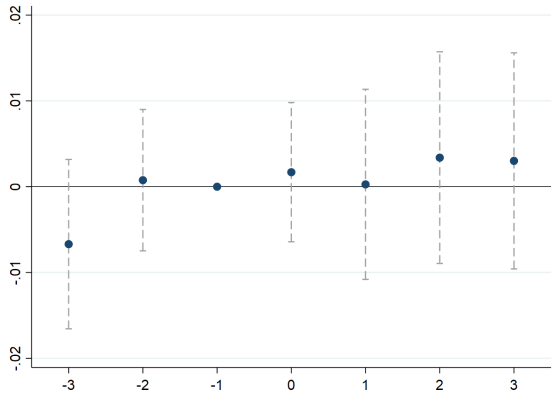


Table 1: Firm-Level Descriptive Statistics

Descriptive statistics for the sample of LBO targets and their control firms. Control firms are matched on 2-digit industry, and industry-specific terciles of employment growth, RoA, employment, gender pay gap before the deal. For each firm in the sample, each variable in the table is measured 2 years before the buyout. Hourly wages and earnings by employee category (men, women, managers, non-managers, old, and young employees) are measured as the average across the firm's employees between the ages of 20 and 70 who belong to that category. Monetary variables are expressed in euros.

	LBO Targets			Control Firms		
	Mean	Median	SD	Mean	Median	SD
Sales (thousands)	40804	16997	77337	40203	13786	120133
Employment	212	80	445	136	59	232
Employment growth	0.05	0.01	0.17	0.04	0.01	0.17
RoA	0.28	0.21	0.43	0.28	0.21	0.41
Leverage	0.14	0.10	0.15	0.14	0.08	0.16
Wage men	20.27	18.78	7.53	20.83	18.17	9.18
Wage women	15.51	14.58	4.90	16.01	14.67	5.68
Wage gap men vs. women	0.20	0.20	0.19	0.19	0.20	0.20
Wage managers	34.53	31.66	12.36	35.27	32.24	13.42
Wage non-managers	14.62	13.95	3.67	14.86	14.13	4.08
Wage gap managers vs. non-managers	0.55	0.55	0.14	0.55	0.56	0.14
Wage old	24.26	20.98	12.37	24.27	20.45	13.18
Wage young	17.26	16.08	5.37	17.60	16.01	6.3
Wage gap old vs. young	0.21	0.20	0.23	0.20	0.20	0.23
Earnings men	31272	28874	11847	32345	28726	14716
Earnings women	23150	21918	7640	23756	21968	8843
Earnings gap men vs. women	0.22	0.23	0.20	0.22	0.24	0.22
Earnings managers	54126	50092	22360	55487	51174	23161
Earnings non-managers	21963	21304	6107	22534	21690	6725
Earnings gap managers vs. non-managers	0.55	0.56	0.17	0.55	0.57	0.18
Earnings old	38066	31468	21571	37983	31770	21979
Earnings young	25978	24817	8104	26864	25044	9814
Earnings gap old vs. young	0.21	0.23	0.29	0.20	0.21	0.27
Share men	0.66	0.71	0.22	0.67	0.72	0.22
Share managers	0.21	0.14	0.21	0.21	0.13	0.21
Share old	0.19	0.18	0.11	0.19	0.18	0.11

Table 2: Employee-Level Descriptive Statistics

Descriptive statistics for the sample of employees working at a buyout target one year before the buyout and their control employees. For each employee in the sample, each variable is measured in the year before the buyout. Employees are matched the year before the buyout, on gender, 5-year age bracket, 2-digit occupation code, full-time status, wage bracket (10 categories), firm size bracket (3 categories), and 2-digit industry. Monetary variables are expressed in euros. Information is from the DADS Panel, which tracks a 1/24th sample of all employees in France until 2001 and a 1/12th sample thereafter.

	At LBO Targets			At Control Firms		
	Mean	Median	SD	Mean	Median	SD
Age	37	37	11	37	37	11
Hours	1522	1814	466	1532	1818	465
Days worked	317	360	83	321	360	81
Male	0.63	1.00	0.48	0.63	1	0.48
Managers	0.39	0.00	0.49	0.39	0.00	0.49
Old	0.17	0.38	0.00	0.17	0.38	0.00
Wage	17.55	14.66	8.92	17.64	14.69	8.92
Earnings	27285	24157	17159	27617	24453	17209

Table 3: Firm Leverage, Profitability, and Growth

This table displays the results of firm-level difference-in-differences regressions comparing firm outcomes at buyout target firms relative to the matched control group. Control firms are matched on 2-digit industry, and industry-specific terciles of employment growth, RoA, employment, gender pay gap before the deal. Standard errors are clustered at the firm level. *, **, and *** denote significance at 10%, 5%, and 1% level.

	Leverage	RoA	ln(Empl.)
	(1)	(2)	(3)
LBO X Post	0.017***	0.034**	0.036***
	(0.005)	(0.012)	(0.013)
Firm FE	Yes	Yes	Yes
Event-time FE	Yes	Yes	Yes
N	188302	206983	188039

Table 4: Firm-Level Average Wage and Wage Gap across Categories of Employees

This table displays the results of firm-level difference-in-differences regressions comparing the evolution of firm average wages and wage gaps across employee categories at buyout targets relative to the control group. Control firms are matched on 2-digit industry, and industry-specific terciles of employment growth, RoA, employment, gender pay gap before the deal. The dependent variable is the logarithm of wage for the focal employee category in columns 1-2, 4-5, 6-7 and the relative wage gap (difference in average wage scaled by the average wage of the high-wage category) in columns 3, 6, and 9. Standard errors are clustered at the firm level. *, **, and *** denote significance at 10%, 5%, and 1% level.

	Gender			Occupation			Age		
	Men	Women	Wage gap	Managers	Non-managers	Wage gap	Old	Young	Wage gap
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LBO X Post	-0.022***	-0.001	-0.013***	-0.050***	-0.003	-0.018***	-0.057***	-0.003	-0.038***
	(0.006)	(0.005)	(0.005)	(0.008)	(0.005)	(0.004)	(0.010)	(0.005)	(0.007)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Event-time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	208243	208243	208243	208243	208243	208243	208243	208243	208243

Table 5: Firm-Level Wage Gaps around a Buyout, Controlling for Changes in Other Wage Gaps

This table displays the results of firm-level difference-in-differences regressions comparing the evolution of firm wage gaps across employee categories at buyout targets relative to the control group. For each wage gap (gender, occupational, age), the regression controls for contemporaneous changes in the other types of wage gaps. Control firms are matched on 2-digit industry, and industry-specific terciles of employment growth, RoA, employment, gender pay gap before the deal. The dependent variable is the relative wage gap (difference in average wage scaled by the average wage of the high-wage category). Standard errors are clustered at the firm level. *, **, and *** denote significance at 10%, 5%, and 1% level.

	Wage Gap		
	Gender	Occupation	Age
	(1)	(2)	(3)
LBO X Post	-0.009**	-0.014***	-0.033***
	(0.004)	(0.004)	(0.006)
Pay gap men		0.107***	0.070***
		(0.014)	(0.021)
Pay gap managers	0.184***		0.218***
	(0.019)		(0.025)
Pay gap old	0.036***	0.071***	
	(0.010)	(0.008)	
Firm FE	Yes	Yes	Yes
Event-time FE	Yes	Yes	Yes
N	208243	208243	208243

Table 6: Employee-Level Analysis: Wage of Employees Staying at the Firm

This table displays the results of employee-level difference-in-differences regressions comparing the evolution of the logarithm of wage of buyout target employees who are employed at the firm in the three years before and after a buyout, relative to their control group. Employees are matched the year before the buyout, on gender, 5-year age bracket, 2-digit occupation code, full-time status, wage bracket (10 categories), firm size bracket (3 categories), and 2-digit industry. The dependent variable is the logarithm of wage. Standard errors are clustered at the firm level. *, **, and *** denote significance at 10%, 5%, and 1% level.

	Gender		Occupation		Age	
	Men	Women	Managers	Non-managers	Old	Young
	(1)	(2)	(3)	(4)	(5)	(6)
LBO X Post	0.015**	0.011	0.028**	0.006*	0.000	0.017***
	(0.007)	(0.010)	(0.012)	(0.005)	(0.017)	(0.006)
Employee FE	Yes	Yes	Yes	Yes	Yes	Yes
Event-time FE	Yes	Yes	Yes	Yes	Yes	Yes
N	275868	104141	83034	294315	72709	307300

Table 7: Probability of Employee Separation by Employee Category

This table displays the results of employee-level cross-sectional regressions comparing the probability of separation of employees at a buyout target employees, relative to their control group. Employees are matched the year before the buyout, on gender, 5-year age bracket, 2-digit occupation code, full-time status, wage bracket (10 categories), firm size bracket (3 categories), and 2-digit industry. The dependent variable is a dummy variable equals to one if the employee leaves the firm in the buyout year or in the three years after. Standard errors are clustered at the firm level. *, **, and *** denote significance at 10%, 5%, and 1% level.

	Gender		Occupation		Age	
	Men	Women	Managers	Non-managers	Old	Young
	(1)	(2)	(3)	(4)	(5)	(6)
LBO	0.057***	0.041**	0.079***	0.030**	0.105***	0.040**
	(0.012)	(0.017)	(0.015)	(0.013)	(0.023)	(0.011)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	258636	213555	98577	373614	44233	427958

Table 8: Leavers' Pay

This table displays the results of employee-level cross-sectional regressions comparing the wage of employees that leave the target firm after the buyout those that stay at the target firm. The dependent variable is the logarithm of hourly wage. Wages are measured in the year before the buyout. Standard errors are clustered at the firm level. *, **, and *** denote significance at 10%, 5%, and 1% level.

	Gender		Occupation		Age	
	Men	Women	Managers	Non-managers	Old	Young
	(1)	(2)	(3)	(4)	(5)	(6)
Has left	0.087***	0.015	0.069***	-0.067***	0.168***	0.018
	(0.024)	(0.020)	(0.026)	(0.011)	(0.043)	(0.019)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	9998	5917	6577	9239	3076	12839

Table 9: Joiners' Pay

This table displays the results of employee-level cross-sectional regressions comparing the wage of employees that join the target firm after the buyout those employed who were already employed at the target firm in the year before the buyout. The dependent variable is the logarithm of hourly wage. The regression is estimated on employees of the target firm. For incumbents, wages are measured in the year before the buyout. For newly hired, wages are measured in the year they join. Standard errors are clustered at the firm level. *, **, and *** denote significance at 10%, 5%, and 1% level.

	Gender		Occupation		Age	
	Men	Women	Managers	Non-managers	Old	Young
	(1)	(2)	(3)	(4)	(5)	(6)
Has Joined	-0.132***	-0.125***	-0.122***	-0.106***	0.026	-0.140***
	(0.021)	(0.018)	(0.024)	(0.010)	(0.071)	(0.014)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	24400	18079	15926	26307	6336	36143

Table 10: Employee Shares

This table displays the results of firm-level difference-in-differences regressions comparing the share of men, managers and old employees at buyout target firms relative to the matched control group. Control firms are matched on 2-digit industry, and industry-specific terciles of employment growth, RoA, employment, gender pay gap before the deal. Standard errors are clustered at the firm level. *, **, and *** denote significance at 10%, 5%, and 1% level.

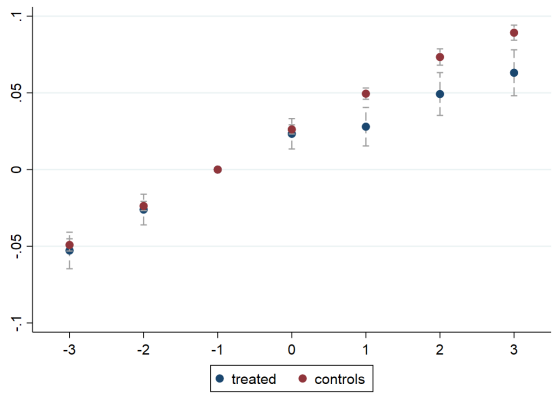
	Men	Managers	Old
	(1)	(2)	(3)
LBO X post	-0.001	0.004	-0.0011***
	(0.002)	(0.003)	(0.002)
Firm FE	Yes	Yes	Yes
Event-time FE	Yes	Yes	Yes
N	208243	208243	208243

A Appendix

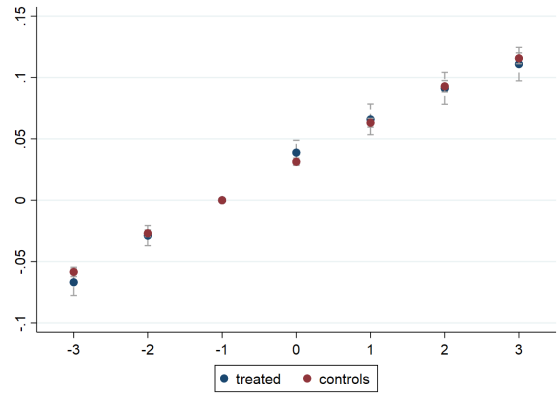
Figure A.1: Firm-Level Average Wage by Employee Category at Target and Control Firms

This figure shows the event study plot for the logarithm of average hourly wage of men, women, managers, non-managers, old, and young employees around a buyout separately for target firms and control firms. The figure is constructed by plotting the coefficients on event-time dummies, in a regression of the dependent variables on these event-time dummies and firm fixed effects. The X-axis displays the years relative to the buyout closing year. The dotted bar indicate the 95% confidence intervals, based on standard errors clustered at the firm level.

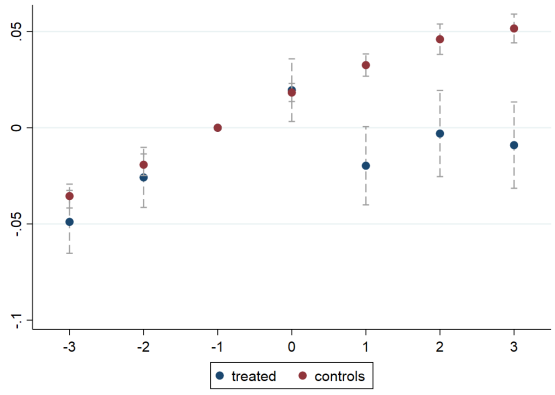
(a) Men



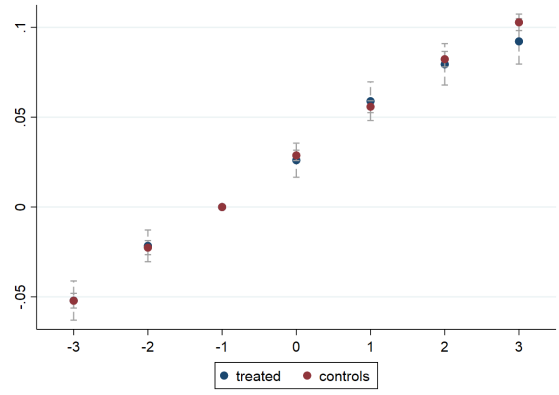
(b) Women



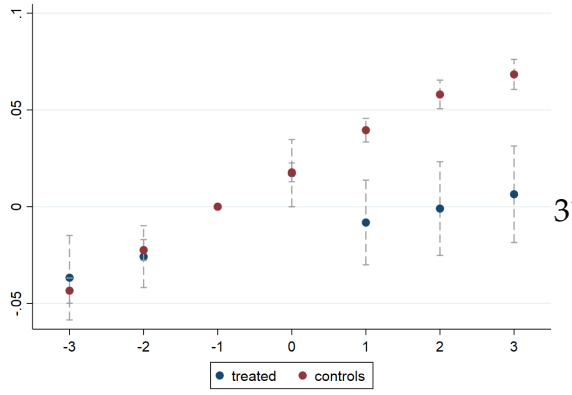
(c) Managers



(d) Non-Managers



(e) Employees Aged over 50 (Old)



(f) Employees Aged less than 50 (Young))

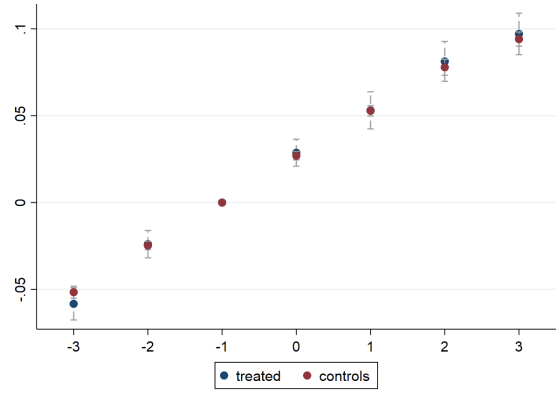


Table A.1: Robustness: Firm-Level Wage Gaps

This table displays the results of robustness tests around the main results of Table 4. Panel A does not impose the balancing of the sample. Panel B includes the buyouts for which we find more than 3 firms recorded in the administrative data under the target's name at the target's address. The dependent variable is the logarithm of wage in columns 1,2,4,5,7,8 and the relative pay gap between the two preceding categories in columns 3, 6, and 9. Standard errors are clustered at the firm level. *, **, and *** denote significance at 10%, 5%, and 1% level.

Panel A: Unbalanced Sample

	Gender			Occupation			Age		
	Men	Women	Wage gap	Managers	Non-managers	Wage gap	Old	Young	Wage gap
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LBO X Post	-0.016***	0.004	-0.013***	-0.045***	0.001	-0.019***	-0.055***	0.007	-0.041***
	(0.005)	(0.005)	(0.004)	(0.008)	(0.004)	(0.003)	(0.009)	(0.005)	(0.006)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Event-time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	277632	277632	277632	277632	277632	277632	277632	277632	277632

Panel B: No Filter on Number of Subsidiaries Matches to Administrative Data

	Gender			Occupation			Age		
	Men	Women	Wage gap	Managers	Non-managers	Wage gap	Old	Young	Wage gap
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LBO X Post	-0.019***	-0.000	-0.012***	-0.044***	-0.001	-0.017***	-0.054***	0.005	-0.038***
	(0.006)	(0.005)	(0.004)	(0.008)	(0.005)	(0.003)	(0.009)	(0.005)	(0.006)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Event-time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	227342	227342	227342	227342	227342	227342	227342	227342	227342