Job Transitions and Employee Earnings After Acquisitions: Linking Corporate and Worker Outcomes*

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Abstract

This paper connects changes in employer characteristics through job transitions to employee earnings following mergers and acquisitions. Using firm balance sheet data linked to individual earnings data in Canada and a matched difference-in-differences design, we find that earnings of workers at target firms decrease after M&As, largely driven by those who move to other firms. Workers leaving targets move to larger and more profitable firms, but experience wage declines potentially due to a loss of firm-specific human capital or backloaded contracts. It appears that losses of match-specific premiums from job transitions primarily explain the post-M&A earnings decline in our setting.

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1 Introduction

Mergers and acquisitions (M&As hereinafter) often result in important changes in corporate structure and worker composition for both target and acquiring firms. While there exists a large literature on how M&As affect firm performance and market value, there is growing interest in understanding labor market impacts of M&As. In theory, M&As may have positive or negative impacts on worker earnings. If M&As lead to efficiency gains for the involved parties, incumbent workers at acquiring firms or target firms may experience a wage increase through rent sharing. By contrast, M&As may lead to layoffs through labor restructuring which can lower displaced workers' wages. Furthermore, M&As can result in increased labor-market or product-market power, again leading to lower wages. Since M&As may bring significant changes in both corporate and labor structure, a key challenge in answering this question is to link worker and firm outcomes following M&As to delve into potential mechanisms behind changes in worker earnings.

In this paper, we provide new empirical evidence on changes in workers' labor market outcomes following corporate M&As. While prior studies focus only on either firm-level outcomes or worker-level outcomes, in our work we are able to link detailed firm balance sheet data from corporate tax returns to worker-level earnings data from individual tax returns in Canada.[1] This allows us to not only assess employee-level outcomes, but also to study firm outcomes to connect and pin down potential mechanisms behind our findings. Specifically, the detailed joint information on firms and workers allows us to study the connection between changes in employer characteristics via job transitions and employee earnings after M&As.

We first examine the impact of M&As on employment and average payrolls at the firm level. To do so, we implement a matched difference-in-differences design, where we match firms that go through M&A events to otherwise similar firms that never undergo M&As during our sample period. Importantly, in our setting, around 80 percent of M&A events are partial acquisitions, where the target sells a part of its businesses and remains operating as a separate entity following the M&A event. This allows us to keep track of the target's and the acquirer's outcomes after the event, so that we can assess the impacts on targets and on acquirers separately.[2] While prior studies focus on mergers, we include and study partial acquisitions in our setting since they match the scope and intensity of M&A activities in the economy. On a conceptual level, partial acquisitions can be as large and disruptive as mergers. The key distinction is that a merger involves two parties becoming one entity while an acquisition involves the acquirer taking over (a part of) the target's

[1] While Arnold (2021) also uses employer-employee matched data in the U.S., the Longitudinal Employer-Household Dynamics (LEHD) data does not have detailed firm balance sheet information, such as profit margins, and therefore cannot be used to simultaneously evaluate firm-level and worker-level outcomes.

[2] As we discuss in detail later, our worker-level results depend substantially on whether the worker was originally at the target or the acquiring firm.

businesses. Importantly, we do not find meaningfully different results on firm-level outcomes in the aggregate between for those involved in partial acquisitions and for those involved in mergers. Given that the vast majority of M&A activities in Canada (and in the United States) involve partial acquisitions, analyzing these activities in addition to mergers allows us to exploit more events and to examine a larger and broader sample of relevant firms and workers.

Focusing on these partial acquisitions, we find that acquirers expand, while targets shrink substantially after M&As. Acquirers' employment increases by 18.8 log points, without much change in average payrolls, on average relative to their matched control firms after M&As. By contrast, targets' employment and average payrolls decrease by 8.9 log points and 2.8 log points on average, respectively. At the aggregate (pooling targets and acquirers) level, however, we find almost no changes in employment or average payrolls in the case of either mergers or partial acquisitions.

Since changes in targets' average payrolls can be driven by changes in worker composition, the next part of our paper estimates the impact of M&As on worker-level earnings. Here, we do not make a distinction between partial acquisitions and mergers, not only because we can track individual worker transitions, but also because we find similar results in both cases (Appendix B). For workers at acquiring firms, we find relatively stable earnings after M&As. However, for target workers, we find their earnings decrease by 1.2 percent. This decline in worker earnings may stem from two channels. First, workers at target firms may face an increased risk of job displacement, implying the impacts on earnings are driven by job transitions. Second, workers at target firms may experience earnings losses due to changes in target firms' wage setting.

To test this, we first estimate the impact of M&As on job transitions. For target workers, we find there is a large increase in the probability of job transitions in the year following an M&A event. Given that we observe the universe of workers in the formal labor market in Canada, we check that most of these post-M&A job transitions are to different companies within the same industry, rather than to self-employment or unemployment. By contrast, for workers at acquiring firms, we find no change in the probability of job transitions.

For individuals who remain at target firms, we observe gradual and medium-run declines in their earnings, with a recovery in the long-run, resulting in a statistically insignificant decrease in earnings (0.8 percent) on average. However, target workers who move jobs after an M&A event suffer immediate earnings losses that continue to accumulate over time, resulting in earnings that are about 4 percent less on average after the M&A event. Given the relatively substantial losses for workers in this group, the next part of the paper explores the source of this decline in earnings.

First, we explore whether changes in the characteristics of the firm employing the worker can explain the drop in earnings, following a recent literature on job displacement (Schmieder et al.

forthcoming and Lachowska et al. 2020). The firm-level dataset allows us to test whether there are observable differences between the target firm and the new firm that target workers move to. We find that the new firms are in fact larger (in terms of employment and revenue) and more profitable on average compared to the target firms.[3] This result suggests that the decline in job movers' earnings cannot be explained by these workers moving to observably worse firms. Importantly, most of these job movers from target firms move to non-acquiring firms, meaning that this transition to larger firms is not mechanically driven by worker reallocation toward acquirers.

Interestingly, these workers still suffer earnings losses despite moving to these observably better firms. This finding suggests there is a pay complementarity between an individual worker and a given firm, which can arise for two reasons. First, firm-specific human capital accumulation (Lazear 2009) will imply a given worker is especially productive at a given firm. Second, firm pay policies, such as backloaded contracts (Lazear 1979 and Saez et al. 2023), imply that long-tenure workers within a firm will be making in excess of their marginal product of labor, meaning that layoffs will lower these workers' pay. Both of these models suggest that high-tenure workers will be especially harmed by job displacement. To explore this channel empirically, we conduct heterogeneity analyses based on worker tenure measured one year before the event. We find that the declines are almost entirely driven by workers with longer tenure. Individuals with shorter tenure are not impacted by the M&A-induced job transition. Furthermore, we find that the earnings losses are much larger among workers at the top quintile of the within-firm earnings distribution. This result is also consistent with the result based on worker tenure, since workers at the top of the within-firm earnings distribution are more likely to be the ones who have accumulated firm-specific human capital.

While we interpret these results as a loss of productivity driven by worker-firm complementaries, an alternative interpretation is that the M&A event allows firms to displace overpaid workers with back-loaded contracts. For example, Shleifer and Summers (1988) argue that takeovers allow firms to renege on implicit contracts and lay off overpaid workers. We cannot directly observe worker productivity in our data, but firms eliminating workers paid more than their productivity may increase their profit margins. We find a decrease in target firms' profit margins, which seems to provide some evidence against the "overpaid-worker" mechanism. However, it is possible for these firms to lose profitability in the post-M&A period even after displacing overpaid workers, so reneging on backloaded contracts could still be a mechanism through which workers leaving target

[3] Additionally, we estimate firm-specific wage premiums (AKM) to study whether job movers transition to systematically lower-paying firms. We find that target workers move to higher-paying firms on average after M&As (see Appendix A). One concern with the AKM estimation is that the effects are residuals which attempt to explain why a given firm pays more relative to other firms; in other words, there is a potential for omitted variables driving the estimated AKM effects. This highlights the importance of using firm balance-sheet data to directly assess their observable characteristics, such as their profitability.

firms may experience a wage decline.

This paper contributes to several distinct literatures. Most directly, we contribute to a literature on the impacts of M&As on the labor market (Brown and Medoff, 1988; Siegel and Simons, 2010). Much of the recent work in this area has focused on particular mechanisms. For example, both Prager and Schmitt (2021) and Arnold (2021) study how M&A events that lead to large changes in labor market concentration affect worker earnings. In these papers, the goal of the analysis is to argue that other changes, such as shifts in productivity or product market power, are stable across M&A events that differentially impact labor market concentration. In this paper, we seek to directly estimate these impacts using firm-level balance-sheet data. Additionally, the sample of M&A events in this paper is quite different. In both our analysis sample and the whole sample of M&A events, we find that shifts in labor market concentration are relatively rare mainly because most M&A events in our setting involve partial acquisitions that happen across different labor markets. However, we find these M&A events still have important impacts on job transitions that translate to changes in worker outcomes.

Relative to previous work documenting that M&A events create significant displacements of workers from target firms with higher wage premiums and reallocation to firms with lower wage premiums (He and le Maire 2022; Lagaras forthcoming), our work shows that the majority of workers displaced from target firms moves to larger and more profitable firms, but experiences a wage loss likely due to a loss of firm-specific human capital or implicit contracts. Besides finding different mechanisms, our study differs from Lagaras (forthcoming) by additionally using firm balance sheet data and showing that job movers do not move to less productive firms on average after M&As. This helps us rule out alternative mechanisms, such as other important differences between new firms and old firms, explaining the decline in worker earnings. Our analysis also complements the study by He and le Maire (2022), which focuses on the role of replacing managers in target firms. Theoretically, high-wage managers may be replaced after M&A events (Shleifer and Summers, 1988) leading to wage declines in target firms. While we cannot distinguish managers from other workers in our data, job displacements at targets may have been led by changes in management. Moreover, our work complements recent studies (Dessaint et al. 2017; Ouimet and Zarutskie 2020; Tate and Yang 2024) documenting human-capital considerations and labor restructuring as important drivers of M&As. While these studies show that acquirers engage in M&As to hire more (productive) workers, we find that most workers at targets move to non-acquiring firms after the event, implying that acquirers engage in M&As to purchase particular assets or intellectual properties of target firms, rather than to poach productive workers.

Second, our paper relates to a literature on how job transitions impact wages. In particular, a large literature studies the role of firm-specific and match-specific components to explain changes

in displaced workers' wages (Lachowska et al. 2020; Schmieder et al. forthcoming). Much of the recent work leverages mass layoffs to identify impacts of job transitions on workers earnings. In this paper, we find that M&A events can lead to significant job transitions for workers from target firms, leading to a decline in their earnings. However, our estimated 4 percent decline in earnings is relatively small compared to the estimates from prior studies on job displacement, which generally find impacts on the order of 15 to 25 percent (Jacobson et al. 1993; Schmieder et al. forthcoming; Lachowska et al. 2020). Furthermore, in contrast to findings in the mass layoff literature, we find that displaced workers from target firms move to larger and more profitable firms on average, likely because M&A events tend to be pro-cyclical in aggregate (Rhodes-Kropf and Viswanathan, 2004).

Lastly, there is a large literature in corporate finance and industrial organization that studies how M&As affect firm performance, finding mixed empirical results. For example, Braguinsky et al. (2015) report positive impacts on productivity in the Japanese cotton spinning industry, while Blonigen and Pierce (2016) show negative impacts on productivity in a sample of U.S. manufacturing mergers. Furthermore, Hoberg and Phillips (2010) finds improved long-term profitability of merging parties when the target and the acquirer share asset complementarities, while Schoar (2002) shows that acquirers' productivity may decrease through a shift in focus of management towards new segments at the expense of existing ones. Additionally, while Boucly et al. (2011) and Davis et al. (2014) find that leveraged buyouts in France and in the United States allow target firms to become more profitable and productive by relaxing financial constraints and by allowing productive establishments to enter, Malmendier et al. (2018) show that acquirers that win bidding contests suffer long-run losses relative to firms that lose the bidding contests. Declines in stock performance of acquiring firms have been attributed to potentially misaligned incentives, such as empire-building motive (Jensen, 1986) and CEO overconfidence (Malmendier and Tate, 2005). Furthermore, acquiring firms' profitability may also decrease in the medium run if the acquisition was covertly intended to reduce competition and retain market power in the long run (Cunningham et al. 2021). Our paper contributes to this literature by estimating the impact of M&As on a variety of firm-level outcomes and by finding results consistent with the set of studies reporting negative impacts of M&As on firm profitability (Appendix B). We then use these firm-level outcomes to rule out alternative mechanisms, such as changes in firms' market power, behind the decline in worker earnings. Our ability to link these firm-level outcomes to the worker-level outcomes is unique to the literature.

This paper is organized as follows. Section 2 provides institutional details on M&A regulations in Canada. Section 3 describes our data and Section 4 describes our research design. Section 5 shows our main results and Section 6 discusses potential mechanisms behind our findings. Section 7 concludes.

2 Institutional Background

This section describes relevant institutional details about competition policy and labor regulation. Competition policy in Canada is administered by the Competition Bureau, an independent law enforcement agency. In 2009, a major reform instituted a two-step process for merger reviews, similar to the American process with notification thresholds, a waiting period, and a supplementary information request. The thresholds for a pre-merger notification requirement are set by the Competition Act. The two most relevant thresholds are the size of parties and the size of transaction. Both of these must be met to trigger a pre-merger notification.[4] In our analysis sample, most M&A deals and involved parties are not large enough to trigger any of these thresholds.

The parties may close the deal when the statutory waiting period (30 days) has expired, been waived, or is terminated; unless extended by the Commissioner of Competition through a Supplementary Information Request similar to a second request in the United States under the Hart-Scott-Rodino Antitrust Improvements Act of 1976 (the HSR Act). Furthermore, all mergers are subject to challenge from the Commissioner for up to one year after closing unless an Advance Ruling Certificate has been issued.[5] Reviewing a merger, the Commissioner considers multiple factors, such as concentration and barriers to entry, and may challenge the proposed merger if it substantially lessens competition. In general, most transactions that underwent pre-merger reviews resulted in no enforcement action.

Section 96 of the Competition Act explicitly lays out an "efficiencies defence" of mergers, which allows anti-competitive mergers to proceed if potential cost savings outweigh the losses to consumers through higher prices. In the United States and many other jurisdictions, efficiency can also be considered as a factor in antitrust decisions for mergers but is given less weight.[6] Legislation currently before the Canadian Parliament would remove the efficiencies defence from the Competition Act. Our work, assessing how acquirers' and targets' performance changes after M&As through a retrospective study, provides evidence that can inform policy discussions about how to weigh potential efficiency gains from M&A activities.

[4]The parties together must have aggregate assets in Canada, or aggregate annual gross revenue from sales in, from or into Canada, in excess of 400 million Canadian dollars. The aggregate value of the assets in Canada to be acquired, or the aggregate annual gross revenue from sales in or from Canada generated from those assets, must be greater than 93 million Canadian dollars. There is also a size of equity threshold that less frequently comes into play: the acquirer holds 20 percent of the shares of a public corporation, 35 percent of the share of a private corporation, or 35 percent of the profits or assets on dissolution of a non-corporate entity.

[5]An Advance Ruling Certificate notifies the parties that the Commissioner does not intend to make an application under section 92 of the Act which is akin to "early termination" in the U.S. under the HSR Act.

[6]Ware and Winter (2016) assert (p. 366) for Canada that "...in no other jurisdiction in the world would a court accept evidence of substantial price effects from a merger and yet allow the merger." A comparison of efficiency defences across many OECD countries is found in OECD (2013).

The Canadian and the U.S. labor markets share many similarities. Labor regulation is the jurisdiction of the provinces for most industries, but unemployment insurance is national through the Canada-wide Employment Insurance program. Measures of employment protection from the OECD show Canada close to the U.S. with much lower levels of protection from dismissals than European countries (OECD, 2020). Dismissing a worker requires several weeks of advance notice to the worker and mandatory severance depending on years of service. Non-compete clauses have recently been banned in certain provinces, but were generally unenforceable even before the explicit banning (Hanson and Cohen, 2012). Therefore, non-compete clauses are unlikely to be a substantial issue for worker transitions following M&As in our setting. One difference for labor markets in Canada is the degree of unionization. During our sample period, the overall coverage in the private sector by union contracts in Canada is about 18 percent on average, compared to 8 percent in the U.S.[7] While the higher union coverage rates in Canada may render it more difficult to lay off workers in general, high unionization may also present a source of inefficiency to be targeted by M&As.

3 Data

This section describes two datasets used for our analysis. First, we use the SDC Platinum database which contains information on M&A activities around the globe. Second, we use the Canadian Employer-Employee Dynamics Database, a matched employee-employer dataset that covers the universe of firms and workers in Canada from 2001 to 2017. To prevent disclosure of confidential information, Statistics Canada requires researchers to round estimates and observation counts.

3.1 SDC Platinum

The SDC Platinum database allows detailed search on M&A activities around the world, covering all corporate (public or private) transactions. This data set includes names of the parties, NAICS industry codes, and other identifying information such as addresses and phone numbers. The dataset on M&A activities was merged with the firm-level data from the Canadian Employer-Employee Dynamics Database using all available identifying variables, such as firm names, addresses, and industry codes. The match rate is around 75 percent on average from 2001 to 2017.

[7]The source for the Canadian statistics is Statistics Canada, Table 14-10-0070-01, "Union Coverage by Industry." The source of the U.S. statistics is Bureau of Labor Statistics, Series ID LUU0204906700, "Percent of Employed, Private Wage and Salary Workers Represented by Unions."

3.2 Canadian Employer Employee Dynamics Database (CEEDD)

The Canadian Employer-Employee Dynamics Database draws information from both individual (T1) and corporate (T2) tax return records, merged with job-level information using T4 employee tax records (like a W-2 in the United States, with information on annual earnings) and Record of Employment (ROE) data with information on work history, and with firm-level information from the National Accounts Longitudinal Micro-data File (NALMF). This database has rich information on the universe of firms and workers in Canada from 2001 to 2017.

The main firm-level outcome variables are employment and average payroll. Employment is defined as the average number of employees reported on the NALMF. Average payroll is defined as the total wage bill divided by the number of employees. In Appendix B, we look at additional firm outcomes, such as revenue, profit margins, and markups, to explore potential mechanisms behind our findings. Profit margins are defined as total revenue minus total expenses, scaled by total revenue. We define markup as the elasticity of output with respect to variable costs as well as the variable costs share (De Loecker and Warzynski, 2012). For the elasticity of output with respect to variable costs, we use estimates from De Loecker et al. (2020) that allow for different elasticities across two-digit NAICS industry codes and years. Given the elasticity estimates, this allows us to estimate firm-level markups as the output elasticity multiplied by the inverse of the variable costs (total wage bills and material costs) share: $\hat{\theta}_{st} * \frac{Sales}{Costs\ of\ Goods}$. Furthermore, we link ownership data with the firm-level data to compute realized capital gains by owners for a given firm in each year. The ownership data contains unique IDs of investors in private firms and their ownership rates. After merging individual tax returns data with the ownership data at the investor-level, we aggregate owners' realized capital gains for each firm in each year to compute total realized capital gains by these investors at the firm level.

At the worker level, the key outcome variable is annual earnings, aggregated across all employers for that worker in a given year. While we include earnings across all employers, we associate workers with the "dominant" employer (i.e., the employer from which the employee receives the highest pay in the year). We also use information on workers' gender and age derived from the T1 income tax filing for creating a matched control group and for heterogeneity analyses.

4 Empirical Strategy

This section describes our empirical design and provides descriptive statistics on our matched sample. To estimate the effects of M&As on firm-level outcomes, we implement a matched difference-

in-differences design by estimating a regression of the following form:

$$Y_{jt} = \sum_{k=-4}^{5} \beta_k^{MA} \mathbb{1}(t_j = t^* + k) \times MA_j + \tau_t + \psi_j + u_{jt} \tag{1}$$

where Y_{jt} is an outcome variable for firm j at year t, MA_j is an indicator for an M&A firm, $\mathbb{1}(t_j = t^* + k)$ indicates an M&A event occurred k years in the past (or future) relative to the period of the M&A event t^*, τ_t are year fixed effects that vary by the year of the M&A event, ψ_j are firm fixed effects, and u_{jt} is an error term. To absorb any industry-specific shock affecting M&A activities in a given year (Maksimovic and Phillips 2001), we include 4-digit industry dummies interacted with year dummies as control variables. Furthermore, we include a quartic function in firm age to ensure that our results are not driven by differences in financial constraints of firms, although dropping these control variables does not qualitatively affect our results. The standard errors are clustered at the firm level. Note that for firms that go through M&As more than once, we focus on their first M&A event.[8] Furthermore, most of M&A firms and their matched control firms are private companies (96 percent) in our analysis sample, so our results remain nearly unchanged even if we focus our analyses exclusively on private firms (Appendix A).

In our setting, roughly 80 percent of M&A events involve partial acquisitions, in which a target sells a part of its businesses or assets to the acquirer. Relative to a merger, a partial acquisition results in the target firm continuing its operation as an independent entity, which allows us to keep track of the target's outcomes separately from the acquirer's outcomes after the event. In theory, we would expect the target firm to mechanically shrink in size, while the acquiring firm might expand at least in the short to medium run, although it still remains ambiguous how their average payrolls would change. In the case of a merger, it is unclear whether the combined entity would maintain its size, expand by hiring more workers, or shrink by cutting some of its redundant employees. To have a clearer picture on how firm size changes after M&As, we examine our firm-level outcomes separately for those involved in partial acquisitions and for those involved in mergers. Specifically, when assessing partial acquisitions, we look at targets and acquirers separately. In contrast, when assessing mergers, we look at the aggregate (targets and acquirers combined) outcomes, although we also look at the aggregate outcomes for partial acquisitions as a comparison. Additionally, we use the worker-level data to examine the extent to which workers reallocate from targets to acquirers.

To assess worker-level impacts, we estimate a similar matched difference-in-difference design

[8] While the majority of firms goes through a merger or an acquisition once during our sample period, there exists a handful of acquirers that engage in M&As more than once. We separately examine acquirers that go through multiple M&As in Appendix A.

of the following form:

$$y_{it} = \sum_{k=-4}^{5} \beta_k^{MA} \mathbb{1}(t_i = t^* + k) \times MA_i + \tau_t + \omega_i + \mu_{it} \tag{2}$$

where y_{it} is an outcome variable for incumbent worker i at year t, ω_i are worker fixed effects, and all other variables are defined as in Equation (1). The standard errors are two-way clustered at the worker-by-firm level.[9]

The key identifying assumption is that outcomes for M&A firms and workers and for control firms and workers would have trended similarly in the absence of the M&A event. This assumption may be strong since M&As are the result of firms' decisions. For example, acquiring firms may target firms that will be profitable in the future, whose earnings may grow even absent the acquisition. By contrast, acquirers may target mismanaged and underperforming businesses whose employment and workers' earnings would fall regardless of M&As. One way to determine the direction of the potential bias is by comparing outcomes for M&A firms and workers to the control firms and workers in the years prior to the M&A event. Parallel pre-trends in firm-level and worker-level outcomes help alleviate the aforementioned concerns. In fact, we find that M&A firms' outcomes share a parallel pre-trend with those of control firms, not only in terms of their sizes (section 5), but also with regards to their sales, profitability, and performance (Appendix B).

While verifying common pre-trends is reassuring for a causal interpretation, contemporaneous shocks that occur with M&A events could still bias our results. For example, there could be a negative demand shock that hits a particular market and causes both a decline in wages and an increase in M&A activities as firms get purchased before they shut down. In this case, M&A activities are correlated with shocks that decrease labor demand. We can also have the opposite scenario; in fact, merger activities tend to be pro-cyclical in aggregate (Rhodes-Kropf and Viswanathan, 2004). We address this concern by also looking at M&As that are less likely to have been triggered by local economic conditions. Specifically, we consider the impact of national M&As that occur among domestic firms with multiple establishments across different commuting zones, and therefore are less likely to be driven by local economic conditions faced by the firms or workers (Appendix B).

4.1 Matched Samples

Before performing a matching procedure between M&A firms and potential control firms, we make the following restrictions. First, we require a firm to have at least 10 workers in the year prior to

[9] Our results are robust to two-way clustering standard errors at the worker and the market (4-digit industry by commuting zone) level – see Appendix A.

the event. This choice focuses our sample on economically active firms with enough pre-period observations, and drops most small businesses that are not comparable to either acquiring or target firms. Additionally, we drop a small share of firms that have missing observations for the key variables used for matching, such as employment, average payroll, and firm age, one year prior to the event. During our sample period, the total number of M&A events is 765 per year on average among this sample of firms eligible for matching (see Figure 1). We then match each firm in the year prior to an M&A event to a control firm in the same province and 2-digit NAICS industry. A firm is a potential control firm for firm j if: (1) the firm is never involved in an M&A event during our sample period, and (2) the firm is in the same decile bin of average payrolls and is in the same 15-quantile bins in total revenue and firm age in the year prior to the M&A event of firm j.[10] Of all the possible counterfactual firms for a given M&A firm, we choose the firm with the closest propensity score, which is estimated by predicting treatment using a linear probability model with a quadratic function in average payrolls, total revenue, and firm age in year $[t-1]$. This matching strategy is similar to a number of recent papers implementing a dynamic difference-in-differences design (Goldschmidt and Schmieder, 2017; Smith et al., 2019; Arnold, 2021). The matching strategy finds a control firm in about 79 percent of all cases among this eligible sample.

Choosing one counterfactual control firm per M&A firm in a given year ensures that the treated and control groups are comparable on the matched variables. We construct an unbalanced panel of firms which extends 4 years prior to and 5 years after the M&A event. M&A firms in our analysis sample are larger than those that fail to find a control group on average in part because we drop firms with fewer than 10 employees. Therefore, the M&A deals in our analysis sample are meaningful and larger than an average M&A deal in Canada during the sample period. Furthermore, there exist firms eligible for matching (i.e., with at least 10 employees), but not matched to control firms (i.e., similar in sizes to M&A firms but located in a different province). We provide descriptive statistics on the sample of unmatched M&A firms (the remaining 21 percent among the eligible firms) and show robustness test results including these excluded firms in Appendix A.

Matching on size, province, and sector finds treatment-control pairs that would plausibly exhibit common trends in the absence of M&A activity. While we do not explicitly match firms based on a market (defined at the 4-digit NAICS by commuting zone level), it is possible that firms are matched within the same market. This is a potential concern if M&As have impacts on local labor markets through increased concentration. If M&As have negative effects on control firms in the same industry and commuting zone, then the impact of M&As on firms will be biased towards zero. However, these potential spillover effects are minimal in our setting given that the number

[10]While this specification yields the best parallel pre-trends on key outcomes, which are important for our identification strategy, our main results remain qualitatively similar when we use different bin sizes or other related firm characteristics for matching. Results based on other variation in matching can be provided upon request.

of M&A deals within the same market is small and the number of competitors in a given market is so large that most M&A deals do not contribute to a meaningful increase in concentration (see Appendix B). Nevertheless, to minimize this concern, we do a robustness check by matching firms within the same province, but in different markets (Appendix A).

To construct the worker-level sample, we extract all workers who were continuously employed in the matched firms during the entire pre-event period (4 years). This tenure restriction is chosen to obtain a sample of workers with attachment to the M&A firms and is similar to tenure restrictions used in the mass layoff literature (Jacobson et al., 1993; von Wachter et al., 2009; Lachowska et al., 2020). Additionally, we restrict workers to have at least 4,000 CAD in annual earnings and drop multiple jobholders to ensure that we study full-time workers with stable income and attached to their firms (Card et al., 2013; Sorkin, 2018), given that we do not observe work hours in our data. For each worker in a treated firm, we choose a worker in any of the matched control firms in the same sector, province, worker age (five-year) bin and gender. If more than one match is found, we choose the worker with the closest propensity score to the treated worker, where the propensity score is estimated by predicting treatment using a linear probability model with a quadratic function in worker age. In total, about 57 percent of workers at treated firms are matched to control workers among the sample of eligible workers at matched control firms. We provide descriptive statistics for the unmatched workers and show robustness test results including these excluded workers (Appendix A). To compute earnings in the worker-level data, we aggregate annual earnings across all employers if a worker is employed at more than one firm in a given year (due to job transitions).

Since we use a matched control group that is never treated, the specifications above do not suffer from the identification issues that arise in conventional event-study designs (Borusyak et al., 2021) with staggered timing (Goodman-Bacon, 2021). Identification here comes from differences in always-treated and never-treated units over time, not from units coming in and out of treatment.[11]

4.2 Descriptive Statistics

We close this section with descriptive statistics of our analysis sample. Panel A of Table 1 shows the averages for key variables across firms, comparing M&A firms to the set of matched control firms one year before the event. On average, M&A firms are a bit larger than their control firms, in terms of total revenue, expenses, and employment. However, for average payrolls, leverage

[11] We let the first M&A event in our analysis sample start from 2005 to ensure that our matched control firms did not go through any M&A event at least 4 years prior to (or after) the first M&A event, given that our data starts from 2001. In this way, we make sure that none of the matched control firms went through any M&A activity from 2001 to 2017.

ratio, and markups, M&A firms are comparable to their control firms, suggesting that firms that go through M&As and firms that never get involved in M&As are comparable with regards to their average employee compensation and financing structure prior to the event. Importantly, as we show in Section 5 and Appendix B, M&A firms and their control firms share parallel pre-trends on these variables, implying that they exhibited similar patterns not only in terms of employment and average payrolls, but also with regards to sales and profitability, prior to the M&A event. The dominant sectors are manufacturing, wholesale, and services (about 70 percent of our firm sample).

Panel C of Table 1 shows average worker characteristics in our analysis sample one year before the event. We distinguish between workers at acquiring firms and workers at target firms. Annual earnings are 70,046 CAD and 71,386 CAD among workers at acquiring firms and workers at the matched control firms, respectively. Annual earnings are 70,625 CAD and 72,317 CAD among workers at target firms and workers at the matched control firms, respectively. Therefore, annual earnings of treated workers are comparable to those of control workers on average. The difference between average payrolls in Panel A and annual earnings in Panel C arises because not all workers from treated firms are matched to workers at control firms, as we impose restrictions on tenure, worker age, and gender for matching. Hence, the average payroll at a given firm may not equal the average annual earnings of workers at a given firm in our matched sample. The age and gender compositions are similar between treated workers and their matched control workers.

5 Results

This section reports the results from the estimation of the difference-in-differences model described in Section 4, and presents additional tests supporting the interpretations of our results.

5.1 Post-M&A Firm Size and Average Payrolls

Figure 2 plots estimates of β_k^{MA} from equation (1) across the main firm-level outcomes using our matched sample. As mentioned in Section 4, we show these results separately for targets and for acquirers involved in partial acquisitions (Panels (a) and (b)) and for the aggregate (targets and acquirers combined, Panels (c) and (d)). Panel (a) shows that acquiring firms' and target firms' employment followed a similar pattern as those of their matched control firms before the M&A event. This pre-event stability is important evidence in support of our empirical strategy. While acquirers' employment significantly increased after the event, targets' employment decreased after the event, compared to those of matched control firms. Panel (b) shows that the pre-event trends for average payroll are also similar between M&A firms and their control firms. While acquirers'

average payroll stayed flat after the M&A event on average, targets' average payroll significantly decreased after the event, compared to control firms' average payroll.[12] In Panel (c) and Panel (d), we pool targets and acquirers and compare their outcomes with those of their matched control firms before and after the M&A event. Here, we simply drop the distinction between acquirers and targets when estimating the equation (1) so that acquirers, targets, and their matched control pairs are all in the same estimation.[13] The black line indicates the aggregate outcomes for those involved in mergers and the red line indicates the aggregate outcomes for those involved in partial acquisitions. Across these outcomes, M&A firms were on a similar trend prior to the event compared to their control firms. In the case of partial acquisitions, employment and average payrolls did not change much after the event on average, except for the initial drop in average payrolls. Similarly, in the case of mergers, employment and average payrolls stayed roughly flat after the event on average, except for the initial increase in employment.

To interpret the magnitude of these results, Table 2 presents the difference-in-differences estimates on these outcomes, separately for targets and acquirers involved in partial acquisitions (Column 1 and 2) and for the aggregate (Column 3 and 4). Column (1) shows that target firms' employment and average payrolls fell by 8.9 log points and 2.8 log points, respectively, after the event. Column (2) shows that acquiring firms' employment increased by 18.8 log points, without significant changes in average payrolls, after the event. Columns (3) and (4) show these outcomes in the aggregate, separately for those involved in partial acquisitions and for those involved in mergers. Columns (3) and (4) show that employment and average payrolls did not change much on average in the aggregate in the case of either partial acquisitions or mergers.[14] Overall, our results show that M&As lead to mechanical firm-size adjustments when we look at targets and acquirers separately, but in the aggregate, firm size remains relatively flat both in partial acquisitions and mergers. To get a better sense of the impacts on worker reallocation and average payrolls, we next turn to worker-level data to assess the impacts of M&As on worker earnings and job transitions.

[12] To account for a small share of firms (especially among targets) that exit the sample after the M&A event, we repeat the same analysis using outcomes measured in levels instead of in logs, where we replace the missing observations with zeros. We find qualitatively similar results when we use the outcomes in levels (see Appendix A).

[13] An alternative approach would be to literally combine acquirers and targets into single entities (i.e., summing up their observations), re-do the firm-level matching to find their control firms, and estimate the equation (1) using the combined entities. However, this new sample would be likely different from the original analysis sample, given that finding matched control firms for the combined entities may result in a lower match rate and therefore a smaller matched sample.

[14] In Column (3), the average estimates are weighted by the relative sample sizes between targets (from Column (1)) and acquirers (from Column (2)), where the target sample size is much larger. Therefore, the negative coefficient estimates from the targets carry a larger weight than the positive coefficient estimates from the acquirers, leading to zero (or slightly negative and insignificant) effects on average at the aggregate level.

5.2 Post-M&A Worker-level Earnings and Job Transitions

Given the considerable turnover at target firms after M&As, changes in average payroll may reflect changes in worker composition. For example, the decrease in firm-level wages could be driven by laying off high-wage workers or reducing wage growth for existing workers, or a combination of both. Therefore, we next turn to the worker-level data that allows us to flexibly control for composition by tracking the same workers over time. Here, we do not make a distinction between workers involved in partial acquisitions and workers involved in mergers, although the results are very similar when we assess them separately (Appendix B).

Panel (a) of Figure 3 shows that annual earnings for incumbent workers at target firms trend similarly to those of their matched control workers in the years prior to the event, but fall significantly afterwards. By contrast, annual earnings of incumbent workers at acquiring firms trend similarly to those of their matched control workers and stayed flat after the event. Column (1) of Table 3 shows that workers at target firms experience a decline of 1.2 log points in annual earnings after the M&A event on average. This decline could be due to M&A workers moving to lower-paying firms or M&A firms reducing earnings for their incumbent workers. Column (2) shows that the annual earnings of workers at acquiring firms did not change much on average.

The drop in employment at target firms, as shown in Table 2, suggests that job transitions could explain a part of the decline in worker-level earnings. The reduction in employment could come primarily through decreased hiring, implying incumbent workers may be relatively unaffected. We first consider the impact of M&As on the probability of worker transitions from a job. This transition could be to another firm or to non- or self-employment. In our data, most of the workers who leave their original employers do so involuntarily, but find a job afterwards.[15] Panel (b) of Figure 3 plots the estimates of equation (2) with an indicator for a job transition as the outcome. As shown in the figure, job transitions spike in the year after an M&A event. Workers in target firms are about 20 percentage points more likely to transition jobs in the year after the M&A event. Transition rates then drop, but remain elevated relative to workers in the control group. Given this notable increase in job separations especially within the first two years after the event, part of the effects on earnings may be coming from departures from their employers rather than within-firm decreases in earnings. By contrast, we find that workers at acquiring firms do not experience any increased probability of a job transition relative to their control counterparts.

To study the impacts solely due to within-firm changes in compensation, Panel (c) of Figure

[15] Our data has an indicator for reasons for job separations, which can be broadly categorized into involuntary (i.e., shortage of work, takeovers, or retirement) or voluntary (i.e., personal or medical reasons). Roughly half of the observations in the relevant sample has these reasons as "unknown." Among the other half, about three quarters of workers moving from target firms left involuntarily after the M&A event.

3 restricts the analysis to workers who stay in the same firm in the years following the event. We make this restriction for both treated workers and control workers so that the treatment group does not mechanically contain workers who have more stable job histories. Column (3) of Table 3 shows that annual earnings for stayers in M&A firms do not change much at either target or acquiring firms on average in the years following the event.[16]

By contrast, Panel (a) of Figure 4 shows large and immediate drops in earnings of workers who move from target firms to other firms within the first two years after the event. Column (1) of Table 4 shows that these job movers experience a decline of 4.0 log points in their earnings on average. Panel (b) also shows that roughly 70 percent of these job transitions happen in the first year after the event, with the rest in the second year.[17] Importantly, about 80 percent of these workers move to non-acquiring firms, meaning that most of these job transitions are not driven by a simple reallocation of workers from targets to acquirers. Interestingly, as Panel (c) and Columns (3) – (4) show, target workers who move to non-acquiring firms experience larger and more immediate drops in their earnings on average, relative to workers who move to acquiring firms. Panel (d) and Column (5) show that the vast majority of these workers are moving to other firms within the same industry, implying that switching an occupation via moving to a different industry is unlikely the reason why these job movers experience a decline in their earnings. In the next section, we focus on these workers at target firms who move to other firms after the event and explore potential mechanisms behind their responses in earnings.

6 Potential Mechanisms and Economic Interpretations

In this section, we discuss and empirically test potential mechanisms behind the responses in workers' earnings after M&As. In principle, both increased labor-market power and increased product-market power may impact worker earnings. For example, Prager and Schmitt (2021) and Arnold (2021) study how M&As that generate large shifts in concentration generate market-level declines in earnings. Similarly, shifts in product-market power could impact earnings through two channels. First, if product-market power increases, firms may cut quantity in order to increase price. A decrease in labor demand in an industry may therefore lower wages. However, in models of rent-sharing, increases in product-market power will increase wages for workers in merging firms.[18]

[16] Note that the coefficient estimates on stayers' earnings at target firms are negative and statistically significant in years 4 and 5. This result seems to suggest that post-event changes in target firms' characteristics, such as decreases in profitability (Appendix B), may help partly explain the decline in stayers' earnings (i.e., via a rent-sharing channel).

[17] We allow these workers to move in subsequent years after their first transition, which explains why there exists a small share of workers moving after the second year.

[18] Kroft et al. (2020) study a setting featuring both labor market power and product market power to quantify markdowns of wages and markups of prices simultaneously.

In our setting, we find limited evidence for these channels. In particular, it is important to note that most M&A events (roughly 80 percent) are partial acquisitions, implying the two firms do not completely consolidate after the event.[19] Second, we find declines in profit margins for both target and acquiring firms, with stable markups (see Appendix B). This decline in profitability, with stable markups, is inconsistent with M&As increasing market power in either the labor market or product market on average (De Loecker et al. 2020). In Appendix B, we perform a variety of heterogeneity analyses to further support this claim. For example, we do not find larger declines in target workers' earnings when an M&A event happens within the same labor market or in the markets with a high initial level of concentration or in non-tradable sectors or in within-industry (horizontal) M&As. The overall takeaway from these results is that we find declines in worker earnings even in M&A events that are unlikely to have any impact on labor or product market power, such as partial acquisitions between firms in different locations or industries.[20]

Given these results, we focus on workers who experience immediate and significant declines in their earnings after M&As: job movers from target firms. We focus on those who move within the first two years after the event because most job transitions from target firms happen within the first two years and are likely induced by the M&A event. Note that control workers who were matched to these job movers are also allowed to move to other firms after the event, but empirically, we find that most of these control workers stay at their original firm.

6.1 Impacts on Job Movers

In this section, we explore mechanisms through which job transitions impact workers. A large body of evidence studies job transitions through mass layoffs. M&A events provide a different and interesting source of variation to study job transitions. Both the motivations and impacts of job transitions may be very different in this setting. For example, while we find similar patterns of earnings losses, the magnitude is much lower in our setting, with a long-run earnings loss of around 4 percent. By contrast, Jacobson et al. (1993) find a long-run earnings loss of 25 percent. Furthermore, M&A events tend to be more procyclical on average (Rhodes-Kropf and Viswanathan, 2004) in contrast to mass layoffs. As we will show later, this may help explain why job movers from target firms were able to move to larger and more profitable firms. Therefore, while M&A events are similar to mass layoffs in the sense that they both create job displacements, the mechanism through

[19] We find similar effects on target workers' earnings for both partial acquisitions and mergers, suggesting a limited role for increased market power driving our findings (Appendix B). Moreover, given that a much larger share of M&A events involves partial acquisitions, there is a limited possibility of large increases in market power after the event.

[20] Note that we continue to find a lack of support for increased market power explaining our results even when we focus on a subset of large firms whose mergers or acquisitions may have larger impacts on market concentration. The results from this subsample analysis may be provided upon request.

which M&As affect job movers' earnings could be different relative to the channel through which mass layoffs affect displaced workers' earnings.

We consider two broad classes of mechanisms. First, job transitions may cause impacts purely from the type of firms individuals are employed at. If M&A events cause workers to move from highly productive and large firms to low productivity and small firms, then these compositional impacts could rationalize the results. For example, Lachowska et al. (2020) and Schmieder et al. (forthcoming) seek to understand whether the characteristics of the firm the individual is employed at can explain long-term earnings losses due to mass layoffs. Similarly, in the next section, we test whether the firm plays a role in earnings losses of job movers after M&A events. In contrast to their studies, our work looks at firm characteristics from the balance-sheet data, such as profitability, to directly assess whether target workers are moving to less productive firms. We show that target workers move to larger and more profitable firms on average after M&As, therefore finding limited evidence for this channel.[21] Therefore, we next consider heterogeneity in the types of workers. We find significant heterogeneity that can be rationalized by models of the labor market in which there is a complementarity between the worker and the firm that is specific to a given employment relationship. In the final part of the paper, we discuss mechanisms through which such a complementarity may arise.

6.1.1 Compositional Effects

To understand the role of the firm, we estimate an analogue to equation (2), substituting in as the outcome variable the observable firm characteristics, such as employment, total revenue, and profit margins. The goal is to assess whether the earnings losses following job transitions can be attributed to a mover's reemployment by an employer with a different size or profitability than the employer from which the mover left.

Figure 5 shows changes in average firm characteristics of target workers who move to other firms after the M&A event. Because of the tenure restriction, any change in pre-event firm characteristics is driven by yearly changes in target firms' characteristics. The change in firm characteristics in event year ($t = 0$) still reflects the change in target firms' characteristics, given that the first job transition happens one year after the event. Starting from one year after the event ($t = 1$), changes in firm characteristics reflect both changes in new employers where target workers moved, and changes in target firms of workers who had not left yet. Figure 5 shows that workers transition to firms with more employees, higher sales, and higher profit margins. Table 5 presents the difference-in-differences results summarizing these impacts, finding workers from target firms

[21] We also find that target workers move to firms with higher firm-specific wage premiums (Appendix A).

move to firms with higher employment (51.8 log points), higher revenue (49.9 log points) and higher profit margins (1.8 percentage points).

To summarize, we find that workers who transition jobs after M&A events move to better firms along a number of dimensions. Despite this, their actual earnings are 4.0 log points lower on average. In the next section we explore mechanisms through which such a result could arise.

6.1.2 Heterogeneity by Workers

In this section, we explore heterogeneity by workers in order to understand who is most impacted by these job transitions. This will allow us to understand various theoretical mechanisms through which workers are affected by M&As. In particular, it will allow us to understand why workers still suffer earnings losses despite moving to on-average larger and more profitable firms.

First, we consider heterogeneity by the worker's tenure. There are two conceptual models that would predict impacts increasing in tenure. First, a model of firm-specific human capital (i.e., Lazear 2009) predicts that high-tenure workers would lose more from moving after an M&A event. This is because the high-tenure worker's productivity is much lower at other firms. Second, a model of backloaded contracts (i.e., Lazear 1979) also predicts high-tenure workers would lose more by moving to other firms. In this model, workers are paid below their marginal product early in an employment spell, and above their marginal product later. This is an optimal contract in situations where effort cannot be perfectly monitored. This model predicts that high-tenure workers will suffer especially large impacts due to job transitions, as these workers currently enjoy wages above their marginal product at the current employer.

To study impacts by tenure, we divide workers into two groups: those with 4 years of tenure (shorter tenure), and those with 7 or more years of tenure (longer tenure).[22] In Figure 6, for individuals with 4 years of tenure we find small, short-run negative impacts that quickly disappear 2 years after the event. Individuals with 7 or more years of tenure see a large decline in their earnings after M&As. As shown in Table 6, on average, they suffer earnings losses of about 4.5 percent relative to workers with 4 years of tenure whose earnings stay similar on average.[23]

These results are consistent with models of the labor market that include some complementarity between the worker and the firm. To understand this channel further, we next exploit heterogeneity by within-firm earnings quintiles. Intuitively, both the productivity and bargaining channels may

[22]For this analysis, we implement another matching strategy to ensure control workers are in the same tenure bin as the target workers. We find qualitatively similar results when we use a different cut to define short tenure and longer tenure workers. Results based on a different cut can be provided upon request.

[23]Furthermore, both short-tenure and long-tenure workers are moving to better-paying firms on average relative to their original firm. These results can be provided upon request.

be more relevant for highly-skilled labor. For example, in hospital mergers, Prager and Schmitt (2021) finds impacts for nurses, but no impacts on unskilled workers such as cafeteria workers, whose skills were not tied to the hospital industry. In our context, we do not observe the worker's occupation. Instead, we use within-firm earnings quintiles to capture a crude measure of the complexity of the job. Additionally, this analysis is also informative about distributional consequences of M&A events.

In Figure 7 we plot the impacts of M&As for individuals in the bottom quintile of the earnings distribution versus individuals in the top quintile of the earnings distribution.[24] For workers in the top quintile, we see a 4.6 log points larger decline in earnings when they move to other firms after the event, relative to job movers in the bottom quintile of the earnings distribution, as shown in Column (1) of Table 7. These differences are not due to the types of firms these workers move to.[25]

Together, these results are consistent with a model in which there is a complementarity between the worker and the firm that results in the worker being paid an especially high wage at a given firm. As discussed before, this complementarity may arise for multiple reasons. It could be a productivity complementarity, in which the long-tenure workers are particularly productive at the M&A firms, and that this complementarity is lost due to the job transition. Or it could be a bargaining complementarity. In other words, these workers were either able to bargain for an especially large portion of the surplus within a job, or were at a point in their contract that they were receiving higher wages. In the next section we conceptualize these two forces in a simple model and discuss how to hypothetically distinguish between them.[26]

6.2 Conceptual Model to Rationalize our Results

In this final section, we clarify the channels that are consistent with our worker-level results. We present a simple model of the labor market following Lazear (1979) and Saez et al. (2023). This model will highlight the two channels that are consistent with our results for workers.

Worker i's productivity at firm j is given by p_{ij}. The worker's outside option is given by O_i. The firm receives the output of the worker p_{ij}. They pay a wage of w_{ij} and have outside option of O_j. We assume a firm must pay a firing cost f in the event of a layoff. This firing cost may be

[24] For this analysis, we implement the matching strategy again to ensure control workers are in the same quintile of the earnings distribution within their firm as the target workers.

[25] Similar to the results by workers' tenure, both bottom-quintile workers and top-quintile workers are moving to better-paying firms on average. These results can be provided upon request.

[26] An alternative explanation could be that target workers move to larger and more profitable firms and accept lower wages due to non-wage amenities, such as geographical proximity or job stability. However, it is also likely that low-tenure or low-wage workers have preferences for non-wage amenities (i.e., good locations or job security), so this channel would be inconsistent with our heterogeneity results based on worker tenure or prior earnings.

driven by either explicit or implicit costs. Explicit firing costs stem from employment protection legislation that may impact the cost of firing a worker, which is studied in Saez et al. (2023). In our context, implicit models arise from multiple sources. For example, Shleifer and Summers (1988) posit that takeovers may allow new managers to lay off workers and reduce salaries by breaching the trust that is developed between the previous manager and workers in a firm. Lazear (1979) illustrates a model in which firms pay initially low wages, which rise over time, eventually eclipsing the marginal product of the worker. Contracts are structured in this way to provide workers an incentive not to shirk on the job. Importantly, firms have an incentive to lay off older workers whose marginal product is lower than their wage, but do not do so due to reputation concerns. If the firm did lay off older workers, then younger workers would not accept the lower pay in the initial part of the contract. We allow the firing cost f to depend on these factors that are implicit in equilibrium contracts.

A worker will remain in a job as long as the participation constraint is satisfied:

$$S_w = w_{ij} - O_w \geq 0 \tag{3}$$

The firm will continue to hire a worker as long as the firm's participation constraint is satisfied:

$$S_j = p_{ij} - w_{ij} - (O_j - f) \geq 0 \tag{4}$$

Models of firm-specific human capital, such as Lazear (2009), predict that individuals with high tenure will accumulate skills that make p_{ij} particularly large at their firm. This suggests the gap between productivity and the outside options for these workers will be large.[27] Therefore, with firm k acquiring firm j, $p_{ik} < p_{ij}$ would explain both why job separations occur and why workers with high tenure suffer larger earnings losses.[28] Essentially, in this case, the acquisition destroys a productive match between a worker and firm.

However, this is not the only channel in this model that can rationalize the results. Shleifer and Summers (1988) and Lazear (1979) both include models in which workers are paid more than their marginal product at some point in their contract. One way to include these types of considerations into the model above is to assume that f is something that can be reduced by M&A activity. For example, if f is composed of implicit firing costs, and these implicit costs do not apply after the

[27] While we are agnostic about exactly how w_{ij} is determined in equilibrium, a higher productivity increases the maximum possible wage that allows for both participation constraints to be still satisfied. Therefore, if the productivity is higher at the firm, the worker is likely to benefit from higher wages.

[28] Increases in productivity can occur within an occupation, or from workers moving up the occupational ladder within the firm, as in Gibbons and Waldman (1999).

takeover, then this could also rationalize increased separations following an M&A event.

In particular, there exists a set of individuals such that $p_{ij} - w_{ij} - O_j < 0$, but are not fired because of the firing cost. Saez et al. (2023) conceptualize these individuals as deadwood labor. These jobs are only sustained due to the presence of firing costs. In other words, contracts as proposed in Shleifer and Summers (1988) and Lazear (1979) will reach points in which the surplus (net of firing costs) for firms is negative. At this point in time, the surplus for workers will be large, as w_{ij} is higher for high-tenure workers. Therefore, we will find the largest impacts for high-tenure workers that receive these backloaded contracts.

In practice, it is difficult to disentangle these two mechanisms. Ideally, one would want to observe worker-level productivity to understand how M&As impact worker-level productivity. However, even at a conceptual level, it is difficult to understand how one would measure worker-level productivity for most jobs.

While we cannot observe worker-level productivity, one observable that is informative of this discussion is firm-level profitability. Note that if firms are firing workers for whom $p_{ij} - w_{ij} - O_j < 0$ then these firms should see increases in profit margins. In this case, the outside option O_j is greater than the profits from worker i ($p_{ij} - w_{ij}$). However, as discussed in Section 6 and Appendix B, we find no evidence of increased profit margins for either acquiring firms or target firms following the M&A event. Therefore, in order to rationalize the worker-level impacts through firing of deadwood labor, one would need to believe that there are multiple off-setting decisions being made by new management. In other words, in this story, management is laying off unproductive workers, so that overall productivity should increase. But they are not realizing any gains from this, so they must be making different, productivity-reducing decisions as well to rationalize the overall decline in profitability. M&As are of course heterogeneous events, so multiple channels are possibly at play.

To summarize, we find that the decrease in earnings in our setting is primarily driven by target workers who transition jobs after an M&A event and move to different firms. While some M&A events may increase labor market or product market power, we find the number of such events is limited in our setting. Workers who transition to new firms after M&A events move to firms that have better observable characteristics along a number of dimensions. These firms have higher revenue, employment, and profit margins. Despite this, workers who transition to these firms still experience decreases in earnings overall. Our results are consistent with a story in which a complementarity between the worker and firm that results in higher wages is destroyed. This is consistent with models featuring firm-specific human capital or backloaded contracts. Our worker-level heterogeneity results are consistent with these complementarity stories, finding that longer-tenure workers or those at the top of the within-firm earnings distribution suffer the largest earnings losses after an M&A event.

7 Conclusion

In this paper, we use linked employer-employee data to connect the impact of M&A events on firms to the impact on their employees. Previous research has looked at the financial impact on firms and the impact on workers' outcomes separately, but our paper is the first to link these impacts directly using our administrative data from tax records on both firms and workers. This allows us to look deeper into firm-based mechanisms than has been possible in previous research.

Using a matched difference-in-differences design, we compare firms that went through an M&A to matched control firms of the same size bins, province, and sector. Our results show that acquiring firms expand, but target firms shrink significantly, without much change in the aggregate (targets and acquirers combined). For workers at target firms, we find that their earnings decline and job separations increase significantly after an M&A event.

Leveraging detailed firm balance sheet data, we investigate different potential mechanisms for the decline in workers' earnings at target firms. Since we see no meaningful change in labor market concentration after M&As, we conclude that a rise in market concentration is unlikely the key mechanism behind post-M&A wage declines. Furthermore, since profit margins decrease at both targets and acquirers, without any meaningful changes in markups, a rise in product market concentration is unlikely to have driven the decline in worker earnings either. Instead, we find that the decrease in earnings of workers at targets is largely driven by those who move to other firms after the M&A event. While these workers move to larger firms with higher profit margins on average, they experience a decline in their earnings potentially due to a loss of firm-specific human capital or backloaded contracts.

Our findings provide important context for research investigating the labor market consequences of corporate M&As. Whichever mechanism is under investigation, care should be taken to account for how firm-level outcomes, especially their profitability and growth, as well as worker-level outcomes, may change after M&As. Our results also matter for public policy. In Canada, an ongoing review of the Competition Act targets both the impact of M&As on labor and how potential efficiency gains are weighed in merger decisions. Similar debates are happening in other countries, including the United States (Naidu et al. 2018). Our results provide new evidence of the negative impact of M&As on wages that add perspective to these policy debates, and our findings on post-M&A firm performance raise doubts about the efficiency arguments made in support of M&As.

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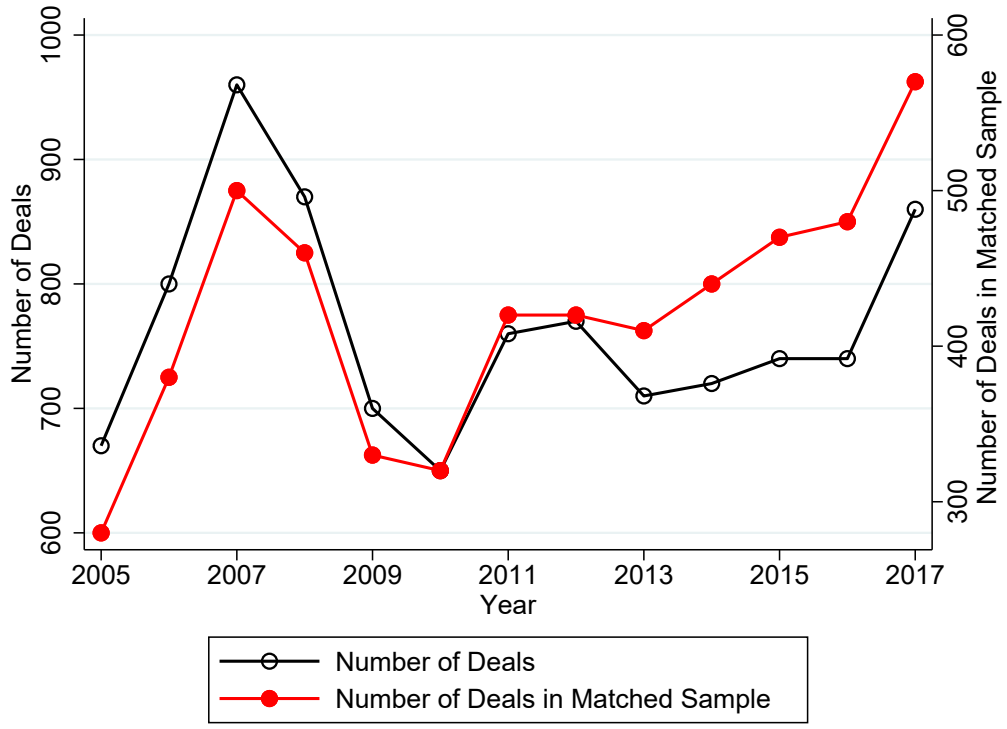
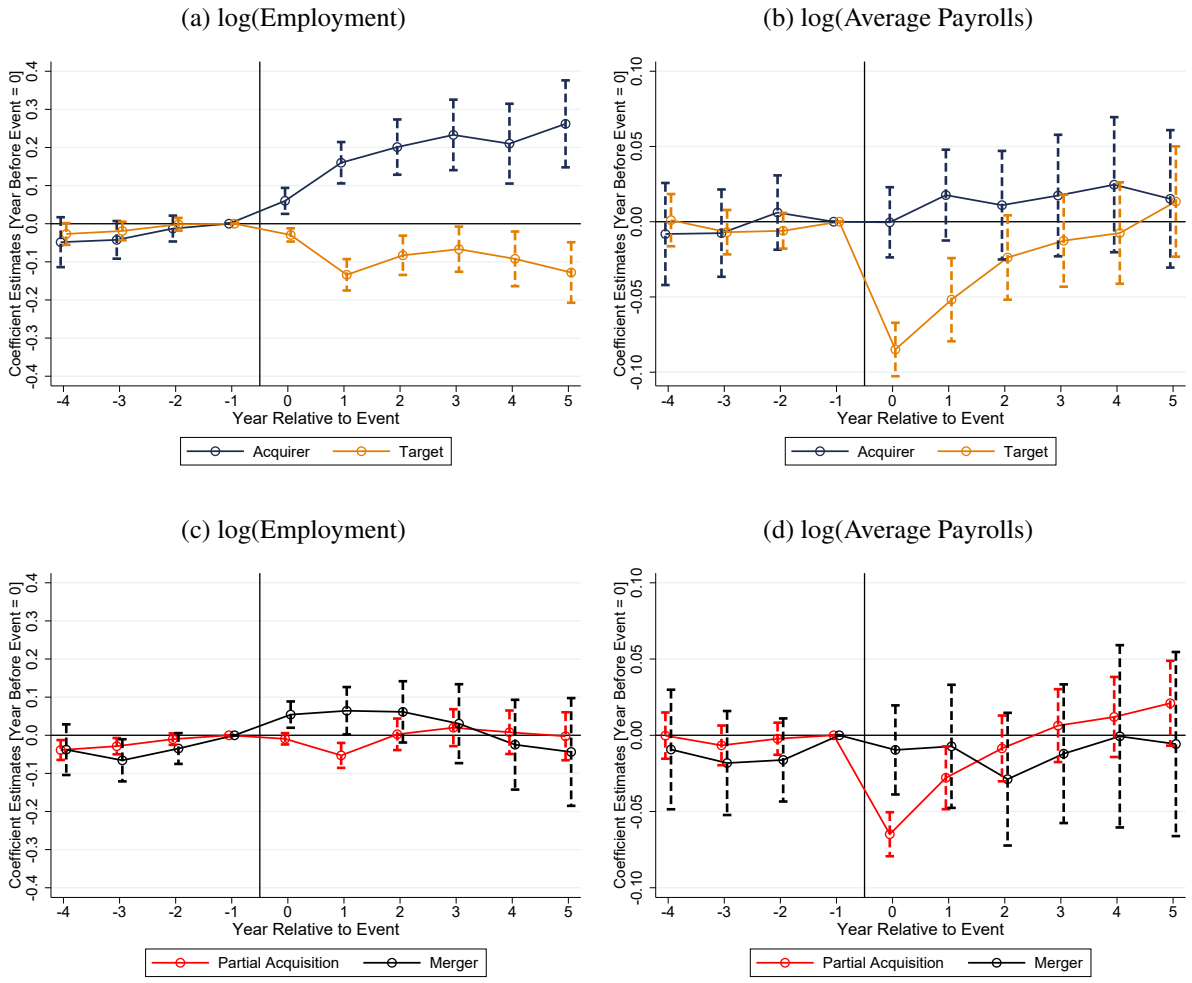
Figure 1: Number of M&A Events



Notes: During our sample period, the number of M&A events is 765 per year (including multiple events for a given firm) on average among the sample of firms eligible for matching as explained in Section 4 (black line). Among these eligible firms, the number of M&A events in the matched sample is 422 per year (including multiple events for a given firm) on average (red line). Section 4 describes how we construct our matched sample of firms. During our sample period, the unique number of firms eligible for matching is 5,200. Among these firms, the unique number of matched firms (both targets and acquirers) is 4,100. Therefore, the matching strategy finds a counterfactual firm in about 79 percent of all cases among this sample of eligible firms.

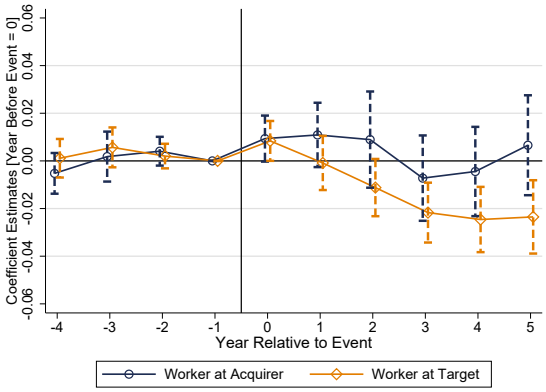
Figure 2: Employment and Average Payrolls After M&As



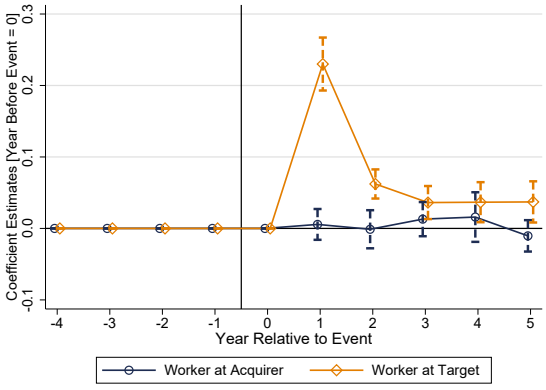
Notes: These figures display event-study estimates for the impact of M&As on employment and average payrolls. Panel (a) and (b) show the estimates for the impact of partial acquisitions, separately for acquiring firms (navy line) and for target firms (orange line). Panel (c) and (d) show the estimates on the aggregate firm-level (targets and acquirers combined) outcomes, separately for those involved in partial acquisitions (red line) and for those involved in mergers (black line). The dashed lines indicate 95 percent confidence intervals where the standard errors are clustered at the firm level. The M&A event is in year 0 and the coefficient is normalized to be zero in year -1.

Figure 3: Worker Earnings and Job Transitions After M&As

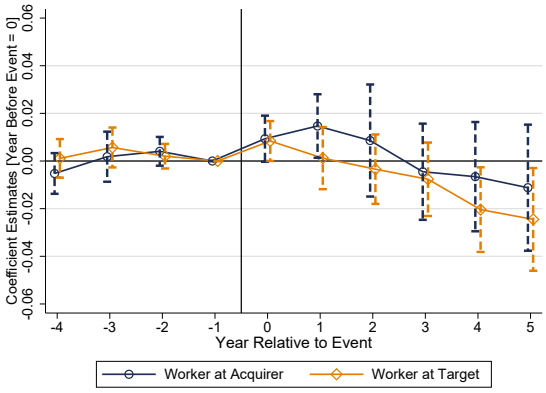
(a) log(Earnings)



(b) Job Transition

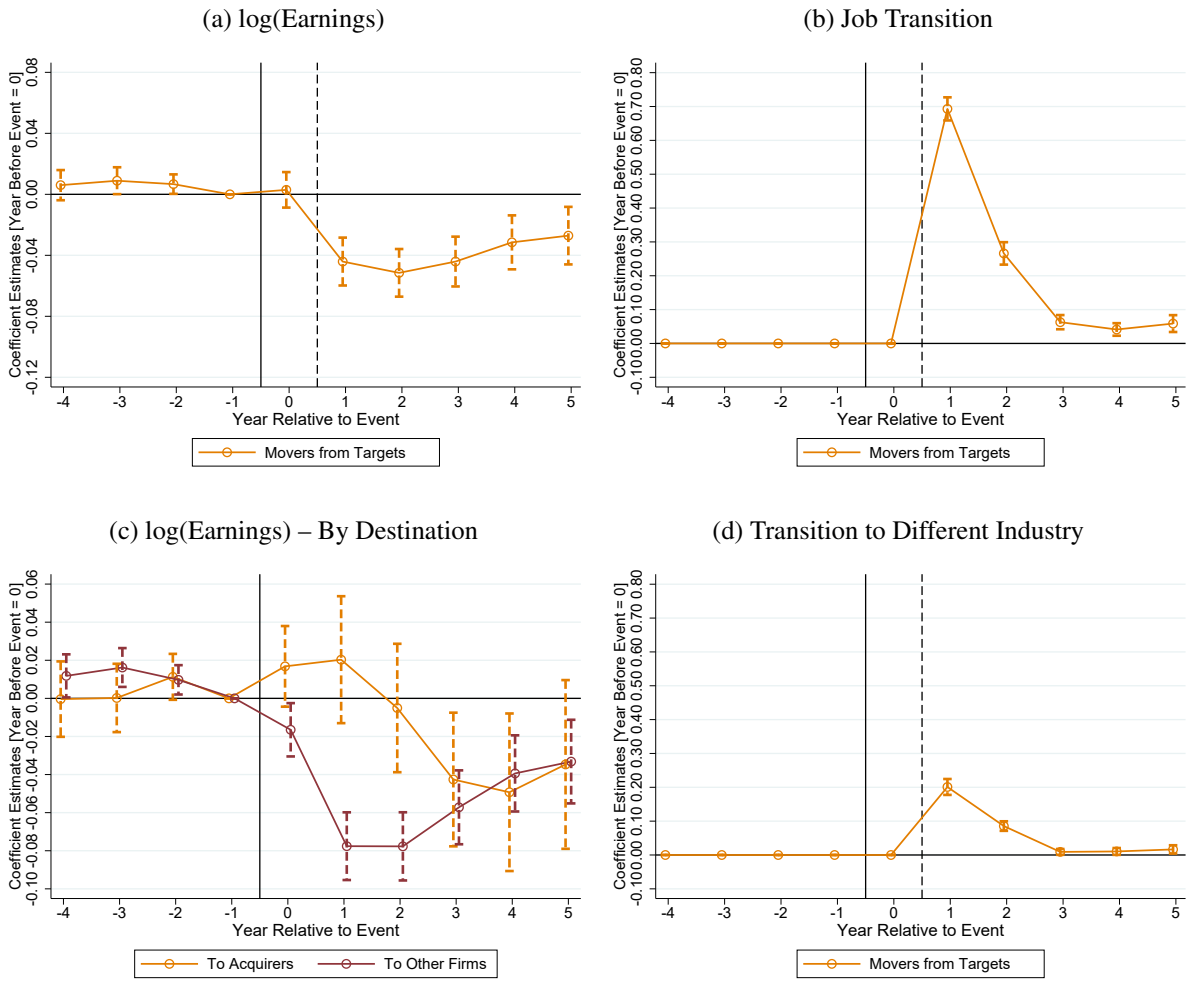


(c) log(Earnings) for Stayers



Notes: These figures display event-study estimates for the impact of M&As on worker-level outcomes, separately for workers at acquiring firms (navy line) and for workers at target firms (orange line). Panel (a) shows the estimates for log of total earnings. Panel (b) shows the estimates for job transition probabilities. Panel (c) shows the estimates for log of total earnings for firm stayers. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker and firm level. The M&A event is in year 0 and the coefficient is normalized to be zero in year -1.

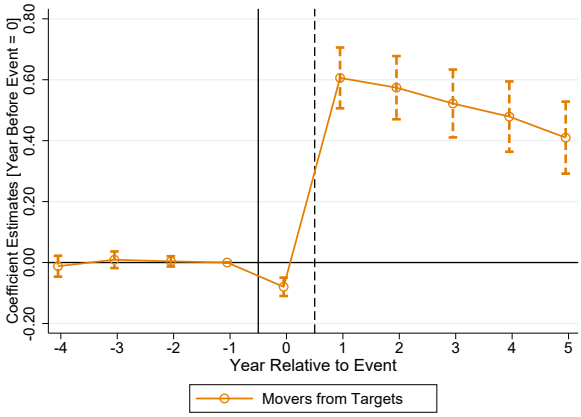
Figure 4: Workers Moving from Targets



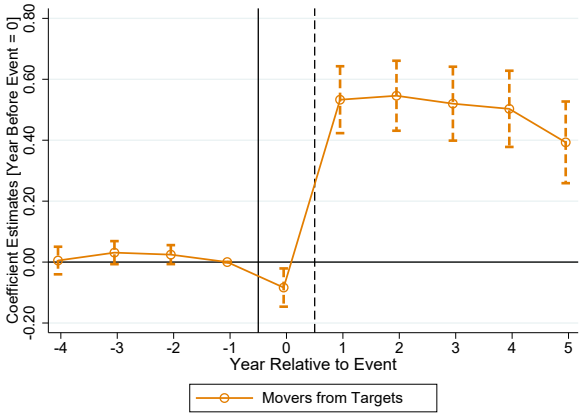
Notes: These figures display event-study estimates for the impact of M&As on workers moving from target firms within the first two years after the event, as described in Section 6. Panel (a) shows the estimates for log of total earnings. Panel (b) shows the estimates for job transition probabilities. Panel (c) shows the estimates for log of total earnings based on their destination. A small share of workers also move within their original parent company; however, we do not observe any impact for these workers, so we do not report their estimates here. Panel (d) shows the estimates for probability of transition to a different industry. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker and firm level. The M&A event is in year 0 and the coefficient is normalized to be zero in year -1.

Figure 5: Firm Characteristics of Workers Moving from Targets

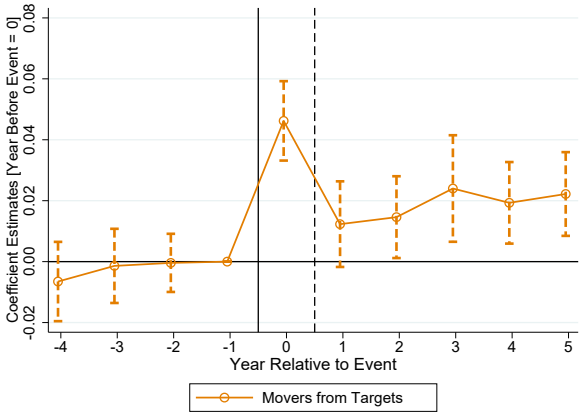
(a) log(Employment)



(b) log(Revenue)

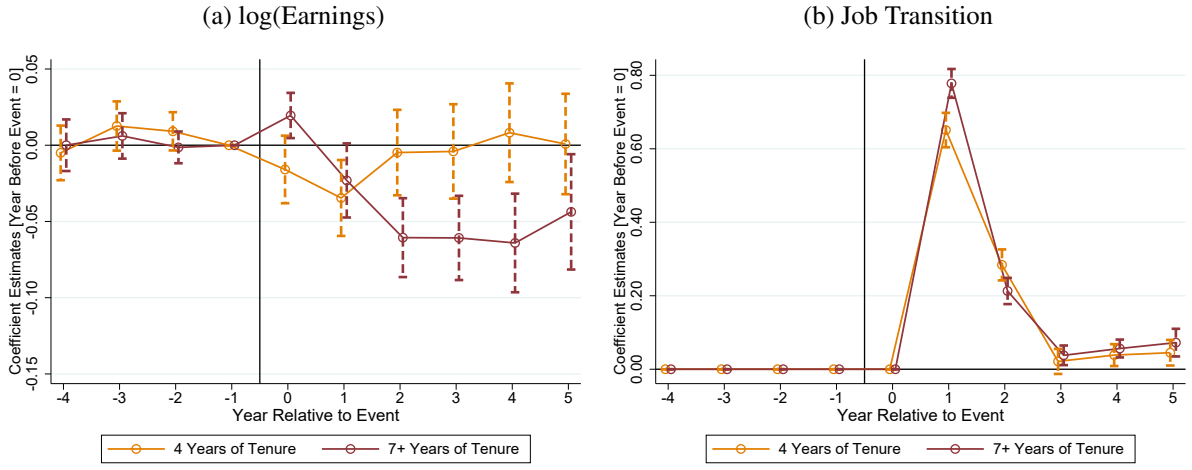


(c) Profit Margins



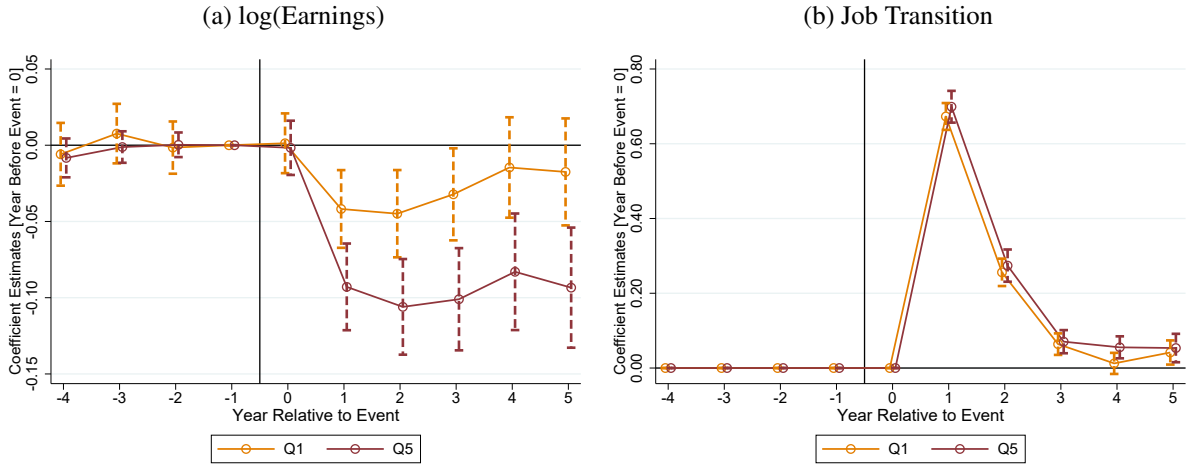
Notes: These figures display event-study estimates for changes in average firm characteristics of workers moving from target firms within the first two years after the event, as described in Section 6. Panel (a) shows the estimates for log of employment. Panel (b) shows the estimates for log of total revenue. Panel (c) shows the estimates for profit margins. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker and firm level. The M&A event is in year 0 and the coefficient is normalized to be zero in year -1.

Figure 6: Workers Moving from Targets – By Worker Tenure



Notes: These figures display event-study estimates for the impact of M&As for workers moving from target firms within the first two years after the event, separately for those with 4 years of tenure and for those with 7 or more years of tenure by one year before the event. Panel (a) shows the estimates for log of total earnings. Panel (b) shows the estimates for job transition probabilities. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker and firm level. The M&A event is in year 0 and the coefficient is normalized to be zero in year -1.

Figure 7: Workers Moving from Targets – By Within-Firm Earnings Distribution



Notes: These figures display event-study estimates for the impact of M&As for workers moving from target firms within the first two years after the event, separately for those at the bottom quintile (Q1) and for those at the top quintile (Q5) of the within-firm earnings distribution. Panel (a) shows the estimates for log of total earnings. Panel (b) shows the estimates for job transition probabilities. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker and firm level. The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Table 1: Descriptive Statistics on the Matched Sample of Firms and Workers

	(1) Acquirer	(2) Control	(3) Target	(4) Control
Panel A: Firm Characteristics				
Total Revenue (in millions)	62	47	34	29
Total Expenses (in millions)	58	44	32	28
Profit Margins	0.02	0.05	0.02	0.05
Number of Employees	187	125	106	87
Average Wage Bill	52,472	51,956	50,380	49,175
Leverage Ratio	0.65	0.67	0.7	0.65
Markups	1.88	1.68	1.88	1.68
Number of Firms	1,040	1,040	3,060	3,060
Panel B: Sectors (Firms)				
Construction	0.06	0.06	0.05	0.05
Manufacturing	0.23	0.23	0.26	0.26
Wholesale	0.15	0.15	0.14	0.14
Retail	0.03	0.03	0.05	0.05
Transportation	0.03	0.03	0.04	0.04
Information	0.04	0.04	0.04	0.04
Services	0.33	0.33	0.32	0.32
Other Sectors	0.13	0.13	0.11	0.11
Panel C: Worker Characteristics				
Total Earnings	70,046	71,386	70,625	72,317
Age	46.7	46.6	47.2	47.0
Female	0.33	0.33	0.31	0.31
Number of Workers	42,780	42,780	64,520	64,520
Panel D: Sectors (Workers)				
Construction	0.03	0.03	0.02	0.02
Manufacturing	0.49	0.49	0.5	0.5
Wholesale	0.16	0.16	0.1	0.1
Retail	0.01	0.01	0.03	0.03
Transportation	0.03	0.03	0.03	0.03
Information	0.02	0.02	0.02	0.02
Services	0.19	0.19	0.21	0.21
Other Sectors	0.05	0.05	0.08	0.08

Notes: This table reports descriptive statistics on the matched sample of firms and workers, measured one year prior to the event. Panel A reports firm characteristics such as total revenue, total expenses, profit margins, number of employees, average payrolls, leverage ratio, and markups. Columns (1) and (3) report these statistics for acquiring firms and for target firms, respectively, and column (2) and (4) report these statistics for their respective matched control firms. Panel B reports the distribution of firms in the matched sample across 2-digit NAICS sectors. Panel C reports worker characteristics such as total annual earnings, age, and gender. Columns (1) and (3) report these statistics for workers at acquirers and for workers at targets, respectively, and column (2) and (4) report these statistics for their respective matched control workers. Panel D reports the distribution of workers in the matched sample across 2-digit NAICS sectors. Other sectors include (1) Agriculture, forestry, and fishing, (2) Mining, quarrying, and oil and gas extraction, (3) Utilities, (4) Real estate and rental and leasing, (5) Arts, entertainment and recreation, (6) Accommodation and food services, (7) Other services, and (8) Public administration.

Table 2: Difference-in-differences Estimates on Firm Outcomes

	(1)	(2)	(3)	(4)
	Partial Acquisition		**Aggregate**	
	Target	Acquirer	Partial Acquisition	Merger
log(Employment)	-0.089***	0.188***	-0.006	0.024
	(0.023)	(0.033)	(0.018)	(0.038)
Mean at t = -1	4.00	4.55	4.14	4.02
Adj. R squared	0.875	0.891	0.879	0.880
Firm-Year Obs.	66,680	21,930	89,230	19,100
log(Average Payrolls)	-0.028***	0.014	-0.010	-0.011
	(0.011)	(0.014)	(0.008)	(0.017)
Mean at t = -1	10.68	10.73	10.70	10.73
Adj. R squared	0.795	0.817	0.798	0.799
Firm-Year Obs.	66,590	21,870	89,080	19,040

Notes: This table reports the difference-in-differences estimates for the impact of M&As on employment and average payrolls. Columns (1) and (2) report the estimates for the impact of partial acquisitions for target firms and for acquiring firms, respectively. Columns (3) and (4) report the estimates on the aggregate firm-level (targets and acquirers combined) outcomes for those involved in partial acquisitions and for those involved in mergers, respectively. The standard errors are clustered at the firm level.

Table 3: Difference-in-differences Estimates on Worker Outcomes

	(1) log(Earnings)	(2) Transition	(3) log(Earnings) - Stayers
Workers at Target	-0.012**	0.067***	-0.008
	(0.005)	(0.007)	(0.006)
Mean at t = -1	11.01	0.00	11.01
Adj. R squared	0.739	0.187	0.797
Worker-Year Obs.	2,023,130	2,0264,40	1,581,880
Workers at Acquirer	0.004	0.004	0.002
	(0.007)	(0.006)	(0.008)
Mean at t = -1	11.02	0.00	11.02
Adj. R squared	0.732	0.171	0.786
Worker-Year Obs.	1,343,370	1,345,330	1,084,030

Notes: This table reports the difference-in-differences estimates for the impacts of M&As on workers' outcomes, separately for those at acquiring firms and for those at target firms. The dependent variables in columns (1) and (2) are log of total earnings and the probability of job transitions. Column (3) reports the estimates on log of total earnings for firm stayers. The standard errors are two-way clustered at the worker and firm level.

Table 4: Workers Moving from Targets

	(1)	(2)	(3)	(4)	(5)
			log(Earnings) - By Destination		
	log(Earnings)	Transition	To Acquirer	To Other Firms	To Diff Industry
Workers Moving	-0.040***	0.224***	-0.016	-0.050***	0.064***
from Targets	(0.007)	(0.006)	(0.013)	(0.007)	(0.004)
Mean at t = -1	10.98	0.00	10.96	10.93	0.00
Adj. R squared	0.739	0.317	0.765	0.736	0.167
Worker-Year Obs.	689,900	691,120	144,550	430,750	691,120

Notes: This table reports the difference-in-differences estimates for the impacts of M&As for workers moving from target firms within the first two years after the event. Column (1) displays the estimates for log of total earnings. Column (2) displays the estimates for the job transition probabilities. Columns (3) and (4) display the estimates for log of total earnings based on workers' destination (to acquiring firms and to other firms, respectively). A small share of workers also move within their original parent company; however, we do not observe any impact for these workers, so we do not report the estimates here. Column (5) displays the estimates for the probability of transition to a different industry. The standard errors are two-way clustered at the worker and firm level.

Table 5: Changes in Average Firm Characteristics of Workers Moving from Targets

	(1) log(Employment)	(2) log(Revenue)	(3) Profit Margins
Workers Moving	0.518***	0.499***	0.018***
From Targets	(0.052)	(0.055)	(0.007)
Mean at t = -1	5.74	18.22	0.05
Adj. R squared	0.790	0.803	0.466
Worker-Year Obs.	688,280	649,220	650,510

Notes: This table reports the difference-in-differences estimates for changes in average firm characteristics of workers moving from target firms within the first two years after the event. Column (1) displays the estimates for log of employment. Column (2) displays the estimates for log of revenue. Column (3) displays the estimates for profit margins. The standard errors are two-way clustered at the worker and firm level.

Table 6: Workers Moving from Targets – By Worker Tenure

	(1) log(Earnings)	(2) Transition
Post × Treated	0.006	0.180***
	(0.011)	(0.008)
Post × Treated × 7+ Years of Tenure	-0.045***	0.012
	(0.014)	(0.010)
Mean at t = -1 (4 Years of Tenure)	10.96	0.00
Mean at t = -1 (7+ Years of Tenure)	11.03	0.00
Adj. R squared	0.745	0.404
Worker-Year Obs. (4 Years of Tenure)	186,170	186,660
Worker-Year Obs. (7+ Years of Tenure)	251,020	251,340

Notes: This table reports the difference-in-differences estimates for the impacts of M&As for workers moving from targets within the first two years after the event, separately for those with 4 years of tenure measured one year prior to the event. The triple interaction term captures the triple-difference estimates for those with 7 or more years of tenure measured one year prior to the event. Column (1) displays the estimates for log of total earnings. Column (2) displays the estimates for the job transition probabilities. The standard errors are two-way clustered at the worker and firm level.

Table 7: Workers Moving from Targets – By Within-Firm Earnings Distribution

	(1) log(Earnings)	(2) Transition
Post × Treated	-0.028**	0.181***
	(0.011)	(0.006)
Post × Treated × Q5	-0.046**	0.007
	(0.021)	(0.005)
Mean at t = -1 (Q1 = 1)	10.45	0.00
Mean at t = -1 (Q5 = 1)	11.56	0.00
Adj. R squared	0.745	0.324
Worker-Year Obs. (Q1 = 1)	126,710	126,980
Worker-Year Obs. (Q5 = 1)	119,950	120,160

Notes: This table reports the difference-in-differences estimates for the impacts of M&As for workers moving from targets within the first two years after the event, separately for those in the bottom quintile (Q1) of the within-firm earnings distribution measured one year prior to the event. The triple interaction term captures the triple-difference estimates for workers in the top quintile (Q5) of the within-firm earnings distribution. Column (1) displays the estimates log of total earnings. Column (2) displays the estimates for the probability of transition. The standard errors are two-way clustered at the worker-firm level.

ONLINE APPENDIX:

Job Transitions and Employee Earnings After Acquisitions: Linking Corporate and Worker Outcomes

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A Robustness Checks

In Appendix A, we provide results from robustness tests discussed in Sections 4 – 6.

A.1 Different Clustering

Our main firm-level results are based on clustering at the firm level and our main worker-level results are based on two-way clustering at both firm level and worker level. We also do robustness tests on the key firm-level and worker-level outcomes, where standard errors are clustered at the market level (defined at the four digit NAICS by commuting zone) for firm-level results, and are two-way clustered at the worker and market level for worker-level results. Figure A1 and Table A1 show that the results on employment and average payrolls, and worker-level earnings are similar to the main estimates. Note that the coefficient estimates on these outcomes are slightly different from our main estimates, even though we only change the way we cluster our standard errors. This is because some firms and workers have missing commuting zone information, so they are dropped from our analysis sample when we cluster the standard errors at the market level.

A.2 Using Matched Control Firms in Different Markets

Matching on size, province, and sector finds firms that would plausibly exhibit common trends in the absence of an M&A activity. However, it is possible that firms can be matched within the same market (defined at the four-digit NAICS industry by commuting zone), which is potentially concerning if M&As have impacts on local labor markets through increased concentration. If M&As have negative effects on firms in the same market, then the impact of M&As on firms and workers will be biased towards zero. To minimize this concern, we do a robustness check by matching firms within the same province, but across different markets, and find similar results to our main results where we allow M&A firms to be matched with control firms within the same market. Figure A2 and Table A2 show that the effects on the key firm-level and worker-level outcomes from this approach are qualitatively similar to our main estimates.

A.3 Outcomes in Levels (Replacing Missing Observations with Zeros)

We show results on the key outcomes, such as employment, average payrolls, and worker-level earnings, in logs. A potential concern with this approach is that we cannot account for firms and workers exiting the sample after M&As. This concern is especially relevant for target firms and

for displaced workers from targets that might exit our sample. Although we find the the vast majority of target firms continue to operate independently and most displaced workers find a job at a different firm, we run our main analyses in levels, replacing missing observations with zeros, to account for a small share of firms and workers who exit the sample after M&As. Figure A3 and Table A3 show that the main results are qualitatively robust to the specification where the outcomes are measured in levels.

A.4 By One-time vs. Repeat Acquirers

Prior research points out that a part of the motive behind M&As involves empire-building, which could result in losses in efficiency and profitability after the event (Jensen, 1986). Even though it is practically difficult to discern whether a particular acquirer has an empire-building motive in our data, we test whether the effects on firm sizes and average payrolls are different depending on whether an acquirer engages in multiple M&A transactions. Specifically, we compare the outcomes of acquirers involved in a single partial acquisition relative to the outcomes of acquirers involved in multiple partial acquisitions during our sample period. Figure A4 and Table A4 show that acquirers involved in repeat M&A transactions tend to grow a bit larger, in terms of the number of employees and average payrolls after the event, compared to acquirers involved in a single M&A deal. While these results provide suggestive evidence consistent with the empire-building story, these differences could be also simply driven by the fact that acquirers involved in multiple deals might mechanically increase in sizes more.

A.5 Using Private Firms Only

Prior research points out that publicly listed firms engage in M&As more than private firms during merger waves, and that acquisitions can be efficiency improving, especially when buyers and sellers are publicly listed firms during on-the-wave mergers (Maksimovic et al., 2013). While the vast majority (96 percent) of firms that go through M&As in our matched sample are private, we repeat our analysis focusing only on private firms, since the effects of M&As on firm-level outcomes might be different between listed firms and private firms. Figure A5 and Table A5 show that the results on firm and worker outcomes are similar to our main results where we include publicly listed companies, implying that our results are robust to just focusing on private firms in our sample.

A.6 Use a Sample of Unmatched Firms and Workers

In our main analysis sample, roughly 20 percent of M&A firms eligible for matching (as described in Section 4) are not matched to their control group either because of their sector, location, or firm characteristics. Correspondingly, about 68 percent of workers in M&A firms (eligible for matching) are not matched to their control group either because their firms were not matched or there are not enough control workers to be matched (as we impose that only one worker is matched with a treated worker). In Table A8, we show characteristics of these unmatched firms and workers. Panel A shows that unmatched firms are quite similar to our matched control firms on average in terms of total revenue, total expenses, and leverage ratio, but are much larger in terms of the number of employees, average payrolls, and markups. Panel C shows that unmatched workers have much lower earnings relative to our matched control workers on average. Note that the number of workers eligible for matching includes those at unmatched M&A firms eligible for matching. Therefore, the match rate for workers decreases from 57 percent (as indicated in Section 4) to 32 percent once we include all eligible workers across all eligible firms. The match rate for our main worker sample (57 percent) is computed using the sample of all eligible workers among the matched sample of firms only.

An external validity concern is whether our matched sample of M&A firms and workers are representative within Canada. We argue that our matched sample of firms and workers are representative of overall M&A activities in Canada, given that we have a good match rate among firms and workers eligible for matching. Still, we test whether our results significantly change once we incorporate these previously unmatched set of firms and workers that were eligible for matching.

Panel (a) of Figure A6 shows the results on employment, separately for targets and for acquirers involved in partial acquisitions, including previously unmatched M&A firms. Here, we just add these unmatched acquirers and targets as part of the treated (M&A) group, without matching them with possible control firms, so we still use the same set of matched control firms in this analysis. As shown in the figure, the parallel pre-trend appears to get a bit weaker once we include previously unmatched firms, but we still find qualitatively similar results on employment after M&As. We find similar results on average payrolls in Panel (b). Panel (c) shows the results on worker-level earnings, separately for workers at targets and for workers at acquirers, including previously unmatched workers from M&A firms. We find that while the parallel pre-trends are not as good as those in our main results (Panel (a) of Figure 3), we still find qualitatively similar results on worker-level earnings after the event. Therefore, these results suggest that our results are not driven by a particular sample of matched M&A firms and workers in our data.

A.7 AKM and Match Effects

A.7.1 AKM effects

To understand the role of the firm in explaining the earnings decline for target workers, we compare the observable characteristics of the targets firms and of the new firms that target workers move to after M&As in Section 6. In this section, we estimate firm-specific pay premiums using standard AKM models. We then characterize a firm-specific wage premium of the old employer and of the new employer for each worker who undergoes a separation following an M&A event to understand the decline in earnings. Our implementation of the AKM model regresses log earnings observed for individual i working at firm j in year t (y_{ijt}) on employer-specific fixed effects which reflect firm characteristics that result in above- or below-average earnings for all workers at firm j ($\phi_{j(i,t)}$), individual fixed effects (ω_i), and year effects (τ_t):

$$y_{ijt} = \phi_{j(i,t)} + \omega_i + \tau_t + u_{ijt} \tag{A1}$$

We can then assess the role played by employers by estimating an analogue to equation (2), substituting in as the outcome variable the estimated firm fixed effects $\hat{\phi}_j$. The goal is to estimate the share of earnings losses following job transitions that can be attributed to a mover's reemployment by an employer with a different $\hat{\phi}_j$ than the employer from which the mover left. Note that we omit M&A firms in the year of the event to avoid changes in composition affecting firm effects estimation, although including them does not affect our estimates by much.

Panel (a) of Figure A7 shows firm-specific wage premiums of workers at target firms who move to other firms after the M&A event. Relative to their matched control workers, job movers from target firms show a significant increase in their firm fixed effects after the event, implying that on average, they move to employers with higher wage premiums. Column (1) of Table A7 shows that workers who move from target firms experience 3.2 log points increase in firm-specific wage premiums after the event.

This suggests that workers are actually moving to firms with higher wage premiums after M&As. Importantly, most of these workers who leave target firms move to non-acquiring firms, meaning that this transition to larger firms is not mechanically driven by worker reallocation toward acquirers. In practice, many factors may contribute to a firm having a higher wage premium. One common issue in this literature is that AKM effects may capture whether some firms pay more relative to others, but cannot control for other aspects of the firm. Therefore, to get into the black box of the AKM effects, we next take advantage of our firm balance sheet data to characterize the types of firms that target workers transition to after M&As (see Section 6).

We test the main assumptions underlying the estimation of the AKM specification following Lachowska et al. (2020).

A.7.2 AKM Assumption 1: Sufficient Mobility

The firm wage premium in the AKM model is identified by workers who move between firms. For this reason, the sample formation strategy (and the underlying mobility pattern) need to exhibit sufficient mobility to allow the firm wage premiums to be estimated. In the average year during our sample period, roughly 18 workers per employer move to other firms. Among full-time workers, the average number of movers per employer is about 8. Across the entire sample, 77 percent of workers make at least one move to a different firm during our sample period. Therefore, the mobility rates in the sample we use to estimate the AKM model appear to be high and comparable to the mobility rate in the sample used by Lachowska et al. (2020).

A.7.3 AKM Assumption 2: Exogenous Mobility

Since the firm wage premium in the AKM model is identified by workers who move between firms, the model requires an assumption of exogenous mobility of workers between firms. If this assumption fails, then the firm wage premium would be biased because the workers who move would be different than those who do not move. We test this using a similar test as in Lachowska et al. (2020) who builds off an exercise in Card et al. (2013). We group firms into quartiles by their estimated firm fixed effects and study the wages of workers who move between firms. If wages of movers are determined by the quartile of the firm effects symmetrically both when moving from high to low and low to high firms, this symmetry supports the assumption that mobility is exogenous. In contrast, if movers show systematic wage gains regardless of the fixed effects of the origin firms and destination firms, then the assumption of exogenous mobility could be violated.

In Figure A8, we plot the log wages of job movers for eight different quartile-to-quartile transitions. The top of the figure shows workers moving from the top (fourth) to the top quartile of firms. The wages of these workers are high and stay high. The same stable pattern can be seen for those going from the bottom (first) to the bottom quartile; their wages are low and stay relatively low. In contrast, for workers going from the fourth to the first quartile of firm fixed effects, their wages drop significantly. Symmetrically, those going from the first to the fourth quartile of firm fixed effects see a strong increase in wages. Because the wage quality of the firm drives the wage change of the moving worker, this provides support for the exogenous mobility assumption.

A.7.4 Match Effects

Our results shown in Section 6 point to the idea that the decline in target workers' earnings is likely driven by these workers losing either firm-specific human capital or backloaded contracts. Following prior research that draws a connection between this mechanism and a loss in "match effects", we estimate match effects base on Lachowska et al. (2020) which implements a strategy based on Woodcock (2015). For each employee-employer spell, we first calculate the average of residualized log earnings ($\overline{y_{ij}}$) by removing calendar-year effects and regressing this adjusted log earnings on years of job tenure and worker-employer match indicators. We then compute within-match averages of the outcome after subtracting the contribution of job tenure. Then we estimate a model similar to the AKM model in equation (A1), but using within-match averages as the dependent variable:

$$\overline{y_{ij}} = \alpha_i + \pi_{j(i,t)} + e_{ij} \tag{A2}$$

where α_i, $\pi_{j(i,t)}$, and e_{ij} denote the worker fixed effects, employer fixed effects, and an error term independent of individual and firm fixed effects, respectively.

We then calculate the residuals from equation (A2) and interpret them as worker-employer match effects averaged over the years we observe a given worker-employee match:

$$\hat{e_{ij}} = \overline{y_{ij}} - \hat{\alpha}_i - \hat{\pi}_{j(i,t)} \tag{A3}$$

We proceed to take the estimated $\hat{e_{ij}}$ terms relevant for the employee in each time period and use them as the dependent variable in equation (2) to see the contribution of match effects in explaining the earnings loss of target workers who move to other firms after the event.

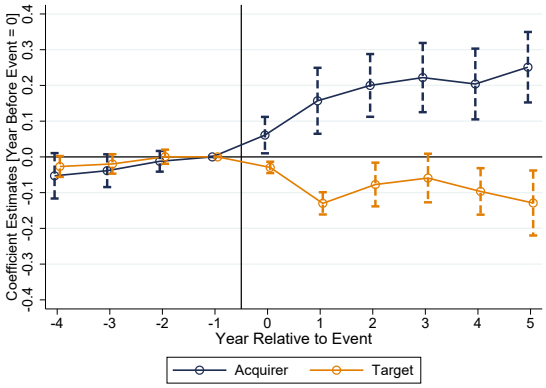
Panel (b) of Figure A7 shows match effects of workers at target firms who move to other firms after the M&A event. Relative to their control workers, movers from target firms experience a significant and large decrease in their match effects after the event, implying that on average, they move to employers with a lower match quality. The decrease in match effects in each post-M&A year comes both from workers who had already left target firms and from workers who leave in each subsequent year. Column (2) of Table A7 shows that workers who move from target firms within the first two years after the event experience 9 log points decrease in match effects.

The decline in match effects may imply that these workers lose the benefit of a specific employee skill set that fits better with the previous employer. Also, the decrease in match effects could simply indicate that these workers lose an employer-specific contract that yields a better work environment or amenity. Taken together, it appears that after target firms shrink through an M&A

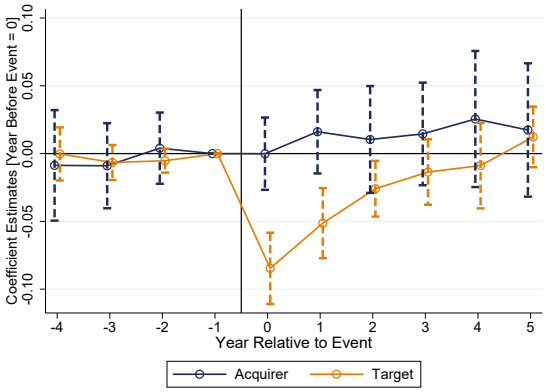
event, workers move to larger firms with higher wage premiums and take a modest wage cut in the medium run due to worse matches with new employers. Relative to previous work (Lagaras forthcoming; He and le Maire 2022) documenting that M&A events create significant displacements of workers from target firms with higher wage premiums and reallocation to firms with lower wage premiums, we find that a significant share of workers' earnings losses after M&As stems primarily from a decline in match quality.

Figure A1: Different Clustering

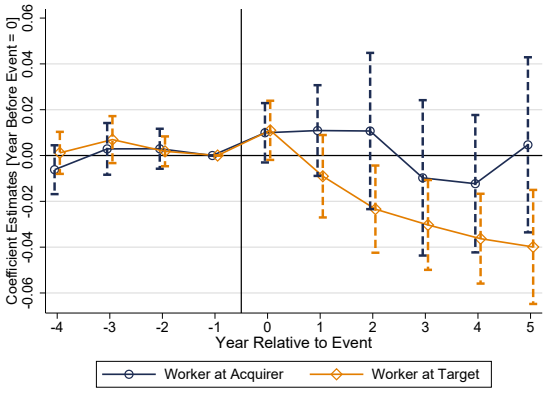
(a) log(Employment)



(b) log(Average Payrolls)



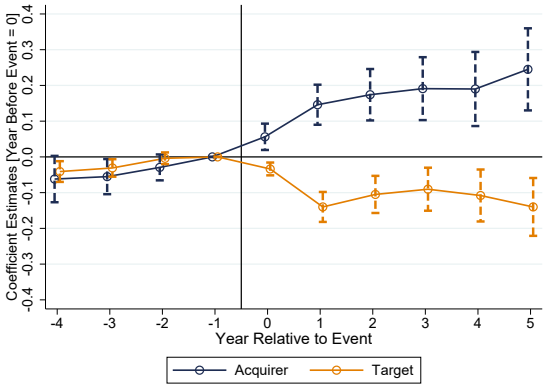
(c) log(Earnings)



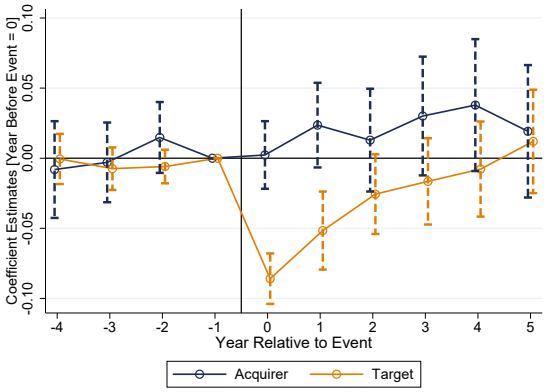
Notes: These figures display event-study estimates for the impact of M&As on the main firm-level and worker-level outcomes. Panel (a) shows the estimates for log of employment for those involved in partial acquisitions. Panel (b) shows the estimates for log of average payrolls for those involved in partial acquisitions. Panel (c) shows the estimates for log of worker-level earnings. The dashed lines indicate 95 percent confidence intervals where the standard errors are clustered at the market-level (by 4-digit NAICS $\times$ commuting zone) for Panels (a) and (b), and at the worker and market level for Panel (c). The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Figure A2: Matched Control Firms in Different Markets

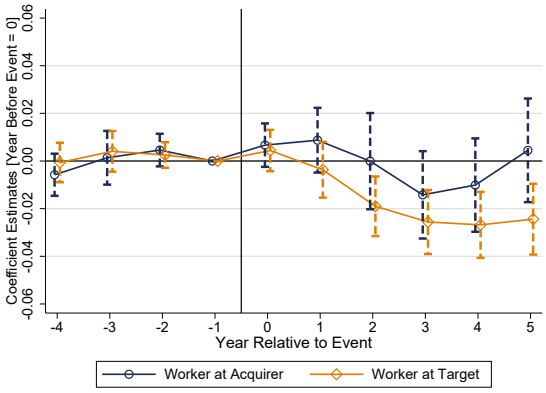
(a) log(Employment)



(b) log(Average Payrolls)



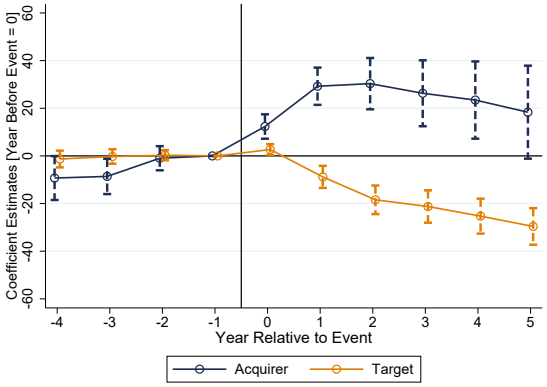
(c) log(Earnings)



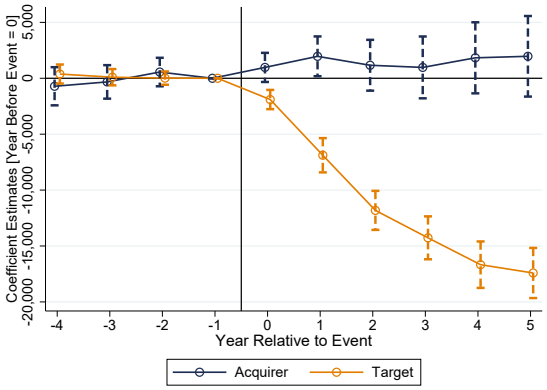
Notes: These figures display event-study estimates for the impact of M&As on the main firm-level and worker-level outcomes. For this analysis, we implement the same matching procedure (Section 4), except that we restrict M&A firms to be at different markets (defined by 4-digit NAICS × commuting zone) from matched control firms. Panel (a) shows the estimates for log of employment for those involved in partial acquisitions. Panel (b) shows the estimates for log of average payrolls for those involved in partial acquisitions. Panel (c) shows the estimates for log of worker-level earnings. The dashed lines indicate 95 percent confidence intervals where the standard errors are clustered at the firm level for Panels (a) and (b), and at the worker and firm level for Panel (c). The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Figure A3: Outcomes in Levels (Replacing Missing with Zeros)

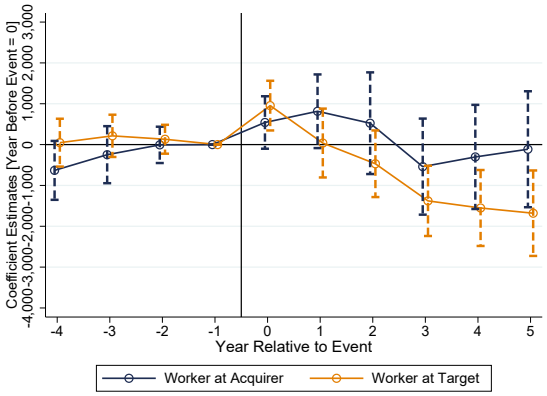
(a) Employment



(b) Average Payrolls

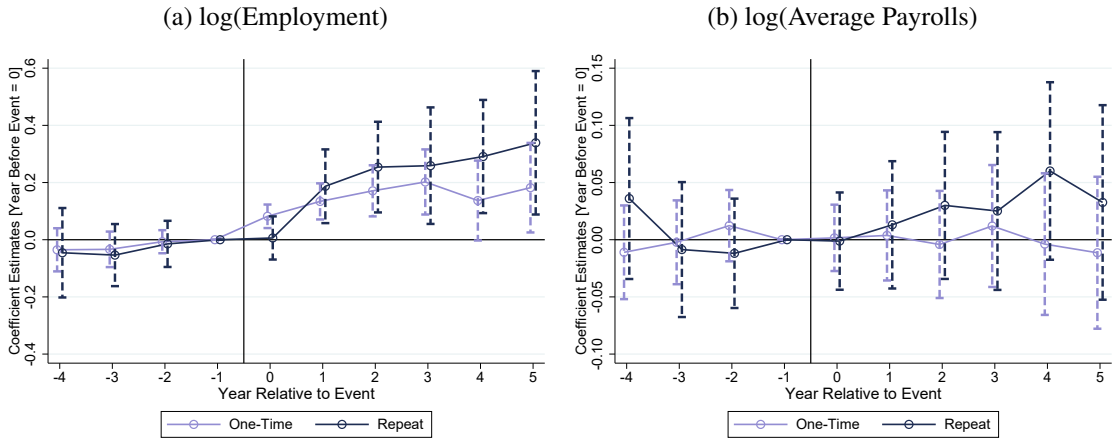


(c) Worker Earnings



Notes: These figures display event-study estimates for the impact of M&As on the main firm-level and worker-level outcomes in levels, where we replace missing observations with zeros if the firms or workers exit the sample. Panel (a) shows the estimates for employment for those involved in partial acquisition.s Panel (b) shows the estimates for average payrolls for those involved in partial acquisitions. Panel (c) shows the estimates for worker-level earnings. The dashed lines indicate 95 percent confidence intervals where the standard errors are clustered at the firm level for Panels (a) and (b), and at the worker and firm level for Panel (c). The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

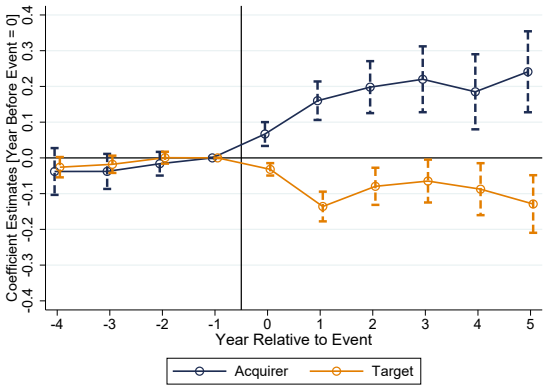
Figure A4: By One-time vs. Repeat M&As (Acquirers)



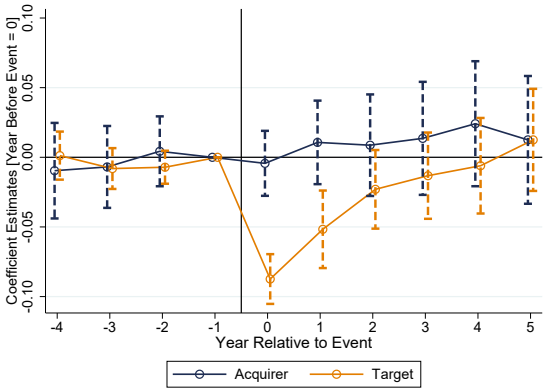
Notes: These figures display event-study estimates for the impact of M&As on the main firm-level outcomes, separately for acquiring firms that go through an M&A only once throughout our sample period and for acquiring firms with more than one M&A events. Panel (a) shows the estimates for log of employment. Panel (b) shows the estimates for log of average payrolls. The dashed lines indicate 95 percent confidence intervals where the standard errors are clustered at the firm level. The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Figure A5: Using Private Firms Only

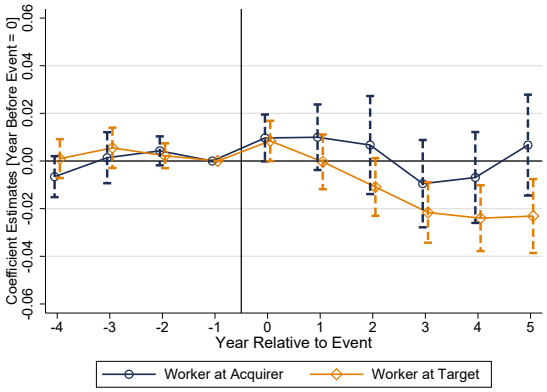
(a) log(Employment)



(b) log(Average Payrolls)



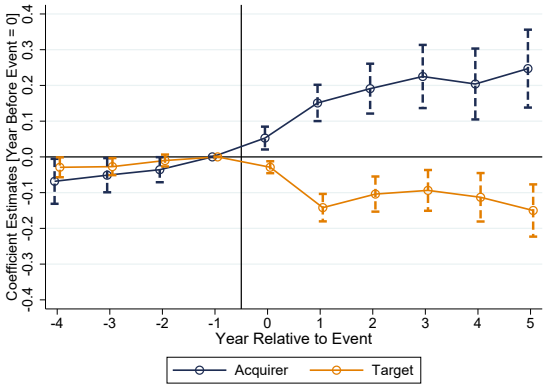
(c) log(Earnings)



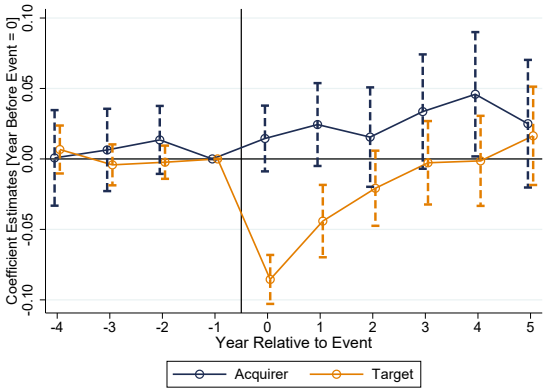
Notes: These figures display event-study estimates for the impact of M&As on the main firm-level and worker-level outcomes using only private firms/workers involved in partial acquisitions in the matched sample. In our matched sample, 96 percent of firms are private during our sample period. Panel (a) shows the estimates for log of employment. Panel (b) shows the estimates for log of average payrolls. Panel (c) shows the estimates for log of worker-level earnings. The dashed lines indicate 95 percent confidence intervals where the standard errors are clustered at the firm level for Panels (a) and (b), and at the worker and firm level for Panel (c). The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Figure A6: Including Unmatched Eligible Firms and Workers

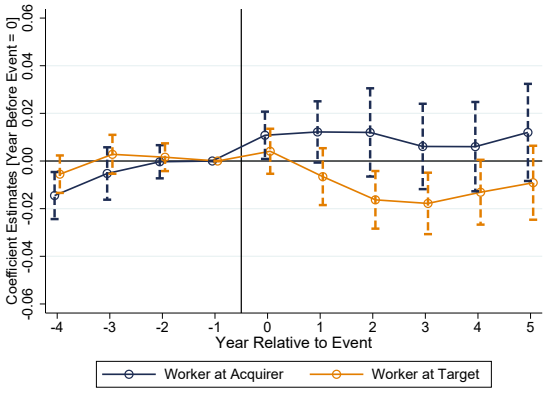
(a) log(Employment)



(b) log(Average Payrolls)

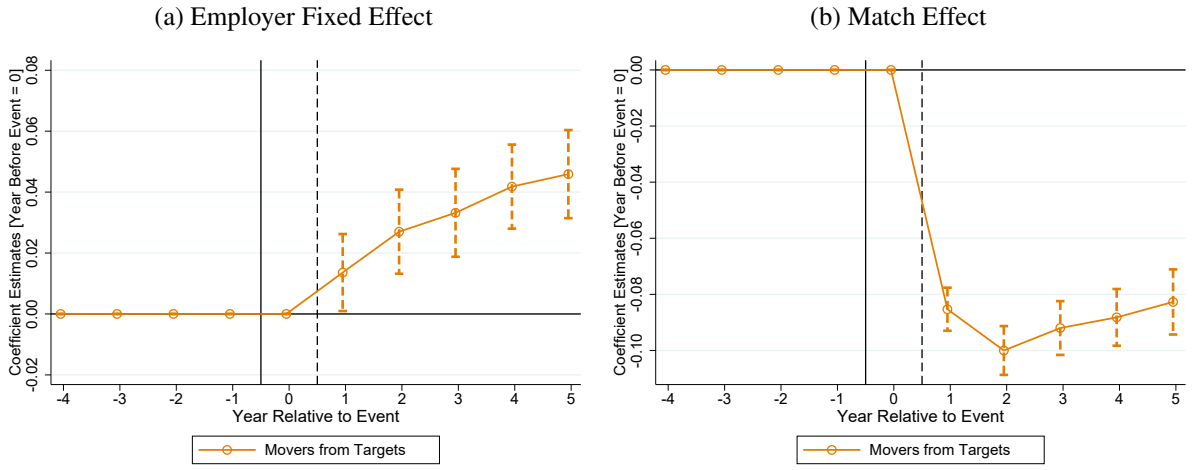


(c) log(Earnings)



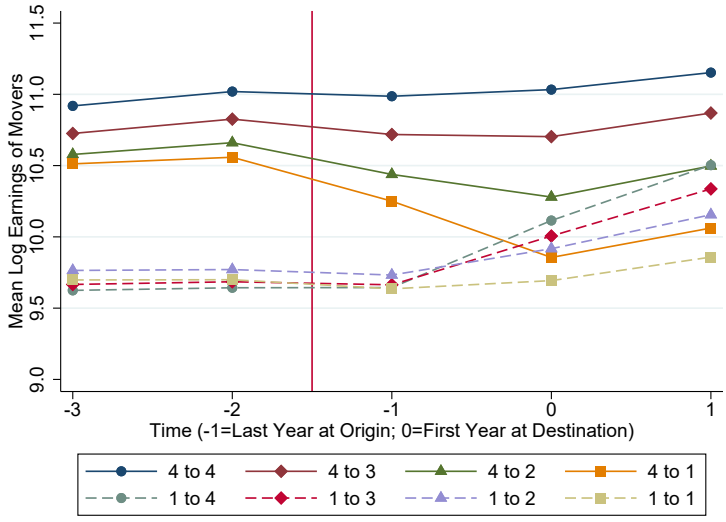
Notes: Panel (a) and (b) display event-study estimates for the impact of M&As on the main firm-level outcomes separately for targets and for acquirers involved in partial acquisitions, including the unmatched sample of M&A firms eligible for matching. Panel (c) displays event-study estimates for the impact of M&As on worker-level earnings for workers at targets and workers at acquirer, including the unmatched sample of eligible workers at M&A firms. The dashed lines indicate 95 percent confidence intervals where the standard errors are clustered at the firm level for Panels (a) and (b), and at the worker and firm level for Panel (c). The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Figure A7: Workers Moving from Targets – Employer FE and Match Effects (Targets)



Notes: This figure displays event-study estimates of the impact of M&As for workers moving from target firms within the first two years after the event. Panel (a) shows the estimates for employer fixed effects. Panel (b) shows the estimates for worker-employer match effects. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker and firm level. The M&A event is in year 0 and the coefficient is normalized to be zero in year -1.

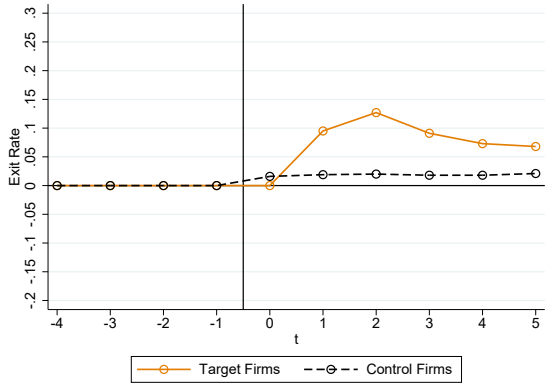
Figure A8: Exogenous Mobility Assumption



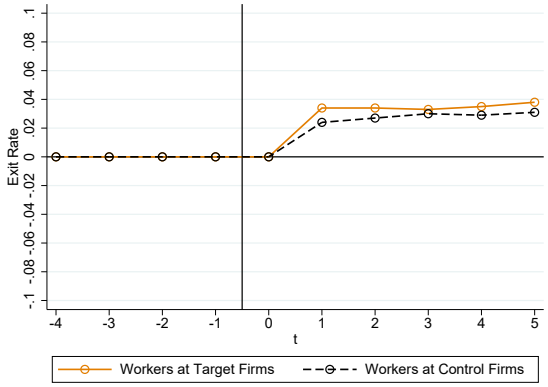
Notes: This figure displays the estimates of the average log earnings of job movers during the four-year period around their transition. The estimates are classified based on the quartile of firm effects at origin firms ($t = -1$) and destination firms ($t = 0$).

Figure A9: Probability of Exit

(a) Firm Exit Rate



(b) Worker Exit Rate



Notes: Panel (a) displays the exit rate of firms in the matched sample, separately for target firms and their control firms. After the event, the probability of exiting the sample increases by 2.4 percentage points (SE = 0.006) for target firms (mostly those involved in mergers) relative to control firms on average. Panel (b) displays the exit rate of workers in the matched sample, separately for workers at target firms and for their control workers. After the event, the probability of exiting the sample increases by 0.6 percentage points (SE = 0.002) for target workers relative to their control workers on average.

Table A1: Different Clustering

	(1) log(Employment)	(2) log(Average Payrolls)	(3) log(Earnings)
Target	-0.087***	-0.029***	-0.021***
	(0.023)	(0.008)	(0.008)
Mean at t = -1	4.00	10.68	11.02
Adj. R squared	0.876	0.797	0.65
Firm/Worker-Year Obs.	66,380	66,260	1,954,480
Acquirer	0.183***	0.014	0.002
	(0.038)	(0.013)	(0.012)
Mean at t = -1	4.55	10.73	11.03
Adj. R squared	0.892	0.819	0.642
Firm/Worker-Year Obs.	21,830	21,760	1,296,770

Notes: This table reports the difference-in-differences estimates for the impacts of M&As on the main firm-level and worker-level outcomes. The outcome variables in Columns (1) to (3) are log of employment, log of average payrolls, and log of worker-level earnings. Columns (1) and (2) show the results for firms involved in partial acquisitions. The standard errors of the firm-level estimates are clustered at the market level (defined by 4-digit NAICS × commuting zone). The standard errors of the worker-level estimates are two-way clustered at the worker and market level. Note that the coefficient estimates also changed slightly from clustering at the market-level because the information on commuting zone is missing for a small share of firms and workers, resulting in a slightly different sample compared to our main analysis sample.

Table A2: Matched Control Firms in Different Markets

	(1) log(Employment)	(2) log(Average Payrolls)	(3) log(Earnings)
Target	-0.103***	-0.029***	-0.016***
	(0.023)	(0.011)	(0.005)
Mean at t = -1	4.00	10.69	11.01
Adj. R squared	0.877	0.797	0.739
Firm/Worker-Year Obs.	65,740	65,620	1,960,640
Acquirer	0.167***	0.021	-0.001
	(0.033)	(0.014)	(0.007)
Mean at t = -1	4.56	10.73	11.02
Adj. R squared	0.891	0.815	0.731
Firm/Worker-Year Obs.	21,620	21,560	1,282,810

Notes: This table reports the difference-in-differences estimates for the impacts of M&As on the main firm-level and worker-level outcomes. For this analysis, we implement the same matching procedure (Section 4), except that we restrict M&A firms to be at different markets (defined by 4-digit NAICS × commuting zone) from matched control firms. The outcome variables in Columns (1) to (3) are log of employment, log of average payrolls, and log of worker-level earnings. Columns (1) and (2) show the results for firms involved in partial acquisitions. The standard errors of firm-level estimates are clustered at the firm level. The standard errors of worker-level estimates are two-way clustered at the worker and firm level.

Table A3: Outcomes in Levels (Replacing Missing with Zeros)

	(1) log(Employment)	(2) log(Average Payrolls)	(3) log(Earnings)
Target	-16.784***	-11492.158***	-681*
	(2.535)	(730.927)	(353)
Mean at t = -1	105.69	49060.32	70,625
Adj. R squared	0.845	0.695	0.79
Firm/Worker-Year Obs.	73,430	73,360	2,026,430
Acquirer	23.330***	1477.942	154
	(5.172)	(1008.155)	(465)
Mean at t = -1	177.75	50885.79	70,046
Adj. R squared	0.86	0.732	0.793
Firm/Worker-Year Obs.	23,300	23,260	1,345,330

Notes: This table reports the difference-in-differences estimates for the impacts of M&As on the firm-level and worker-level outcomes in levels, where we replace missing observations with zeros if the firms or the workers exit the sample. The outcome variables in Columns (1) to (3) are log of employment, log of average payrolls, and log of worker-level earnings. Columns (1) and (2) show the results for firms involved in partial acquisitions. The standard errors of firm-level estimates are clustered at the firm level. The standard errors of worker-level estimates are two-way clustered at the worker and firm level.

Table A4: By One-time vs. Repeat M&A (Acquirer)

	(1) log(Employment)	(2) log(Average Payrolls)
Post × Treated	0.130***	0.009
	(0.038)	(0.016)
Post × Treated × Repeat	0.130**	0.010
	(0.066)	(0.027)
Mean at t = -1 (One-Time Acquirer = 1)	4.40	10.73
Mean at t = -1 (Repeat Acquirer = 1)	4.85	10.74
Adj. R squared	0.892	0.817
Firm-Year Obs. (One-Time Acquirer = 1)	15,400	15,360
Firm-Year Obs. (Repeat Acquirer = 1)	7,110	7,100

Notes: This table reports the difference-in-differences estimates of the impact of M&As on the main firm-level outcomes for acquiring firms with only one M&A event during our sample period. The triple interaction term captures the triple-difference estimates for acquiring firms with repeated M&A events. Column (1) displays the estimates for log of employment. Column (2) displays the estimates for log of average payrolls. The standard errors are clustered at the firm level.

Table A5: Using Private Firms Only

	(1) log(Employment)	(2) log(Average Payrolls)	(3) log(Earnings)
Target	-0.088***	-0.028***	-0.012**
	(0.023)	(0.011)	(0.005)
Mean at t = -1	4.01	10.68	11.01
Adj. R squared	0.876	0.796	0.739
Firm/Worker-Year	65,560	65,450	1,990,940
Acquirer	0.178***	0.011	0.003
	(0.033)	(0.014)	(0.007)
Mean at t = -1	4.56	10.73	11.02
Adj. R squared	0.894	0.818	0.732
Firm/Worker-Year	21,040	20,990	1,308,270

Notes: This table reports the difference-in-differences estimates for the impacts of M&As on the main firm-level and worker-level outcomes using only private firms/workers in the matched sample. In our matched sample, 96 percent of firms are private during our sample period. The outcome variables in Columns (1) to (3) are log of employment, log of average payrolls, and log of worker-level earnings. Columns (1) and (2) show the results for firms involved in partial acquisitions. The standard errors of firm-level estimates are clustered at the firm level. The standard errors of worker-level estimates are two-way clustered at the worker and firm level.

Table A6: Including Unmatched Eligible Firms and Workers

	(1) log(Employment)	(2) log(Average Payrolls)	(3) log(Earnings)
Target	-0.105***	-0.023**	-0.010*
	(0.021)	(0.010)	(0.005)
Mean at t = -1	4.00	10.64	10.83
Adj. R squared	0.872	0.793	0.732
Firm/Worker-Year	73,670	73,580	3,815,300
Acquirer	0.178***	0.027*	0.010
	(0.032)	(0.014)	(0.007)
Mean at t = -1	4.53	10.68	10.93
Adj. R squared	0.890	0.816	0.697
Firm/Worker-Year	24,610	24,580	3,143,520

Notes: Columns (1) and (2) report the difference-in-differences estimates for the impacts of M&As on the main firm-level outcomes separately for targets and for acquirers involved in partial acquisitions, including the unmatched sample M&A firms eligible for matching. Column (3) reports the difference-in-differences estimates for the impact of M&As on worker-level earnings, including the unmatched sample of eligible workers at M&A firms. The standard errors of firm-level estimates are clustered at the firm level. The standard errors of worker-level estimates are two-way clustered at the worker and firm level.

Table A7: Worker-Employer Match Effects (Targets)

	(1) Employer FE	(2) Match Effect
Workers Moving From Target	0.032***	-0.090***
	(0.006)	(0.004)
Mean at t = -1	0.20	0.06
Adj. R squared	0.881	0.205
Worker-Year Obs.	684,800	677,750

Notes: This table reports the difference-in-differences estimates for the impacts of M&As for workers moving from target firms within the first two years after the event. Column (1) displays the estimates for the employer fixed effects. Column (2) displays the estimates for worker-employer match effects. The standard errors are two-way clustered at the worker and firm level.

Table A8: Mean Log Wage Before and After Employer Change by Quartile of Mean Coworkers' Wages at Origin and Destination Firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Mean Log Wage of Movers				**Change from t = -2 to t=+1**	
Origin to Destination Quartile	Number of Observations	Two Years Before	One Year Before	One Year After	Two Year After	Unadjusted	Adjusted
1 to 1	1,355,190	9.70	9.64	9.70	9.87	0.16	0.00
1 to 2	834,130	9.77	9.73	9.92	10.15	0.38	0.22
1 to 3	429,280	9.68	9.66	10.00	10.33	0.65	0.49
1 to 4	306,100	9.64	9.65	10.12	10.51	0.86	0.70
2 to 1	384,560	10.05	9.89	9.80	9.99	-0.06	-0.18
2 to 2	1,110,570	10.30	10.22	10.26	10.42	0.12	0.00
2 to 3	777,090	10.38	10.33	10.44	10.63	0.26	0.14
2 to 4	383,820	10.27	10.23	10.48	10.77	0.51	0.39
3 to 1	160,360	10.30	10.05	9.82	10.03	-0.27	-0.38
3 to 2	429,880	10.51	10.35	10.31	10.50	-0.01	-0.12
3 to 3	1,009,290	10.66	10.61	10.65	10.77	0.11	0.00
3 to 4	956,990	10.72	10.70	10.79	10.92	0.20	0.09
4 to 1	97,140	10.57	10.26	9.87	10.08	-0.49	-0.62
4 to 2	187,550	10.68	10.45	10.30	10.51	-0.17	-0.30
4 to 3	413,630	10.85	10.72	10.71	10.88	0.03	-0.10
4 to 4	1,250,900	11.02	10.99	11.04	11.15	0.13	0.00

Notes: This table reports the average of log of earnings for workers who move and are observed for at least two years prior to a job transition, and for two years after. We define quartiles based on the average earnings of coworkers at the origin firm in the year prior to transition, and at the destination firm in the year after. The adjusted earnings change is estimated as the average change for each origin-destination group, minus the average change for switchers from the same origin quartile who remain in the same quartile.

Table A9: Descriptive Statistics on Unmatched Firms and Workers

	(1) Acquirer	(2) Target
Panel A: Firm Characteristics		
Total Revenue (in millions)	42	24
Total Expense (in millions)	40	24
Number of Employees	238	155
Average Wage Bill	64,637	64,653
Leverage Ratio	0.67	0.73
Markups	2.97	2.87
Number of Firms	290	810
Panel B: Sectors (Firms)		
Construction	0.01	0.02
Manufacturing	0.14	0.13
Wholesale	0.05	0.08
Retail	0.04	0.03
Transportation	0.03	0.06
Information	0.15	0.19
Services	0.12	0.19
Other Sectors	0.46	0.3
Panel C: Worker Characteristics		
Total Earnings	61,611	55,731
Age	47.0	45.0
Female	0.39	0.43
Number of Workers	115,866	112,539
Panel D: Sectors (Workers)		
Construction	0.03	0.01
Manufacturing	0.15	0.23
Wholesale	0.07	0.08
Retail	0.10	0.43
Transportation	0.37	0.02
Information	0.06	0.02
Services	0.08	0.08
Other Sectors	0.13	0.13

Notes: This table reports descriptive statistics on the the unmatched sample of M&A firms and workers eligible for matching, measured one year prior to the event. Panel A reports firm characteristics such as total revenue, total expenses, number of employees, average payrolls, leverage ratio, and markups. Panel B reports the distribution of firms in the matched sample across 2-digit NAICS sectors. Panel C reports worker characteristics such as total annual earnings, age, and gender. Panel D reports the distribution of workers in the matched sample across 2-digit NAICS sectors. Other sectors include (1) Agriculture, forestry, and fishing, (2) Mining, quarrying, and oil and gas extraction, (3) Utilities, (4) Real estate and rental and leasing, (5) Arts, entertainment and recreation, (6) Accommodation and food services, (7) Other services, and (8) Public administration.

Table A10: Descriptive Statistics on Workers at Targets

	(1)	(2)	(3)	(4)	(5)	(6)
			Movers from Targets		**By Destination**	
	Movers	Stayers	Voluntary Separation	Involuntary Separation	To Acquirer	To Other Firms
Total Earnings	68,023	72,551	65,800	64,531	67,820	65,082
Age	46.0	48.6	40.9	46.6	46.7	45.7
Female	0.31	0.31	0.35	0.32	0.36	0.32
Number of Workers	21,890	33,130	2,510	7,880	4,560	13,660

Notes: This table reports descriptive statistics on the matched sample of workers at target firms, measured one year prior to the event. Columns (1) and (2) report these statistics, respectively, for workers moving from target firms within the first two years after the event and for workers who stay at target firms throughout the entire post-event period. Column (3) reports these statistics for workers moving voluntarily from target firms and column (4) reports these statistics for workers displaced from targets. Column (5) reports these statistics for workers who move to acquiring firms after the M&A event and column (6) reports the statistics for workers who move to other firms after the M&A event.

B Additional Heterogeneity Results

In Appendix B, we provide results from heterogeneity analyses in addition to those discussed in Section 5 and 6. Here, for worker-level analyses, we focus on target workers to see whether alternative mechanisms can explain the decline in their earnings after M&As. For most of the heterogeneity results, we separately look at stayers at targets and job movers from targets to get a better sense where the effects are concentrated.

B.1 By Local vs. National M&As

While checking common pre-trends is reassuring for a causal interpretation when implementing a difference-in-differences design, contemporaneous shocks that occur with M&A events could still bias our results. For example, there could be a negative demand shock that affects a commuting zone and causes both a decline in employment and wages and an increase in M&A activities as firms get purchased before they shut down. In this case, M&A activities are correlated with shocks that decrease labor demand. We can also have the opposite scenario.

We address this concern by also looking at M&As that are less likely to have been triggered by local economic conditions of the firm. Specifically, we consider the impact of national M&As that occur among domestic firms with multiple establishments across different commuting zones. The intuition is that these changes in ownership are less likely to be driven by the local economic conditions of the firms or workers. Figure B1 and Table B1 show that the effect of local M&As on earnings of target workers is economically indistinguishable from the effect of national M&As on the same outcome. Therefore, the decline in earnings of workers at target firms is unlikely driven by local economic conditions of firms where M&A activities occur.

B.2 By Partial Acquisition vs. Merger

In our analysis sample, roughly 80 percent of M&A events are partial acquisitions (75 percent among the entire M&A events). In other words, the vast majority of M&A events in Canada (and in North America) involves an acquirer purchasing a part of a target's businesses. It is possible that a wage decline is larger (or smaller) in the case of a merger, where there is a complete transfer of ownership. We explore whether impacts on worker earnings are larger in the case of a merger, compared to a partial acquisition. We examine these impacts separately for stayers and job movers, so that we can see in which group the effects are concentrated. In Figure B2 and Table B2, we find that decreases in workers' earnings in target firms in the case of mergers were not larger than

decreases in workers' earnings in the case of partial acquisitions, suggesting that our results are not driven by the fact the majority of our M&A events involves partial acquisitions. In other words, both mergers and partial acquisitions create job separations of workers from target firms, resulting in a wage loss that we observe in the data.

B.3 By Within vs. Across Labor Markets

We explore whether impacts on worker earnings are larger in markets where merging firms are located in the same labor market (defined at the four-digit industry by commuting zone level), following Prager and Schmitt (2021). Once again, we look at these impacts separately for stayers and job movers, so that we can see where the effects are concentrated. In Figure B3 and Table B3, we find that decreases in workers' earnings in target firms where M&As occur within the same market were not larger than decreases in workers' earnings where M&As occur across different markets, suggesting a limited role for the change in concentration in explaining the change in worker earnings after M&As.

B.4 Distribution of HHI Across Markets

Before we assess the heterogeneity based on the initial level of concentration (measured in Herfindahl-Hirschman Index) in labor markets, we examine the distribution of labor market concentration across different markets (defined at the four-digit industry by commuting zone level) in our data. Panel (a) in Figure B4 shows that the distribution of HHI across the entire labor market is a bit skewed towards the left, with some spikes around the middle and at the very right tail. Column (1) in Table B4 shows that the average and median HHI are 0.38 and 0.28 across the entire labor market in Canada during our sample, with roughly 12 percent of labor markets have a single employer in each market. Focusing on labor markets in the entire sample with any M&A event during our sample period, however, the distribution becomes a lot more left-skewed, with only 3 percent of labor markets having a single firm, as shown in panel (b) of Figure B3. Column (2) of Table B4 shows that the average and median HHI are 0.264 and 0.175. These statistics become even smaller (to 0.138 and 0.069, respectively, as shown in Column (3) of Table B4) when we zoom in on labor markets with any M&A event in our matched analysis sample, with less than one percent of labor markets having a single employer. Therefore, while the labor markets in the entire sample are reasonably concentrated, the markets in our analysis sample are not very concentrated on average to begin with, which can explain why M&A events in our analysis sample have little impacts on concentration in our setting.

B.5 By Initial Level of Concentration

Our findings on the decreases in employment and worker-level earnings in target firms can be potentially rationalized by an increase in monopsony power of firms through increased concentration. Prager and Schmitt (2021) and Arnold (2021) study this channel in the U.S. context and find that M&A events that generate large shifts in concentration result in market-level declines in earnings. While this channel may still be a factor for a subset of the M&A events we study in Canada, we rule it out as being the only factor determining wage losses.

In particular, we find that 99 percent of M&A events have a zero predicted change in local labor-market concentration. This is consistent with the description on the distribution of HHI in our analysis sample in the previous subsection. In contrast, Prager and Schmitt (2021) and Arnold (2021) isolate M&A events with statistically significant increases in concentration.

To examine this in more detail, in Figure B5 and Table B5, we turn to a metric that antitrust authorities consider: the initial concentration level. To study this channel, we split the analysis sample by quintiles in the HHI measured one year before the event. In both the high-concentration markets (fifth quintile) and the low-concentration markets (first quintile), we find similar levels of declines in earnings of either stayers at or job movers from target firms.[29] This is not surprising given most of these events do not actually increase concentration in the local labor market.

Taken together, these results, along with the results from Section B3, suggest that increased monopsony power due to changes in local labor-market concentration or outside options is unlikely to be the primary driver of declines in worker earnings in our setting.[30]

B.6 By Initial Level of (flows-adjusted) Concentration

In the previous subsection, we show our estimates on worker earnings, separately for markets with low level (below the first quintile) of HHI and for markets with high level (above the last quintile) of HHI measured one year before the event. A standard Herfindahl-Hirschmann Index (HHI) takes as given the definition of the market and then computes

[29] Given that the change in concentration after M&As was close to zero for about 99 percent of labor markets in our sample, cutting our analysis sample based on the predicted change in HHI after M&As, as in Arnold (2021), is not meaningful in our setting due to the lack of variation in the predicted change in HHI.

[30] Even if the results are not driven by changes in concentration, changes in bargaining power of workers may be independent of concentration changes. For example, He and le Maire (2022) finds that M&A events in Denmark result in high-wage managers being replaced in target firms. Such a change in management may result in shifts in bargaining power of workers at target firms. However, a change in bargaining power through a change in management is only relevant for incumbent or new workers at target firms, and thus is unlikely to explain the decline in earnings of workers leaving target firms.

$$HHI = \sum_j s_j^2, \tag{B1}$$

as the measure of concentration. We describe a flows-adjusted concentration measure that takes into account transitions across markets, following Arnold (2021). To begin, let market m be defined by the interaction between 4-digit NAICS and commuting zone. The flows-adjusted concentrated measure (denoted C) requires computing transition rates across markets. While, in theory, transition rates across markets may change, we instead choose to pool the entire sample in order to retrieve a consistent and more precise measure of the rate of transitions across markets. The share of firm j in market m is given by:

$$\tilde{s}_{jm} = \frac{l_{jm}}{\sum_k \alpha_{m\to k} L_k} \tag{B2}$$

where

$$\alpha_{m\to k} = \frac{P(k|m)}{P(m|m)} \frac{L_m}{L_k} \tag{B3}$$

where $P(k|m)$ is the probability an individual from market m transitions to market k conditional on experiencing a transition. The intuition behind this formulation is that jobs in other markets likely provide viable options for workers. Arnold (2021) shows that one can use a discrete choice model and empirical flows across markets (*i.e.*, $\alpha_{k\to m}$) to measure the value a worker from a given market places on another market.

Intuitively, if we observe a large number of flows from market m to k, then k likely serves as a viable outside option. Additionally, we need to take into account the relative sizes of the markets. For example, if k is a relatively small market, but we still observe high rates of flows to this market, it must provide a particularly good option for the workers. This is why the relative size between m and k is taken into account when determining the value individuals from m place in receiving a job in market k. The concentration in market m is given by:

$$\tilde{C} = \sum_j \tilde{s}_{jm}^2 \tag{B4}$$

One key difference in this formulation relative to Arnold (2021) is that transitions across both industries and locations are taken into account. In Arnold (2021), the market shares depend only on employment in other industries within the same commuting zone. In this more general version, the market share depends on employment in other commuting zones as well.

Second, the relative size term in $\alpha_{m\to k}$ (i.e. $\mathbb{E}[\frac{L_k}{L_m}]$) is now the expected relative size of industries

across commuting zones. To understand this factor, imagine there are two equally sized industries that use similar workers but are generally located in different areas. For example, imagine plastic manufacturing and rubber manufacturing plants hire similar workers, but plastic manufacturing primarily takes place in Texas while rubber manufacturing primarily takes place in Ohio. In this case, the aggregate relative size of the industries will be quite different than the expected relative size within a commuting zone given the two industries primarily operate in different commuting zones. Therefore, a low volume of flows between the two industries does not necessarily reflect low substitutability, but rather they are generally located in different areas.

The flows-adjusted local labor market concentration measure, C_{mc}, is defined as:

$$C_{mc} = \sum_{j \in c} (\tilde{s}_{jmc})^2 \tag{B5}$$

Figure B6 and Table B6 show the effects of M&As on earnings of workers at target firms, separately for markets with high (flow-adjusted) HHI and for markets with low (flow-adjusted) HHI. Similar to our main results based on the regular HHI, these results show that the decline in worker earnings is not larger for high-HHI markets.

B.7 Results on Firm Profitability

Before we show our results based on firms' product market power (exploiting cross-sector or cross-industry variation), we first describe what happens to firms' profitability as more direct evidence for changes in firms' market power. We use net profit margins (total revenue minus total expenses, scaled by total revenue) as our main measure of profitability. Additionally, we use two alternative measures, returns on assets (net income divided by total assets) and EBITDA per worker. Panel (a) of Figure B7 shows the results on profit margins, separately for targets and for acquirers involved in partial acquisitions. Both targets' and acquirers' profitability were in a parallel trend with those of their matched control firms prior to the event. We find that while acquirers' profit margins decrease significantly after the event, targets' profit margins spiked in the year of M&A, and decreased afterwards. The initial increase in profit margins for targets is likely mechanical, due to a larger saving in fixed costs from downsizing relative to the initial fall in sales at the event year. Panel (d) shows the aggregate outcomes (targets and acquirers combined) separately for those involved in partial acquisitions and for those involved in mergers. In both cases, we find that profit margins decreased after the event in the aggregate. We find similar results on return on assets (Panel (b) and (e)) and EBITDA per worker (Panel (c) and (f)).

To interpret the magnitude of these results, Table B7 presents the difference-in-differences

estimates on these outcomes. Columns (1) and (2) show that targets' profit margins decrease by 0.7 percentage points (albeit not statistically significant), while acquirers' profit margins decrease by 1.9 percentage points on average after the event. Columns (3) and (4) show that in the aggregate, profit margins decrease by 0.9 percentage points in the case of partial acquisitions, while they decrease by 1.9 percentage points in the case of mergers. Columns (1) and (2) show that targets' ROAs decrease by 3.3 percentage points, while acquirers' ROAs decrease by 1.3 percentage points on average. Columns (3) and (4) show that in the aggregate, ROAs decrease by 2.7 percentage points in the case of partial acquisitions, while they decrease by 2.9 percentage points in the case of mergers. Columns (1) and (2) show that targets' EBITDA decreases by 2,887 CAD per worker, while acquirers' EBITDA decreases by 4,570 CAD per worker on average. Columns (3) and (4) show that in the aggregate, EBITDA decreases by 3,428 CAD per worker in the case of partial acquisitions, while it decreases by 7,106 CAD per worker in the case of mergers.

While efficiency gains through synergies are often argued as potential benefits of merger activities, we do not find any evidence of increased profitability for either acquiring or target firms after M&As. This has potentially important implications for pro-merger arguments that rely on predicted synergy gains. This result might be surprising if M&A events are undertaken by profit-maximizing firms, but this is consistent with a corporate finance literature that finds overall mixed results of M&A events on firm performance or market valuation. These results also have important implications for the impact on workers. If M&As did increase productivity, we might expect some workers to benefit through rent sharing. In this setting, however, the lack of productivity gains suggests that workers may not benefit from the M&A events if there are no increased rents to share. Note that our results capture short to medium run outcomes, so firms' profitability may improve in the long run. Next, we look at firms' revenue, markups and realized capital gains to further explore this channel.

B.8 Results on Revenue, Markups, and Realized Capital Gains

To get a better sense of why acquirers' and targets' profitability decreases after M&As, we next examine what happens to their revenue, markups, and cash-out responses. Panel (a) of Figure B8 shows the results on total revenue, separately for targets and for acquirers involved in partial acquisitions. Both targets' and acquirers' sales were in a parallel trend with those of their matched control firms prior to the event. We find that while acquirers' revenue increases significantly after the event, targets' revenue declines after the event. Even though acquirers' sales increase after M&As, their profit margins can decrease if the costs of acquisitions outweigh the benefits in the short to medium run. Furthermore, while the decline in targets' revenue is mechanical in the case

of partial acquisitions, the decrease in profitability happens if they sold a profitable part of their businesses to acquirers. Panel (d) shows the aggregate outcomes (targets and acquirers combined) separately for those involved in partial acquisitions and for those involved in mergers. In both cases, revenue significantly decreases after the event in the aggregate.

Panel (b) of Figure B8 shows the results on markups, separately for targets and for acquirers involved in partial acquisitions. Both targets' and acquirers' markups were in a parallel trend with those of their matched control firms prior to the event, and remained relatively unchanged after the event. Panel (e) shows the aggregate outcomes (targets and acquirers combined) separately for those involved in partial acquisitions and for those involved in mergers. In the case of partial acquisitions, markups do not change much after the event. In the case of mergers, markups decrease after the event in the aggregate. These results, in conjunction with the results on profitability, provide more direct evidence that firms' product market power did not increase after the event at least in the short to medium run.

Panel (c) of Figure B8 shows the results on realized capital gains, separately for targets and for acquirers involved in partial acquisitions. We find that while acquirers' realized capital gains decreased slightly after the event, targets' realized capital gains increase significantly after the event. The increase in realized capital gains at targets is driven by their initial investors selling a part of their shares ("cashing out") to those in acquiring firms, while the slight decrease in realized capital gains at acquiring firms indicate that their investors were net buyers of shares after the event. Panel (f) shows the aggregate outcomes (targets and acquirers combined) separately for those involved in partial acquisitions and for those involved in mergers. In both cases, we see increases in realized capital gains. These results imply that even though targets' profitability did not improve after the event, initial investors still benefitted from the transactions by selling a part of their shares to acquirers.

To interpret the magnitude of these results, Table B8 presents the difference-in-differences estimates on these outcomes. Columns (1) and (2) show that targets' revenue decreases by 54.5 log points, while acquirers' revenue increases by 26.9 log points on average. Columns (3) and (4) show that in the aggregate, revenue decreases by 30.7 log points in the case of partial acquisitions, while it decreases by 10.3 log points in the case of mergers. Columns (1) and (2) show that acquirers' and targets' markups do not change much after the event on average. Columns (3) and (4) show that in the aggregate, markups do not change in the case of partial acquisitions, while they decrease by 4.2 log points in the case of mergers. Columns (1) and (2) show that targets' realized capital gains increase by 27,558 CAD, while acquirers' realized capital gains decrease by 13,071 CAD on average. Columns (3) and (4) show that in the aggregate, realized capital gains increase by 21,646 CAD in the case of partial acquisitions, while they increase by 28,002 CAD in the case

of mergers. Overall, the decrease in profitability, without much change in markups, suggests that neither targets nor acquirers experienced an increase in market power after M&As at least in the short to medium run (De Loecker et al. 2020).

B.9 By Tradable vs. Non-Tradable Sectors

There are several results that suggest product market power is not the main driver of the observed labor-market impacts. First, we find that profitability decreased for both target and acquiring firms. If product market power increased on average after M&A events, we would expect to see a rise in profits, not a decline (De Loecker et al. 2020). Additionally, we estimate markups and do not find any statistically significant impacts of M&A events on markups for either target or acquiring firms.

To explore this channel further, we also conduct our analysis separately by tradable and non-tradable goods sectors. The intuition is that an M&A would have a larger impact on a firm's market power if the firm does not face competition outside its geographical (i.e., international) markets. We define firms as active in tradable good sectors if they fall under Agriculture, Forestry, Fishing, Mining, Quarrying, and Oil and Gas Extraction, and Manufacturing. Firms active in other sectors (i.e., Construction, Retail, Real Estate, Services, etc) are defined as falling under non-tradable sectors (Berger et al., 2022; Delgado et al., 2014). Figure B9 and Table B9 show that the declines in worker earnings at target firms are not larger for non-tradable sectors. Therefore, this finding, along with the results on decreased profit margins without much change in markups, suggests that an increase in product market concentration seems to be unlikely the key driver behind the decline in target workers' earnings.

B.10 By Within vs. Between Industry M&As

In the previous subsection, we show that the decline in earnings of workers at target firms is similar between M&As that happen in tradable sectors and those that happen in non-tradable sectors, suggesting a limited role for the change in product market power in explaining the change in worker earnings. To further support this conclusion, we also conduct our analysis separately by within-industry M&As and between-industry M&As. The intuition is that an M&A would have a larger impact on firms' market power if the acquirer buys another firm within the same industry (i.e., horizontal mergers). We divide our sample of all M&A firms based on the industries of the parties involved in a transaction. An M&A is within-industry the industries (4-digit NAICS) of both parties are identical and it is between-industry (i.e., vertical mergers) if the industries are different. For firms with one transaction, we define a firm as "within" if it participated in a

within-industry M&A and as "between" if it participated in a between-industry M&A. For firms with multiple M&A deals, we consider the majority of transactions to determine the within- and between-indicator. Figure B10 and Table B10 show that the decline in worker earnings is larger for those involved in within-industry M&As. These results imply that a rise in product market power is unlikely the main driver behind the results on worker earnings.

B.11 By Type of Transitions

When workers are displaced, they may suffer larger wage losses, relative to workers who voluntarily leave their firms, due to the deterioration in their bargaining position. Therefore, we explore heterogeneity by the type of transition. In our sample, roughly three quarters of these workers leave target firms involuntarily after the M&A event.[31] If our results are driven by workers losing either firm-specific human capital or implicit contracts, we would expect the displaced workers to experience larger declines in earnings, relative to workers that voluntarily left their firm. Panel (a) of Figure B11 shows earnings of workers at target firms who move to other firms, separately for those who move voluntarily and for those who move involuntarily. Relative to their control workers, those who move involuntarily show a larger decline in earnings compared to those who move voluntarily after the event. However, both types of workers end up moving to firms that are similar in terms of employer fixed effects. These suggest that an unobservable dimension (i.e., a loss of firm-specific human capital or reneging implicit contracts) can explain why workers displaced from targets experience a larger decline in earnings relative to those who voluntarily leave targets after the M&A event.

B.12 By Worker Characteristics

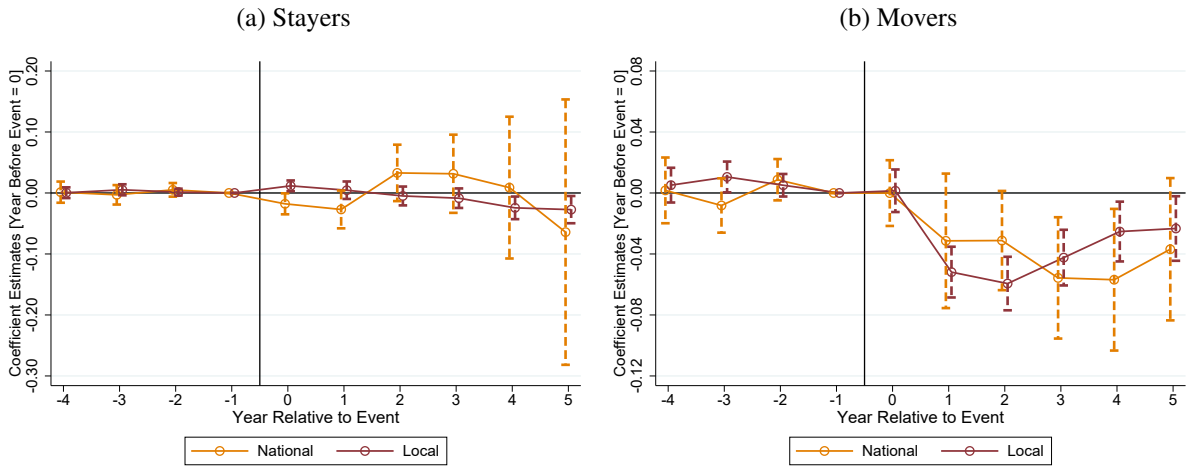
We additionally explore whether the decline in earnings of workers at target firms is different based on worker characteristics, such as gender and age. Prior studies have found differential impacts of firm-level shocks on worker earnings depending on their gender and age (Kline et al. 2019; Saez et al. 2019). Figure B12 and Table B12 show that the decline of workers' earnings at target firms is similar between male workers and female workers.

As shown in Section 5, the decline in workers' earnings at target firms is entirely driven by those who move to other firms after the M&A event. Therefore, we focus on the job movers from target firms, and estimate what happens to their earnings and job transitions, separately across different

[31] The reason for separations is missing for about a half of the observations in our matched sample. We omit these individuals from this calculation, although the effects on earnings for these individuals are close to zero.

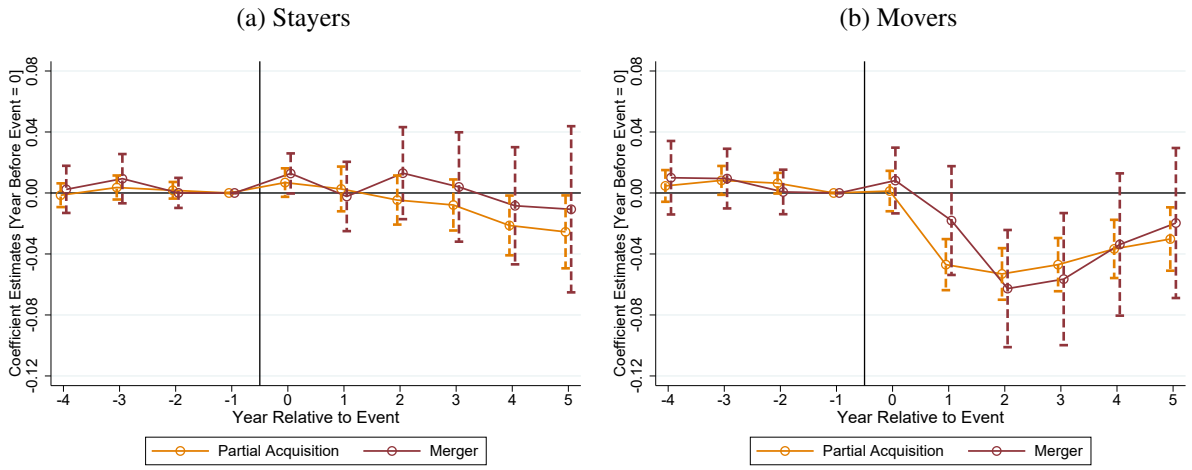
age groups. Figure B13 and Table B13 show that while we observe declines in earnings across all age groups for workers moving from target firms, the decline in earnings is largest among movers who are at least 50 years old before the event, without much change in employer fixed effects. Taken together, these results imply that there exists a substantial degree of heterogeneity across age groups for changes in worker earnings and employer fixed effects after the M&A event. These results are consistent with our main results based on worker tenure in Section 6.

Figure B1: Worker-level Earnings By National M&As vs. Local M&As (Targets)



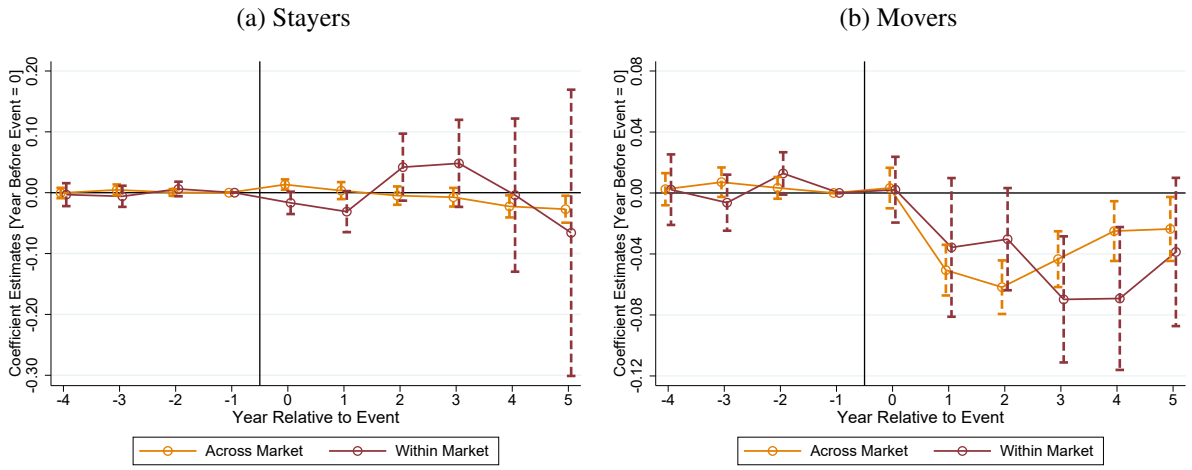
Notes: These figures display event-study estimates for the impact of M&As on log of total earnings for workers at target firms, separately for those involved in national M&A deals and for those involved in local M&A deals. Panel (a) displays the estimates for stayers and panel (b) displays the estimates for workers moving from target firms within the first two years after the event. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker-firm level. The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Figure B2: Worker-level Earnings By Partial Acquisition vs. Merger (Targets)



Notes: These figures display event-study estimates for the impact of M&As on log of total earnings for workers at target firms, separately for those involved in partial acquisitions and for those involved in mergers. Panel (a) displays the estimates for stayers and panel (b) displays the estimates for workers moving from target firms within the first two years after the event. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker-firm level. The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

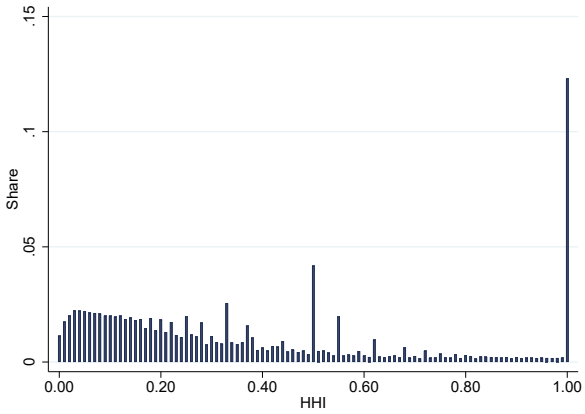
Figure B3: Worker-level Earnings By Within Market M&As vs. Across Market M&As (Targets)



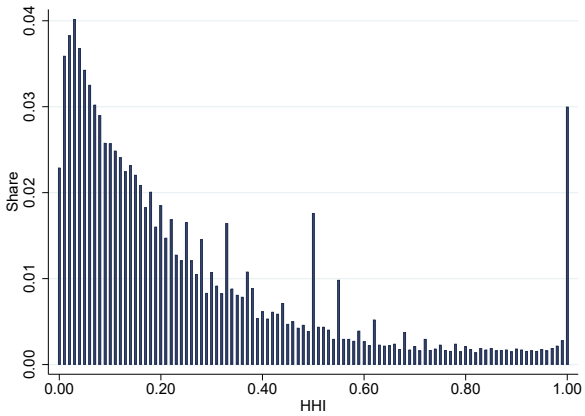
Notes: These figures display event-study estimates for the impact of M&As on log of total earnings for workers at target firms, separately for M&As that happen within the same labor market and for M&As that happen across different labor markets. Panel (a) displays the estimates for stayers and panel (b) displays the estimates for workers moving from target firms within the first two years after the event. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker-firm level. The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Figure B4: Distribution of HHI across markets

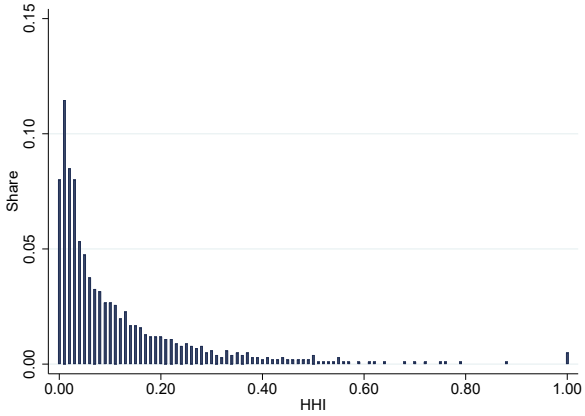
(a) All Markets



(b) Treated Markets

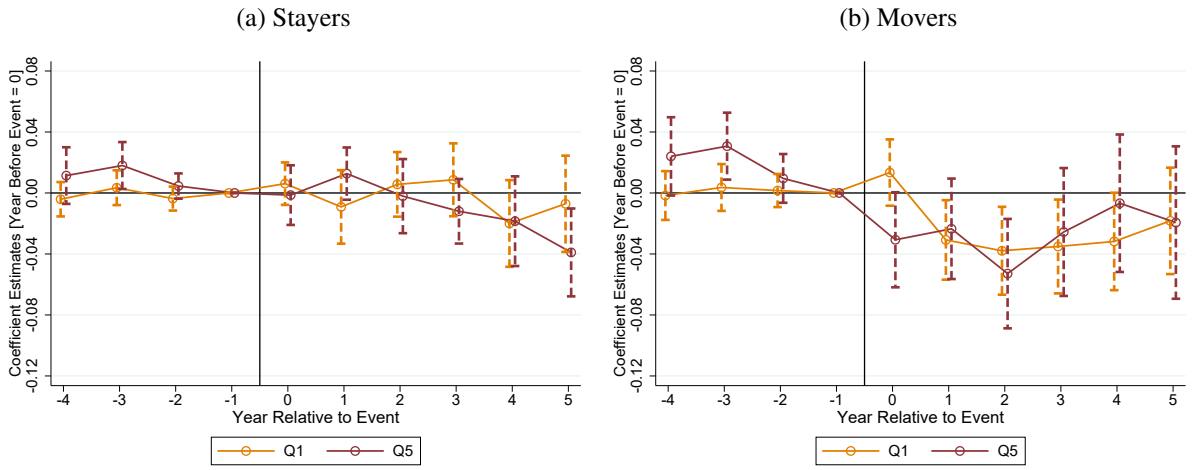


(c) Matched Markets



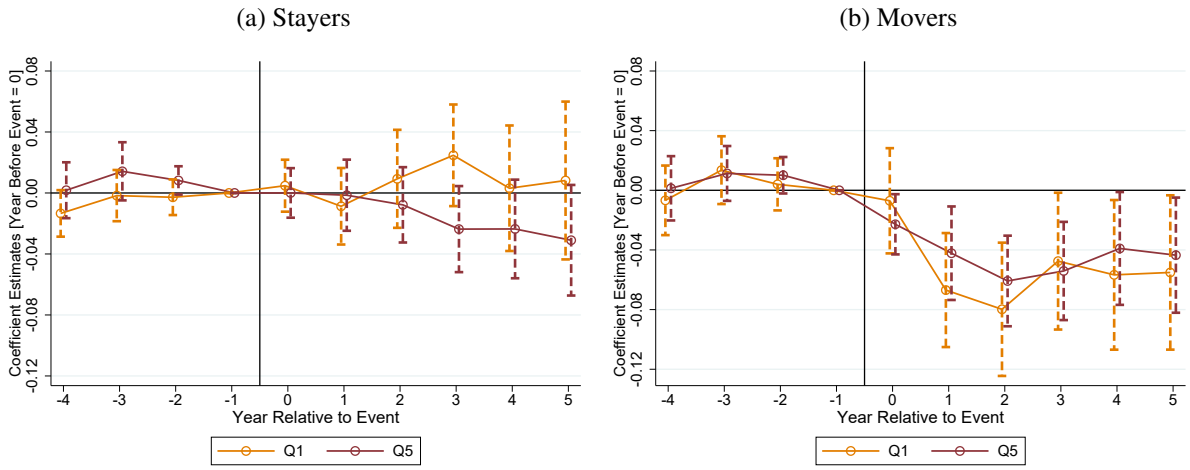
Notes: These figures display the distribution of concentration (measured by HHI) across labor markets. Panel (a) displays the distribution across all labor markets in the entire sample. Panel (b) displays the distribution across labor markets with at least one M&A deal in the entire sample during our sample period. Panel (c) displays the distribution across labor markets with at least one M&A deal in our matched sample (used for the main analyses).

Figure B5: Worker-level Earnings By Initial Level of HHI (Targets)



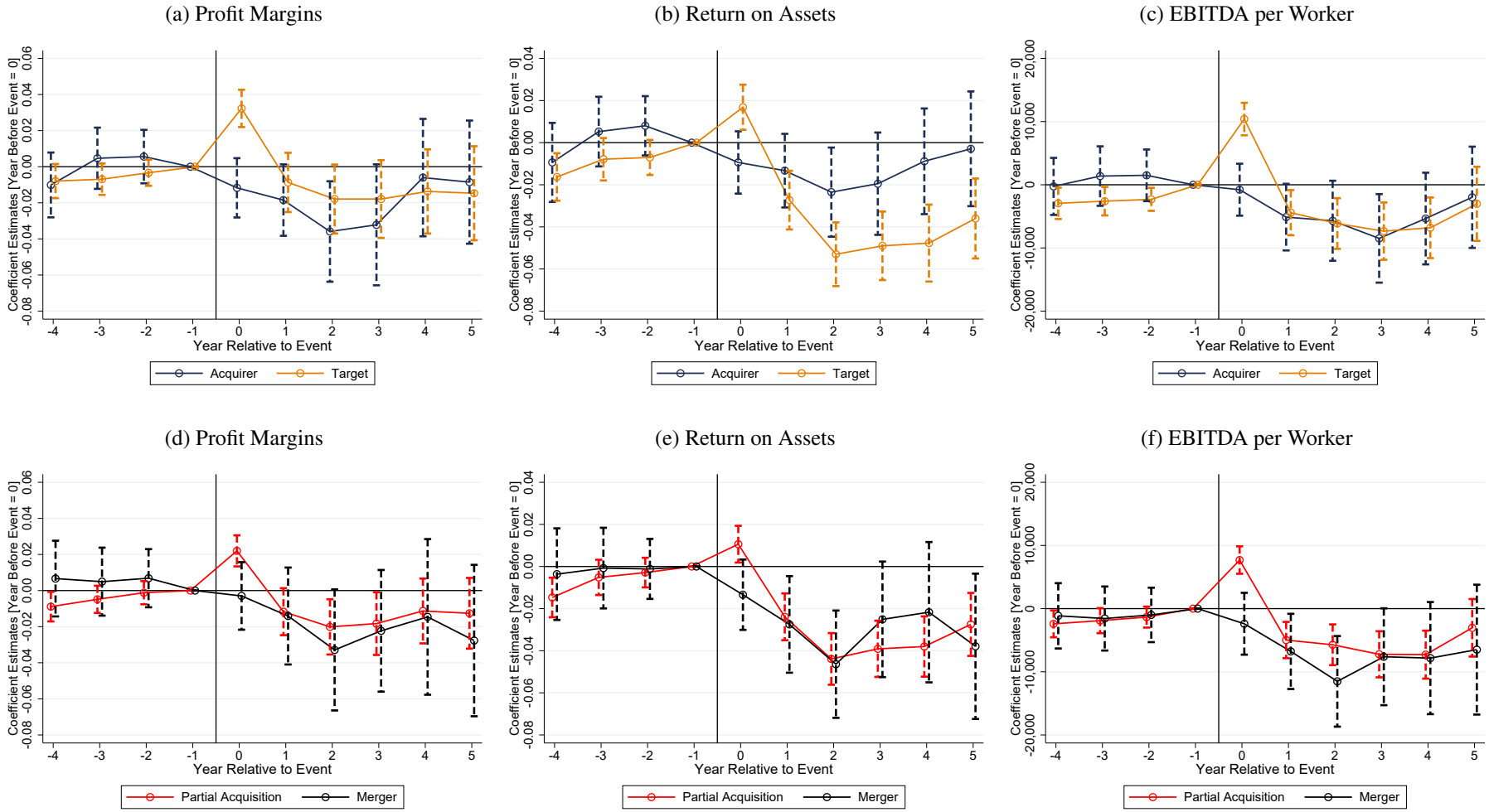
Notes: These figures display event-study estimates for the impact of M&As on log of total earnings for workers at target firms, separately for those in markets with low initial level of concentration (first quintile) and for those in markets with high initial level of concentration (fifth quintile). Panel (a) displays the estimates for stayers and panel (b) displays the estimates for workers moving from target firms within the first two years after the event. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker-firm level. The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Figure B6: Worker-level Earnings By Initial Level of Flows-adjusted HHI (Targets)



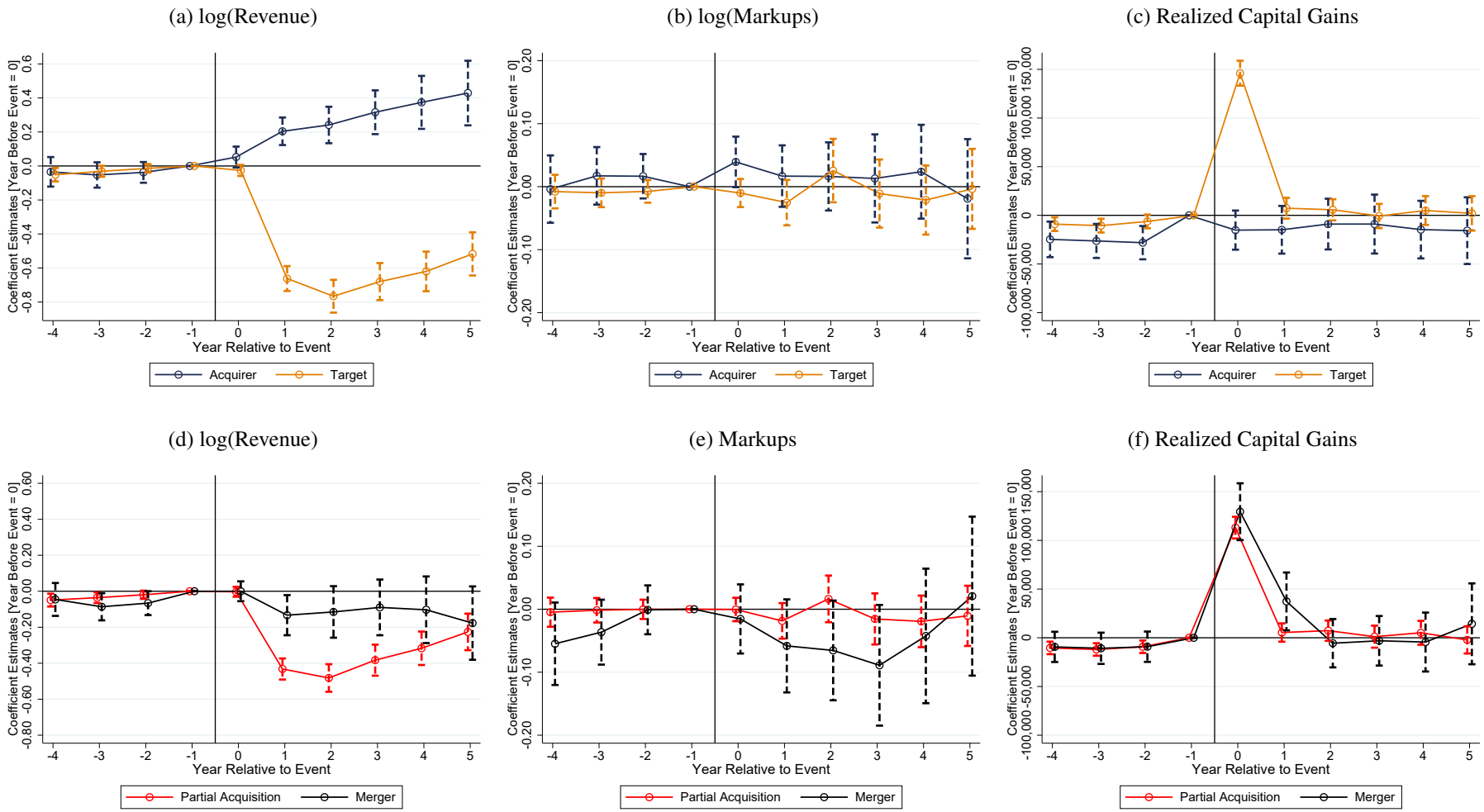
Notes: These figures display event-study estimates for the impact of M&As on log of total earnings for workers at target firms, separately for those in markets with low initial level of concentration (first quintile) and for those in markets with high initial level of concentration (fifth quintile). Panel (a) displays the estimates for stayers and panel (b) displays the estimates for workers moving from target firms within the first two years after the event. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker-firm level. The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Figure B7: Difference-in-differences Estimates on Firms' Profitability



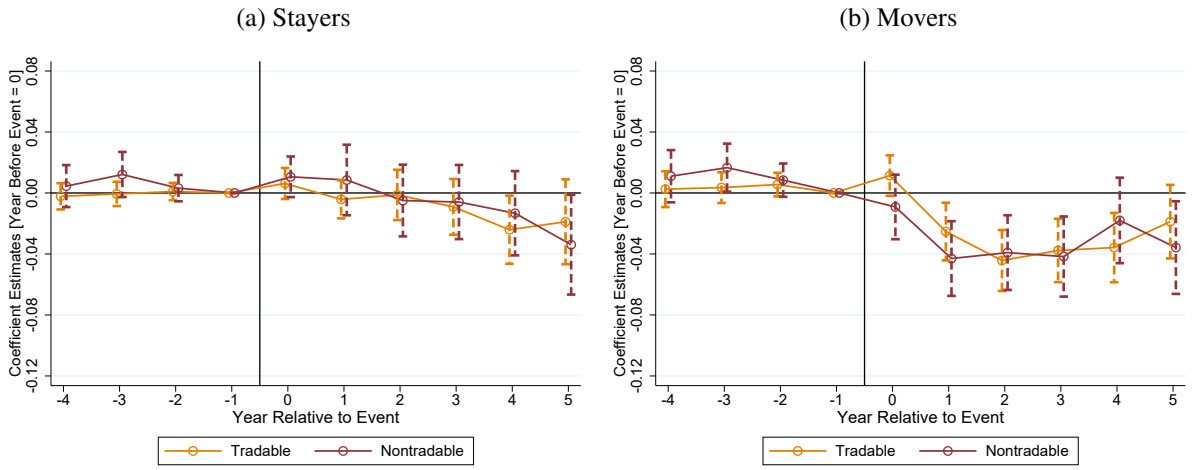
Notes: Panels (a) – (c) display event-study estimates for the impact of M&As on firm-level profitability for firms involved in partial acquisitions, separately for acquiring firms (navy line) and for target firms (orange line). Panel (a) shows the estimates for profit margins. Panel (b) shows the estimates for return on assets. Panel (c) shows the estimates for EBDITA per worker. Panels (d) – (f) display event-study estimates for the impact of M&As on the aggregate firm-level (targets and acquirers combined) profitability, separately for those involved in partial acquisitions (red line) and for those involved in mergers (black line). Panel (d) shows the estimates for profit margins. Panel (e) shows the estimates for return on assets. Panel (f) shows the estimates for EBDITA per worker. The dashed lines indicate 95 percent confidence intervals where the standard errors are clustered at the firm level. The M&A event is in year 0 and the coefficient is normalized to be zero in year -1.

Figure B8: Difference-in-differences Estimates on Firms' Sales, Markups, and Payouts



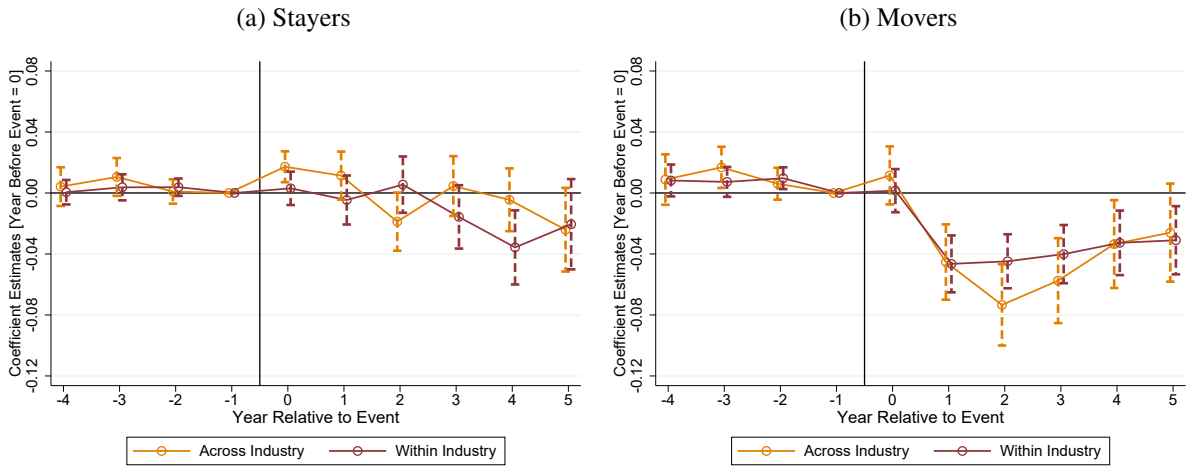
Notes: Panels (a) – (c) display event-study estimates for the impact of M&As on other firm-level outcomes for firms involved in partial acquisitions, separately for acquiring firms (navy line) and for target firms (orange line). Panel (a) shows the estimates for log of total revenue. Panel (b) shows the estimates for log of markups. Panel (c) shows the estimates for owners' realized capital gains aggregated at the firm level. Panels (d) – (f) display event-study estimates for the impact of M&As on the aggregate firm-level (targets and acquirers combined) outcomes, separately for those involved in partial acquisitions (red line) and for those involved in mergers (black line). Panel (d) shows the estimates for log of total revenue. Panel (e) shows the estimates for log of markups. Panel (f) shows the estimates for owners' realized capital gains aggregated at the firm level. The dashed lines indicate 95 percent confidence intervals where the standard errors are clustered at the firm level. The M&A event is in year 0 and the coefficient is normalized to be zero in year -1.

Figure B9: Worker-level Earnings By Tradable Sectors vs. Non-tradable Sectors (Targets)



Notes: These figures display event-study estimates for the impact of M&As on log of total earnings for workers at target firms, separately for those in tradable sectors and for those in non-tradable sectors. Panel (a) displays the estimates for stayers and panel (b) displays the estimates for workers moving from target firms within the first two years after the event. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker-firm level. The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

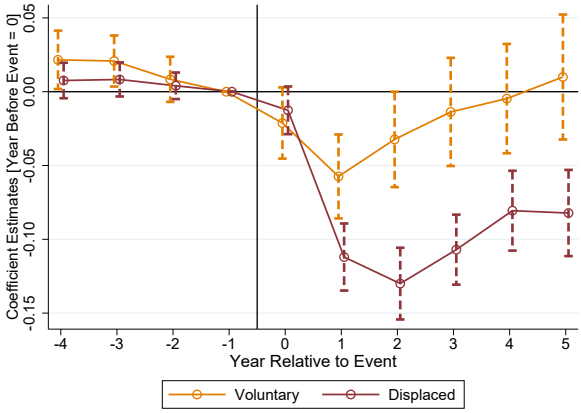
Figure B10: Worker-level Earnings By Within Industry vs. Across Industry (Targets)



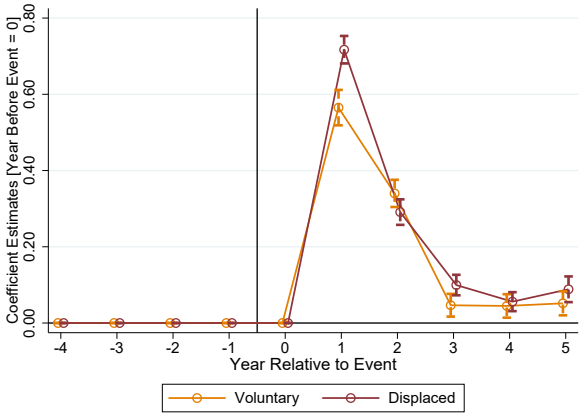
Notes: These figures display event-study estimates for the impact of M&As on log of total earnings for workers at target firms, separately for those involved in (horizontal) M&As that happen within the same industry and for those involved in (vertical) M&As that happen across different industries. Panel (a) displays the estimates for stayers and panel (b) displays the estimates for workers moving from target firms within the first two years after the event. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker-firm level. The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Figure B11: Workers Moving from Targets – By Type of Separation (Targets)

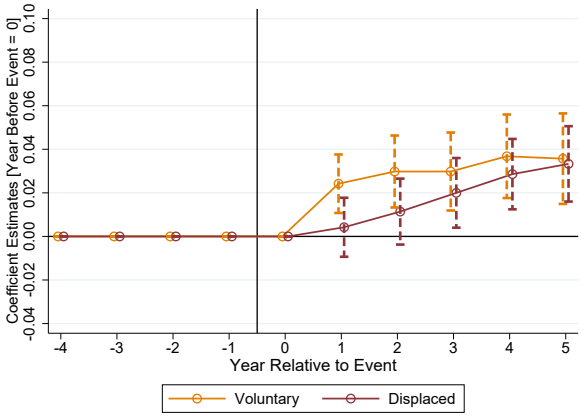
(a) log(Earnings)



(b) Job Transition

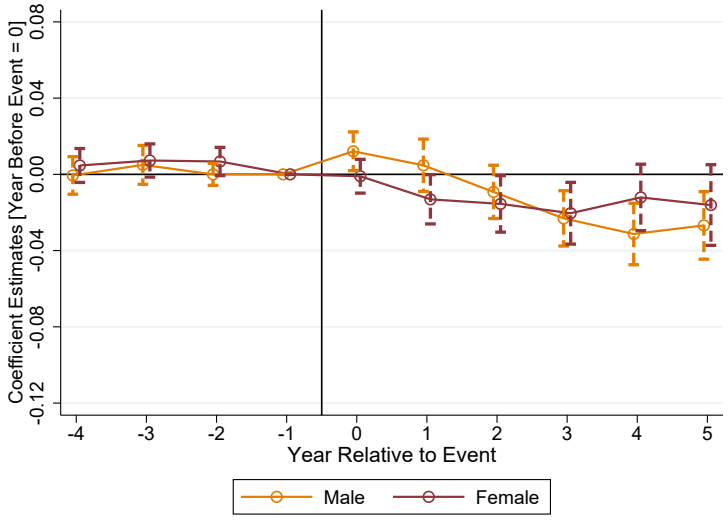


(c) Employer Fixed Effect



Notes: These figures display event-study estimates for the impact of M&As for workers moving from target firms within the first two years after the event, separately for those who leave voluntarily and for those displaced. Panel (a) shows the estimates for log of total earnings. Panel (b) shows the estimates for job transition probabilities. Panel (c) shows the estimates for employer fixed effects. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker and firm level. The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

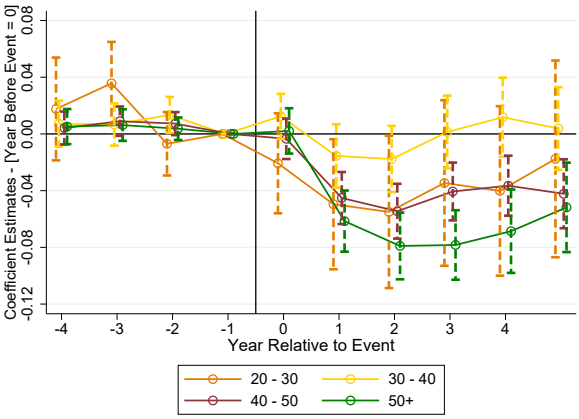
Figure B12: Worker Earnings – By Worker Gender (Targets)



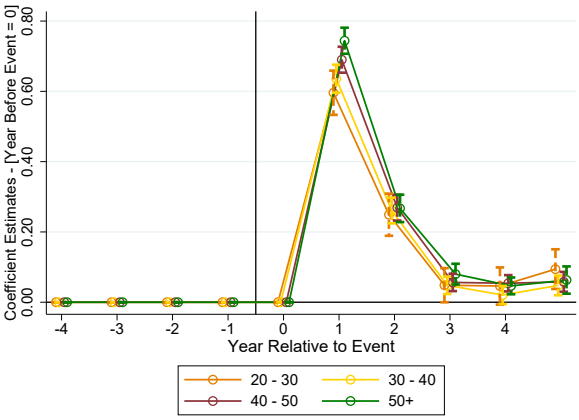
Notes: This figure displays event-study estimates of the impact of M&As on log of total earnings for workers at target firms, separately for male workers and for female workers. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker and firm level. The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Figure B13: Workers Moving from Targets – By Worker Age (Targets)

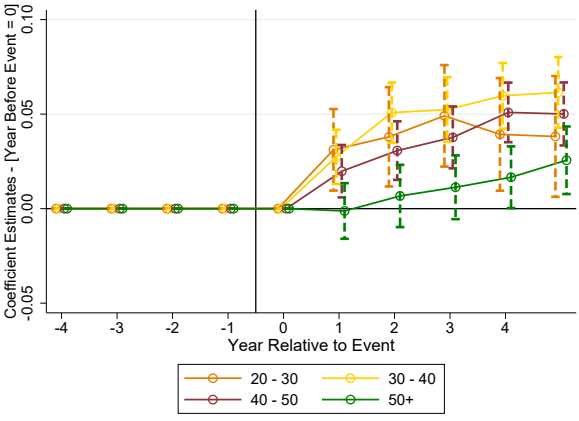
(a) log(Earnings)



(b) Transition



(c) Employer Fixed Effects



Notes: These figures display event-study estimates of the impact of M&As on worker-level outcomes for workers moving from target firms within the first two years after the event, separately for various age groups. Panel (a) shows the estimates for log of total earnings. Panel (b) shows the estimates for job transition probabilities. Panel (c) shows the estimates for employer fixed effects. The dashed lines indicate 95 percent confidence intervals where the standard errors are two-way clustered at the worker and firm level. The M&A event is in year 0 and the coefficient estimate is normalized to be zero in year -1.

Table B1: Worker-level Earnings By National M&As vs. Local M&As (Targets)

	(1) Stayers	(2) Movers
National	-0.008	-0.033***
	(0.006)	(0.007)
Mean at t = -1	11.00	10.95
Adj. R squared	0.799	0.741
Worker-Year Obs.	1,373,290	549,560
Local	-0.006	-0.035**
	(0.030)	(0.014)
Mean at t = -1	11.09	11.08
Adj. R squared	0.790	0.744
Worker-Year Obs.	193,180	134,420

Notes: This table reports the difference-in-differences estimates of the impact of M&As on log of total earnings for workers at target firms, separately for those involved in national M&As and for those involved in local M&As. Columns (1) and column (2) display the estimates for stayers and for workers moving from target firms within the first two years after the event, respectively. The standard errors are two-way clustered at the worker and firm level.

Table B2: Worker-level Earnings By Partial Acquisition vs. Merger (Targets)

	(1) Stayers	(2) Movers
Partial Acquisition	-0.008	-0.035***
	(0.006)	(0.007)
Mean at t = -1	11.01	10.97
Adj. R squared	0.800	0.743
Worker-Year Obs.	1,365,580	601,180
Merger	0.001	-0.030*
	(0.013)	(0.016)
Mean at t = -1	11.01	11.02
Adj. R squared	0.785	0.726
Worker-Year Obs.	216,050	88,190

Notes: This table reports the difference-in-differences estimates of the impact of M&As on log of total earnings for workers at target firms, separately for those involved in partial acquisitions and for those involved in mergers. Columns (1) and column (2) display the estimates for stayers and for workers moving from target firms within the first two years after the event, respectively. The standard errors are two-way clustered at the worker and firm level.

Table B3: Worker-level Earnings By Within Market M&As vs. Across Market M&As (Targets)

	(1) Stayers	(2) Movers
Across Market	-0.007	-0.034***
	(0.006)	(0.007)
Mean at t = -1	11.00	10.95
Adj. R squared	0.799	0.741
Worker-Year Obs.	1,387,150	547,370
Within Market	-0.005	-0.040***
	(0.033)	(0.015)
Mean at t = -1	11.1	11.09
Adj. R squared	0.786	0.743
Worker-Year Obs.	170,870	120,900

Notes: This table reports the difference-in-differences estimates of the impact of M&As on log of total earnings for workers at target firms, separately for those involved in M&As that happen across different labor markets (defined at the four-digit NAICS by commuting zone) and for those involved in M&As that happen within the same labor market. Columns (1) and column (2) display the estimates for stayers and for workers moving from target firms within the first two years after the event, respectively. The standard errors are two-way clustered at the worker and firm level.

Table B4: Distribution of HHI across labor markets

	(1) All Markets	(2) Markets with M&A (Entire Sample)	(3) Markets with M&A (Matched Sample)
Average	0.3827	0.264	0.1383
Median	0.28	0.1753	0.0694
Min	0.0002	0.0003	0.0004
Max	1	1	1
Market-Year Obs.	745,849	177,629	10,120

Notes: This table reports summary statistics (average, median, min and max) on concentration, measured by HHI, (1) across all labor markets in the entire sample, (2) across labor markets with at least one M&A event in the entire sample, and (3) across labor markets with at least one M&A event in the matched analysis sample.

Table B5: Worker-level Earnings By Initial Level of HHI (Targets)

	(1) Stayers	(2) Movers
Q1	-0.003	-0.023**
	(0.009)	(0.011)
Mean at t = -1	11.04	11.03
Adj. R squared	0.814	0.748
Worker-Year Obs.	384,470	186,790
Q5	-0.010	-0.026*
	(0.008)	(0.015)
Mean at t = -1	11.03	11.00
Adj. R squared	0.777	0.744
Worker-Year Obs.	379,700	122,390

Notes: This table reports the difference-in-differences estimates of the impact of M&As on log of total earnings for workers at target firms, separately for those in markets with initially low level of concentration (first quintile) and for those in markets with initially high level of concentration (fifth quintile). Columns (1) and column (2) display the estimates for stayers and for workers moving from target firms within the first two years after the event, respectively. The standard errors are two-way clustered at the worker and firm level.

Table B6: Worker Earnings - By Initial Level of Flows-Adjusted HHI (Targets)

	(1) Stayers	(2) Movers
Q1	0.007	-0.052***
	(0.012)	(0.016)
Mean at t = -1	10.97	10.95
Adj. R squared	0.812	0.735
Worker-Year Obs.	166,590	66,840
Q5	-0.015	-0.044***
	(0.010)	(0.012)
Mean at t = -1	11.06	10.97
Adj. R squared	0.792	0.747
Worker-Year Obs.	395,720	182,240

Notes: This table reports the difference-in-differences estimates of the impact of M&As on log of total earnings for workers at target firms, separately for those in markets with initially low level of concentration (first quintile) and for those in markets with initially high level of concentration (fifth quintile). Columns (1) and column (2) display the estimates for stayers and for workers moving from target firms within the first two years after the event, respectively. The standard errors are two-way clustered at the worker and firm level.

Table B7: Difference-in-differences Estimates on Firms' Profitability

	(1)	(2)	(3)	(4)
	Partial Acquisition		**Aggregate**	
	Target	Acquirer	Partial Acquisition	Merger
Profit Margins	-0.007	-0.019**	-0.009*	-0.019
	(0.007)	(0.009)	(0.005)	(0.012)
Mean at t = -1	0.02	0.02	0.02	0.00
Adj. R squared	0.356	0.355	0.352	0.380
Firm-Year Obs.	68,910	22,200	91,730	19,520
Return on Assets	-0.033***	-0.013	-0.027***	-0.029***
	(0.006)	(0.008)	(0.005)	(0.010)
Mean at t = -1	0.08	0.05	0.07	0.04
Adj. R squared	0.384	0.420	0.387	0.433
Firm-Year Obs.	69,900	22,390	92,900	19,690
EBITDA per worker	-2886.774*	-4570.210**	-3427.987***	-7105.831***
	(1484.173)	(2329.311)	(1204.799)	(2730.995)
Mean at t = -1	15,880.58	17,906.32	16,375.09	14,431.66
Adj. R squared	0.441	0.458	0.436	0.449
Firm-Year Obs.	65,810	21,600	88,050	18,690

Notes: This table reports the difference-in-differences estimates for the impact of M&As on different measures of firms' profitability. Columns (1) and (2) report the estimates for target firms and for acquiring firms involved in partial acquisitions, respectively. Columns (3) and (4) report the estimates on the aggregate firm-level (targets and acquirers combined) outcomes, for those involved in partial acquisitions and for those involved in mergers, respectively. The standard errors are clustered at the firm level.

Table B8: Difference-in-differences Estimates on Firms' Sales, Markups, and Payouts

	(1)	(2)	(3)	(4)
	Partial Acquisition		**Aggregate**	
	Target	Acquirer	Partial Acquisition	Merger
log(Revenue)	-0.545***	0.269***	-0.307***	-0.103*
	(0.038)	(0.048)	(0.030)	(0.058)
Mean at t = -1	16.37	17.02	16.53	16.45
Adj. R squared	0.820	0.861	0.829	0.840
Firm-Year Obs.	68,460	22,060	91,140	19,400
log(Markups)	-0.008	0.015	-0.008	-0.042
	(0.019)	(0.024)	(0.014)	(0.034)
Mean at t = -1	0.42	0.40	0.42	0.39
Adj. R squared	0.758	0.811	0.769	0.746
Firm-Year Obs.	40,800	12,760	54,150	11,170
Realized Capital Gains	27,557.747***	-13,071.405	21,645.781***	28,002.089***
	(4,309.922)	(9,385.609)	(3,735.874)	(9,603.254)
Mean at t = -1	37,938.34	51,147.49	40,770.09	35,448.88
Adj. R squared	0.282	0.209	0.245	0.304
Firm-Year Obs.	42,150	10,820	53,670	9,410

Notes: This table reports the difference-in-differences estimates for the impact of M&As on firms' sales, markups, and realized capital gains. Columns (1) and (2) report the estimates for target firms and for acquiring firms involved in partial acquisitions, respectively. Columns (3) and (4) report the estimates on the aggregate firm-level (targets and acquirers combined) outcomes, for those involved in partial acquisitions and for those involved in mergers, respectively. The standard errors are clustered at the firm level.

Table B9: Worker-level Earnings By Tradable Sectors vs. Non-tradable Sectors (Targets)

	(1) Stayers	(2) Movers
Tradable	-0.006	-0.031***
	(0.009)	(0.010)
Mean at t = -1	10.97	10.95
Adj. R squared	0.788	0.739
Worker-Year Obs.	826,140	320,350
Nontradable	-0.009	-0.025***
	(0.007)	(0.008)
Mean at t = -1	11.06	11.00
Adj. R squared	0.804	0.748
Worker-Year Obs.	755,700	369,300

Notes: This table reports the difference-in-differences estimates of the impact of M&As on log of total earnings for workers at target firms, separately for those in tradable sectors and for those in non-tradable sectors. Columns (1) and column (2) display the estimates for stayers and for workers moving from target firms within the first two years after the event, respectively. The standard errors are two-way clustered at the worker and firm level.

Table B10: Worker-level Earnings By Within Industry vs. Across Industry (Targets)

	(1) Stayers	(2) Movers
Across Industry	-0.002	-0.037***
	(0.007)	(0.010)
Mean at t = -1	10.97	10.88
Adj. R squared	0.798	0.755
Worker-Year Obs.	679,760	233,960
Within Industry	-0.011	-0.032***
	(0.007)	(0.007)
Mean at t = -1	11.04	11.03
Adj. R squared	0.798	0.732
Worker-Year Obs.	901,990	455,670

Notes: This table reports the difference-in-differences estimates of the impact of M&As on log of total earnings for workers at target firms, separately for those involved in M&As that happen across different industries and for those involved in M&As that happen within the same industry. Columns (1) and column (2) display the estimates for stayers and for workers moving from target firms within the first two years after the event, respectively. The standard errors are two-way clustered at the worker and firm level.

Table B11: Workers Moving from Targets – By Separation Type (Targets)

	(1) log(Earnings)	(2) Transition	(3) Employer FE
Voluntary	-0.020	0.175***	0.026***
	(0.013)	(0.007)	(0.007)
Mean at t = -1	10.92	0.00	0.18
Adj. R squared	0.748	0.259	0.866
Worker-Year Obs.	78,940	79,050	77,970
Displaced	-0.087***	0.209***	0.016***
	(0.009)	(0.006)	(0.006)
Mean at t = -1	10.92	0.00	0.16
Adj. R squared	0.738	0.289	0.863
Worker-Year Obs.	248,940	249,310	246,850

Notes: This table reports the difference-in-differences estimates for the impacts of M&As on workers moving from target firms within the first two years after the event, separately for those who move voluntarily and for those displaced. Column (1) displays the estimates for log of total earnings. Column (2) displays the estimates for the job transition probabilities. Column (3) displays the estimates for the employer fixed effects. The standard errors are two-way clustered at the worker and firm level.

Table B12: Worker-level Earnings By Worker Gender (Targets)

	(1) log(Earnings)
Male	-0.012**
	(0.006)
Mean at t = -1	11.13
Adj. R squared	0.723
Worker-Year	1,389,790
Female	-0.013**
	(0.006)
Mean at t = -1	10.76
Adj. R squared	0.729
Worker-Year	633,180

Notes: This table reports the difference-in-differences estimates of the impact of M&As on log of total earnings, separately for male workers and for female workers at target firms. The standard errors are two-way clustered at the worker and firm level.

Table B13: Workers Moving from Targets – By Worker Age (Targets)

	(1) log(Earnings)	(2) Transition	(3) Employer FE
20s	-0.036*	0.172***	0.033***
	(0.021)	(0.011)	(0.010)
Mean at t = -1	10.69	0.00	0.13
Adj. R squared	0.764	0.282	0.872
Worker-Year Obs.	32,390	32,410	31,860
30s	-0.001	0.169***	0.042***
	(0.009)	(0.006)	(0.006)
Mean at t = -1	10.98	0.00	0.22
Adj. R squared	0.73	0.267	0.852
Worker-Year Obs.	154,250	154,370	152,650
40s	-0.037***	0.188***	0.032***
	(0.007)	(0.006)	(0.006)
Mean at t = -1	11.05	0.00	0.22
Adj. R squared	0.778	0.333	0.886
Worker-Year Obs.	246,160	246,510	244,400
50+	-0.056***	0.200***	0.010
	(0.009)	(0.007)	(0.006)
Mean at t = -1	10.95	0.00	0.18
Adj. R squared	0.761	0.369	0.909
Worker-Year Obs.	256,090	256,800	254,880

Notes: This table reports the difference-in-differences estimates for the impacts of M&As on workers moving from target firms within the first two years after the event across various age groups. Column (1) displays the estimates log of total earnings. Column (2) displays the estimates for the transition probabilities. Column (3) displays the estimates for the employer fixed effects. The standard errors are two-way clustered at the worker and firm level.