Post-Merger Restructuring of the Labor Force

Finance Working Paper N° 753/2021
November 2023

Britta Gehrke
Freie University of Berlin, IAB and IZA

Ernst Maug
University of Mannheim and ECGI

Stefan Obernberger
Erasmus University Rotterdam

Christoph Schneider
University of Münster

ECGI Working Paper Series in Finance

Post-Merger Restructuring of the Labor Force

Working Paper N° 753/2021

November 2023

Britta Gehrke
Ernst Maug
Stefan Obernberger
Christoph Schneider

We are grateful to Ramin Baghai, Andrea Caggese, Giacinta Cestone, Dirk Jenter, Felix von Meyerinck, Clemens Müller, Linus Siming, Elena Simintzi, Paolo Volpin, Wei Wang, Jean-Philippe Weisskopf, Moqi Groen-Xu, and Liu Yang, to conference participants of the American Finance Association, the Corporate Finance Day (Rotterdam), the first ESADE Spring Workshop, the European Finance Association, the Financial Intermediation Research Society, the German Finance Association, the Northern Finance Association, the sixth Annual Mergers and Acquisitions Research Centre Conference, the SFS Cavalcade, the Swiss Finance Association meetings, and seminar participants at Aalto University, Bayes Business School (London), CEIBS, Erasmus University (Rotterdam), Humboldt University (Berlin), IE Business School (Madrid), NYU (Shanghai), Queen-Mary University (London), Tilburg University, Tinbergen Institute (Amsterdam), University of Essex, and WHU (Vallendar) for comments and discussions. We are very grateful to Peter Severin for excellent research assistance.

Abstract

We study the restructuring of the labor force after M&As by taking a comprehensive view that analyzes targets, acquirers, and merged firms. We show that acquirers' establishments grow significantly as many jobs move from the target to the acquirer. Employee turnover is large because many employees leave the merged firm voluntarily, and vacant positions at the acquirer are filled with external hires. Restructuring involves significant changes to the management and the organization of the firm. These findings highlight that redrawing the boundaries of the firm has also first-order consequences for the organization and composition of the labor force of the acquirer.

Keywords: M&A, Restructuring, Employment, Internal Labor Markets

JEL Classifications: G30, G34, J24, J31, M51

Britta Gehrke
Professor
Freie University of Berlin
P.O. Box 7240
Bonn, D-53072, Gernmany
e-mail: britta.gehrke@fu-berlin.de

Ernst Maug*
Professor of Corporate Finance
University of Mannheim, Business School
L9 1-2
68131 Mannheim, Germany
phone: +49 621 181 1952
e-mail: ernst.maug@uni-mannheim.de

Stefan Obernberger
Associate Professor of Finance
Erasmus University Rotterdam, Erasmus School of Economics
Burgemeester Oudlaan 50
3062 PA Rotterdam, The Netherlands
phone: +31 10 408 1329
e-mail: obernberger@ese.eur.nl

Christoph Schneider
Professor of Finance
University of Münster
Universitätsstraße 14-16
48143 Münster, Germany
phone: + 49 251 83-22088
e-mail: Christopy.Schneider@wiwi.uni-muenster.de

*Corresponding Author

Post-merger Restructuring of the Labor Force*

Britta Gehrke† Ernst Maug‡ Stefan Obernberger§

Christoph Schneider¶

November 21, 2023

Abstract

We study the restructuring of the labor force after M&As by taking a comprehensive view that analyzes targets, acquirers, and merged firms. We show that acquirers' establishments grow significantly as many jobs move from the target to the acquirer. Employee turnover is large because many employees leave the merged firm voluntarily, and vacant positions at the acquirer are filled with external hires. Restructuring involves significant changes to the management and the organization of the firm. These findings highlight that redrawing the boundaries of the firm has also first-order consequences for the organization and composition of the labor force of the acquirer.

Keywords: M&As, Restructuring, Employment, Internal Labor Markets

JEL Classifications: G30, G34, J24, J31, M51

*We are grateful to Ramin Baghai, Andrea Caggese, Giacinta Cestone, Dirk Jenter, Felix von Meyerinck, Clemens Müller, Linus Siming, Elena Simintzi, Paolo Volpin, Wei Wang, Jean-Philippe Weisskopf, Moqi Groen-Xu, and Liu Yang, to conference participants of the American Finance Association, the Corporate Finance Day (Rotterdam), the first ESADE Spring Workshop, the European Finance Association, the Financial Intermediation Research Society, the German Finance Association, the Northern Finance Association, the sixth Annual Mergers and Acquisitions Research Centre Conference, the SFS Cavalcade, the Swiss Finance Association meetings, and seminar participants at Aalto University, Bayes Business School (London), CEIBS, Erasmus University (Rotterdam), Humboldt University (Berlin), IE Business School (Madrid), NYU (Shanghai), Queen-Mary University (London), Tilburg University, Tinbergen Institute (Amsterdam), University of Essex, and WHU (Vallendar) for comments and discussions. We are very grateful to Peter Severin for excellent research assistance.

†Freie Universität Berlin, 14163 Berlin, IAB and IZA. Email: britta.gehrke@fu-berlin.de.

‡University of Mannheim, 68161 Mannheim, Germany. Email: ernst.maug@uni-mannheim.de.

§Erasmus University, 3000DR Rotterdam, The Netherlands. Email: obernberger@ese.eur.nl.

¶University of Münster, 48143 Münster, Germany. Email: Christoph.Schneider@wiwi.uni-muenster.de.

1 Introduction

What is the role of the labor force in creating synergies in mergers and acquisitions? A recent literature shows that frictions that hamper the reallocation of employees such as employment protection legislation or unionization are associated with lower merger activity (John, Knyazeva, and Knyazeva, 2015; Dessaint, Golubov, and Volpin, 2017; Levine, Lin, and Shen, 2020). These papers suggest that synergies in M&As depend critically on the ability of firms to restructure their labor force after mergers. Despite its purported significance, however, we have only limited knowledge about how acquirers actually restructure their labor force after acquisitions.

In this paper, we analyze the post-merger restructuring of the labor force and depart threefold from prior literature. First, we focus on the employees of the merged firm, including those of the acquirer, whereas existing contributions mostly analyze employment at the target. Second, we decompose net employment growth into granular employment flows between acquirers and targets, and between the outside labor market and the merging firms. Third, we ask how M&As affect the organization of the labor force by analyzing how acquirers restructure their management and change their hierarchical structure.

We find that M&As have first-order effects on the labor force of the acquirer, which are similar in magnitude to those on the employees of the target. Acquirer establishments grow, but mostly through external recruiting and not through transfers from the target. Hence, while jobs frequently move to the acquirer, the target's employees do not. Many employees from both merging firms leave for better-paid jobs, likely voluntarily, which creates additional demand for new hiring and large employee turnover: acquisitions do not satisfy the demand for labor, they increase it.

We associate these changes to the labor force with multiple organizational changes: Merged firms become more hierarchical if they grow; many targets are closed; and restructuring affects mostly management, as many managerial jobs move to the establishments of the acquirer. Productivity and wages increase during post-merger restructuring, sug-

gesting that these organizational changes pay off to shareholders and to most employees affected by the merger.

We analyze 1,043 acquisitions in Germany between 1997 and 2014 and investigate an employer-employee-linked data set with over 500,000 employees. Germany is ideally suited to study these issues, because the strictness of its employment protection legislation puts it at the median of the OECD, and we have detailed data on the compensation, education, occupations, and skill levels of the German labor force.[1] We perform matched-sample difference-in-differences analyses and match each target firm and each acquirer firm to a control firm.[2] We conduct analyses at the establishment level and track the flows between the establishments of acquirers and targets, and external flows to and from the outside labor market. We track these flows from the beginning of the year of the acquisition to the end of the second year after the acquisition.

Acquirer establishments grow even if the merged firm shrinks. We find acquirers' establishments exhibit strong abnormal growth of 14.5% of their pre-acquisition labor force relative to matching controls, without including the additional employees at target establishments. Moreover, and somewhat surprisingly, most of this growth - about five-sixths of the total increase - comes from external hiring, and only a small part comes from employees who transfer from target to acquirer establishments. Hence, while jobs move, employees do not.

About three-fifths of the employees who leave the combined firms move to higher-paid jobs at other firms. In all likelihood, these employees leave voluntarily. We attribute these departures to the organizational changes associated with M&As, which close employees' career paths and make staying with the firm less attractive for them. We take these voluntary departures as a cue to investigate organizational changes and conclude that

[1]There is no prior study on post-merger employment restructuring in Germany among the almost 40 studies we survey below. None of the studies on other countries addresses the questions we focus on in this paper. See OECD (2020) for country-level scores on employment protection legislation. See also Kim, Maug, and Schneider (2018) for further detail on labor market regulation in Germany compared to other countries.

[2]See Davis et al. (2014), Antoni, Maug, and Obernberger (2019), and Geurts and Van Biesebroeck (2019) for other studies using a similar approach to constructing a counterfactual.

acquisitions do not satisfy acquirers' demand for labor. Rather, they create additional demand for external hires as many employees leave and need to be replaced.

M&As drive employee turnover and organizational change. Employee turnover is large after M&As and increases by about 30% relative to control firms. Changes in net employment reveal only a small part of overall post-merger restructuring, as about two out of three employees who leave the combined firm are replaced. Acquirers have better-skilled and better-paid employees than targets before mergers, and employee turnover changes the composition of the labor force: New external hires are about four years younger and earn about 11.2% less compared to those who leave the combined firm. New hires are also slightly better skilled on average, but on this dimension merging firms do not differ from non-merging control firms, they only turn over the workforce and thus change its skill composition at a much higher rate. In contrast, internal transfers between the establishments of the merged firm are biased toward employees who are highly-skilled and highly-paid (internal hires earn 47% more than external hires), but also less experienced. Hence, firms' hiring policies emphasize labor costs and their retention policies try to preserve the general skills but not the firm-specific human capital of their workforce.

We analyze the hierarchical structure of the firm by classifying employees into hierarchical layers based on occupational codes. We draw on theories in organizational economics, which argue that firms can create economies of scale by increasing the number of layers if they grow, thereby reassigning tasks from employees in the middle of the organization to those at the top. We find that acquirers significantly increase the number of layers if they grow, consistent with the predicted economies-of-scale effect. Moreover, acquirers grow the lower layers and the highest layer more than the middle layer, which is consistent with theories that emphasize the hollowing out of the middle of the organization: These theories argue that highly-skilled employees at the top of the organization attract more complex tasks, whereas the employees in the middle of the organization work in the "shadow of the superstars" (Garicano and Rossi-Hansberg, 2015), which may be an important driver of inequality within firms.

We interpret additional layers and a higher share of employees in the upper layers as evidence for more managerial capabilities. Thus, acquirers enhance their managerial capabilities after M&As. However, acquirers increase the middle management layer of the firm *less* in proportion to overall employment growth, and the lower layers *more* in proportion to growth, thus increasing control spans.

Acquirers combine the operational knowledge of the target with the managerial capabilities of the acquirer. We undertake a separate analysis of the flows of employees whose occupational classification identifies them as managers, the majority of whom constitutes middle management. Turnover and replacements are about twice as high for managers as for non-managerial employees: Post-merger restructuring happens mostly at the top of the organization.

Acquirers always move managerial jobs to their own establishments, but the details of the restructuring of management critically depend on how they treat the establishments of the target. In 36% of all transactions, targets are fully integrated into the acquirer and their establishments are closed. We view acquirers' choice to integrate the target as a decision to take more direct managerial control, and find that most employment losses associated with M&As are concentrated in these transactions. If acquirers integrate the target, then they retain target managers at a much *higher* rate than their non-managerial employees. These target managers then displace incumbent acquirer managers, who leave. By contrast, if acquirers do not integrate the target, then they retain the target's managers at a much *lower* rate than non-managerial employees. Instead, they build managerial capabilities through external recruiting and move managerial jobs, but not the managers themselves, from the target's to the acquirer's establishments. From these observations, we conclude that, independently of whether targets are integrated or not, acquirers need the knowledge and skills of two groups of managers: those from the target, probably because they understand the target's operations; and those of the acquirer, probably because they are familiar with the acquirer's management practices. Hence, acquirers concentrate management at their establishments and combine the complementary skills of the managers from both merging

firms.

Finally, we measure productivity using data on sales growth, labor productivity, and on wage growth, which we interpret as a measure of growth in labor productivity. All measures indicate that productivity grows after mergers, consistent with prior literature (Li, 2013). We therefore conclude from our analyses that the large changes to the workforce and the organization of the firm pay off for shareholders and for those employees who stay with the firm, whereas a significant minority (about 40%) of those employees who leave experiences losses to their human capital.

We conclude with a discussion of theories of synergies in M&As and find that many of them have limited explanatory power for our salient findings. Our results support two paradigms: First, they are consistent with the notion that M&As create economies of scale by leveraging managerial capabilities through hierarchies. Second, M&As exploit complementary assets, which are intangible in our case: They combine the operational knowledge of the target managers with the managerial capabilities of the acquirer.

Discussion of the literature. This paper contributes to the literature on the impact of M&As on labor market outcomes and post-merger restructuring. In Table A1 in Appendix A.5, we survey a total of 39 studies that analyze labor market outcomes as consequences of mergers and acquisitions, two of which analyze cross-country data sets. The 37 single-country studies cover predominately the US, the UK, and other countries with lenient employment protection regulation.[3] There is no prior study on Germany, which is close to the median of the OECD in terms of the strictness of employment protection regulation. The table provides information on whether the effects of M&As on labor market outcomes are positive (P), negative (N), insignificant (I), or ambiguous (A, i.e., they depend on moderating factors). While the majority of papers documents negative effects of M&As

[3]This statement is based on the 2019 OECD scores for the strictness of employment protection legislation (EPL), which are 1.3 for the US (22 studies), 1.6 for Canada (one study), 1.7 for the UK (4 studies), and 1.8 for Denmark (2 studies). The score for Germany is 2.2. The other six single-country studies with OECD EPL scores are from countries with stricter EPL regulation compared to Germany. See OECD (2020), Table 3.3.

on employment (17 studies, compared to 4 studies with positive effects), the literature is about evenly divided on the direction of wage effects (23 studies: 6 negative, 7 positive, 10 insignificant or ambiguous). Note, however, that several studies explicitly attribute employment losses to the voluntary decisions of employees to leave their jobs (e.g., Kim, 2020; Ranft and Lord, 2000). Our study contributes to this literature by studying the economic mechanisms that drive the aggregate effect on net employment. In particular, we show how changes in net employment are associated with large employee turnover, especially additional hiring at the acquirer, and correspondingly larger job losses at the target; we show how it is related to job rotations within the merged firm; to changes in the composition of the workforce; and to changes in the organizational structure of the firm.

Only few papers discuss post-merger restructuring of the labor force beyond effects on aggregate employment and wages. Our study is most closely related to Lagaras (2021) and Ma, Ouimet, and Simintzi (2021), who both study the post-merger changes in the occupational composition of the labor force. Ma, Ouimet, and Simintzi (2021) analyze a US sample of horizontal mergers, and find that post-merger restructuring displaces workers in routine-based jobs and that wage inequality increases, in line with their hypothesis that mergers implement technological change. Lagaras (2021) uses a sample of M&As from Brazil and shows that targets increase their share of highly-skilled workers and that occupational overlap significantly influences the likelihood of separations. The focus of both papers is on target firms and on technological change and thus complementary to our focus on organizational change and the restructuring of management. As such, we take a cue from Acemoglu et al. (2007) and Bloom et al. (2014) who associate improvements in information and communication technology with changes in the hierarchical structure and organization of firms, thereby showing that technological change and organizational change are complements. Smeets, Ierulli, and Gibbs (2016) study a sample of Danish M&As in the 1980s and 1990s and investigate the mixing of target and acquirer employees. They also document that internal transfers between acquirer and target establishments are low, and that employee turnover increases after mergers. However, they do not associate these

changes with changes in management or organizational change. As such, their inference that post-merger integration may be possible by "reconciling policies and coordinating across groups [of employees] without much need to disturb day-to-day operations" (p. 464) is different from ours.

Finally, a group of studies hypothesizes that the benefits from mergers depend on the overlap between the acquirer's and the target's labor force. Neffke and Henning (2013), Lee, Mauer, and Xu (2018), Lagaras (2021), Dobbelaere et al. (2022), and Tate and Yang (2022) all develop measures of human-capital relatedness and occupational overlap, and all find that they positively predict the likelihood of mergers. Relatedly, Beaumont, Hebert, and Lyonnet (2022) show that companies undertake diversifying acquisitions if they lack the human capital to diversify into new industries. This literature is also complementary to our study by showing that the pre-merger characteristics of the labor force influence the decision to merge, whereas we focus on post-merger restructuring.[4]

2 Sample and methodology

2.1 Sample construction

We start with the universe of all mergers and acquisitions in the Bureau van Dijk (BvD) Zephyr database for which the target and the acquirer are headquartered in Germany. After applying the standard filters, we arrive at 3,602 transactions for the period from 1997 to 2014. Table OA1 in the Online Appendix provides an overview of all steps of the data set construction. In the next step, we link these transactions to the Orbis-ADIAB data set provided by the Research Data Center of the Institute of Employment Research (IAB) using the BvD identifier. Details on the record-linkage between BvD and IAB data are described in Antoni et al. (2018). The Orbis-ADIAB data set contains the standard IAB establishment identifier, which we use to match our data to the Establishment History

[4]Tate and Yang (2022) also estimate how the transfers of workers and their retention after acquisitions depends on their measure of human capital transferability.

Panel (BHP, see Schmucker et al. 2016). The BHP contains aggregated information on employees and establishment characteristics. After identifying all establishments involved in an acquisition, we aggregate these establishments to the firm (target or acquirer) level. About one-third of the firms covered by our M&A sample can be linked to the establishment data. For each acquisition, we require that both, the target and the corresponding acquirer be successfully linked, otherwise we remove them from the sample. We obtain 1,147 transactions with aggregate employment data for both firms involved in the deal.

2.2 Constructing a matched firm sample

We follow earlier contributions in the literature (e.g., Davis et al., 2014; Antoni, Maug, and Obernberger, 2019) and apply nearest-neighbor matching. The objective of this approach is to make treatment random conditional on the matching variables. Hence, for each target firm and acquirer firm, we identify one control firm using the firm-level aggregated BHP data and the following criteria.[5] First, we remove all target firms from the list of potential controls that have been involved in an acquisition themselves at any time during the sample period. Acquiring firms are not part of the list of potential controls from one year before to one year after the transaction. Second, we build matching cells based on two-digit industry affiliation (88 categories), calendar year, region, and number of establishments. We pick the nearest neighbor in terms of the Euclidean distance based on our numerical matching variables: the firm-level averages of *Wage* and *Age*, the shares of, respectively, high-qualified, medium-qualified, and female employees, as well as *Size*. In the last step, we identify one control firm from the set of nearest neighbors for each target and for each acquirer firm. We match with replacement, i.e., a control firm may be matched to more than one target or acquirer. Of the 1,147 target and acquirer companies, we can match 1,136 (1,069) targets (acquirers). For a deal to be considered in the analysis, we

[5] As a basis for the aggregation, we use the record-linkage from the IAB, which links 1,365,323 establishments to 955,784 German firms. The firm-level categorical variables are based on the firms' largest establishment, e.g., a firm's region is determined by the location of its largest establishment.

require data on both target and acquirer simultaneously, which leaves us with 1,043 jointly matched firm-pairs.

Table OA2 in the Online Appendix shows the matching results. For all our matching variables and several important outcome variables (*Hierarchy*, the number of layers, *Pre-Growth*), the values for the treated firms are close to those for control firms. We use the normalized differences proposed by Imbens and Wooldridge (2009) and used by Imbens and Rubin (2015) to examine whether the differences between two groups of observations are economically significant. Imbens and Wooldridge (2009) recommend that normalized differences be below 0.25 in absolute value. The test statistic is never higher than 0.10 for any of the variables. We conclude that our control groups match target and acquirer firms very closely on all relevant criteria.

For the matched transactions, we select all employees who work for either the treated or the control firms during the period from one year prior to two years after the transaction. Our individual employee-level data come from the Integrated Employment Biographies (IEB) at the IAB. [6] These steps leave us with 1,043 transactions and 2,086 acquirer and target firms. Table 1 provides summary statistics for the treated and control firms as well as employees are in .

2.3 Employee flows

We define *Employment growth* from time t to time $t+k$ as $g_{j,t,t+k} = \frac{E_{j,t+k} - E_{jt}}{0.5\left(E_{j,t+k} + E_{jt}\right)}$, where E_{jt} denotes the level of employment in firm j at time t.[7] We follow Antoni, Maug, and Obernberger (2019) and decompose firm-level employment growth into inflows and outflows. We define the normalized inflow of newly-hired employees (*Inflow*) from time t to time $t+k$ as $h_{j,t,t+k} \equiv \frac{\sum_{\tau=1}^{\tau=k} H_{j,t+\tau}}{0.5(E_{jt} + E_{j,t-1})}$, where H_{jt} is the number of employees who enter firm

[6] For an overview and definitions of all variables see Table A2 in the Appendix. The IEB contain detailed longitudinal data on almost the entire German workforce.

[7] Davis et al. (2014) point out that this growth rate measure has become standard in analyses of establishment and firm dynamics. See Davis, Haltiwanger, and Schuh (1996) and Tornqvist, Vartia, and Vartia (1985) for detailed discussions. This definition of growth rates is less skewed and can take values between -200% and +200%. Further properties are discussed in Appendix A.1.

j in period t ("hiring"). Analogously, we define *Outflow* as $s_{j,t,t+k} \equiv \frac{\sum_{\tau=1}^{\tau=k} S_{j,t+\tau}}{0.5(E_{jt}+E_{j,t-1})}$, where S_{jt} is the number of employees who leave firm j in period t ("separations"). It follows that $g_{j,t,t+k} = h_{j,t,t+k} - s_{j,t,t+k}$. (See Appendix A.1 for further details.) We further decompose employee flows into flows within the same firm (*Internal inflow* or *outflow within*), flows between the corresponding target/acquirer firm (*Internal inflow* or *outflow between*), and external flows (*External inflow* or *outflow*), which includes all other flows, in particular those to and from other companies, unemployment, training and education, or foreign establishments.

Descriptive statistics. Table 1 presents descriptive statistics of the numerical variables for the treated firms (Panel A), control firms (Panel B), and the correlations among labor flows (Panel C). Our final firm-level data set covers a cross-section of 1,043 acquirer-target pairs. On average, the merged firm employs 565 domestic employees (*Size*) in the year prior to the announcement, 102 at the target and 463 at the acquirer. Pre-acquisition employment growth (*Growth*) is very similar for targets and acquirers. We observe each target (acquirer) firm from two years before the acquisition to two years after the acquisition.

2.4 Methodology: Regression design

To provide a generic representation of employee flows, let $f_{j,t-1,t+2}$ be a labor flow relating to firm j from $t-1$ to $t+2$, where f can, for example, be an inflow ($f = h$), an outflow ($f = s$), or employment growth ($f = g$). We adapt the approach of Davis et al. (2014) and regress three-year flows on a target (acquirer)-firm indicator, control variables, and a set of fixed effects:

$$f_{j,t-1,t+2} = \alpha + \theta \times Treated_j + \lambda g_{j,t-3,t-1} + \beta X_{j,t-1} + \sum_c D_{cj}\delta_c + \varepsilon_j, \qquad (1)$$

where $Treated_j$ is a dummy variable equal to one for target and acquirer firms in all sample years, and zero for matching controls. We control for past employment growth using $g_{j,t-3,t-1}$, the two-year pre-acquisition growth rate. In the baseline regression, the only control variable included in the vector $X_{j,t-1}$ is the driving distance between the headquarter of the target and the acquirer. Like Davis et al. (2014) and Antoni, Maug, and Obernberger (2019), we use non-parametric controls by including a set of dummy variables D_{cj}, which equal one for cell c for firm j, and cells are defined by the full cross product of acquisition year; industry; firm size category, based on the number of establishments; and geographic region; these dummy variables also absorb the intercept.[8] The coefficients of interest are the difference-in-differences estimates of θ, which denotes the differences in flows (*Employment growth*, *Inflow*, *Outflow*) between sample firms and matching firms after subtracting the influence of control variable. Throughout the paper, we report t-statistics and significance levels based on standard errors clustered at the firm level. Definitions of all variables can be found in Table A2 in the Appendix.

3 Employment growth and turnover

We begin the discussion by analyzing the abnormal flows of employees from and to target establishments ("targets") and acquirer establishments ("acquirers"). Table 2 presents our results for all employees of the combined firms (column 1), targets (columns 2 and 3) and acquirers (columns 4 and 5). For targets and acquirers, we report the abnormal flows scaled by the employment of the respective firm (targets: column 2; acquirers: column 4) and the same flows but scaled by the employment of the combined firm (targets: column 3; acquirers: column 5), to provide comparability with column 1. The tables report only the coefficient estimates of θ as in equation (1), which measure the treatment effects after controlling for distance and pre-acquisition growth; we refer to these as abnormal flows,

[8] We group firms into five size brackets according to their number of establishments. These brackets are: 1, 2, 3-5, 6-10, and larger than 10.

but will mostly omit the labeling as "abnormal" if there is no confusion. Indented flows are breakdowns of the flows shown directly above them.

3.1 Acquirer growth

The first salient observation is that post-merger restructuring involves significant employment flows at acquirers' establishments. These establishments exhibit strong *Employment growth* of 14.54%, measured relative to their own workforce (column 4 of Table 2).[9] This observation is novel. It may appear unsurprising, as acquirer establishments might be expected to grow by absorbing employees released by the target. Remarkably, this is not the case. We evaluate the contribution of internal transfers by separately calculating *Internal growth* (defined as the balance of *Internal inflow between* and *Internal outflow between*), which contributes only 2.35 percentage points (pp), or one-sixth of acquirers' net employment growth. The remaining five-sixths come from *External growth* of 12.20%, defined as the balance of external hiring and external separations.[10] For targets we find, consistent with prior literature, that their employment declines, in our sample quite dramatically by 55.36% of targets' labor force. Employment of the combined firm declines by 7.22%, which results from the net balance of acquirer growth (6.97%) and target decline (-14.01%; see columns 1, 3, and 5; abnormal flows only add up exactly within columns but not across columns, where control variables vary and give rise to slight differences).

Equally important, we observe that most of those employees who leave find new employment at higher wages at other firms. In particular, the *External outflow* of the acquirer amounts to 4.34% of the combined firm's labor force, and of these, 2.49 pp experience a wage increase, whereas the remaining 1.85 pp either accept lower-paid jobs or become

[9]Note that this analysis refers only to the growth of those establishments that belong to acquirers before the acquisition and does not include the employees of the target that may legally belong to the organization of the acquirer after the acquisition.

[10]The conclusions are qualitatively similar but quantitatively a little less extreme if we weight employee flows by the employment of the combined firm and not by that of the acquirer (column 5). In all likelihood, larger targets create larger employee flows to the acquirer, and transactions involving these targets receive a higher weight in column 5. Then analogous calculations show that the internal contribution to net employment growth is about one-quarter.

unemployed. Hence, about three-fifth (2.49/4.34=0.58) of those who leave the acquirer's establishments experience gains to their human capital; if we scale these flows by acquirers' own employment, then this fraction is almost 70% (see column 4: 4.31/6.23=0.69). We assume that these employees leave voluntarily. This observation is noteworthy, since we would expect that those employees who find better-paid jobs after M&As could have left the firm and found these better-paying jobs earlier. One possible explanation is that most employees do not search for jobs because they underestimate their outside options (Jäger et al., 2023). Merger transactions then trigger increased job search among employees (Agrawal and Tambe, 2019), which appears to be often successful. Our preferred, and mutually non-exclusive, interpretation of these voluntary departures is that the reorganization of the firm closes the career paths for some employees, who then leave. Ferreira and Nikolowa (2022a, 2022b) develop models in which firms compete for employees by offering them such career paths with associated wage profiles. These career paths are affected by changes to the organizational structure and determine employees' decisions to leave or stay with an employer. We will explore this explanation at a later stage when we discuss hierarchies (Section 4.2).

Repeating the same calculations for targets generates virtually identical results: About 60% of the target employees who leave after M&As find better-paid jobs. Some studies (Kim, 2020; Chen, Gao, and Ma, 2021) discuss the difficulties of acquirers to retain the key employees of the target, and identify reasons such as the "cultural fit" of target employees to the acquirer's organization. However, we observe that the proportions of employees who leave the firm for a better-paid job is almost identical for targets and for acquirers. This observation is inconsistent with the cultural-fit explanation, which predicts that target employees leave the firm at a much higher rate than acquirer employees, whereas the job-search and career-path explanations described in the previous paragraph are consistent with our findings.

3.2 Target integration

We find that in 373 transactions, or 36% of the sample, all target establishments have zero employees at the end of year two after the acquisition, and we refer to these targets as being *fully integrated,* or, for brevity, *integrated*. By contrast, we refer to the complement of transactions in which at least some employees remain at some target establishments as *not integrated*.[11] (We prefer this label for clearer distinction, even though some partial integration clearly takes place.) This observation appears broadly consistent with Maksimovic, Phillips, and Prabhala (2011), who find that acquirers close or divest 46% of acquired plants within three years of the acquisition; however, note that these analyses are not directly comparable.

The change in employment and labor flows differ significantly, depending on whether targets are integrated or not. To see this, Table 3 reports the selected abnormal employee flows separately for integrated and for non-integrated targets.[12] The overall employment of combined firms that integrate their targets declines by 27.56%, compared to a small and marginally significant employment increase of 3.75% for transactions with non-integrated targets. Hence, there are large employment losses if targets are integrated, and small and marginally significant employment gains otherwise.[13] We conclude that M&A-related losses of human capital are concentrated in transactions that involve the full integration of the target. This relationship should not be construed as causal. It is plausible that acquirers tend to integrate those targets in which they intend to replace a larger portion of the workforce.

Acquirers' establishments grow for both subsamples, slightly more when the target is integrated (9.20%) than when it is not (5.95%), whereas targets always decline, though only slightly if they are not integrated (-2.10%). Hence, growth is concentrated in acquirers'

[11] Of the 1,043 targets in the sample, 894 (86%) have one establishment and 149 (14%) have multiple establishments. We do not separately consider cases in which only one of multiple establishments is closed.

[12] Table OA3 in the Online Appendix reports the full set of abnormal labor flows for integrated and non-integrated targets, using the same format as Table 2.

[13] Table OA3 in the Online Appendix shows that wages losses are also concentrated in transactions with integrated targets.

establishments and jobs tend to move from targets to acquirers. The next section analyzes the flows of employees, rather than jobs, from targets to acquirers.

3.3 Internal labor markets

Theories of internal labor markets suggest that mergers create value by providing firms with better access to skilled labor, or by providing insurance to employees and avoiding costly layoffs after negative shocks, as well as a range of other reasons.[14] We observe a significant increase in the activity of internal labor markets after acquisitions, with a 3.50% higher flow between establishments of the combined firm (Table 2, column 1); column 2 shows that the flows from targets to acquirers amount to 18.11% of the targets' workforce. We can infer from Table 3 that internal transfers are important only when targets are integrated, in which case 5.40%, or three-fifth of the acquirer's growth of 9.20% (measured relative to the workforce of the combined firm) is accounted for by inflows from the target. When the target is not integrated, internal transfers from the acquirer to the target amount to only 0.41%, which is negligible relative to the acquirer's net employment growth of 5.95% in this subsample.

To evaluate the argument that mergers provide firms with better access to skilled labor ("acqui-hiring") as a potential explanation of internal flows, we define the *Internal hiring rate* as the ratio of the merged firms' internal hiring (*Internal inflow,* which captures all inflows into establishments of the merged firm from other establishments of the merged firm) to its total hiring during the same period.[15] (See equation (9) in Appendix A.1.) This ratio would be 100% if all hiring between $t-1$ and $t+2$ would be internal. Table 4 reports

[14]The literature on access to skilled labor and that on employment insurance are summarized in footnote 15, respectively, footnote 17 below. Other reasons include: Internal labor markets provide a better matching of capital and tasks to employees: Berk, van Binsbergen, and Liu (2017), Luo, Manconi, and Schumacher (2018); they provide incentives for investments in firm-specific human capital: Tate and Yang (2015); they allow firms to capture growth opportunities: Cestone et al. (2023); they transfers management practices: Atalay, Hortacsu, and Syverson (2014), Huneeus et al. (2021); see Section 4.1 on the last argument.

[15]See Giroud and Mueller (2015); Kim (2020); Ouimet and Zarutskie (2020); Chen, Hshieh, and Zhang (2023) and Zhang, Zhong, and Yang (2023) for discussions and evidence on the acqui-hiring argument.

the mean *Internal hiring rate* in column 1, separately for acquirers, targets, and combined firms. Panel A reports the averages of unadjusted rates, whereas Panel B reports the abnormal rates, estimated from running regression (1), as before. The average unadjusted *Internal hiring rate* across all combined firms is only 9.23% and the corresponding abnormal *Internal hiring rate* is 4.57%. Hence, there is a statistically highly significant increase in the internal labor market activity of the combined firm.[16] Acquirers hire more than 90% of new employees from the external labor market, whereas internal hiring contributes very little to acquirers' demand for labor. We conclude that acquisitions increase internal labor market activity, but they do not satisfy firms' demand for employees. Rather, M&As create more demand for hiring from the external labor market.

Alternatively, the internal transfers we observe may also be explained by the theory of implicit contracts, which holds that internal labor markets provide employees with insurance against losses in their productivity.[17] To investigate this hypothesis, we define the *Internal separation rate* analogously as the ratio of internal separations (flows to the merging partner, *Internal inflow*) to total separations (*Outflow*; see equation (10) in the Appendix). For targets, this ratio would be 100% if all departing target employees find new jobs at the establishments of the acquirer. However, the unadjusted (abnormal) *Internal separation rate* is only 11.25% (9.27%) for targets, as most target employees, who leave, find new jobs at other firms. Hence, the insurance through the external labor market is about one order of magnitude larger compared to insurance through the internal labor market.

Note that our findings are consistent with the results of Cestone et al. (2020; 2023) and Huneeus et al. (2021), who find significant increases in internal labor market activities after exogenous shocks in business groups. As reported above, we also find statistically significant and economically meaningful transfers, which represent a substantial increase

[16]Note that the *Internal hiring rate* for control firms is positive, since there are transfers between the establishments of the same firm.

[17]See Pagano (2020) for an extensive survey of the literature and Ellul, Pagano, and Schivardi (2017), Kim, Maug, and Schneider (2018), Cestone et al. (2020), and Faccio and O'Brien (2021) for recent contributions on insurance provision within firms.

compared to the pre-merger exchanges of employees. However, this literature asks a slightly different question and studies how industry shocks *change* the relative importance of internal flows relative to external flows in business groups. By contrast, the analysis above compares the actual size of internal relative to external flows, not its change, and finds that the size itself is small.

Overall, we cannot conclude that mergers establish a vibrant internal labor market, in which employees regularly rotate between target plants and acquirer plants. In fact, the transfers between acquirers and targets are different from zero in only 266 transactions (number not tabulated; see also Table 11, Panel B below), one-quarter of the sample, and these transfers are mostly concentrated in the subsample in which targets are integrated. Therefore, we view the internal transfers after mergers and acquisitions as a phenomenon that is mostly associated with acquirers absorbing about one-fifth of the employees of integrated targets, in all likelihood because they are required to continue the operations of the target.

Finally, we ask whether internal labor markets and external labor markets are substitutes or complements. If firms that operate more active internal labor markets rely comparatively less on external recruiting, then they would be substitutes and we should see that internal and external flows are negatively correlated. We see in Panel B of Table 1 that the correlations between internal and external flows are always positive and statistically significant for acquirers, and always small in absolute value and statistically insignificant for targets; this holds for inflows as well as for outflows. We conclude from this bivariate analysis that internal and external markets tend to be complements rather than substitutes. Merging firms and non-merging control firms appear to rely on external and internal markets in relatively similar proportions, and differ mainly in the overall turnover of their labor force.

3.4 Turnover and the composition of the workforce

Employee turnover is remarkably large. The 14.54% *Employment growth* of acquirers' employment results from a 23.78% abnormal *Inflow* and a 9.24% abnormal *Outflow*. We follow the literature (e.g., Davis and Haltiwanger, 1999; Cahuc, Carcillo, and Zylberberg, 2014) and define *Turnover* as the average of *Inflow* and *Outflow*, so abnormal $Turnover = 16.51$ for acquirer establishments (see Table 2), which exceeds the baseline turnover at control firms by 32%. (baseline *Turnover* for combined control firms is 52.32 from Table 1.) Hence, it appears that firms hire new employees to replace those who leave. To investigate this observation further, we define *Replacements* as the lower of the number of separations and hirings at each firm, normalized by total employment. If there are more (fewer) hirings than separations, then the firm has a net employment gain (loss). We also obtain the *Replacement rate* as the ratio of replacements to separations, which measures the fraction of separations that result in new hirings.[18] Table 4 reports the mean unadjusted *Replacement rate* in column 4*,* which is 67.69% for combined firms in our sample, i.e., two new employees are hired for three employees who leave. Importantly, abnormal *Replacements* are 7.83 and highly significant, whereas the abnormal *Replacement rate* is statistically indistinguishable from zero: M&As do not result in a higher *Replacement rate*, as the ratio between hiring and separations is unaffected. Rather, M&As significantly increase *Turnover*, which results in a higher number of replacements.

To understand the reasons behind the large increase in employee turnover, we investigate how turnover and the large number of replacements affect the composition of the labor force. To begin, we compare the composition of the labor force of acquirers and targets before the merger. Table 5 provides descriptive evidence on the education and job descriptions of employees in the year before the merger. Acquirers employ a larger proportion of employees as executives (layer 4: 7.0% vs. only 5.3% for targets) and middle managers

[18] See equations (11) and (12) for formal definitions of *Replacements*, respectively, the *Replacement rate.* See the paragraph "Turnover" in Appendix A.1 for a discussion of how *Employment growth*, *Turnover*, and *Replacements* are related. The *Replacement rate* is defined only for transactions with a positive separation rate, which is the case for 99% of the sample.

(layer 3: 16.5% vs. only 14.1% for targets) . Acquirer employees are also better educated, with 24.9% of them holding a university degree (17.7% for targets), whereas more target employees have only an intermediate school leaving certificate without vocational training (8.1% vs. 6.8% for acquirers) or with vocational training (49.6%, compared to 42.6% for acquirers). Hence, acquirers have better-educated and better-paid employees compared to targets (Table 1, Panel A reports a difference of €15.12 in *Wage,* or 17% of the average target *Wage*).

Next, we analyze the characteristics of inflows and outflows to combined firms regarding wages, education, qualification, tenure, and age in Table 6. To analyze qualification and education, we define indices. *Qualification index* is constructed by mapping occupational codes into three categories (low, middle, high), and *Education index* is constructed based on educational attainments grouped into five categories (see Appendix A.2 for details). Panel A of Table 6 reports the averages of these indicators before the merger and averages of these indicators for the flows to and from the external labor market after the merger, for combined firms and for their synthetic controls. Panel B shows the same information for the internal flows of combined firms. Note that the number of observations differs across panels because the averages can only be calculated for firms for which the respective flows are positive.

We observe that inflows and outflows to combined firms differ regarding all four characteristics, but to very different degrees. Newly-hired employees are, on average, slightly more qualified and better educated than those who leave the firm. However, these effects are economically small and amount to 3.18% (*Education index*) and 0.69% (*Qualification index*) of the pre-merger level. Moreover, these changes are almost identical for control firms, for which we observe relative changes of 2.63% and 1.03% for *Education index* and *Qualification index*, respectively. The similarity of the changes in merging firms and control firms suggests that both follow a similar blueprint for the skill composition, only that merging firms turn over their workforce at a higher rate. By contrast, newly-hired employees are, on average, 3.95 years younger than leaving employees, which is 9.92% of the

pre-merger age, and they receive €10.99 or 11.17% less of *Wage*. These effects are economically large and statistically highly significant. Moreover, the corresponding changes at control firms are one order of magnitude smaller, with a decline of *Age* by 0.36 years and of *Wage* by €0.57. Hence, regarding these characteristics, merging firms and their non-merging controls follow very different strategies.

Our findings can be interpreted in the context of the theory of knowledge-based hierarchies, which argues that firms choose the composition and organization of their workforce to optimally use the skill and knowledge required in production.[19] It predicts that firms can achieve economies of scale by adding additional layers of management as they grow, which then relieves the skill and training requirements in the middle of the organization and casts a "shadow of the superstars" (Garicano and Rossi-Hansberg, 2015) on those in the middle of the organization. We will revisit theories and findings on the hierarchical structure and changes in management below (Section 4.2).

In Panel B of Table 6, we repeat the same analysis for internal flows as Panel A provides for external flows. Recall from our discussion of internal labor markets that only 266 observations have non-zero internal flows. The most remarkable feature of internal flows is that they involve more highly-paid employees: The average *Wage* is higher for internal outflows relative to external outflows (+22% = €114.99/€94.48), as well as relative to the entire workforce (+17% = €114.99/€98.36). The higher compensation reflects a higher *Education index* (+17% / +22%) and *Qualification index* (+10% / + 14%) compared to both benchmarks. However, those who are transferred internally are slightly younger than external outflows (38.41 years compared to 39.02 years) and have correspondingly lower *Tenure* (4.88 years compared to 5.39 years). On average, transferred employees receive a 7% pay increase (€122.82/€114.99), underscoring the fact that these employees are typically transferred for operational rather than insurance reasons. Hence, retentions are biased toward highly-skilled and highly-paid but younger and less experienced employees. We

[19]See Garicano (2000), and the survey of Garicano and Rossi-Hansberg (2015), which contains further references.

conclude that firms try to preserve the general skills but not necessarily the firm-specific human capital of their workforce.

4 Management and organization

In this section, we pursue the analysis of changes to the management and the organization of firms after mergers. We address two dimensions of organizational change in this section: changes of management (Section 4.1) and changes in the hierarchical structure of firms (Section 4.2).

4.1 Management

A literature in organizational economics argues that the quality of management and managerial practices have a significant role in creating productivity improvements, which is as important as changes in technology (e.g., Bloom and Van Reenen, 2007; Bloom et al., 2013; Atalay, Hortacsu, and Syverson, 2014). Building on this literature, we hypothesize that acquirers will reorganize their management to adapt to changes in scale, and apply their management practices to the operations of targets.

Table 7 shows the flows for managers, broken down by the status of target integration, in the same format as Table 3 does for the general workforce. Here, the term "managers" is defined from the occupational codes using the Blossfeld (1987) classification (see Appendix A.2.1). About 4.4% (7.1%) of target (acquirer) employees are classified as managers according to Blossfeld (1987).[20] Note that Table 7 includes, in addition to the flows analyzed before, the transitions between managerial and non-managerial positions, which we refer to as promotions, respectively, as demotions. These flows are statistically mostly

[20]Table OA4 in the Online Appendix shows the abnormal flows of managers in a more detailed format, in parallel to Table 2 for the general workforce. Table OA5 in the Online Appendix repeats the same analysis for highly-qualified employees. Highly-qualified employees are also defined from the occupational codes using the Blossfeld (1987) classification and include managers. We do not discuss the results for highly-qualified employees in detail, since they lie usually somewhere between those for managers and those for the general workforce; thus, analyzing them does not provide additional insights.

insignificant, but have an economically relevant magnitude, and they are required so that the component flows for managers in Table 7 add up to the total flows and *Employment growth* as they do in Table 3. Table 8 reports the *Internal hiring rate*, *Internal separation rate*, *Replacements*, and the *Replacement rate* for managers, in the same format as Table 4 does for the general workforce. However, for managers we also provide the same information separately for transactions with integrated targets (Panels C and D) and with non-integrated targets (Panels E and F).

To begin, we observe that *Turnover* is significantly higher for managers compared to the general workforce (with integrated targets: 36.01% / 27.02%; non-integrated targets: 11.32% / 5.66%; compare Tables 7 and 3). Similarly, abnormal *Replacements* are about twice as high for managers (15.80%, Table 8, Panel B) compared to the general workforce (7.83%, Table 4, Panel B). Hence, we can safely conclude that restructuring is happening mostly at the top of the organization, consistent with the notion that restructuring is largely about changing the organization of the firm and its management processes. For the remaining discussion, we analyze transactions with integrated and non-integrated targets separately.

4.1.1 Management in integrated targets

The most remarkable observation on the transactions in which the target is integrated is the large abnormal loss of acquirer managers, which is 24.32% (*External outflow*), compared to only 10.88% for the corresponding flow for the general workforce of the acquirer. Hence, when targets are integrated, the abnormal loss of managers is more than twice as high as the loss of non-managerial employees at the acquirer. By contrast, the loss of target managers (*External outflow*) is only 12.91% (Table 7, column 2), which is unusually small in comparison to the same numbers for all employees (22.66%, see Table 3). Hence, when acquirers integrate target establishments, they retain the target's managers at a much *higher* rate than they retain its non-managerial employees, whereas they retain their own managers at a *lower* rate than they retain non-managerial employees. Our interpretation

of these observations is that acquirers continue the operations of the target, but transfer them to their own establishments. For this purpose, they need a critical number of the managers of the target, more than they need the target's other employees, presumably because the human capital required to continue targets' operations is concentrated in their managers. However, the managers who are transferred from the target's to the acquirer's establishments then displace some of the acquirer's incumbent managers. These are laid off or leave voluntarily, potentially because they do not wish to compete with the transferred target managers for future promotions.[21] These observations complement those from Section 3.4 and Table 6, where we show that employees who are retained and transferred internally are more highly skilled.

This displacement argument appears more plausible than the acqui-hiring argument, because for every target manager who is transferred to the acquirer (*Internal outflow between* = 5.59%; Table 7, column 2), there are two target managers who leave for the external labor market (*External outflow* = 12.91%; column 2), and more than four managers who are hired externally at the acquirer (where *External inflow* is 26.22%; column 3). (See the related argument regarding the general workforce above.) Given the large costs associated with hirings and separations, it appears more likely that acquirers wish to retain the operational knowledge of the target's managers.

4.1.2 Management in non-integrated targets

We now consider the restructuring of management for those transactions in which acquirers do not integrate targets. Here, the most salient observation is by how much these acquirers build up management capabilities at their own establishments through external recruiting. They increase *External growth* by 10.74%, mostly through higher external recruiting (+8.81% *External inflow*). By comparison, *External growth* is only 5.98% for the general workforce in the same subsample (column 6 of Table 3) and it is only 1.91% for

[21] Table OA4 in the Online Appendix shows that acquirer managers leave mostly for new jobs with a higher wage (columns 4, 5) , which supports the notion that most of them leave voluntarily rather than being laid off.

managers in transactions in which targets are integrated (column 3 of Table 7).

However, the overall *Employment growth* of managers in the combined firm is much smaller (4.73%; Table 7, column 4), because there are two countervailing effects that mitigate the large external recruiting of acquirer managers. The first is a significant reduction of managers at targets, for which *Employment growth* of managers equals -3.44% (Table 7, column 5). Hence, the transfer of managerial jobs from targets to acquirers exceeds the flow of managers who move in this direction (0.71%) by a factor of almost five.

The second mitigating effect that reduces the *Employment growth* of managers in relation to the large external recruiting gains is a reduction in the balance between promotions and demotions, which declines by 2.57% (column 6) at acquirers' and by 0.73% (column 5) at targets' establishments. While these declines are individually not statistically significant, they represent about one-third of the gain from *External growth* at the acquirer. Hence, M&As tend to replace some internal promotions by external recruiting, which suggests that the internal career paths of some employees will be closed, as new managers are hired from outside the merging firms.

The literature on managerial practices cited above argues that these practices can often not be transferred like technological blueprints and are embedded in the managers who are familiar with these practices. Hence, we hypothesize that acquirers transfer their management practices to targets by moving some managers there. Consistent with this prediction, we find that the transfer of managers from the acquirer to the target is statistically highly significant *(Internal inflow* from the acquirer to the target is 0.83%, see column 6), which is twice as much as the corresponding number for all employees (which is 0.41%; Table 3, column 6). This finding is in line with the theory, although the magnitude of these transfers is low compared to external recruiting at target establishments (3.65%; column 5 of Table 7).

Hence, acquirers that do not integrate targets retain the general workforce of their targets, but completely reorganize the way in which they are managed by combining four measures, ranked in the order of their quantitative importance: (1) external recruiting of

new managers, mostly at the acquirer establishments; (2) concentration of managerial jobs at the acquirer by moving some of these jobs away from the target; (3) reducing internal promotions from non-managerial to managerial jobs; (4) replacing some managers at the target by transfers from acquirer to target establishments.

Restructuring management. Overall, if targets are not integrated, then their general workforce is mostly retained, but much of their management is replaced. By contrast, if targets are integrated, most of their workforce leaves whereas a significant fraction of managers is retained. In both cases, managerial jobs tend to move to the establishments of the acquirer and the post-merger firm is managed by some managers from the acquirer, some from the target, and new recruits. We infer that acquirers combine the critical skills from both firms: The target's managers, probably because they understand the target's technology and clients; and those of the acquirer's managers, probably because they are steeped in the acquirer's management practices. These findings support arguments that emphasize asset complementarities as a motivation to undertake mergers and acquisitions (Rhodes-Kropf and Robinson, 2008; Levine, 2017; Lagaras, 2021), but emphasizes intangible assets, namely, the skills of critical employees.

4.2 Hierarchies

We are interested in how M&As affect the internal organization of the firm. Extant theories in organizational economics imply that, as firms redraw their boundaries and replace markets with hierarchies, they need to build managerial capabilities and organizational structures, since the organization of the firm replaces the coordinating function of markets.[22] This literature suggests that firms trade off two aspects of organizational design: they can either increase the span of control, which increases the constraints on management time at the top of the organization and requires higher-paid employees who work

[22]We do not attempt to survey the extensive literature here. Classic contributions include Williamson (1967), Mirrlees (1976), and Calvo and Wellisz (1978, 1979). Rajan and Wulf (2006) provide a succinct summary of the theoretical literature in their introduction.

more independently in the existing layers; or they can insert an additional layer of management, which adds extra costs for the new layer, but relaxes the requirement for paying higher wages in the existing layers. As Chen (2017), who builds a model in the spirit of Calvo and Wellisz (1978, 1979), puts it: "(...) adding a layer is *like* an efficiency-enhancing investment with a fixed cost, which generates *endogenous* increasing returns to scale at the firm level." (pp. 204-5).[23] This economies-of-scale argument predicts a strong positive relationship between an increase (decrease) in scale and an increase (decrease) in the number of hierarchical layers. Moreover, changes in the hierarchical structure imply changes in the composition of the workforce: Expanding firms should increase the number of layers, otherwise they would have to increase their control spans, which require higher-skilled and more expensive employees who work more independently.

To test this organizational economies-of-scale hypothesis, we use the growth of the labor force as a measure of scale. For our purposes, we regard all employees that are subordinated to the management of the acquirer as being part of the organization of the acquirer. If targets are not integrated, this includes those employees who continue to work at target establishments. Hence, we define the employment growth of the acquirer, $Growth_A$, by comparing the employment of the merged firm *after* the merger (t+2) with the employment of the acquirer *before* the merger ($t-1$). This definition is appropriate, since theories in organizational economics define the workforce of a firm as including all employees who are subordinated to the same management.

We analyze changes in the hierarchical structure of the firm at the extensive margin (change in the number of layers) and at the intensive margin (changes in the employment shares of different layers). We construct layers of employees following the approach of Caliendo, Monte, and Rossi-Hansberg (2015), which has been widely used and was applied to German data by Gumpert, Steimer, and Antoni (2019).[24] The layers are inferred from

[23]That additional layers of management have this economies-of-scale effect appears to be a robust prediction across theories, independently of whether their framework builds on information processing (e.g., Radner and Van Zandt, 1992), incentives (e.g., Calvo and Wellisz, 1978; Qian, 1994), or tasks (e.g., Garicano, 2000; Caliendo and Rossi-Hansberg, 2012).

[24]This methodology for mapping hierarchical structures is the most widely-used in the literature, because

occupational codes, with the lowest layer being layer 1 (production workers), followed by layer 2 (supervisors), layer 3 (senior experts and middle managers), and layer 4, the highest layer (executives; see Appendix A.2.2 for more details).[25]

We measure the change in the number of layers, $\Delta Layers$, as the difference between the number of layers of the merged firm in period $t+2$ and the number of layers of the acquirer in period $t-1$. We begin with an analysis of the extensive margin by running a simple OLS regression of $\Delta Layers$ on $Growth_A$. In addition, we define dummy variables to separate increases from decreases in the number of layers, so that $D(\Delta Layers > 0) = 1$ for an increase and $D(\Delta Layers < 0) = 1$ for a reduction in the number of layers. Table 9 shows the results with our standard controls. The coefficients on the acquirer's employment growth, $Growth_A$, always have the expected signs if we only include the treated firms (Panel A of Table 9): There is a strong association between the change in the scale of operations and the change in the number of hierarchical layers, consistent with the economies-of-scale argument: Acquirers that grow increase the number (column 1) of layers. They increase the number of layers with a higher frequency (column 2) and reduce the number of layers with a lower frequency (column 3). Including control firms (Panel B) shows that the effect is concentrated in M&A firms: The coefficients on $Growth_A$ without the interaction with *Treated* are indistinguishable from zero. Note that $Growth_A$ for acquirers combines organic growth with external growth through acquiring the target, whereas $Growth_A$ for non-acquiring control firms reflects only organic growth. Hence, we interpret this result as implying that organic growth does not mandate changes in the organizational structure, whereas external growth often does.

Next, we turn to the intensive margin and analyze how employment and wages in each

it can be used on large-scale data sets. It has been used by Caliendo, Monte, and Rossi-Hansberg (2015) (France) Tåg (2013, 2016) (Sweden); Bastos, Monteiro, and Straume (2018) (Portugal); Gumpert, Steimer, and Antoni (2019) (Germany); and Friedrich (2022) (Denmark).

[25]See Appendix A.6 for details on the definition of layers and the difference between the definition of *managers* used in Section 4.1 and the occupations included in layer 4, which we refer to as *executives*. Table OA6 in the Online Appendix shows that about two-thirds of the acquirers and a little less than half of the targets have four layers and that acquirers have a more hierarchical structure, with higher proportions of employees in the higher layers before the merger.

layer change in M&As. We define the employment growth of acquirer j in layer l by $Growth_A^l$ and regress it only on the *Treated* indicator in Table 10 (Panel A), and then on the *Treated* indicator, contemporaneous growth, and their interaction (Panel B). If growing (declining) firms would simply increase (reduce) employment in all layers at the same rate, the elasticity of employment growth in each layer with respect to total employment growth of the acquirer should equal one; we report the test for this null hypothesis in the table. Moreover, if M&A firms and control firms would only differ in the size of their employment changes, but not in how they adapt their organizational structures, the coefficients on *Treated* and the interactions with *Treated* should all be zero, as all differences between them would be captured by by controlling for employment growth.

We find in Panel A that the abnormal overall growth rate of acquirers, $Growth_A$, is 39.34%, significantly more than the abnormal growth at acquirers' establishments of 14.54% reported above, since $Growth_A$ also includes the additional employees of the target. Executives (layer 4), and especially production workers and their immediate supervisors (layers 1 and 2) grow above the average growth rate, whereas the middle of the organization (layer 3) grows only at 28.28%, which is eleven pp below the overall growth rate. This observation is consistent with the notion that M&As hollow out the middle of the organization and with the "shadow-of-the-superstars" effect mentioned above (see Section 3.4).

The impact of growth in M&As is different from that in the control group, which is captured by the interaction $Treated \times Growth_A$. These coefficients show a clear pattern in panel B: Growth rates decline with the layer index from +10% (layer 1) to −28% (layer 4). Hence, control spans increase after M&As, so acquirers combine an increase in the number of layers (9) with an increase in control spans, as suggested by the literature discussed at the beginning of this section. This observation also implies that employees in lower layers have to compete with more peers for promotions to a higher layer, consistent with our earlier interpretation of voluntary departures, where we argue that post-merger changes to the organizational structure negatively affect the career opportunities for some employees (see Sections 3.1 and 4.1).

5 Performance

Sections 3 and 4 show that acquirers undertake significant changes after mergers, which affect the composition, location, and organization of the workforce. Hence, we are interested in whether M&As pay off and whether these changes affect performance. In this regard, our analysis is limited by the availability of data, since our data provider does not have access to firm-level data, and financial statements are often missing, in particular for non-listed firms, which are the majority in of our sample.[26] However, we can use two strategies to assess performance based on the data we have. First, we can establish sales and sales growth for a larger number of firms. Accordingly, we calculate *Sales growth* from one period prior to two periods after the transaction, using the same definition of growth rates as for employment (see equation (2)), i.e., we compare the sales of the merged firm in $t+2$ to those of acquirer and target combined in $t-1$. Similarly, we construct a variable *Labor productivity*, which is defined as the ratio of *Sales* to the number of employees; we calculate the growth in *Labor productivity* accordingly. We then perform the standard regressions on the *Treated* indicator, with *Sales growth* and *Labor productivity* as the dependent variables. Table 11 reports the results for all observations for which we can calculate *Sales growth* (columns 1, 2), and for those observations for which we can calculate *Sales growth* for the treated firms as well as for the matching control firms (columns 3, 4). The even-numbered columns include non-parametric cell indicators, whereas the odd-numbered columns do not. There is only weak evidence that *Sales growth* is higher for combined firms compared to matching control firms, as the estimates are insignificant except in column 1. However, there is consistent evidence that *Labor productivity* increases after mergers if we measure the change in *Labor productivity* in euros (Panel B), and somewhat weaker evidence if we use the percentage growth in *Labor productivity* as the dependent variable (Panel C), where statistical significance drops to the 10% level if we add fixed effects.

Our second approach uses the high-quality wage data we have access to more directly,

[26] During most of our sample period, the penalty for not complying with reporting requirements was only €25,000. Apparently, many firms treated this fine as an opt-out fee.

and builds on the notion that wages per employee measure labor productivity in a competitive equilibrium (see Huneeus et al., 2021, for a similar argument and analysis). Since the composition of the labor force changes dramatically after M&As, our focus is on those employees who were employed with either the acquirer or the target in the year before the acquisition, and who remain with the combined firm until two years after the acquisition. We report the changes in wages of these "stayers" in Panel D of Table 11. All measures show that wages of employees who stay go up consistently by 0.7% to 0.8%. These increases are statistically significant, and significance increases when we add fixed effects.. Hence, the wage-based analysis corroborates the results from Panels A to C that labor productivity increases after mergers (see Li, 2013, for a related finding). The results for employees who stay also provides evidence against the hypothesis that mergers involve a "breach of trust" (Shleifer and Summers, 1988), which implies that employees who are locked into their employment relationship with the firm have to accept wage cuts after mergers (see Rosett, 1990, for an earlier critical assessment of this hypothesis).

6 Discussion: Synergies in M&As

In this section, we draw on our results to shed some light on theories of synergies in M&As. A large literature analyzes the sources of synergies in mergers, usually by associating the pre-acquisition characteristics of the merging firms with their short-run and long-run stock returns.[27] By contrast, our analysis on the post-merger restructuring of the labor force gives rise to some salient observations on the actions firms take to create value after mergers. Specifically, we document a large turnover of the workforce, in particular of managers, a substantial restructuring of the workforce of the acquirer itself, a large fraction of voluntary departures of employees, and a significant change in the organizational structure. Since the previous section suggests that these changes create synergies, we ask which of the extant

[27]The literature on M&As and the sources of synergies discussed in this literature is far too large to survey here. See Eckbo (2014) and Mulherin, Netter, and Poulsen (2017) for recent surveys.

theories of how M&As create synergies may help with understanding our results. Note that we do not attempt to test, let alone reject, any of these theories of synergies. Rather, we ask whether they can help with explaining the salient observations we document above.

Our findings support two broad paradigms. The first focuses on the way in which M&As exploit economies of scale, and our findings are consistent with theories that emphasize the endogenous creation of organizational economies of scale through investments in managerial capabilities before and after the merger. The second paradigm builds on asset complementarities, which also fits our findings of how acquirers combine the managers from the target with their own managers. In this case, the relevant assets are intangible and embedded in critical employees.

By contrast, we find that some other theories of how M&As create synergies have little explanatory power for our findings, and we comment on them above. Specifically, we do not find much support for arguments that M&As create internal labor markets, because restructuring involves mostly external labor markets (Section 3.3). As such, we also do not support the related argument that firms acqui-hire skilled employees through M&As (Sections 3.3 and 4.1). Finally, the previous section also shows that M&As increase the wages of employees who stay with the firm, which is inconsistent with the notion that M&As transfer wealth by breaking implicit contracts.

7 Conclusion

We investigate the post-merger restructuring of the labor force by taking a comprehensive view of the combined firm. We find that post-merger restructuring involves the establishments of the acquirer: their employee turnover increases and their employment grows, but mostly through increased external recruiting: Many jobs but only few employees move from target to acquirer plants.

In about one-third of the transactions, the target is fully integrated and all its establishments are closed. Then most of the target's non-managerial employees leave, whereas

many of their managers are retained and displace those of the acquirer. By contrast, if targets are not integrated, acquirers retain their non-managerial employees, but replace a part of their managers. We conclude that M&As result in the combination of two intangible and complementary assets: the operational skills and knowledge of the target managers, and the managerial skills and processes of the acquirer.

Managerial capabilities appear to be critical for M&As, as acquirers tend to invest in managerial capabilities through external recruiting, increasing the size of the top layer of their firms, and by concentrating managerial jobs at the acquirer's establishments.

Many employees leave, and most of them leave for better-paid jobs at other firms. We interpret these separations as voluntary departures and associate them with organizational changes that reduce their career opportunities: external recruiting replaces internal promotions, increased control spans make internal tournaments more competitive, and employees from integrated targets displace incumbent acquirer employees. We infer that much of the large turnover after M&As results from organizational changes that trigger voluntary departures, which then create an increased demand for new hiring.

References

Acemoglu, Daron, Philippe Aghion, Claire Lelarge, John Van Reenen, and Fabrizio Zilibotti. 2007. "Technology, Information, and the Decentralization of the Firm." *The Quarterly Journal of Economics* 122 (4):1759–1799.

Agrawal, Ashwini K. and Prasanna Tambe. 2019. "Takeovers and Endogenous Labor Reallocation." *Working Paper, London School of Economics* .

Ahmad, Muhammad Farooq and Thomas Lambert. 2019. "Collective Bargaining and Mergers and Acquisitions Activity Around the World." *Journal of Banking & Finance* 99:21–44.

Almeida, Rita. 2007. "The Labor Market Effects of Foreign Owned Firms." *Journal of International Economics* 72 (1):75–96.

Amess, Kevin, Sourafel Girma, and Mike Wright. 2014. "The Wage and Employment Consequences of Ownership Change." *Managerial and Decision Economics* 35 (2):161–171.

Antoni, Manfred, Andreas Ganzer, and Philipp Vom Berge. 2016. "Sample of Integrated Labour Market Biographies (SIAB) 1975-2014." *FDZ Datenreport* (04/2016).

Antoni, Manfred, Katharina Koller, Marie-Christine Laible, and Florian Zimmermann. 2018. "Orbis-ADIAB: From Record Linkage Key to Research Dataset." *FDZ-Methodenreport* 04/2018.

Antoni, Manfred, Ernst Maug, and Stefan Obernberger. 2019. "Private Equity and Human Capital Risk." *Journal of Financial Economics* 133 (3):634–657.

Arnold, David. 2019. "Mergers and Acquisitions, Local Labor Market Concentration, and Worker Outcomes." *Working Paper, Princeton University* .

Atalay, Enghin, Ali Hortacsu, and Chad Syverson. 2014. "Vertical Integration and Input Flows." *American Economic Review* 104 (4):1120–48.

Bandick, Roger and Holger Görg. 2010. "Foreign Acquisition, Plant Survival, and Employment Growth." *Canadian Journal of Economics* 43 (2):547–573.

Bastos, Paulo, Natalia P. Monteiro, and Odd Rune Straume. 2018. "Foreign Acquisition and Internal Organization." *Journal of International Economics* 114:143–163.

Beaumont, Paul, Camille Hebert, and Victor Lyonnet. 2022. "Build or Buy? Human Capital and Corporate Diversification." *Fisher College of Business Working Paper* (2019-03-018).

Berk, Jonathan B., Jules H. van Binsbergen, and Binying Liu. 2017. "Matching Capital and Labor." *Journal of Finance* 72 (6):2467–2504.

Bhagat, Sanjay, Andrei Shleifer, and Robert Vishny. 1990. "Hostile Takeovers in the 1980's: The Return to Corporate Specialization." *Brookings Papers on Economic Activity; Microeconomics* :1–84.

Bloom, Nicholas, Benn Eifert, Aprajit Mahajan, David McKenzie, and John Roberts. 2013. "Does Management Matter? Evidence from India." *The Quarterly Journal of Economics* 128 (1):1–51.

Bloom, Nicholas, Luis Garicano, Raffaella Sadun, and John Van Reenen. 2014. "The Distinct Effects of Information Technology and Communication Technology on Firm Organization." *Management Science* 60 (12):2859–2885.

Bloom, Nicholas and John Van Reenen. 2007. "Measuring and Explaining Management Practices Across Firms and Countries." *The Quarterly Journal of Economics* 122 (4):1351–1408.

Blossfeld, Hans-Peter. 1987. "Labor-Market Entry and the Sexual Segregation of Careers in the Federal Republic of Germany." *American Journal of Sociology* 93 (1):89–118.

Brown, Charles and James L. Medoff. 1988. *The Impact of Firm Acquisitions on Labor*. Chicago and London: The University of Chicago Press, 1st ed., 9–32.

Cahuc, Pierre, Stephane Carcillo, and Andre Zylberberg. 2014. *Labor Economics*. MIT Press.

Caliendo, Lorenzo, Ferdinando Monte, and Esteban Rossi-Hansberg. 2015. "The Anatomy of French Production Hierarchies." *Journal of Political Economy* 123 (4):809–852.

Caliendo, Lorenzo and Esteban Rossi-Hansberg. 2012. "The Impact of Trade on Organization and Productivity." *The Quarterly Journal of Economics* 127 (3):1393–1467.

Calvo, Guillermo A. and Stanislaw Wellisz. 1978. "Supervision, Loss of Control, and the Optimum Size of the Firm." *Journal of Political Economy* 86 (5):943–952.

———. 1979. "Hierarchy, Ability, and Income Distribution." *Journal of Political Economy* 87 (5, Part 1):991–1010.

Carriquiry, Juan Martin. 2018. "M&A and Employee Turnover: Who's Leaving?" *Working Paper, Aalborg University* .

Cestone, G., C. Fumagalli, F. Kramarz, and G. Pica. 2023. "Exploiting Growth Opportunities: The Role of Internal Labor Markets." *Review of Economic Studies (forthcoming)* .

Cestone, Giacinta, Chiara Fumagalli, Francis Kramarz, and Giovanni Pica. 2020. "Insurance between Firms: The Role of Internal Labor Markets." *CSEF Working Paper* (386).

Chen, Cheng. 2017. "Management Quality and Firm Hierarchy in Industry Equilibrium." *American Economic Journal: Microeconomics* 9 (4):203–44.

Chen, Deqiu, Huasheng Gao, and Yujing Ma. 2021. "Human Capital-Driven Acquisition: Evidence from the Inevitable Disclosure Doctrine." *Management Science* 67 (8):4643–4664.

Chen, Jun, Shenje Hshieh, and Feng Zhang. 2023. "Hiring High-Skilled Labor through Mergers and Acquisitions." *Journal of Financial and Quantitative Analysis (Forthcoming)* .

Conyon, Martin J., Sourafel Girma, Steve Thompson, and Peter W. Wright. 2001. "Do Hostile Mergers Destroy Jobs?" *Journal of Economic Behavior & Organization* 45 (4):427–440.

———. 2002. "The Impact of Mergers and Acquisitions on Company Employment in the United Kingdom." *European Economic Review* 46 (1):31–49.

Davis, Steven J. and John Haltiwanger. 1999. "On the Driving Forces behind Cyclical Movements in Employment and Job Reallocation." *American Economic Review* 89 (5):1234–1258.

Davis, Steven J., John Haltiwanger, Kyle Handley, Ron Jarmin, Josh Lerner, and Javier Miranda. 2014. "Private Equity, Jobs, and Productivity." *American Economic Review* 104 (12):3956–90.

Davis, Steven J, John Haltiwanger, and Scott Schuh. 1996. "Small Business and Job Creation: Dissecting the Myth and Reassessing the Facts." *Small business economics* 8 (4):297–315.

Dessaint, Olivier, Andrey Golubov, and Paolo Volpin. 2017. "Employment Protection and Takeovers." *Journal of Financial Economics* 125 (2):369–388.

Dobbelaere, Sabien, Grace McCormack, Daniel Prinz, and Sandor Sovago. 2022. "Firm Consolidation and Labor Market Outcomes." *IZA Discussion Paper* (15724).

Eckbo, B. Espen. 2014. "Corporate Takeovers and Economic Efficiency." *Annual Review of Financial Economics* 6 (1):51–74.

Ellul, Andrew, Marco Pagano, and Fabiano Schivardi. 2017. "Employment and Wage Insurance within Firms: Worldwide Evidence." *The Review of Financial Studies* 31 (4):1298–1340.

Faccio, Mara and William J. O'Brien. 2021. "Business Groups and Employment." *Management Science* 67 (6):3468–3491.

Ferreira, Daniel and Radoslawa Nikolowa. 2022a. "Prestige, Promotion, and Pay." *Journal of Finance (forthcoming)* .

———. 2022b. "Talent Discovery and Poaching Under Asymmetric Information." *The Economic Journal* 133 (649):201–234.

Friedrich, Benjamin U. 2022. "Trade Shocks, Firm Hierarchies, and Wage Inequality." *The Review of Economics and Statistics* 104 (4):652–667.

Furlan, Benjamin. 2015. "Acquire and Fire? Evidence from European Mergers." *Working Paper, University of Salzburg* .

Garicano, Luis. 2000. "Hierarchies and the Organization of Knowledge in Production." *Journal of Political Economy* 108 (5):874–904.

Garicano, Luis and Esteban Rossi-Hansberg. 2015. "Knowledge-Based Hierarchies: Using Organizations to Understand the Economy." *Annual Review of Economics* 7 (1):1–30.

Geurts, Karen and Johannes Van Biesebroeck. 2019. "Employment Growth Following Takeovers." *The RAND Journal of Economics* 50 (4):916–950.

Girma, Sourafel and Holger Görg. 2017. "Blessing or Curse? Domestic Plants' Survival and Employment Prospects after Foreign Acquisitions." *IZA Discussion Paper* (706).

Giroud, Xavier and Holger M. Mueller. 2015. "Capital and Labor Reallocation within Firms." *The Journal of Finance* 70 (4):1767–1804.

Gokhale, Jagadeesh, Erica L. Groshen, and David Neumark. 1995. "Do Hostile Takeovers Reduce Extramarginal Wage Payments?" *The Review of Economics and Statistics* 77 (3):470–485.

Gugler, Klaus and Burcin B. Yurtoglu. 2004. "The Effects of Mergers on Company Employment in the USA and Europe." *International Journal of Industrial Organization* 22 (4):481–502.

Gumpert, Anna, Henrike Steimer, and Manfred Antoni. 2019. "Firm Organization with Multiple Establishments." *CESifo Working Paper* (7435).

———. 2022. "Firm Organization with Multiple Establishments." *The Quarterly Journal of Economics* 137 (2):1091–1138.

He, Alex Xi and Daniel le Maire. 2022. "Managing Inequality: Manager-specific Wage Premiums and Selection in the Managerial Labor Market." *Working Paper, University of Maryland* .

Huneeus, Federico, Borja Larrain, Mauricio Larrain, and Mounu Prem. 2021. "The Internal Labor Markets of Business Groups." *Journal of Corporate Finance* 69:102017.

Huttunen, Kristiina. 2007. "The Effect of Foreign Acquisition on Employment and Wages: Evidence from Finnish Establishments." *The Review of Economics and Statistics* 89 (3):497–509.

Imbens, Guido and Donald B. Rubin. 2015. *Causal Inference for Statistics, Social, and Biomedical Sciences: An Introduction.* New York: Cambridge University Press.

Imbens, Guido W and Jeffrey M Wooldridge. 2009. "Recent Developments in the Econometrics of Program Evaluation." *Journal of Economic Literature* 47 (1):5–86.

John, Kose, Anzhela Knyazeva, and Diana Knyazeva. 2015. "Employee Rights and Acquisitions." *Journal of Financial Economics* 118 (1):49–69.

Jäger, Simon, Christopher Roth, Nina Roussille, and Benjamin Schoefer. 2023. "Worker Beliefs About Outside Options." *NBER Working Paper* (29623).

Kim, E. Han, Ernst Maug, and Christoph Schneider. 2018. "Labor Representation in Governance as an Insurance Mechanism." *Review of Finance* 22 (4):1251–1289.

Kim, J. Daniel. 2020. "Startup Acquisitions as a Hiring Strategy: Worker Choice and Turnover." *Academy of Management Proceedings* 2020 (1):12959.

Krishnan, Hema A., Michael A. Hitt, and Daewoo Park. 2007. "Acquisition Premiums, Subsequent Workforce Reductions and Post-acquisition Performance." *Journal of Management Studies* 44 (5):709–732.

Lagaras, Spyridon. 2021. "Corporate Takeovers and Labor Restructuring." *Working Paper, University of Pittsburgh* .

———. 2023. "M&As, Employee Costs and Labor Reallocation." *Journal of Finance (forthcoming)* .

Lee, Kyeong Hun (Kyle), David C. Mauer, and Qianying (Emma) Xu. 2018. "Human Capital Relatedness and Mergers and Acquisitions." *Journal of Financial Economics* 129 (1):111–135.

Lehto, Eero and Petri Böckerman. 2008. "Analysing the Employment Effects of Mergers and Acquisitions." *Journal of Economic Behavior & Organization* 68 (1):112–124.

Levine, Oliver. 2017. "Acquiring Growth." *Journal of Financial Economics* 126 (2):300–319.

Levine, Ross, Chen Lin, and Beibei Shen. 2015. "Cross-border Acquisitions and Labor Regulations." *National Bureau of Economic Research Working Paper Series* No. 21245.

———. 2020. "Cross-border Acquisitions: Do Labor Regulations Affect Acquirer Returns?" *Journal of International Business Studies* 51 (2):194–217.

Li, Kai and Jin Wang. 2023. "Inter-Firm Inventor Collaboration and Path-Breaking Innovation: Evidence From Inventor Teams Post-Merger." *Journal of Financial and Quantitative Analysis* 58 (3):1144–1171.

Li, Xiaoyang. 2013. "Productivity, Restructuring, and the Gains from Takeovers." *Journal of Financial Economics* 109 (1):250–271.

Lichtenberg, Frank R. and Donald Siegel. 1990. "The Effect of Ownership Changes on the Employment and Wages of Central Office and Other Personnel." *The Journal of Law & Economics* 33 (2):383–408.

Lie, Erik and Tingting Que. 2019. "Union Concessions Following Asset Sales and Takeovers." *Journal of Financial and Quantitative Analysis* 54 (1):393–424.

Luo, Mancy, Alberto Manconi, and David Schumacher. 2018. "The Value of Human Capital Synergies in M&A: Evidence from Global Asset Management." *Working Paper, Erasmus University* .

Ma, Wenting, Paige Parker Ouimet, and Elena Simintzi. 2021. "Mergers and Acquisitions, Technological Change and Inequality." *ECGI Finance Working Paper* (485/2016).

Maksimovic, Vojislav, Gordon Phillips, and N. R. Prabhala. 2011. "Post-merger Restructuring and the Boundaries of the Firm." *Journal of Financial Economics* 102 (2):317–343.

McGuckin, Robert H. and Sang V. Nguyen. 1995. "On Productivity and Plant Ownership Change: New Evidence from the Longitudinal Research Database." *The RAND Journal of Economics* 26 (2):257–276.

———. 2001. "The Impact of Ownership Changes: A View from Labor Markets." *International Journal of Industrial Organization* 19 (5):739–762.

McGuckin, Robert H., Sang V. Nguyen, and Arnold P. Reznek. 1998. *On Measuring the Impact of Ownership Change on Labor: Evidence from U.S. Food-Manufacturing Plant-Level Data*. Chicago and London: National Bureau of Economic Research, Inc, 207–248.

Mirrlees, James A. 1976. "The Optimal Structure of Incentives and Authority within an Organization." *Bell Journal of Economics* 7:105–131.

Mulherin, J., Jeffry Netter, and Annette Poulsen. 2017. *The Evidence on Mergers and Acquisitions: A Historical and Modern Report*. North Holland.

Neffke, Frank and Martin Henning. 2013. "Skill Relatedness and Firm Diversification." *Strategic Management Journal* 34 (3):297–316.

OECD. 2020. *OECD Employment Outlook 2020*.

Oldford, Erin and Isaac K. Otchere. 2016. "Are Cross-border Acquisitions Enemy of Labor? An Examination of Employment and Productivity Effects." *Pacific-Basin Finance Journal* 40:438–455.

Ouimet, Paige and Rebecca Zarutskie. 2020. "Acquiring Labor." *Quarterly Journal of Finance* 10 (3):2050011.

Pagano, Marco. 2020. "Risk Sharing within the Firm: A Primer." *Foundations and Trends in Finance* 12 (2):117–198.

Prager, Elena and Matt Schmitt. 2021. "Employer Consolidation and Wages: Evidence from Hospitals." *American Economic Review* 111 (2):397–427.

Qian, Yingyi. 1994. "Incentives and Loss of Control in an Optimal Hierarchy." *The Review of Economic Studies* 61 (3):527–544.

Radner, Roy and Timothy Van Zandt. 1992. "Information Processing in Firms and Returns to Scale." *Annales d'Economie et de Statistique* (25/26):265–298.

Rajan, Raghuram G. and Julie Wulf. 2006. "The Flattening Firm: Evidence from Panel Data on the Changing Nature of Corporate Hierarchies." *The Review of Economics and Statistics* 88 (4):759–773.

Ranft, Annette L. and Michael D. Lord. 2000. "Acquiring New Knowledge: The Role of Retaining Human Capital in Acquisitions of High-tech Firms." *The Journal of High Technology Management Research* 11 (2):295–319.

Rhodes-Kropf, Matthew and David T. Robinson. 2008. "The Market for Mergers and the Boundaries of the Firm." *The Journal of Finance* 63 (3):1169–1211.

Rosett, Joshua G. 1990. "Do Union Wealth Concessions Explain Takeover Premiums?: The Evidence on Contract Wages." *Journal of Financial Economics* 27 (1):263–282.

Schmucker, Alexandra, Stefan Seth, Johannes Ludsteck, Johanna Eberle, and Andreas Ganzer. 2016. "Establishment History Panel 1975–2014." *FDZ Datenreport* (01/2017).

Shleifer, Andrei and Lawrence H. Summers. 1988. *Breach of Trust in Hostile Takeovers*. Chicago, London: University of Chicago Press, 33–56.

Siegel, Donald S. and Kenneth L. Simons. 2010. "Assessing the Effects of Mergers and Acquisitions on Firm Performance, Plant Productivity, and Workers: New Evidence from Matched Employer-Employee Data." *Strategic Management Journal* 31 (8):903–916.

Smeets, Valerie, Kathryn Ierulli, and Michael Gibbs. 2016. "An Empirical Analysis of Post-merger Organizational Integration." *Scandinavian Journal of Economics* 118 (3):463–493.

Tate, Geoffrey A. and Liu Yang. 2015. "The Bright Side of Corporate Diversification: Evidence from Internal Labor Markets." *Review of Financial Studies* 28 (8):2203–2249.

———. 2022. "The Human Factor in Acquisitions: Cross-industry Labor Mobility and Corporate Diversification." *US Census Bureau Center for Economic Studies Paper* (CES-WP-15-31).

Tian, Xuan and Wenyu Wang. 2021. "Hard Marriage with Heavy Burdens: Organized Labor as Takeover Deterrents." *The Review of Corporate Finance Studies* 10 (2):306–346.

Tornqvist, Leo, Pentti Vartia, and Yrjo O. Vartia. 1985. "How Should Relative Changes Be Measured?" *The American Statistician* 39 (1):43–46.

Tåg, Joacim. 2013. "Production Hierarchies in Sweden." *Economics Letters* 121 (2):210–213.

Tåg, Joacim, Thomas Åstebro, and Peter Thompson. 2016. "Hierarchies and Entrepreneurship." *European Economic Review* 89:129–147.

Williamson, Oliver E. 1967. "Hierarchical Control and Optimum Firm Size." *Journal of Political Economy* 75 (2):123–138.

Younge, Kenneth A., Tony W. Tong, and Lee Fleming. 2015. "How Anticipated Employee Mobility Affects Acquisition Likelihood: Evidence from a Natural Experiment." *Strategic Management Journal* 36 (5):686–708.

Zhang, Denghui, Hao Zhong, and Jingyuan Yang. 2023. "Acqui-hiring or Acqui-quitting: Data-driven Post-M&A Turnover Prediction via a Dual-fit Model." *Working Paper, Rutgers Business School* .

A Appendix

This appendix provides more detailed information about the computation of growth rates, hiring rates, and separation rates (Section A.1).

A.1 Growth rates, separation rates, and hiring rates

We use the following definitions:

Symbol	Definition
E_{jt}	Number of all employees employed in firm j at the end of year t.
H_{jt}	Number of employees who enter firm j in period t, i.e. between the end of year $t-1$ and the end of year t.
S_{jt}	Number of employees who are separated from firm j in period t, i.e. between the end of year $t-1$ and the end of year t.

We then define employment growth between period $t-1$ and period t as

$$g_{j,t-1,t} \equiv \frac{E_{jt} - E_{j,t-1}}{0.5\,(E_{jt} + E_{j,t-1})} \tag{2}$$

and observe that

$$E_{jt} - E_{j,t-1} = H_{jt} - S_{jt}. \tag{3}$$

We define one-year hiring rates and separation rates as

$$h_{jt} = \frac{H_{jt}}{0.5\,(E_{jt} + E_{j,t-1})},\ s_{jt} = \frac{S_{jt}}{0.5\,(E_{jt} + E_{j,t-1})}. \tag{4}$$

From (2), (3), and ((4)), we have

$$g_{j,t-1,t} = h_{jt} - s_{jt}. \tag{5}$$

We also compute multi-period employment flows as

$$E_{j,t+k} - E_{j,t-1} = \sum_{\tau=0}^{\tau=k} (E_{j,t+\tau} - E_{j,t+\tau-1}) = \sum_{\tau=0}^{\tau=k} (H_{j,t+\tau} - S_{j,t+\tau}) = H_{j,t-1,t+\tau} - S_{j,t-1,t+\tau}. \tag{6}$$

Multi-period rates. Multi-period growth rates between periods $t-1$ and $t+k$ are defined as

$$g_{j,t,t+k} \equiv \frac{E_{j,t+k} - E_{j,t-1}}{0.5\,(E_{j,t+k} + E_{j,t-1})}. \tag{7}$$

Multi-period hiring rates and separation rates are defined analogously to (7). Note that, generally, $g_{j,t-1,t+k} \neq \sum_{\tau=0}^{\tau=k} g_{j,t+\tau-1,t+\tau}$ and analogously for separation and hiring rates.

Percentage growth rates. We use γ to refer to conventional one-year percentage growth rates, which can be defined as

$$\gamma_{j,t-1,t} \equiv \frac{E_{jt} - E_{j,t-1}}{E_{j,t-1}}. \tag{8}$$

It is easy to show that

$$g_{j,t-1,t} = \frac{2\gamma_{j,t-1,t}}{2 + \gamma_{j,t-1,t}} \Leftrightarrow \gamma_{j,t-1,t} = \frac{2g_{j,t-1,t}}{2 - g_{j,t-1,t}}$$

and that $g_{j,t-1,t}$ and $\gamma_{j,t-1,t}$ are monotonically increasing functions of each other. However, their ranges are different, $\gamma_{j,t-1,t} \in [-1, \infty)$ whereas $g_{j,t-1,t} \in [-2, 2]$.

Growth rates and employment fractions. For this discussion, suppress the firm index j and the time indices $t-1$ and t, and index employees in group h by the superscript h. Let $\phi_t^h \equiv \frac{E_t^h}{E_t}$ be the fraction of employees in group h, given by E_t^h, relative to the total number of employees $E_t \equiv \sum_h E_t^h$. Define the percentage growth rate of group h as $\gamma^h \equiv \frac{E_t^h - E_{t-1}^h}{E_{t-1}^h}$. The growth of the whole workforce, $\gamma \equiv E_t/E_{t-1} - 1$, is a weighted average of the percentage growth rates of the different groups, i.e.

$$\gamma = \frac{\sum_h E_{t-1}^h \left(1 + \gamma^h\right)}{E_{t-1}} - E_{t-1} = \sum_h f_{t-1}^h \gamma^h.$$

Note that the growth rates g defined in (2) and (7) do not have this property. Observe also that

$$\phi_t^h = \frac{E_{t-1}^h \left(1 + \gamma^h\right)}{E_{t-1}\left(1 + \gamma\right)} = \phi_{t-1}^h \frac{\gamma^h - \gamma}{1 + \gamma}.$$

Hence, $\phi_t^h > \phi_{t-1}^h \iff \gamma^h > \gamma$. Since the previous observation implies that $\gamma^h > \gamma \iff g^h > g$, we have that fractions ϕ^h increase exactly for those groups whose employment growth is higher than the overall growth rate, independently of whether the growth rate is defined as in (2), or as a percentage growth rate, as in (8).

Internal flows. We calculate the contribution of internal hiring to the overall hiring of firm j over the period from $t-1$ to $t+2$ as

$$Internal\ hiring \equiv \frac{\sum_{\tau=t}^{\tau=t+2} H_{jt}^{ILM}}{\sum_{\tau=t}^{\tau=t+2} H_{jt}}. \tag{9}$$

Here, H_{jt}^{ILM} indicates all internal transfers (ILM stands for "internal labor market"), i.e., between the establishments of the combined firm, whereas H_{jt} indicates total hiring (internal plus external) of firm j, as before. Similarly internal separations of firm j for the same period are defined as

$$Internal\ separations \equiv \frac{\sum_{\tau=t}^{\tau=t+2} S_{jt}^{ILM}}{\sum_{\tau=t}^{\tau=t+2} S_{jt}}, \tag{10}$$

where S_{jt}^{ILM} is defined analogously to H_{jt}^{ILM}.

Replacements and replacement rate. We define replacements at firm j between periods $t-1$ and $t+2$ as

$$Replacements_{j,t,t+k} \equiv \frac{Min\left(H_{j,t-1,t+2}, S_{j,t-1,t+2}\right)}{\frac{1}{2}\left(E_{j,t+2}+E_{j,t-1}\right)} = Min\left(h_{j,t-1,t+2}, s_{j,t-1,t+2}\right). \tag{11}$$

Moreover, the *Replacement rate* is defined as

$$Replacement\ rate_{j,t,t+k} \equiv \frac{Min\left(H_{j,t-,t+2}, S_{j,t-1,t+2}\right)}{S_{j,t-1,t+2}^{+}}. \tag{12}$$

Turnover. We define *Turnover* as follows:

$$Turnover_{j,t-1,t+2} = \frac{s_{j,t-1,t+2} + h_{j,t-1,t+2}}{2}. \tag{13}$$

This definition is in line with prior literature (e.g., Davis and Haltiwanger, 1999; Cahuc, Carcillo, and Zylberberg, 2014). We observe the following relationship between *Turnover*,

Replacements, and the growth rate. We obtain (suppress subscripts for simplicity):

$$\begin{aligned} Replacement &= Min\left(s,h\right) \\ &= \frac{s+h}{2} + \frac{1}{2}Min\left(h-s, s-h\right) \\ &= \frac{s+h}{2} - \frac{1}{2}Max\left(h-s, s-h\right) \\ &= Turnover - \frac{1}{2}\left|g\right|, \end{aligned}$$

where the last line uses ((5)). Hence,

$$Turnover = \frac{|g|}{2} + Replacment,$$

so, defining turnover as above also captures net employment growth.

A.2 Variables derived from the Integrated Employment Biographies

Most variables in our analyses are derived from the Integrated Employment Biographies (IEB) database. The IEB contains every dependent employee in Germany, i.e. all regular employees since 1975 in West Germany and since 1992 in East Germany as well as all marginally employed workers since 1999.[28] The data are structured in terms of spells, i.e. employment relationships, and the data source reports starting and ending dates of these spells on a daily basis. If employment relationships continue into the following calendar year, a notification is given by the employer at the end of each year. The continued employment relationship is represented by a new spell in the following calendar year. For categorical variables such as education, qualification, and establishment affiliation, we use the information from the latest spell in a calendar year. An employee's daily wage is based on the individual's earnings in the firm over the calendar year divided by the number of days in employment. The employee's earnings are top-coded, because earnings above a threshold ranging from 51,000 in 1998 to 70,000 in 2013 Euros are exempt from certain social-security contributions. *Age* is determined on the last day of the calendar year.

[28]The IEB does not cover civil servants and the self-employed. These groups are irrelevant for the companies in our sample. For more details on the sources and structure of IAB's administrative data, see Antoni, Ganzer, and Vom Berge (2016).

A.2.1 Occupation-related variables based on Blossfeld (1987): *Qualification* and *Manager*

All qualification-related variables and *Manager* are derived from Blossfeld (1987), who classifies jobs into 12 distinct major occupations based on the German Classification of Occupations 1970 ("Klassifikation der Berufe 1970"). Table 1 on page 99 in Blossfeld (1987) provides a detailed overview on those 12 occupations and related ISCO codes. We sort the occupational groups presented in Blossfeld (1987) into three groups according to the level of their qualification. Low qualification: Simple manual occupations, simple services, simple commercial and administrative occupations. Medium qualification: Skilled manual occupations, qualified services, semi-professions, qualified commercial and administrative occupations. High qualification: technicians, engineers, professions, managers. The *Qualification index* reports the average employee qualification level of an entity at the end of the calendar year. We assign a value of one for each low qualification, two for each medium qualification, and three for each high qualification employee.

A.2.2 Layers

We construct a four layer management hierarchy following Caliendo, Monte, and Rossi-Hansberg (2015). Based on five-digit occupational codes from the German (IAB) data we assign each employee (at the end of the calendar year) to one layer, the lowest layer being layer 1 (production workers) and the highest layer being layer 4 (executives and managing directors). Layers 2 and 3 include different ranks of supervisors, middle managers, and experts. Not all companies have four layers, see Table OA6 in the Online Appendix for details. We use the layer assignment from occupational codes as Gumpert, Steimer, and Antoni (2022), who adapt the layer definitions used by Caliendo, Monte, and Rossi-Hansberg for France to German (IAB) data. See their Online Appendix A.3 ("Assignment of occupations to layers") for further details. The following table provides examples and is adapted from Gumpert, Steimer, and Antoni (2022) (see Appendix A.2 for further details).

Layer	Designation	Examples
4	Executives	Executives, managing directors
3	Middle managers	Software developers, financial analysts, managers in business organization and strategy
2	Supervisors	Quality managers, training supervisors, engineers
1	Production workers	Office clerks, machine and equipment assemblers, various unskilled / semi-skilled occupations

Note that the definition of managers used in Section 4.1 and Table OA4 is based on Blossfeld (1987) and overlaps with but is not identical to the assignment of occupations to layer 4 by Gumpert, Steimer, and Antoni (2022). Specifically, Blossfeld (1987) includes employees with more advisory functions (e.g., consultants and accountants) as managers, whereas Gumpert, Steimer, and Antoni (2022) assign them to layer 3. Conversely, Gumpert, Steimer, and Antoni (2022) assign employees who head some departments (e.g., head of sales) to layer 4, but these are not included in Blossfeld's definition of "managers."

We define the index $Hierarchy_j$ for firm j as the employment-weighted average of the layer index as

$$Hierarchy_j \equiv \frac{\sum_{l=1}^{l=4} l \times E_{j,t-1}^{l}}{\sum_{l=1}^{l=4} E_{j,t-1}^{l}}, \tag{14}$$

where $E_{j,t-1}^{l}$ denotes the employment in layer l of firm j at time $t-1$ and $\sum_{l=1}^{l=4} E_{j,t-1}^{l} = E_{j,t-1}$ by definition.

A.2.3 Education index

Education index is based on a categorical variable in the IEB database, which records the following education milestones: no school leaving certificate or intermediate school leaving certificate (ISLC), ISLC with vocational training, upper secondary school leaving certificate (USSLC) with or without vocational training, college, university degree. The *Education index* reports the average employee education level of an entity at the end of the calendar year. We assign a value of one for each employee with only ISLC, two for each employee with ISLC and vocational training, three for each employee with USSLC with or without vocational training, four for each employee with college degree, and five for each employee with university degree at the end of the calendar year.

A.3 Human capital relatedness (*HCR*): Lee, Mauer, and Xu, 2018

Lee, Mauer, and Xu, 2018 propose HCR as a measure of the relatedness between the workforce of two companies. Their original measure is based on 4-digit NAICS Occupation profiles from Occupational Employment Statistics (OES) and 3-digit SIC codes from the Compustat Industry Segment Database (CIS). The measure therefore does not compute the human capital relatedness of two firms, but of the two industries in which these firms operate. We deviate from this approach because our data allows us to compute the human capital relatedness of two firms. We start by computing firm-specific occupation shares

based on a three-digit job classifier (142 values, according to the German Classification of Occupations 2010, KldB 2010). For each firm we compute the share of each occupation of those 142 occupations and compute HCR as $HCR = (H_A H_T') \,/\, \left(\sqrt{(H_A H_A')}\sqrt{(H_T H_T')}\right)$. H_A and H_T denote the human capital profile of the acquirer and the target firm (vector of occupations shares). HCR is thus a normalized measure between zero and one.

A.4 Industry relatedness (*Related*)

Related indicates whether the acquirer and the target operate in related industries. *Related* is equal to 1 if both target and acquirer operate in the same industry according to the 2-digit NACE-code or if target and acquirer operate in vertically integrated industries. To determine vertical integration, we use industry-level data on the input and output of goods provided by the OECD for Germany (in 2010). We expand the 36 industries in the OECD data to the 88 2-digit NACE industries in our sample and compute the relatedness of output and input between two industries. We define two industries to be vertically integrated, if the input-output relatedness is above the median input-output relatedness of all industries in our sample. We use the 2018 edition of the OECD input-output tables, which can be found here: `https://stats.oecd.org/Index.aspx?DataSetCode=IOTSI4_2018`.

A.5 Overview of the literature on M&As and labor

Table A1: Literature overview. This table provides a condensed overview of the Labor and M&A literature. The columns provide the following information. *Country*: ISO code of the country for domestic studies and INT for international (cross-country) samples. *Period*: Sample period. *#Obs*: Number of transactions investigated in the study. *Transaction*: Type of corporate control transaction investigated in the study. *Empl.*: Reports how employment is affected by corporate control transactions. *Wages*: Reports how employee wages are affected by corporate control transactions. Codes: A - ambiguous, P - significantly positive, N significantly negative, I - insignificant. *Topic*: Reports the direction of causality investigated in the study: M&A => Labor - the effect of M&As on labor outcome variables, Labor => M&A - the effect of labor variables on M&As.

Paper	Sample			Transaction	Labor outcome		Topic
	Country	Period	# Obs		Empl.	Wages	
Agrawal and Tambe (2019)	USA	n.a.	29,648	M&As			M&A => Labor
Ahmad and Lambert (2019)	INT	1992-2010	32,912	M&As			Labor => M&A
Almeida (2007)	PRT	1991-1998	1,381	M&As	I	I	M&A => Labor, Labor => M&A
Amess, Girma, and Wright (2014)	GBR	1996-2006	527	Takeovers, LBOs	N	I	M&A => Labor
Arnold (2019)	USA	1999-2009	7,100	M&As, OC of plants		A	M&A => Labor
Bandick and Görg (2010)	SWE	1993-2002	207	M&As	P		M&A => Labor
Bhagat, Shleifer, and Vishny (1990)	USA	1984-1986	62	Hostile takeovers	N		M&A => Labor
Brown and Medoff (1988)	USA	1978-1984	6,884	M&As	A	A	M&A => Labor
Carriquiry (2018)	DNK	2001-2010	3,489	M&As	N		M&A => Labor
Chen, Gao, and Ma (2021)	USA	1980-2013	10,911	M&As			Labor => M&A
Conyon et al. (2001)	GBR	1983-1996	240	Takeovers	N		M&A => Labor
Conyon et al. (2002)	GBR	1967-1996	442	M&As	N		M&A => Labor
Dessaint, Golubov, and Volpin (2017)	INT	1985-2007	45,696	M&As			Labor => M&A
Furlan (2015)	INT	2003-2010	ca. 1200	M&As	P		M&A => Labor
Geurts and Van Biesebroeck (2019)	BEL	2005-2012	2,601	M&As, Takeovers	N		M&A => Labor
Girma and Görg (2017)	GBR	1981-1994	303		A	A	M&A => Labor
Gokhale, Groshen, and Neumark (1995)	USA	1980-1991	133	Takeovers		P	M&A => Labor
Gugler and Yurtoglu (2004)	INT	1981-1998	646	M&As	A		M&A => Labor
He and le Maire (2022)	DNK	1995-2011	ca. 3700	M&As		N	M&A => Labor
Huttunen (2007)	FIN	1988-2001	284	Foreign M&As	N	P	M&A => Labor

Table A1: Literature overview (continued).

Paper	Sample			Transaction	Labor outcome		Topic
	Country	Period	# Obs		Empl.	Wages	
Kim (2020)	USA	1990-2011	3,700	M&As of startups	N		M&A => Labor
Krishnan, Hitt, and Park (2007)	USA	1992-1998	174	M&As	N		M&A => Labor
Lagaras (2021)	BRA	2004-2012	2,096	M&As	N	P	M&A => Labor
Lagaras (2023)	BRA	2004-2012	2,096	M&As		N	M&A => Labor
Lee, Mauer, and Xu (2018)	USA	1997-2012	1,322		N		M&A => Labor, Labor => M&A
Lehto and Böckerman (2008)	FIN	1989-2003	7,923	M&As	N		M&A => Labor
Levine, Lin, and Shen (2015)	INT	1991-2012	11,485	M&As			Labor => M&A
Li and Wang (2023)	USA	1981-2012	942	M&As			M&A => Labor
Li (2013)	USA	1981-2002	1,430	M&As	N	N	M&A => Labor
Lichtenberg and Siegel (1990)	USA	1972-1981	2,027	OC of plants	N	I	M&A => Labor
Lie and Que (2019)	USA	1987-2009	10,835	Asset sales, takeovers		I	M&A => Labor
Ma, Ouimet, and Simintzi (2021)	USA	1980-2010	396	M&As		P	M&A => Labor
McGuckin and Nguyen (1995)	USA	1977-1987	4,495	M&As	A	A	M&A => Labor
McGuckin and Nguyen (2001)	USA	1977-1987	20,383	OC of plants	P	P	M&A => Labor
McGuckin, Nguyen, and Reznek (1998)	USA	1977-1987	2,111	OC of plants	P	P	M&A => Labor
Neffke and Henning (2013)	SWE	2004-2007	17,504	Organic growth			Labor => M&A
Oldford and Otchere (2016)	CAN	1980-2008	804	M&As	N	N	M&A => Labor
Ouimet and Zarutskie (2020)	USA	1995-2005	1,800	M&As		P	M&A => Labor
Prager and Schmitt (2021)	USA	2000-2010	85	M&As		A	M&A => Labor
Ranft and Lord (2000)	USA	1994-1995	89	M&As	N		M&A => Labor
Rosett (1990)	USA	1976-1987	258	Takeovers		I	M&A => Labor
Shleifer and Summers (1988)	USA	1970-1985	4	Takeovers	N	N	M&A => Labor
Siegel and Simons (2010)	SWE	1985-1998	ca. 11000	M&As		N	M&A => Labor
Tate and Yang (2022)	USA	1995-2007	3,900	M&As			M&A => Labor, Labor => M&A
Tian and Wang (2021)	USA	1978-2008	1,814	Union elections			Labor => M&A
Younge, Tong, and Fleming (2015)	USA	1979-1998	ca. 500	M&As			Labor => M&A

A.6 Variable definitions

Table A2: Description of variables. The table defines the main numerical variables used in the paper. All other variables are defined in the respective captions of the tables using them. The subscript k refers to the acquirer (A), the target (T), or the combined firm (C).

Variable name	Definition	Values
$Age_{A\text{-}T}$	Age_A - Age_T	[0:∞]
Age_k	Average age (in years) of all full-time employees in entity k	[0:∞]
Distance	Driving distance between target HQ and acquirer HQ in minutes	[0:∞]
$Education_{A\text{-}T}$	$Education_A$ - $Education_T$	[-100:100]
$Education_k$	Share of employees with college or university degree in entity k	[0:100]
Emp. $Growth_k$	Employment growth rate g of entity k from event year t=-1 to t=2 as defined in Section 3.3 and Appendix A.1	[-2:2]
External $inflow_k$	$Inflow_k$ from the external labor market, i.e., inflow from an establishment which is not part of the merged firm	[0:∞]
External $outflow_k$	$Outflow_k$ into the external labor market, i.e., outflow to an establishment which is not part of the merged firm	[0:∞]
HCR	Human capital relatedness index based on Lee et al. (2018), details see Appendix A.3	[0:100]
$Hierarchy_k$	Employee-weighted average of the number of hierarchical layers in entity k	[1:4]
$Inflow_k$	Employment inflow h into an establishment of entity k between event year t=-1 and t=2 as defined in Section 3.3 and Appendix A.1	[0:∞]
Internal $inflow_k$	$Inflow_k$ from the internal labor market, i.e., inflow from another establishment of the merged firm	[0:∞]
Internal $outflow_k$	$Outflow_k$ into the internal labor market, i.e., outflow to another establishment of the merged firm	[0:∞]
Manager	One if occupation is equal to "Manager" (cf. Table 3)	[0,1]
$Outflow_k$	Employment outflow s from an establishment of entity k between event year t=-1 and t=2 as defined in Section 3.3 and Appendix A.1	[0:∞]
$PreGrowth_k$	Employment growth rate g from t=-3 to t=-1 as defined in Section 3.3 and Appendix A.1	[-2:2]
$Qualification_{A\text{-}T}$	$Qualification_A$ - $Qualification_T$	[-100:100]
$Qualification_k$	Share of employees identified as Technicians, Engineers, Profession-Members, or Managers in entity k	[0:100]
Related	One if target and acquirer are in the same industry or display above median relatedness, details see Appendix A.2	[0,1]
$Size_k$	Number of employees employed in entity k	[0:∞]
Target integration	One if employment in target is zero at the end of t=2	[0,1]
$Wage_{A\text{-}T}$	$Wage_A$ - $Wage_T$	[0:∞]
$Wage_k$	Average daily wage (in euros) of all full-time employees in entity k	[0:∞]

B Tables

Table 1: Summary statistics. This table provides descriptive statistics for all numerical variables. The firm level data set consists of 1,043 target, acquirer, and consequently combined firms. Each of these firm pairs has exactly one matched control firm pair. Panel A (Panel B) provides summary statistics for the treated (control) firms. Panel C provides correlations for some of our key flow variables and reports the correlations for targets (acquirers) below (above) the diagonal. All growth variables are measured from t=-1 to t=+2, all other variables are measured at t=-1. All variables are defined in Table A2 in the Appendix.

Panel A: Treated firms

	N	Mean	SD	Min	P25	P50	P75	Max
$Age_{A\text{-}T}$ (years)	1,043	-0.16	6.38	-27.42	-3.71	-0.03	3.67	26.43
Age_{T} (years)	1,043	40.02	5.98	20.00	36.19	40.27	43.56	66.50
Distance (minutes)	1,043	173.23	150.17	0.00	37.97	140.15	284.77	642.68
$Education_{A\text{-}T}$ (%)	1,030	7.95	25.65	-82.22	-4.07	5.02	20.45	100.00
$Education_{T}$ (%)	1,035	23.75	23.95	0.00	4.88	15.38	34.38	100.00
Emp. $growth_{A}$ (%)	1,043	-10.21	61.98	-200.00	-19.83	-4.30	11.97	200.00
Emp. $growth_{C}$ (%)	1,043	-26.94	53.66	-200.00	-41.38	-13.00	2.02	152.54
Emp. $growth_{T}$ (%)	1,037	-84.57	95.37	-200.00	-200.00	-44.44	-7.23	200.00
$Growth_{A}$ (%)	1,043	23.62	73.87	-200.00	-8.54	10.53	52.33	200.00
HCR	1,027	49.49	32.11	0.00	18.97	49.24	80.34	99.99
$Hierarchy_{A}$	1,037	1.74	0.58	1.00	1.28	1.60	2.07	4.00
$Hierarchy_{T}$	1,034	1.65	0.59	1.00	1.20	1.47	2.00	4.00
$Inflow_{A}$ (%)	1,043	64.95	140.47	0.00	24.82	41.44	70.82	2,880.00
$Inflow_{C}$ (%)	1,043	47.89	41.23	0.00	23.71	37.93	57.01	531.25
$Inflow_{T}$ (%)	1,037	37.51	60.87	0.00	0.00	22.50	47.06	1,000.00
$Outflow_{A}$ (%)	1,043	75.16	153.13	0.00	30.07	45.83	72.34	2,920.00
$Outflow_{C}$ (%)	1,043	74.83	61.45	10.38	36.89	54.97	90.59	664.58
$Outflow_{T}$ (%)	1,037	122.08	98.02	0.00	40.00	93.62	200.00	1,200.00
$PreGrowth_{A}$ (%)	1,039	27.58	56.59	-200.00	3.03	14.67	34.41	200.00
$PreGrowth_{C}$ (%)	1,043	22.93	35.71	-170.52	5.97	15.20	29.63	200.00
$PreGrowth_{T}$ (%)	1,041	30.01	54.55	-200.00	5.65	17.54	37.66	200.00
$Qualification_{A\text{-}T}$	1,030	2.05	26.20	-100.00	-8.33	1.82	13.17	100.00
$Qualification_{T}$	1,035	20.70	22.61	0.00	3.70	13.64	31.12	100.00
Related	1,043	0.72	0.45	0.00	0.00	1.00	1.00	1.00
$Size_{A}$	1,043	463.03	1,343.45	0.00	31.00	117.00	375.00	18,177
$Size_{A}$ (ln)	1,043	4.66	1.80	0.00	3.47	4.77	5.93	9.81
$Size_{C}$	1,043	564.84	1,401.79	2.00	79.00	203.00	495.00	18,439
$Size_{T}$	1,043	101.81	273.33	0.00	14.00	40.00	103.00	6,242
$Size_{T}$ (ln)	1,043	3.68	1.39	0.00	2.71	3.71	4.64	8.74
Target integration	1,043	0.36	0.48	0.00	0.00	0.00	1.00	1.00
$Tenure_{A\text{-}T}$ (years)	1,030	0.03	4.70	-16.04	-2.40	0.23	2.62	14.16
$Tenure_{T}$ (years)	1,035	5.87	4.06	0.01	2.68	4.89	8.41	20.87
$Wage_{A\text{-}T}$ (euros)	1,030	15.12	33.54	-143.29	-5.15	12.54	34.01	123.73
$Wage_{T}$ (euros)	1,035	89.33	29.12	2.67	69.06	88.19	107.55	190.68

Table 1: Summary statistics (continued).

Panel B: Control firms

	N	Mean	SD	Min	P25	P50	P75	Max
$Age_{A\text{-}T}$ (years)	1,043	0.02	6.25	-26.19	-3.40	0.04	3.72	31.86
Age_{T} (years)	1,043	40.06	5.57	20.00	36.71	40.13	43.37	67.50
Distance (minutes)	1,043	206.31	136.80	0.00	96.63	180.62	295.45	622.23
$Education_{A\text{-}T}$ (%)	1,024	6.23	26.80	-96.77	-5.89	3.42	18.44	100.00
$Education_{T}$ (%)	1,035	22.72	23.95	0.00	4.55	13.46	33.33	100.00
Emp. $growth_{A}$ (%)	1,034	-26.34	59.15	-200.00	-30.12	-10.81	0.00	200.00
Emp. $growth_{C}$ (%)	1,043	-20.59	41.02	-200.00	-27.34	-11.35	0.00	111.89
Emp. $growth_{T}$ (%)	1,036	-29.51	61.35	-200.00	-34.31	-12.58	0.00	200.00
$Growth_{A}$ (%)	1,034	-26.34	59.15	-200.00	-30.12	-10.81	0.00	200.00
HCR	1,021	34.71	30.58	0.00	7.85	25.53	57.28	100.00
$Hierarchy_{A}$	1,030	1.67	0.58	1.00	1.22	1.53	2.00	4.00
$Hierarchy_{T}$	1,035	1.59	0.55	1.00	1.14	1.41	1.91	4.00
$Inflow_{A}$ (%)	1,034	39.15	42.49	0.00	17.15	28.57	47.41	600.00
$Inflow_{C}$ (%)	1,043	37.86	29.64	0.00	20.66	30.63	44.64	320.00
$Inflow_{T}$ (%)	1,036	39.80	40.70	0.00	16.75	29.28	50.00	633.33
$Outflow_{A}$ (%)	1,034	65.49	64.85	0.00	27.08	41.28	76.58	800.00
$Outflow_{C}$ (%)	1,043	58.45	45.50	9.09	30.10	43.19	68.42	400.00
$Outflow_{T}$ (%)	1,036	69.31	67.00	0.00	28.57	45.19	83.05	588.89
$PreGrowth_{A}$ (%)	1,039	27.58	56.59	-200.00	3.03	14.67	34.41	200.00
$PreGrowth_{C}$ (%)	1,043	22.93	35.71	-170.52	5.97	15.20	29.63	200.00
$PreGrowth_{T}$ (%)	1,041	30.01	54.55	-200.00	5.65	17.54	37.66	200.00
$Qualification_{A\text{-}T}$	1,024	2.11	28.45	-100.00	-10.36	1.11	13.37	100.00
$Qualification_{T}$	1,035	19.79	23.69	0.00	2.18	10.62	29.38	100.00
Related	1,043	0.72	0.45	0.00	0.00	1.00	1.00	1.00
$Size_{A}$	1,043	423.98	1,256.14	0.00	29.00	109.00	340.00	15,814
$Size_{A}$ (ln)	1,043	4.56	1.81	0.00	3.40	4.70	5.83	9.67
$Size_{C}$	1,043	522.91	1,309.91	3.00	73.00	192.00	437.00	16,018
$Size_{T}$	1,043	98.93	262.52	0.00	14.00	39.00	100.00	5,266
$Size_{T}$ (ln)	1,043	3.64	1.40	0.00	2.71	3.69	4.62	8.57
Target integration	1,043	0.08	0.28	0.00	0.00	0.00	0.00	1.00
$Tenure_{A\text{-}T}$ (years)	1,024	0.22	4.84	-16.39	-2.82	0.14	3.42	15.81
$Tenure_{T}$ (years)	1,035	6.07	3.77	0.08	3.02	5.36	8.44	21.12
$Wage_{A\text{-}T}$ (euros)	1,024	13.28	36.71	-124.56	-8.11	10.97	35.13	139.76
$Wage_{T}$ (euros)	1,035	86.11	31.10	0.00	65.52	85.11	106.48	190.04

Panel C: Correlations

	External inflow	External outflow	Internal inflow	Internal outflow
External inflow		0.661***	0.219***	0.765***
External outflow	0.379***		0.692***	0.324***
Internal inflow	0.031	0.011		0.031
Internal outflow	0.006	-0.045	0.183***	

Table 2: Firm-level aggregate employee flows for the general workforce. The table reports the estimated differences in growth rates from $t = -1$ to $t = +2$ between the establishments of treated firms (All, Target, Acquirer) and their control firms. Estimates are obtained as estimates of θ from equation (1) for the dependent variables presented in the first column. *All establ.* refers to the combined flows of target and acquirer establishments, respectively, their matched pairs. All rates are either scaled by the combined employment of target and acquirer (i.e., the merged firm denoted as *Combined*; columns 1, 3, 5) or the employment of the respective entity (columns 2 and 4). In all regressions, we control for driving distance, the pre-acquisition growth rate, and fixed effects for cells from the full product of the calendar year, region, and firm size category, where size categories are defined based on the number of firms' establishments: 1, 2, 3-5, 6-10, and more than 10. All variables are defined in Table A2 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 2: Firm-level aggregate employee flows for the general workforce (continued).

Entity:	All establ.	Target establ.		Acquirer establ.	
Scaled by employment of establishments of...	Combined firm	Target	Combined firm	Acquirer	Combined firm
	(1)	(2)	(3)	(4)	(5)
Employment growth	-7.22***	-55.36***	-14.01***	14.54***	6.97***
	(-3.50)	(-15.75)	(-10.07)	(5.55)	(4.61)
External growth	-7.22***	-38.54***	-12.09***	12.20***	5.04***
	(-3.50)	(-12.73)	(-8.90)	(4.32)	(3.39)
Internal growth	0.00	-16.62***	-1.92***	2.35***	1.92***
		(-10.21)	(-7.51)	(1.22)	(7.44)
Inflow	9.72***	-2.22	-2.90***	23.78***	12.52***
	(6.66)	(-0.95)	(-3.71)	(5.45)	(9.41)
External inflow	6.21***	-4.04*	-3.27***	18.19***	9.39***
	(4.95)	(-1.79)	(-4.39)	(4.75)	(8.46)
Inflow other firms	5.81***	-0.81	-1.40**	14.45***	7.17***
	(5.91)	(-0.56)	(-2.51)	(4.71)	(8.44)
with wage increase	5.09***	0.06	-0.85**	12.43***	5.90***
	(6.97)	(0.06)	(-2.49)	(4.86)	(8.79)
with wage decrease	0.72	-0.87	-0.55*	2.03***	1.27***
	(1.61)	(-1.30)	(-1.68)	(2.93)	(4.11)
Inflow new entrant	0.40	-3.26***	-1.86***	3.72***	2.20***
	(0.80)	(-2.67)	(-5.64)	(3.53)	(5.23)
Internal inflow	3.50***	1.83***	0.37**	5.59***	3.14***
	(7.36)	(3.63)	(2.05)	(3.56)	(7.09)
Inflow within	1.04***	0.54	0.10	1.09**	0.93**
	(2.58)	(1.22)	(0.59)	(2.58)	(2.57)
Inflow between	2.47***	1.29***	0.27***	4.50***	2.20***
	(9.57)	(5.27)	(4.12)	(2.96)	(8.82)
Outflow	16.93***	53.14***	11.11***	9.24*	5.56***
	(7.37)	(14.09)	(8.22)	(1.84)	(3.06)
External outflow	13.43***	34.50***	8.82***	5.99	4.34***
	(6.26)	(9.76)	(6.67)	(1.48)	(2.62)
Outflow other firms	11.71***	30.68***	8.28***	6.23**	3.26**
	(6.69)	(11.23)	(7.64)	(1.97)	(2.44)
with wage increase	7.85***	20.80***	5.26***	4.31*	2.49**
	(6.00)	(9.86)	(7.01)	(1.78)	(2.39)
with wage decrease	3.86***	9.88***	3.03***	1.92*	0.77*
	(5.94)	(8.46)	(5.95)	(1.79)	(1.92)
Outflow unemployment	1.73**	3.81**	0.54	-0.24	1.08*
	(2.30)	(2.24)	(1.21)	(-0.17)	(1.89)
Internal outflow	3.50***	18.65***	2.29***	3.25*	1.21***
	(7.36)	(12.39)	(7.66)	(1.82)	(3.28)
Outflow within	1.04***	0.54	0.10	1.09**	0.93**
	(2.58)	(1.22)	(0.59)	(2.58)	(2.57)
Outflow between	2.47***	18.11***	2.19***	2.15	0.28***
	(9.57)	(12.50)	(8.82)	(1.24)	(3.99)
Turnover	13.33	25.46	4.11	16.51	9.04
N	2,086	2,071	2,086	2,072	2,086

Table 3: Firm-level aggregate employee flows for the general workforce by status of target integration. The table reports the estimated differences in growth rates from $t = -1$ to $t = +2$ between the establishments of treated firms (All, Target, Acquirer) and their control firms. The table distinguishes between transaction in which the target is integrated and transactions in which the target is not integrated at the end of year 2. Estimates are obtained as estimates of θ from equation (1) for the dependent variables presented in the first column. *All establ.* refers to the combined flows of target and acquirer, respectively, their matched pairs. All rates are either scaled by the combined employment of target and acquirer (i.e., the merged firm). In all regressions, we control for driving distance, the pre-acquisition growth rate, and fixed effects for cells from the full product of the calendar year, region, and firm size category, where size categories are defined based on the number of firms' establishments: 1, 2, 3-5, 6-10, and more than 10. All variables are defined in Table A2 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Integrated targets			Non-integrated targets		
Entity:	All establ. (1)	Target establ. (2)	Acquirer establ. (3)	All establ. (4)	Target establ. (5)	Acquirer establ. (6)
Employment growth	-27.56***	-36.73***	9.20***	3.75*	-2.10*	5.95***
	(-6.84)	(-12.83)	(3.49)	(1.69)	(-1.76)	(3.24)
External growth	-27.56***	-31.35***	3.80	3.75*	-2.10*	5.98***
	(-6.84)	(-10.91)	(1.50)	(1.69)	(-1.76)	(3.26)
Internal growth	0.00	-5.38***	5.40***	0.00	0.00	-0.03
		(-8.54)	(8.52)			(-0.25)
Inflow	13.23***	-8.85***	22.02***	7.53***	0.23	7.33***
	(4.87)	(-7.00)	(8.70)	(5.03)	(0.25)	(5.74)
External inflow	6.07***	-8.69***	14.68***	6.05***	-0.44	6.51***
	(2.72)	(-7.17)	(7.37)	(4.35)	(-0.50)	(5.50)
Internal inflow within	1.79**	-0.16	1.94**	0.63	0.25	0.40
	(2.14)	(-0.52)	(2.52)	(1.61)	(1.40)	(1.17)
Internal inflow between	5.38***	0.00	5.40***	0.84***	0.41***	0.41***
	(8.53)	(1.06)	(8.52)	(6.23)	(4.35)	(6.27)
Outflow	40.80***	27.88***	12.81***	3.78*	2.33**	1.38
	(8.97)	(10.09)	(3.75)	(1.70)	(1.96)	(0.73)
External outflow	33.63***	22.66***	10.88***	2.31	1.67	0.53
	(7.96)	(8.12)	(3.65)	(1.07)	(1.44)	(0.29)
Internal outflow within	1.79**	-0.16	1.94**	0.63	0.25	0.40
	(2.14)	(-0.52)	(2.52)	(1.61)	(1.40)	(1.17)
Internal outflow between	5.38***	5.38***	0.00	0.84***	0.41***	0.44***
	(8.53)	(8.54)	(1.06)	(6.23)	(6.26)	(4.20)
Turnover	27.02	9.52	17.42	5.66	1.28	4.36
N	746	746	746	1,340	1,340	1,340

Table 4: Internal labor market activity and replacement rates. This table examines the extent to which the merged firm's (abnormal) labor flows are related to its internal labor market (columns 1 and 2) and to what extent inflows into the merged firm replace outflows (columns 3 and 4). *Internal hiring (separation) rate* is the defined as the ratio of *Internal inflow (Internal outflow)* to *Inflow (Outflow)*; see equations (9) and (10) in Appendix A.1. *Replacements* is defined as the lower of the numbers of *Inflow* and *Outflow*, and *Replacement rate* is defined as the ratio of *Inflow* to *Outflow*; see, respectively, equations (11) and (12) in Appendix *A.1.* Panel A describes the mean values for these variables. Panel B reports the estimated differences from $t = -1$ to $t = +2$ between treated firms and their control firms. The reported coefficients are obtained as estimates of θ from equation (1) for the dependent variables presented in the first column. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Internal hiring rate (%) (1)	Internal sep. rate (%) (2)	Replacements (3)	Replacement rate (%) (4)
Panel A: Unadjusted rates				
Combined firms	9.23	6.85	42.29	67.69
Targets	7.99	11.25	32.12	43.38
Acquirers	8.38	4.40	51.47	76.88
Panel B: Abnormal rates				
Combined firms	4.57***	3.49***	7.83***	-1.74
Targets	5.96***	9.27***	-2.33***	-20.88***
Acquirers	3.93***	1.27***	8.16***	10.09***

Table 5: Composition of acquirers' and targets' workforce. This table shows the education and qualification of acquirer and target employees. It also reports the percentage of employees working in each layer of the hierarchy. *Education index, Qualification index*, and *Layers* are defined in Appendix A.2. All statistics are based on the year prior to the transaction ($t = -1$).

	Target	Acquirer	Difference
Education index			
Intermediate school leaving certificate [ISLC] (low)	8.1	6.8	1.3
ISLC with vocational training (medium)	49.6	42.6	7.1
Upper secondary school leaving certificate [USSLC] (medium)	18.3	18.6	-0.3
University of applied sciences degree (high)	6.2	7.1	-0.9
University degree (high)	17.7	24.9	-7.2
Total	100.0	100.0	
Qualification index			
Low qualification	24.9	21.8	3.1
Medium qualification	51.1	52.4	-1.3
High qualification	20.7	22.7	-2.0
Total	96.7	97.0	
Layers			
Layer 1: Clerks, operators, production workers	59.5	56.4	3.1
Layer 2: Supervisors, engineers, technicians, professionals	21.1	20.0	1.0
Layer 3: Senior experts, middle managers	14.1	16.5	-2.4
Layer 4: CEOs, managing directors	5.3	7.0	-1.7
Total	100.0	100.0	

Table 6: Characteristics of inflows and outflows. This table reports the mean and standard deviations of average employee education and qualification levels as well as the average employee age and the daily wage (at $t = -1$) for merged firms. It also reports the average of these variables for the inflows (outflows) from (to) the external labor market (Panel A) and the internal labor market (Panel B) during the three year period from $t = 0$ to $t = +2$ together with its difference (absolute and in %) and a paired t-test. *Education index* and *Qualification index* are defined in Appendix A.2, *Age* and *Wage* are defined in Table A2. *Tenure* is the number of years an employee has worked for the firm and we only report it for outflows. Panel B (internal labor market) does not report *Education index, Qualification index,* and *Age* for the internal inflows, as these are identical to the values for the outflows. *Wage* does change when employees move in the internal labor market and the table reports it for inflows and outflows.

Panel A

		Education index (1)	Qualification index (2)	Age (3)	Wage (4)	Tenure (years) (5)
Treated firms	Mean at t = -1	2.825	1.898	39.78	98.36	6.35
N = 1034	SD at t = -1	0.695	0.360	4.14	25.93	3.46
	External inflow	3.040	1.979	35.08	83.48	
	External outflow	2.950	1.966	39.02	94.48	5.39
	Difference	0.090	0.013	-3.95	-10.99	
	in % of t = -1	3.18	0.69	-9.92	-11.17	
	t-stat	9.43	2.61	-32.87	-23.98	
Control firms	Mean at t = -1	2.724	1.865	39.99	94.85	6.65
N = 1043	SD at t = -1	0.687	0.394	3.81	27.48	3.36
	External inflow	2.823	1.826	36.17	74.57	
	External outflow	2.751	1.807	36.53	75.13	3.32
	Difference	0.072	0.019	-0.36	-0.57	
	in % of t = -1	2.63	1.03	-0.91	-0.60	
	t-stat	48.85	23.04	-18.24	-5.55	

Panel B

		Education index (1)	Qualification index (2)	Age (3)	Wage (4)	Tenure (years) (5)
Treated firms	Mean at t = -1	2.891	1.918	39.46	99.91	6.62
N = 266	SD at t = -1	0.699	0.344	4.02	26.48	3.52
	Internal inflow				122.82	
	Internal outflow	3.444	2.157	38.41	114.99	4.88
	Difference				7.83	
	in % of t = -1				7.84	
	t-stat				6.90	

Table 7: Firm-level aggregate employee flows for managers by status of target integration. This table reports the estimated differences in growth rates from $t = -1$ to $t = +2$ between the establishments of treated firms (All, Target, Acquirer) and their control firms for transactions for which *Target integration* is equal to one (columns 1 to 3) and for transactions for which *Target integration* is equal to zero (columns 4 to 6). Coefficient estimates denote θ from equation (1) for the dependent variables presented in the first column. *All establ.* refers to the combined flows of target and acquirer, respectively, their matched pairs. All rates are scaled by the combined employment of target and acquirer (i.e., the merged firm denoted as *Combined*). In all regressions, we control for driving distance, the pre-acquisition growth rate, and fixed effects for cells from the full product of the calendar year, region, and firm size category, where size categories are defined based on the number of firms' establishments: 1, 2, 3-5, 6-10, and more than 10. All variables are defined in Table A2 in the Online Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Integrated targets			Non-integrated targets		
Entity:	All establ. (1)	Target establ. (2)	Acquirer establ. (3)	All establ. (4)	Target establ. (5)	Acquirer establ. (6)
Employment growth	-21.17***	-29.95***	8.71	4.73	-3.44	8.11**
	(-3.03)	(-7.54)	(1.49)	(1.08)	(-1.25)	(2.35)
External growth	-17.83***	-19.84***	1.91	8.01**	-2.86	10.73***
	(-2.92)	(-5.66)	(0.39)	(2.11)	(-1.22)	(3.63)
Internal growth	0.06	-5.50***	5.63***	0.17	0.15	-0.05
	(0.07)	(-5.44)	(4.87)	(0.64)	(0.47)	(-0.18)
Promotions - demotions	-3.32	-4.61**	1.16	-3.37**	-0.73	-2.57*
	(-0.78)	(-2.38)	(-0.22)	(-2.17)	(-0.88)	(-1.67)
Inflow	27.09***	-7.27***	33.89***	15.37***	4.60***	10.71***
	(3.92)	(-3.60)	(5.17)	(5.40)	(2.67)	(4.25)
External inflow	19.82***	-6.94***	26.23***	12.49***	3.65**	8.81***
	(3.02)	(-3.52)	(4.23)	(4.52)	(2.19)	(3.60)
Internal inflow within	1.69	-0.33	2.01*	1.40***	0.12	1.30***
	(1.53)	(-0.88)	(1.96)	(2.64)	(0.40)	(2.82)
Internal inflow between	5.59***	0.00	5.65***	1.47***	0.83***	0.61***
	(4.88)		(4.91)	(5.49)	(3.77)	(4.47)
Outflow	44.93***	18.07***	26.35***	7.26*	7.31***	0.03
	(5.59)	(4.56)	(3.73)	(1.86)	(2.95)	(0.01)
External outflow	37.65***	12.91***	24.32***	4.48	6.51***	-1.93
	(4.81)	(3.38)	(3.53)	(1.17)	(2.71)	(-0.63)
Internal outflow within	1.61	-0.42	2.03**	1.33***	0.09	1.26***
	(1.47)	(-1.03)	(1.99)	(2.60)	(0.32)	(2.80)
Internal outflow between	5.60***	5.59***	0.00	1.38***	0.71***	0.70***
	(5.56)	(5.56)		(5.58)	(4.82)	(3.21)
Turnover	36.01	5.40	30.12	11.32	5.96	5.37
N	667	667	667	1,301	1,301	1,301

Table 8: Hiring, separations, and replacements for managers. This table examines the extent to which the merged firm's (abnormal) labor flows of managers are related to its internal labor market (columns 1 and 2) and to what extent inflows into the merged firm replace outflows (columns 3 and 4). *Internal hiring (separation) rate* is the defined as the ratio of *Internal inflow (Internal outflow)* to *Inflow (Outflow)*; see equations (9) and (10) in Appendix *A.1.* *Replacements* is defined as the lower of the numbers of *Inflow* and *Outflow*, and *Replacement rate* is defined as the ratio of *Inflow* to *Outflow*; see, respectively, equations (11) and (12) in Appendix *A.1.* Panel A and Panel B include all transactions (N= 2086), Panel C and Panel D (N=667) include transactions in which the target is integrated, and Panel E and Panel F (N=1,301) include transactions in which the target is not integrated.

	Internal sep. rate (%) (1)	Internal hiring rate (%) (2)	Replacements (3)	Replacement rate (%) (4)
Panel A: unadjusted rates, all transactions				
Combined firms	8.06	10.77	42.57	63.42
Targets	12.77	10.06	30.77	38.78
Acquirers	5.88	10.75	39.54	68.93
Panel B: abnormal rates, all transactions				
Combined firms	4.94***	4.62***	15.80***	5.91***
Targets	9.98***	8.31***	0.66	-11.59***
Acquirers	2.43***	3.84***	12.56***	14.14***
Panel C: unadjusted rates, integrated targets				
Combined firms	10.60	13.12	52.26	56.17
Targets	21.22	9.75	21.09	9.55
Acquirers	4.09	13.87	50.02	72.85
Panel D: abnormal rates, integrated targets				
Combined firms	7.55***	6.86***	26.97***	-0.32
Targets	13.58***	7.06	-3.77**	-32.20***
Acquirers	0.67	5.36**	25.55***	16.18***
Panel E: unadjusted rates, non-integrated targets				
Combined firms	6.75	9.65	37.48	67.15
Targets	8.27	10.10	34.41	54.34
Acquirers	6.80	9.09	33.99	66.93
Panel F: abnormal rates, non-integrated targets				
Combined firms	3.63***	3.51***	9.85***	8.39***
Targets	7.61***	8.83***	2.69**	-1.92
Acquirers	3.18***	2.02	5.79***	11.85***

Table 9: Hierarchies and organization. This table reports regression results of changes in acquirers' hierarchy on organizational growth measured by $Growth_A$. In model (1), the dependent variable is $\Delta Layers$,which is the difference in the number of layers of the merged firm in $t+2$ and the number of layers of the acquirer in $t-1$. In model (2) (model (3)) the dependent variable is $D(\Delta Layers > 0)$ ($D(\Delta Layers < 0)$), a dummy variable that equals one if $\Delta Layers > 0$ ($\Delta Layers < 0$), and zero otherwise. In all regressions, we control for driving distance, the pre-acquisition growth rate, and fixed effects for cells from the full product of the calendar year, region, and firm size category, where size categories are defined based on the number of firms' establishments: 1, 2, 3-5, 6-10, and more than 10. All variables are defined in Table A2 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable:	ΔLayers	D(ΔLayers>0)	D(ΔLayers<0)
	(1)	(2)	(3)
Panel A			
Growth_A	0.69***	0.24***	-0.13***
	(5.96)	(4.45)	(-2.74)
Controls	Yes	Yes	Yes
Observations	1,022	1,022	1,022
adj. R^2	0.4241	0.3130	0.0875
Panel B			
Treated	-0.06**	-0.02*	0.01
	(-2.41)	(-1.69)	(0.96)
Growth_A	-0.02	-0.01	0.00
	(-0.38)	(-0.34)	(0.32)
Treated × Growth_A	0.28***	0.10***	-0.05***
	(4.86)	(3.97)	(-2.64)
Controls	Yes	Yes	Yes
Observations	2,036	2,036	2,036
adj. R^2	0.6522	0.6661	0.5953

Table 10: Employment growth of the acquirer. The table reports the estimated differences in $Growth_A$ from $t = -1$ to $t = +2$ between treated firms and their control firms. $Growth_A$ measures the employment growth in all establishments that belong to the acquirer by adding the employment at target establishments to that at the acquirer establishments after $t = 0$; no additional establishments are included for control firms matched to acquirers. Coefficient estimates are obtained as estimates of θ from equation (1) for the dependent variables presented in the first column. In all regressions, we control for driving distance, the pre-acquisition growth rate, and fixed effects for cells from the full product of the calendar year, region, and firm size category, where size categories are defined based on the number of firms' establishments: 1, 2, 3-5, 6-10, and more than 10. All variables are defined in Table A2 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dependent variable:		Employment growth			
Layer:	All	1	2	3	4
Panel A					
Treated	39.34***	41.90***	42.57***	28.28***	39.21***
	(13.18)	(12.25)	(10.10)	(6.59)	(7.73)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	1,328	1,328	1,328	1,328	1,328
adj. R^2	0.1587	0.1837	0.1135	0.1211	0.1385
Panel B					
Treated		3.85*	4.20	-6.10	5.38
		(1.93)	(1.27)	(-1.60)	(1.12)
Growth_A		0.92***	1.00***	0.96***	0.99***
		(25.76)	(20.61)	(18.42)	(15.24)
Treated × Growth_A		0.10**	-0.06	-0.18**	-0.28***
		(2.15)	(-0.72)	(-2.10)	(-3.03)
Controls		Yes	Yes	Yes	Yes
Observations		1,328	1,328	1,328	1,328
adj. R^2		0.5311	0.4233	0.3451	0.7680

Table 11: Sales growth and labor productivity. The table reports regression results with sales growth (Panel A), change in labor productivity (Panel B), labor productivity growth (Panel C), and growth of average daily wage of employees who stay with the combined firm (Panel D) from $t = -1$ to $t = 2$ as the dependent variable. In columns 1 and 2 the sample includes all available observations and in columns 3 and 4 the sample includes only observations for which all dependent and independent variables are available for the treated and for the control firm. Sales is the sum of target and acquirer sales reported by BvD. Labor productivity is the ratio of sales to the total number of employees ($Size_C$). Change in labor productivity is the difference between labor productivity in $t = 2$ and $t = -1$. Sales growth and labor productivity growth are defined following the definition of growth rates described in Section 3.3 and equation (2) for employment growth. Fixed effects are the full product of calendar year, region, and firm size category, where size categories are defined based on the number of the firms' establishments: 1, 2, 3-5, 6-10, and more than 10. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	All Observations		Matched Observations	
	(1)	(2)	(3)	(4)
Panel A: Sales growth from t=-1 to t=+2				
Treated	6.95**	2.22	1.17	1.17
	(2.22)	(0.54)	(0.30)	(0.31)
Fixed effects	No	Yes	No	Yes
Observations	1201	1201	750	750
adj. R^2	0.003	0.075	-0.001	0.069
Panel B: Change in labor productivity from t=-1 to t=+2				
Treated	525.27***	491.25***	451.59***	451.59***
	(7.98)	(5.50)	(5.22)	(5.55)
Fixed effects	No	Yes	No	Yes
Observations	1199	1199	746	746
adj. R^2	0.044	0.172	0.034	0.147
Panel C: Labor productivity growth from t=-1 to t=+2				
Treated	11.92***	8.18*	7.73*	7.73*
	(3.50)	(1.80)	(1.79)	(1.84)
Fixed effects	No	Yes	No	Yes
Observations	1199	1199	746	746
adj. R^2	0.009	0.098	0.003	0.060
Panel D: Average stayer wage growth from t=-1 to t=+2				
Treated	0.74**	0.79***	0.76**	0.76**
	(2.20)	(2.61)	(2.26)	(2.53)
Fixed effects	No	Yes	No	Yes
Observations	2032	2032	1994	1994
adj. R^2	0.002	0.205	0.002	0.201

C Online Appendix

Table OA1: Sample construction. This table presents an overview of the sample construction. For each step the number of remaining observations and the percentage of lost observations is reported.

Description	N	Type	Loss in %
(1) All M&A deals where the target is headquartered in Germany from 1996 until 2014	11,415	Transactions	
(2) Delete all non-majority acquisitions (ownership <50% before and >=75% after)	8,152	Transactions	28.6
(3) Delete all deals with multiple acquirers or targets	7,532	Transactions	5.4
(4) Delete all deals defined as asset sale, build up, exit, LBO, nationalisation, privatisiation, restructuring, secondary buy-out, sovereign wealth fund, unsuccessful public takeover or start up	6,852	Transactions	6.0
(5) Delete all target-year duplicates and deals where target equals acquirer (targets and acquirers obtained after step 5 are removed from the list of potential controls)	6,792	Transactions	0.5
(6) Delete deals if acquirer is not headquartered in Germany	3,602	Transactions	27.9
(7) Delete all deals where the record linkage did not work for either target or acquirer	1,147	Transactions	21.5
(8) Delete all deals where either the target or the acquirer has no adequate control firm	1,043	Transactions	0.9

Table OA2: Firm matching success. Panel A presents descriptive statistics on target firms and control firms. Panel B presents descriptive statistics on acquirer firms and control firms. All variables are measured in the year prior to the acquisition announcement (t=-1). *Diff. mean* reports the difference between the means of treated and control firms. The Imbens-Wooldridge statistic (I-W test; Imbens and Wooldridge, 2009) measures the normalized difference between two variables. The test divides the difference between two variables by the square root of the sum of their variances. As a rule of thumb, a test statistic exceeding 0.25 indicates that the analysis tends to be sensitive to the specification.

Panel A: Target firms

	Treated firms			Control firms				
	Mean	P50	SD	Mean	P50	SD	Diff. mean	I-W test
Average Daily Wage	89.33	88.19	29.12	86.11	85.11	31.10	3.22	0.08
Average Employee Age	40.02	40.27	5.98	40.06	40.13	5.57	-0.04	0.00
Hierarchy	1.65	1.47	0.59	1.59	1.41	0.55	0.06	0.07
Layers	3.06	3.00	1.00	2.94	3.00	1.03	0.12	0.09
PreGrowth (%)	9.00	3.20	24.64	8.27	3.39	20.25	0.73	0.02
Share Medium-Qualified (%)	63.29	69.23	24.04	64.42	70.21	23.64	-1.12	0.03
Share High-Qualified (%)	23.81	15.38	24.10	22.93	14.00	23.87	0.88	0.03
Share Female (%)	35.88	30.77	23.66	35.59	30.43	22.92	0.29	0.01
Size	101.81	40.00	273.33	98.93	39.00	263.43	2.88	0.01

Panel B: Acquirer firms

	Treated firms			Control firms				
	Mean	P50	SD	Mean	P50	SD	Diff. mean	I-W test
Average Daily Wage	104.45	100.73	33.54	99.39	96.08	36.71	5.06	0.10
Average Employee Age	39.86	40.13	4.86	40.08	40.34	4.58	-0.22	0.03
Hierarchy	1.74	1.60	0.76	1.67	1.53	0.76	0.07	0.06
Layers	3.49	4.00	0.93	3.38	4.00	0.97	0.11	0.08
PreGrowth (%)	16.15	9.64	29.08	14.67	7.95	29.83	1.49	0.04
Share Medium-Qualified (%)	57.91	62.71	23.27	59.54	65.33	22.94	-1.62	0.05
Share High-Qualified (%)	31.21	24.73	25.29	28.75	21.37	25.05	2.46	0.07
Share Female (%)	37.72	34.05	21.50	37.53	33.33	21.82	0.18	0.01
Size	463.03	117.00	1,343	423.98	109.00	1,256	39.05	0.02

Table OA3: Firm-level aggregate employee flows: target integration vs. target non-integration. The table reports the estimated differences in growth rates from $t = -1$ to $t = +2$ between the establishments of treated firms (All, Target, Acquirer) and their control firms for transactions where *Target integration* is equal to zero (Panel A) and transactions where *Target integration* is equal to one (Panel B). Estimates are obtained as estimates of θ from equation (1) for the dependent variables presented in the first column. *All establ.* refers to the combined flows of target and acquirer, respectively, their matched pairs. All rates are either scaled by the combined employment of target and acquirer (i.e., the merged firm denoted as *Combined*; columns 1, 3, 5) or the employment of the respective entity (columns 2 and 4). In all regressions, we control for driving distance, the pre-acquisition growth rate, and fixed effects for cells from the full product of the calendar year, region, and firm size category, where size categories are defined based on the number of firms' establishments: 1, 2, 3-5, 6-10, and more than 10. All variables are defined in Table A2. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table OA3: Firm-level aggregate employee flows: target survival vs. closure (continued).

Panel A - Non-integrated targets					
Entity:	All establ.	Target establ.		Acquirer establ.	
Scaled by employment of establishments of...	Combined firm	Target	Combined firm	Acquirer	Combined firm
	(1)	(2)	(3)	(4)	(5)
Employment growth	3.75*	2.89	-2.10*	12.31***	5.95***
	(1.69)	(0.94)	(-1.76)	(3.91)	(3.24)
Inflow	7.53***	3.05	0.23	17.99***	7.33***
	(5.03)	(1.43)	(0.25)	(3.50)	(5.74)
External inflow	6.05***	0.49	-0.44	16.77***	6.51***
	(4.35)	(0.24)	(-0.50)	(3.28)	(5.50)
Inflow other firms	5.79***	2.09	0.42	13.75***	5.46***
	(5.49)	(1.53)	(0.68)	(3.35)	(5.98)
with wage increase	4.92***	2.29**	0.33	12.23***	4.64***
	(6.41)	(2.24)	(0.72)	(3.61)	(6.99)
with wage decrease	0.87*	-0.20	0.09	1.51*	0.82**
	(1.90)	(-0.31)	(0.42)	(1.71)	(2.01)
Inflow new entrant	0.26	-1.60	-0.85**	3.02**	1.05**
	(0.43)	(-1.24)	(-2.05)	(2.29)	(2.15)
Internal inflow	1.47***	2.56***	0.66***	1.22***	0.82**
	(3.57)	(4.61)	(3.30)	(2.72)	(2.32)
Inflow within	0.63	0.60	0.25	0.51	0.40
	(1.61)	(1.40)	(1.40)	(1.18)	(1.17)
Inflow between	0.84***	1.96***	0.41***	0.71***	0.41***
	(6.23)	(5.57)	(4.35)	(5.77)	(6.27)
Outflow	3.78*	0.17	2.33**	5.68	1.38
	(1.70)	(0.05)	(1.96)	(0.98)	(0.73)
External outflow	2.31	-4.17	1.67	1.85	0.53
	(1.07)	(-1.39)	(1.44)	(0.47)	(0.29)
Outflow other firms	2.60	-2.01	1.34	4.19	1.24
	(1.50)	(-0.88)	(1.49)	(1.39)	(0.85)
with wage increase	1.93	-1.90	0.86	2.49	1.07
	(1.48)	(-1.08)	(1.30)	(1.08)	(0.97)
with wage decrease	0.67	-0.12	0.49	1.71	0.17
	(1.15)	(-0.11)	(1.30)	(1.58)	(0.39)
Outflow unemployment	-0.30	-2.16	0.32	-2.34	-0.71
	(-0.34)	(-1.49)	(0.68)	(-1.56)	(-1.03)
Internal outflow	1.47***	4.34***	0.66***	3.82	0.84**
	(3.57)	(5.80)	(3.48)	(1.47)	(2.35)
Outflow within	0.63	0.60	0.25	0.51	0.40
	(1.61)	(1.40)	(1.40)	(1.18)	(1.17)
Outflow between	0.84***	3.73***	0.41***	3.32	0.44***
	(6.23)	(6.05)	(6.26)	(1.29)	(4.20)
N	1,340	1,333	1,340	1,332	1,340

Table OA3: Firm-level aggregate employee flows: target survival vs. closure (continued).

Panel B - Integrated targets					
Entity:	All establ.	Target establ.		Acquirer establ.	
Scaled by employment of establishments of...	Combined firm	Target	Combined firm	Acquirer	Combined firm
	(1)	(2)	(3)	(4)	(5)
Employment growth	-27.56***	-163.19***	-36.73***	18.75***	9.20***
	(-6.84)	(-44.92)	(-12.83)	(4.06)	(3.49)
Inflow	13.23***	-14.13***	-8.85***	30.73***	22.02***
	(4.87)	(-3.43)	(-7.00)	(5.11)	-8.7
External inflow	6.07***	-14.47***	-8.69***	19.38***	14.68***
	(2.72)	(-3.61)	(-7.17)	(4.47)	(7.37)
Inflow other firms	5.57***	-6.98**	-4.78***	14.89***	10.30***
	(3.16)	(-2.43)	(-4.99)	(4.40)	(6.96)
with wage increase	5.15***	-4.52**	-3.15***	12.25***	8.22***
	(3.92)	(-2.34)	(-7.29)	(4.24)	(6.61)
with wage decrease	0.42	-2.46*	-1.63**	2.64***	2.08***
	(0.51)	(-1.92)	(-2.30)	(2.74)	(5.67)
Inflow new entrant	0.47	-7.57***	-3.91***	4.45***	4.35***
	(0.56)	(-4.43)	(-7.62)	(2.81)	(5.66)
Internal inflow	7.17***	0.34	-0.16	11.35***	7.34***
	(6.88)	(0.34)	(-0.52)	(3.77)	(7.39)
Inflow within	1.79**	0.34	-0.16	2.27**	1.94**
	(2.14)	(0.34)	(-0.52)	(2.58)	(2.52)
Inflow between	5.38***	0.00	0.00	9.08***	5.40***
	(8.53)	(1.05)	(1.06)	(3.12)	(8.52)
Outflow	40.80***	149.06***	27.88***	11.98	12.81***
	(8.97)	(30.10)	(10.09)	(1.61)	(3.75)
External outflow	33.63***	104.50***	22.66***	9.71	10.88***
	(7.96)	(17.52)	(8.12)	(1.34)	(3.65)
Outflow other firms	28.36***	91.30***	21.84***	6.38	6.51***
	(8.27)	(18.55)	(9.53)	(1.15)	(2.69)
with wage increase	18.54***	63.27***	13.79***	5.12	4.71**
	(7.50)	(16.14)	(9.08)	(1.19)	(2.54)
with wage decrease	9.82***	28.03***	8.05***	1.26	1.80**
	(6.58)	(10.44)	(6.53)	(0.67)	(2.28)
Outflow unemployment	5.27***	13.20***	0.83	3.33	4.37***
	(3.70)	(3.71)	(0.86)	(1.31)	(4.54)
Internal outflow	7.17***	44.56***	5.22***	2.27**	1.94**
	(6.88)	(12.11)	(7.38)	(2.58)	(2.52)
Outflow within	1.79**	0.34	-0.16	2.27**	1.94**
	(2.14)	(0.34)	(-0.52)	(2.58)	(2.52)
Outflow between	5.38***	44.22***	5.38***	0.00	0.00
	(8.53)	(12.38)	(8.54)	(1.06)	(1.06)
N	746	738	746	740	746

Table OA4: Firm-level aggregate employee flows for managers. The table reports the estimated differences in growth rates for managers from $t = -1$ to $t = +2$ between the establishments of treated firms (All, Target, Acquirer) and their control firms. Estimates are obtained as estimates of θ from equation (1) for the dependent variables presented in the first column. *All establ.* refers to the combined flows of target and acquirer, respectively, their matched pairs. All rates are either scaled by the combined employment of target and acquirer (i.e., the merged firm denoted as *Combined*; columns 1, 3, 5) or the employment of the respective entity (columns 2 and 4). In all regressions, we control for driving distance, the pre-acquisition growth rate, and fixed effects for cells from the full product of the calendar year, region, and firm size category, where size categories are defined based on the number of firms' establishments: 1, 2, 3-5, 6-10, and more than 10. All variables are defined in Table A2 in the Online Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table OA4: Firm-level aggregate employee flows for managers (continued).

Entity:	All establ.	Target establ.		Acquirer establ.	
Scaled by employment of establishments of...	Combined firm	Target	Combined firm	Acquirer	Combined firm
	(1)	(2)	(3)	(4)	(5)
Employment growth	-3.92	-48.93***	-12.04***	14.19***	8.06***
	(-1.04)	(-6.74)	(-5.24)	(3.19)	(2.69)
Inflow	19.57***	9.70**	0.89	25.00***	18.50***
	(6.36)	(2.09)	(0.66)	(6.79)	(6.44)
External inflow	15.32***	5.30	0.37	18.91***	14.76***
	(5.14)	(1.18)	(0.28)	(5.64)	(5.32)
Inflow other firms	11.38***	-1.06	-1.12	15.30***	12.42***
	(5.06)	(-0.32)	(-1.16)	(5.87)	(6.00)
with wage increase	8.59***	-1.54	-1.23	12.32***	9.76***
	(4.55)	(-0.52)	(-1.43)	(5.58)	(5.74)
with wage decrease	2.79***	0.48	0.11	2.98***	2.66***
	(3.37)	(0.37)	(0.33)	(3.15)	(3.50)
Inflow new entrant	3.98***	6.36**	1.49*	3.65**	2.37**
	(2.93)	(2.33)	(1.82)	(2.55)	(2.02)
Internal inflow	4.25***	4.40***	0.52*	6.09***	3.75***
	(6.54)	(3.49)	(1.86)	(5.14)	(6.27)
Inflow within	1.45***	0.19	-0.04	1.71***	1.50***
	(3.01)	(0.28)	(-0.18)	(3.15)	(3.48)
Inflow between	2.80***	4.21***	0.56***	4.38***	2.25***
	(6.39)	(3.96)	(3.61)	(4.15)	(5.40)
Outflow	20.36***	60.25***	10.94***	6.63	9.24***
	(5.13)	(7.82)	(5.05)	(1.55)	(2.75)
External outflow	16.14***	42.96***	8.74***	3.90	7.30**
	(4.15)	(7.38)	(4.17)	(0.93)	(2.22)
Outflow other firms	12.76***	37.04***	7.41***	3.40	5.17**
	(4.28)	(7.92)	(4.63)	(1.04)	(2.13)
with wage increase	10.59***	27.10***	5.93***	3.59	4.53**
	(4.25)	(6.90)	(4.38)	(1.33)	(2.23)
with wage decrease	2.17*	9.93***	1.48**	-0.18	0.64
	(1.75)	(4.34)	(2.11)	(-0.13)	(0.67)
Outflow unemployment	3.45*	5.93*	1.33	0.50	2.13
	(1.73)	(1.76)	(1.17)	(0.22)	(1.32)
Internal outflow	4.14***	17.29***	2.20***	2.73***	1.94***
	(6.97)	(3.92)	(5.42)	(4.30)	(4.34)
Outflow within	1.38***	0.21	-0.09	1.71***	1.47***
	(2.91)	(0.34)	(-0.41)	(3.21)	(3.50)
Outflow between	2.77***	17.07***	2.29***	1.02***	0.47***
	(7.57)	(3.76)	(-0.18)	(2.90)	(3.05)
N	1,968	1,457	1,968	1,808	1,968

Table OA5: Firm-level aggregate employee flows for highly-qualified employees. The table reports the estimated differences in growth rates for highly qualified from $t = -1$ to $t = +2$ between the establishments of treated firms (All, Target, Acquirer) and their control firms. Estimates are obtained as estimates of θ from equation (1) for the dependent variables presented in the first column. *All establ.* refers to the combined flows of target and acquirer, respectively, their matched pairs. All rates are either scaled by the combined employment of target and acquirer (i.e., the merged firm denoted as *Combined*; columns 1, 3, 5) or the employment of the respective entity (columns 2 and 4). In all regressions, we control for driving distance, the pre-acquisition growth rate, and fixed effects for cells from the full product of the calendar year, region, and firm size category, where size categories are defined based on the number of firms' establishments: 1, 2, 3-5, 6-10, and more than 10. All variables are defined in Table A2 in the Online Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table OA5: Firm-level aggregate employee flows for highly-qualified employees (continued).

Entity:	All establ.	Target establ.		Acquirer establ.	
Scaled by employment of establishments of...	Combined firm	Target	Combined firm	Acquirer	Combined firm
	(1)	(2)	(3)	(4)	(5)
Employment growth	-6.13**	-52.19***	-12.45***	14.34***	6.34***
	(-2.05)	(-9.65)	(3.94)	(3.94)	(2.74)
Inflow	14.77***	2.37	-0.58	22.03***	0.46
	(5.47)	(0.71)	(-0.52)	(7.19)	(0.34)
External inflow	10.46***	-0.07	-1.26	16.98***	15.22***
	(4.54)	(-0.02)	(-1.18)	(6.50)	(6.18)
Inflow other firms	7.99***	-2.11	-1.05	13.35***	11.57***
	(4.61)	(-0.89)	(-1.21)	(6.22)	(5.68)
with wage increase	6.89***	-0.06	-0.58	11.53***	8.99***
	(4.90)	(-0.03)	(-0.77)	(6.58)	(5.88)
with wage decrease	1.10	-2.05**	-0.47	1.81**	7.42***
	(1.52)	(-2.01)	(-1.63)	(1.97)	(6.25)
Inflow new entrant	2.45**	2.04	-0.21	3.60***	1.57**
	(2.46)	(1.04)	(-0.42)	(3.20)	(2.32)
Internal inflow	4.31***	2.44***	0.67***	5.06***	2.56***
	(5.10)	(3.48)	(3.26)	(4.83)	(2.87)
Inflow within	1.77**	0.58	0.38*	1.69**	3.66***
	(2.36)	(1.11)	(1.94)	(2.06)	(4.44)
Inflow between	2.54***	1.85***	0.30***	3.36***	2.26***
	(6.57)	(3.95)	(4.25)	(5.25)	(5.85)
Outflow	20.04***	57.83***	11.06***	6.16	8.73***
	(5.69)	(11.15)	(6.00)	(1.54)	(2.99)
External outflow	15.73***	40.99***	8.74***	3.31	6.60***
	(4.95)	(9.32)	(4.90)	(0.91)	(2.63)
Outflow other firms	13.17***	36.48***	7.81***	4.78*	5.17***
	(5.53)	(9.64)	(5.59)	(1.69)	(2.70)
with wage increase	10.66***	26.34***	6.17***	2.91	4.33***
	(5.32)	(8.01)	(5.23)	(1.28)	(2.73)
with wage decrease	2.51***	10.15***	1.64***	1.87	0.84
	(2.91)	(6.39)	(3.01)	(1.63)	(1.27)
Outflow unemployment	2.40	4.51**	0.93	-1.47	1.43
	(1.58)	(2.01)	(1.08)	(-0.83)	(1.28)
Internal outflow	4.47***	16.84***	2.32***	2.85***	2.13***
	(5.32)	(6.57)	(6.51)	(3.28)	(2.80)
Outflow within	1.93**	0.55	0.34*	1.91**	1.60**
	(2.57)	(1.06)	(1.66)	(2.33)	(2.21)
Outflow between	2.53***	16.29***	1.98***	0.94***	0.53**
	(6.61)	(6.20)	(1.94)	(3.21)	(2.25)
N	2,050	1,752	2,050	1,932	2,050

Table OA6: Layer structure. This tables reports the average number of employees as well as the mean and median daily wage for target, acquirer, and combined firm depending on the number of layers the respective firm has at t=-1.

Panel A				
Number of layers (L)	N	Mean		Median
		Size	Wage	Wage
Target				
1	97	16.81	72.78	68.28
2	192	33.19	87.41	85.42
3	293	59.48	88.15	82.75
4	452	178.66	94.66	95.09
Acquirer				
1	53	18.57	103.49	102.20
2	91	40.82	97.21	92.61
3	189	171.25	99.99	96.30
4	704	633.34	106.60	106.02
Combined firm				
1	4	62.50	63.68	63.51
2	42	85.14	84.59	79.17
3	133	120.35	88.97	88.69
4	864	658.91	100.64	99.80

about ECGI

The European Corporate Governance Institute has been established to improve *corporate governance through fostering independent scientific research and related activities.*

The ECGI will produce and disseminate high quality research while remaining close to the concerns and interests of corporate, financial and public policy makers. It will draw on the expertise of scholars from numerous countries and bring together a critical mass of expertise and interest to bear on this important subject.

The views expressed in this working paper are those of the authors, not those of the ECGI or its members.

ECGI Working Paper Series in Finance

www.ecgi.global/content/working-papers

Electronic Access to the Working Paper Series

The full set of ECGI working papers can be accessed through the Institute's Web-site (www.ecgi.global/content/working-papers) or SSRN:

Finance Paper Series	http://www.ssrn.com/link/ECGI-Fin.html
Law Paper Series	http://www.ssrn.com/link/ECGI-Law.html