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DISCUSSION PAPER SERIES

IZA DP No. 14409

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ABSTRACT

Post-merger Restructuring of the Labor Force*

We study the restructuring of the labor force after mergers and acquisitions. Overall restructuring is large. Net employment of targets declines by more than half within two years after acquisitions relative to a matched sample, and is concentrated in targets that close all establishments. There is a substantial increase in employee turnover. We place our analysis within a framework in which acquirers seek growth options from targets and provide managerial capabilities to organize production more efficiently. Consistent with this framework, we show that growth and turnover are both higher for managers, and that firms become more hierarchical if they grow and if they become more diversified. Acquirers have a better-educated, better-paid, and more qualified workforce than targets, and they adapt the workforce by hiring new employees who are much younger and less expensive. Mergers create internal labor markets, which are more active if firms have more managerial capacities. However, most hiring is external, especially for managers.

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

Keywords: M&A, restructuring, employment, internal labor markets

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1 Introduction

How do firms restructure their operations after mergers? 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.[1] Little is known about how firms restructure their operations to realize synergies after mergers. Yet, much can be learned from analyzing how acquirers integrate the target by changing the composition and size of the workforce of the combined firm, reassigning employees to new jobs, and moving them to different plants. This perspective from the human side complements research on the asset side of restructuring, and extant research on the impact of mergers and acquisitions on employees, which has mostly looked at changes in net employment and aggregate wage bills.[2]

In this paper, we argue that M&As create value by bringing together two intangible assets. First, the growth options of the target, which include product designs, patents, or a stock of customers and which create the ability to generate revenues (Levine, 2017). These growth options are realized by leveraging the organizational capabilities and management practices of the acquirer. We regard these organizational skills as the second intangible asset, which is contributed by the acquirer. It increases productive efficiency, and leads to changes in the composition and organization of the workforce.[3]

Hence, we take a detailed look at the post-merger reallocation of labor. We ask how many and which employees are hired externally after acquisitions? How many and which employees leave the firm, or are transferred between acquirers and targets in the post-acquisition period? Specifically, we are interested in these flows for managers, changes in the hierarchical structure of the combined firm, and how managerial capacities and the structure of

[1]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.

[2]On the asset side of restructuring, see Maksimovic, Phillips, and Prabhala (2011) on plant closures, Kaplan and Weisbach (1992) on divestitures, and Bena and Li (2014) on patents. We provide a comprehensive discussion of the large literature of the labor consequences of M&As in Section 2. Recent contributions include Li (2013), Smeets, Ierulli, and Gibbs (2016), Tate and Yang (2016), Lee, Mauer, and Xu (2018), Geurts and Van Biesebroeck (2019), Ma, Ouimet, and Simintzi (2021), and Ouimet and Zarutskie (2020). John, Knyazeva, and Knyazeva, 2015 relate state-level labor protections to post-acquisition restructuring and M&A announcement returns.

[3]See Bloom and Van Reenen (2007) and Atalay, Hortacsu, and Syverson (2014), among others, for discussions of how organizational designs and management practices can become the sources of competitive advantage that cannot be easily reproduced.

the acquirer influence labor flows. As such, ours is one of the very few papers that analyze the human-capital consequences of mergers by taking a comprehensive view at the combined firm, and focus not only on targets (see Section 2 for details). Finally, we analyze the activities of internal labor markets, and how important they are relative to the external labor market.

Our theoretical framework combines two paradigms. We begin with the theory of Levine (2017), which conceives of acquisitions as transfers of growth opportunities ("seeds"), in which firms specialize either in the development and exploration of growth opportunities, or in their exploitation.[4] Seeds cover all transferable growth opportunities. For example, a firm that operates in a different niche of the same product market, or offers the same product in a different geographic region, would also offer a seed and may become a target. Firms with such transferable growth options but high production costs become targets of M&As, whereas firms that are short of growth options but have a comparative advantage in efficient production become acquirers.[5]

The theory of Levine (2017) leaves open where the comparative advantage of acquirers comes from. We argue that acquirers gain this advantage for exploiting growth opportunities from their superior organization and composition of their labor force. This part of our framework relies on the theory of knowledge-based hierarchies, our second paradigm. This theory holds that firms choose their organizational structure to optimize the application of employees' knowledge and time to production problems.[6] In particular, firms trade off the costs of the skills and knowledge of a better-trained workforce against the costs of a more hierarchical structure with more specialized managers, who solve those production

[4]Levine attributes the concept of seeds to Jovanovic (2009), who develops a model in which physical investments require complementary ideas to be productive. Gomes and Livdan (2004) also develop a theory of M&As based on the the idea that acquirers are firms that cannot generate growth opportunities internally.

[5]Levine (2017) develops this theory to explain his own empirical findings as well as earlier observations that high-valuation acquirers also buy high-valuation targets (Rhodes-Kropf and Robinson, 2008). This "like-buys-like" result is inconsistent with neoclassical theories of reallocating physical assets through mergers (e.g., Jovanovic and Rousseau, 2008). Gomes and Livdan, 2004 argue theoretically and Bena and Li, 2014 empirically that firms with more (fewer) growth options, respectively, R&D expenses, become targets (acquirers).

[6]See Garicano (2000), Garicano and Rossi-Hansberg (2006), and Caliendo and Rossi-Hansberg (2012). The theory of knowledge-based hierarchies has been applied to a range of empirical questions, see Garicano and Rossi-Hansberg (2015) for a survey. See Bastos, Monteiro, and Straume (2018) for the only prior application of this theory to M&As. Altomonte, Ottaviano, and Rungi (2018) and Huneeus et al. (2018) explore its usefulness to understand the internal labor markets of business groups.

problems that cannot be solved in the lower tiers of the organization. We hypothesize that acquirers tend to resolve this trade-off in favor of a more hierarchical structure with a stronger management.

Overall, we conceptualize M&As as combining two intangible assets: Targets contribute seeds, whereas acquirers provide the organizational skills and management practices to organize production efficiently. Hence, our theoretical framework emphasizes the complementarity of these intangible assets to create synergies, and thus adds to the discussion of what creates synergies in M&As.[7] Thus, in a broader context, we respond to the call of Zingales (2000) to develop the theory of M&As, and the theory of the firm more generally, in a direction that gives a more prominent role to human capital and to the internal organization of the firm.[8] We formulate specific hypotheses on how M&As influence the organization and the composition of the workforce within this framework, and use it also more generally as a template to interpret our empirical findings and guide our analysis.

We analyze 1,043 acquisitions in Germany between 1997 and 2014, investigating 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.[9] We perform matched-sample difference-in-difference analyses and match each target firm and each acquirer firm to a control firm. We conduct analyses at the establishment level and track the flows between establishments, in particular, internal flows between acquirer establishments and target establishments, and external flows to and from the outside labor market. We track these flows from the beginning

[7]An incomplete list of theories of synergies with selected references includes: Creation of monopoly power: Eckbo (1983); Cai, Song, and Walkling (2011); creation of monopsony power in labor markets: Fulghieri and Sevilir (2011); overcoming contracting inefficiencies along the supply chain: Kedia, Ravid, and Pons, 2011; product differentiation: Hoberg and Phillips (2010), Sheen (2014); recombining assets: Maksimovic, Phillips, and Prabhala (2011); efficiency gains: Erel (2011); relaxing financial constraints: Erel, Jang, and Weisbach (2015), Almeida, Kim, and Kim (2015).

[8]Fulghieri and Sevilir (2019) also develop a theory of post-merger integration, which is based on employees' complementarity of human capital. However, they do not focus on the organization of the firm and management practices, which are critical for our predictions on the composition of the workforce.

[9]There is no prior study on post-merger employment restructuring in Germany among the more than 30 studies we survey in Section 2. None of the studies on other countries addresses the questions we focus on in this paper. See Section 2 for a discussion of the literature and 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.

of the year of the acquisition to the end of the second year after the acquisition.

Overall restructuring activity is very large. On average, targets lose 55.4% of their workforce by the end of the second calendar year after the acquisition, and the combined workforce of the merged firm declines by 7.2%. This employment decline is concentrated in those targets that are closed completely, which account for one-third of the sample: their plants have no employees two years after the acquisition; employment in surviving targets is stagnant. More than 40% of the employees who leave the merged firm lose some of their human capital by becoming either unemployed, or by accepting lower-paid jobs. Larger acquirers grow more after an acquisition of a target of a given size, which is surprising, since larger firms typically grow less. We conclude that larger acquirers are more "seed constrained:" They have more managerial capacities in place, but lack the growth options to deploy them, which they need to acquire externally.

There is a significant increase in employee turnover, so that net employment changes alone do not reveal the full extent of restructuring. Two years after the acquisition, merged firms have lost 13.4% more employees than comparable control pairs of acquirer and target, about half of whom are replaced by new hires. Turnover shifts jobs from the target to the acquirer, since increased hiring occurs at acquirers, whereas job losses are concentrated at the target.[10] The main drivers of employee turnover are the pre-acquisition growth of the acquirer, and (to a lesser extent) of the target, and the similarity of acquirers' and targets' workforce, which we measure through an index of human-capital relatedness (following Lee, Mauer, and Xu, 2018). It is intuitive that growth drives turnover, because firm growth involves a continuous reconfiguration of operations and tasks, and, therefore, of the workforce. In contrast, the results for human-capital relatedness seem surprising, because they imply that firms replace employees if target employees are more similar to those of the acquirer, which we would have expected to result in more duplicate jobs, redundancies and separations, but not more replacements (e.g., Lee, Mauer, and Xu, 2018). Further investigations show that firms replace departing workers with new hires with similar qualifications and a slightly better education, but who are on average much younger (about four years or 10% of the average pre-acquisition

[10]In this paper, we define turnover as the minimum of inflows and outflows to emphasize the aspect of replacing workers, and to separate this aspect from net employment growth. See Section (4.4) for details.

age of the work force) and less expensive than the departing employees (about 11% reduction in daily compensation). Hence, firms save costs when they replace workers by hiring less-experienced workers, who may also be more adaptable to the processes of the acquirer, not by hiring workers with lower education or qualification. This observation is consistent with our framework, since knowledge-based hierarchies allow firms to transfer more problem-solving to the higher layers of the organization, and economize on the costs of employees in the middle and lower layers.[11]

Mergers create internal labor markets. Flows between establishments of the merged firm increase by 3.5% of the merged firm's total employment. These are mostly flows from the target to the acquirer, with a much smaller flow in the opposite direction. Interestingly, there are also abnormal flows of about 1% of the merged firm's employment within acquirers or within targets. These within-firm transfers would have been feasible before the acquisition and indicate that mergers set in motion a chain of new job assignments within the merged firm. However, while activity in the newly created internal labor market of the merged firm is significant, it accounts for only about one-quarter of abnormal employee flows. The other three quarters of the restructuring after acquisitions occurs through external hiring and releases of employees to the external labor market, either to other firms or to unemployment. The main driver of reliance on the internal labor market is the degree of hierarchization of the acquirer. We rely on prior literature to map the hierarchical structure of the firm from occupational codes. Based on our theoretical framework, we conclude that the hierarchical structure of the acquirer measures its managerial capacities, and that operating an internal labor market demands higher managerial capacities. Other factors that predict a higher activity of internal labor markets are the pre-acquisition growth of the acquirer and the index of human-capital relatedness, which is unsurprising: A more similar workforce reveals a higher similarity of the production processes and tasks between acquirer and target, and creates a larger scope for transferring employees.

We analyze two aspects of organizational change: the flows of employees with managerial functions, mostly middle management, and the hierarchical structure of firms. For managers,

[11] See Garicano and Rossi-Hansberg (2015) for a discussion of this "shadow of the superstars" that may emerge in a knowledge economy.

we observe a smaller and insignificant decline in net employment, but about twice as much turnover as for the general workforce. Moreover, the additional turnover of managers occurs exclusively through the external labor market, whereas internal labor market activities for managers are almost identical to those for the general workforce.

The analysis of organizational changes shows that acquisitions that result in larger changes in the scale of the firm are associated with larger increases in the number of hierarchical layers. Moreover, we hypothesize that firms increase the number of managerial layers not only to accommodate a larger scale, but also a higher complexity of their organization, which we measure as the number of product lines the firm operates in. It turns out that acquisitions that lead to a larger increase in the number of product lines are also more likely to increase the number of managerial layers. We conclude that acquirers build more hierarchical structures after acquisitions to create more managerial capacities, which in turn allow them to manage more complex operations, create internal labor markets, and reduce the operating costs by being able to replace experienced employees with new hires who are younger and less expensive.

Overall, we show that mergers and acquisitions allow firms to economize on the costs of the labor force in three ways: First, by streamlining production and reducing the size of the workforce; second, by increasing turnover, which shifts jobs from the target's establishments to those of the acquirer, and leads to the displacement of existing employees by younger, less expensive, and better-educated employees; third, by increasing job rotations in internal labor markets. Building hierarchical structure and managerial capacities appears critical for this process.

2 Contribution to the literature

This paper contributes to three broad strands of the literature: On the impact of M&As on labor market outcomes, on the impact of labor market institutions on M&As, and on internal labor markets. In this section, we provide a brief survey of each of these strands of the literature by introducing the key topics and findings, but note that the size of the literature may warrant a more detailed survey or meta-study, which is beyond the scope of this paper. Similarly, we refrain from discussing the much broader literature on M&As, for which multiple excellent surveys exist.[12]

The influence of M&As on labor market outcomes. 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.[13] 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. Overall, 13 studies discuss employment as well as wage outcomes, 14 only employment and ten only wages; two studies focus on other labor market outcomes.[14] 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 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 decisions of employees to leave their jobs (e.g., Kim (2018); Ranft and Lord (2000)). Our study contributes to this literature by studying the economic mechanisms that drive the the net effect on employment. In particular, we show how the aggregate employment effect is associated with large employee turnover, especially additional hiring at the acquirer, and correspondingly larger job losses at the target; how it is related to job rotations within the merged firm; its association with changes in the composition of the workforce; and how it is related to changes in the organizational structure of the firm.

[12] See, for example, Betton, Eckbo, and Thorburn (2008), Renneboog and Vansteenkiste (2019), Mulherin, Netter, and Poulsen (2017), and Tarba, Brock, and Calipha (2010) and the literature mentioned in footnote 7.

[13] This statement is based on the 2019 OECD scores for the strictness of employment protection legislation (EPL), which are 1.3 for the US (18 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 are from countries with stricter EPL regulation compared to Germany. See OECD (2020), Table 3.3.

[14] Tate and Yang (2016) analyze the cross-industry migration of employees and Li and Wang (2020) the post-merger collaboration of inventors.

Post-merger restructuring. 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 (2020a), who analyzes the employment dynamics after M&As for a Brazilian sample. However, Lagaras (2020a) focuses on the labor force of targets, whereas we analyze the labor force of the target and the acquirer, which allows us to explicitly analyze target employees who are transferred to the acquirer, especially after target closures, the knowledge transfer of the acquirer to (surviving) targets, and the post-merger changes in the organization of the acquirer. Ma, Ouimet, and Simintzi (2021) analyze a US sample and study post-merger changes in the occupational composition of the labor force. They also focus on targets 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. Their focus on technology is complementary to our focus on on organizational structure. Smeets, Ierulli, and Gibbs (2016) study a sample of Danish M&As in the 1980s and 1990s and focuses on the mixing of target and acquirer employees. They also document that internal transfers between acquirer and target plants are low, and that employee turnover increases after mergers. However, they do not associate these changes with explanatory variables or changes in managerial structures. 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.

The influence of labor markets on M&As. The second strand of the literature identifies three broad categories of factors about how labor markets influence M&As. The first hypothesis is that unions and employment protection laws create frictions in the restructuring process, and thereby reduce the profitability and the incidence of M&As. Three cross-country studies find that labor regulations that provide employees with stronger employment protection have the predicted effect (Ahmad and Lambert (2019); Dessaint, Golubov, and Volpin (2017); Levine, Lin, and Shen (2015)). Surprisingly, the effect of unionization on M&As is ambiguous. Whereas Tian and Wang (2020) find the predicted deterring effect of unions on takeovers, in line with the theory of Pagano and Volpin (2005), Ahmad and Lambert (2019) find that stronger unions facilitate takeovers. The literature on non-compete agreements is complementary to these studies on labor-market regulations that protect employees. Non-compete agreements protect acquirers, because they prevent key employees from leaving the target after the acquisition. Younge, Tong, and Fleming (2015) and Chen, Gao, and Ma (2020) both find that such regulations, which increase employee retention after acquisitions, increase the likelihood of acquisitions. Since our study is on a single country, a comparative analysis of labor market institutions, such as unions, employment protection regulation, and non-compete agreements, is outside the scope of our analysis.

Finally, a third group of studies hypothesizes that the benefits from mergers depend on the overlap between the acquirer's and the target's labor force, which may be related to the potential to consolidate the workforce, but also provide a measure for how closely the operations of the merging partners are related. Neffke and Henning (2013), Tate and Yang (2016), and Lee, Mauer, and Xu (2018) all develop measures of human-capital relatedness and find that they positively predict the likelihood of mergers. We contribute to this literature by using the measure of Lee, Mauer, and Xu, 2018 of human-capital relatedness to show that it positively affects the turnover of employees, especially managers, and the activity of internal labor markets.

Internal labor markets. The literature on internal labor markets (ILMs) goes back at least to Doeringer and Piore (1966) and Doeringer and Piore (1970). The earlier literature focuses on how ILMs shield themselves from the outside labor market by limiting the ports of entry into the firm, and how they structure employees' promotions along career ladders.[15] By contrast, the literature on internal capital markets builds on earlier work on the boundaries of the firm and compares the efficiency of resource allocation in internal and external markets.[16] The literature on internal labor markets started to address these questions on efficiency and the boundaries of the firm only recently, initially by emphasizing the (partial) complementarity of labor and capital in internal markets (Giroud and Mueller, 2015, Belen-

[15] See Baker, Gibbs, and Holmstrom (1994a), Baker, Gibbs, and Holmstrom (1994b), and Baker and Holmstrom (1995) for foundational empirical work on these questions, Napari and Kauhanen (2015) for more recent results, and Groshen and Levine (1998) for a longitudinal study of ILMs.

[16] We do not survey the literature on internal capital markets here. See Stein (2003), Maksimovic and Phillips (2007), and Maksimovic and Phillips (2013) for comprehensive surveys.

zon and Tsolmon, 2016). Tate and Yang (2015) may be the first to analyze the potential of internal labor markets to add value by facilitating transfers of employees from shrinking to expanding industries after adverse shocks.

Theories of internal labor markets argue that conglomerates or business groups create value by providing firms with internal, and therefore less expensive, access to skilled labor; by allowing firms to better match tasks and employees; by creating employment insurance and avoiding costly layoffs after negative shocks; by creating incentives for employees to invest in firm-specific human capital; and by allowing firms to transfer management practices across units of the same firm.[17] However, ILMs may also be costly if they lead to wage convergence as workers from low-paid industries demand higher wages in a conglomerate that is active in high-wage industries (Silva, 2017).

Our study contributes to the analysis of ILMs by showing how M&As create ILMs, by studying the change in employee flows before and after mergers, and by comparing post-acquisition internal employee flows in ILMs to those in external labor markets. While M&As create significant internal labor flows in merged firms, post-merger restructuring is dominated by hiring from and releases of employees to the external labor market. We do not attempt to separate the overlapping arguments for how ILMs create value, but some of the theories are better supported by our analysis than others. Specifically, the notions that ILMs improve the assignment of employees to jobs, and that they permit the transfer of management practices, are integral to our framework. By contrast, we do not see that the creation of ILMs after M&As are critical to providing additional insurance opportunities, as far more employees find new jobs outside the merging firms. Similarly, we are skeptical about the skill-shortage argument, which holds that acquirers purchase targets whose employees have scarce skills, which are sought by the acquirer. This argument has been successful in explaining some patterns of employee flows and wage changes in some specific situations, notably high-tech industries.[18] However, we find that ILMs play a relatively larger role for the general workforce

[17]Access to skilled labor: Giroud and Mueller (2015); better matching of capital and tasks to employees: Berk, van Binsbergen, and Liu (2017), Luo, Manconi, and Schumacher (2018); avoid costly layoffs: Belenzon and Tsolmon (2016); provide employment insurance: Sraer and Thesmar (2007), Cestone et al. (2017), Ellul, Pagano, and Schivardi (2017), Kim, Maug, and Schneider (2018), Faccio and O'Brien (2020); investments in firm-specific human capital: Tate and Yang (2015); transfers of management practices: Atalay, Hortacsu, and Syverson (2014), Huneeus et al. (2018).

[18]See Ranft and Lord (2000); Chen, Gao, and Ma (2020); Ouimet and Zarutskie (2020); Qiu and Wang

than they do for highly-qualified employees or managers, and we would assume skill shortages to be concentrated in these segments of the workforce.

3 Theoretical framework and hypotheses

We develop a general theoretical framework in Section 3.1 and develop specific hypotheses for our context in Section 3.2.

3.1 Theoretical framework

The theoretical framework builds on the seeds theory of acquisitions developed by Levine (2017) and on the theory of knowledge-based hierarchies.

The seeds theory of acquisitions. Levine lists three components that distinguish the seeds theory of M&As from the more conventional neoclassical theory (Q-theory) of M&As. First, all firms own opportunities to generate revenues ("seeds"). These intangible assets are complementary to physical assets and conceived of as a combination of two parameters: (1) a limit on sales, which reflects the notion that physical production needs to be matched with ideas, otherwise the productivity of expanding physical capacities is zero beyond a certain point; (2) the ability to generate revenues from physical assets, i.e. total factor productivity. Second, the costs of production and distribution are governed by a different parameter than revenue productivity, which marks an important distinction from neoclassical theory, in which production costs are related to productivity. Third, seeds are transferable, such that acquirers can purchase the target's seeds, i.e., its ability to generate sales and its revenue productivity, but acquirers can produce at their own lower costs. In this theory, acquirers purchase not so much targets' physical capital but their intangibles, like product designs, product concepts, brands, customer lists, patents, and proprietary methods (Levine, 2017, p. 308).

The model shows that firms specialize depending on their stock of seeds and their productivity into targets, acquirers, and firms that do not participate in M&As. Firms with a large stock of intangible assets and high revenue productivity ("explorers") become targets,

(2017); Beaumont, Hebert, and Lyonnet (2018) for different versions of this argument.

whereas those with low production costs ("exploiters") become acquirers.[19] The seeds theory of M&As can explain some stylized facts about M&As, but it makes no predictions about how firms organize the labor force and production after mergers, and why firms have different costs of production such that acquirers can purchase and then exploit the seeds of targets but can then bring targets' products to market more efficiently than the targets themselves.

Knowledge-based hierarchies. We turn to the theory of knowledge-based hierarchies (KBH) to address the questions left open by seeds theory.[20] Note that the literature on KBH theory has produced a number of models of firms' production and organization, each of which has a different focus and slightly different assumptions, and none of which addresses all the issues relevant for our empirical analysis. Hence, we rely on multiple models and contributions to guide our discussion and hypothesis development.[21]

The key notion of KBH theory is that employees solve problems in production, which can be ranked by complexity and the skills required to solve them from simplest to hardest. In equilibrium, this results in a ranking from the most frequent to the least frequently occurring problems. Moreover, employees differ in their skills to solve problems.[22]

The primary objective of firm organization is to minimize the costs of solving production problems. Firms address this problem by structuring employees into multi-layered hierarchies. Less-skilled employees become production workers who solve simple problems and refer more complex problems to their managers. Multiple layers of managers emerge, such that the less-skilled managers solve the simpler problems referred to them, and harder problems are referred to progressively higher layers of management; there is one CEO at the top of the

[19]Depending on the parameters, there is typically a third category of firms that do not participate in M&As and become neither targets nor acquirers. See Driver, Kolasinski, and Stanfield (2020) for a related distinction in the innovation literature. Schoar (2002) finds that conglomerate acquirers are above-average productivity (TFP) firms.

[20]KBH theory as developed by Garicano (2000), Garicano and Rossi-Hansberg (2006) Caliendo and Rossi-Hansberg (2012), and others; see Garicano and Rossi-Hansberg (2015) for a survey.

[21]The verbal discussion largely follows Caliendo and Rossi-Hansberg (2012) and the simplified presentation of their model in Caliendo, Monte, and Rossi-Hansberg (2015). Our reliance on multiple models sometimes requires us to assume that insights from one model will carry over to the context of another model. In order not to burden the presentation, we will alert the reader to the theoretical issues resulting from this approach in the footnotes of this section. Some subtle issues cannot be addressed here to preserve space.

[22]KBH models are static and mostly assume that employees are ex ante identical and firms train employees at a costs (see Garicano and Rossi-Hansberg (2006) for an exception). Then it is optimal to sort problems by the frequency with which they occur in production and train more employees on the more frequent problems, which then also become endogenously the simpler problems that can be solved by most or all employees.

hierarchy.

Firms incur communication costs if problems are referred to a higher layer and more skilled employees receive higher wages.[23] Hence, firms face a trade-off. A lower number of layers reduces communication costs as problem-solving is decentralized and fewer problems are passed up along the hierarchy. However, more decentralized problem solving requires higher-skilled employees who receive higher wages.

Firms incur fixed costs for adding a layer of more expensive managers to their hierarchy. However, doing so allows them to reduce control spans and hire less-skilled and less expensive employees, who refer more problems to their superiors. Put differently, adding layers allows firms to assign the solution of the hardest and rarest problems to a small number of specialists in the higher layers, and economize on the problem-solving capacity of a much larger number of employees in the lower layers, which renders some of the intermediate skills of medium-skilled employees obsolete.

KBH theory is static. To apply it to M&A events, we adapt the argument of Caliendo, Monte, and Rossi-Hansberg (2015) and treat M&As as discrete changes of the scale of operations, which can be analyzed as shifts from one equilibrium of the model to another equilibrium. Hence, we compare the combined firm after the acquisition to the acquirer before the acquisition.

Organizational capabilities and management practices. KBH theory does not specify why some firms can organize hierarchies better than others. Hence, the theory predicts that all firms in the economy follow the same blueprint and differ in their hierarchical structures only if they differ in terms of scale, communication costs, and the training costs for acquiring relevant skills.[24] Similarly, Levine's seed theory assumes that firms' cost functions are different. The best way to conceptualize differences in costs in our framework is to assume that firms differ in their ability to create and manage KBHs, and that these organizational capabilities are embedded in the skills of managers. Such managerial practices can then be re-

[23] In most KBH models, all firms incur higher training costs if they educate employees to solve harder problems. Our discussion still follows Garicano and Rossi-Hansberg (2006), who assume that employees incur the costs of their education and firms reimburse them for these costs through higher wages.

[24] For example, Caliendo and Rossi-Hansberg (2012) develop a general equilibrium model with product differentiation, in which all firms optimize conditional on the same cost function.

garded as intangible assets that can be leveraged either through the movement of managers or management teams across firms, or by moving workers across firms and subordinating them to a different management.[25]

Hence, our theoretical framework conceives of M&As as complementing the intangible assets of the target, which create the ability to generate revenues, with the organizational capability and management practices of the acquirer, which help to organize production efficiently. Thus, our framework gives key roles to human capital and to the internal organization of the firm (Zingales, 2000).

3.2 Hypotheses

In this section, we use the theoretical framework developed above to develop specific hypotheses.

Growth and turnover. The most salient implication of KBH theory when applied to acquisitions is that the efficiency gains from acquisitions require managerial capacities, so that we should expect that merging firms increase the relative number of managers in the organization. Moreover, if the organizational capabilities of the acquirer are embedded in its managers, then we should expect either that managers are transferred from the acquirer to the target, or that operations are transferred from the target to the acquirer, which would result in the closure of the target.

Hypothesis 1 (**Management**). *Acquisitions are followed (i) by growth in management relative to other employees and (ii) either by a transfer of managers from the acquirer to the target, or a closure of the operations of the target.*

In return for the higher costs associated with a more top-loaded structure of the organization, merging firms can save costs by reducing payroll in the lower and intermediate layers of the organization, and by replacing highly-compensated employees with less expen-

[25]See Grant (1996b), Grant (1996a), Sirmon, Hitt, and Ireland (2007), and Teece (2007) for contributions to the literature on organizational capabilities and Bloom and Van Reenen (2007), Atalay, Hortacsu, and Syverson (2014), and Bloom, Sadun, and Reenen (2017) for the notion of management practices as non-transferable intangible assets.

sive employees. The effect results mainly from economies of scale, since the fixed costs of the highly-compensated employees can only be recovered in a sufficiently large organization:

Hypothesis 2 (**Turnover and wages**)**.** *Acquisitions are followed by an increase in the turnover of employees, such that new hires receive lower wages compared to those who leave.*

Garicano and Rossi-Hansberg (2015) refer to this implication of knowledge-based hierarchies as the "shadow of superstars," since employees with qualifications and wages in the middle of the distribution are displaced by high-earning "superstars" (Rosen, 1982).

Note that the baseline model of KBH theory does not make predictions about the composition of the workforce, because it assumes that all employees are ex ante identical. However, our argument can be supported by Garicano and Rossi-Hansberg (2006), who develop a KBH theory in which employees have heterogeneous abilities, such that the costs of learning new skills differ across workers. Under these assumptions, changes in the costs of employees result from changes in the composition of the workforce.[26]

Finally, we note that the theoretical framework has no prediction for changes in employment. Efficiency gains from restructuring would generally imply a reduction in net employment. However, more efficient production and the acquisition of seeds may also unleash new growth, and it is *a priori* not clear which of these effects dominates.

Layers and control spans. KBH theory predicts that the optimal layer structure depends on the size of the firms. Larger firms optimally decide to increase the number of layers and refer some production problems to a small group of highly specialized managers. Hence, acquisitions that increase the size of the acquirer by a larger proportion should be associated with an increase in the number of layers, whereas acquisitions that are associated with subsequent consolidation, and that reduce the size of the organization should be associated with a reduction in the number of layers:

Hypothesis 3 (**Layers and scale**)**.** *Increases (reductions) in scale after the acquisition are associated with an increase (reduction) in the number of layers.*

[26]See Caliendo, Monte, and Rossi-Hansberg (2015) for a similar argument in an empirical application.

If acquirers grow larger after acquisitions, they need to increase the payroll of the firm and trade off an increase in the number of layers against an increase in the control spans of managers. Hence, KBH theory predicts that, for a given number of layers, control spans should increase across all layers of the organization if acquirers grow, and vice versa if they shrink after acquisitions:[27]

Hypothesis 4 (Control spans). *Conditional on a given number of layers, a larger increase in demand after the acquisition is associated with an increase in the number of employees, i.e. an increase in the control span of the managers in each layer.*

The hierarchical structure of the firm should not only reflect the size, but also the complexity of the organization. The critical parameter of KBH theory is the communication cost, which reflects the difficulty of referring a problem to a higher layer. Extant KBH models do not explicitly address multi-product firms, but it is reasonable to assume that employees in multi-product firms have higher costs to communicate a problem to their superiors if these managers are less familiar with the product, and have to oversee a wider and more heterogeneous range of operations. Then the acquirer would have to reduce control spans and add another layer of middle managers in order to be able to manage new product lines. Based on this reasoning, we obtain:

Hypothesis 5 (Hierarchies and diversification). *If the acquisition increases (reduces) the number of product lines, such that the post-merger firm is active in more (fewer) industries than the acquirer was before the merger, than the number of layers in the post merger firm is larger (smaller), holding total demand fixed, compared to a post-acquisition firm that did not change the number of product lines.*

Gumpert, Steimer, and Antoni (2019) employ a similar reasoning in their theoretical and empirical analysis of the geographic complexity of firms. They argue that firms introduce additional layers of middle managers to overcome the frictions in communication arising from their geographic diversity.

[27]The theory could be extended such that Hypothesis 4 applies for any given *change* in the number of layers. However, as will become clear below, the methodology we use for testing this hypothesis in Section 6.1, which follows Caliendo, Monte, and Rossi-Hansberg (2015), can only accommodate a constant number of layers.

4 Data and methodology

4.1 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 1997 to 2014 (see Table OA1). In the next step, we link our list of 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 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. After matching target firms and acquirer firms to control firms, we are left with 1,043 transactions for our analysis (details on matching below). 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.[28] These steps leave us with 1,043 transactions and 2,086 acquirer and target firms. Table OA1 provides an overview of all steps of the data set construction.

[28]For an overview and definitions of all variables see Table 1. Summary statistics for the treated and control firms as well as employees are in Table 2. The IEB contain detailed longitudinal data on almost the entire German workforce.

4.2 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.[29] 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 number of employees, and the shares of, respectively, high-qualified, medium-qualified, and female employees. 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 require data on both target and acquirer simultaneously which leaves us with 1,043 jointly matched firm-pairs.

Table OA2 shows the matching results. For all numerical variables, the relative differences between the target group and the control group are below 5%. We further use the normalized differences proposed by Imbens and Wooldridge (2009) and used by Imbens and Rubin (2015) to examine significant differences between two groups of observations. Imbens and Wooldridge (2009) recommend that normalized differences be below 0.25 in absolute value. For all matching variables, the test statistic is never higher than 0.04, and we conclude that our control groups match target and acquirer firms very closely on all relevant criteria. Unmatched target and acquirer firms differ substantially in the matching variables from the matched sample averages. In particular, very large acquirers cannot be matched

[29] 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, i.e., a firm's region is determined by the location of its largest establishment.

satisfactorily to a non-acquirer control firm. Since it is impossible to find a sufficiently close counterfactual firm, we prefer to eliminate these deals from the sample.

4.3 Descriptive statistics

Table 2 presents descriptive statistics of the numerical variables for the treated and the control firms. 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. Acquirer employees and target employees are of similar age, but earn on average 17% more than target employees (average daily wage of €104.45 compared to €89.33).

4.4 Methodology: Variable definitions and regression design

Employee flows. We define *Net 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.[30] 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 $h_{j,t,t+k} = \frac{\sum_{\tau=0}^{\tau=k} H_{j,t+\tau}}{0.5(E_{jt}+E_{j,t-1})}$, where H_{jt} is the number of employees who enter firm j in period t ("hiring"). Analogously, we define *Outflow*, $s_{j,t,t+k}$, 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 company (*Internal inflow/outflow within*), flows between the corresponding target/acquirer firm (*Internal inflow/outflow between*), and external flows (*External inflow/outflow*), which includes all other flows, in particular those to and from other companies, unemployment, training and education, or foreign establishments. For some analyses, we need to break down employee flows into subgroups of employees, e.g.,

[30] 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.

by education or qualification. We explain these additional breakdowns when we discuss the respective results. Finally, we are interested in employee turnover, i.e., the degree to which employees are replaced. We conceive of replacements of employees as equal numbers of hirings and separations. Accordingly, we define turnover as

$$TO_{j,t,t+k} = Min\left(h_{j,t,t+k}, s_{j,t,t+k}\right). \tag{1}$$

Other contributions in the literature define turnover alternatively as $\frac{s+h}{2}$ (e.g., Davis and Haltiwanger, 1999; Cahuc, Carcillo, and Zylberberg, 2014). In Appendix (A.1), we show that $\frac{s+h}{2} = TO + \frac{|g|}{2}$, i.e., this alternative measure of turnover also captures the absolute value of net employment growth, which renders it less useful for our purpose, since we want to capture new employment growth separately.[31]

To provide a generic representation, let $f_{j,t-1,t+2}$ be a labor flow relating to firm j from $t-1$ to $t+2$, where f can be an inflow ($f = h$), an outflow ($f = s$), a net employment change ($f = g$), or turnover ($f = TO$). 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:

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

where $Treated_j$ is a dummy variable equal to one for target and acquirer firms in all sample years. 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, establishment size category, and geographic region.[32] The coefficients of interest are the difference-in-differences estimates of

[31]To illustrate the point, consider a firm that has 20 separations and 3 new hires. Hence, our measure of turnover is 3 and captures the low number of replacements. By contrast, the alternative definition would be 11.5 and reflect half of the new employment decline of 17.

[32]We group firms into five size brackets according to their number of establishments. These brackets are:

θ, which denotes the differences in flows (net growth, inflow, outflow) between sample firms and matching firms. Throughout the paper, we report t-statistics and significance levels based on standard errors clustered at the firm level. Precise definitions of all variables can be found in Table 1.

Defining layers of management. We construct layers of managers following Caliendo, Monte, and Rossi-Hansberg (2015) and Gumpert, Steimer, and Antoni (2019). The layers are inferred from occupational codes, with the lowest layer being layer 1 (production workers) and the highest potential layer being layer 4 (CEOs and managing directors). Layers 2 and 3 include different ranks of middle managers. See Appendix A.2 for further details.

Table 3 provides descriptive information on the number of layers, employment, and wages in each firm, separately for targets and acquirers (in the pre-acquisition year) and for the merged firms. Only two-thirds of the acquirers (704 firms) and two-fifths of the targets (452 firms) have four layers. Note that some firms with fewer than four layers have structures with non-consecutive layers. For example, a firm may have employees in layers 1, 2, and 4, but none in layer 3. Table 3 reports such a firm as a 3-layer firm. There is a clear correlation between the number of layers and the number of employees, and larger firms with more layers of management almost always pay higher wages. (The exception are single-layer acquiring firms, which seem to consist of a single layer of highly-paid professionals.)

5 Labor flows

In this section, we provide an extensive analysis of labor flows after acquisitions. In Section 5.1, we establish several salient facts based on a detailed description of labor flows to, from, and between the merging partners based on equation (2). In Section 5.2, we expand the set of explanatory variables to explain these facts based on characteristics of the merging partners and the transaction.

1, 2, 3-5, 6-10, and larger than 10.

5.1 Restructuring after mergers

We begin the discussion of employee flows by analyzing the flows of employees between targets and acquirers. Table 4 presents our results for all employees of the merged firms (column 1), targets (columns 2 and 3) and acquirers (columns 4 and 5). For targets and acquirers, we report the results with flows scaled by the employment of the respective firm (columns 2, 4) and with flows scaled by the employment of the merged firm (columns 3, 5), to provide comparability with column 1. Note that the estimates in columns 3 and 5 add up to those in column 1 by construction. Column 6 reports turnover as defined in equation (1). Table 5 reports the same results for managers, and Table OA3 in the Online Appendix repeats the analysis for highly-qualified employees.[33] The tables report only the coefficient estimates of θ as denoted in Equation (2), which measure the treatment effects after controlling for distance and pre-acquisition growth; we refer to these as abnormal flows, but will often omit the labeling as "abnormal." Indented flows are breakdowns of other flows.

Loss of employment is large. The first salient observation is that post-merger restructuring involves a large reduction of employment at the establishments of the target firm, which declines by 55.4% from the beginning of the year of the acquisition until the end of the second calendar year after the acquisition. By contrast, acquirers grow (*Net employment growth*: +14.5%), whereas the overall employment of the merged firm declines by 7.2%. Hence, our overall result is in line with the majority of the previous literature surveyed in Section 2, which finds declines in employment. In the context of our theoretical discussion, this means that the efficiency effect of restructuring dominates the growth effect.

A significant proportion of the employees who leave incur losses to their human capital. The *External outflow* of the merged firm amounts to 13.4% of the merged firm's labor force. Of these, 3.86 percentage points (pp) experience a wage decline, and a further 1.73 pp become unemployed, hence, 42% (=(3.86+1.73)/13.4) of those who leave the merged firm incur losses to their human capital. Most of these are target employees who take lower-paid jobs (3.03%), whereas most of those who become unemployed are acquirer employees (1.08%).

[33] Managers and highly-qualified employees are defined from the occupational codes using the Blossfeld (1987) classification. Highly-qualified employees include managers.

The remaining employees experience wage increases, and we expect that many of them will have left the firm voluntarily. Some studies (Kim, 2018; Chen, Gao, and Ma, 2020) discuss the difficulties of acquirers to retain the key employees of the target. Indeed, we find that 20.8% of target employees leave for other firms at a higher wage. However, the proportion of employees who leave the firm and experience a wage increase as fraction of all employees who leave for other firms is almost identical for targets (0.68=20.8/30.68; see column 2) and acquirers (0.69=4.31/6.23; see column 4). Hence, we conjecture that the restructuring of the organization and the labor force blocks some employees' career paths in both merging firms, and these employees then leave voluntarily.

Many targets lose all employees: Figure 2A shows that about 30% of all targets have zero employees at the end of year two after the acquisition, which corresponds broadly to the finding of Maksimovic, Phillips, and Prabhala (2011), who find that acquirers close 46% of acquired plants within three years of the acquisition. The change in employment and labor flows differ depending on whether targets are closed or not. To see this, we define an indicator variable *Target closure*, which is one if the target has zero employees in the second calendar year following the acquisition. Note that targets may close some but not all establishments, in which case *Target closure* equals zero. In Table 6, we report the employee flows separately for surviving and for closing targets. The overall employment of merged firms that close their targets declines by 27.6%, compared to a small and marginally significant increase of 3.8% for firms with surviving targets. The growth of firms with surviving targets happens entirely at the acquirer plants (12.3% of the acquirer's labor force, see column 4 of Table 6A), whereas target growth is statistically and economically small. External outflows are insignificant for surviving targets, but large and significant for closing targets, including outflows to unemployment or to other firms with wage declines. Hence, a significant portion of restructuring and human capital losses is associated with target closures.

Our theoretical framework suggests that restructuring of the workforce should be associated with significant changes in the employment of managers of the firm (Hypothesis 1), which is shown in Table 5. The net employment decline for managers is small (*Net employment growth* = -3.9%), about half the point estimate for the general workforce and statistically insignificant. In addition to inflows and outflows from other establishments, we also have to consider promotions of employees of the same plant to managerial positions, which decline by 1.7%, and demotions of employees from managerial positions, which account for 1.4%, which are both statistically insignificant. The proportion of leaving managers who incur human capital losses is slightly lower (35%=(2.17+3.45)/16.14 of *External outflow*), and a larger proportion of those who leave for better-paid jobs are from the acquirer (42%=4.53/10.59, see columns 1 and 5) compared to the corresponding proportions for the general workforce. Moreover, human capital losses are only significant for target managers.

Turnover is high and shifts jobs from targets to acquirers. Net employment changes do not reveal the overall extent of restructuring activity. The merged firm has abnormal outflows of 17.0%, matched by abnormal inflows of 9.7% over the same period. *Turnover*, defined in equation (1), increases by 7.8% after acquisitions relative to control firms (see Table 4, column 6). However, turnover at the level of the merged firm does not take the form of separations and new hirings in the same establishment. Rather, additional hiring is only at acquirer establishments (*Inflow* up by 12.5% for acquirers and down by 2.9% for targets; see columns 3 and 5 of Table 4), and most of the separations occur at target establishments (*Outflow* up by 11.1% for targets, compared to 5.6% for acquirers). Hence, M&As involve large abnormal employee turnover, such that most of the jobs lost are at the target and new jobs are created at the acquirer. *Turnover* is more than twice as high with closing targets (12.3%) compared to surviving targets (5.2%), although the last number is still economically and statistically significant (see Table 6). Note that acquirer outflows are also significantly larger when targets close (12.8%; Panel B, column 5) than when they survive (insignificant 1.4%; Panel A, column 5). Hence, target closures are associated with more restructuring in both firms.

The turnover of management is a little more than twice as high (16.2%) as that of the general workforce. Similar to the general workforce, job creation happens exclusively at the acquirer, but a much larger proportion of these outflows, almost one-half (9.24/20.36=45%; columns 4 and 5), are also at the acquirer. Together with the earlier findings on departures associated with wage increases, this observation suggests that post-acquisition restructuring involves a significant reconfiguration of management at the acquirer. In the context of our theoretical framework, these observations suggest that acquisitions affect the hierarchies of acquirers in such a way that they require managers with different skill sets.

Internal labor markets become more active. There is a significant increase in the activity of internal labor markets after acquisitions, with an increase of 3.5% of the flows between establishments of the merged firm (by construction, *Internal inflow* = *Internal outflow*). There is a substantial flow from targets to acquirers: The target's *Outflow between* of 2.2% (Table 4, column 3; scaled by the employment of the merged firm) corresponds to 18.1% of the target's employment (column 2); the matching inflow to the acquirer corresponds to 4.5% the acquirer's employment. (Acquirers are on average about four times larger than targets, see Table 2.) These findings are consistent with the results of Cestone et al. (2017) and Huneeus et al. (2018), who find significant increases in internal labor market activities after exogenous shocks in business groups.

The flows in the opposite direction from acquirers to targets are much smaller. The target's *Inflow between* is 0.27% (1.29%) as a percentage of the employment of the merged firm (target), but statistically still highly significant. Interestingly, there are also higher transfers within the acquirer and within the target compared to the control group: the abnormal *Inflow within* of the merged firm is 1.0%, driven mostly by flows within the acquirer. While smaller than other abnormal flows, these increases are still noteworthy, since they could have taken place even without an acquisition. We interpret them as the outcome of an overall reconfiguration of jobs and tasks. Hence, acquisitions set in motion a chain of internal job changes and transfers, which give rise to a substantial overall increase in the activity level of internal labor markets..

The internal flows of managers are much larger than those for other employees. We observe an *Internal inflow between* to the target of 4.21% of the target's workforce, compared to 1.29% for the general workforce (see column 2 of, respectively, Table 5 and Table 4). By contrast, the flows of managers from the target to the acquirer are almost exactly identical for managers and the general workforce (4.38% and 4.50%; see column 4 in the same tables). Hence, consistent with Hypothesis 1 and the argument that managerial capabilities are embedded in the acquirer's management, we observe a higher number of internal transfers from acquirers to targets compared to other employees. Moreover, Table 6 shows that there are significant transfers from the acquirer to the target only for surviving targets (compare *Internal outflow* of the acquirer and *Internal inflow* of the target in columns 3 and 5 of both panels). Hence, either targets are closed and many target employees move to the acquirer, or targets survive and acquirer employees move to the target. These patterns are consistent with our theoretical framework, since efficiency increases require the application of improved managerial practices, either by moving acquirer employees to the establishments of the target, or by integrating target employees into the establishments of the acquirer.

External flows dominate internal flows. However, while the increase in internal labor market activity is large and significant, it still contributes only about one-quarter of overall employee flows at the acquirer and the target. The transfers from the target to the acquirer account for less than one-fifth of the acquirers' *Total inflow* (2.20/12.52=0.18) and about one-quarter of the merged firm's *Total inflow* (2.47/9.72=0.25). Hence acquirers grow mostly through external recruiting and not through transferring employees from the target.

Similarly, only one-fifth of the total outflow of target employees moves to the acquirer (2.19/11.11=0.20), whereas half of the leaving target employees move to other firms at a higher wage (5.26/11.11=0.47), and a further quarter moves to other firms at a lower wage (3.30/11.11=0.27). Hence, internal labor markets have a much smaller role than external labor markets in providing target employees with new employment opportunities.[34]

The relative importance of internal labor flows is much lower when targets survive after acquisitions. The *Internal inflow* of 3.5% mentioned above is higher when targets are closed (+7.2%) than when they survive (+1.5%). Hence, most of the increased activity in internal labor markets documented in Table 4 is associated with transfers of target employees to

[34]See Ellul, Pagano, and Schivardi (2017), Kim, Maug, and Schneider (2018), and Cestone et al. (2017) for recent work on insurance provision within firms. Our argument is not inconsistent with the findings of Cestone et al. (2017), who show that internal hiring becomes relatively more important to external hiring after adverse industry shocks. They compare how the relative importance of internal flows compared to total (external plus internal) flows in business groups *changes* after industry shocks. By contrast, the analysis above compares the size of internal relative to external flows and not its change. Similarly, Huneeus et al. (2018) compare flows between pairs of business group affiliated firms to flows between pairs of non-affiliated firms and find that the former are four to five times larger than the latter. We would expect similar findings within merged firms, since the external transfers spread across a far larger set of firms than the internal transfers.

acquirer plants when targets close. For surviving targets, moves to the acquirer account only for 3.7% (closures: 44.2%) of the target's labor force, or 0.4% (closures: 5.4%) of the labor force of the merged firm.

Internal labor markets are about as important for managers as for the general workforce in absolute terms: *Turnover* for internal flows is 3.50% for the whole workforce and 3.41% for managers (see column 6 of Tables 4 and 5 for managers and the general workforce, respectively). However, overall turnover and flows to and from the external labor market are much larger for managers: external turnover is higher by 11.9%, compared to 4.33% for the general workforce. This fact arises mainly because for managers, firms rely much more on external recruiting (*External inflow* = 15.3%) compared to the general workforce (6.2%; see column 1 of Tables 4 and 5). Moreover, the *Internal inflow* of managers to the acquirer is higher than that for the general workforce only because there are more internal transfers of managers from other establishments of the acquirer (*Internal inflow within* = 1.50%; column 5 of Table 5) compared to the general workforce (0.93%; column 5 of Table 4), not because there are more transfers from the target to the acquirer. Hence, the changes in skill requirements for managers require more external hiring and less internal retraining or job reassignments compared to other employees.

Highly-qualified employees. In Table OA3 in the Online Appendix, we provide the same results as in Tables 4 and 5 for highly-qualified employees, a broader group of employees, which includes managers. The results for this group for net employment, turnover, and reliance on internal labor markets are about in the middle between those for managers and those for the general workforce. Hence, we do not discuss these results in detail here.

5.2 Explaining restructuring

In this section, we shed more lights on the findings documented in the previous section by relating the salient observations on employment growth, turnover, and internal labor markets to variables that characterize the merging partners and the acquisition.

Methodology. Do do so, we expand Equation (2) by including additional variables that describe the labor force of the merging partners, their hierarchical structure, their size and pre-acquisition growth, as well as their relatedness. We measure all these variables in the pre-acquisition year $t-1$ and interact them with the *Treated* indicator. Hence, we run:

$$\begin{aligned} f_{j,t-1,t+2} = &\alpha_t + \theta \times Treated_j + \beta X_{j,t-1} + \gamma \times Treated_j \times X_{j,t-1} \\ &+ \lambda g_{j,t-3,t-1} + \sum_c D_{cj} \delta_c + \varepsilon_j. \end{aligned} \tag{3}$$

In the vector $X_{j,t-1}$ we include the following variables (precise definitions of all variables can be found in Table 1 and the Appendix):

Relatedness (3 variables). We use three variables that characterize key aspects of the relationship between acquirer and target:

- *HCR*, or human-capital relatedness, is a measure of the pairwise human-capital relatedness of acquirers and targets as defined in Lee, Mauer, and Xu, 2018.[35]
- *Related* is an indicator variable that is equal to one if acquirer and target serve the same horizontal market, or if they are vertically related (see Appendix (A.4) for details). Hence, *Related* equals zero only in diversifying acquisitions in which acquirer and target are unrelated. We often refer to *Related* as industrial or output-market relatedness, to distinguish it from human-capital relatedness.
- *Distance* is the driving distance between the headquarters of the acquirer and the headquarters of the target.

Hierarchy (2 variables). We use the number of layers in the firm (see Section 4.4) to characterize the degree of hierarchization of the acquirer and the target ($Hierarchy_A$, $Hierarchy_T$).

Growth and size (4 variables). We include the pre-acquisition growth of employment of the acquirer ($Growth_A$) and of the target ($Growth_T$) as in the baseline regressions based

[35]We also ran all key regressions using the measure of human capital transferability of Tate and Yang, 2016 and obtain similar results.

on equation (2) discussed in the previous section. We also include the logarithm of total employment of acquirer and target as a proxy for size ($Size_A$, $Size_T$).

Hence, we have 17 explanatory variables and the treatment indicator *Treated.* To characterize flows for the entire workforce, we focus on four key dependent variables (*Growth*, *Inflow*, *Outflow*, *Turnover*) plus the breakdown of flows into inflows and outflows (another four variables). Since the number of variables and regressions is rather large, we only report estimates for the coefficients θ on $Treated_j$ and the coefficients γ on $Treated_j \times X_{j,t-1}$. Table 7 shows the results at the level of the merged firm (Panel A), at the level of the acquirer (Panel B), and at the level of the target (Panel C). The results for the labor force characteristics for the merged firm and for acquirers are relegated to Table OA4 in the Online Appendix, since these estimates are almost always insignificant and less relevant for our discussion. Table 8 shows the results for managers at the level of the merged firm. For managers, the results for acquirers and targets are shown in Table OA5 of the Online Appendix. For highly-qualified employees, all results are shown in Table OA6 of the Online Appendix.

Characteristics of the labor force (8 variables). We use the average daily wage, the average employee age, and the percentages of employees with high education, respectively, high qualification. In each case, we include the value for the target and a second variable that measures the difference of this measure (age, wage, etc.) between the acquirer and the target. The coefficients for these variables are only reported in Table OA3 of the Online Appendix.

5.2.1 What drives growth and employment losses?

We begin by asking which variables drive the large net employment decline, particularly, the employment decline at the target. Note that the treatment indicator is never significant, even though it is significant in regressions without additional explanatory variables. Hence, the explanatory variables and their interactions with treatment added in equation (3) and Table 7 absorb the influence of treatment. Only two variables have significant explanatory power. *Related* reduces growth of the merged firm (-8.3%; column 1 of Panel A) and of the target (-7.1%; column 1 of Panel B). Hence, industrial relatedness creates efficiency gains from consolidation.

Interestingly, acquirer size ($Size_A$) has a highly significant positive impact and target size ($Size_T$) has an equally significant negative impact. To evaluate economic significance, we multiply the coefficients from Table 7 by the standard deviations of the explanatory variables (see Table 2), which gives an impact of 12.2 pp for both variables (acquirer: +6.78x1.8; target: -8.71x1.4). The signs and size of these effects is surprising. First, we would have expected larger targets to carry more seeds, which permit the merged firm to growth faster, but this does not appear to be the case. Rather, it seems that larger targets have already matured and grown these seeds themselves, and require more adaptations to fit the purposes of the acquirer. Acquirers restructure these larger targets more radically, which is reflected in larger external outflows from the merged firm (Panel A, column 5). These fall in about equal amounts on the acquirer (+2.98% *External outflow,* Panel B, column 5) and the target (+3.85% *External outflow,* Panel C, column 5).

We would have expected larger acquirers to grow more slowly, simply because an acquisition of a given size has relatively less impact on a larger acquirer, and because larger firms generally grow more slowly (Sutton, 1997). We can offer two mutually non-exclusive explanations in the context of our framework. First, it is plausible that larger acquires are more "seed constrained," i.e., their growth is more constrained by the availability of growth options, whereas they have all other resources, in particular management and management processes, already in place. Then an acquisition spurs faster post-acquisition growth, because it relaxes a more stringent constraint. Second, it could be that larger acquirers possess more capacities to integrate targets into their organization, either by absorbing target employees in the acquirer's firm or by managing the target as an independent entity. Absorbing the target into the acquirer's organization would suggest more internal labor flows from the target and to the acquirer, but we do not observe these: The coefficients of $Size_A$ on the acquirer's *Internal inflow* (-0.57; Panel B, column 4) and on the target's *Internal outflow* (-0.97; Panel C, column 7) are both negative.

By contrast, if acquirers manage the target as a separate entity we should observe lower (external) outflows from the target's plants. We do find that targets purchased by larger acquirers experience much lower external outflows. To explore whether these lower external outflows are related to the closure of targets, we analyze the potential causes of target closure in Table OA7 in the Online Appendix, where we run a regression of the indicator *Target closure* against the same explanatory variables as in Tables 7 and 8. We observe that, apart from the treatment indicator and the driving distance between acquirers' and targets' headquarters, the only other variables that reliably predict *Target closure* are the size of acquirer and target, which both have a highly significant negative impact. Hence, we find indeed that larger acquirers are less likely to close targets, consistent with the notion that larger acquirers have more managerial capacities to manage targets as independent units. In addition, we observe that the decision to close the target is largely unrelated to all other explanatory variables.

Table 8 shows the regression results from estimating equation (3) for managers. Several results for managers are similar to those for the general workforce, but some differences stand out. First, the treatment indicator is now significant and also large, showing that acquisitions are associated with an 151.1% increase in management that cannot be related to any of the other explanatory variables, and is not observed for the general workforce. This result is consistent with our predictions (Hypothesis 1), in which managers play a key role in transforming and integrating the target by moving problem solving from the lower layers to the managerial layers of the organization. Second, acquirer size is not significant anymore. While we observe significantly lower (external) outflows for larger acquirers (see coefficients on $Size_A$ in columns 5 and 6 of Table 8), these are almost matched by equally lower (external) inflows (columns 2 and 3). This is unsurprising, because larger acquirers already have the managerial capacity in place. More hierarchical targets grow their management by 12.5% (=22.76%*0.55) less for a one standard-deviation increase in $Hierarchy_T$, whereas the hierarchical structure has no impact on the growth of the general workforce. Hence, more hierarchical targets seem to have already much of the managerial structure in place that acquirers need, so that the net growth in management is correspondingly lower.

5.2.2 What drives the increase in turnover?

Next, we discuss the increase in employee turnover. Employee turnover, defined in equation (1) and measured at the level of the merged firm, increases by 7.83% for the general workforce and by 16.18% for managers (see Tables 4 and 5 and Section 5.1). Three variables consistently explain the cross-sectional variation in turnover (see column 10 in Table 8): A one-standard deviation increase in HCR (0.50) increases turnover by 2.25 pp (=0.50x4.49); a one-standard deviation increase in acquirer growth (0.29) increases turnover by 2.77 pp (=0.29x9.40), and a one-standard deviation increase in target growth (0.23) increases turnover by 1.85 pp (=0.23x8.20).

Our interpretation is that growth is a process in which tasks and the labor force need to be continuously reconfigured; hence, growth drives turnover. Interestingly, the growth of the acquirer carries a quantitatively larger weight compared to the growth of the target. Hence, it is more the pre-acquisition growth of the acquirer that requires a more significant adaptation of the workforce than that of the target. These adaptations are more significant if HCR is higher, i.e., if the workforce of the acquirer and of the target are more similar, and this effect has economically about the same size as that of pre-acquisition growth. Note that, unlike industrial relatedness measured by *Related*, human-capital relatedness does not predict net employment growth (see column 1).[36] We hypothesize that a more similar target workforce has less complementarity with the skill set of the acquirer and induces more replacements, i.e., the acquirer hires lower-paid employees with similar qualifications compared to those who leave. We will investigate this hypothesis in Section 6.2 below (see also Hypothesis 2).

Next, we ask whether inflows and outflows are potentially associated with other variables than those that influence turnover, i.e., that jointly influence inflows as well as outflows. Table 7 shows that the only other variables that influence outflows in addition to those that influence turnover are *Related* and *Size*, both of which we discuss extensively as determinants of net employment growth above. By contrast, there are no variables associated with inflows other than those that influence turnover. Specifically, the variables that influence net employment growth influence almost only external outflows but not inflows. We conclude that the scope of restructuring is mainly related to the scope of outflows, and that inflows are driven mainly by the need to replace employees who leave. We explore this aspect further by regressing *External inflow* on outflows and report these results in Table 9. The analysis in column

[36]This finding differs from that of Lee, Mauer, and Xu (2018) for M&As in the U.S., who find that HCR is related to net employment growth.

1 shows that there is a consistent but surprisingly small response of inflows to outflows: On average, one acquirer (target) employee who leaves the merged firm is replaced by 0.20 (0.13) new employees. Importantly, the interactions with the treatment indicator are all insignificant. Hence, the relationship between inflows and outflows is the same for treated firms and for control firms, only that employees are replaced at a higher rate in treated firms.

The variables that influence the turnover of managers are the same as those for the general workforce, but the effects are more than twice as high (see Table 8), which reflects the fact that management turnover as such is about twice as high as that of the general workforce (see Table 5). For managers, we also need to consider promotions to and demotions from managerial roles, which we capture by running regression (3) with promotions (column 8) and demotions (column 9) as dependent variables. It is remarkable that most of the treatment effect on growth we noted above (151.1, column 1) can be accounted for by an increase in promotions (+43.4%, but statistically insignificant), and a reduction in demotions (-47.7%, significant at the 5%-level). Almost the entire reduction of employment growth we observe in related acquisitions can be attributed to a reduction in promotions. Hence, promotions and demotions account for much of the variation in the growth of employment in managerial positions, even though the averages of these flows are economically small and statistically insignificant (see Table 5). These findings suggest that the requirements for managers are to a significant degree satisfied through assigning jobs to existing employees, not through departures and hiring. They also show that post-acquisition restructuring is, to a significant degree, a restructuring of the managerial functions in the firm (Hypothesis 1).

5.2.3 What drives the growth in the ILM?

Finally, we ask which factors affect whether firms increase the activity of their ILMs. The main factor that drives the activity level of the internal labor market is the degree of hierarchization of acquirers and targets. A one-standard deviation (0.53) increase in $Hierarchy_A$ increases the internal flows of the merged firm by 2.38 pp, which compares to an overall increase in ILM flows after acquisitions of 3.50% of the merged firm's labor force. The hierarchy index of the target is not relevant for the ILM of the merged firm, but it does affect the ILM flows of the target itself (coefficients of -1.35 on *Internal inflow* and -2.11 on *In-*

ternal outflow). Note that hierarchy does not proxy for size here, which we control for and which has by itself a negative and less significant impact. We conclude that operating ILMs requires managerial capacities, so that higher degrees of acquirer hierarchization increase ILM activity. By contrast, more hierarchical targets appear to require less restructuring and new job assignments, so that the internal flows to and from the target are reduced in more hierarchical targets, showing again that managerial capacities are critical.

Other factors that affect the activity level of the ILM are the pre-acquisition growth of the acquirer (coefficient: +3.46) and HCR (coefficient: +1.88); a one-standard deviation increase in either of these variables increases ILM activity at the merged firm by one percentage point. Both variables are also associated with external inflows to the acquirer. Hence, it seems plausible that external inflows and internal inflows are complementary by serving the staffing requirements of the acquirer.

The results for the internal flows of managers are broadly similar to those of the general workforce, with the point estimates for acquirers' pre-acquisition growth and hierarchy being slightly larger. The most notable difference is that for managers, the industrial relatedness of the merging partners appears relevant, whereas human-capital relatedness does not, the opposite of what we see for the general workforce. This is plausible, because the transferability of managers' skills depends more likely on the similarity of the operations than on the similarity of the occupational characteristics of the workforce.

6 Organizational change and the composition of the workforce

6.1 Organizational change

In this section, we test our hypotheses on changes in the organizational structures of the firm, which we capture by the number of layers of management. Specifically, we ask which factors drive changes in the layer structure, which we measure as described in Section 4.4. To test hypotheses 3 and 5, we define $\Delta Layers$ as the change in the number of layers. To construct this and other related variables, we measure the number of layers of the merged firm in period $t+2$ and subtract the number of layers of the acquirer in period $t-1$.

Changes in scale and the number of layers. Testing Hypothesis 3 requires a measure of scale, and we use the growth of the wage bill, denoted by g^{WB}, which compares the wage bill of the merged firm in period $t+2$ with the wage bill of the acquirer in period $t-1$. We construct this variable as the closest possible approximation to the variable "Value added" used in Caliendo, Monte, and Rossi-Hansberg (2015).[37]

We begin by running a simple OLS regression of $\Delta Layers$ on g^{WB} and report the results in line (1) of Table 10, Panel A. Next, we define dummy variables to separate increases in the number of layers from decreases in the number of layers, hence, $D\left(\Delta Layers > 0\right) = 1$ for an increase in the number of layers, and $D\left(\Delta Layers < 0\right) = 1$ for a reduction in the number of layers; both variables are zero otherwise. We run linear probability models with these dummy variables as dependent variables and report the results in lines (2) and (3) of Table 10A. As hypothesized, there is a strong positive relationship between the increase (decrease) in scale and an increase (decrease) in the number of layers: Expanding firms increase the number of layers, since they would otherwise have to increase control spans, which requires higher-skilled and more expensive employees. Similarly, contracting firms reduce the number of layers, since maintaining additional layers of management is associated with fixed costs.

Next, we want to distinguish expanding from contracting acquirers, since these are economically different scenarios. Hence, we break up g^{WB} into a positive and a negative component and define $g^{WB+} \equiv Max\left\{g^{WB}, 0\right\}$ to capture expansions and $g^{WB-} \equiv Min\left\{g^{WB}, 0\right\}$ to capture contracting acquirers. We report the results for OLS regressions with $\Delta Layers$ as the dependent variable in line (4), and those with the dummy variables $D\left(\Delta Layers > 0\right)$ and $D\left(\Delta Layers < 0\right)$ dependent variables in lines (5) and (6). All coefficients have the expected signs. Moreover, the effects are fairly symmetric, with expansions and contractions leading to about equally strong increases, respectively, decreases of the number of layers.

Finally, we run a multinomial logit regressions, in which the dependent variable is either equal to $+1$ if the number of layers increases ($\Delta Layers > 0$), equal to -1 if it declines ($\Delta Layers < 0$), or equal to zero, if the number of layers remains unchanged ($\Delta Layers = 0$).

[37]This restriction is imposed by our data provide. IAB does not report profits at the plant level, so we approximate value added by using the sum of all wages of all employees of the firm as reported by IAB.

We report the results with $g^{WB+}$and g^{WB-}as independent variables in line (7), which support the conclusions of the linear probability models.

Industrial relatedness and the number of layers. Hypothesis 5 relates the layer structure to the industrial relatedness of the firm. We define a new variable g^{Num}, which is the growth of the number of industries in which the acquirer operates between $t-1$ and $t+2$, and run multivariate regressions of $\Delta Layers$, respectively $D\left(\Delta Layers>0\right)$ and $D\left(\Delta Layers<0\right)$, on g^{WB} and on g^{Num}. Lines (1) - (4) of Table 10, Panel B report the results with these definitions, and lines (5) - (8) repeat the analysis with growth expressed as a change in logarithms. We find some evidence for a positive impact of increases in the number of industries on the number of layers in the linear probability models (coefficients of 0.07 and 0.06, both significant at the 10% level), and higher significance in the multinomial logit models. Overall, these results support the conclusion that unrelated acquisitions that increase the number of product lines require more layers of middle management.

Changes in employment and control spans. Finally, we test Hypothesis 4 by adapting the research design of Caliendo, Monte, and Rossi-Hansberg (2015) (see their Table 9). In particular, we run regressions of growth in the normalized number of employees by the entire workforce in each layer, on the growth of the wage bill (g^{WB}), separately for each layer and for each subsample of firms with a total of L layers. We denote the growth of normalized number of employees by $g^{n(l,L)}$, where l indexes layers and L indexes the total number of layers of the firm. Hence, we run the following regression:

$$g^{n(l,L)}_{j,t-1,t+2}=\alpha+\beta_{l,L}g^{WB}_{j,t-1,t+2}+\varepsilon_j. \tag{4}$$

The number of employees in each layer is normalized by the number of employees in the top layer, since the theory assumes that employment in the top layer is fixed. Accordingly, this regression cannot be run for the highest layer in each group of firms. Table 11 reports the results in columns 3 - 6.[38] Hypothesis 4 predicts an increase in control spans, which

[38]Caliendo, Monte, and Rossi-Hansberg (2015) estimate elasticities of hours worked in each layer relative to value added by using log changes instead of growth rates. In addition, they detrend all time series by normalizing with aggregate trends. Table OA8 in the Online Appendix replicates their Table 9 as closely

implies that the coefficients $\beta_{l,L}$ decrease in the layer index l, i.e., $\beta_{L,l} < \beta_{L,l-1}$: We should expect a larger increase in the number of employees for the lower layers of the hierarchy. This prediction is partially borne out by the results, which are meaningful only for four-layer firms, for which we have a sufficient number of observations. We observe the predicted pattern for the higher layers of management (layers $l = 2$ compared to layer $l = 3$), where the coefficient drops from 0.51 to 0.23 (column 3). However, we observe a much smaller change for the lower layers, as the coefficients for $l = 2$ (0.51) is only insignificantly smaller than the coefficient for $l = 1$ (0.52). Our interpretation of this finding is that restructuring after acquisitions is not just a change in scale, but involves more restructuring of the higher layers of management, and much less restructuring of the lower tiers of the organization.

6.2 The composition of employee flows

One of the salient observations on the composition of the workforce is that acquirers have more highly-qualified, better-educated and better-paid employees compared to targets. In addition, Hypothesis 2 predicts that the employee flows after acquisitions lead to reduction in compensation of the workforce. Hence, we should expect that labor flows lead to an exchange of employees so that newly-hired employees are on average paid less than those who leave.

We analyze the characteristics of external inflows and outflows in terms of wage, education, qualification, and age in Table 12. 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). In line with our expectations, we do observe that inflows and outflows differ regarding all four characteristics. Newly-hired employees are, on average, slightly more qualified and better educated than those who leave the firm. However, the effect is economically small: The education (qualification) index of the acquirer increases by 2.2% (0.4%) and that of the target by 2.7% (1.0%) relative to the pre-merger values. These differences between inflows and outflows do little to close the differences in these indexes between acquirer and target before the merger, which are three to

as possible by rerunning the regressions using the detrended log changes of normalized hours worked and detrended log changes of the wage bill. These results are qualitatively very similar.

four times larger: E.g, the difference between the education index of inflows and outflows is 0.09, which compares to a difference of 0.25 (2.984-2.737) between acquirer and target before the merger. Newly-hired employees are 3.95 years younger than leaving employees; this is 10.0% of the pre-merger age, which is almost identical for acquirer and target. Moreover, newly-hired employees are also less expensive and receive €11.20 or 11.2% less of daily wage. Both effects are very similar for acquirer and target establishments. Overall, these results provide a coherent picture. Firms replace departing employees with new employees that have almost the same qualifications. When doing so, they hire employees who are much younger and less expensive, but also slightly better educated than those who leave.

These results are predicted by Hypothesis 2. When acquirers restructure the labor force after acquisitions, they increase the number of layers as well as the proportion of managers in the firm. This hierarchization concentrates specialized knowledge at the top of the organization and, according to the theory of knowledge-based hierarchies, relaxes the demands on the remaining employees, which allows firms to reduce costs by hiring less expensive employees. In addition, restructuring involves a shift of employees' human capital from firm-specific human capital, adapted to the target firm, to generalized human capital, which is captured by our education index. This is plausible, because restructuring probably involves that a significant portion of target employees' specialized human capital becomes obsolete, whereas younger, better-educated workers can be trained to work with the organizational processes of the acquirer.

7 Conclusion

We study the restructuring of the labor force after acquisitions for a sample of M&As in Germany. We find that overall employment declines after mergers and is concentrated in about one-third of mergers that close all target establishments within two years of the acquisition. Either target employees move from closed target establishments to acquirer establishments, or some acquirer employees move to the surviving target establishments. Equally important, employee turnover increases, especially for middle managers and highly-qualified workers, for whom employment declines less. Finally, firms build managerial capacities through restructuring middle management and increasing the degree of hierarchical layering of the firm, especially for firms that grow faster and that increase the number of their product lines.

We interpret these findings in the context of a theoretical framework in which firms with growth options and superior abilities to generate revenues become targets, and those with superior managerial capacities to manage production efficiently become acquirers. The organization of acquirers delegates complex tasks to managers in the higher layers of the firm, and relieves the middle layers of the organization from these tasks, which can then be assigned to less expensive employees. As such, we put our discussion into a theoretical framework that emphasizes the internal organization of the firm, and the importance of human capital and intangible assets. Developing this framework more formally is left for future research.

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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

$$g_{j,t-1,t} \equiv \frac{E_{jt} - E_{j,t-1}}{0.5\left(E_{jt} + E_{j,t-1}\right)} \tag{5}$$

and observe that

$$E_{jt} - E_{j,t-1} = H_{jt} - S_{jt}. \tag{6}$$

We define one-year hiring rates and separation rates as

$$h_{jt} = \frac{H_{jt}}{0.5\left(E_{jt} + E_{j,t-1}\right)},\ s_{jt} = \frac{S_{jt}}{0.5\left(E_{jt} + E_{j,t-1}\right)}. \tag{7}$$

From (5), (6), and ((7)), we have

$$g_{j,t-1,t} = h_{jt} - s_{jt}. \tag{8}$$

We also compute multi-period employment flows as

$$E_{j,t+k} - E_{j,t-1} = \sum_{\tau=0}^{\tau=k}\left(E_{j,t+\tau} - E_{j,t+\tau-1}\right) = \sum_{\tau=0}^{\tau=k}\left(H_{j,t+\tau} - S_{j,t+\tau}\right) = H_{j,t-1,t+\tau} - S_{j,t-1,t+\tau}. \tag{9}$$

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

$$g_{j,t,t+k} \equiv \frac{E_{j,t+k} - E_{j,t-1}}{0.5\left(E_{j,t+k} + E_{j,t-1}\right)}. \tag{10}$$

Multi-period hiring rates and separation rates are defined analogously to (10). 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

$$\gamma_{j,t-1,t} \equiv \frac{E_{jt} - E_{j,t-1}}{0.5\,(E_{jt} + E_{j,t-1})}. \tag{11}$$

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 by $\gamma^h \equiv \frac{E_t^h - E_{t-1}^h}{E_{t-1}^h}$. 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 (5) and (10) do not have this property. Observe also that

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

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 a percentage growth rate or as in (5) and (10).

Turnover. To relate our definition of *Turnover* in equation (1) to other definitions in the literature, which regard turnover as an average of inflows and outflows (e.g., Davis and Haltiwanger, 1999; Cahuc, Carcillo, and Zylberberg, 2014), observe the following (suppress subscripts for time and firm for simplicity):

$$
\begin{aligned}
TO &= Min\,(s,h) \\
&= \frac{s+h}{2} + \frac{1}{2} Min\,(h-s, s-h) \\
&= \frac{s+h}{2} - \frac{1}{2} Max\,(h-s, s-h) \\
&= \frac{s+h}{2} - \frac{1}{2}\,|g|\,,
\end{aligned}
\tag{12}
$$

where the last line uses ((8)). Hence, defining turnover as $\frac{s+h}{2}$ also captures the absolute value of net employment growth, $|g|$.

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.[39] 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.

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

All qualification-related variables and *Manager* are derived from Blossfeld (1987). The author classified jobs that are coded according to the German Classification of Occupations 1988 (KldB 1988) into 12 distinct major occupations. Table 1 on page 99 in Blossfeld (1987)

[39]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 **?**.

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 potential layer being layer 4 (CEOs and managing directors). Layers 2 and 3 include different ranks of middle managers. We use the exact same layer assignment from occupational codes as Gumpert, Steimer, and Antoni (2019), who adapt the layer definitions Caliendo, Monte, and Rossi-Hansberg use for France to German (IAB) data. See Gumpert, Steimer, and Antoni (2019), especially their Appendix A.3 ("Assignment of occupations to layers") for further details.

A.2.3 Education

Education is based on a categorical variable in the IEB database and contains five distinct values: (1) no school leaving certificate or intermediate school leaving certificate (ISLC), (2) ISLC with vocational training, (3) upper secondary school leaving certificate (USSLC) with or without vocational training, (4) college or (5) university degree. We categorize an employee into highly educated if she holds a college or 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 (2020)	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 (2020)	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 (2018)	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 (2020a)	BRA	2004-2012	2,096	M&As	N	P	M&A => Labor
Lagaras (2020b)	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 (2020)	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 (2016)	USA	1995-2007	3,900	M&As			M&A => Labor, Labor => M&A
Tian and Wang (2020)	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

B Figures

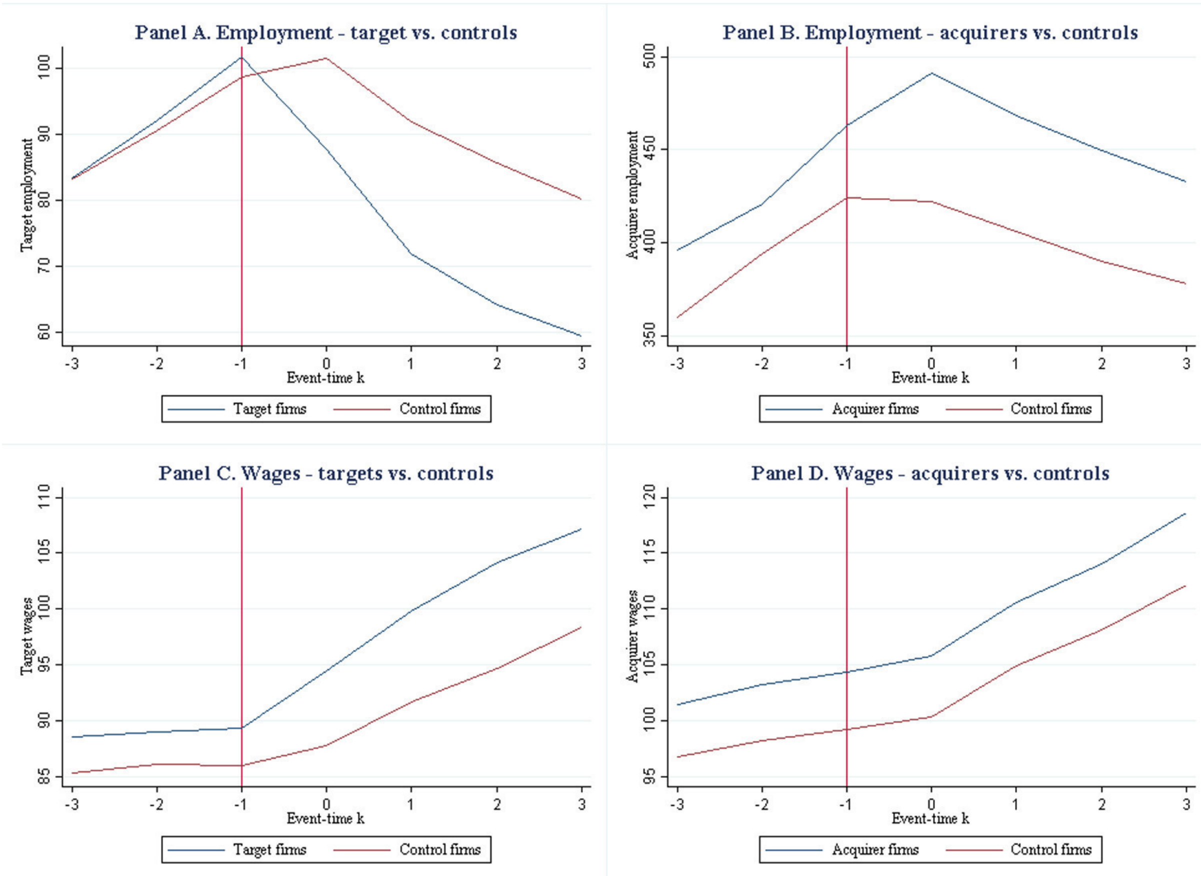

Figure 1: Firm-level employment and wages. Panel A (Panel B) shows the average total employment at the target (acquirer). Panel C (Panel D) shows the average *Wage* paid at the at the target (acquirer). *Wage* is defined in Table 1.

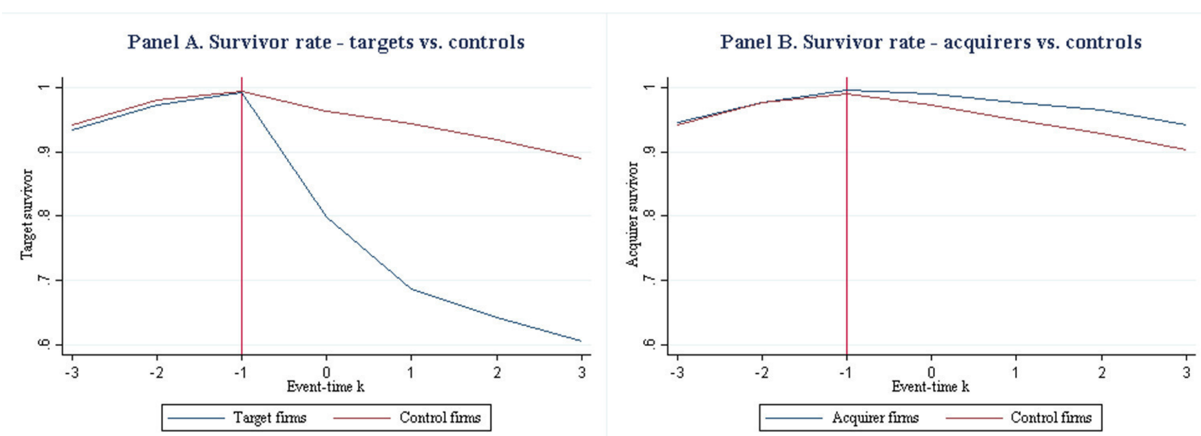

Figure 2: Firm-level development of labor force characteristics. Panel A (Panel B) plots the survival rate of target (acquirer) firms relative to control firms.

C Tables

Table 1: 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.

Variable name	Definition	Values
$\text{Age}_{\text{A-T}}$	Age_{A} - Age_{T}	[0:∞]
Age_{k}	Average age of all full-time employees in entity k	[0:∞]
Distance	Driving distance between target HQ and acquirer HQ in minutes	[0:∞]
$\text{Education}_{\text{A-T}}$	$\text{Education}_{\text{A}}$ - $\text{Education}_{\text{T}}$	[-100:100]
$\text{Education}_{\text{k}}$	Share of employees with high education as defined in Appendix A.2	[0:100]
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 $\text{outflow}_{\text{k}}$	$\text{Outflow}_{\text{k}}$ into the external labor market, i.e., outflow to an establishment which is not part of the merged firm	[0:∞]
Growth_{k}	Employment growth rate g from t=-2 to t=-1 as defined in Section 4.4 and Appendix A.1	[-2:2]
HCR	Human capital relatedness index based on Lee et al. (2018), details see Appendix A.3	[0:100]
$\text{Hierarchy}_{\text{k}}$	Number of layers in entity k	[0:4]
Inflow_{k}	Employment inflow h into an establishment of entity k between event year t=-1 and t=2 as defined in Section 4.4 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 $\text{outflow}_{\text{k}}$	$\text{Outflow}_{\text{k}}$ into the internal labor market, i.e., outflow to another establishment of the merged firm	[0:∞]
Manager	One if occupation is equal to “Manager” as defined in Appendix A.2	[0,1]
Net Emp. Growth_{k}	Employment growth rate g of entity k from event year t=-1 to t=2 as defined in Section 4.4 and Appendix A.1	[-2:2]
$\text{Outflow}_{\text{k}}$	Employment outflow s from an establishment of entity k between event year t=-1 and t=2 as defined in Section 4.4 and Appendix A.1	[0:∞]
$\text{Qualification}_{\text{A-T}}$	$\text{Qualification}_{\text{A}}$ - $\text{Qualification}_{\text{T}}$	[-100:100]
$\text{Qualification}_{\text{k}}$	Share of employees with high qualification as defined in Appendix A.2	[0:100]
Related	One if target and acquirer are in the same industry or display above median relatedness, details see Appendix A.4	[0,1]
Size_{k}	Number of employees employed in entity k	[0:∞]
Target closure	One if employment in target is zero at the end of t=2	[0,1]
$\text{Wage}_{\text{A-T}}$	Wage_{A} - Wage_{T}	[0:∞]
Wage_{k}	Average daily wage of all full-time employees in entity k	[0:∞]

Table 2: Summary statistics. This table provides descriptive statistics for all numerical variables. The firm level data set consists of 1,043 target, acquirer, and consequently merged 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. 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 1.

Panel A: Treated firms

	N	Mean	SD	Min	P25	P50	P75	Max
$\text{Age}_{\text{A-T}}$	1,043	-0.16	6.38	-27.42	-3.71	-0.03	3.67	26.43
Age_{T}	1,043	40.02	5.98	20.00	36.19	40.27	43.56	66.50
Distance	1,043	173.23	150.17	0.00	37.97	140.15	284.77	642.68
$\text{Education}_{\text{A-T}}$	1,030	7.95	25.65	-82.22	-4.07	5.02	20.45	100.00
$\text{Education}_{\text{T}}$	1,035	23.75	23.95	0.00	4.88	15.38	34.38	100.00
Growth_{A} (%)	1,039	30.45	53.88	-200.00	5.50	16.29	37.50	200.00
Growth_{M} (%)	1,043	25.15	38.40	-171.23	7.16	15.95	32.80	200.00
Growth_{T} (%)	1,041	31.65	59.52	-200.00	5.50	18.04	41.86	200.00
HCR	1,027	49.49	32.11	0.00	18.97	49.24	80.34	99.99
$\text{Hierarchy}_{\text{A}}$	1,038	2.58	0.52	1.00	2.15	2.46	2.93	4.00
$\text{Hierarchy}_{\text{T}}$	1,035	2.50	0.54	1.00	2.08	2.33	2.83	4.00
Inflow_{A} (%)	1,043	64.95	140.47	0.00	24.82	41.44	70.82	2,880
Inflow_{M} (%)	1,043	47.89	41.23	0.00	23.71	37.93	57.01	531
Inflow_{T} (%)	1,037	37.51	60.87	0.00	0.00	22.50	47.06	1,000
Net emp. growth_{A} (%)	1,043	-10.21	61.98	-200.00	-19.83	-4.30	11.97	200.00
Net emp. growth_{M} (%)	1,043	-26.94	53.66	-200.00	-41.38	-13.00	2.02	152.54
Net emp. growth_{T} (%)	1,037	-84.57	95.37	-200.00	-200.00	-44.44	-7.23	200.00
$\text{Outflow}_{\text{A}}$ (%)	1,043	75.16	153.13	0.00	30.07	45.83	72.34	2,920
$\text{Outflow}_{\text{M}}$ (%)	1,043	74.83	61.45	10.38	36.89	54.97	90.59	665
$\text{Outflow}_{\text{T}}$ (%)	1,037	122.08	98.02	0.00	40.00	93.62	200.00	1,200
$\text{Qualification}_{\text{A-T}}$	1,030	2.05	26.20	-100.00	-8.33	1.82	13.17	100.00
$\text{Qualification}_{\text{T}}$	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_{M}	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
$\text{Wage}_{\text{A-T}}$	1,030	15.12	33.54	-143.29	-5.15	12.54	34.01	123.73
Wage_{T}	1,035	89.33	29.12	2.67	69.06	88.19	107.55	190.68

Table 2: **Summary statistics (continued).**

Panel B: Control firms								
	N	Mean	SD	Min	P25	P50	P75	Max
$\text{Age}_{\text{A-T}}$	1,043	0.02	6.25	-26.19	-3.40	0.04	3.72	31.86
Age_{T}	1,043	40.06	5.57	20.00	36.71	40.13	43.37	67.50
Distance	1,043	206.31	136.80	0.00	96.63	180.62	295.45	622.23
$\text{Education}_{\text{A-T}}$	1,024	6.23	26.80	-96.77	-5.89	3.42	18.44	100.00
$\text{Education}_{\text{T}}$	1,035	22.72	23.95	0.00	4.55	13.46	33.33	100.00
Growth_{A} (%)	1,039	27.58	56.59	-200.00	3.03	14.67	34.41	200.00
Growth_{M} (%)	1,043	22.93	35.71	-170.52	5.97	15.20	29.63	200.00
Growth_{T} (%)	1,041	30.01	54.55	-200.00	5.65	17.54	37.66	200.00
HCR	1,021	34.71	30.58	0.00	7.85	25.53	57.28	100.00
$\text{Hierarchy}_{\text{A}}$	1,032	2.52	0.54	1.00	2.11	2.37	2.88	4.00
$\text{Hierarchy}_{\text{T}}$	1,035	2.45	0.56	1.00	2.04	2.27	2.78	4.00
Inflow_{A} (%)	1,034	39.15	42.49	0.00	17.15	28.57	47.41	600
Inflow_{M} (%)	1,043	37.86	29.64	0.00	20.66	30.63	44.64	320
Inflow_{T} (%)	1,036	39.80	40.70	0.00	16.75	29.28	50.00	633
Net emp. growth_{A} (%)	1,034	-26.34	59.15	-200.00	-30.12	-10.81	0.00	200.00
Net emp. growth_{M} (%)	1,043	-20.59	41.02	-200.00	-27.34	-11.35	0.00	111.89
Net emp. growth_{T} (%)	1,036	-29.51	61.35	-200.00	-34.31	-12.58	0.00	200.00
$\text{Outflow}_{\text{A}}$ (%)	1,034	65.49	64.85	0.00	27.08	41.28	76.58	800
$\text{Outflow}_{\text{M}}$ (%)	1,043	58.45	45.50	9.09	30.10	43.19	68.42	400
$\text{Outflow}_{\text{T}}$ (%)	1,036	69.31	67.00	0.00	28.57	45.19	83.05	589
$\text{Qualification}_{\text{A-T}}$	1,024	2.11	28.45	-100.00	-10.36	1.11	13.37	100.00
$\text{Qualification}_{\text{T}}$	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_{M}	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
$\text{Wage}_{\text{A-T}}$	1,024	13.28	36.71	-124.56	-8.11	10.97	35.13	139.76
Wage_{T}	1,035	86.11	31.10	0.00	65.52	85.11	106.48	190.04

Table 3: Layer structure. This tables shows the hierarchical structure of our sample firms. Panel A reports the average number of employees as well as the mean and median daily wage for target, acquirer, and merged firm depending on the number of layers the respective firm has at t=-1. Panel B reports for treated and control firms summary statistics for the number of layers, the share of employees in each layer, the control span of each layer (defined as number of employees in l-1 divided by the number of employees in l), and the mean daily wage in each layer at t=-1.

Panel A				
Number of layers (L)	N	Mean Size	Mean Wage	Median 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
Merged 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

Table 3: **Layer structure (continued).**

Panel B								
Target								
Number of layers (L)	1,034	3.06	1.00	3.00	1,035	2.94	1.03	3.00
Share in $l = 1$	1,035	0.58	0.31	0.63	1,035	0.60	0.32	0.67
Share in $l = 2$	1,035	0.20	0.21	0.13	1,035	0.21	0.23	0.13
Share in $l = 3$	1,035	0.14	0.22	0.04	1,035	0.12	0.21	0.03
Share in $l = 4$	1,035	0.05	0.11	0.01	1,035	0.04	0.09	0.01
Control span $l = 2$	837	7.49	13.08	2.85	822	8.24	14.07	3.16
Control span $l = 3$	706	4.63	7.11	2.00	660	5.10	7.43	2.55
Control span $l = 4$	619	5.34	9.88	2.00	547	4.37	6.98	2.00
Wage $l = 1$	989	74.35	26.67	72.92	984	72.34	27.79	71.11
Wage $l = 2$	842	104.99	33.85	106.92	831	105.52	36.05	106.74
Wage $l = 3$	713	119.13	36.35	121.80	671	117.31	39.23	122.00
Wage $l = 4$	624	147.88	33.21	155.59	556	146.63	35.82	154.13
Acquirer								
Number of layers (L)	1,037	3.49	0.86	4.00	1,030	3.38	0.94	4.00
Share in $l = 1$	1,038	0.55	0.29	0.57	1,032	0.57	0.31	0.62
Share in $l = 2$	1,038	0.19	0.19	0.14	1,032	0.21	0.22	0.15
Share in $l = 3$	1,038	0.16	0.21	0.07	1,032	0.14	0.22	0.04
Share in $l = 4$	1,038	0.07	0.14	0.02	1,032	0.05	0.12	0.02
Control span $l = 2$	902	8.41	15.46	3.00	886	9.11	18.37	3.00
Control span $l = 3$	872	4.19	7.30	1.95	806	5.20	8.16	2.73
Control span $l = 4$	809	6.79	14.57	2.18	762	7.08	15.07	2.00
Wage $l = 1$	1,005	87.91	28.13	86.49	993	83.22	29.42	80.98
Wage $l = 2$	913	117.37	31.34	119.67	902	116.48	33.98	119.46
Wage $l = 3$	882	132.02	31.36	136.71	814	129.96	32.99	134.50
Wage $l = 4$	818	156.90	27.37	166.18	768	153.55	30.60	163.36
Merged firm								
Number of layers (L)	1,043	3.78	0.52	4.00	1,043	3.74	0.59	4.00
Share in $l = 1$	1,043	0.57	0.27	0.62	1,043	0.60	0.27	0.64
Share in $l = 2$	1,043	0.20	0.17	0.16	1,043	0.21	0.18	0.16
Share in $l = 3$	1,043	0.15	0.20	0.07	1,043	0.13	0.19	0.05
Share in $l = 4$	1,043	0.05	0.07	0.03	1,043	0.04	0.06	0.02
Control span $l = 2$	993	8.26	14.60	3.14	992	9.32	17.06	3.45
Control span $l = 3$	951	4.22	6.51	2.25	943	5.12	7.01	3.00
Control span $l = 4$	922	6.68	13.22	2.29	896	6.40	13.09	2.14

Table 4: 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 treated firms (Merged, Target, Acquirer) and their control firms. Estimates are obtained as estimates of θ from equation (2) for the dependent variables presented in the first column. *Merged* 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 *Merged*; columns 1, 3, 5) or the employment of the respective entity (columns 2 and 4). In column 6, the dependent variable is *Turnover* as defined in equation 1). In all our 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 1 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 4: Firm-level aggregate employee flows for the general workforce (continued).

Entity	Merged	Target		Acquirer		Turnover
Scaled by	Merged (1)	Target (2)	Merged (3)	Acquirer (4)	Merged (5)	Merged (6)
Net employment growth	-7.22***	-55.36***	-14.01***	14.54***	6.97***	
	(-3.50)	(-15.75)	(-10.07)	(5.55)	(4.61)	
Inflow	9.72***	-2.22	-2.90***	23.78***	12.52***	7.83***
	(6.66)	(-0.95)	(-3.71)	(5.45)	(9.41)	(6.11)
External inflow	6.21***	-4.04*	-3.27***	18.19***	9.39***	4.33***
	(4.95)	(-1.79)	(-4.39)	(4.75)	(8.46)	(4.07)
Inflow other firms	5.81***	-0.81	-1.40**	14.45***	7.17***	4.13***
	(5.91)	(-0.56)	(-2.51)	(4.71)	(8.44)	(5.82)
with wage increase	5.09***	0.06	-0.85**	12.43***	5.90***	3.48***
	(6.97)	(0.06)	(-2.49)	(4.86)	(8.79)	(6.03)
with wage decrease	0.72	-0.87	-0.55*	2.03***	1.27***	0.70***
	(1.61)	(-1.30)	(-1.68)	(2.93)	(4.11)	(3.40)
Inflow new entrant	0.40	-3.26***	-1.86***	3.72***	2.20***	0.25
	(0.80)	(-2.67)	(-5.64)	(3.53)	(5.23)	(0.57)
Internal inflow	3.50***	1.83***	0.37**	5.59***	3.14***	3.50***
	(7.36)	(3.63)	(2.05)	(3.56)	(7.09)	(7.36)
Inflow within	1.04***	0.54	0.10	1.09**	0.93**	1.04***
	(2.58)	(1.22)	(0.59)	(2.58)	(2.57)	(2.58)
Inflow between	2.47***	1.29***	0.27***	4.50***	2.20***	2.47***
	(9.57)	(5.27)	(4.12)	(2.96)	(8.82)	(9.57)
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)	
N	2,086	2,071	2,086	2,072	2,086	2,086

Table 5: 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 treated firms (Merged, Target, Acquirer) and their control firms. Estimates are obtained as estimates of θ from equation (2) for the dependent variables presented in the first column. *Merged* 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 *Merged*; columns 1, 3, 5) or the employment of the respective entity (columns 2 and 4). In column 6, the dependent variable is *Turnover* as defined in equation 1). In all our 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 1 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 5: Firm-level aggregate employee flows for managers (continued).

Entity	Merged	Target		Acquirer		Turnover
Scaled by	Merged (1)	Target (2)	Merged (3)	Acquirer (4)	Merged (5)	Merged (6)
Net 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***	16.18***
	(6.36)	(2.09)	(0.66)	(6.79)	(6.44)	(6.33)
External inflow	15.32***	5.30	0.37	18.91***	14.76***	11.86***
	(5.14)	(1.18)	(0.28)	(5.64)	(5.32)	(4.88)
Inflow other firms	11.38***	-1.06	-1.12	15.30***	12.42***	8.61***
	(5.06)	(-0.32)	(-1.16)	(5.87)	(6.00)	(5.03)
with wage increase	8.59***	-1.54	-1.23	12.32***	9.76***	6.73***
	(4.55)	(-0.52)	(-1.43)	(5.58)	(5.74)	(4.75)
with wage decrease	2.79***	0.48	0.11	2.98***	2.66***	1.61***
	(3.37)	(0.37)	(0.33)	(3.15)	(3.50)	(3.07)
Inflow new entrant	3.98***	6.36**	1.49*	3.65**	2.37**	2.53**
	(2.93)	(2.33)	(1.82)	(2.55)	(2.02)	(2.55)
Internal inflow	4.25***	4.40***	0.52*	6.09***	3.75***	3.41***
	(6.54)	(3.49)	(1.86)	(5.14)	(6.27)	(5.94)
Inflow within	1.45***	0.19	-0.04	1.71***	1.50***	1.29***
	(3.01)	(0.28)	(-0.18)	(3.15)	(3.48)	(2.80)
Inflow between	2.80***	4.21***	0.56***	4.38***	2.25***	2.11***
	(6.39)	(3.96)	(3.61)	(4.15)	(5.40)	(6.06)
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	1,968

Table 6: Firm-level aggregate employee flows: target survival vs. target closure. The table reports the estimated differences in growth rates from $t = -1$ to $t = +2$ between the treated firms (Merged, Target, Acquirer) and their control firms for transactions where *Target closure* is equal to zero (Panel A) and transactions where *Target closure* is equal to one (Panel B). Estimates are obtained as estimates of θ from equation (2) for the dependent variables presented in the first column. *Merged* 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 *Merged*; columns 1, 3, 5) or the employment of the respective entity (columns 2 and 4). In column 6, the dependent variable is *Turnover* as defined in equation 1). In all our 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 1. 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 6: Firm-level aggregate employee flows: target survival (Panel A).

Entity	Merged	Target		Acquirer		Turnover
Scaled by	Merged (1)	Target (2)	Merged (3)	Acquirer (4)	Merged (5)	Merged (6)
Net 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***	5.17***
	(5.03)	(1.43)	(0.25)	(3.50)	(5.74)	4.42
External inflow	6.05***	0.49	-0.44	16.77***	6.51***	3.70***
	(4.35)	(0.24)	(-0.50)	(3.28)	(5.50)	3.44
Inflow other firms	5.79***	2.09	0.42	13.75***	5.46***	3.33***
	(5.49)	(1.53)	(0.68)	(3.35)	(5.98)	5.38
with wage increase	4.92***	2.29**	0.33	12.23***	4.64***	2.62***
	(6.41)	(2.24)	(0.72)	(3.61)	(6.99)	5.66
with wage decrease	0.87*	-0.20	0.09	1.51*	0.82**	0.67***
	(1.90)	(-0.31)	(0.42)	(1.71)	(2.01)	3.30
Inflow new entrant	0.26	-1.60	-0.85**	3.02**	1.05**	0.06
	(0.43)	(-1.24)	(-2.05)	(2.29)	(2.15)	0.11
Internal inflow	1.47***	2.56***	0.66***	1.22***	0.82**	1.47***
	(3.57)	(4.61)	(3.30)	(2.72)	(2.32)	3.57
Inflow within	0.63	0.60	0.25	0.51	0.40	0.63
	(1.61)	(1.40)	(1.40)	(1.18)	(1.17)	1.61
Inflow between	0.84***	1.96***	0.41***	0.71***	0.41***	0.25
	(6.23)	(5.57)	(4.35)	(5.77)	(6.27)	1.39
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	1,340

Table 6: Firm-level aggregate employee flows: target closure (Panel B).

Entity	Merged	Target		Acquirer		Turnover
Scaled by	Merged (1)	Target (2)	Merged (3)	Acquirer (4)	Merged (5)	Merged (6)
Net employment growth	-27.56***	-163.2***	-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***	12.33***
	(4.87)	(-3.43)	(-7.00)	(5.11)	(8.70)	4.78
External inflow	6.07***	-14.47***	-8.69***	19.38***	14.68***	5.16**
	(2.72)	(-3.61)	(-7.17)	(4.47)	(7.37)	2.51
Inflow other firms	5.57***	-6.98**	-4.78***	14.89***	10.30***	5.43***
	(3.16)	(-2.43)	(-4.99)	(4.40)	(6.96)	3.78
with wage increase	5.15***	-4.52**	-3.15***	12.25***	8.22***	4.80***
	(3.92)	(-2.34)	(-7.29)	(4.24)	(6.61)	4.18
with wage decrease	0.42	-2.46*	-1.63**	2.64***	2.08***	0.83*
	(0.51)	(-1.92)	(-2.30)	(2.74)	(5.67)	1.89
Inflow new entrant	0.47	-7.57***	-3.91***	4.45***	4.35***	0.54
	(0.56)	(-4.43)	(-7.62)	(2.81)	(5.66)	0.70
Internal inflow	7.17***	0.34	-0.16	11.35***	7.34***	7.17***
	(6.88)	(0.34)	(-0.52)	(3.77)	(7.39)	6.88
Inflow within	1.79**	0.34	-0.16	2.27**	1.94**	1.79**
	(2.14)	(0.34)	(-0.52)	(2.58)	(2.52)	2.14
Inflow between	5.38***	0.00	0.00	9.08***	5.40***	-0.17
	(8.53)	(1.05)	(1.06)	(3.12)	(8.52)	-0.53
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	746

Table 7: Flow regressions: all employees. The table reports the estimated differences in growth rates from *t=-1* to *t=2* between the treated firms (Panel A: Merged firm, Panel B: Target, Panel C: Acquirer) and their control firms. *Merged firm* refers to the combined employment (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). The table reports estimates of θ (*Treatment*) and γ (*Treatment* $\times$ variable of interest) of equation (3) for the dependent variables *Net employment growth* (column 1), *Inflow* (column 2), *External inflow* (column 3), *Internal inflow* (column 4), *Outflow* (column 5), *External outflow* (column 6), *Internal outflow* (column 7), and *Tur*nover as defined in equation (1) (column 8). In all our regressions, we include additional control variables accounting for average employee age (*Age*), employee wage (*Wage*), employee qualification (*Qualification*), and employee education (*Education*) in the target, and the difference between the acquirer and the target. We report the estimates of γ for these variables in Table OA4. All variables are defined in Table 1. 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.

Panel A - Merged firm

	Net emp. growth (1)	Inflow (2)	External inflow (3)	Internal inflow (4)	Outflow (5)	External outflow (6)	Internal outflow (7)	Turnover (8)
Treatment	2.12	-34.97	-31.56	-3.41	-37.09	-33.68	-3.41	-27.07
	(0.06)	(-1.07)	(-1.19)	(-0.34)	(-0.78)	(-0.78)	(-0.34)	(-0.88)
$\times$ Distance	5.37	-1.00	-1.74	0.74	-6.37	-7.11	0.74	-1.10
	(0.87)	(-0.24)	(-0.45)	(0.69)	(-1.02)	(-1.20)	(0.69)	(-0.34)
$\times$ Related	-8.29*	2.73	1.77	0.95	11.01**	10.06**	0.95	2.49
	(-1.73)	(0.89)	(0.65)	(0.97)	(2.36)	(2.24)	(0.97)	(0.99)
$\times$ HCR	3.13	5.98**	4.10	1.88*	2.85	0.97	1.88*	4.49*
	(0.73)	(2.07)	(1.59)	(1.95)	(0.64)	(0.23)	(1.95)	(1.85)
$\times$ $\text{Hierarchy}_{\text{T}}$	1.16	4.59	4.92	-0.33	3.43	3.76	-0.33	4.35
	(0.13)	(0.65)	(0.87)	(-0.15)	(0.31)	(0.37)	(-0.15)	(0.64)
$\times$ $\text{Hierarchy}_{\text{A}}$	-1.30	7.63	3.16	4.47**	8.93	4.46	4.47**	5.99
	(-0.14)	(1.22)	(0.61)	(2.13)	(0.87)	(0.47)	(2.13)	(1.02)
$\times$ Growth_{T}	0.15	9.76*	8.56*	1.20	9.61	8.41	1.20	8.20*
	(0.03)	(1.85)	(1.94)	(0.81)	(1.30)	(1.28)	(0.81)	(1.69)
$\times$ Growth_{A}	-2.15	12.63**	9.17**	3.46***	14.79**	11.32	3.46***	9.40**
	(-0.33)	(2.57)	(2.03)	(2.68)	(2.02)	(1.63)	(2.68)	(2.18)
$\times$ Size_{T}	-8.71***	-2.16*	-1.88*	-0.27	6.55***	6.83***	-0.27	-0.82
	(-5.25)	(-1.72)	(-1.71)	(-0.68)	(3.57)	(3.99)	(-0.68)	(-0.74)
$\times$ Size_{A}	6.78***	-1.12	-0.52	-0.60*	-7.90***	-7.30***	-0.60*	-0.97
	(4.48)	(-1.17)	(-0.63)	(-1.93)	(-4.99)	(-4.83)	(-1.93)	(-1.20)
N	2,036	2,036	2,036	2,036	2,036	2,036	2,036	2,036
adj. R^2	0.154	0.303	0.339	0.076	0.271	0.281	0.076	0.312

Table 7: Flow regressions: all employees (continued).

Panel B - Target

	Net emp. growth (1)	Inflow (2)	External inflow (3)	Internal inflow (4)	Outflow (5)	External outflow (6)	Internal outflow (7)	Turnover (8)
Treatment	-29.55	-11.72	-10.39	-1.34	17.82	1.98	15.85***	-8.70
	(-1.42)	(-1.00)	(-0.92)	(-0.56)	(0.96)	(0.11)	(3.04)	(-0.96)
× Distance	2.63	-0.65	-0.97	0.32	-3.27	-3.20	-0.08	-0.59
	(0.72)	(-0.25)	(-0.38)	(0.68)	(-0.99)	(-0.97)	(-0.10)	(-0.33)
× Related	-7.14**	0.26	0.18	0.08	7.40***	7.47***	-0.07	0.02
	(-2.25)	(0.14)	(0.10)	(0.19)	(2.58)	(2.61)	(-0.09)	(0.01)
× HCR	-0.92	-0.19	-0.16	-0.03	0.73	-1.22	1.94***	0.22
	(-0.37)	(-0.12)	(-0.11)	(-0.08)	(0.32)	(-0.54)	(3.13)	(0.19)
× $\text{Hierarchy}_\text{T}$	0.59	0.17	1.52	-1.35**	-0.42	1.69	-2.11*	0.02
	(0.12)	(0.07)	(0.64)	(-2.40)	(-0.08)	(0.33)	(-1.92)	(0.01)
× $\text{Hierarchy}_\text{A}$	-0.40	-4.20	-4.88*	0.67	-3.81	-4.28	0.47	-3.43
	(-0.07)	(-1.53)	(-1.87)	(1.23)	(-0.69)	(-0.78)	(0.42)	(-1.44)
× Growth_T	2.95	1.98	1.23	0.75*	-0.97	-0.75	-0.22	0.99
	(0.86)	(0.81)	(0.51)	(1.90)	(-0.32)	(-0.25)	(-0.33)	(0.58)
× Growth_A	-7.09	0.89	0.70	0.19	7.98*	5.27	2.71**	0.60
	(-1.47)	(0.37)	(0.30)	(0.42)	(1.75)	(1.18)	(2.54)	(0.31)
× Size_T	-5.50***	-1.81***	-1.85***	0.04	3.69***	3.85***	-0.16	-1.13**
	(-5.00)	(-2.77)	(-3.13)	(0.19)	(3.69)	(3.95)	(-0.61)	(-2.36)
× Size_A	7.18***	1.23**	1.26**	-0.03	-5.95***	-4.99***	-0.97***	0.94**
	(6.70)	(2.25)	(2.43)	(-0.21)	(-6.12)	(-5.22)	(-4.23)	(2.29)
N	2,036	2,036	2,036	2,036	2,036	2,036	2,036	2,036
adj. R^2	0.344	0.392	0.409	0.096	0.537	0.514	0.107	0.446

Panel C - Acquirer

	Net emp. growth (1)	Inflow (2)	External inflow (3)	Internal inflow (4)	Outflow (5)	External outflow (6)	Internal outflow (7)	Turnover (8)
Treatment	31.66	-23.25	-21.17	-2.08	-54.92	-35.65	-19.26**	-26.30
	(1.04)	(-0.74)	(-0.84)	(-0.21)	(-1.29)	(-0.95)	(-2.35)	(-0.90)
× Distance	2.74	-0.35	-0.77	0.42	-3.09	-3.91	0.82	-0.76
	(0.58)	(-0.10)	(-0.24)	(0.43)	(-0.63)	(-0.85)	(1.08)	(-0.29)
× Related	-1.14	2.47	1.60	0.87	3.61	2.59	1.02	2.31
	(-0.32)	(0.93)	(0.70)	(0.99)	(1.02)	(0.77)	(1.59)	(1.15)
× HCR	4.05	6.18**	4.26*	1.92**	2.12	2.18	-0.06	2.67
	(1.23)	(2.38)	(1.88)	(2.18)	(0.59)	(0.65)	(-0.08)	(1.25)
× $\text{Hierarchy}_\text{T}$	0.57	4.42	3.40	1.02	3.85	2.07	1.78	4.78
	(0.08)	(0.63)	(0.61)	(0.49)	(0.39)	(0.24)	(0.99)	(0.73)
× $\text{Hierarchy}_\text{A}$	-0.90	11.84*	8.04	3.80*	12.74	8.74	4.00**	10.02*
	(-0.13)	(1.93)	(1.62)	(1.85)	(1.48)	(1.14)	(2.27)	(1.81)
× Growth_T	-2.80	7.78	7.33*	0.46	10.58	9.16	1.42	7.76*
	(-0.62)	(1.60)	(1.88)	(0.32)	(1.62)	(1.61)	(1.10)	(1.70)
× Growth_A	4.94	11.74**	8.47**	3.27***	6.81	6.05	0.76	6.76*
	(1.10)	(2.47)	(1.98)	(2.71)	(1.31)	(1.20)	(1.16)	(1.73)
× Size_T	-3.21***	-0.35	-0.03	-0.32	2.87*	2.98**	-0.11	0.15
	(-2.61)	(-0.31)	(-0.03)	(-0.96)	(1.91)	(2.18)	(-0.37)	(0.16)
× Size_A	-0.40	-2.35***	-1.78**	-0.57**	-1.94*	-2.31**	0.37*	-1.03
	(-0.40)	(-2.72)	(-2.43)	(-2.03)	(-1.75)	(-2.19)	(1.76)	(-1.42)
N	2,036	2,036	2,036	2,036	2,036	2,036	2,036	2,036
adj. R^2	0.120	0.336	0.361	0.089	0.302	0.324	0.064	0.354

Table 8: Flow regressions: managers. The table reports the estimated differences in growth rates for managers from *t=-1* to *t=2* between the treated firms for the merged firm. *Merged firm* refers to the combined employment (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). The table reports estimates of θ (*Treatment*) and γ (*Treatment* $\times$ variable of interest) of equation (3) for the dependent variables *Net employment growth* (column 1), *Inflow* (column 2), *External inflow* (column 3), *Internal inflow* (column 4), *Outflow* (column 5), *External outflow* (column 6), *Internal outflow* (column 7), and *Tur*nover as defined in equation (1) (column 8). In all our regressions, we include additional control variables accounting for average employee age (*Age*), employee wage (*Wage*), employee qualification (*Qualification*), and employee education (*Education*) in the target, and the difference between the acquirer and the target. All variables are defined in Table 1. 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 8: Flow regressions: managers.

	Net emp. growth (1)	Inflow (2)	External inflow (3)	Internal inflow (4)	Outflow (5)	External outflow (6)	Internal outflow (7)	Promotion (8)	Demotion (9)	Turnover (10)
Treatment	151.10**	51.10	50.23	0.87	-8.92	-10.98	-1.27	43.40	-47.69**	43.32
	(2.03)	(0.80)	(0.80)	(0.08)	(-0.11)	(-0.14)	(-0.11)	(1.16)	(-1.97)	(0.75)
× Distance	12.67	-9.34	-8.98	-0.37	-14.00	-14.15	0.29	8.20	0.20	-9.51
	(1.17)	(-0.95)	(-0.93)	(-0.29)	(-1.33)	(-1.36)	(0.28)	(1.53)	(0.05)	(-1.23)
× Related	-15.03*	-2.24	-4.79	2.56*	-1.80	-4.91	2.62**	-13.07**	1.52	-3.05
	(-1.77)	(-0.28)	(-0.60)	(1.90)	(-0.18)	(-0.49)	(2.30)	(-2.10)	(0.52)	(-0.46)
× HCR	-1.05	15.17**	16.08**	-0.91	14.02*	14.36*	-0.40	-1.25	0.95	11.76**
	(-0.13)	(2.23)	(2.45)	(-0.60)	(1.65)	(1.75)	(-0.28)	(-0.25)	(0.34)	(2.03)
× $\text{Hierarchy}_{\text{T}}$	-26.76*	-3.19	-2.14	-1.04	9.34	8.65	2.27	-11.15	3.08	-3.32
	(-1.87)	(-0.25)	(-0.17)	(-0.39)	(0.57)	(0.53)	(1.05)	(-1.54)	(0.65)	(-0.28)
× $\text{Hierarchy}_{\text{A}}$	-3.88	4.61	-0.76	5.37*	12.63	8.43	4.14	6.75	2.61	10.12
	(-0.23)	(0.34)	(-0.06)	(1.80)	(0.75)	(0.51)	(1.52)	(0.82)	(0.49)	(0.85)
× Growth_{T}	-11.60	16.67	16.10	0.57	25.31**	24.65**	0.76	2.22	5.18	15.91*
	(-1.11)	(1.64)	(1.64)	(0.31)	(2.01)	(1.98)	(0.44)	(0.34)	(1.36)	(1.68)
× Growth_{A}	-8.77	17.83*	12.42	5.41**	22.97*	19.65	3.22**	4.90	8.53***	24.59**
	(-0.74)	(1.67)	(1.18)	(2.38)	(1.69)	(1.46)	(2.12)	(0.74)	(2.66)	(2.57)
× Size_{T}	-10.78***	-3.96	-3.42	-0.55	5.06*	5.75*	-0.77	-1.63	0.13	-1.83
	(-3.45)	(-1.56)	(-1.42)	(-1.01)	(1.67)	(1.95)	(-1.49)	(-1.09)	(0.12)	(-0.87)
× Size_{A}	0.23	-4.82**	-4.58**	-0.24	-6.42**	-6.06**	-0.33	0.38	1.75*	-2.61
	(0.08)	(-2.02)	(-1.99)	(-0.49)	(-2.08)	(-2.00)	(-0.78)	(0.26)	(1.93)	(-1.24)
N	1,925	1,925	1,925	1,925	1,925	1,925	1,925	1,925	1,925	1,925
adj. R^2	0.098	0.094	0.076	0.197	0.143	0.142	0.129	0.331	0.307	0.080

Table 9: Inflows and outflows. The table reports the regression results of *External Inflow* on outflows from the target and acquirer for seven different groups indicated at the top of the table. All flows are scaled by the total employment of the merged firm. All variables are defined in Table 1. 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 (1)	Manager (2)	HQ (3)	Layer1 (4)	Layer2 (5)	Layer3 (6)	Layer4 (7)
Treatment	1.65	-1.94	-5.05	5.71	-2.32	7.60	-1.47
	(0.55)	(-0.41)	(-1.08)	(1.61)	(-0.71)	(1.43)	(-0.28)
Ext.outflow$_{\mathrm{T}}$	0.13*	0.17**	0.19***	0.23***	0.24***	0.09	0.27***
	(1.88)	(2.19)	(2.68)	(3.22)	(3.42)	(1.19)	(3.33)
Ext. outflow$_{\mathrm{A}}$	0.20***	0.31***	0.35***	0.29***	0.12**	0.17**	0.18**
	(3.20)	(3.83)	(3.92)	(5.02)	(1.97)	(2.43)	(2.41)
Internal outflow$_{\mathrm{T}}$	0.27	-0.13	0.20	0.17	0.39**	0.80*	-0.48*
	(1.23)	(-0.30)	(0.73)	(0.86)	(2.17)	(1.83)	(-1.90)
Internal outflow$_{\mathrm{A}}$	0.31	-0.19	-0.65*	0.12	-0.12	0.71*	-0.01
	(1.26)	(-0.70)	(-1.84)	(0.42)	(-0.55)	(1.81)	(-0.05)
$\times$ Ext. outflow$_{\mathrm{T}}$	-0.08	-0.01	0.04	-0.14**	-0.09	-0.01	-0.04
	(-1.30)	(-0.10)	(0.48)	(-2.04)	(-1.25)	(-0.09)	(-0.48)
$\times$ Ext. outflow$_{\mathrm{A}}$	0.10	0.29**	0.18	-0.01	0.18**	-0.02	0.35**
	(1.48)	(2.42)	(1.56)	(-0.16)	(2.05)	(-0.22)	(2.56)
$\times$ Int. outflow$_{\mathrm{T}}$	-0.12	0.10	0.06	-0.18	-0.20	-0.92**	0.41
	(-0.49)	(0.22)	(0.18)	(-0.79)	(-0.92)	(-2.00)	(1.18)
$\times$ Int. outflow$_{\mathrm{A}}$	0.17	0.18	0.98***	0.27	0.86***	-0.48	0.23
	(0.48)	(0.47)	(2.64)	(0.79)	(3.40)	(-0.75)	(0.71)
N	2,086	1,968	2,050	2,077	2,041	1,980	1,920
adj. R^2	0.386	0.322	0.430	0.437	0.382	0.178	0.321

Table 10: Restructuring the layers of management. Panel A of this table reports results for seven regressions, in which the change in acquirers' hierarchy after the acquisition is measured with different dependent variables. In models (1) and (5), 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 models (2) and (6) (models (3) and (7)) the dependent variable is $D\left(\Delta Layers > 0\right)$ $\left(D\left(\Delta Layers < 0\right)\right)$, a dummy variable that equals one if $\Delta Layers > 0$ ($\Delta Layers < 0$), and zero otherwise. Models (1) to (3) perform OLS regressions, in which the independent variable is the growth in the wage bill (g^{WB}) from t-1 (acquirer) to t+2 (merged firm). Wage bill is the total amount of wages the respective entity pays in a calendar year. Models (5) to (7) perform OLS regressions with two independent variables, the positive and the negative growth in wage bill from t-1 (acquirer) to t+2 (merged firm). Positive (negative) growth in the wage bill is defined as $g^{WB+} = Max\left(g^{WB}, 0\right)$ and negative growth of the wage bill is defined as $g^{WB-} = Min\left(g^{WB}, 0\right)$. Models (4) and (8) are a multinomial logit regressions with a three-level dependent variable defined as +1 if $\Delta Layers > 0$; 0 if $\Delta Layers = 0$; and -1 if $\Delta Layers < 0$. In Panel B, models (1) to (3) repeat the analysis of Panel A, models (1) to (3), and adds the growth in the number of industries g^{NUM} as an additional independent variable. The growth in the number of industries, g^{NUM}, is defined as number of industries in which the merged firm is active in t+2, minus the number of industries the acquirer is active in t-1. Model (4) repeats the analysis of model (4) in Panel A with g^{WB} and g^{NUM} as independent variables. Models (5) to (8) repeat the analysis of models (1) to (4) but change the definition of the independent variables from growth rates to log changes. All models include event year fixed effects. The reported R^2 is an adjusted R^2 for models (1) to (3) and (5) to (7), and a pseudo R^2 for models (4) and (8).

Panel A

	Method	Dependent variable	Independent variables						N	R^2
			g^{WB}		g^{WB+}		g^{WB-}			
			Coefficient	t/z-value	Coefficient	t/z-value	Coefficient	t/z-value		
(1)	OLS	$\Delta Layers$	0.49***	13.55					835	0.185
(2)	Linear probability	$D(\Delta Layers > 0)$	0.19***	9.38					835	0.096
(3)	Linear probability	$D(\Delta Layers < 0)$	-0.07***	-5.45					835	0.036
(4)	Multinomial logit	$\Delta Layers > 0 = +1$	1.63***	7.98					835	0.155
		$\Delta Layers < 0 = -1$	-2.09***	-5.27						
(5)	OLS	$\Delta Layers$			0.53***	12.53	0.29***	2.59	835	0.188
(6)	Linear probability	$D(\Delta Layers > 0)$			0.24***	10.17	-0.05	-0.79	835	0.113
(7)	Linear probability	$D(\Delta Layers < 0)$			-0.03*	-1.81	-0.30***	-7.1	835	0.071
(8)	Multinomial logit	$\Delta Layers > 0 = +1$			1.74***	8.17	-0.56	-0.56	835	0.159
		$\Delta Layers < 0 = -1$			-1.37*	-1.86	-2.60***	-4.44		

Table 10: Restructuring the layers of management. (continued).

Panel B

	Method	Dependent variable	Independent variables				N	R^2
			g^{WB}		g^{NUM}			
			Coefficient	t/z-value	Coefficient	t/z-value		
(1)	OLS	$\Delta Layers$	0.48***	13.35	0.02	0.22	835	0.184
(2)	Linear probability	$D(\Delta Layers > 0)$	0.18***	9	0.08*	1.88	835	0.099
(3)	Linear probability	$D(\Delta Layers < 0)$	-0.08***	-5.46	0.01	0.52	835	0.035
(4)	Multinomial logit	$\Delta Layers > 0 = +1$	-2.14***	-5.28	0.53	0.76	835	0.163
		$\Delta Layers < 0 = -1$	1.58***	7.67	1.46**	2.41		
			$\Delta logWB$		$\Delta logNUM$			
			Coefficient	t/z-value	Coefficient	t/z-value		
(5)	OLS	$\Delta Layers$	0.37***	16.81	0	0.06	835	0.262
(6)	Linear probability	$D(\Delta Layers > 0)$	0.14***	11.38	0.07*	1.84	835	0.145
(7)	Linear probability	$D(\Delta Layers < 0)$	-0.04***	-4.53	0.01	0.33	835	0.024
(8)	Multinomial logit	$\Delta Layers > 0 = +1$	-1.83***	-5.07	0.52	0.81	835	0.179
		$\Delta Layers < 0 = -1$	1.05***	7.73	1.27**	2.41		

Table 11: Employment and growth. This table reports the results of OLS regressions of the growth in normalized number of employees at layer l, in a firm with L layers on the growth of the wage bill, g^{WB}, and event year dummies. Only merged firms that maintain a constant number of layers L layers from $t-1$ (acquirer) until $t+2$ (merged firm) and that have a consecutively ordered layer structure are included in the analysis. With the latter restriction we follow the analysis of Caliendo, Monte, and Rossi-Hansberg (2015) (see their Table 9). Column 3 reports the coefficient on the growth of the wage bill, g^{WB}. The number of employees in a layer is normalized with the number of employees in the highest layer of the respective firm. Hence, we cannot perform regressions for the highest layer ($l = L$). *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Number of	Layer (l)	Growth in normalized number of employees in layer l			
layers (L)		Coefficient	t-value	adj. R^2	N
(1)	(2)	(3)	(4)	(5)	(6)
1	1				
2	1	-0.01	-0.02	0.161	12
2	2				
3	1	-0.19	0.88	0.213	33
3	2	-0.03	1.76	0.340	33
3	3				
4	1	0.52***	8.83	0.274	651
4	2	0.51***	8.29	0.162	651
4	3	0.23***	3.87	0.067	651
4	4				

Table 12: Characteristics of inflows and outflows. This table reports the mean and standard deviations of average employee education and qualification levels as well as average employee age and daily wage (at t=-1) for targets, acquirers, and merged firms. It also reports the average of these variables for the inflows (outflows) from (to) the external labor market 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 1.

		Education index (1)	Qualification index (2)	Age (3)	Wage (4)
Target	Mean at t = -1	2.767	1.912	39.59	90.95
N = 749	SD at t = -1	0.736	0.418	5.29	27.45
	External inflow	2.941	1.986	36.02	79.10
	External outflow	2.865	1.966	39.80	89.83
	Difference	0.076	0.020	-3.77	-10.73
	in % of t = -1	2.7	1.0	-9.5	-11.8
	t-stat	4.31	2.02	-18.23	-11.04
Acquirer	Mean at t = -1	2.970	1.946	39.71	103.98
N = 1007	SD at t = -1	0.801	0.414	4.95	31.03
	External inflow	3.127	2.007	35.11	86.39
	External outflow	3.060	2.000	38.80	97.20
	Difference	0.067	0.008	-3.69	-10.81
	in % of t = -1	2.3	0.4	-9.3	-10.4
	t-stat	5.93	1.19	-26.54	-20.16
Merged	Mean at t = -1	2.825	1.898	39.78	98.50
N = 1022	SD at t = -1	0.695	0.360	4.13	26.00
	External inflow	3.042	1.981	35.08	83.55
	External outflow	2.951	1.967	39.06	94.57
	Difference	0.091	0.013	-3.97	-11.02
	in % of t = -1	3.2	0.7	-10.0	-11.2
	t-stat	9.43	2.65	-32.84	-23.80

D 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). The Imbens-Wooldridge statistic 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

	Wage	Age	Size	Share MQ	Share HQ	Share female
Matched treated target firms ($N = 1,043$)						
Mean	89.33	40.02	101.81	0.63	0.24	0.36
Median	88.19	40.27	40.00	0.69	0.15	0.31
SD	29.12	5.98	273.33	0.24	0.24	0.24
Matched control target firms ($N = 1,043$)						
Mean	86.11	40.06	98.93	0.64	0.23	0.36
Median	85.11	40.13	39.00	0.70	0.14	0.30
SD	31.10	5.57	263.43	0.24	0.24	0.23
Relative difference of mean	0.0360	0.0056	0.0565	0.0280	0.0790	0.0049
Imbens-Wooldridge test	0.08	0.00	0.01	0.03	0.03	0.01

Table OA2: Firm matching success (continued)

Panel B: Acquirer firms

	Wage	Age	Size	Share MQ	Share HQ	Share female
Matched treated acquirer firms ($N = 1,043$)						
Mean	104.45	39.86	463.03	0.58	0.31	0.38
Median	100.73	40.13	117.00	0.63	0.25	0.34
SD	33.54	4.86	1,343.45	0.23	0.25	0.21
Matched control acquirer firms ($N = 1,043$)						
Mean	99.39	40.08	423.98	0.60	0.29	0.38
Median	96.08	40.34	109.00	0.65	0.21	0.33
SD	36.71	4.58	1,256.14	0.23	0.25	0.22
Relative difference of mean	0.0484	0.0056	0.0565	0.0280	0.0790	0.0049
Imbens-Wooldridge test	0.10	0.03	0.02	0.05	0.07	0.01

Table OA3: Firm-level aggregate employee flows for highly-qualified employees.

Entity	Merged	Target		Acquirer		Turnover
Scaled by	Merged (1)	Target (2)	Merged (3)	Acquirer (4)	Merged (5)	Merged (6)
Net employment growth	-6.13** (-2.05)	-52.19*** (-9.65)	-12.45*** (3.94)	14.34*** (3.94)	6.34*** (2.74)	
Inflow	14.77*** (5.47)	2.37 (0.71)	-0.58 (-0.52)	22.03*** (7.19)	0.46 (0.34)	13.61*** (5.53)
External inflow	10.46*** (4.54)	-0.07 (-0.02)	-1.26 (-1.18)	16.98*** (6.50)	15.22*** (6.18)	9.24*** (4.56)
Inflow other firms	7.99*** (4.61)	-2.11 (-0.89)	-1.05 (-1.21)	13.35*** (6.22)	11.57*** (5.68)	7.49*** (5.34)
with wage increase	6.89*** (4.90)	-0.06 (-0.03)	-0.58 (-0.77)	11.53*** (6.58)	8.99*** (5.88)	6.14*** (5.69)
with wage decrease	1.10 (1.52)	-2.05** (-2.01)	-0.47 (-1.63)	1.81** (1.97)	7.42*** (6.25)	1.15*** (2.85)
Inflow new entrant	2.45** (2.46)	2.04 (1.04)	-0.21 (-0.42)	3.60*** (3.20)	1.57** (2.32)	1.62** (1.98)
Internal inflow	4.31*** (5.10)	2.44*** (3.48)	0.67*** (3.26)	5.06*** (4.83)	2.56*** (2.87)	3.92*** (4.93)
Inflow within	1.77** (2.36)	0.58 (1.11)	0.38* (1.94)	1.69** (2.06)	3.66*** (4.44)	1.96*** (2.64)
Inflow between	2.54*** (6.57)	1.85*** (3.95)	0.30*** (4.25)	3.36*** (5.25)	2.26*** (5.85)	0.38* (1.96)
Outflow	20.04*** (5.69)	57.83*** (11.15)	11.06*** (6.00)	6.16 (1.54)	8.73*** (2.99)	
External outflow	15.73*** (4.95)	40.99*** (9.32)	8.74*** (4.90)	3.31 (0.91)	6.60*** (2.63)	
Outflow other firms	13.17*** (5.53)	36.48*** (9.64)	7.81*** (5.59)	4.78* (1.69)	5.17*** (2.70)	
with wage increase	10.66*** (5.32)	26.34*** (8.01)	6.17*** (5.23)	2.91 (1.28)	4.33*** (2.73)	
with wage decrease	2.51*** (2.91)	10.15*** (6.39)	1.64*** (3.01)	1.87 (1.63)	0.84 (1.27)	
Outflow unemployment	2.40 (1.58)	4.51** (2.01)	0.93 (1.08)	-1.47 (-0.83)	1.43 (1.28)	
Internal outflow	4.47*** (5.32)	16.84*** (6.57)	2.32*** (6.51)	2.85*** (3.28)	2.13*** (2.80)	
Outflow within	1.93** (2.57)	0.55 (1.06)	0.34* (1.66)	1.91** (2.33)	1.60** (2.21)	
Outflow between	2.53*** (6.61)	16.29*** (6.20)	1.98*** (1.94)	0.94*** (3.21)	0.53** (2.25)	
N	2,050	1,752	2,050	1,932	2,050	1,968

Table OA4: Flow regressions: all employees. The table reports the estimated differences in growth rates for managers from *t=-1* to *t=2* between the treated firms (Panel A: Merged firm, Panel B: Target, Panel C: Acquirer) and their control firms for all control variables not reported in Table 7. *Merged firm* refers to the combined employment (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). The table reports estimates of θ (*Treatment*) and γ (*Treatment* $\times$ variable of interest) of equation (3) for the dependent variables *Net employment growth* (column 1), *Inflow* (column 2), *External inflow* (column 3), *Internal inflow* (column 4), *Outflow* (column 5), *External outflow* (column 6), *Internal outflow* (column 7), and *Tur*nover as defined in equation (1) (column 8). All variables are defined in Table 1. 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.

Panel A - Merged firm

	Net emp. growth (1)	Inflow (2)	External inflow (3)	Internal inflow (4)	Outflow (5)	External outflow (6)	Internal outflow (7)	Turnover (8)
Treatment	2.12	-34.97	-31.56	-3.41	-37.09	-33.68	-3.41	-27.07
	(0.06)	(-1.07)	(-1.19)	(-0.34)	(-0.78)	(-0.78)	(-0.34)	(-0.88)
$\times$ Age$_{\text{T}}$	0.01	0.53	0.47	0.06	0.52	0.46	0.06	0.39
	(0.02)	(1.24)	(1.22)	(0.43)	(0.79)	(0.73)	(0.43)	(1.04)
$\times$ Age$_{\text{A-T}}$	0.64	0.74*	0.59*	0.14	0.09	-0.05	0.14	0.38
	(1.05)	(1.95)	(1.75)	(1.04)	(0.15)	(-0.09)	(1.04)	(1.20)
$\times$ Wage$_{\text{T}}$	-0.05	0.01	0.02	-0.01	0.06	0.07	-0.01	-0.02
	(-0.39)	(0.10)	(0.30)	(-0.48)	(0.44)	(0.57)	(-0.48)	(-0.31)
$\times$ Wage$_{\text{A-T}}$	-0.06	0.03	0.07	-0.03	0.10	0.13	-0.03	0.00
	(-0.51)	(0.40)	(0.95)	(-1.26)	(0.77)	(1.07)	(-1.26)	(0.02)
$\times$ Qualific.$_{\text{T}}$	0.07	-0.03	0.01	-0.03	-0.09	-0.06	-0.03	-0.11
	(0.38)	(-0.23)	(0.05)	(-0.88)	(-0.45)	(-0.31)	(-0.88)	(-0.95)
$\times$ Qualific.$_{\text{A-T}}$	0.08	-0.03	-0.01	-0.01	-0.10	-0.09	-0.01	-0.08
	(0.46)	(-0.29)	(-0.17)	(-0.40)	(-0.61)	(-0.57)	(-0.40)	(-0.94)
$\times$ Educ.$_{\text{T}}$	0.03	-0.16	-0.10	-0.06	-0.18	-0.12	-0.06	-0.09
	(0.11)	(-0.75)	(-0.56)	(-1.03)	(-0.58)	(-0.43)	(-1.03)	(-0.43)
$\times$ Educ.$_{\text{A-T}}$	0.14	-0.12	-0.07	-0.05	-0.26	-0.21	-0.05	-0.07
	(0.72)	(-1.10)	(-0.74)	(-1.39)	(-1.38)	(-1.17)	(-1.39)	(-0.70)
N	2,036	2,036	2,036	2,036	2,036	2,036	2,036	2,036
adj. R^2	0.154	0.303	0.339	0.076	0.271	0.281	0.076	0.312

Table OA4: Flow regressions: all employees.

Panel B - Target								
	Net emp. growth (1)	Inflow (2)	External inflow (3)	Internal inflow (4)	Outflow (5)	External outflow (6)	Internal outflow (7)	Turnover (8)
Treatment	-29.55	-11.72	-10.39	-1.34	17.82	1.98	15.85***	-8.70
	(-1.42)	(-1.00)	(-0.92)	(-0.56)	(0.96)	(0.11)	(3.04)	(-0.96)
× Age_{T}	0.24	0.23	0.16	0.07	-0.01	0.10	-0.11	0.13
	(0.64)	(1.03)	(0.76)	(1.38)	(-0.03)	(0.29)	(-1.21)	(0.77)
× $\text{Age}_{\text{A-T}}$	0.59	0.35*	0.25	0.10*	-0.24	-0.18	-0.06	0.17
	(1.51)	(1.67)	(1.30)	(1.75)	(-0.66)	(-0.49)	(-0.67)	(1.07)
× Wage_{T}	-0.05	0.09*	0.08**	0.00	0.14*	0.14*	-0.00	0.07**
	(-0.62)	(1.89)	(1.99)	(0.10)	(1.77)	(1.85)	(-0.05)	(2.01)
× $\text{Wage}_{\text{A-T}}$	-0.04	0.12**	0.14***	-0.02	0.16*	0.16*	-0.01	0.09**
	(-0.42)	(2.28)	(2.79)	(-1.19)	(1.83)	(1.89)	(-0.25)	(2.24)
× $\text{Qualific.}_{\text{T}}$	0.05	0.08*	0.08*	0.01	0.03	0.05	-0.02	0.07*
	(0.52)	(1.73)	(1.65)	(0.83)	(0.37)	(0.61)	(-0.99)	(1.82)
× $\text{Qualific.}_{\text{A-T}}$	-0.09	-0.00	0.01	-0.02**	0.09	0.11	-0.02	0.00
	(-0.87)	(-0.07)	(0.28)	(-2.00)	(0.84)	(1.01)	(-1.03)	(0.01)
× Educ._{T}	0.05	-0.02	-0.03	0.01	-0.07	-0.10	0.03	-0.00
	(0.32)	(-0.34)	(-0.51)	(0.63)	(-0.54)	(-0.75)	(0.86)	(-0.05)
× $\text{Educ.}_{\text{A-T}}$	0.12	-0.02	-0.02	0.01	-0.14	-0.13	-0.00	-0.02
	(0.88)	(-0.26)	(-0.38)	(0.42)	(-1.13)	(-1.09)	(-0.19)	(-0.45)
N	2,036	2,036	2,036	2,036	2,036	2,036	2,036	2,036
adj. R^2	0.344	0.392	0.409	0.096	0.537	0.514	0.107	0.446

Panel C - Acquirer								
	Net emp. growth (1)	Inflow (2)	External inflow (3)	Internal inflow (4)	Outflow (5)	External outflow (6)	Internal outflow (7)	Turnover (8)
Treatment	31.66	-23.25	-21.17	-2.08	-54.92	-35.65	-19.26**	-26.30
	(1.04)	(-0.74)	(-0.84)	(-0.21)	(-1.29)	(-0.95)	(-2.35)	(-0.90)
× Age_{T}	-0.22	0.31	0.31	-0.01	0.53	0.36	0.17*	0.29
	(-0.47)	(0.78)	(0.90)	(-0.06)	(1.04)	(0.74)	(1.83)	(0.90)
× $\text{Age}_{\text{A-T}}$	0.06	0.39	0.34	0.05	0.33	0.13	0.20**	0.26
	(0.13)	(1.11)	(1.10)	(0.36)	(0.81)	(0.33)	(2.14)	(0.99)
× Wage_{T}	-0.00	-0.08	-0.06	-0.02	-0.08	-0.06	-0.01	-0.11*
	(-0.01)	(-1.05)	(-0.95)	(-0.64)	(-0.76)	(-0.67)	(-0.69)	(-1.86)
× $\text{Wage}_{\text{A-T}}$	-0.03	-0.09	-0.07	-0.02	-0.06	-0.03	-0.03*	-0.12**
	(-0.33)	(-1.38)	(-1.29)	(-0.73)	(-0.77)	(-0.42)	(-1.76)	(-2.43)
× $\text{Qualific.}_{\text{T}}$	0.01	-0.11	-0.07	-0.04	-0.13	-0.11	-0.01	-0.17
	(0.11)	(-0.92)	(-0.71)	(-1.07)	(-0.71)	(-0.70)	(-0.43)	(-1.58)
× $\text{Qualific.}_{\text{A-T}}$	0.17	-0.02	-0.03	0.00	-0.19	-0.20	0.01	-0.07
	(1.43)	(-0.26)	(-0.35)	(0.12)	(-1.44)	(-1.63)	(0.22)	(-0.97)
× Educ._{T}	-0.02	-0.13	-0.06	-0.07	-0.11	-0.03	-0.09*	-0.11
	(-0.11)	(-0.64)	(-0.36)	(-1.25)	(-0.42)	(-0.11)	(-1.72)	(-0.57)
× $\text{Educ.}_{\text{A-T}}$	0.02	-0.10	-0.05	-0.05*	-0.12	-0.08	-0.04*	-0.07
	(0.13)	(-1.02)	(-0.56)	(-1.71)	(-0.91)	(-0.64)	(-1.73)	(-0.84)
N	2,036	2,036	2,036	2,036	2,036	2,036	2,036	2,036
adj. R^2	0.120	0.336	0.361	0.089	0.302	0.324	0.064	0.354

Table OA5: Flow regressions: managers, acquirer and target level. The table reports the estimated differences in growth rates for managers from *t=-1* to *t=2* between the treated firms for the target (Panel A) and the acquirer (Panel B). All rates are scaled by the combined employment of target and acquirer (i.e., the merged firm). The table reports estimates of θ (*Treatment*) and γ (*Treatment* $\times$ variable of interest) of equation (3) for the dependent variables *Net employment growth* (column 1), *Inflow* (column 2), *External inflow* (column 3), *Internal inflow* (column 4), *Outflow* (column 5), *External outflow* (column 6), *Internal outflow* (column 7), and *Tur*nover as defined in equation (1) (column 8). In all our regressions, we include additional control variables accounting for average employee age (*Age*), employee wage (*Wage*), employee qualification (*Qualification*), and employee education (*Education*) in the target, and the difference between the acquirer and the target. All variables are defined in Table 1. 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.

Panel A - Target										
	Net emp. growth (1)	Inflow (2)	External inflow (3)	Internal inflow (4)	Outflow (5)	External outflow (6)	Internal outflow (7)	Promotion (8)	Demotion (9)	Turnover (10)
Treatment	42.07	7.80	6.82	0.98	-14.67	-21.16	6.49	-8.45	-28.05	3.22
	(0.98)	(0.32)	(0.28)	(0.23)	(-0.43)	(-0.63)	(0.70)	(-0.48)	(-1.53)	(0.20)
× Distance	6.77	-0.74	-0.93	0.19	-3.91	-4.31	0.40	5.28*	1.68	-0.98
	(1.00)	(-0.21)	(-0.27)	(0.32)	(-0.72)	(-0.80)	(0.60)	(1.92)	(0.63)	(-0.43)
× Related	-7.75	2.81	2.11	0.70	4.05	3.37	0.68	-5.76***	0.74	0.68
	(-1.49)	(0.88)	(0.68)	(1.04)	(0.84)	(0.72)	(0.81)	(-2.75)	(0.39)	(0.28)
× HCR	-3.21	-1.01	-0.66	-0.36	3.95	3.58	0.37	0.53	-1.23	1.11
	(-0.69)	(-0.41)	(-0.28)	(-0.55)	(0.96)	(0.92)	(0.40)	(0.25)	(-0.67)	(0.58)
× $\text{Hierarchy}_{\text{T}}$	-4.16	0.06	0.69	-0.63	-0.71	-0.19	-0.53	-2.54	2.39	-1.25
	(-0.47)	(0.01)	(0.15)	(-0.70)	(-0.08)	(-0.02)	(-0.38)	(-0.67)	(0.85)	(-0.31)
× $\text{Hierarchy}_{\text{A}}$	-11.48	-10.61*	-10.21*	-0.40	1.01	-1.84	2.85	3.52	3.38	-5.45
	(-1.05)	(-1.93)	(-1.93)	(-0.36)	(0.11)	(-0.21)	(1.27)	(0.60)	(0.77)	(-1.29)
× Growth_{T}	-2.92	-1.80	-3.29	1.49*	-4.72	-4.72	-0.00	-1.34	4.50*	-1.50
	(-0.51)	(-0.62)	(-1.22)	(1.84)	(-1.05)	(-1.07)	(-0.00)	(-0.67)	(1.92)	(-0.73)
× Growth_{A}	-9.71	-3.51	-3.37	-0.14	3.95	1.90	2.05*	0.67	2.92	0.23
	(-1.16)	(-0.72)	(-0.69)	(-0.26)	(0.55)	(0.27)	(1.72)	(0.20)	(1.20)	(0.07)
× Size_{T}	-7.06***	-1.99**	-2.12**	0.13	3.41**	3.52***	-0.11	-1.71**	-0.05	-0.56
	(-3.81)	(-2.00)	(-2.34)	(0.40)	(2.36)	(2.58)	(-0.34)	(-1.97)	(-0.08)	(-0.86)
× Size_{A}	2.87	-1.35	-1.14	-0.21	-3.87**	-3.40**	-0.47	1.16	0.80	-0.77
	(1.39)	(-1.22)	(-1.08)	(-0.69)	(-2.20)	(-1.98)	(-1.60)	(1.27)	(1.09)	(-0.92)
N	1,925	1,925	1,925	1,925	1,925	1,925	1,925	1,925	1,925	1,925
adj. R^2	0.140	0.197	0.195	0.096	0.251	0.250	0.070	0.199	0.017	0.214

Table OA5: Flow regressions: managers, acquirer and target level (continued).

Panel B - Acquirer

	Net emp. growth (1)	Inflow (2)	External inflow (3)	Internal inflow (4)	Outflow (5)	External outflow (6)	Internal outflow (7)	Promotion (8)	Demotion (9)	Turnover (10)
Treatment	109.03*	43.30	43.40	-0.11	5.75	13.51	-7.76	51.85	-19.63	30.97
	(1.82)	(0.71)	(0.72)	(-0.01)	(0.08)	(0.18)	(-1.09)	(1.58)	(-1.07)	(0.56)
× Distance	5.90	-8.61	-8.04	-0.56	-10.09	-9.98	-0.11	2.92	-1.49	-9.45
	(0.70)	(-0.95)	(-0.90)	(-0.50)	(-1.09)	(-1.09)	(-0.13)	(0.61)	(-0.44)	(-1.27)
× Related	-7.28	-5.04	-6.90	1.86	-5.85	-7.79	1.94**	-7.31	0.77	-2.78
	(-1.05)	(-0.67)	(-0.93)	(1.58)	(-0.67)	(-0.90)	(2.46)	(-1.26)	(0.32)	(-0.45)
× HCR	2.16	16.19**	16.74***	-0.55	10.07	10.84	-0.77	-1.78	2.18	9.09*
	(0.33)	(2.48)	(2.66)	(-0.41)	(1.37)	(1.53)	(-0.71)	(-0.39)	(0.90)	(1.66)
× $\text{Hierarchy}_{\text{T}}$	-22.61**	-3.25	-2.84	-0.41	10.06	7.26	2.80	-8.61	0.69	-1.54
	(-2.02)	(-0.26)	(-0.23)	(-0.16)	(0.68)	(0.49)	(1.64)	(-1.41)	(0.17)	(-0.14)
× $\text{Hierarchy}_{\text{A}}$	7.60	15.22	9.45	5.77**	11.62	10.33	1.29	3.23	-0.77	14.28
	(0.62)	(1.18)	(0.75)	(2.07)	(0.79)	(0.71)	(0.77)	(0.57)	(-0.20)	(1.28)
× Growth_{T}	-8.68	18.47*	19.39**	-0.92	30.03***	29.27**	0.76	3.55	0.68	19.09**
	(-1.00)	(1.85)	(2.00)	(-0.54)	(2.59)	(2.56)	(0.54)	(0.58)	(0.20)	(2.07)
× Growth_{A}	0.94	21.34**	15.78	5.56**	19.02*	17.85*	1.17	4.23	5.62**	22.74**
	(0.12)	(2.16)	(1.63)	(2.50)	(1.79)	(1.70)	(1.27)	(0.73)	(2.23)	(2.50)
× Size_{T}	-3.72	-1.97	-1.30	-0.67	1.65	2.31	-0.66	0.08	0.18	-1.01
	(-1.51)	(-0.85)	(-0.58)	(-1.53)	(0.62)	(0.89)	(-1.61)	(0.06)	(0.19)	(-0.50)
× Size_{A}	-2.64	-3.47	-3.44	-0.02	-2.55	-2.69	0.14	-0.77	0.95	-1.24
	(-1.30)	(-1.62)	(-1.63)	(-0.06)	(-1.08)	(-1.17)	(0.42)	(-0.68)	(1.44)	(-0.64)
N	1,925	1,925	1,925	1,925	1,925	1,925	1,925	1,925	1,925	1,925
adj. R^2	0.060	0.092	0.061	0.223	0.127	0.114	0.150	0.312	0.268	0.056

Table OA6: **Flow regressions: highly-qualified employees.** The table reports the estimated differences in growth rates for highly qualified employees from *t=-1* to *t=2* between the treated firms for the merged firm (Panel A), the target (Panel B), and the acquirer (Panel C). High qualification is defined in Appendix A.2. All rates are scaled by the combined employment of target and acquirer (i.e., the merged firm). The table reports estimates of θ (*Treatment*) and γ (*Treatment* $\times$ variable of interest) of equation (3) for the dependent variables *Net employment growth* (column 1), *Inflow* (column 2), *External inflow* (column 3), *Internal inflow* (column 4), *Outflow* (column 5), *External outflow* (column 6), *Internal outflow* (column 7), and *Tur*nover as defined in equation (1) (column 8). In all our regressions, we include additional control variables accounting for average employee age (*Age*), employee wage (*Wage*), employee qualification (*Qualification*), and employee education (*Education*) in the target, and the difference between the acquirer and the target. All variables are defined in Table 1. 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.

Panel A - Merged firm

	Net emp. growth (1)	Inflow (2)	External inflow (3)	Internal inflow (4)	Outflow (5)	External outflow (6)	Internal outflow (7)	Promotion (8)	Demotion (9)	Turnover (10)
Treatment	63.59	39.70	48.35	-8.65	-8.27	8.78	-11.78	-15.28	-30.90	38.93
	(1.02)	(0.80)	(1.11)	(-0.56)	(-0.13)	(0.15)	(-0.79)	(-0.48)	(-1.52)	(0.88)
$\times$ Distance	0.10	-4.92	-4.19	-0.73	-3.46	-2.31	-1.24	0.89	-0.67	-6.16
	(0.01)	(-0.81)	(-0.78)	(-0.45)	(-0.42)	(-0.30)	(-0.79)	(0.25)	(-0.24)	(-1.21)
$\times$ Related	-7.95	2.87	1.13	1.74	3.67	0.76	2.90**	-5.96*	1.19	2.46
	(-1.22)	(0.56)	(0.25)	(1.18)	(0.53)	(0.12)	(2.11)	(-1.74)	(0.58)	(0.54)
$\times$ HCR	2.08	11.21**	10.07**	1.13	14.17*	12.55*	1.89	0.91	-4.13*	11.43**
	(0.33)	(1.98)	(2.04)	(0.66)	(1.91)	(1.86)	(1.09)	(0.28)	(-1.90)	(2.20)
$\times$ $\text{Hierarchy}_\text{T}$	-17.15	-16.22	-15.73*	-0.49	-7.25	-8.37	1.40	-1.94	6.25	-14.68
	(-1.37)	(-1.62)	(-1.71)	(-0.20)	(-0.51)	(-0.61)	(0.74)	(-0.32)	(1.49)	(-1.61)
$\times$ $\text{Hierarchy}_\text{A}$	3.60	4.85	2.15	2.70	3.47	2.11	0.93	2.35	0.13	3.61
	(0.27)	(0.49)	(0.24)	(0.97)	(0.25)	(0.16)	(0.36)	(0.46)	(0.03)	(0.39)
$\times$ Growth_T	-4.46	22.61**	20.22**	2.39	22.92*	19.68*	3.74	2.54	6.70**	19.73*
	(-0.54)	(2.11)	(2.36)	(0.67)	(1.74)	(1.77)	(1.00)	(0.45)	(2.35)	(1.89)
$\times$ Growth_A	-10.14	18.07*	11.69	6.38**	27.57**	22.07*	5.17**	4.27	4.91*	19.88**
	(-1.15)	(1.68)	(1.16)	(2.48)	(2.03)	(1.68)	(2.37)	(0.89)	(1.95)	(1.98)
$\times$ Size_T	-7.58***	-1.28	-1.12	-0.16	6.25**	6.28***	-0.26	0.82	0.86	-0.41
	(-3.16)	(-0.69)	(-0.67)	(-0.33)	(2.51)	(2.69)	(-0.53)	(0.77)	(1.23)	(-0.25)
$\times$ Size_A	3.13	-2.77	-2.74	-0.03	-6.35**	-6.29**	-0.15	0.86	1.31*	-1.83
	(1.42)	(-1.24)	(-1.30)	(-0.07)	(-2.23)	(-2.29)	(-0.29)	(1.01)	(1.88)	(-0.87)
N	2,003	2,003	2,003	2,003	2,003	2,003	2,003	2,003	2,003	2,003
adj. R^2	0.124	0.183	0.183	0.133	0.176	0.178	0.144	0.372	0.426	0.194

Table OA6: Flow regressions: highly-qualified employees (continued).

Panel B - Target	Net emp. growth (1)	Inflow (2)	External inflow (3)	Internal inflow (4)	Outflow (5)	External outflow (6)	Internal outflow (7)	Promotion (8)	Demotion (9)	Turnover (10)
Treatment	-23.85	17.06	16.51	0.55	45.93	34.05	11.88	-10.81	-15.83	12.01
	(-0.71)	(0.97)	(0.97)	(0.22)	(1.65)	(1.23)	(1.48)	(-0.90)	(-0.98)	(0.96)
× Distance	1.09	-1.59	-1.62	0.03	-0.04	0.13	-0.17	3.30*	0.66	-2.27
	(0.21)	(-0.63)	(-0.66)	(0.07)	(-0.01)	(0.03)	(-0.23)	(1.95)	(0.34)	(-1.26)
× Related	-7.20*	2.83	2.47	0.37	7.22*	6.88*	0.34	-1.74	1.08	2.99*
	(-1.72)	(1.18)	(1.07)	(0.79)	(1.87)	(1.82)	(0.45)	(-1.36)	(0.75)	(1.67)
× HCR	0.01	-0.53	-0.44	-0.10	3.07	2.66	0.41	1.09	-2.53	0.68
	(0.00)	(-0.27)	(-0.23)	(-0.23)	(0.91)	(0.81)	(0.58)	(0.91)	(-1.60)	(0.45)
× $\text{Hierarchy}_{\text{T}}$	-3.18	-4.30	-2.98	-1.32**	-4.21	-2.98	-1.23	-0.04	3.06	-3.98
	(-0.43)	(-1.08)	(-0.81)	(-1.98)	(-0.61)	(-0.44)	(-1.08)	(-0.02)	(1.20)	(-1.28)
× $\text{Hierarchy}_{\text{A}}$	-0.80	-5.36	-5.23	-0.13	-4.56	-5.46	0.90	1.30	1.30	-2.77
	(-0.09)	(-1.40)	(-1.38)	(-0.28)	(-0.54)	(-0.66)	(0.61)	(0.35)	(0.33)	(-0.90)
× Growth_{T}	1.04	0.71	-0.18	0.89*	-4.63	-4.04	-0.60	0.16	4.47**	-0.17
	(0.22)	(0.27)	(-0.07)	(1.66)	(-1.19)	(-1.05)	(-0.71)	(0.12)	(2.38)	(-0.09)
× Growth_{A}	-8.05	-1.47	-1.55	0.09	5.84	3.43	2.41**	1.41	2.15	-0.23
	(-1.22)	(-0.49)	(-0.52)	(0.21)	(0.91)	(0.54)	(2.10)	(0.60)	(0.92)	(-0.09)
× Size_{T}	-4.48***	-0.12	-0.28	0.16	4.28***	4.05***	0.23	0.19	0.26	0.44
	(-2.99)	(-0.16)	(-0.40)	(0.78)	(3.43)	(3.35)	(0.85)	(0.39)	(0.53)	(0.78)
× Size_{A}	5.58***	-0.37	-0.19	-0.18	-5.92***	-5.17***	-0.74***	0.63	0.60	-0.39
	(3.58)	(-0.51)	(-0.27)	(-1.36)	(-4.31)	(-3.82)	(-2.93)	(1.29)	(1.03)	(-0.67)
N	2,003	2,003	2,003	2,003	2,003	2,003	2,003	2,003	2,003	2,003
adj. R^2	0.201	0.283	0.283	0.094	0.343	0.326	0.125	0.212	0.141	0.321

Table OA6: Flow regressions: highly-qualified employees (continued).

Panel C - Acquirer

	Net emp. growth (1)	Inflow (2)	External inflow (3)	Internal inflow (4)	Outflow (5)	External outflow (6)	Internal outflow (7)	Promotion (8)	Demotion (9)	Turnover (10)
Treatment	87.44*	22.64	31.84	-9.20	-54.20	-30.54	-23.66*	-4.47	-15.07	19.30
	(1.70)	(0.48)	(0.78)	(-0.60)	(-0.94)	(-0.59)	(-1.89)	(-0.14)	(-0.95)	(0.45)
× Distance	-1.00	-3.33	-2.57	-0.76	-3.42	-2.35	-1.07	-2.42	-1.33	-3.71
	(-0.15)	(-0.59)	(-0.52)	(-0.49)	(-0.50)	(-0.37)	(-0.77)	(-0.73)	(-0.60)	(-0.81)
× Related	-0.75	0.03	-1.34	1.37	-3.55	-6.10	2.55**	-4.22	0.11	-0.13
	(-0.15)	(0.01)	(-0.34)	(0.98)	(-0.63)	(-1.18)	(2.21)	(-1.29)	(0.07)	(-0.03)
× HCR	2.07	11.74**	10.51**	1.23	11.10*	9.62*	1.48	-0.18	-1.61	9.53*
	(0.43)	(2.17)	(2.25)	(0.73)	(1.75)	(1.73)	(0.93)	(-0.06)	(-0.95)	(1.92)
× $\text{Hierarchy}_{\text{T}}$	-13.97	-11.92	-12.75	0.83	-3.03	-5.66	2.63*	-1.90	3.19	-11.71
	(-1.39)	(-1.23)	(-1.43)	(0.36)	(-0.26)	(-0.50)	(1.74)	(-0.33)	(0.88)	(-1.33)
× $\text{Hierarchy}_{\text{A}}$	4.41	10.22	7.39	2.83	8.03	8.00	0.03	1.05	-1.17	6.75
	(0.48)	(1.10)	(0.90)	(1.03)	(0.72)	(0.78)	(0.02)	(0.25)	(-0.39)	(0.79)
× Growth_{T}	-5.50	21.90**	20.40**	1.50	27.55**	23.22**	4.33	2.38	2.24	20.82**
	(-0.82)	(2.10)	(2.48)	(0.42)	(2.23)	(2.31)	(1.19)	(0.43)	(0.88)	(2.03)
× Growth_{A}	-2.10	19.54*	13.25	6.29**	21.74**	18.98*	2.76	2.86	2.76	16.68*
	(-0.34)	(1.89)	(1.38)	(2.48)	(2.03)	(1.87)	(1.51)	(0.64)	(1.51)	(1.72)
× Size_{T}	-3.10*	-1.16	-0.84	-0.32	1.97	2.46	-0.49	0.63	0.60	-0.98
	(-1.67)	(-0.67)	(-0.53)	(-0.70)	(0.93)	(1.26)	(-1.18)	(0.64)	(0.99)	(-0.62)
× Size_{A}	-2.45	-2.40	-2.55	0.15	-0.43	-1.03	0.60	0.23	0.71	-0.37
	(-1.59)	(-1.16)	(-1.31)	(0.28)	(-0.19)	(-0.49)	(1.34)	(0.28)	(1.43)	(-0.19)
N	2,003	2,003	2,003	2,003	2,003	2,003	2,003	2,003	2,003	2,003
adj. R^2	0.073	0.205	0.199	0.140	0.199	0.204	0.152	0.304	0.408	0.208

Table OA7: Explaining target closure. The table reports the results for a linear probability model of *Target closure*. All variables are defined in Table 1. 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.

	Target closure		
	(1)	(2)	(3)
Treatment	0.7857***	0.7534***	1.1235***
	(3.02)	(2.63)	(3.79)
× Age_{T}	-0.0052	-0.0049	-0.0068
	(-1.04)	(-0.95)	(-1.32)
× $\text{Age}_{\text{A-T}}$	-0.0096**	-0.0099**	-0.0108***
	(-2.32)	(-2.37)	(-2.59)
× Wage_{T}	-0.0016	-0.0019*	-0.0011
	(-1.53)	(-1.73)	(-0.98)
× $\text{Wage}_{\text{A-T}}$	-0.0008	-0.0010	-0.0005
	(-0.95)	(-0.96)	(-0.52)
× $\text{Qualification}_{\text{T}}$	0.0003	-0.0002	-0.0002
	(0.23)	(-0.11)	(-0.16)
× $\text{Qualification}_{\text{A-T}}$	0.0007	0.0005	0.0006
	(0.68)	(0.45)	(0.53)
× $\text{Education}_{\text{T}}$	0.0012	0.0015	0.0006
	(0.72)	(0.85)	(0.39)
× $\text{Education}_{\text{A-T}}$	0.0004	0.0005	-0.0003
	(0.28)	(0.38)	(-0.21)
× Distance	-0.0004***	-0.0003**	-0.0004***
	(-3.00)	(-2.45)	(-3.10)
× Related	-0.0465	-0.0435	-0.0466
	(-1.18)	(-1.11)	(-1.20)
× HCR	0.0303	0.0281	0.0488
	(0.85)	(0.79)	(1.39)
× $\text{Hierarchy}_{\text{T}}$	-0.0445	-0.0283	-0.0501
	(-0.62)	(-0.35)	(-0.64)
× $\text{Hierarchy}_{\text{A}}$	0.0286	0.0182	0.0146
	(0.53)	(0.28)	(0.23)
× Growth_{T}	-0.0824**	-0.0772	-0.0892*
	(-2.04)	(-1.56)	(-1.83)
× Growth_{A}	0.0495	0.0535	0.0208
	(1.38)	(1.28)	(0.48)
× Size_{T}			-0.0399***
			(-2.85)
× Size_{A}			-0.0275***
			(-2.60)
N	2,036	2,036	2,036
adj. R^2	0.138	0.166	0.199

Table OA8: Employment and growth. This table reports the results of OLS regressions of the detrended log change in normalized hours worked at layer l, in a firm with L layers on the detrended log change in the wage bill and no constant. The dependent (independent) variable is detrended with the average number of hours worked (wage bill) across all layers of all acquirer firms (treated and control). Only merged firms that maintain a constant number of layers L layers from $t-1$ (acquirer) until $t+2$ (merged firm) and that have a consecutively ordered layer structure are included in the analysis. With the latter restriction we follow the analysis of Caliendo, Monte, and Rossi-Hansberg (2015) (see their Table 9). Column 3 reports the coefficient on the log change in detrended wage bill. The hours worked in a layer is normalized with the hours worked in the highest layer of the respective firm. Hence, we cannot perform regressions for the highest layer ($l = L$). *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Number of	Layer (l)	Detrended log change in normalized hours worked in layer l			
layers (L)		Coefficient	t-value	adj. R^2	N
(1)	(2)	(3)	(4)	(5)	(6)
1	1				
2	1	-0.97	-1.47	-0.062	12
2	2				
3	1	0.43	1.00	0.002	33
3	2	1.30**	2.26	0.083	33
3	3				
4	1	0.66***	9.79	0.086	651
4	2	0.65***	9.66	0.095	651
4	3	0.41***	6.00	0.022	651
4	4				