Arbitraging Labor Markets

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Keywords: Business groups, location, employment, internal labor markets

JEL Classification: G30, G34, J21, J24, J61, M51

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Arbitraging Labor Markets*

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Abstract

We develop a new rationale for firms to operate in multiple locations within the same country. We show that business group firms relocate operations and grow less if firms of the same group in other local labor markets offer a better labor supply, an improved fit between the requirements of the firm and the local labor force, and lower labor costs. The first two aspects are more important than costs; hence, business groups primarily address their access to human capital. Relocation is concentrated in industries with lower asset tangibility, in high-skilled jobs, and in business groups with decentralized managerial functions. Local labor conditions are of similar importance to and distinct from agglomeration economies. Variation in employment growth rates is associated with changes in hiring and separations, whereas internal transfers of employees account for only a small portion of the variation, as business groups predominantly move jobs, but not employees, between their locations. As such, they arbitrage local labor markets.

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1 Introduction

Why do many firms span multiple locations when distance raises information and coordination costs? A large literature has documented that operating across multiple locations is costly and that geographic proximity is valuable for decision-making. For example, M&As of more proximate firms create more value (Kang and Kim, 2008), proximity of plants to headquarters improves organizational efficiency (Gumpert et al., 2022) and investment efficiency (Giroud, 2013), and capital reallocation favors subsidiaries closer to headquarters (Giroud and Mueller, 2015). More generally, geographic proximity improves decision-making.[1] While some multi-location firms may benefit from proximity to customers and suppliers to justify the costs of geographic dispersion, the general prevalence of such firms is puzzling.

In this paper, we offer a new explanation: Multi-location firms improve efficiency by facilitating the transfer of operations across local labor markets. Labor is immobile, since employees rarely commute long distances or change residence, which makes moving employees closer to firms' operations difficult.[2] Instead, multi-location firms have the unique advantage that they can move operations closer to locations where suitable employees are available and cost less without incurring the fixed costs of entering a new location: They arbitrage local labor markets.

The relocation of roughly 2,600 jobs by BASF illustrates this process. In 2023, the firm laid off a similar number of administrative staff at its headquarters in Ludwigshafen, while simultaneously opening a "service hub" in Berlin. The move targeted skilled administrative workers who were substantially cheaper, locally available in greater numbers, and more likely to have international experience, in a city where the firm already operated.[3] The core prediction from this argument is that firms respond to variations in the costs and availability of employees across their operating locations by expanding or shrinking these locations. We test this hypothesis using multi-location business groups in Germany.

We study a sample of around 23,000 firms affiliated to more than 7,000 business groups (BGs) in Germany over the period from 2005 to 2017. German business groups are an ideal laboratory to study this question, because they have multiple, independent firms within the

[1] This has also been shown for shareholder monitoring in corporate governance (John et al., 2011; Alam et al., 2014), venture capital (Bernstein et al., 2016) and fund management (Ellis et al., 2020).

[2] See Alesina et al. (2015) for an international study of the geographic mobility of workers and Prager and Schmitt (2021), Azar et al. (2022), and Rinz (2022) for US-based studies that also define labor markets at the local level for the same reason. Even professional workers are remarkably immobile, see (Yonker, 2017) for evidence on CEOs and (Chen et al., 2026) for SEC attorneys.

[3] See Melissa Eddy, "BASF to Cut 2,600 Jobs after a Year of High Energy Costs," *New York Times*, February 23, 2023 (online edition), https://www.nytimes.com/2023/02/24/world/europe/basf-layoffs-germany.html; and Alix Faßmann, "BASF eröffnet neuen Standort für flexible Arbeitszeiten und moderne Bürowelt," Der Tagesspiegel, November 23, 2023, https://www.tagesspiegel.de/berlin/basf-eroffnet-neuen-standort-fur-flexible-arbeitszeiten-moderne-burowelt-10822234.html.

same country and thus share company law and labor regulations, which allows for cleaner identification.[4] Moreover, business groups allow us to relatively cleanly identify entities that span multiple locations for operational reasons, whereas establishments that are not incorporated as independent firms often operate in multiple locations to achieve closer proximity to customers, such as chain stores or gas stations.

Following the literature, we define a business group as a collection of firms–at least two–that share the same ultimate corporate owner. We create an employer-employee matched data set and study the employment growth and job flows of business group firms across 400 German counties, which we identify as local labor markets. Local labor markets are then characterized from the perspective of each business group firm along three dimensions: labor costs, labor market shortage (or tightness), and labor fit–how well the labor force fits the requirement of the firm. We refer to these three dimensions comprehensively as *local labor market conditions* and show that the growth of business group firms depends systematically on how any particular firm relates to the other firms in the same group along these three dimensions: business group firms grow their workforce faster if they offer more attractive labor market conditions for the operations of *other* firms in the group, and they grow more slowly if other firms in the business group offer more attractive conditions for their own operations. We conclude that business group structures may create efficiency gains by arbitraging differences between local labor markets.

We begin by analyzing employment growth at the *intensive* margin, i.e., we ask how existing business group firms grow depending on their own and their business group members' local labor market conditions, holding the membership of the firm fixed. We refer to growth through entering and exiting locations as the *extensive* margin. We ask which firms become donors of jobs and hypothesize that any focal firm grows more slowly if other firms in the same group offer better labor market conditions in the locations where they operate. Similarly, we ask which firms become recipients of jobs from other firms in the same group and hypothesize that a focal firm offering better labor market conditions for particular operations compared to other group firms should attract these operations and grow faster. Our findings confirm these hypotheses. Firms that offer better labor-market supply and labor fit to other group firms grow faster, whereas firms that suffer from worse conditions along these dimensions grow more slowly. These effects are also economically important: on average, each variable accounts for about 20% (40%) of mean (median) employment growth. Interestingly, we find

[4]In Germany, both company law and labor regulations are decided at the federal level and member states cannot enact legislation in these areas (see Basic Law for the Federal Republic of Germany, Article 74, paragraph 1, no. 11 and 12). This advantage stands in contrast to the literature on offshoring, since relocation decisions across countries always involve multiple margins of adjustment, such as taxation; labor-related and other regulations; and proximity to customers, suppliers, and natural resources. See the methodological discussions in Antràs and Helpman (2004) and Hummels et al. (2018).

significant results for labor costs only on the donor side: firms with high labor costs grow more slowly and lose operations to other group firms, whereas those that offer lower labor costs to other group firms do not grow significantly faster. Hence, business groups reallocate operations in response to changing local labor market conditions, but addressing access to human capital appears to be more important than simply reducing costs.

An important confounding factor for the local labor market conditions on which we focus are agglomeration economies, which have been widely studied in the literature and build on the notion that larger concentrations of economic activities create positive externalities from proximity to customers, suppliers, natural resources, or, in our case, the improved matching in local labor markets. We want to separate the labor-related benefits offered by other business group firms from those arising from agglomeration economies. We control for agglomeration economies by including year times county and year times industry fixed effects in all regressions, which control for time-varying economic conditions at the industry and at the county level, including agglomeration economies. In addition to these controls, we construct measures of agglomeration benefits in relation to other business group firms in parallel to the three labor-related measures. We find that the effects of our business-group level measures of agglomeration economies are comparable in size to those for variables that measure labor-related benefits, which remain highly significant. Hence, the labor-related effects we document are different from and prevail in addition to agglomeration economies.

After establishing our main result, we refine the analysis and ask how the relocation of operations depends on the type of operations and the composition of the workforce. To begin, we conjecture that business groups are more likely to move operations that involve lower physical relocation costs. Several sample splits provide evidence for this hypothesis by showing that operations with lower capital intensity and less tangible assets are more likely to be moved. Hence, business groups appear to trade off the benefits from avoiding constraints in local labor markets and the costs of relocation.

Next, we ask how the movement of operations depends on the characteristics of the labor force and build on two different strands of the literature, which have developed competing predictions. The offshoring literature associates relocation decisions mainly with the objective of reducing labor costs, arguably the most important criterion in the low-skill segment of the labor market. By contrast, the literature on search and matching models emphasizes that skill mismatch and labor shortages dominate in the high-skill segment of the labor market. We analyze employment growth for different subsamples defined by education, qualification, task complexity, and the distinction between managerial and non-managerial functions. Our findings unequivocally support the second argument: The relocation effects we document are concentrated in high-skilled jobs with high task complexity, which emphasizes skill matching

and shortages, consistent with our earlier finding that cost-related variables are less important.

Relatedly, we also ask how evenly managerial functions are distributed within business groups and distinguish groups in which managerial capabilities such as human-resource management and accounting are skewed toward one group firm from those in which these functions are evenly distributed. We find that relocation occurs predominantly in business groups with decentralized management functions. Our interpretation of this finding is that relocation requires local expertise and managerial capabilities, which are lacking in firms that function merely as operating satellites of a dominant apex firm.

Further, we break up labor flows and distinguish between internal and external growth, building on the literature on internal labor markets in business groups. We are interested in this distinction, because several recent papers have emphasized the importance of internal labor markets in business groups for the ability of these firms to capture growth opportunities or to provide employment insurance to their employees (e.g., Cestone et al., 2024; Beaumont et al., 2025). Specifically, we define growth as internal if it results from employees who migrate between firms that belong to the same business group, and as external if it results from separations to and the hiring of employees from the external labor market, e.g., other firms. Surprisingly, we find that the observations we report above are mostly driven by growth through the external labor market. About 80% of the size of the effects we report above comes from external employment growth, and only 20% can be attributed to internal transfers. We conclude from this observation that business groups mostly move jobs but not employees across locations.

In the final set of analyses, we address growth at the extensive margin and analyze business groups' decisions to buy or set up firms in new locations in which the group was not present before (referred to as *entry*), or sell or close firms and thereby leave locations altogether (referred to as *exit*). We expect that growth at the intensive and the extensive margins should respond to the same drivers. However, entry and exit decisions arguably involve higher fixed costs from setting up and closing firms compared to relocation decisions that affect only the intensive margin. Hence, we hypothesize that decisions at the extensive margin only respond to relatively persistent differences in labor market conditions. We find that labor market conditions are of first-order importance and highly significant for growth at the extensive margin. Business groups are more (less) likely to exit local labor markets with higher (lower) labor costs, worse (better) labor supply, and labor fit. Importantly, labor costs are more important at the extensive than at the intensive margin whereas labor shortages are transitory and do not affect growth at the extensive margin. Hence, while relocation decisions at the intensive and the extensive margins are driven by overlapping sets

of variables, these variables have different importance, indicating the different economics of these margins of improvement.

We provide some extensions and robustness checks to investigate potential limitations of our baseline analysis. Most importantly, we apply a wider definition of local labor markets, in which we assume that firms cannot only recruit workers from (or lose workers to other firms in) the county in which they are located, but also from neighboring counties. Our baseline analysis lacks a counterfactual, but we provide a robustness check in which we match business group firms to standalone firms to rule out the possibility that our findings could be attributed to (macro)economic or demographic factors that business group firms share with similar standalone firms. We recognize that location decisions are not only present in business groups but also in multi-location conglomerates that do not organize their subsidiaries as legally separate entities. We analyze a sample of such multi-location non-business group firms and show qualitatively similar results. Finally, we investigate alternative measures for the fit of the workforce, labor supply, and agglomeration economies. The qualitative conclusions from our baseline analysis are not affected in these extensions and robustness checks. The quantitative deviations from the baseline analysis are mostly small, and we discuss the few cases in which we observe larger deviations.

Discussion of the literature

This paper pursues a new explanation for why firms span multiple, distant locations. The existing literature emphasizes that geographical proximity reduces information and coordination frictions. For example, proximity facilitates monitoring and improves investment efficiency (Giroud, 2013), tilts internal capital reallocation towards subsidiaries closer to headquarters (Landier et al., 2009; Giroud and Mueller, 2015), and improves organizational efficiency (Gumpert et al., 2022). Local acquirers create more value and engage more actively in post-acquisition governance than distant acquirers (Kang and Kim, 2008). Firms located far from major financial centers adopt higher payout policies when agency conflicts are severe (John et al., 2011), and boards with fewer local directors rely more on hard information and equity-based pay in CEO evaluation and turnover decisions (Alam et al., 2014). Proximity strengthens monitoring and improves performance in venture capital and asset management (Bernstein et al., 2016; Ellis et al., 2020). Hence, it appears that geographic proximity improves information production, decision-making, and governance. In contrast, we show that there is a compensating advantage for the costs incurred by distributing operations across locations: Geographically dispersed firms have access to different local labor markets and improve efficiency by transferring operations across those markets. Our argument builds on two distinct strands of the literature.

Internal markets. Our analysis complements the literature on internal markets, which argues that business groups add value by substituting internal markets for external markets when frictions reduce the efficiency of external markets (see Teece, 1982 and the surveys of Khanna and Palepu, 2000 and Maksimovic and Phillips, 2007, 2013). This literature has two major strands. The first and larger strand argues that internal *capital* markets can add value by allowing conglomerate firms to make better investment decisions than standalone firms (Gertner et al., 1994; Stein, 1997; Khanna and Tice, 2001); by improving risk-sharing (Khanna and Yafeh, 2005, but they reject this hypothesis); or by supplying capital when external markets become inaccessible (Matvos and Seru, 2014; Almeida et al., 2015). While some studies emphasize efficiency gains (e.g., Maksimovic and Phillips, 2002), others put more weight on the costs from inefficient cross-subsidization and reduced responsiveness to investment opportunities (e.g., Shin and Stulz, 1998; Rajan et al., 2000; Ozbas and Scharfstein, 2010). We complement this literature by showing how business groups in Germany exploit their comparative advantage from operating in multiple locations. Whereas the literature analyzes how firms choose their industry portfolio and reallocate capital across industries, we show how business groups move operations across locations.

A second strand of the literature on internal markets argues that firms operate internal *labor* markets, which allow them to provide more attractive jobs and careers to their employees (Doeringer and Piore, 1966; Baker and Holmstrom, 1995; Huitfeldt et al., 2022; Ferreira and Nikolowa, 2022), provide insurance to employees (Faccio and O'Brien, 2021), take advantage of new business opportunities (Beaumont et al., 2025; Cestone et al., 2024), allocate workers to jobs more efficiently (Huneeus et al., 2021; Tate and Yang, 2022), and bypass labor market frictions (Cestone et al., 2023). Our analysis reveals the surprising fact that internal labor markets play a secondary role in the transfer of operations between business group firms, as business groups mostly transfer jobs, but not employees. Hence, our results nuance the perspective of the literature on internal markets by emphasizing the importance of external markets.

Offshoring. A second related strand of the literature on multinational enterprises (MNEs) has related the decision to acquire or set up new firms in other countries ("offshoring") mainly to labor-cost differentials (see Carlton, 1983 and Bellak et al., 2008; see Hummels et al., 2018 for a survey). However, this literature studies the decision to set up new subsidiaries, the extensive margin, whereas we ask a different question by focusing on relocations within groups, the intensive margin. In addition, the offshoring literature focuses on labor costs as the dominant factor that determines relocation decisions, and the comprehensive survey of the empirical literature in Hummels et al. (2018) is dedicated

exclusively to this dimension. Other contributions recognize the importance of the proximity to a pool of skilled workers (Porter, 1994, Dunning, 2009). By contrast, we include a larger set of labor-related frictions in addition to costs, and show that costs carry a lower weight for relocating operations at the intensive margin.

Our analysis also differs regarding the main results. The offshoring literature documents that relocations lead to a decline of low-skilled jobs, whereas higher-skilled jobs remain domestic and even expand (Feenstra and Hanson, 1999; Harrison and McMillan, 2011). We find the exact opposite: it is the high-skilled jobs that are relocated within business groups. Finally, the offshoring literature documents a range of other factors for location choice, such as taxes (e.g., Giroud and Rauh, 2019), subsidies (e.g., Basile et al., 2008), proximity to consumers (Dudey, 1990; Fontagne and Mayer, 2005) and to firms operating related technologies (e.g., Chung and Alcacer, 2002), or more generally, agglomeration benefits (e.g., Glaeser and Gottlieb, 2009; Alcacer and Chung, 2014).

By studying relocations within one country, our analysis is less sensitive to the overlap with other margins of adjustment, which we can control for with saturated fixed effects and other control variables. Specifically, heterogeneity of regulations plays no role in our analysis, which distinguishes ours from studies that focus on this factor for explaining the cross-sectional variation in firm growth and performance (John et al., 2015; Dessaint et al., 2017; Bai et al., 2019). The few cross-regional studies within the same country that would hold many other factors of location choice constant focus on whether factor-price equalization obtains within countries (e.g., Hanson and Slaughter, 1999, on the U.S.; Bernard et al., 2003 on the United Kingdom; Tomiura, 2005, on Japan), which is a different question from ours.

2 Data and methodology

2.1 Sample construction

We draw financial, ownership, and other descriptive information of all medium-sized and large German firms within the sample period 2005 through 2017 from the Orbis database.[5] We define a business group (BG) as a collection of at least two firms under common ownership. A firm is classified as a member firm of a BG if the ultimate owner of the BG holds more than 50% of the firm's voting shares, directly or indirectly.[6] Specifically, we require the ultimate

[5]We define medium-sized and large firms in a similar manner to the European Commission in Directive 2013/34/EU. More specifically, a firm is included in our sample if it satisfies at least two of the following three conditions simultaneously in at least one year throughout the sample period: 1) Total assets exceed 20 million euros (MEUR); 2) total revenues exceed 40 MEUR; and 3) the number of employees exceeds 250.

[6]Papers adopting the same definition include Altomonte et al. (2025), Boutin et al. (2013) and Cestone et al. (2020). Belenzon and Tsolmon (2016), and Belenzon and Berkovitz (2010) adopt the same definition

owner to also be a firm, as in Belenzon and Berkovitz (2010) and Belenzon and Tsolmon (2016). Furthermore, we drop all BGs with state-controlled entities and those ultimately controlled by a foreign owner. This leaves us with 482,909 firm-year observations involving 74,765 distinct firms and 20,466 distinct BGs.

Next, we draw administrative data from the IAB (Institute for Employment Research) for our sample firms. We mainly use their Integrated Employment Biographies (IEB) data set and draw the career biographies of all employees who were ever employed by any sample firm at some date during the sample period. The IEB data set provides detailed demographic information and career histories of all employees who are employed by establishments residing in Germany and pay German social insurance taxes. After aggregating the employee-level data to the firm level, we use the Orbis-ADIAB record linkage key developed by Antoni et al. (2018) to merge the two data sets. We successfully merge 23,001 firms affiliated with 7,105 distinct BGs, totaling 149,117 BG-firm-year observations.[7]

To investigate decision-making on the BG level, we further aggregate the firm-level sample to the BG level. For each BG-year, we either sum up the firm-level variables (e.g., for total assets), or we take labor-weighted averages of firm-level variables (e.g., for education scores). This process results in 46,925 BG-year observations involving 7,105 BGs.

To characterize local labor markets within German counties, we draw employment information of all German establishments within the sample period from IAB's Establishment History Panel ("Betriebshistorisches Panel," BHP).[8] We then aggregate the data to the county level. Finally, we complement the sample with county-level economic and demographic data collected from the Federal Statistical Office (Statistisches Bundesamt).

2.2 Research design

The baseline analysis is at the firm level. We use the panel of German BG firms from 2005 to 2017 and analyze which BG, firm, and county characteristics influence employment growth. The main methodological challenge for investigating the location decisions of BGs is that the

for private firms but lower the voting share threshold to 20% for public firms. Given that private firms predominate in our sample - representing 99.78% of all observations, we apply the same definition to all firms.

[7]We use the terms affiliating and disaffiliating instead of acquiring and divesting BG firms, as we want to highlight the difference between an acquisition (divestiture) and an affiliation (disaffiliation). An affiliation (disaffiliation) implies that an acquired (divested) company remains (was) a legally independent entity after (before) the acquisition (divestiture). Hence, we treat firms that are acquired and then completely integrated by one of the BG firms as organic employment growth, and similarly for divestitures of formerly integrated operations.

[8]The BHP is aggregated from the IEB to the establishment level. We use the IEB to infer firm-level employment on a more granular basis for our sample firms. We cannot infer county-level employment from the IEB due to technical limitations and data protection regulations.

decision of BG b to enter, exit, or grow in county c at time t leads to a very large number of possible BG-county-year combinations. However, most BGs are not present in most counties most of the time, so for most of the BG-county-year combinations, the activity levels are zero. We address this issue by performing the analysis at the BG-firm-year level and omitting all observations in year t if the activity level in year $t-1$ was zero, in which case the growth rate between $t-1$ and t for this BG is not defined. This step eliminates all zero observations from the analysis. Accordingly, the baseline analysis can only investigate firm growth at the *intensive* margin, which is the main focus of our paper. The entry of a BG into a location in which it was not present before involves observations in which employment in the prior year was zero. Such an analysis of the *extensive* margin requires an analysis at the group level and is deferred to Section 4. We only consider the county-level data from the county where a firm's headquarters is located. Since 80% of the BG firms in the sample are active in only one county, such a simplification should not have material effects on our results.

2.2.1 Dependent variables

We are interested in characterizing the outcome of BG location decisions and therefore want to measure the employment growth of the firm (or BG) as well as entry and exit into/from counties. *Employment growth* is defined as the one-year growth rate of employment E of firm i:

$$g_{it} = \frac{E_{it} - E_{it-1}}{0.5\,(E_{it} + E_{it-1})}, \tag{1}$$

following an established practice in the literature (see Davis et al., 2014; Antoni et al., 2019).

2.2.2 Independent variables

The independent variables describe the characteristics that are likely to influence BGs decisions to expand, shrink, enter, or exit certain locations. These variables can be separated into two groups. The first group characterizes local labor markets and is described in the remaining part of this section. The second group of variables characterizes these markets in relation to the requirements and structure of a particular BG; these variables are described in Section 3.1 and Appendix A.2.

We define three measures to characterize local labor markets: labor costs, labor shortage, and labor fit.

Labor costs. Differential costs of labor have long been identified as a primary driver of firms' organizational decisions and their choices of where to locate operations (Feenstra and Hanson, 1999; Antràs and Helpman, 2004; Hummels et al., 2018). We only observe average

wages and the job composition at the establishment-level, which means we need to estimate average wages by occupations at the level of local labor markets (counties). To infer wages for each occupation, we regress w_{et}, the total daily wage sum of establishment e in year t, on k_{elt}, the number of workers employed at establishment e in occupation l in year t:

$$w_{et} = \alpha + \sum_{l=1}^{12} \beta_{clt} k_{elt} + \epsilon_{et}. \tag{2}$$

Hence, we use c to index German counties, e to index establishments, i to index firms, l to index the 12 Blossfeld (1987) occupations, and t to index calendar years.[9] The regression estimates $\hat{\beta}_{clt}$ should then recover the wages of workers in occupation l in county c in year t. This regression is run for each county-year cross-section. Establishments for which more than 10% of the employees could not be assigned to any occupation are excluded from the sample.

With these provisions, the expected labor cost of a firm that is active in industry s and located in county c in year t is calculated as follows. Let p_{clt} be the fraction of employees working in occupation l in county c in year t and let p_{sl} be the average fraction of employees working in occupation l in industry s across all sample years. Then we define labor costs for each industry-county-year as the employment-weighted average of the estimates for county-occupation-specific wages $\hat{\beta}_{clt}$ from running regression (2).

$$\textit{Labor cost}_{sct} = \sum_{l} \hat{\beta}_{clt} \times p_{sl}. \tag{3}$$

Labor shortage. Access to labor is critical for firms, especially when their technology relies heavily on human capital. In such settings, constraints on the availability of suitable workers can be as limiting for firm growth as financial constraints, restricting firms' ability to grow and exploit investment opportunities (Paul, 2022; Chen et al., 2025; Maug, 2025). The measure for labor shortage assumes that labor supply within a labor market is relatively fixed in the short and medium term. Then one employer tapping into the supply pool more heavily would lead to a shortage for the others: Any positive demand shock will lead to a shortage, and any negative demand shock will lead to a surplus. Hence, under these premises, shocks to county-level employment growth can be used to approximate shocks to the labor supply for individual firms. To implement this idea, we regress county-level employment growth rates for each occupation on their own lags over the past three years:

[9] Blossfeld (1987) classifies jobs into 12 distinct major occupations based on the German Classification of Occupations 1988 (KldB 1988). Table 1 on page 99 in Blossfeld (1987) provides a detailed overview on those 12 occupations and related ISCO codes. See Appendix A.3 for details.

$$g_{clt} = \eta_{cl} + \lambda_1 g_{cl,t-1} + \lambda_2 g_{cl,t-2} + \lambda_3 g_{cl,t-3} + \mu_{clt}. \tag{4}$$

We then interpret the residuals $\hat{\mu}_{clt}$ from this regression as demand shocks to occupation l for county c in year t. The labor shortage in occupation l, county c and year t is calculated as an equally-weighted three-year average, $\bar{\mu}_{clt} = (\hat{\mu}_{clt} + \hat{\mu}_{cl,t-1} + \hat{\mu}_{cl,t-2})/3$. We proxy for the labor shortage of each firm by defining a measure of the labor shortage of the firm's industry s, and aggregate the labor-shortage measure $\bar{\mu}_{clt}$ by using the industry-level occupational shares p_{sl} again:

$$Labor\ shortage_{sct} = \sum_l \bar{\mu}_{clt} \times p_{sl}, \tag{5}$$

which measures the occupation-weighted labor shortage in industry s.

Labor fit. Firms have specific skill requirements, and workers with different skills are not substitutes for each other. Thus, the growth of firms depends on their ability to attract the skills of workers that are complementary to their technology.[10] We follow prior literature (e.g., Glaeser and Kerr, 2009; Alcacer and Chung, 2014) and measure how well a county's labor force fits a firm's skill requirements by the distance between the long-term job mix of the firm's industry and the current job mix of the county:

$$Labor\ fit_{sct} = -\sum_l |p_{sl} - p_{clt}|, \tag{6}$$

where p_{sl} and p_{clt} are defined as above. Fit_{sct} equals zero whenever the county-level supply and the industry-level demand of skills match perfectly.

Agglomeration. All three variables that characterize local labor markets might be related to the spatial agglomeration of industries, which provide BG firms with benefits from agglomeration economies, e.g., proximity to suppliers and customers.[11] Therefore, we also define a variable that characterizes the degree of industrial agglomeration in local labor markets. Specifically, we denote the level of spatial agglomeration of industry s in county

[10] The importance of the availability of workers with requisite skills is already recognized in Marshall (1890). Some recent contributions emphasize the skill match of the labor force for mergers and acquisitions (Lee et al., 2018; Tate and Yang, 2022) and for location decisions of start-ups (Glaeser and Kerr, 2009) and first-time foreign entrants (Alcacer and Chung, 2014).

[11] See Wheeler (2001), for a theoretical model of agglomeration economies and Dauth et al. (2022) for evidence for Germany. See Combes and Gobillon (2015) for a survey of empirical research on agglomeration economies and Donovan et al. (2024) for a recent meta-study. There are different dimensions of agglomeration economies and mechanisms in which they generate externalities (Duranton and Puga, 2004). In their Section 3.1, Combes and Gobillon (2015) argue that different measures are often too highly correlated to be able to distinguish different dimensions.

c and year t by Agg_{sct} and define it as the number of employees hired by establishments in industry s and in county c. In Section 6.4 we provide additional robustness checks with alternative measures of agglomeration economies.

2.3 Descriptive statistics

Panel A of Table 1 provides descriptive statistics for the sample at the firm level. Table OA1 in the Online Appendix provides the correlations between all main variables of our analysis. The average (median) BG firm in our data set is 26 (17) years old, has 271 (75) employees and 159.7 (7.7) million euros of assets. The mean (median) Industry Q is 1.78 (1.65). On average 0.8% of BG firms are divested ($Exit$) per year. Belenzon and Tsolmon (2016) use a similar sample of European BGs but require that BG firms have at least $10 million in sales. The BG firms in their sample are somewhat younger (17 years) and smaller (92 employees) on average. The average BG firm in Belenzon et al. (2013) is 25 years old and has 392 employees, which is similar to our numbers.

Panel B of Table 1 provides descriptive statistics for the sample at the BG level. The average age of a BG in our sample is 30 years and has 3.3 member firms with a total of 977 employees. These numbers are comparable to Belenzon and Tsolmon (2016), who report that BGs in their sample from 15 European countries have on average 4 member firms and 973 employees. The probability of a BG to enter (exit) a new location is 3.6% (2.1%) per year.

Figure 1a shows the geographical distribution of BG firms relative to all firms in our sample. Figure 1b (1c) provides the ratio of BG firm assets (employees) to assets (employees) of all firms in our sample. Across all three maps, we observe substantial variation across German counties but no particular geographical pattern in the distribution of BG firms, assets, or the number of employees. For example, BG firms are generally not more or less prevalent in the south or east of Germany. However, we observe that BG firms cluster in metropolitan areas, which indicates that BG firms prefer agglomeration centers.

3 Baseline analysis: The intensive margin

The analysis proceeds in the following steps. In Section 3.1, we begin by analyzing growth at the intensive margin. We then analyze relocation decisions in more depth by exploring which type of operations are moved (Section 3.2). Next, we decompose employment growth at the intensive margin into a component that results only from labor flows between BG firms, and a component that results from flows between BG firms and the external labor market (Section 3.3). In Section 3.4, we look at the extent to which managerial capabilities

at the firm level facilitate relocations between BG firms.

3.1 Adjusting operations at the intensive margin

We begin by asking whether BG firms can improve their operations by shifting activities to other locations where the BG is already present and take two perspectives: (1) operations of the focal firm are moved to another BG firm in a different location, or (2) operations of another BG firm in a different location are moved to the focal firm. We call the first the *donor* perspective because the focal firm gives operations, jobs, and employees to other group firms. We call the second the *recipient* perspective because the focal firm receives operations from other group firms. Our hypothesis implies that a focal firm should grow less if the BG would benefit from relocating the operations of the focal firm to other firms within the same group, and it should grow more if it benefits from relocating operations to the focal firm.

We take the group structure as given, i.e., we only ask whether BGs shift operations across firms that already belong to the group. The rationale is that affiliating new member firms involves fixed costs, so that firms can move some or all of their operations at a lower cost to a county where the BG is already present, compared to a county in which the BG is not (yet) present. In Section 4.2, we ask whether group firms would benefit from relocating operations to counties in which the group is not yet present.

Hence, for each BG b at time t, we define the set of all firms that belong to that BG as $BG_b(t)$. We define the donor benefits of the BG firm from reallocating jobs from the focal firm i to other firms $j \neq i \in BG_b(t)$ of the same BG as the upside potential offered by the other group firms in relation to the focal firm i.

Measuring donor benefits. We discuss the measures we use for benefits from saving labor costs in more detail, as the measures for labor fit and labor shortage are constructed analogously. Recall that $Labor\ cost_{ict}$ represents the expected labor costs of firm i if it produces in county c at time t (equation 3). We define the donor benefits from saving labor costs, $Cost_{it}^{Don}$, as the hypothetical log reduction in the wage bill of firm i at time t from relocating all its operations from county c, where it is currently located, to the county n that minimizes its wage costs and where another group firm j is located. Here, the minimum is calculated across all group firms at time t. Given our definitions above, the lowest possible wage bill can be calculated as $min\{Labor\,cost_{int}\}_{j \in BG(t)}$, the lowest labor costs across all member firms. Accordingly, $Cost_{it}^{Don}$ is defined as

$$Cost_{it}^{Don} = max\left\{ln(Labor\,cost_{ict}/Labor\,cost_{int}), 0\right\}_{j \in BG(t)}. \tag{7}$$

Hence, $Cost_{it}^{Don}$ is the hypothetical log reduction in the wage bill if firm i were to relocate all its operations to the county that minimizes its overall wage bill, while holding the occupational proportions of its labor force constant.

Measuring recipient benefits. Now we take the perspective of a recipient firm. These are the firms that generate potential benefits to the BG by moving the operations from *other* (donor) firms $j \neq i \in BG_b(t)$ in the same BG to the focal firm i, where improvements result again from lower labor costs. We refer to these improvements that BG firms offer as *recipient benefits*, which form the flip side of donor benefits. Both types of benefits are defined from the perspective of the focal firm. Whereas donor benefits are defined in relation to multiple potential recipients, recipient benefits are defined in relation to multiple potential donors.

To measure recipient benefits, we must compare the potential benefits that a focal firm can offer to the benefits that other member firms could offer in relation to the same candidate donor firm. Specifically, consider any firm i that offers recipient benefits to relocate jobs from a donor firm j in the group. While these benefits may be attractive, there could be a third member firm k, such that the recipient benefits offered by k are even more attractive compared to those offered by j. We begin by assuming that BGs resolve this issue by simply choosing the best relocation opportunity within the group, i.e., the firm with the highest recipient benefits.

To begin, we ask by how much the labor costs of the operations of BG firm $j \in BG_b(t)$ in county n would improve if it were to relocate these operations to the county c in which the focal firm $i \in BG_b(t)$, which belongs to the same BG, is located. $Cost_{it}^{Rec}$ is defined as

$$Cost_{it}^{Rec} = \sum_{j \in BG(t)} max_{j \in BG(t)} \left\{ ln(Labor\, cost_{jnt}/Labor\, cost_{jct}), 0 \right\} \frac{E_{jnt}}{E_{ict}}. \tag{8}$$

$Cost_{it}^{Rec}$ proxies for the recipient benefits of BG firm i in offering lower labor costs to other BG firms $j \neq i$ of the same BG. For each of these firms, relocation to county c in which firm i is located presents an opportunity for improvement if two conditions are satisfied: (1) the hypothetical costs firm j would have in county c, $Labor\, cost_{jct}$, are lower than its expected costs in county n, $Labor\, cost_{jnt}$; (2) there is no other firm k in the group, $k \neq j$ and $k \neq i$, that provides even lower labor costs to firm j than firm i, so that firm i offers the highest recipient benefits within the same group to firm j. The first condition is expressed in the term $max\left\{ ln(Labor\, cost_{jnt}/Labor\, cost_{jct}), 0 \right\}$, which is positive if and only if the BG can reduce the labor costs of the operations of firm j in county n by relocating these operations to county c, where firm i is located.

The second condition is expressed by taking the maximum of the log change

$ln(Labor\,cost_{jnt}/Labor\,cost_{jct})$ over all firms $j \neq i$ of the same BG. If the focal firm i cannot offer a reduction in labor costs to the operations of any other BG firm j, then $ln(Labor\,cost_{jnt}/Labor\,cost_{jct}) < 0$ for all $j \neq i$, and $Cost_{it}^{Rec} = 0$. If the focal firm offers the lowest labor costs to at least one other BG firm, then $Cost_{it}^{Rec} > 0$. Note that the labor costs of firm j in county c, $Labor\,cost_{jct}$, are calculated with respect to the proportions of the labor force of firm j, not with respect to those of firm i.

Finally, we multiply by $\frac{E_{jnt}}{E_{ict}}$, because the potential growth of a candidate recipient firm depends on its size relative to that of the potential donor firms in the same group. The larger the size of the donor relative to the recipient, the more the recipient could potentially grow. Therefore, we weigh the potential cost reduction by the relative employment size of the donor (E_{jnt}) to the recipient firm (E_{ict}).

We standardize the donor and recipient benefits with a zero mean and unit standard deviation. The measures for labor shortage, $\dot{Short}^{Don}$ and $Short^{Rec}$, and labor fit, $\dot{Fit}^{Don}$and Fit^{Rec}, are defined analogously to $Cost^{Don}$ and $Cost^{Rec}$ (see Appendix A.2). We will refer to these six variables comprehensively as *labor-related relocation benefits*.

Other margins of adjustment. The definitions of donor and recipient benefits above do not describe the further reduction of labor costs that firm i could achieve from moving to counties without presence of the BG so far, from adjusting its production technology and changing the proportions between different categories of workers, or from moving operations of some donor firm i to multiple recipient firms within the group instead of the "winner takes all" feature of our definition. Hence, these additional margins of improvement are not captured. Moreover, the definition of benefits involves a maximization across counties. Therefore, it will tend to increase in the number of counties in which a BG is present, such that a larger geographic dispersion of the BG is associated with higher relocation benefits. Note also that firms can be simultaneously donors and recipients. For example, in a group with firms A and B, A can offer the lowest labor costs to B, but B may offer the best labor fit to A.

Regression specification. To investigate the relationship between the employment growth of BG firms, g_{it} (see equation (1)) and local labor market conditions, we estimate the following panel regression model:

$$\begin{aligned} g_{it} =& \beta_1 Cost_{it-1}^{Don} + \beta_2 Short_{it-1}^{Rec} + \beta_3 Short_{it-1}^{Don} + \beta_4 Cost_{it-1}^{Rec} + \beta_5 Fit_{it-1}^{Don} + \beta_6 Fit_{it-1}^{Rec} \\ &+ \mathbf{X}_{it-1} \cdot \boldsymbol{\gamma} + \mathbf{Z}_{sct} \cdot \boldsymbol{\delta} + \eta_{ct} + \theta_{st} + \varepsilon_{icst}, \end{aligned} \tag{9}$$

where subscript i denotes an individual firm, c denotes the county where firm i is headquartered, s denotes the industry (two-digit NACE Rev. 2 codes) of firm i, and t denotes the calendar year. The vector $\mathbf{X_{it-1}}$ contains time-varying control variables, including firm size (log of total assets), firm age, and indexes of average employee education and qualification. To account for the relative importance of a BG firm among its affiliates, we add *Relative size*, the fraction of assets of a focal firm relative to the group. We include a dummy variable *Small firm,* which equals one if a firm employs at most ten employees, and zero otherwise, since smaller firms in Germany are subject to more lenient labor regulations.[12] In addition, we include the donor and recipient benefits from relocating operations of the BG to regions with a higher level of industrial agglomeration, which are defined in parallel to the corresponding definitions for labor-related benefits above (see Appendix A.2). To measure managerial capabilities of business group firms, we introduce two additional variables. First, we use *Enabling share*, the fraction of all firm employees working in the following enabling functions: management, office workers, human resources, and accounting (identified from occupational codes).[13] Second, we define managerial capabilities, mc_{it}, as the employment of the focal firm i working in enabling functions relative to the employment in enabling functions of the whole group. As county-industry level controls ($\mathbf{Z}_{sct}$), we include *Labor cost*, *Labor shortage*, *Labor fit*, and *Agglomeration*, the level of agglomeration. Additional control variables are added at later stages. Finally, we include county-year fixed effects η_{ct} and industry-year fixed effects θ_{st} to remove all time-varying confounding factors within counties and within industries.

Results. Table 2 presents the results.[14] We have one specification with no controls except fixed effects (column 1), and then successively add firm-level control variables (columns 2 and 3), the characteristics of the labor force (column 4), and the benefits from agglomeration economies (column 5); column 6 enters only the benefits from agglomeration but no labor-related benefits. Across all specifications, the coefficient estimates for relocation benefits have the expected sign and are statistically significant or highly significant, except for the recipient

[12]Firms with less than ten (five) employees are exempt from the *Protection against Unfair Dismissal Act* (*Works Constitution Act*). Above these thresholds, employees can only be dismissed because of a specific reason after six months of employment (cannot elect a works council). See Wiedemann (1980) and Guertzgen and Hiesinger (2020) for more details.

[13]See Bias et al. (2024) for a similar argument. However, their definition of enabling functions is more comprehensive and used for a different purpose.

[14]We provide analyses in which labor costs, labor shortage and labor fit variables are entered separately in Tables OA3, OA4, and OA5 in the Online Appendix. The coefficient estimates for all six benefit measures have the predicted signs and are economically and statistically significant throughout all specifications. Separate and joint analyses produce similar results because the correlations between these variables are never large; see Table OA1 in the Online Appendix for correlations.

benefits from saving labor costs, which are economically small and statistically insignificant.[15] Higher donor (recipient) benefits are associated with reduced (increased) *Employment growth* at the focal firm.

In our most stringent specification (column 5) a one-standard-deviation increase in relocation benefits reduces (increases) *Employment growth* by 38 (36) bp for *Short*, by 32 (33) bp for *Fit*, and by 63 bp for donor benefits of *Cost*. Hence, on average, a one standard deviation increase in a measure of donor (recipient) benefits decreases (increases) employment growth by about 0.4%. These effects represent about 20% (40%) of the mean (median) of *Employment growth*, which is 1.936% (1.096%, see Table 1). Hence, BGs move operations to counties with lower labor shortages and higher labor fit, and away from locations characterized by constrained labor markets.

Importantly, while labor costs have a significant influence on the donor side–firms tend to lose operations if they are in high labor-cost counties, offering lower labor costs by itself does not provide recipient firms with a measurable advantage. Our interpretation is that BGs strategically move operations away from locations with more constraints in the local labor markets and toward locations where they are less constrained, but their objective is not simply to reduce labor costs. This finding is remarkable in comparison to the literature on offshoring and multinational firms, which often finds that labor costs are a primary driver for international relocations (e.g., Feenstra and Hanson, 1999 and Hummels et al., 2018). However, this literature primarily analyzes the extensive margin.

Control variables. The size and statistical significance of the coefficients for the control variables remain more or less unchanged across the different specifications in Table 2. In general, larger and older firms grow more slowly, in line with the findings in prior literature (e.g., Mansfield, 1962; Harhoff et al., 1998). *Age* and *Size* (defined as the logarithm of total assets) both have a negative impact on growth.

We control for the importance of a firm for the entire group by using the variable *Relative size*, which is the percentage of the focal firm's assets in the assets of the entire group. Firms with a higher value of *Relative size* are more likely to be part of the core segments of the group and thus more important for the group than peripheral firms with a lower *Relative size* (see Maksimovic and Phillips (2002) for a related notion and results that support this assumption). This variable has the strongest impact if we enter it along with measures for the quality of the work force (column 3): A one-standard deviation increase in *Relative size* (33%) increases *Employment growth* by 26bp (column 2) to 144bp (column 3). Hence, core

[15] Table OA2 provides the same analysis using BG-year clustering. Statistical significance increases slightly with clustering at the BG-year level. However, recipient benefits from labor costs remain insignificant.

BG firms grow faster than peripheral firms. In addition, we observe that firms with fewer than ten employees grow significantly less by about 12 to 16 pp. Hence, even though labor-market regulations are more lenient for small firms, these do not attract more operations.

Labor cost and *Labor shortage* itself have no significant impact on *Employment growth*, whereas *Labor fit* and *Agglomeration* have a negative impact. *Education* and *Qualification* both have a strong and positive impact. Since all regressions already control for industry-year fixed effects, the effects of *Education* and *Qualification* capture only within-industry-year variation and are thus surprisingly strong: A one-standard deviation increase in the scores for *Education* (*Qualification*) is associated with about 2.4 (0.6) percentage point higher *Employment growth.*

Finally, donor (recipient) benefits from agglomeration economies, Agg_{it-1}^{Don} (Agg_{it-1}^{Rec}), reduce (increase) *Employment growth* by 74 bp (65 bp). As expected, BGs take into account other location characteristics that are important in their respective industry, such as the proximity to customers and suppliers. These findings demonstrate that agglomeration benefits are important not only at the extensive margin but also at the intensive margin. To the best of our knowledge, this observation is new as the empirical agglomeration literature studies the wages, employment, and productivity of firms or establishments and thus focuses on the extensive margin (see Duranton and Puga, 2004 and Combes and Gobillon, 2015 for surveys). Moreover, a comparison of columns 4 and 5 reveals that agglomeration benefits reduce the explanatory power of *Short* and *Fit* by, respectively, 25% and 50%, whereas a comparison of columns 5 and 6 shows that adding the variables for labor-related benefits reduces the coefficients for agglomeration benefits by, respectively, 27% and 20%. These results suggest that agglomeration benefits are not only about proximity to customers and suppliers, but also about conditions in the local labor market.

3.2 Which operations are moved?

In this section, we ask which operations are more likely to be moved in response to changing labor-market conditions and investigate the influence of asset tangibility (Section 3.2.1) and the skill compositions of the jobs involved (Section 3.2.2).

3.2.1 Moving tangible versus intangible assets

Arguably, relocation benefits are strongly influenced by the costs of physically relocating operations. These physical relocation costs are mainly determined by the costs of moving the fixed assets of the firm. Therefore, we hypothesize that firms with (1) less tangible assets relative to total value added (*Tangibility*), (2) less tangible assets relative to employment size

(*Capital intensity*), and (3) higher investments in software (*Software intensity*), measured by the ratio of gross software investment to tangible assets, are more sensitive to labor relocation benefits.

We test this hypothesis by splitting our sample at the median of (1) *Tangibility,* (2) *Capital intensity,* and (3) *Software intensity,* and rerun the regression of Table 2, column 5 for each subsample. Results are presented in Table 3.[16] In line with our hypothesis, we find that the sensitivity of employment growth to donor benefits ($Cost^{Don}$, $Short^{Don}$, Fit^{Don}) and to recipient benefits ($Short^{Rec}$, Fit^{Rec}) is significantly larger for the subsamples of firms with lower physical relocation costs, i.e., lower *Tangibility* (column 2), lower *Capital intensity* (column 4), and higher *Software intensity* (column 6). Interestingly, we observe the opposite for the sensitivity to agglomeration benefits. Agg^{Don} is stronger in the subsamples with high *Tangibility* (column 1), high *Capital intensity* (column 3), and low *Software intensity* (column 5). We observe a similar pattern for Agg^{Rec}, but to a lesser extent. These results imply that labor-related benefits are mainly important for firms with relatively low physical relocation costs, whereas agglomeration benefits are higher for more capital-intensive operations.

Table OA6 in the Online Appendix provides further sample splits for the results from Table 2 (column 5), which refine the observations from Table 3. The first split is by industry into manufacturing industries, service industries, and other industries (columns 1 to 3). With a couple of minor exceptions, all results are concentrated in service industries, which reinforces the finding above that operations are more likely to be moved if physical relocation costs are lower. The prior literature has shown that jobs in tradable sectors are more likely to be offshored as they do not need to be close to the customer. Therefore, we analyze how the effect of relocation benefits differs between tradable and non-tradable sectors (Table OA6, columns 4 and 5). To define tradability, we follow Piton (2021), who uses a measure of tradability based on observed trade exposure.[17] We observe no significant difference between the two sectors with respect to relocation benefits, which confirms that the economics of within-country relocations differ significantly from those of offshoring.

[16] For example, intangible sectors include finance (NACE Rev. 2 Section K), other services (S), and scientific activities (M). Tangible sectors include agriculture (A), real estate (L), and transportation (H). Software-intensive sectors include information and communication (J), finance (K), and wholesale trade (G). Sectors that rely less on software include real estate (L), healthcare (Q), and water supply and related utilities (E). Capital-intensive sectors include utilities (D and E) and real estate (L), while labor-intensive sectors include construction (F), hospitality (I), and other services (S).

[17] This approach is superior compared to older work that relies on sectoral classifications, since it recognizes that services have become increasingly tradable (see also Burstein and Vogel, 2017; Sotelo, 2020).

3.2.2 Moving high-skilled versus low-skilled jobs

Since relocation benefits depend on the type of operation that is moved, we hypothesize further that they may also be associated with the characteristics of the jobs that are moved. The literature suggests two mutually non-exclusive hypotheses on how the skill composition of the labor force may be relevant for firms' decisions to move operations. The literature on MNEs and offshoring suggests that firms relocate operations to benefit from lower labor costs. This argument predicts that the relocation of operations involves mostly lower-skilled employees, who are easier to substitute and retrain.[18] By contrast, if firms primarily address human-capital constraints, we would expect the opposite, since these frictions are concentrated in the market for skilled employees, who are harder to substitute.[19]

We use the occupational classifications of our data provider and break up employment growth into subgroups of jobs defined by skill requirements. More specifically, we use indices for three different characteristics and group them into terciles (low, middle, high): education, qualification, and task complexity. In addition, we differentiate managerial from non-managerial jobs. We provide detailed explanations of how these variables and subsamples are constructed using Blossfeld (1987) occupations in Appendix A.3.2. Then we ask how the relocation benefits affect the employment growth of the different subgroups of employees, by replacing $E_{it} - E_{it-1}$ in the numerator of equation (1) by $E^a_{it} - E^a_{it-1}$, where the superscript "a" refer to employment in a particular category, e.g., highly-educated employees.

Table 4 presents the results. The most remarkable insight from breaking up employment growth is that the effects of donor benefits are mostly concentrated in the top terciles: The coefficient estimates for donor benefits in the highest terciles of education (columns 2, 3), qualification (columns 5, 6), and task complexity (columns 8, 9) are highly significant, whereas those for the lowest terciles (columns 1, 4 and 7) are not significant or marginally significant. By contrast, there is no clear pattern for recipient benefits across these three dimensions. Our interpretation is that operations involving higher-skilled jobs are more likely to be moved to different locations if the current (donor) location becomes less suitable regarding labor market conditions. However, if operations are moved to a different location, then the additional growth of the labor force in the recipient firm is different from the corresponding lower growth in the donor firm. A second observation from Table 4 is that the patterns for agglomeration benefits differ from those for the labor-related relocation benefits.

[18] See Feenstra and Hanson (1999), Harrison and McMillan (2011), and Becker et al. (2013) for evidence on the relevance of labor-cost differentials in offshoring. Usually, high-skilled employment remains domestic and even expands. See also the survey of Hummels et al. (2018) for further evidence.

[19] Frictions in the labor market tend to increase with the skill segment of the market. Higher skill levels are associated with more occupational mismatch (Davis et al., 2013; Şahin et al., 2014) and skill shortages (Cappelli, 2015).

For example, the donor benefits from agglomeration are always significant for all occupational characteristics.

Finally, we distinguish managerial from non-managerial occupations (for details see Appendix A.3.1). The main finding is that all effects are concentrated in the growth of non-managerial employment (column 10), whereas the estimates for managers are economically and statistically insignificant (column 11). We infer that the movement of operations involves the movement of operational jobs but not of managerial jobs.

3.3 Decomposing growth

In this section, we explore the mechanisms through which BGs transfer operations within their member firms by decomposing employment growth into growth through internal transfers versus external labor markets (Section 3.3.1) and into hiring and separations (Section 3.3.2).

3.3.1 External and internal growth

We are interested in the extent to which BGs operate internal labor markets and transfer workers between their firms, and the extent to which they rely on external labor markets, motivated by the growing literature on the role of internal labor markets in business groups (Beaumont et al., 2025; Cestone et al., 2023, 2024; Huneeus et al., 2021). In this section, we break down employment growth into one component that captures the labor flows between firms that belong to the same BG, and a second component that captures the labor flows between BG firms and the outside labor market. Specifically, we define *Internal employment growth*, g_{it}^I, as the growth rate that results only from those changes in employment that involve firms of the same group, i.e., separations from the focal firm i when its employees are hired by another group firm, and the hiring of firm i of employees from other group firms. Similarly, *External employment growth*, g_{it}^X, is the growth rate from changes in employment that involve flows between group firm i and the external labor market, which includes flows to and from domestic firms that do not belong to the same group, foreign firms, training, retirement, or unemployment. We provide more precise definitions in Appendix A.1 and show that these growth rates decompose *Employment growth* such that

$$g_{it} = g_{it}^I + g_{it}^X. \tag{10}$$

Table 5 reports the same regression specification as before, but uses *Internal employment growth* (columns 1 to 3) and *External employment growth* (columns 4 to 6) separately as dependent variables. The specifications are those of columns 3 to 5 of Table 2. To gauge the

relative importance of internal growth and external growth, column 7 reports the ratio of the coefficient estimates in column 6 to the sum of the coefficients of columns 3 and 6. Since internal and external growth rates add up as in equation (10), the sum of the coefficients in columns 3 and 6 of Table 5 is equal to the corresponding coefficients in column 5 of Table 2. Hence, we treat the ratios reported in column 7 as a measure of the relative importance of internal labor markets for realizing benefits from relocation.

Results. Column 7 shows that for most independent variables, about 70% to 90% of their impact can be attributed to *External employment growth*, whereas only the remaining 10% to 30% can be attributed to *Internal employment growth.* The coefficients for internal flows in column 3 are often insignificant. Hence, the corresponding independent variable is associated with significant changes in *External employment growth*, but not with corresponding changes in *Internal employment growth*.

3.3.2 Hiring and separations

The analysis so far uses net employment growth as a dependent variable. In this section, we ask whether changes in employment growth result from changes in the hiring rate or the separation rate. For example, higher net employment growth may result either from more hiring or from fewer separations. To address this question, we denote by H_{it} and S_{it} the number of new hires, respectively, separations of firm i in period t. and define hiring and separation rates as:

$$Hiring\ rate = h_{it} \equiv \frac{H_{it}}{0.5\left(E_{it} + E_{it-1}\right)}; \quad Separation\ rate = s_{it} \equiv \frac{S_{it}}{0.5\left(E_{it} + E_{it-1}\right)}. \quad (11)$$

Note that $E_{it} - E_{it-1} = H_{it} - S_{it}$ and $g_{it} = h_{it} - s_{it}$. Table 6 shows the results with the hiring and separation rates as dependent variables.

The impact of relocation benefits differs strongly between hiring and separations. On the donor side, labor costs reduce the hiring rate, but do not affect separations, whereas labor shortages and labor fit increase the separation rate, but do not affect hiring: Firms in high-cost labor markets hire less, and those in constrained labor markets, i.e., with higher donor benefits from labor fit and labor shortage, lose more employees.

On the recipient side, higher cost benefits reduce separations as well as hiring. Hence, BG firms in locations that offer benefits from lower labor costs to group firms reduce employee turnover, which explains the insignificant results we found for $Costs^{Rec}$ in Table 2: the simultaneous effects on hiring and separations cancel each other. The estimates for Fit^{Rec} reveal that benefits from a better fit are realized only through additional hiring: recipient

firms can recruit from a better local pool of workers. By contrast, the estimates for $Short^{Rec}$ show that the benefits from a lower labor shortage are realized only through fewer separations: a better supply of workers implies that recipient firms improve the retention of employees, who probably receive fewer outside offers, but firms do not recruit more employees. Together, these observations suggest that BGs move operations to locations in which they are less vulnerable to losing employees to competitors, and away from locations in which they are more likely to lose employees, consistent with the earlier observation that access to human capital plays a primary role.

3.4 Managerial capabilities

The results so far suggest that BGs move operations that can be operated more efficiently by recipient firms than by donor firms. However, to move operations, BGs must identify them in the donor firm, relocate them to the recipient firm, and recipient firms then have to integrate and manage these new operations. All these are managerial functions, and based on the literature on managerial capabilities and processes (e.g., Atalay et al., 2014; Bloom et al., 2017) we expect that managerial capabilities are necessary to transfer operations across firms. We see two principal ways in which BGs may carry out these transfers. BGs may organize themselves as a network with a hub in which one firm serves as a coordinator for the entire group. Then managerial capabilities would be concentrated in this coordinating firm, most likely the apex firm of the group, which organizes transfers across BG member firms. Alternatively, BGs can be less centralized, such that member firms have more autonomy and managerial capabilities of their own, which may have the advantage that each firm collects information and monitors the conditions in its local labor market. Hence, we explore the role of managerial capabilities and whether centralized or decentralized BGs are more responsive to changes in local labor market conditions.

As in Section 3.1, we measure the managerial capabilities of firm i in year t (mc_{it}) as its employment in enabling functions relative to that of the whole group. Table 7 shows the results for a sample split at the median of mc_{it} in columns 1 and 2. The donor benefits from labor fit and labor shortage are insignificant for above-median firm-years, and the coefficient for labor costs is only one-third of the size of compared to the below-median firms. Hence, firms with lower managerial capacities are more likely to lose operations.

The distribution of mc is highly skewed (Mean: 0.3236; Median: 0.2000). Hence, some BGs concentrate their enabling functions in one firm, probably the apex firm that owns the other BG member firms, and we conjecture that it may serve as a hub or coordinator, such that the other member firms focus on operations. To explore this question further, we define a measure of how evenly employees in enabling functions are distributed across group firms.

Specifically, we define the following measure of the imbalance of managerial capacities at the group level:

$$imb_{bt} \equiv \sum_{j \in BG_b(t)} \frac{E_{jt}}{E_{bt}} \cdot \left| \frac{E_{jt}^{EF}}{E_{bt}^{EF}} - \frac{E_{jt}}{E_{bt}} \right|, \tag{12}$$

with $E_{i,t}^{EF}$ being the number of employees in enabling functions at firm i in year t and $E_{bt}^{EF} \equiv \sum_{j \in BG_b(t)} E_{jt}^{EF}$ being the same number for the whole BG b. The key expression in the sum is $E_{jt}^{EF}/E_{bt}^{EF} - E_{jt}/E_{bt}$, which measures the proportion of employees in enabling functions, E_{jt}^{EF}/E_{bt}^{EF}, relative to the share of all other employees in the group, E_{jt}/E_{bt}. If managerial capacities are evenly distributed across the whole BG, then these two shares are the same for all BG firms, the expression in (12) equals zero, and *imb* equals zero as well. By contrast, BGs that concentrate the enabling functions in one coordinating firm have a high value of $E_{jt}^{EF}/E_{bt}^{EF} - E_{jt}/E_{bt}$ in that firm and low values for this expression, i.e, high absolute values, in the other firms; these BGs have a high value of imb_{bt}. The sample split according to the median of imb_{bt} (columns 5-6 of Table 7) shows that the donor benefits for labor fit and labor shortage are concentrated in groups with a low imbalance *imb*. Hence, BGs that devolve enabling functions to the member firms reallocate operations more than those that concentrate them in one firm, which supports the notion that labor reallocation requires managerial capacities at the donor and at the recipient firms. BGs with a more hierarchical structure, in which enabling functions are centralized, therefore, do not reallocate operations as much.

4 Entry and exit: The extensive margin

In this section, we address the extensive margin. BGs may enter or exit locations depending on local labor market conditions, and the benefits available at the extensive margin should be the same as those available at the intensive margin. However, cost considerations introduce a difference. Winding down and, especially, entering locations, either through green-field investments or through acquisitions, is associated with fixed costs. If these costs are significant, the hurdles for entry, and potentially also for exit, would be higher and make these decisions less reversible. In this case, we would expect entries and exits only if the prospects of the new location are significantly better than those of all existing locations, which should, in turn, depend not only on the size but also on the expected persistence of benefits. Figure 2 shows the autocorrelations for *Labor costs*, *Labor shortage*, and *Labor fit*, which display a clear pattern: *Labor fit* is highly persistent, *Labor costs* are persistent, and *Labor shortage* is not persistent at all. Hence, we expect that the benefits for *Labor fit* and *Labor costs* are higher for the extensive margin than the intensive margin, whereas we expect the opposite

for the benefits from *Labor shortage.* We proceed by first analyzing exits in Section 4.1 and then entries in Section 4.2.

4.1 When do business groups exit?

The analysis so far is focused entirely on the intensive margin of job flows between locations and takes the membership of the BG at each point in time as given. In the next step, we analyze decisions in which BGs exit certain locations. In our context, an exit refers to a BG's decision to either divest or to close an existing firm, i.e., to leave a location in which it has been present so far. We analyze exit decisions on the firm level with two different dependent variables. First, we define the dummy variable $Exit_{ict}$, which equals one if firm i in county c is divested or closed in year t, and zero otherwise.[20] Second, we define a $Exit\ LW_{ict}$, a labor-weighted modification of *Exit,* as the number of employees leaving the BG in location c, expressed as a fraction of the BG's total employment at time t, conditional on the BG exiting location c; $Exit\ LW_{ict}$ equals zero whenever $Exit_{ict}$ equals zero. Hence, $Exit\ LW_{ict}$ weighs the exit decision with its economic importance for the BG, based on the notion that it is easier for a BG to exit from a location if this decision is less disruptive for its overall operations.

The results are presented in Table 8. Since a complete exit from a location is an extreme form of shrinking the operations in that location, we expect that the coefficients with *Exit* as the dependent variable are significant whenever those with *Employment growth* are significant, albeit with opposite signs. This prediction is supported for most independent variables. The estimates for all measures of donor benefits and for the recipient benefits from labor costs always have the predicted signs in columns 1 to 3 of Table 8; they have the corresponding opposite signs in the intensive-margin regressions in Table 2. They are also economically significant: A one standard deviation change of these proxies for donor (recipient) benefits increases (decreases) the probability of exit by about 13 to 23 basis points, which is between 16% and 29% of the unconditional sample mean of *Exit* (0.8 pp from Table 1). By contrast, the variables for the recipient benefits from labor fit and labor shortage have positive signs, which is counterintuitive.

The regressions in columns 4 to 6 of Table 8 use the continuous exit measure *Exit LW* and we obtain the predicted signs across all proxies for relocation benefits. The difference between the two proxies suggests that BGs exit some locations in which they have a small presence for different reasons, and the dummy variable gives a higher weight to these exits. Economic significance is comparable to *Exit*: A one standard deviation change in each proxy

[20] There are some cases in which a BG has two or more firms in the same county in the same year. Then we require that the BG divests all firms in the same county for *Exit* to be one.

for donor (recipient) benefits increases (decreases) the probability of exit by about 1 to 4 basis points, which is between 10% and 40% of the unconditional sample mean of *Exit LW.* Consistent with expectations, donor and recipient benefits from labor fit and labor costs have the highest coefficient estimates in these regressions, whereas the coefficients for labor shortage are smaller in size and often insignificant. Hence, the benefits from lower labor costs and a better labor fit–the more persistent variables–increase the probability of exit the most. Note that the recipient benefits from lower labor costs are economically and statistically significant in all exit regressions, even though they were never significant in the intensive-margin regressions in Tables 2 and 3.

4.2 Growth at the extensive margin: Entry and exit

Next, we add entry into new locations to the analysis of the extensive margin. Entry refers to a BG's decision to acquire an existing firm or to make a green field investment in a location in which it has not been present so far, and we refer to BG growth through acquisitions as growth at the extensive margin. At the firm level, we can only analyze exit decisions, which represent an extreme form of negative growth, but we cannot do the same for entry decisions, since firm-level analyses require that firms are already members of a BG. Accordingly, we perform the analysis of entry and exit decisions at the group level and define three different group-level variables that measure extensive growth: (1) *Entry dummy* (*Exit dummy*), which equal one in a year in which the BG enters (exits from) at least one new county, *Entry count* (*Exit count*), which is the number of counties a BG enters (exits) in a particular year, and (3) *Entry LW* (*Exit LW*), which is the fraction of employees joining (leaving) the BG because it enters (exits) from the respective counties. We aggregate the measures of donor benefits to the BG level by taking the employment-weighted average of all BG firms for each BG-year. We do not include measures of recipient benefits in the regressions, since they contain the same information as the measures for donor benefits when aggregated to the BG level. Table 9 presents the results for the group-level analyses. Columns 1 to 3 (4 to 6) show results for the three exit (entry) variables as the dependent variable. All columns include year and BG-level fixed effects, and thus rely only on the within-group variation. As a baseline, we expect that the results for *Exit* are similar to those in Table 8, whereas those for *Entry* have the opposite signs.

The results for *Exit* fully conform to our expectations and confirm the observations from Table 8. All three labor-related variables ($Cost^{BG}$, $Short^{BG}$, Fit^{BG}) as well as agglomeration benefits (Agg^{BG}) have the predicted positive signs. Most importantly, benefits from saving labor costs through moving operations across locations, $Cost^{BG}$, now turn out to be statistically and economically significant and of first-order importance: The probability of

exiting a county increases by 1.8% for a one-standard deviation increase in $Cost^{BG}$, which represents about 35% of the unconditional sample mean of *Exit* of 5.2% (see Panel B of Table 1). The results for benefits from improved labor fit are of comparable magnitude, whereas those for labor shortage are economically much weaker, again consistent with the notion that persistent benefits matter more at the extensive margin, and temporary benefits less.

The results for the proxies for donor benefits in the *Entry* regressions have the opposite sign of those found in the *Exit* regressions, and the magnitudes are comparable, as expected. For BGs with larger donor benefits, we find lower probabilities of entering new locations. The economic significance is again large, in particular with respect to the persistent benefits from labor costs and labor fit. A one-standard-deviation increase in $Cost^{BG}$ (Fit^{BG}) decreases the likelihood of entry by 2.5% (2.2%), which is 48% (42%) of the sample mean, whereas a one-standard-deviation increase in $Short^{BG}$ reduces the likelihood of entry by a mere 1.3%.

To get a better grasp of the quantitative impact of the benefits at the intensive and the extensive margins, we compare their overall impact on group-level employment. The table below provides these comparisons for a one-standard deviation change in the benefits variables on the percentage changes of group-level employment. The numbers for the extensive margin simply repeat the corresponding results from Table 9, columns 3 (exit) and 6 (entry). The numbers for the intensive margin are derived by converting the estimates from Table 2 for growth rates to percentage employment changes and aggregating them to the group level following the procedure explained in Appendix A.4. The comparison shows that the

Table: Comparing the intensive and extensive margins

	Intensive margin		Extensive margin	
	Donor	Recipient	Exit	Entry
Cost	-0.550%	0.137%	-0.610%	0.429%
Short	-0.327%	0.314%	-0.331%	0.219%
Fit	-0.275%	0.289%	-0.934%	0.559%
Agglomeration	-0.646%	0.562%	-0.444%	0.443%

impact of intensive and extensive margin relocations have similar magnitudes. The extensive margin is more important for *Fit*, whereas the intensive margin is almost equally important for *Short* and *Cost* and slightly more important for agglomeration benefits. Overall, we conclude that the impact of labor-related relocation benefits is similar at the extensive and the intensive margins, but with quantitative differences that can be related to the persistence of the respective benefits.

5 Standalone firms

In this section, we extend our baseline analysis to non-BG firms to address additional questions. Specifically, we construct a counterfactual to BG firms from standalone firms (Section 5.1) and explore a sample of multi-location standalone firms (Section 5.2).

5.1 Constructing a counterfactual

The baseline analysis only considers BG firms and provides an analysis of the cross-sectional variation in employment growth of these firms, but it does not compare BG firms to non-BG, standalone firms. In this robustness check, we extend the baseline analysis by constructing a counterfactual from matching standalone firms. If the relative patterns of employment growth documented in Section 3 could be attributed to general regional patterns of the migration of jobs and operations, which may occur for reasons related to demographics, migration, changes in transport systems, or structural changes in the economy, then these patterns should be shared by standalone firms as well. Matching BG firms with similar non-BG firms controls for these unobservable factors.

To identify matching standalone firms, we adopt a two-step procedure. In the first step, we require that standalone firms perfectly match the BG firm on a set of categorical variables. Specifically, we define cells based on the full cross-product of counties (400 units), calendar years (12), 2-digit industry codes (84), and the number of establishments (4 categories: 1 establishment, 2-5, 6-10, and more than 10 establishments). Among the firms that provide a perfect categorical match, we then pick that standalone firm as a match that minimizes the Euclidean distance to its matching BG firm based on six continuous variables: firm size, measured as beginning-of-year log employment, log firm age, log average worker age, percentage of female workers, percentage of highly qualified workers, and percentage of medium-qualified workers. All continuous variables are standardized.

Table OA7 shows the matching results and reports the mean and median of firm size and firm age for the matched BG firms ($N = 68,977$), the unmatched BG firms ($N = 27,814$) and the matched standalone firms. The Imbens-Wooldridge statistic for relative differences (Imbens and Wooldridge, 2009), which measures the economic rather than the statistical significance of the difference between BG firms and matching standalone firms, is below the recommended threshold of 0.25 for all six variables reported in Table OA7. We can match about 70% of the firm-year observations in our sample. The unmatched BG firms are on average 73% larger than the matched BG firms: Most large firms are affiliated with BGs and thus difficult to match with standalone firms.

Columns 1 and 2 of Table 10 reproduce the main results for the regressions with *Employ-*

ment growth as the dependent variable. Comparing the regressions for matched BG firms (column 1) with those for standalone firms (column 2) shows that the patterns observed in Table 2 can be attributed entirely to the BG status of firms and not to demographic or structural factors that are common to BG firms and matching standalone firms. In fact, all measures of labor-related benefits are insignificant for standalone firms, whereas the results for the subset of BG firms we can match is not only qualitatively but for almost all variables also quantitatively similar to what we find for the whole sample in Table 2, which shows that the suspected confounding factors do not influence the analysis, which is unsurprising given the inclusion of saturated fixed effects.

5.2 Multi-location standalone firms

In the analysis so far, we have used a sample of multi-location BGs to test our hypothesis. As noted above, most larger multi-location firms in Germany operate as BGs in which the subsidiaries are incorporated as separate legal entities. However, our hypothesis does not require that the subsidiaries that either lose or attract new operations are legally separate entities, and we can legitimately ask whether the observations established in the previous sections would also extend to standalone firms that operate establishments in multiple locations, but do not incorporate these establishments as legally separate entities. Hence, we create a sample of standalone firms that operate establishments in at least two different counties in Germany. From non-tabulated results, we observe that multi-location standalone firms are smaller and have smaller establishments.[21] Hence, potential differences may arise from either differences in the economics of operating smaller entities, or from the potential relevance of not operating their establishments as legally separate entities.

Columns 3 to 5 of Table 10 replicates the analysis of Table 2 for multi-location standalone firms, but the analysis is now performed at the establishment level. The results for donor benefits and recipient benefits are qualitatively similar to those found for multi-location BGs, but we can note some quantitative differences. The donor benefits play a somewhat smaller role for standalone firms than for BGs, and, in particular, the results for *Short* are weaker. Recipient benefits are generally stronger and become statistically significant across all three labor market measures. We conclude from this analysis that multi-location standalone firms behave similarly to multi-location BGs and take advantage of differences across labor markets within Germany, but that firm size and legal status affect the relative strength of the economic forces we identify.

[21] The average employee count of multi-location standalone firms is 179, 34% less than a BG firm, and 82% less than an entire BG. Establishments of multi-location standalone firms have only 45 employees, 42% less compared to 78 employees for BG establishments.

6 Robustness

In this section, we discuss additional robustness checks that use alternative definitions of local labor markets and some key independent variables. Specifically, we use an alternative definition of local labor markets (Section 6.1); provide alternative definitions for the measurement of labor fit (Section 6.2), labor shortage (Section 6.3), and for agglomeration benefits (Section 6.4). In all cases, we replicate the regressions from Table 2 (column 5), Table 5 (columns 3, 6, and 7), Table 8 (columns 3 and 6), and from Table 9 (columns 1 to 6). All tables are relegated to the Online Appendix.

6.1 The definition of local labor markets

Our baseline specifications use counties to define local labor markets. However, Germany has 400 counties with an average population of about 200,000, which makes the average county relatively small. Too narrow a definition of local labor markets may overlook that employees are often willing to commute to work from neighboring counties. Moreover, employees who live in the border region of a county have about equal access to firms in their own as well as their neighboring county and thereby form part of the labor supply of both counties. Using a broader definition of local labor markets, such as dividing Germany into 50 commuting zones (Kropp and Schwengler, 2016; Popp, 2023), addresses only the first but not the second issue.[22]

We use a different approach and define the local labor market to which firms have access as comprising their own county as well as all neighboring counties. More specifically, for any firm j located in county c at time t, the local labor market in relation to which we define the measures of labor costs, labor shortage, and labor fit comprises all employees who live either in county c or in any other county $g \neq c$ that has a common border with county c. In this way, local labor markets are necessarily overlapping. This strategy addresses both issues discussed in the previous paragraph. Accordingly, we define the measures of labor market characteristics and agglomeration benefits for a firm j located in county c as employment-weighted averages of the respective measures for county c and all its adjacent counties. The definitions of all other variables remain unchanged.

We report the results in Table OA8 in the Online Appendix and they are qualitatively robust and show that none of our conclusions above depend on the way in which we define local labor markets. There are noteworthy changes for the coefficients for Fit^{Don}, which become economically and statistically more significant. Hence, the regressions in Table 2

[22]Studies on US data also use both definitions: Rinz (2022)) and Bai et al. (2022) use commuting zones, whereas and Kim (2020) Kim (2020) and Benmelech et al. (2022) use the more granular county level.

appear to underestimate donor benefits, since they do not account for the possibility that firms can lure workers from neighboring counties. With the broader definition of local labor markets, the improvements from Fit become much larger.

6.2 Labor fit

As an alternative to Fit, we use the cosine similarity measure for human-capital relatedness introduced by Lee et al. (2018). However, whereas Lee et al. (2018) measure the relatedness between the labor force of a target and an acquirer in a merger, we measure the similarity between the labor force of firm i and that of all employees located in county c. Appendix A.5 provides a detailed description and formal definition of this measure and Table OA9 in the Online Appendix shows the results. The coefficients have the predicted signs. However, the economic and statistical significance for HCR is smaller across the board, which suggests that HCR is a noisier measure of labor fit compared to Fit.

6.3 Labor shortage

To construct an alternative measure of labor shortage, we build on Cestone et al. (2024) and use establishment closures in a county as a source of exogenous shocks to the labor supply of other firms. As in our baseline measure, the idea is that for each focal firm, changes in the labor demand of all other firms represent a change in labor supply. Hence, we measure shocks to labor shortage by counting all employees in occupation l in county c in year t that are separated from their firms because of establishment closures, which are reported by our data provider. Separated employees are then scaled by the beginning-of-year county-level employment in the same occupation. The resulting numbers replace the regression residuals $\hat{\mu}_{clt}$ in equation (4), averaged over three years, and inserted in equation (5) to provide an alternative measure of labor shortage.

Table OA10 shows the results, which are qualitatively and quantitatively similar to the baseline results for analyses of the intensive margin. The largest change is for the donor benefits from labor shortage, $Short^{Don}$, which shift more strongly toward external labor markets (85.1% instead of 61.5% of the effect is attributable to internal transfers). For the entry and exit regressions, there are some larger changes in both directions. The most significant difference relative to the baseline results is for the BG level (Panel B), for which labor shortage is completely insignificant with the new measure, potentially because, compared to our baseline measure, establishment closures provide an even less persistent shock to the supply of labor to trigger exits and entry. This impact on significance may also account for the sign changes for the labor fit and agglomeration variables.

6.4 Agglomeration benefits

We measure how attractive a location is based on the proximity to customers and suppliers. Being closer to customers and suppliers offers several agglomeration benefits, such as lower transportation costs and more information spillovers. We follow the literature in regional economics (Glaeser and Kerr 2009; Alcacer and Chung, 2014) and define two additional variables, Buy_{sct} and Sup_{sct}, which measure the buyer fit and the supplier fit of county c at time t for a firm that operates in industry s. Both measures are constructed from industry-level input-output tables for Germany and increase if the industries from (to) which a focal firm buys (sells), account for a larger fraction of the employment in its county. Appendix OA11 provides a detailed description and formal definitions of these measures, and Table OA11 in the Online Appendix shows the results. *Buyer* and *Supplier* show the predicted signs consistently across almost all specifications, but only about half of these coefficients are statistically and economically significant. Overall, these results imply that firms have a tendency to relocate their operations to counties that have a higher density of potential customer and supplier firms, but this aspect does not seem to be of first-order importance. Moreover, adding buyer and supplier fit has only a minor impact on the estimates for the measures of relocation benefits that are the focus of our analysis.

7 Conclusion

We explore a new explanation of how multi-location firms may add value: By operating firms in multiple locations, they can move operations and jobs between affiliated firms. We focus on moves between existing locations–the intensive margin–and find that BGs move jobs across counties if the destination county has a higher labor supply and offers a better skill match to the firm. Firms move operations away from locations with high labor costs, but low labor costs do not necessarily make another location more attractive, which shows that relaxing human-capital constraints is more important than reducing costs. Whereas BGs realize labor-related relocation benefits if it is easier to move physical operations, the opposite applies to agglomeration economies. BGs tend to move more operations if this involves more high-skilled jobs, contrary to what the offshoring literature finds for international relocations. At the extensive margin, labor-related benefits that are more persistent–labor costs and the fit to firms' skill requirements–are more important, whereas addressing shorter-lived labor shortages becomes less important compared to relocations at the intensive margin. Overall, we show how business groups strategically arbitrage the use of immobile resources in different locations.

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A Appendix

A.1 Growth rates

We use the following definitions:

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

A.1.1 Internal and external growth rates

From our definitions above, we obtain

$$\Delta E_{ict} \equiv E_{ict} - E_{ic,t-1} = H_{ict} - S_{ict}. \tag{13}$$

Hence, we can rewrite the growth rate (1) as:

$$g_{ict} = \frac{H_{ict} - S_{ict}}{0.5\left(E_{it} + E_{i,t-1}\right)}. \tag{14}$$

We define one-year hiring rates and separation rates as

$$h_{ict} = \frac{H_{ict}}{0.5\left(E_{ict} + E_{ic,t-1}\right)},\ s_{jt} = \frac{S_{ict}}{0.5\left(E_{ict} + E_{ic,t-1}\right)}. \tag{15}$$

From (13), (14), and (15), we have

$$g_{ict} = h_{ict} - s_{ict}. \tag{16}$$

Next, we decompose hirings and separations into an internal component and an external component:

$$\begin{aligned} H_{it} =& H_{it}^{I} + H_{it}^{X} \\ S_{it} =& S_{it}^{I} + S_{it}^{X}, \end{aligned} \tag{17}$$

where the superscript "I" refers to internal flows and the superscript "X" refers to external flows. We define a flow as internal whenever an employee moves jobs between two firms that

belong to the same BG at the time of the move. Accordingly, we define *Internal employment growth* as

$$g_{it}^{I} = \frac{H_{it}^{I} - S_{i,t-1}^{I}}{0.5\,(E_{it} + E_{i,t-1})}, \tag{18}$$

and *External employment growth* as

$$g_{it}^{X} = \frac{H_{it}^{X} - S_{i,t-1}^{X}}{0.5\,(E_{it} + E_{i,t-1})}. \tag{19}$$

With these definitions, we obtain equation (10) in the text from (14) and (17).

A.2 Relocation benefits regarding labor fit, labor shortage, and agglomeration

Analogous to $Cost^{Don}$ ($Cost^{Rec}$), we define the donor (recipient) benefits from relieving labor shortages ($Labor\ shortage_{ict}$) as

$$Short_{it}^{Don} = max\{Labor\ shortage_{ict} - Labor\ shortage_{int}, 0\}_{j \in BG(t)}, \tag{20}$$

$$Short_{it}^{Rec} = \sum_{j \in BG(t)} max_{j \in BG(t)} \{Labor\ shortage_{jnt} - Labor\ shortage_{jct}, 0\} \frac{E_{jnt}}{E_{ict}}. \tag{21}$$

Next, we define the donor (recipient) benefits from improving the labor fit based on our measure of the quality of labor fit ($Labor\ fit_{ict}$) as

$$Fit_{it}^{Don} = max\{Labor\ fit_{int} - Labor\ fit_{ict}, 0\}_{j \in BG(t)}, \tag{22}$$

$$Fit_{it}^{Rec} = \sum_{j \in BG(t)} max_{j \in BG(t)} \{Labor\ fit_{jct} - Labor\ fit_{jnt}, 0\} \frac{E_{jnt}}{E_{ict}}. \tag{23}$$

Finally, we define the donor and recipient benefits from relocating operations of the BG to regions with a higher level of industrial agglomeration ($Agglomeration_{ict}$) as

$$Agg_{it}^{Don} = max\left\{ln(Agglomeration_{int}/Agglomeration_{ict}), 0\right\}_{j \in BG(t)}. \tag{24}$$

$$Agg_{it}^{Rec} = \sum_{j \in BG(t)} max_{j \in BG(t)} \{ln(Agglomeration_{jct}/Agglomeration_{jnt}), 0\} \frac{E_{jnt}}{E_{ict}}. \tag{25}$$

A.3 Variables derived from the Integrated Employment Biographies

The employee-level data used 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.[23] 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. We always use the information from the latest spell in a calendar year.

A.3.1 Occupational characteristics

We observe three occupational characteristics at the employee level: education, qualification and task complexity. In addition, we can distinguish between managerial and non-managerial employees.We describe their construction in the following. All occupation-related variables follow the definitions of Blossfeld (1987), who classifies jobs into 12 distinct major occupations based on the German Classification of Occupations 1970 ("Klassifikation der Berufe 1970"). Table 1 on page 99 in Blossfeld (1987) provides a detailed overview of those 12 occupations and related ISCO codes.

Qualification index. We sort the occupational groups presented in Blossfeld (1987) into three groups according to the level of their qualification. We assign level 1 to employees with a low qualification S(simple manual occupations, simple services, simple commercial and administrative occupations); level 2 to employees with a medium qualification (skilled manual occupations, qualified services, semi-professions, qualified commercial and administrative occupations); and level 3 to employees with a high qualification (technicians, engineers, professions, managers). The variable *Qualification* is defined as the average employee qualification level of an entity at the end of the calendar year.

Education index. *Education* is based on the academic and vocational education background recorded in the IEB database. We assign employees the following education milestones based on this information: no school leaving certificate or intermediate school leaving

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

certificate (ISLC), ISLC with vocational training, upper secondary school leaving certificate (USSLC) with or without vocational training, college, and university degree. We assign a value of one to each employee with ISLC only; two to each employee with an ISLC and vocational training, or with an USSLC with or without vocational training; and three to each employee with a college or university degree at the end of the calendar year. *Education* is then defined as the average employee education level of an entity at the end of the calendar year.

Task complexity index. *Task complexity* is captured from the variable "niveau" in the IEB database, which characterizes each occupation with one of four values: one ("helper"), two ("skilled"), three ("specialist"), or four ("expert"). The variable *Task complexity* is defined as the weighted average of the occupation task complexity level across all employees of an entity at the end of the calendar year.

Managers. We also use the Blossfeld classification to distinguish between managerial and non-managerial occupations. The latter are all 11 Blossfeld occupations that are not managers.

A.3.2 Sample splits for groups defined by occupational characteristics

In this section, we use the occupational characteristics defined in the previous section to split the sample into groups of employees and break up employment growth into subsamples. These subsamples are used in Table 4. However, simply averaging employee characteristics within each occupation-year cell may reflect differences in the composition of workers across industries, counties, and years, rather than attributes intrinsic to the occupation itself. To isolate cross-occupational variation, we adopt a three-step procedure:

1. Calculate the averages of education, qualification, and task complexity across all employees within a county for each sector (1-digit NACE Rev. 2 industry code) and year. Then we subtract the respective mean from the measures of education, qualification, and task complexity to remove county and industry fixed effects before we assign observations to terciles. For each employee e, we calculate

$$\dot{v}_{et} = v_{et} - \frac{1}{M_{cdt}} \sum_{e \in I_{cdt}} v_{et},$$

   where $v \in \{\textit{Education}, \textit{Qualification}, \textit{Task complexity}\}$; I_{cdt} is the set of all employees in county c, sector d, and calendar year t; and M_{cdt} is the number of employees in I_{cdt}.

2. Across all employee-years, calculate the time-invariant characteristic of occupation l as

$$\bar{v}_l = \frac{1}{N_l} \sum_{e \in I_l} \dot{v}_{et},$$

where I_l consists of all employee-years of occupation l; N_l is the number of employee-years in I_l.

3. Split the employees for each firm i at time t, E_{it}, into three groups E^a_{it}, $a \in \{1, 2, 3\}$, according to $\bar{v}_l$, such that $E_{it} = E^1_{it} + E^2_{it} + E^3_{it}$. The breakpoints are determined by the terciles of $\bar{v}_l$ across all sample employees (all counties, all sample years) and, therefore, constant across all sample years.

The split into three groups allows us to decompose employment growth g_{it} into three components:

$$g^a_{it} = \frac{E^a_{it} - E^a_{i,t-1}}{0.5 \cdot (E_{it} + E_{i,t-1})}, \quad a \in \{1, 2, 3\},$$

such that $g_{it} = g^1_{it} + g^2_{it} + g^3_{it}$.

A.4 Converting firm-level growth rates to group-level employment changes

We cannot directly compare the effect of relocation benefits on employment at the intensive margin with that at the extensive margin, because the former is measured as firm-level employment growth (column 5 of Table 2), whereas the latter is measured as the percentage share of group-level employment (columns 3 and 6 of Table 9). We therefore convert the former to the latter.

First, we estimate the firm-level absolute employment changes attributable to each of the eight relocation benefits. Taking $Cost^{Don}$ as an example, the predicted absolute employment change for firm i in year t attributable to a one-standard-deviation increase in $Cost^{Don}$ is

$$\mathbb{E}\left[\Delta E_{it} \mid \Delta Cost^{Don} = 1\right] = 1 \cdot \widehat{\beta}_1 \cdot \left[(E_{it} + E_{it-1}) \cdot 0.5\right],$$

where $\widehat{\beta}_1$ denotes the estimated coefficient on the variable $Cost^{Don}$ in column 5 of Table 2 and $(E_{it} + E_{it-1}) \cdot 0.5$ is the average firm employment of firm i between year $t-1$ and t. Please note that all eight relocation benefit variables are normalized with mean zero and standard deviation one. Next, we aggregate the predicted annual firm-level absolute employment changes to the group-year level and scale the sum by the corresponding group-level employment. This yields the expected percentage change in group-level employment in re-

sponse to a one-standard-deviation increase in $Cost^{Don}$. Finally, we average these percentage changes in employment over group-years to capture the average effect in our sample.

A.5 Defining human-capital relatedness

HCR is calculated as the cosine similarity between a firm's job vector $\mathbf{k}_{it}$ and a county's job vector $\mathbf{k}_{ct}$. The vector $\mathbf{k}_{it} \equiv (k_{i1t}, k_{i2t}, ..., k_{i12t})$ gives the number of firm employees in each of the twelve Blossfeld occupations, analogously, the vector $\mathbf{k}_{ct}$ represents the composition of the labor force at the county level.

$$HCR_{ict} = \frac{\mathbf{k}'_{it}\mathbf{k}_{ct}}{\sqrt{\|\mathbf{k}_{it}\| \cdot \|\mathbf{k}_{ct}\|}}. \tag{26}$$

HCR_{ict} achieves its maximum value of 1 if the vectors $\mathbf{k}_{it}$ and $\mathbf{k}_{ct}$ are exactly proportional to each other, so that $\mathbf{k}_{it} = \phi\mathbf{k}_{ct}$ for some positive constant ϕ. In that case, firm i employs workers across occupations in exactly the same proportions in which they appear in county c's labor force. We obtain the following measures for donor and recipient benefits:

$$HCR_{it}^{Don} = max\{HCR_{int} - HCR_{ict}, 0\}_{n \in BG(t)}, \tag{27}$$

$$HCR_{it}^{Rec} = \sum_{j \in BG(t)} max_{j \in BG(t)} \{HCR_{jct} - HCR_{jnt}, 0\} \frac{E_{jnt}}{E_{ict}}. \tag{28}$$

A.6 Defining supplier and buyer fit

We follow Glaeser and Kerr (2009) and Alcacer and Chung (2014) and define buyer fit as:

$$Buyer_{sct} = \left[\sum_{r=1,...,S} output_{s \to r} \frac{E_{rct}}{E_{rt}} \right] \frac{E_{ct}}{E_t}, \tag{29}$$

where $output_{s \to r}$ is the share of industry s's output that goes to industry r, E_{rct} is the employment of industry r in county c at time t, E_{rt} is the total employment for industry r across locations at time t, E_{ct} is the total employment (across industries) for county c at time t, and E_t is total employment across location and industries (national employment) at time t. We measure *output* using the German input-output table from year 2010 through 2017 provided by the Federal Statistical Office of Germany. Following Glaeser and Kerr (2009) and Alcacer and Chung (2014), we define supplier fit as:

$$Supplier_{sct} = \sum_{r=1,...,R} \left| input_{s \leftarrow r} - \frac{E_{rct}}{E_{ct}} \right|, \tag{30}$$

where $input_{s \leftarrow r}$ is the share of industry s's inputs that come from industry r, E_{rct} is the employment of industry r in county c at time t, and E_{ct} is the total employment (across industries) for county c at time t. Again, we measure *input* using the same German input-output table. We obtain the following measures for donor and recipient benefits:

$$Buy_{it}^{Don} = max\{Buyer_{int} - Buyer_{ict}, 0\}_{n \in BG(t)}, \tag{31}$$

$$Buy_{it}^{Rec} = \sum_{j \in BG(t)} max_{j \in BG(t)} \{Buyer_{jct} - Buyer_{jnt}, 0\} \frac{E_{jnt}}{E_{ict}}, \tag{32}$$

$$Sup_{it}^{Don} = max\{Supplier_{int} - Supplier_{ict}, 0\}_{n \in BG(t)}, \tag{33}$$

$$Sup_{it}^{Rec} = \sum_{j \in BG(t)} max_{j \in BG(t)} \{Supplier_{jct} - Supplier_{jnt}, 0\} \frac{E_{jnt}}{E_{ict}}. \tag{34}$$

A.7 Variable definitions

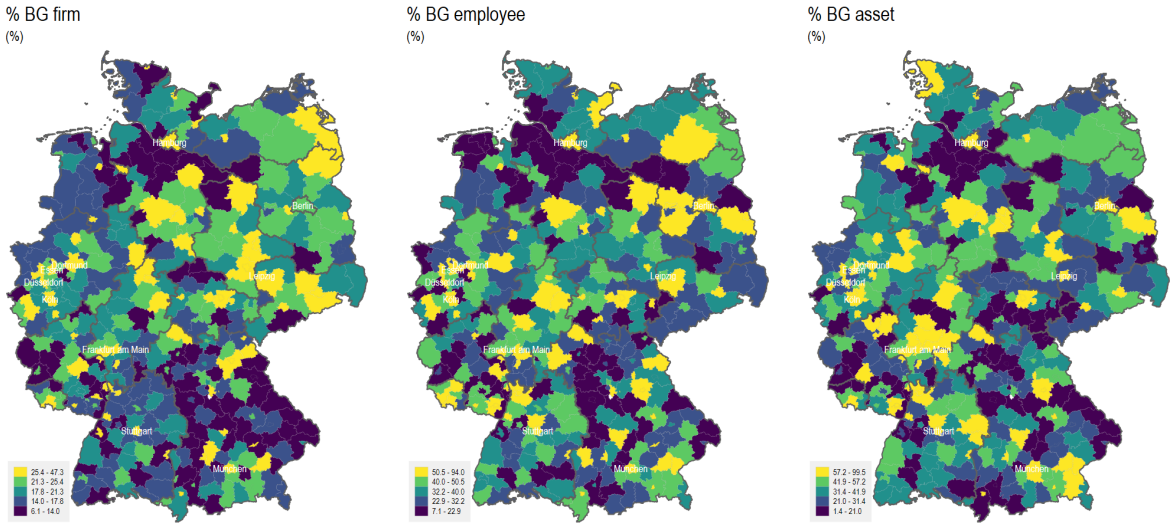
Table A1: Description of variables. The table defines the main numerical variables used in the paper. All other variables are defined in the respective captions of the tables using them.

Variable	Definition
Panel A: Firm-level variables	
Employment growth	Employment growth rate from t-1 to t as defined in Section 2.2.1 and Appendix A.1.
Int. emp. growth	Internal employment growth rate from t-1 to t as defined in Appendix A.1.
Ext. emp. growth	External employment growth rate from t-1 to t as defined in Appendix A.1.
Hiring rate	Hiring rate from t-1 to t as defined in Section 3.3.2.
Separation rate	Separation rate from t-1 to t as defined in Section 3.3.2.
Exit	Dummy. Equals one if a BG firm is no longer affiliated to a BG and, consequently, the BG loses its presence in the BG firm's county of residence and remains absent for the rest of the sample period. Equals zero otherwise.
Labor cost	A firm's expected labor cost in a county given its job profile, calculated as the job-weighted average of county-level average wages across 12 Blossfeld job categories. See Section 2.2.2.
Labor shortage	A firm's expected labor shortage in a county given its average industry job profile, calculated as the job-weighted average of county-level unexpected labor demand rise across 12 Blossfeld job categories. See Section 2.2.2.
Labor fit	A firm's expected labor fit in a county given its average industry job profile, calculated as the Manhattan distance between the job profile demanded by the industry and the job profile supplied by a county across 12 Blossfeld job categories. See Section 2.2.2.
Agglomeration	The level of spatial agglomeration for an industry in a county, proxied by the number of employees hired by establishments operating in a given industry and domiciled in a given county, in logarithm. See Section 2.2.2.
$Cost^{Don}$	Donor benefits with respect to labor cost. The maximum cut in labor cost a BG firm could achieve if it hires employees in another county where the BG is present. See Section 3.1.
$Short^{Don}$	Donor benefits with respect to labor supply. The maximum relief of labor shortage a BG firm could achieve if it hires employees in another county where the BG is present. See Appendix A.2.
Fit^{Don}	Donor benefits with respect to labor fit. The maximum improvement of labor fit a BG firm could achieve if it hires employees in another county where the BG is present. See Appendix A.2.
Agg^{Don}	Donor benefits with respect to agglomeration. The largest extent to get closer to competitors a BG firm could achieve if it employees in another county where the BG is present. See Appendix A.2.
$Cost^{Rec}$	Recipient benefits with respect to labor cost. The maximum labor cost cut a BG firm could contribute by allowing affiliated firms to relocate their employees towards it. See Section 3.1.
$Short^{Rec}$	Recipient benefits with respect to labor supply. The maximum labor shortage relief a BG firm could contribute by allowing affiliated firms to relocate their employees towards it. See Appendix A.2.
Fit^{Rec}	Recipient benefits with respect to labor fit. The maximum labor fit improvement a BG firm could contribute by allowing affiliated firms to relocate their employees towards it. See Appendix A.2.

Table A1: Description of variables (continued).

Variable	Definition
Agg^{Rec}	Recipient benefits with respect to agglomeration economics. The largest extent to get closer to competitors a BG firm could contribute by allowing affiliated firms to relocate their employees towards it. See Appendix A.2.
Size	Total assets in logarithm.
Age	Firm age.
Relative size	Firm asset divided by BG asset.
Small firm	Dummy. Equals one if a firm has fewer than 10 employees, and zero otherwise.
Education	A firm's weighted average of employee education ranks (4 categories). See Appendix A.3.1.
Qualification	A firm's weighted average of employee qualification ranks (3 categories). See Appendix A.3.1.
Enabling share	Firm employment in enabling functions (management, office workers, human resources, and accounting) divided by total firm employment.
mc	Firm employment in enabling functions (management, office workers, human resources, and accounting) divided by total BG employment in enabling functions.
imb	Imbalance of managerial capabilities across BG member firms. See Section 3.4.
Panel B: BG-level variables	
Entry	Dummy. Equals one if a BG gains its presence in a county for the first time in the sample period. Equals zero otherwise.
Entry count	Number of counties a BG enters.
Entry LW	Equals the fraction of workers added by entering counties.
Exit	Dummy. Equals one if a BG loses its presence in a county. Equals zero otherwise.
Exit count	Number of counties a BG exits from.
Exit LW	Equals the fraction of workers lost by exiting from counties.
Labor cost	Labor-weighted average of the firm-level version.
Labor shortage	Labor-weighted average of the firm-level version.
Labor fit	Labor-weighted average of the firm-level version.
Agglomeration	Labor-weighted average of the firm-level version.
$Cost^{BG}$	Labor-weighted average of donor benefits with respect to labor costs.
$Short^{BG}$	Labor-weighted average of donor benefits with respect to labor shortage.
Fit^{BG}	Labor-weighted average of donor benefits with respect to labor fit.
Agg^{BG}	Labor-weighted average of donor benefits with respect to agglomeration economics.
Size	Total assets of all firms with a BG in logarithm.
Age	Labor-weighted average of the firm-level version.
Education	Labor-weighted average of the firm-level version.
Qualification	Labor-weighted average of the firm-level version.
Enabling share	Labor-weighted average of the firm-level version.

B Figures



(a) **(b)** **(c)**

Figure 1: Geographical distribution of BG firms across Germany. This figure plots the distribution of BG firms across 400 German counties from 2005 to 2017. Each variable plotted is calculated at the county-year level, averaged across all sample years, sorted into quintiles and marked with different colors. The range of each quintile is given in the legend of each panel. Figure 1a plots the number of BG firms as a percentage of all firms. Figure 1b plots the total number of employees of BG firms as a percentage of the total number of employees of all firms. Figure 1c plots the total amount of assets owned by BG firms as a percentage of the total assets of all firms.

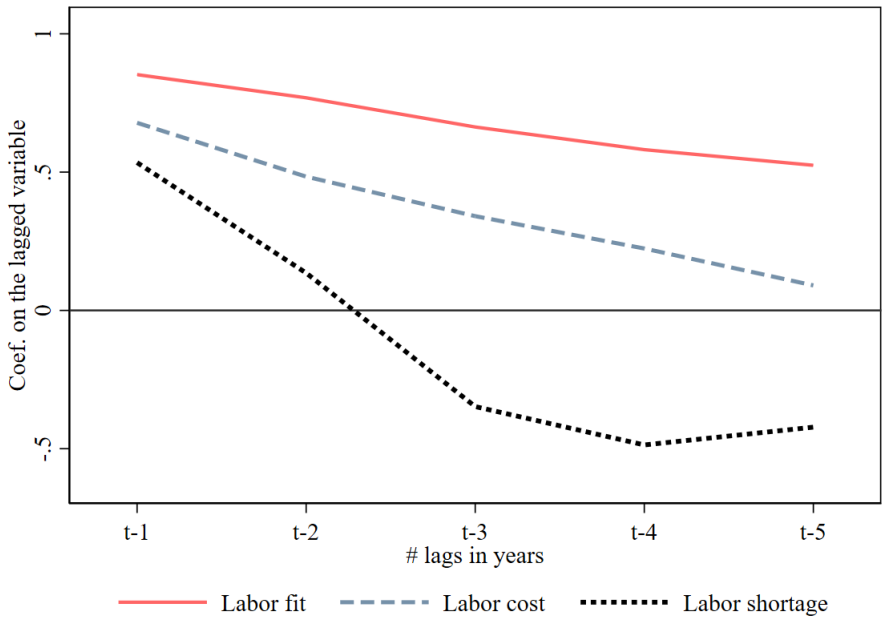


Figure 2: Autocorrelations of Labor costs, Labor shortage, and Labor fit. This figure plots the coefficients estimated from the following autoregression model: $Y_{sct} = \phi \cdot Y_{sct-n} + \psi_{sc} + \chi_t + \varsigma_{sct}$, where c indexes counties, s indexes industries (defined by 2-digit NACE Rev. 2 codes), and t indexes calendar years. The dependent variable Y_{sct} is one of $Labor\,cost_{sct}$, $Labor\,fit_{sct}$, or $Labor\,shortage_{sct}$. The independent variable Y_{sct-n} is the dependent variable lagged by n years, where n ranges from 1 to 5. Each line plots the coefficient ϕ as a function of n. The sample covers all county-industry pairs observed between 2000 and 2017.

C Tables

Table 1: Summary statistics. This table provides descriptive statistics for all variables used in our main analyses. All variables are defined in Table A1.

	N	Mean	SD	P1	P25	P50	P75	P99
Panel A: Firm-level variables								
# Employees	97,390	271.421	2,874.220	1.000	33.000	75.000	168.000	2,061.000
Total assets (mln EUR)	97,390	159.725	2,479.828	0.146	2.896	7.719	22.218	1,495.577
Employment growth (%)	97,390	1.936	24.224	-83.974	-4.138	1.096	8.418	78.594
Int. emp. growth (%)	97,390	0.042	8.948	-21.818	-0.989	0.000	0.962	23.077
Ext. emp. growth (%)	97,390	1.893	21.781	-68.182	-3.802	0.976	7.947	66.667
Hiring rate (%)	97,390	20.583	19.432	0.000	8.840	15.827	26.230	100.000
Separation rate (%)	97,390	18.647	19.335	0.000	8.065	13.793	22.642	100.000
Exit (%)	97,390	0.813	8.981	0.000	0.000	0.000	0.000	0.000
Exit LW (%)	97,390	0.141	2.427	0.000	0.000	0.000	0.000	0.000
Labor cost	97,390	4.776	0.266	4.138	4.608	4.766	4.944	5.418
Labor shortage	97,390	0.000	0.019	-0.053	-0.009	0.000	0.009	0.056
Labor fit	97,390	-0.869	0.233	-1.409	-1.033	-0.879	-0.700	-0.388
Agglomeration	97,390	7.933	1.528	3.932	7.007	7.971	8.941	11.108
$Cost^{Don}$	97,390	0.000	1.000	-0.659	-0.659	-0.659	0.477	3.378
$Short^{Don}$	97,390	0.000	1.000	-0.580	-0.580	-0.580	0.264	4.311
Fit^{Don}	97,390	0.000	1.000	-0.608	-0.608	-0.608	0.332	3.678
Agg^{Don}	97,390	0.000	1.000	-0.615	-0.615	-0.615	0.352	3.352
$Cost^{Rec}$	97,390	0.000	1.000	-0.198	-0.198	-0.198	-0.179	8.149
$Short^{Rec}$	97,390	0.000	1.000	-0.229	-0.229	-0.229	-0.192	7.278
Fit^{Rec}	97,390	0.000	1.000	-0.228	-0.228	-0.228	-0.184	7.288
Agg^{Rec}	97,390	0.000	1.000	-0.233	-0.233	-0.233	-0.186	7.243
Size	97,390	15.936	1.847	11.894	14.879	15.859	16.916	21.126
Age	97,390	25.711	30.159	2.000	9.000	17.000	28.000	146.000
Relative size	97,390	0.363	0.331	0.000	0.055	0.265	0.631	1.000
Small firm	97,390	0.100	0.300	0.000	0.000	0.000	0.000	1.000
Education	97,390	2.057	0.306	1.353	1.882	2.000	2.197	3.000
Qualification	97,390	1.820	0.444	1.000	1.480	1.880	2.090	3.000
Enabling share	97,390	0.222	0.256	0.000	0.046	0.122	0.286	1.000
mc	97,390	0.323	0.323	0.000	0.041	0.200	0.563	1.000
imb	97,390	0.153	0.152	0.002	0.047	0.105	0.208	0.712
Industry Tobin's Q	97,390	1.775	0.857	1.122	1.440	1.650	1.952	2.933
County GDP growth	88,852	0.030	0.040	-0.090	0.013	0.032	0.049	0.132

Table 1: Summary statistics (continued).

	N	Mean	SD	P1	P25	P50	P75	P99
Panel B: BG-level variables								
# Employees	35,901	976.631	6,300.000	8.000	112.000	242.000	617.000	9,786.000
Entry (%)	35,901	3.565	18.543	0.000	0.000	0.000	0.000	100.000
Entry count	35,901	0.052	0.350	0.000	0.000	0.000	0.000	1.000
Entry LW (%)	35,901	0.789	6.035	0.000	0.000	0.000	0.000	29.374
Exit (%)	35,901	2.072	14.246	0.000	0.000	0.000	0.000	100.000
Exit count	35,901	0.034	0.336	0.000	0.000	0.000	0.000	1.000
Exit LW (%)	35,901	0.520	5.114	0.000	0.000	0.000	0.000	17.568
Labor cost	35,901	0.000	1.000	-1.933	-0.657	-0.133	0.509	3.074
Labor shortage	35,901	0.000	1.000	-2.993	-0.452	-0.006	0.459	3.121
Labor fit	35,901	0.000	1.000	-2.454	-0.722	0.028	0.685	2.166
Agglomeration	35,901	0.000	1.000	-0.541	-0.443	-0.312	0.013	3.852
$Cost^{BG}$	35,901	0.000	1.000	-0.609	-0.609	-0.551	0.252	3.784
$Short^{BG}$	35,901	0.000	1.000	-0.576	-0.576	-0.521	0.203	4.204
Fit^{BG}	35,901	0.000	1.000	-0.610	-0.610	-0.579	0.246	3.710
Agg^{BG}	35,901	0.000	1.000	-0.390	-0.390	-0.390	-0.111	4.734
Size	35,901	17.258	1.731	13.531	16.207	17.062	18.174	22.343
Age	35,901	30.065	30.711	2.093	12.500	20.674	36.369	137.579
Education	35,901	2.023	0.244	1.424	1.888	2.000	2.134	2.734
Qualification	35,901	1.786	0.355	1.032	1.536	1.813	2.021	2.714
Enabling share	35,901	0.195	0.194	0.000	0.066	0.134	0.246	0.930

Table 2: Firm growth and benefits from relocation. This table reports panel regressions of firm-level employment growth against donor benefits, recipient benefits, control variables, and fixed effects. Employment growth is calculated as the net rate of hiring and separation. All independent variables are lagged by one year. $Cost^{Don}$, $Short^{Don}$, Fit^{Don} and Agg^{Don} measure the potential for a BG firm to reduce labor cost, relieve labor shortage, improve labor fit, and exploit agglomeration economies by hiring its employees in another county where the BG is present. $Cost^{Rec}$, $Short^{Rec}$, Fit^{Rec} and Agg^{Rec} measure the potential for a BG firm to contribute to reducing labor cost, relieving labor shortage, improving labor fit, and exploiting agglomeration economies by allowing affiliated firms to relocate their employees towards it. All eight relocation benefit variables are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 2: Firm growth and opportunities for relocation (continued).

Dep. var.	Employment growth(%)					
	(1)	(2)	(3)	(4)	(5)	(6)
$Cost_{t-1}^{Don}$	-0.496***	-0.525***	-0.483***	-0.561***	-0.633***	
	(-3.88)	(-4.03)	(-3.60)	(-4.19)	(-4.69)	
$Short_{t-1}^{Don}$	-0.314***	-0.380***	-0.353***	-0.488***	-0.376***	
	(-2.85)	(-3.46)	(-3.05)	(-4.23)	(-3.23)	
Fit_{t-1}^{Don}	-0.217**	-0.278**	-0.522***	-0.635***	-0.316**	
	(-1.99)	(-2.50)	(-4.05)	(-4.88)	(-2.21)	
$Cost_{t-1}^{Rec}$	0.050	0.000	0.026	0.040	0.158	
	(0.37)	(-0.00)	(0.19)	(0.30)	(1.14)	
$Short_{t-1}^{Rec}$	0.333**	0.725***	0.735***	0.495***	0.361***	
	(2.51)	(5.44)	(5.51)	(3.76)	(2.71)	
Fit_{t-1}^{Rec}	0.419***	0.844***	0.855***	0.602***	0.333**	
	(2.73)	(5.43)	(5.50)	(3.83)	(1.98)	
Agg_{t-1}^{Don}					-0.743***	-1.019***
					(-5.39)	(-8.83)
Agg_{t-1}^{Rec}					0.647***	0.805***
					(3.98)	(5.62)
$Size_{t-1}$		-0.670***	-0.647***	-1.122***	-1.101***	-1.197***
		(-8.81)	(-8.47)	(-14.13)	(-13.88)	(-15.34)
Age_{t-1}		-0.035***	-0.035***	-0.026***	-0.026***	-0.026***
		(-8.17)	(-8.28)	(-6.43)	(-6.41)	(-6.54)
$Relative\ size_{t-1}$		0.986***	0.867**	4.463***	4.338***	4.674***
		(2.87)	(2.52)	(10.70)	(10.38)	(11.27)
$Small\ firm_{t-1}$		-11.561***	-11.654***	-15.821***	-16.099***	-15.672***
		(-22.37)	(-22.49)	(-27.63)	(-27.77)	(-27.28)
$Labor\ cost_{t-1}$			0.108	0.870	0.844	-0.664
			(0.08)	(0.66)	(0.64)	(-0.51)
$Labor\ shortage_{t-1}$			9.454	13.954	12.162	1.398
			(1.00)	(1.49)	(1.29)	(0.16)
$Labor\ fit_{t-1}$			-3.804***	-4.834***	-3.297**	-1.367
			(-2.92)	(-3.71)	(-2.46)	(-1.17)
$Agglomeration_{t-1}$			-0.194	-0.153	-0.444***	-0.571***
			(-1.30)	(-1.03)	(-2.81)	(-3.68)
$Education_{t-1}$				7.745***	7.702***	7.830***
				(13.79)	(13.71)	(13.93)
$Qualification_{t-1}$				1.345***	1.318***	1.374***
				(3.52)	(3.44)	(3.59)
$Enabling\ share_{t-1}$				7.164***	7.125***	7.139***
				(11.08)	(11.00)	(11.04)
mc_{t-1}				-6.651***	-6.711***	-6.473***
				(-16.88)	(-16.99)	(-16.57)
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.012	0.032	0.032	0.050	0.051	0.049
N	97,389	97,389	97,389	97,389	97,389	97,389

Table 3: Operational mobility. This table reports panel regressions of firm-level employment growth against donor benefits, recipient benefits, control variables, and fixed effects, replicating Table 2, column 5 for three sets of subsamples. The sample is split at the median of three variables: $Tangibility$, $Capital\,intensity$, and $Software\,intensity$ each measured on the industry level. $Tangibility$ is measured by the ratio of tangible assets to total value added. $Capital\,intensity$ is measured by the ratio of tangible assets to employment size. $Software\,intensity$ is measured by the ratio of gross software investment to tangible assets. The data is taken from Bontadini et al. (2023). *Employment growth* is calculated as the net rate of hiring and separation. All independent variables are lagged by one year. All eight relocation benefit variables are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 3: Operational mobility (continued).

Dep. var.:	Tangibility		Capital intensity		Software intensity	
Employment growth (%)	High (1)	Low (2)	High (3)	Low (4)	High (5)	Low (6)
$Cost_{t-1}^{Don}$	-0.435**	-0.810***	-0.495**	-0.794***	-0.412*	-0.794***
	(-2.01)	(-4.37)	(-2.54)	(-4.05)	(-1.95)	(-4.25)
$Short_{t-1}^{Don}$	-0.136	-0.613***	-0.262*	-0.482**	-0.018	-0.640***
	(-0.86)	(-3.32)	(-1.71)	(-2.52)	(-0.11)	(-3.55)
Fit_{t-1}^{Don}	-0.116	-0.478**	-0.165	-0.423**	-0.239	-0.474**
	(-0.52)	(-2.42)	(-0.82)	(-2.00)	(-1.10)	(-2.33)
$Cost_{t-1}^{Rec}$	0.411	0.143	0.345	0.136	0.379	0.156
	(1.32)	(0.91)	(1.29)	(0.83)	(1.28)	(0.99)
$Short_{t-1}^{Rec}$	0.160	0.474***	0.140	0.558***	0.161	0.494***
	(0.62)	(2.92)	(0.65)	(3.07)	(0.64)	(3.03)
Fit_{t-1}^{Rec}	0.281	0.393*	0.225	0.503**	0.262	0.463**
	(0.94)	(1.84)	(0.88)	(2.19)	(0.90)	(2.11)
Agg_{t-1}^{Don}	-1.060***	-0.498**	-0.773***	-0.728***	-1.160***	-0.452**
	(-5.35)	(-2.44)	(-3.98)	(-3.62)	(-5.78)	(-2.21)
Agg_{t-1}^{Rec}	0.783**	0.597***	0.631**	0.630***	0.784**	0.559***
	(2.35)	(3.20)	(2.26)	(3.13)	(2.36)	(2.99)
$Size_{t-1}$	-1.318***	-0.916***	-1.254***	-1.004***	-1.246***	-0.984***
	(-11.94)	(-7.69)	(-11.37)	(-8.70)	(-11.40)	(-8.35)
Age_{t-1}	-0.022***	-0.033***	-0.022***	-0.033***	-0.021***	-0.032***
	(-4.00)	(-6.77)	(-4.53)	(-6.02)	(-3.98)	(-6.39)
$Relative\ size_{t-1}$	4.839***	4.207***	4.605***	4.221***	4.825***	4.232***
	(8.06)	(6.84)	(7.78)	(6.99)	(8.17)	(6.87)
$Small\ firm_{t-1}$	-16.890***	-15.816***	-16.098***	-16.131***	-17.009***	-15.586***
	(-18.10)	(-21.13)	(-18.86)	(-20.47)	(-18.05)	(-20.90)
$Labor\ cost_{t-1}$	3.497*	-0.997	3.781*	-1.911	1.567	0.430
	(1.84)	(-0.47)	(1.94)	(-0.96)	(0.81)	(0.21)
$Labor\ shortage_{t-1}$	-6.138	19.624	13.815	10.842	-5.489	13.180
	(-0.47)	(1.23)	(1.03)	(0.70)	(-0.42)	(0.83)
$Labor\ fit_{t-1}$	-0.787	-3.871**	-0.213	-3.898*	-1.569	-4.082**
	(-0.38)	(-2.04)	(-0.11)	(-1.91)	(-0.78)	(-2.05)
$Agglomeration_{t-1}$	-0.432**	-0.606**	-0.195	-1.157***	-0.580***	-0.421
	(-2.02)	(-2.34)	(-1.00)	(-4.00)	(-2.78)	(-1.60)
$Education_{t-1}$	8.926***	6.986***	7.709***	7.830***	8.777***	6.896***
	(10.69)	(8.89)	(9.13)	(10.33)	(10.55)	(8.78)
$Qualification_{t-1}$	0.973*	1.534***	1.132**	1.472***	0.812	1.740***
	(1.72)	(2.81)	(2.06)	(2.66)	(1.46)	(3.15)
$Enabling\ share_{t-1}$	6.793***	7.008***	6.364***	7.543***	6.899***	6.910***
	(6.45)	(8.28)	(6.58)	(8.53)	(6.59)	(8.19)
mc_{t-1}	-6.439***	-7.189***	-6.534***	-6.824***	-6.486***	-7.075***
	(-11.23)	(-12.45)	(-11.53)	(-11.99)	(-11.41)	(-12.30)
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.050	0.051	0.047	0.057	0.048	0.051
N	48,470	48,316	48,332	48,444	48,231	48,574

Table 4: Occupational characteristics. This table reports panel regressions with firm-level employment growth attributable to occupations characterized by low, medium, and high *Education*, *Qualification*, and *Task complexity* as well as for non-managerial vs. managerial occupations. The dependent variables are defined in Appendix A.3.2. The independent variables are donor benefits, recipient benefits, control variables, and fixed effects. The control variables and fixed effects are the same as in column 5 of Table 2. All independent variables are lagged by one year. All eight relocation benefit variables are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. var.	Employment growth attributable to occupations characterized by ... (%)										
	Education			Qualification			Task complexity			Managerial	
	Low	Medium	High	Low	Medium	High	Low	Medium	High	No	Yes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
$Cost_{t-1}^{Don}$	-0.076	-0.206***	-0.293***	-0.060	-0.328***	-0.189**	-0.130	-0.098	-0.348***	-0.502***	-0.073**
	(-1.18)	(-2.85)	(-3.47)	(-0.90)	(-4.25)	(-2.47)	(-1.56)	(-1.38)	(-4.39)	(-3.95)	(-2.43)
$Short_{t-1}^{Don}$	-0.074	-0.205**	-0.099	-0.135*	-0.117	-0.126*	-0.103	-0.106	-0.170**	-0.377***	-0.001
	(-0.99)	(-2.34)	(-1.29)	(-1.84)	(-1.39)	(-1.73)	(-1.21)	(-1.31)	(-2.40)	(-3.41)	(-0.05)
Fit_{t-1}^{Don}	0.005	-0.098	-0.199**	-0.016	-0.143*	-0.132	-0.046	-0.149**	-0.095	-0.259*	-0.031
	(0.08)	(-1.31)	(-2.25)	(-0.22)	(-1.84)	(-1.64)	(-0.55)	(-2.06)	(-1.14)	(-1.92)	(-0.99)
$Cost_{t-1}^{Rec}$	-0.121**	0.071	0.177*	0.316***	-0.296***	0.106	-0.233***	0.630***	-0.270***	0.138	-0.012
	(-2.10)	(0.90)	(1.85)	(4.63)	(-3.52)	(1.26)	(-2.73)	(8.18)	(-2.90)	(1.10)	(-0.27)
$Short_{t-1}^{Rec}$	-0.017	0.128	0.039	-0.055	0.176**	0.029	0.251**	-0.220***	0.119	0.115	0.034
	(-0.24)	(1.62)	(0.40)	(-0.94)	(2.09)	(0.29)	(2.54)	(-3.02)	(1.39)	(0.95)	(0.77)
Fit_{t-1}^{Rec}	0.190**	0.075	0.130	-0.009	0.151	0.253**	0.207**	-0.092	0.280***	0.262	0.134***
	(2.49)	(0.85)	(1.19)	(-0.12)	(1.55)	(2.46)	(2.04)	(-1.08)	(2.87)	(1.59)	(2.74)
Agg_{t-1}^{Don}	-0.160**	-0.376***	-0.169**	-0.131*	-0.446***	-0.127*	-0.282***	-0.234***	-0.189**	-0.713***	0.008
	(-2.33)	(-5.14)	(-2.11)	(-1.84)	(-5.81)	(-1.70)	(-3.42)	(-3.21)	(-2.38)	(-5.39)	(0.33)
Agg_{t-1}^{Rec}	0.149**	0.223***	0.318***	0.278***	0.194*	0.218**	0.226**	0.226***	0.239**	0.672***	0.019
	(2.44)	(2.67)	(2.63)	(3.90)	(1.88)	(2.15)	(2.45)	(2.91)	(2.22)	(4.27)	(0.41)
No. of controls	12	12	12	12	12	12	12	12	12	12	12
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.156	0.222	0.111	0.267	0.270	0.173	0.174	0.336	0.228	0.046	0.005
N	88,030	88,030	88,030	88,030	88,030	88,030	88,030	88,030	88,030	88,030	88,030

Table 5: Movements of jobs and movements of employees. This table reports panel regressions of firm-level internal and external employment growth against donor benefits, recipient benefits, control variables, and fixed effects. Internal employment growth is calculated as the net rate of hiring and separation from/to affiliated firms. External employment growth is calculated as the net rate of hiring and separation from/to the outside labor market. All independent variables are lagged by one year. All eight relocation benefit variables are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. The regression results for control variables are reported in Table OA12 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.

	Dependent variable						% Ext.
	Internal employment growth(%)			External employment growth(%)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Cost_{t-1}^{Don}$	-0.116***	-0.088**	-0.112**	-0.514***	-0.504***	-0.521***	82.4%
	(-2.72)	(-1.98)	(-2.48)	(-4.29)	(-4.08)	(-4.23)	
$Short_{t-1}^{Don}$	-0.115***	-0.114***	-0.145***	-0.205**	-0.167	-0.231**	61.5%
	(-3.09)	(-2.96)	(-3.74)	(-2.01)	(-1.55)	(-2.16)	
Fit_{t-1}^{Don}	0.045	-0.015	-0.031	-0.120	-0.263**	-0.285**	90.1%
	(1.11)	(-0.31)	(-0.66)	(-1.07)	(-2.03)	(-2.17)	
$Cost_{t-1}^{Rec}$	-0.060	-0.054	-0.053	0.186	0.210*	0.210*	133.6%
	(-1.05)	(-0.94)	(-0.93)	(1.48)	(1.66)	(1.68)	
$Short_{t-1}^{Rec}$	0.126**	0.126**	0.090	0.400***	0.409***	0.271**	75.0%
	(2.14)	(2.14)	(1.53)	(3.32)	(3.40)	(2.28)	
Fit_{t-1}^{Rec}	0.121*	0.124*	0.099	0.344**	0.346**	0.234	70.2%
	(1.77)	(1.80)	(1.44)	(2.36)	(2.38)	(1.59)	
Agg_{t-1}^{Don}	-0.083*	-0.085*	-0.134***	-0.410***	-0.470***	-0.608***	81.9%
	(-1.96)	(-1.89)	(-2.96)	(-3.49)	(-3.74)	(-4.79)	
Agg_{t-1}^{Rec}	0.166***	0.167***	0.118*	0.717***	0.726***	0.529***	81.8%
	(2.66)	(2.67)	(1.89)	(4.96)	(5.00)	(3.64)	
No. of controls	4	8	12	4	8	12	
County × year FE	Yes	Yes	Yes	Yes	Yes	Yes	
Adj. R^2	-0.001	-0.001	0.003	0.040	0.040	0.054	
N	97,389	97,389	97,389	97,389	97,389	97,389	

Table 6: Hiring and separation. This table replicates in Panel A firm-level regressions from Table 2 (column 5) but replaces the dependent variables with measures of hiring and separation. All variables are defined in Table A1 in the Appendix. The regression results for control variables are reported in Table OA13 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.

Dep. var.	Hire(%)			Separation(%)		
	(1)	(2)	(3)	(4)	(5)	(6)
$Cost_{t-1}^{Don}$	-0.360***	-0.392***	-0.467***	0.270**	0.201	0.166
	(-2.86)	(-3.00)	(-3.58)	(2.20)	(1.58)	(1.30)
$Short_{t-1}^{Don}$	0.049	0.056	-0.023	0.368***	0.337***	0.353***
	(0.54)	(0.59)	(-0.25)	(3.97)	(3.48)	(3.67)
Fit_{t-1}^{Don}	0.084	-0.017	-0.058	0.159	0.261*	0.258*
	(0.70)	(-0.12)	(-0.42)	(1.30)	(1.85)	(1.84)
$Cost_{t-1}^{Rec}$	-0.457***	-0.459***	-0.453***	-0.584***	-0.616***	-0.611***
	(-3.61)	(-3.62)	(-3.59)	(-4.95)	(-5.22)	(-5.22)
$Short_{t-1}^{Rec}$	0.020	0.019	-0.050	-0.506***	-0.517***	-0.411***
	(0.17)	(0.16)	(-0.42)	(-4.70)	(-4.80)	(-3.83)
Fit_{t-1}^{Rec}	0.318**	0.317**	0.277*	-0.148	-0.153	-0.055
	(2.10)	(2.09)	(1.83)	(-1.03)	(-1.06)	(-0.38)
Agg_{t-1}^{Don}	0.132	0.252*	0.132	0.624***	0.807***	0.875***
	(1.07)	(1.90)	(0.98)	(4.98)	(5.98)	(6.55)
Agg_{t-1}^{Rec}	0.413***	0.426***	0.332**	-0.470***	-0.466***	-0.315**
	(2.79)	(2.88)	(2.25)	(-3.26)	(-3.23)	(-2.15)
No. of controls	4	8	12	4	8	12
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.167	0.168	0.172	0.147	0.148	0.162
N	97,389	97,389	97,389	97,389	97,389	97,389

Table 7: Managerial capabilities. This table reports panel regressions of firm-level employment growth against donor benefits, recipient benefits, control variables, and fixed effects, replicating Table 2, column 5 for three sets of subsamples. The sample is split at the median of *mc* and *imb*, where *mc* is the employment share of the focal firm for enabling functions relative to the whole group, and *imb* is employment-weighted average of the absolute values of the difference between a focal firm's *mc* and its employment share in its group. *Employment growth* is calculated as the net rate of hiring and separation. All independent variables are lagged by one year. All eight relocation benefit variables are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. The regression results for control variables are reported in Table OA14 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.

Dep. var.:	Employment growth (%)			
Subsample:	*mc*		*imb*	
	Low	High	Low	High
	(1)	(2)	(3)	(4)
$Cost_{t-1}^{Don}$	-0.916***	-0.368**	-0.541***	-0.692***
	(-4.29)	(-2.08)	(-3.00)	(-3.21)
$Short_{t-1}^{Don}$	-0.311*	-0.178	-0.688***	-0.070
	(-1.71)	(-1.16)	(-4.14)	(-0.38)
Fit_{t-1}^{Don}	-0.678***	0.056	-0.796***	0.086
	(-3.04)	(0.30)	(-4.08)	(0.40)
$Cost_{t-1}^{Rec}$	0.140	6.015**	0.274*	-0.105
	(0.90)	(1.98)	(1.67)	(-0.28)
$Short_{t-1}^{Rec}$	0.356**	0.381	0.384**	0.365
	(2.47)	(0.23)	(2.29)	(1.37)
Fit_{t-1}^{Rec}	0.192	0.671	0.339*	0.416
	(1.06)	(0.34)	(1.69)	(1.27)
Agg_{t-1}^{Don}	-1.101***	-0.464**	-0.950***	-0.442**
	(-5.35)	(-2.45)	(-4.93)	(-2.15)
Agg_{t-1}^{Rec}	0.500***	1.226	0.676***	0.625**
	(2.88)	(1.02)	(3.41)	(2.11)
No. of controls	12	12	12	12
Industry × year FE	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes
Adj. R^2	0.063	0.049	0.055	0.046
N	48,333	48,378	48,372	48,386

Table 8: Firm-level analysis of exits. This table reports panel regressions of firm-level exiting decision variables against donor benefits, recipient benefits, control variables, and fixed effects. *Exit* equals one if a firm is no longer affiliated and, consequently, the BG loses its presence in a county. *Exit LW* is calculated as the fraction of BG employees lost after exiting a county. All independent variables are lagged by one year. All eight variables relocation benefit are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. The regression results for control variables are reported in Table OA15 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.

Dep. var.	Exit(%)			Exit LW(%)		
	(1)	(2)	(3)	(4)	(5)	(6)
$Cost_{t-1}^{Don}$	0.159***	0.135***	0.129**	0.029**	0.024*	0.027**
	(3.17)	(2.68)	(2.57)	(2.29)	(1.83)	(2.09)
$Short_{t-1}^{Don}$	0.173***	0.191***	0.185***	0.017	0.017	0.020
	(3.37)	(3.69)	(3.56)	(1.33)	(1.29)	(1.50)
Fit_{t-1}^{Don}	0.193***	0.225***	0.219***	0.025*	0.040**	0.041***
	(3.60)	(3.93)	(3.82)	(1.88)	(2.54)	(2.63)
$Cost_{t-1}^{Rec}$	-0.141**	-0.151***	-0.150***	-0.038***	-0.040***	-0.040***
	(-2.56)	(-2.74)	(-2.73)	(-4.76)	(-5.06)	(-5.06)
$Short_{t-1}^{Rec}$	0.114**	0.112**	0.108*	-0.016**	-0.017**	-0.014*
	(1.99)	(1.96)	(1.88)	(-2.03)	(-2.07)	(-1.81)
Fit_{t-1}^{Rec}	0.162**	0.162**	0.160**	-0.014**	-0.014**	-0.013**
	(2.39)	(2.39)	(2.36)	(-2.42)	(-2.47)	(-2.34)
Agg_{t-1}^{Don}	0.443***	0.469***	0.461***	0.057***	0.060***	0.064***
	(8.08)	(8.49)	(8.32)	(4.04)	(3.96)	(4.18)
Agg_{t-1}^{Rec}	-0.075	-0.078	-0.082	-0.016***	-0.016***	-0.014***
	(-1.35)	(-1.39)	(-1.47)	(-3.30)	(-3.43)	(-2.86)
No. of Controls	4	8	12	4	8	12
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.030	0.030	0.030	0.013	0.013	0.013
N	97,389	97,389	97,389	97,389	97,389	97,389

Table 9: Group-level analysis. This table reports panel regressions of BG-level entry and exit decision variables against BG-level relocation benefits, control variables and fixed effects. *Entry dummy* (*Exit dummy*) equals one if a BG enters (leaves) a county. *Entry count* (*Exit count*) is the number of counties a BG enters (leaves). *Entry LW* (*Exit LW*) is the fraction of BG employees gained (lost) by entering (leaving) counties. All independent variables are lagged by one year. $Cost^{BG}$, $Short^{BG}$, Fit^{BG} and Agg^{BG} measure the potential for a BG to reduce labor cost, relieve labor shortage, improve labor fit, and exploit agglomeration economies by relocating employees across counties where the BG is present. All four relocation benefit variables are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. var.	Exit			Entry		
	Dummy(%)	Count	LW(%)	Dummy(%)	Count	LW(%)
	(1)	(2)	(3)	(4)	(5)	(6)
$Cost^{BG}_{t-1}$	-2.517***	-0.044***	-0.610***	1.795***	0.041***	0.429***
	(-5.57)	(-4.46)	(-3.34)	(4.77)	(4.67)	(2.89)
$Short^{BG}_{t-1}$	-1.314***	-0.022***	-0.331***	0.575***	0.017***	0.219***
	(-6.49)	(-4.60)	(-4.62)	(3.83)	(2.88)	(3.80)
Fit^{BG}_{t-1}	-2.165***	-0.035***	-0.934***	2.225***	0.046***	0.559***
	(-4.23)	(-3.26)	(-4.17)	(4.85)	(4.46)	(3.10)
Agg^{BG}_{t-1}	-0.843*	-0.016	-0.444***	1.444***	0.042***	0.443*
	(-1.76)	(-1.47)	(-2.60)	(2.95)	(3.29)	(1.93)
$Size_{t-1}$	-0.409	-0.022*	-0.698***	0.953***	0.030***	0.240*
	(-1.30)	(-1.88)	(-4.65)	(3.28)	(2.99)	(1.71)
Age_{t-1}	-0.029	0.000	0.005	-0.019	-0.001	-0.006
	(-1.46)	(0.21)	(0.59)	(-1.25)	(-1.23)	(-0.78)
Labor cost$_{t-1}$	0.041**	0.001***	0.023***	-1.618***	-0.042***	-0.441
	(2.12)	(2.62)	(2.81)	(-2.89)	(-2.77)	(-1.55)
Labor short$_{t-1}$	11.325**	0.065	3.487**	-0.039	-0.001	-0.007
	(2.31)	(0.78)	(2.07)	(-0.66)	(-0.78)	(-0.29)
Labor fit$_{t-1}$	-0.312	0.023	0.438	0.759	0.013	0.086
	(-0.11)	(0.26)	(0.32)	(1.46)	(1.03)	(0.35)
$Agglomeration_{t-1}$	0.001	0.000	0.002	-0.075	-0.005	-0.138
	(0.05)	(-0.49)	(0.28)	(-0.13)	(-0.44)	(-0.41)
$Education_{t-1}$	-0.738	0.095*	2.267***	-1.082	-0.071*	-1.398*
	(-0.43)	(1.74)	(2.84)	(-0.67)	(-1.86)	(-1.76)
$Qualification_{t-1}$	-0.543	0.004	0.393	-0.334	0.020	-0.446
	(-0.48)	(0.19)	(0.74)	(-0.33)	(0.82)	(-0.88)
Enabling share$_{t-1}$	-0.084	0.055	1.985*	-2.999**	-0.087**	-1.018
	(-0.05)	(1.45)	(1.94)	(-2.20)	(-2.54)	(-1.51)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
BG FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.163	0.174	0.114	0.148	0.116	0.119
N	35,901	35,901	35,901	35,901	35,901	35,901

Table 10: Standalone firms as a counterfactual and multi-location standalone firms. Columns 1 and 2 replicate the firm-level regressions from Table 2 (column 5) using matched BG and standalone firms. We match each BG firm to a comparable standalone firm. The matching is done in two steps. In the first step, all BG and standalone firm observations are assigned to cells constructed by crossing county codes (400), 2-digit NACE Rev. 2 industry codes (84), number of establishments (4 categories: 1, 2-5, 6-10 and above 10) and calendar years (12). In the second step, the Euclidean distance is calculated based on the logarithmic employment size,firm age, log average worker age, percentage of female workers, percentage of highly qualified workers, and percentage of medium-qualified workers within each cell, for each BG firm and its matched standalone firm. All six variables are scaled by the respective sample standard deviation of the BG firms. For each BG firm, we select the standalone firm with the smallest Euclidean distance as its counterfactual. For matching diagnostics, see OA7. Columns 3 through 5 replicate the firm-level regressions from Table 2 using establishments of multi-location standalone firms. The relocation benefits are recomputed among the establishments within standalone firms. $Education$, $Qualification$, and mc are defined at the establishment-level. Standard errors are clustered at the firm- or establishment-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Matched BG firms	Matched standalone firms	Multi-location standalone firms		
	(1)	(2)	(3)	(4)	(5)
$Cost_{t-1}^{Don}$	-0.420***	0.097	-0.310***	-0.388***	-0.365***
	(-2.65)	(0.77)	(-3.16)	(-3.65)	(-3.44)
$Short_{t-1}^{Don}$	-0.325**	-0.005	-0.248**	-0.201*	-0.107
	(-2.27)	(-0.04)	(-2.45)	(-1.83)	(-0.97)
Fit_{t-1}^{Don}	-0.481***	-0.127	-0.378***	-0.334***	-0.272**
	(-2.67)	(-0.85)	(-4.13)	(-2.97)	(-2.41)
$Cost_{t-1}^{Rec}$	0.222	-0.044	0.736***	0.733***	0.714***
	(1.55)	(-0.34)	(6.75)	(6.72)	(6.51)
$Short_{t-1}^{Rec}$	0.159	0.056	0.425***	0.418***	0.447***
	(1.05)	(0.45)	(3.65)	(3.57)	(3.79)
Fit_{t-1}^{Rec}	0.341	-0.061	-0.218**	-0.297***	-0.265**
	(1.60)	(-0.39)	(-2.09)	(-2.68)	(-2.37)
Agg_{t-1}^{Don}	-0.609***	-0.035	1.323***	1.335***	1.254***
	(-3.38)	(-0.22)	(12.08)	(12.17)	(11.38)
Agg_{t-1}^{Rec}	0.916***	-0.015	1.338***	1.347***	1.344***
	(4.73)	(-0.09)	(11.20)	(11.25)	(11.04)
No. of controls	10	10	3	7	11
Industry × year FE	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.047	0.064	0.021	0.021	0.024
N	68,134	68,022	189,230	189,230	189,230

D Online Appendix

Table OA1: Correlations. This table provides correlation coefficients for all variables used in our main analyses. Panel A provides correlations for the BG-level data set and Panel B for the firm-level data set. All variables are defined in Table A1. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel B: BG-level variables

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	Entry	1.00											
(2)	Entry count	0.77***	1.00										
(3)	Entry LW	0.68***	0.63***	1.00									
(4)	Exit	0.18***	0.18***	0.12***	1.00								
(5)	Exit count	0.17***	0.21***	0.10***	0.69***	1.00							
(6)	Exit LW	0.11***	0.11***	0.12***	0.70***	0.62***	1.00						
(7)	Labor cost	0.02***	0.02***	0.01	0.03***	0.02***	0.01	1.00					
(8)	Labor shortage	-0.01	-0.01	-0.01	0.00	0.00	0.00	-0.01	1.00				
(9)	Labor fit	0.00	0.00	-0.01	0.00	0.00	0.00	0.18***	0.00	1.00			
(10)	Agglomeration	-0.01	-0.01	0.00	0.00	0.00	0.01	0.14***	0.01**	0.18***	1.00		
(11)	$Cost^{BG}$	0.21***	0.19***	0.12***	0.17***	0.13***	0.09***	0.19***	-0.01	0.01	0.02***	1.00	
(12)	$Short^{BG}$	0.19***	0.18***	0.11***	0.14***	0.12***	0.09***	0.05***	0.19***	-0.01***	-0.04***	0.42***	1.00
(13)	Fit^{BG}	0.19***	0.17***	0.12***	0.16***	0.13***	0.09***	0.10***	-0.01**	-0.07***	-0.06***	0.47***	0.38***
(14)	Agg^{BG}	0.15***	0.14***	0.10***	0.13***	0.11***	0.10***	0.02***	-0.01**	-0.03***	0.02***	0.25***	0.26***
(15)	Size	0.18***	0.17***	0.07***	0.15***	0.13***	0.06***	0.19***	0.00	0.10***	0.01**	0.32***	0.24***
(16)	Age	0.00	0.00	-0.02***	-0.01	-0.01	-0.01**	0.06***	-0.01	0.13***	-0.02***	0.10***	0.06***
(17)	Education	0.02***	0.01**	0.01**	0.03***	0.02***	0.02***	0.46***	0.01**	0.09***	0.12***	0.05***	0.03***
(18)	Qualification	0.01	0.01	0.01	0.02***	0.02***	0.01	0.44***	0.00	0.00	0.06***	0.03***	0.00

		(12)	(13)	(14)	(15)	(16)	(17)	(18)
(13)	Fit^{BG}	1.00						
(14)	Agg^{BG}	0.38***	1.00					
(15)	Size	0.26***	0.15***	1.00				
(16)	Age	0.08***	-0.02***	0.23***	1.00			
(17)	Education	0.03***	0.04***	0.22***	-0.05***	1.00		
(18)	Qualification	0.01**	0.01*	0.21***	-0.05***	0.68***	1.00	

Table OA1: Correlations (continued).

Panel A: Firm-level variables

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)	*Employment growth*	1.00												
(2)	*Int. employment growth*	0.44***	1.00											
(3)	*Ext. employment growth*	0.93***	0.08***	1.00										
(4)	*Hiringrate*	0.63***	0.28***	0.59***	1.00									
(5)	*Separationrate*	-0.62***	-0.28***	-0.58***	0.22***	1.00								
(6)	*Exit*	-0.01	0.01	-0.01**	0.00	0.01	1.00							
(7)	*Exit LW*	0.00	0.00	0.00	0.00	0.00	0.64***	1.00						
(8)	*Labor cost*	0.00	0.02***	-0.01*	-0.04***	-0.04***	0.00	0.00	1.00					
(9)	*Labor shortage*	0.00	0.00	0.00	0.00	-0.01**	0.00	0.00	-0.01***	1.00				
(10)	*Labor fit*	-0.02***	0.00	-0.03***	-0.06***	-0.03***	0.00	0.00	0.17***	0.01	1.00			
(11)	*Agglomeration*	0.01**	0.00	0.01***	0.08***	0.07***	-0.01***	0.00	0.17***	0.02***	-0.03***	1.00		
(12)	$Cost^{Don}$	-0.02***	-0.01	-0.02***	-0.02***	0.01**	0.05***	0.02***	0.31***	0.00	0.00	0.18***	1.00	
(13)	$Short^{Don}$	-0.02***	-0.01***	-0.02***	-0.03***	0.00	0.05***	0.02***	0.00	0.35***	-0.03***	0.04***	0.42***	1.00
(14)	Fit^{Don}	-0.02***	0.00	-0.02***	-0.03***	0.00	0.07***	0.03***	0.05***	-0.02***	-0.14***	-0.09***	0.38***	0.35***
(15)	Agg^{Don}	-0.02***	-0.01*	-0.02***	-0.03***	0.00	0.07***	0.03***	-0.07***	-0.02***	-0.04***	-0.32***	0.25***	0.36***
(16)	$Cost^{Rec}$	-0.06***	-0.03***	-0.05***	-0.05***	0.02***	0.02***	-0.01***	-0.07***	-0.01***	0.00	0.01***	0.16***	0.26***
(17)	$Short^{Rec}$	-0.07***	-0.03***	-0.07***	-0.05***	0.04***	0.03***	-0.01***	0.03***	-0.12***	0.01**	0.02***	0.23***	0.11***
(18)	Fit^{Rec}	-0.07***	-0.03***	-0.07***	-0.05***	0.04***	0.04***	-0.01***	0.05***	0.00	0.04***	-0.01***	0.23***	0.20***
(19)	Agg^{Rec}	-0.08***	-0.03***	-0.07***	-0.04***	0.06***	0.02***	-0.01***	0.11***	0.00	0.04***	0.12***	0.29***	0.17***
(20)	*Size*	-0.01**	0.01***	-0.01***	-0.22***	-0.21***	0.00	0.00	0.23***	0.00	0.14***	-0.02***	0.13***	0.06***
(21)	*Age*	-0.06***	-0.01***	-0.06***	-0.17***	-0.10***	-0.01***	0.00	0.07***	-0.01***	0.10***	-0.05***	0.02***	-0.01***
(22)	*Relative size*	0.00	0.00	0.00	-0.06***	-0.07***	-0.06***	-0.01***	0.09***	0.00	0.05***	-0.04***	-0.21***	-0.23***
(23)	*Small firm*	-0.12***	-0.03***	-0.12***	-0.05***	0.09***	-0.01***	-0.02***	0.08***	0.00	0.05***	-0.04***	-0.03***	-0.06***
(24)	*Education*	0.02***	0.03***	0.01***	-0.08***	-0.10***	0.00	-0.01	0.37***	0.01***	0.09***	0.04***	0.05***	-0.01***
(25)	*Qualification*	0.02***	0.02***	0.02***	-0.10***	-0.12***	0.01***	0.00	0.40***	0.00	0.02***	0.03***	0.02***	-0.05***
(26)	*Enabling share*	-0.03***	0.01**	-0.03***	-0.07***	-0.03***	-0.01***	-0.01***	0.27***	0.00	0.18***	-0.01***	0.07***	-0.02***
(27)	*mc*	0.04***	0.01***	0.04***	-0.04***	-0.09***	-0.05***	0.00	0.05***	0.00	0.06***	-0.04***	-0.22***	-0.23***

		(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
(15)	Agg^{Don}	0.52***	1.00											
(16)	$Cost^{Rec}$	0.26***	0.29***	1.00										
(17)	$Short^{Rec}$	0.19***	0.22***	0.50***	1.00									
(18)	Fit^{Rec}	0.18***	0.22***	0.51***	0.50***	1.00								
(19)	Agg^{Rec}	0.13***	0.05***	0.28***	0.45***	0.57***	1.00							
(20)	*Size*	0.07***	0.02***	0.00	0.02***	0.02***	0.03***	1.00						
(21)	*Age*	0.00	-0.03***	-0.04***	-0.02***	-0.02***	-0.02***	0.33***	1.00					
(22)	*Relative size*	-0.20***	-0.24***	-0.18***	-0.17***	-0.17***	-0.15***	0.44***	0.25***	1.00				
(23)	*Small firm*	-0.05***	-0.04***	0.09***	0.17***	0.19***	0.22***	0.03***	-0.02***	0.03***	1.00			
(24)	*Education*	0.01***	-0.01***	0.03***	0.09***	0.11***	0.14***	0.28***	-0.01***	0.09***	0.25***	1.00		
(25)	*Qualification*	-0.01***	-0.05***	-0.01***	0.05***	0.07***	0.10***	0.28***	0.01*	0.12***	0.22***	0.67***	1.00	
(26)	*Enabling share*	0.01***	-0.01***	0.05***	0.11***	0.13***	0.16***	0.27***	0.06***	0.14***	0.39***	0.43***	0.42***	1.00
(27)	*mc*	-0.21***	-0.24***	-0.19***	-0.20***	-0.20***	-0.20***	0.25***	0.20***	0.61***	-0.16***	0.00	0.06***	0.12***

Table OA2: BG-year-level clustering. This table replicates firm-level regressions from Table 2 with BG-year-level clustering. All variables are defined in Table A1 in the Appendix. Standard errors are clustered at the BG-year-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. var.	Employment growth(%)				
	(1)	(2)	(3)	(4)	(5)
$Cost_{t-1}^{Don}$	-0.496***	-0.496***	-0.525***	-0.483***	-0.633***
	(-4.42)	(-4.42)	(-4.60)	(-4.13)	(-5.41)
$Short_{t-1}^{Don}$	-0.314***	-0.314***	-0.380***	-0.353***	-0.376***
	(-2.87)	(-2.87)	(-3.47)	(-2.92)	(-3.18)
Fit_{t-1}^{Don}	-0.217**	-0.217**	-0.278***	-0.522***	-0.316**
	(-2.22)	(-2.22)	(-2.84)	(-4.54)	(-2.52)
$Cost_{t-1}^{Rec}$	0.050	0.050	0.000	0.026	0.158
	(0.35)	(0.35)	(-0.00)	(0.18)	(1.05)
$Short_{t-1}^{Rec}$	0.333***	0.333***	0.725***	0.735***	0.361***
	(2.62)	(2.62)	(5.40)	(5.47)	(2.75)
Fit_{t-1}^{Rec}	0.419***	0.419***	0.844***	0.855***	0.333**
	(2.99)	(2.99)	(5.89)	(5.95)	(2.22)
Agg_{t-1}^{Don}					-0.743***
					(-5.85)
Agg_{t-1}^{Rec}					0.647***
					(4.40)
$Size_{t-1}$			-0.670***	-0.647***	-1.101***
			(-9.34)	(-8.91)	(-14.64)
Age_{t-1}			-0.035***	-0.035***	-0.026***
			(-11.94)	(-11.99)	(-9.06)
$Relative\ size_{t-1}$			0.986***	0.867***	4.338***
			(3.17)	(2.77)	(11.70)
$Small\ firm_{t-1}$			-11.561***	-11.654***	-16.099***
			(-22.88)	(-23.00)	(-29.00)
$Labor\ cost_{t-1}$				0.108	0.844
				(0.09)	(0.71)
$Labor\ shortage_{t-1}$				9.454	12.162
				(0.88)	(1.15)
$Labor\ fit_{t-1}$				-3.804***	-3.297***
				(-3.35)	(-2.85)
$Agglomeration_{t-1}$				-0.194	-0.444***
				(-1.54)	(-3.29)
$Education_{t-1}$					7.702***
					(15.52)
$Qualification_{t-1}$					1.318***
					(3.80)
$Enabling\ share_{t-1}$					7.125***
					(12.49)
mc_{t-1}					-6.711***
					(-19.32)
Industry × year FE	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.012	0.032	0.032	0.050	0.051
N	97,389	97,389	97,389	97,389	97,389

Table OA3: Firm growth and benefits from decreasing labor costs. This table reports panel regressions of firm-level employment growth against donor and recipient benefits from labor cost savings, control variables, and fixed effects. Employment growth is calculated as the net rate of hiring and separation. All independent variables are lagged by one year. $Cost^{Don}$ measures the potential for a BG firm to reduce labor cost by hiring its employees in another county where the BG is present. $Cost^{Rec}$ measures the potential for a BG firm to contribute to reducing labor cost by allowing affiliated firms to relocate their employees towards it. Both variables are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. var.	Employment growth(%)				
	(1)	(2)	(3)	(4)	(5)
$Cost^{Don}_{t-1}$	-0.566***	-0.484***	-0.501***	-0.751***	-0.736***
	(-5.04)	(-4.11)	(-4.17)	(-7.59)	(-5.84)
$Cost^{Rec}_{t-1}$	0.288***	0.536***	0.534***	0.318***	0.285**
	(2.59)	(4.77)	(4.75)	(3.65)	(2.55)
Agg^{Don}_{t-1}					-0.886***
					(-7.27)
Agg^{Rec}_{t-1}					0.883***
					(5.83)
$Size_{t-1}$		-0.691***	-0.681***	-1.185***	-1.129***
		(-9.17)	(-9.03)	(-20.22)	(-14.35)
Age_{t-1}		-0.035***	-0.035***	-0.026***	-0.026***
		(-8.18)	(-8.26)	(-8.82)	(-6.43)
$Relative\ size_{t-1}$		0.891***	0.867***	4.653***	4.415***
		(2.66)	(2.59)	(13.80)	(10.60)
$Small\ firm_{t-1}$		-10.767***	-10.799***	-15.225***	-15.838***
		(-21.47)	(-21.52)	(-49.84)	(-27.55)
$Labor\ cost_{t-1}$			0.378	1.503	1.102
			(0.29)	(1.27)	(0.83)
$Labor\ shortage_{t-1}$			-0.039	1.169	2.705
			(-0.00)	(0.12)	(0.30)
$Labor\ fit_{t-1}$			-0.986	-1.663*	-1.639
			(-0.85)	(-1.74)	(-1.41)
$Agglomeration_{t-1}$			-0.233	-0.185	-0.536***
			(-1.57)	(-1.42)	(-3.43)
$Education_{t-1}$				7.912***	7.767***
				(20.33)	(13.84)
$Qualification_{t-1}$				1.382***	1.341***
				(4.93)	(3.50)
$Enabling\ share_{t-1}$				7.325***	7.205***
				(17.45)	(11.15)
mc_{t-1}				-6.579***	-6.726***
				(-20.38)	(-17.09)
Industry × year FE	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.011	0.030	0.030	0.048	0.050
N	97,389	97,389	97,389	97,389	97,389

Table OA4: Firm growth and benefits from relieving labor shortage. This table reports panel regressions of firm-level employment growth against donor and recipient benefits from relieving labor shortage, control variables, and fixed effects. Employment growth is calculated as the net rate of hiring and separation. All independent variables are lagged by one year. $Short^{Don}$ measures the potential for a BG firm to relieve labor shortage by hiring its employees in another county where the BG is present. $Short^{Rec}$ measures the potential for a BG firm to contribute to relieving labor shortage by allowing affiliated firms to relocate their employees towards it. Both variables are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. var.	Employment growth(%)				
	(1)	(2)	(3)	(4)	(5)
$Short_{t-1}^{Don}$	-0.488***	-0.488***	-0.523***	-0.765***	-0.571***
	(-4.98)	(-4.84)	(-4.99)	(-7.69)	(-5.21)
$Short_{t-1}^{Rec}$	0.304***	0.754***	0.756***	0.461***	0.253**
	(2.82)	(6.86)	(6.87)	(5.58)	(2.22)
Agg_{t-1}^{Don}					-0.849***
					(-6.95)
Agg_{t-1}^{Rec}					0.778***
					(4.96)
$Size_{t-1}$		-0.710***	-0.698***	-1.203***	-1.160***
		(-9.47)	(-9.30)	(-20.68)	(-14.79)
Age_{t-1}		-0.036***	-0.036***	-0.026***	-0.026***
		(-8.34)	(-8.41)	(-9.05)	(-6.54)
$Relative\ size_{t-1}$		1.004***	0.967***	4.701***	4.501***
		(3.05)	(2.93)	(13.98)	(10.83)
$Small\ firm_{t-1}$		-10.989***	-11.020***	-15.323***	-15.780***
		(-21.69)	(-21.74)	(-50.02)	(-27.44)
$Labor\ cost_{t-1}$			-0.883	-0.346	-0.674
			(-0.68)	(-0.30)	(-0.52)
$Labor\ shortage_{t-1}$			13.325	20.342**	16.535*
			(1.42)	(2.09)	(1.77)
$Labor\ fit_{t-1}$			-0.906	-1.497	-1.427
			(-0.79)	(-1.57)	(-1.22)
$Agglomeration_{t-1}$			-0.227	-0.177	-0.515***
			(-1.53)	(-1.35)	(-3.29)
$Education_{t-1}$				7.892***	7.788***
				(20.28)	(13.88)
$Qualification_{t-1}$				1.387***	1.359***
				(4.94)	(3.55)
$Enabling\ share_{t-1}$				7.231***	7.162***
				(17.22)	(11.07)
mc_{t-1}				-6.506***	-6.642***
				(-20.16)	(-16.93)
Industry × year FE	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.011	0.030	0.030	0.048	0.050
N	97,389	97,389	97,389	97,389	97,389

Table OA5: Firm growth and benefits from improving labor fit. This table reports panel regressions of firm-level employment growth against donor and recipient benefits from improving labor fit, control variables, and fixed effects. Employment growth is calculated as the net rate of hiring and separation. All independent variables are lagged by one year. Fit^{Don} measures the potential for a BG firm to improve labor fit by hiring its employees in another county where the BG is present. Fit^{Rec} measures the potential for a BG firm to contribute to improving labor fit by allowing affiliated firms to relocate their employees towards it. Both variables are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. var.	Employment growth(%)				
	(1)	(2)	(3)	(4)	(5)
Fit^{Don}_{t-1}	-0.409***	-0.413***	-0.656***	-0.871***	-0.487***
	(-4.12)	(-4.01)	(-5.56)	(-8.76)	(-3.53)
Fit^{Rec}_{t-1}	0.491***	0.985***	1.016***	0.716***	0.468***
	(3.73)	(7.32)	(7.53)	(8.66)	(3.14)
Agg^{Don}_{t-1}					-0.831***
					(-6.15)
Agg^{Rec}_{t-1}					0.626***
					(3.87)
$Size_{t-1}$		-0.729***	-0.695***	-1.198***	-1.170***
		(-9.72)	(-9.22)	(-20.58)	(-14.87)
Age_{t-1}		-0.035***	-0.036***	-0.026***	-0.026***
		(-8.17)	(-8.30)	(-9.03)	(-6.51)
$Relative\ size_{t-1}$		1.234***	1.049***	4.775***	4.612***
		(3.72)	(3.14)	(14.21)	(11.09)
$Small\ firm_{t-1}$		-11.146***	-11.247***	-15.514***	-15.813***
		(-21.82)	(-21.96)	(-50.49)	(-27.45)
$Labor\ cost_{t-1}$			-1.052	-0.438	-0.697
			(-0.81)	(-0.38)	(-0.54)
$Labor\ shortage_{t-1}$			-1.830	-0.217	1.123
			(-0.20)	(-0.02)	(0.13)
$Labor\ fit_{t-1}$			-4.096***	-5.564***	-3.662***
			(-3.19)	(-5.25)	(-2.75)
$Agglomeration_{t-1}$			-0.205	-0.162	-0.498***
			(-1.37)	(-1.24)	(-3.15)
$Education_{t-1}$				7.829***	7.774***
				(20.12)	(13.83)
$Qualification_{t-1}$				1.395***	1.368***
				(4.97)	(3.57)
$Enabling\ share_{t-1}$				7.160***	7.126***
				(17.07)	(11.03)
mc_{t-1}				-6.488***	-6.588***
				(-20.12)	(-16.80)
Industry × year FE	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.012	0.031	0.031	0.049	0.050
N	97,389	97,389	97,389	97,389	97,389

Table OA6: Sample split by industries. This table replicates firm-level regressions from Table 2 (column 5) for five subsamples by firms' industry affiliation. *Service* includes NACE Rev. 2 Sections G through U. *Non-service* includes the other sections. *Manufacturing* corresponds to Section C. We follow Piton (2021) to classify tradable and non-tradable industries. All variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table OA6: Sample split by industries (continued).

Dep. var.:	Non-service		Service	Tradable	Non-tradable
	Manufacturing	Others			
	(1)	(2)	(3)	(4)	(5)
$Cost_{t-1}^{Don}$	-0.045	1.207	-0.782***	-0.631***	-0.666**
	(-0.18)	(1.12)	(-4.51)	(-3.44)	(-2.49)
$Short_{t-1}^{Don}$	-0.304	-0.694	-0.415***	-0.446***	-0.327
	(-1.44)	(-0.97)	(-2.61)	(-2.79)	(-1.21)
Fit_{t-1}^{Don}	-0.538**	-0.312	-0.168	-0.334*	-0.817***
	(-2.30)	(-0.26)	(-0.84)	(-1.86)	(-2.58)
$Cost_{t-1}^{Rec}$	1.054	2.913***	0.004	0.217	0.442***
	(1.60)	(3.23)	(0.02)	(0.70)	(2.79)
$Short_{t-1}^{Rec}$	0.492	-0.997	0.466***	0.540***	0.133
	(1.22)	(-1.64)	(2.99)	(2.64)	(0.75)
Fit_{t-1}^{Rec}	-0.229	-1.074	0.598***	0.155	0.235
	(-0.47)	(-1.10)	(3.11)	(0.60)	(1.00)
Agg_{t-1}^{Don}	-0.296	0.213	-0.911***	-0.548***	-0.760**
	(-1.10)	(0.20)	(-5.09)	(-2.86)	(-2.40)
Agg_{t-1}^{Rec}	-0.390	0.820	0.620***	0.793***	0.371
	(-0.54)	(0.78)	(3.61)	(3.19)	(1.55)
$Size_{t-1}$	-0.893***	-2.234***	-1.131***	-0.987***	-1.393***
	(-4.88)	(-4.51)	(-12.15)	(-8.81)	(-7.63)
Age_{t-1}	-0.011*	-0.084***	-0.036***	-0.022***	-0.031***
	(-1.76)	(-3.40)	(-7.40)	(-3.90)	(-4.35)
$Relative\ size_{t-1}$	-23.190***	-18.012***	-15.997***	-16.816***	-16.971***
	(-8.16)	(-7.11)	(-24.97)	(-20.40)	(-14.43)
$Small\ firm_{t-1}$	4.420***	5.379*	4.644***	4.047***	4.125***
	(4.97)	(1.90)	(9.08)	(6.98)	(4.43)
$Labor\ cost_{t-1}$	12.917***	-4.717	0.699	2.294	-4.652
	(3.01)	(-0.46)	(0.42)	(1.15)	(-1.37)
$Labor\ shortage_{t-1}$	-43.580	99.751	15.735	24.188	-14.679
	(-1.26)	(1.61)	(1.16)	(1.62)	(-0.70)
$Labor\ fit_{t-1}$	2.613	-9.594	-3.679*	-4.390**	-5.796*
	(0.44)	(-0.83)	(-1.92)	(-2.51)	(-1.85)
$Agglomeration_{t-1}$	-0.086	0.447	-1.061***	-0.279	-0.468
	(-0.30)	(0.60)	(-4.05)	(-1.48)	(-0.96)
$Education_{t-1}$	10.004***	17.515***	6.708***	6.578***	9.050***
	(6.42)	(4.67)	(10.63)	(8.35)	(7.18)
$Qualification_{t-1}$	-0.173	-1.522	1.940***	1.857***	1.323*
	(-0.21)	(-0.88)	(4.07)	(3.44)	(1.71)
$Enabling\ share_{t-1}$	10.997***	11.638***	6.725***	6.648***	6.893***
	(4.65)	(3.33)	(9.37)	(7.79)	(5.22)
mc_{t-1}	-5.003***	-10.308***	-7.344***	-6.463***	-6.861***
	(-5.73)	(-4.01)	(-15.18)	(-11.76)	(-7.92)
Industry × year FE	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.050	0.044	0.055	0.047	0.050
N	18,297	3,985	69,292	51,956	24,455

Table OA7: Matching diagnostics. The table reports statistics of all continuous variables for matched standalone firms, matched BG firms, and unmatched BG firms. In addition, we also compare the matched BG firms to matched standalone firms and to unmatched BG firms. We report differences in means and the Imbens-Wooldridge statistics. We match each BG firm to a comparable standalone firm. The matching is done in two steps. In the first step, all BG and standalone firm observations are assigned to cells constructed by crossing county codes (400), 2-digit NACE Rev. 2 industry codes (84), number of establishments (4 categories: 1, 2-5, 6-10 and above 10) and calendar years (12). In the second step, the Euclidean distance is calculated based on the logarithmic employment size, firm age, log average worker age, percentage of female workers, percentage of highly qualified workers, and percentage of medium-qualified workers within each cell, for each BG firm and its matched standalone firm. All six variables are scaled by the respective sample standard deviation of the BG firms. For each BG firm, we select the standalone firm with the smallest Euclidean distance as its counterfactual.

Variable	Log employment size	Log firm age	Log worker age	% female	% highly qualified	% medium-qualified
Panel A: Matched BG firm-years (N = 68,977)						
Mean	4.019	2.885	3.715	0.419	0.195	0.676
Median	4.127	2.833	3.730	0.381	0.110	0.731
St. Dev.	1.384	0.832	0.135	0.269	0.222	0.218
Panel B: Unmatched BG firm-years (N = 27,814)						
Mean	4.566	2.949	3.733	0.437	0.185	0.696
Median	4.554	2.890	3.745	0.414	0.116	0.743
St. Dev.	1.549	0.868	0.125	0.273	0.198	0.197
Panel C: Matched standalone firm-years (N = 68,977)						
Mean	3.906	2.953	3.710	0.421	0.163	0.689
Median	3.989	2.944	3.722	0.383	0.090	0.739
St. Dev.	1.080	0.748	0.125	0.256	0.192	0.200
Panel D: Difference between matched BG and standalone firms						
Diff	0.113	-0.068	0.006	-0.002	0.032	-0.013
IW-stat	0.091	-0.086	0.043	-0.009	0.156	-0.060
Panel E: Difference between matched and unmatched BG firms						
Diff	-0.547	-0.064	-0.017	-0.018	0.010	-0.020
IW-stat	-0.373	-0.075	-0.134	-0.067	0.049	-0.096

Table OA8: Extended local labor markets. This table replicates in Panel A firm-level regressions from Table 2 (column 5), Table 5 (columns 3 and 6), and Table 8 (columns 3 and 6) and in Panel B BG-level regressions from Table 9 (columns 1 to 6) using a different definition of local labor markets. For each firm in county c, the definition of the local labor market includes all firms and employees located in county c and all those located in counties that share at least one border with county c. The local labor market characteristics for each focal county c (labor cost, shortage, fit, and agglomeration) are calculated as the worker-weighted average of the respective county-level variables across the focal county and its adjacent counties. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Firm-level regressions

Dep. var.:	Employment growth				Exit	
	Total (%)	Internal (%)	External (%)	% Ext.	Dummy (%)	LW (%)
	(1)	(2)	(3)	(4)	(5)	(6)
$Cost_{t-1}^{Don}$	-0.592***	-0.079*	-0.513***	86.6%	0.094*	0.020
	(-4.39)	(-1.78)	(-4.12)		(1.84)	(1.58)
$Short_{t-1}^{Don}$	-0.344***	-0.186***	-0.158	45.8%	0.214***	0.020
	(-3.04)	(-4.91)	(-1.52)		(4.18)	(1.57)
Fit_{t-1}^{Don}	-0.513***	-0.102**	-0.411***	80.1%	0.390***	0.058***
	(-3.82)	(-2.26)	(-3.35)		(7.39)	(4.23)
$Cost_{t-1}^{Rec}$	-0.128	-0.093	-0.034	26.9%	-0.072	-0.031***
	(-0.83)	(-1.52)	(-0.25)		(-1.19)	(-4.23)
$Short_{t-1}^{Rec}$	0.275**	0.037	0.238**	86.6%	-0.010	-0.020***
	(2.05)	(0.70)	(2.04)		(-0.19)	(-3.08)
Fit_{t-1}^{Rec}	0.691***	0.180***	0.511***	73.9%	0.210***	-0.013**
	(4.41)	(3.00)	(3.60)		(3.20)	(-2.48)
Agg_{t-1}^{Don}	-0.847***	-0.099**	-0.748***	88.3%	0.304***	0.048***
	(-6.11)	(-2.15)	(-5.81)		(5.95)	(3.45)
Agg_{t-1}^{Rec}	0.563***	0.111*	0.452***	80.3%	-0.083	-0.014**
	(3.78)	(1.79)	(3.36)		(-1.55)	(-2.49)
No. of controls	12	12	12		12	12
Industry × year FE	Yes	Yes	Yes		Yes	Yes
County × year FE	Yes	Yes	Yes		Yes	Yes
Adj. R^2	0.051	0.004	0.055		0.031	0.013
N	97,389	97,389	97,389		97,389	97,389

Table OA8: Extended local labor markets (continued).

Panel B: BG-level regressions

Dep. var.	Exit			Entry		
	Dummy(%)	Count	LW(%)	Dummy(%)	Count	LW(%)
	(1)	(2)	(3)	(4)	(5)	(6)
	Dummy (%)	Count	LW (%)	Dummy (%)	Count	LW (%)
$Cost_{t-1}^{BG}$	-2.918***	-0.052***	-0.823***	2.375***	0.048***	0.505**
	(-5.01)	(-4.36)	(-3.49)	(5.04)	(4.94)	(2.52)
$Short_{t-1}^{BG}$	-1.145***	-0.016***	-0.258***	0.248	0.012*	0.117**
	(-5.68)	(-3.50)	(-3.69)	(1.64)	(1.91)	(2.13)
Fit_{t-1}^{BG}	-1.147**	-0.022*	-0.621**	2.124***	0.042***	0.511**
	(-1.97)	(-1.83)	(-2.43)	(4.24)	(3.06)	(2.33)
Agg_{t-1}^{BG}	-3.310***	-0.059***	-1.309***	3.046***	0.081***	1.190***
	(-5.75)	(-4.56)	(-5.71)	(5.49)	(5.14)	(5.86)
No. of controls	9	9	9	9	9	9
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
BG FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.165	0.175	0.116	0.151	0.119	0.122
N	35,901	35,901	35,901	35,901	35,901	35,901

Table OA9: Human capital relatedness. This table replicates in Panel A firm-level regressions from Table 2 (column 5), Table 5 (columns 3 and 6), and Table 8 (columns 3 and 6) and in Panel B BG-level regressions from Table 9 (columns 1 to 6) using HCR instead of $Labor\ fit$. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Firm-level regressions

Dep. var.:	Employment growth				Exit	
	Total (%) (1)	Internal (%) (2)	External (%) (3)	% Ext. (4)	Dummy (%) (5)	LW (%) (6)
$Cost_{t-1}^{Don}$	-0.629***	-0.113**	-0.517***	82.1%	0.151***	0.029**
	(-4.50)	(-2.41)	(-4.05)		(2.88)	(2.15)
$Short_{t-1}^{Don}$	-0.386***	-0.147***	-0.239**	61.9%	0.199***	0.023*
	(-3.31)	(-3.80)	(-2.23)		(3.83)	(1.67)
HCR_{t-1}^{Don}	-0.207	-0.018	-0.189	91.5%	0.072	0.020
	(-1.42)	(-0.36)	(-1.42)		(1.37)	(1.42)
$Cost_{t-1}^{Rec}$	0.153	-0.066	0.218	143.0%	-0.114*	-0.030***
	(0.91)	(-0.98)	(1.46)		(-1.89)	(-4.07)
$Short_{t-1}^{Rec}$	0.394***	0.098*	0.296**	75.2%	0.126**	-0.015*
	(2.99)	(1.66)	(2.53)		(2.21)	(-1.89)
HCR_{t-1}^{Rec}	0.180	0.081	0.099	54.8%	0.053	-0.024***
	(0.98)	(1.07)	(0.61)		(0.81)	(-3.69)
Agg_{t-1}^{Don}	-0.802***	-0.140***	-0.662***	82.6%	0.538***	0.075***
	(-6.12)	(-3.19)	(-5.47)		(10.16)	(5.14)
Agg_{t-1}^{Rec}	0.730***	0.137**	0.593***	81.3%	-0.028	-0.012**
	(4.67)	(2.31)	(4.22)		(-0.54)	(-2.57)
No. of controls	12	12	12		12	12
Industry × year FE	Yes	Yes	Yes		Yes	Yes
County × year FE	Yes	Yes	Yes		Yes	Yes
Adj. R^2	0.050	0.003	0.054		0.031	0.013
N	97,389	97,389	97,389		97,389	97,389

Panel B: BG-level regressions

Dep. var.	Exit			Entry		
	Dummy(%) (1)	Count (2)	LW(%) (3)	Dummy(%) (4)	Count (5)	LW(%) (6)
$Cost_{t-1}^{BG}$	-2.363***	-0.041***	-0.522***	1.759***	0.042***	0.428***
	(-5.25)	(-4.17)	(-2.79)	(4.67)	(4.58)	(2.86)
$Short_{t-1}^{BG}$	-1.295***	-0.021***	-0.324***	0.558***	0.016***	0.214***
	(-6.39)	(-4.50)	(-4.49)	(3.71)	(2.81)	(3.72)
HCR_{t-1}^{BG}	-2.192***	-0.036***	-1.051***	1.615***	0.025**	0.351**
	(-4.64)	(-3.94)	(-4.95)	(3.99)	(2.44)	(2.24)
Agg_{t-1}^{BG}	-1.026**	-0.018*	-0.515***	1.679***	0.047***	0.505**
	(-2.14)	(-1.78)	(-3.07)	(3.44)	(3.65)	(2.20)
No. of controls	9	9	9	9	9	9
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
BG FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.163	0.174	0.114	0.147	0.115	0.118
N	35,901	35,901	35,901	35,901	35,901	35,901

Table OA10: Establishment closures. This table replicates in Panel A firm-level regressions from Table 2 (column 5), Table 5 (columns 3 and 6), and Table 8 (columns 3 and 6) and in Panel B BG-level regressions from Table 9 (columns 1 to 6) using *Labor supply* instead of *Labor shortage*. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Firm-level regressions

Dep. var.:	Employment growth				Exit	
	Total (%)	Internal (%)	External (%)	% Ext.	Dummy (%)	LW (%)
	(1)	(2)	(3)	(4)	(5)	(6)
$Cost_{t-1}^{Don}$	-0.553***	-0.114**	-0.438***	79.3%	0.171***	0.029**
	(-4.08)	(-2.54)	(-3.55)		(3.44)	(2.33)
$Supply_{t-1}^{Don}$	-0.169***	-0.029*	-0.140***	82.9%	0.023	0.001
	(-3.97)	(-1.89)	(-3.60)		(1.13)	(0.12)
Fit_{t-1}^{Don}	-0.309**	-0.046	-0.263**	85.1%	0.237***	0.040***
	(-2.15)	(-0.98)	(-2.00)		(4.12)	(2.63)
$Cost_{t-1}^{Rec}$	0.011***	0.003***	0.008***	71.9%	0.002*	0.000***
	(4.34)	(2.68)	(3.51)		(1.93)	(-3.23)
$Supply_{t-1}^{Rec}$	0.372**	0.074	0.298**	80.2%	0.184***	-0.012**
	(2.24)	(1.01)	(2.03)		(2.62)	(-2.17)
Fit_{t-1}^{Rec}	-0.622***	-0.126***	-0.495***	79.7%	0.481***	0.064***
	(-4.38)	(-2.71)	(-3.78)		(8.37)	(4.22)
Agg_{t-1}^{Don}	0.075	-0.064	0.140	185.6%	-0.165***	-0.032***
	(0.56)	(-1.23)	(1.15)		(-3.14)	(-4.27)
Agg_{t-1}^{Rec}	0.468***	0.060	0.409***	87.3%	-0.129**	-0.008*
	(2.70)	(0.88)	(2.66)		(-2.50)	(-1.94)
No. of controls	12	12	12		12	12
Industry × year FE	Yes	Yes	Yes		Yes	Yes
County × year FE	Yes	Yes	Yes		Yes	Yes
Adj. R^2	0.051	0.003	0.055		0.031	0.013
N	97,389	97,389	97,389		97,389	97,389

Panel B: BG-level regressions

Dep. var.	Exit			Entry		
	Dummy(%)	Count	LW(%)	Dummy(%)	Count	LW(%)
	(1)	(2)	(3)	(4)	(5)	(6)
$Cost_{t-1}^{BG}$	1.807***	0.041***	0.422***	-2.707***	-0.047***	-0.656***
	(4.90)	(4.61)	(2.99)	(-6.03)	(-4.69)	(-3.62)
$Supply_{t-1}^{BG}$	-0.067	-0.002	-0.052	-0.047	0.000	0.056
	(-0.53)	(-0.96)	(-0.54)	(-0.66)	(0.20)	(1.06)
Fit_{t-1}^{BG}	2.205***	0.046***	0.564***	-2.036***	-0.033***	-0.900***
	(4.83)	(4.42)	(3.15)	(-3.99)	(-3.08)	(-4.02)
Agg_{t-1}^{BG}	1.473***	0.042***	0.446**	-0.927*	-0.017	-0.467***
	(3.04)	(3.28)	(1.96)	(-1.95)	(-1.62)	(-2.74)
No. of controls	9	9	9	9	9	9
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
BG FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.147	0.113	0.116	0.160	0.171	0.109
N	35,921	35,921	35,921	35,921	35,921	35,921

Table OA11: Buyer fit and supplier fit. This table replicates in Panel A firm-level regressions from Table 2 (column 5), Table 5 (columns 3 and 6), and Table 8 (columns 3 and 6) and in Panel B BG-level regressions from Table 9 (columns 1 to 6) including measures for the proximity to customers and suppliers. We follow the literature in regional economics (Glaeser and Kerr 2009; Alcacer and Chung, 2014) and define two additional variables, Buy_{sct} and Sup_{sct}, which measure the buyer fit and the supplier fit of county c at time t for a firm that operates in industry s. Both variables are included as additional controls. We then construct relocation benefits related to them in a similar manner as our labor-related relocation benefits. The definitions are provided in Section A.6 in the Appendix.. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Firm-level regressions

Dep. var.:	Employment growth				Exit	
	Total (%)	Internal (%)	External (%)	% Ext.	Dummy (%)	LW (%)
	(1)	(2)	(3)	(4)	(5)	(6)
$Cost_{t-1}^{Don}$	-0.618***	-0.112**	-0.507***	81.9%	0.132**	0.031**
	(-4.45)	(-2.43)	(-3.99)		(2.57)	(2.32)
$Short_{t-1}^{Don}$	-0.363***	-0.150***	-0.212**	58.5%	0.189***	0.023*
	(-3.09)	(-3.87)	(-1.96)		(3.59)	(1.66)
Fit_{t-1}^{Don}	-0.240	-0.025	-0.215	89.7%	0.221***	0.043***
	(-1.64)	(-0.51)	(-1.61)		(3.75)	(2.69)
$Cost_{t-1}^{Rec}$	0.018	-0.087	0.105	581.4%	-0.106*	-0.034***
	(0.12)	(-1.45)	(0.80)		(-1.82)	(-4.39)
$Short_{t-1}^{Rec}$	0.291**	0.070	0.221*	75.9%	0.107*	-0.012
	(2.17)	(1.20)	(1.85)		(1.82)	(-1.45)
Fit_{t-1}^{Rec}	0.202	0.070	0.132	65.5%	0.200***	-0.007
	(1.19)	(0.98)	(0.89)		(2.82)	(-1.29)
Agg_{t-1}^{Don}	-0.607***	-0.124**	-0.483***	79.6%	0.475***	0.067***
	(-4.08)	(-2.48)	(-3.52)		(7.88)	(3.98)
Buy_{t-1}^{Don}	-0.172	-0.054	-0.119	68.9%	0.063	-0.011
	(-1.51)	(-1.34)	(-1.15)		(1.20)	(-1.12)
Sup_{t-1}^{Don}	-0.283*	0.000	-0.283**	100.1%	-0.047	-0.002
	(-1.88)	(0.00)	(-2.00)		(-0.73)	(-0.12)
Agg_{t-1}^{Rec}	0.409**	0.044	0.365**	89.3%	-0.079	-0.009*
	(2.32)	(0.62)	(2.30)		(-1.28)	(-1.65)
Buy_{t-1}^{Rec}	0.326**	0.050	0.276**	84.8%	-0.227***	-0.021***
	(2.19)	(0.77)	(2.13)		(-3.85)	(-3.88)
Sup_{t-1}^{Rec}	0.524***	0.170**	0.355**	67.7%	0.056	-0.006
	(3.22)	(2.44)	(2.36)		(0.91)	(-1.24)
No. of controls	14	14	14		14	14
Industry × year FE	Yes	Yes	Yes		Yes	Yes
County × year FE	Yes	Yes	Yes		Yes	Yes
Adj. R^2	0.051	0.004	0.055		0.031	0.013
N	97,189	97,189	97,189		97,189	97,189

Table OA11: Buyer fit and supplier fit (continued).

Panel B: BG-level regressions

Dep. var.	Exit			Entry		
	Dummy(%)	Count	LW(%)	Dummy(%)	Count	LW(%)
	(1)	(2)	(3)	(4)	(5)	(6)
$Cost_{t-1}^{BG}$	-2.462***	-0.042***	-0.575***	1.622***	0.037***	0.375**
	(-5.48)	(-4.35)	(-3.18)	(4.32)	(4.38)	(2.55)
$Short_{t-1}^{BG}$	-1.279***	-0.021***	-0.314***	0.521***	0.015***	0.198***
	(-6.32)	(-4.54)	(-4.42)	(3.49)	(2.66)	(3.45)
Fit_{t-1}^{BG}	-1.913***	-0.032***	-0.851***	1.939***	0.038***	0.459***
	(-3.70)	(-2.99)	(-3.77)	(4.16)	(3.71)	(2.58)
Agg_{t-1}^{BG}	-0.667	-0.014	-0.393**	1.314***	0.037***	0.382*
	(-1.37)	(-1.40)	(-2.30)	(2.71)	(3.03)	(1.69)
Buy_{t-1}^{BG}	-0.158	-0.008	-0.095	0.868***	0.017**	0.161
	(-0.55)	(-1.35)	(-0.91)	(2.65)	(2.32)	(1.33)
Sup_{t-1}^{BG}	-1.176***	-0.014**	-0.464***	0.901***	0.028***	0.446***
	(-3.11)	(-2.26)	(-3.41)	(2.70)	(3.38)	(3.14)
No. of controls	11	11	11	11	11	11
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
BG FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.164	0.175	0.115	0.150	0.119	0.121
N	35,901	35,901	35,901	35,900	35,900	35,900

Table OA12: Movements of jobs and movements of employees. This table reports panel regressions of firm-level internal and external employment growth against donor benefits, recipient benefits, control variables, and fixed effects. Internal employment growth is calculated as the net rate of hiring and separation from/to affiliated firms. External employment growth is calculated as the net rate of hiring and separation from/to the outside labor market. All independent variables are lagged by one year. All eight relocation benefit variables are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table OA12: Movements of jobs and movements of employees (continued).

	Dependent variable						% Ext.
	Internal employment growth(%)			External employment growth(%)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Cost_{t-1}^{Don}$	-0.116***	-0.088**	-0.112**	-0.514***	-0.504***	-0.521***	82.4%
	(-2.72)	(-1.98)	(-2.48)	(-4.29)	(-4.08)	(-4.23)	
$Short_{t-1}^{Don}$	-0.115***	-0.114***	-0.145***	-0.205**	-0.167	-0.231**	61.5%
	(-3.09)	(-2.96)	(-3.74)	(-2.01)	(-1.55)	(-2.16)	
Fit_{t-1}^{Don}	0.045	-0.015	-0.031	-0.120	-0.263**	-0.285**	90.1%
	(1.11)	(-0.31)	(-0.66)	(-1.07)	(-2.03)	(-2.17)	
$Cost_{t-1}^{Rec}$	-0.060	-0.054	-0.053	0.186	0.210*	0.210*	133.6%
	(-1.05)	(-0.94)	(-0.93)	(1.48)	(1.66)	(1.68)	
$Short_{t-1}^{Rec}$	0.126**	0.126**	0.090	0.400***	0.409***	0.271**	75.0%
	(2.14)	(2.14)	(1.53)	(3.32)	(3.40)	(2.28)	
Fit_{t-1}^{Rec}	0.121*	0.124*	0.099	0.344**	0.346**	0.234	70.2%
	(1.77)	(1.80)	(1.44)	(2.36)	(2.38)	(1.59)	
Agg_{t-1}^{Don}	-0.083*	-0.085*	-0.134***	-0.410***	-0.470***	-0.608***	81.9%
	(-1.96)	(-1.89)	(-2.96)	(-3.49)	(-3.74)	(-4.79)	
Agg_{t-1}^{Rec}	0.166***	0.167***	0.118*	0.717***	0.726***	0.529***	81.8%
	(2.66)	(2.67)	(1.89)	(4.96)	(5.00)	(3.64)	
$Size_{t-1}$	-0.022	-0.018	-0.092***	-0.642***	-0.617***	-1.009***	91.7%
	(-0.89)	(-0.69)	(-3.46)	(-9.28)	(-8.88)	(-13.95)	
Age_{t-1}	-0.005***	-0.005***	-0.003**	-0.031***	-0.031***	-0.023***	89.5%
	(-3.99)	(-4.01)	(-2.36)	(-7.88)	(-7.98)	(-6.42)	
$Relative\ size_{t-1}$	-0.338***	-0.360***	0.622***	1.254***	1.138***	3.716***	85.7%
	(-2.93)	(-3.11)	(4.66)	(3.93)	(3.55)	(9.62)	
$Small\ firm_{t-1}$	-1.474***	-1.494***	-2.329***	-10.429***	-10.514***	-13.770***	85.5%
	(-7.10)	(-7.18)	(-10.45)	(-22.01)	(-22.13)	(-26.37)	
$Labor\ cost_{t-1}$		-0.854*	-0.675		1.064	1.520	180.0%
		(-1.87)	(-1.48)		(0.88)	(1.26)	
$Labor\ shortage_{t-1}$		2.217	3.104		6.554	9.059	74.5%
		(0.68)	(0.95)		(0.76)	(1.06)	
$Labor\ fit_{t-1}$		-0.865*	-1.001**		-1.844	-2.295*	69.6%
		(-1.94)	(-2.26)		(-1.50)	(-1.87)	
$Agglomeration_{t-1}$		-0.045	-0.052		-0.374**	-0.392***	88.3%
		(-0.87)	(-1.00)		(-2.52)	(-2.67)	
$Education_{t-1}$			1.230***			6.472***	84.0%
			(6.00)			(12.61)	
$Qualification_{t-1}$			0.125			1.194***	90.6%
			(0.88)			(3.39)	
$Enabling\ share_{t-1}$			1.359***			5.766***	80.9%
			(5.44)			(9.86)	
mc_{t-1}			-1.883***			-4.828***	71.9%
			(-14.98)			(-13.27)	
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes	
County × year FE	Yes	Yes	Yes	Yes	Yes	Yes	
Adj. R^2	-0.001	-0.001	0.003	0.040	0.040	0.054	
N	97,389	97,389	97,389	97,389	97,389	97,389	

Table OA13: Hiring and separation. This table replicates in Panel A firm-level regressions from Table 2 (column 5) but replaces the dependent variables with measures of hiring and separation. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. var.	Hire(%)			Separation(%)		
	(1)	(2)	(3)	(4)	(5)	(6)
$Cost_{t-1}^{Don}$	-0.360***	-0.392***	-0.467***	0.270**	0.201	0.166
	(-2.86)	(-3.00)	(-3.58)	(2.20)	(1.58)	(1.30)
$Short_{t-1}^{Don}$	0.049	0.056	-0.023	0.368***	0.337***	0.353***
	(0.54)	(0.59)	(-0.25)	(3.97)	(3.48)	(3.67)
Fit_{t-1}^{Don}	0.084	-0.017	-0.058	0.159	0.261*	0.258*
	(0.70)	(-0.12)	(-0.42)	(1.30)	(1.85)	(1.84)
$Cost_{t-1}^{Rec}$	-0.457***	-0.459***	-0.453***	-0.584***	-0.616***	-0.611***
	(-3.61)	(-3.62)	(-3.59)	(-4.95)	(-5.22)	(-5.22)
$Short_{t-1}^{Rec}$	0.020	0.019	-0.050	-0.506***	-0.517***	-0.411***
	(0.17)	(0.16)	(-0.42)	(-4.70)	(-4.80)	(-3.83)
Fit_{t-1}^{Rec}	0.318**	0.317**	0.277*	-0.148	-0.153	-0.055
	(2.10)	(2.09)	(1.83)	(-1.03)	(-1.06)	(-0.38)
Agg_{t-1}^{Don}	0.132	0.252*	0.132	0.624***	0.807***	0.875***
	(1.07)	(1.90)	(0.98)	(4.98)	(5.98)	(6.55)
Agg_{t-1}^{Rec}	0.413***	0.426***	0.332**	-0.470***	-0.466***	-0.315**
	(2.79)	(2.88)	(2.25)	(-3.26)	(-3.23)	(-2.15)
$Size_{t-1}$	-1.970***	-1.978***	-2.072***	-1.306***	-1.344***	-0.972***
	(-26.18)	(-26.22)	(-26.98)	(-18.11)	(-18.58)	(-13.31)
Age_{t-1}	-0.049***	-0.049***	-0.046***	-0.014***	-0.014***	-0.020***
	(-10.06)	(-10.06)	(-9.58)	(-4.31)	(-4.29)	(-5.74)
$Relative\ size_{t-1}$	2.950***	2.965***	5.154***	2.035***	2.188***	0.816**
	(8.78)	(8.78)	(12.98)	(5.88)	(6.28)	(2.06)
$Small\ firm_{t-1}$	-4.563***	-4.570***	-6.183***	7.341***	7.438***	9.915***
	(-12.07)	(-12.06)	(-15.68)	(14.36)	(14.53)	(18.03)
$Labor\ cost_{t-1}$		1.740	2.288*		1.530	1.444
		(1.32)	(1.74)		(1.17)	(1.12)
$Labor\ shortage_{t-1}$		-1.615	0.181		-10.386	-11.981
		(-0.21)	(0.02)		(-1.37)	(-1.59)
$Labor\ fit_{t-1}$		-2.423*	-2.799**		0.286	0.497
		(-1.78)	(-2.05)		(0.21)	(0.38)
$Agglomeration_{t-1}$		0.379**	0.368**		0.799***	0.813***
		(2.32)	(2.25)		(5.03)	(5.11)
$Education_{t-1}$			2.541***			-5.162***
			(4.63)			(-9.78)
$Qualification_{t-1}$			-1.438***			-2.756***
			(-3.85)			(-7.67)
$Enabling\ share_{t-1}$			3.594***			-3.531***
			(6.18)			(-6.03)
mc_{t-1}			-4.290***			2.422***
			(-11.57)			(6.58)
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.167	0.168	0.172	0.147	0.148	0.162
N	97,389	97,389	97,389	97,389	97,389	97,389

Table OA14: Managerial capabilities. This table reports panel regressions of firm-level employment growth against donor benefits, recipient benefits, control variables, and fixed effects, replicating Table 2, column 5 for two sets of subsamples. The sample is split at the median of *mc* and *imb*. *mc* is the employment share of the focal firm for enabling functions relative to the whole group. *imb* is employment-weighted average of the absolute values of the difference between a focal firm's *mc* and its employment share in its group. *Employment growth* is calculated as the net rate of hiring and separation. All independent variables are lagged by one year. All eight relocation benefit variables are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table OA14: Managerial capabilities (continued).

Dep. var.:	Employment growth (%)			
Subsample:	*mc*		*imb*	
	Low	High	Low	High
	(1)	(2)	(3)	(4)
$Cost_{t-1}^{Don}$	-0.916***	-0.368**	-0.541***	-0.692***
	(-4.29)	(-2.08)	(-3.00)	(-3.21)
$Short_{t-1}^{Don}$	-0.311*	-0.178	-0.688***	-0.070
	(-1.71)	(-1.16)	(-4.14)	(-0.38)
Fit_{t-1}^{Don}	-0.678***	0.056	-0.796***	0.086
	(-3.04)	(0.30)	(-4.08)	(0.40)
$Cost_{t-1}^{Rec}$	0.140	6.015**	0.274*	-0.105
	(0.90)	(1.98)	(1.67)	(-0.28)
$Short_{t-1}^{Rec}$	0.356**	0.381	0.384**	0.365
	(2.47)	(0.23)	(2.29)	(1.37)
Fit_{t-1}^{Rec}	0.192	0.671	0.339*	0.416
	(1.06)	(0.34)	(1.69)	(1.27)
Agg_{t-1}^{Don}	-1.101***	-0.464**	-0.950***	-0.442**
	(-5.35)	(-2.45)	(-4.93)	(-2.15)
Agg_{t-1}^{Rec}	0.500***	1.226	0.676***	0.625**
	(2.88)	(1.02)	(3.41)	(2.11)
Size_{t-1}	-1.498***	-0.778***	-1.123***	-1.059***
	(-11.98)	(-8.04)	(-9.84)	(-9.62)
Age_{t-1}	-0.048***	-0.020***	-0.024***	-0.030***
	(-7.20)	(-4.44)	(-4.46)	(-5.64)
$Relative\ size_{t-1}$	5.820***	2.444***	5.899***	3.493***
	(8.30)	(4.68)	(8.96)	(6.25)
$Small\ firm_{t-1}$	-17.783***	-18.481***	-17.282***	-15.703***
	(-22.78)	(-17.76)	(-20.59)	(-19.49)
$Cost_{t-1}$	0.916	1.164	1.747	0.123
	(0.44)	(0.71)	(0.92)	(0.07)
$Short_{t-1}$	5.885	20.771*	7.865	16.176
	(0.40)	(1.66)	(0.55)	(1.15)
Fit_{t-1}	-6.365***	-1.704	-7.760***	-0.073
	(-2.72)	(-1.06)	(-3.94)	(-0.04)
Agg_{t-1}	-1.263***	0.165	-0.378*	-0.539**
	(-4.63)	(0.88)	(-1.67)	(-2.41)
$Education_{t-1}$	8.577***	5.357***	8.125***	7.288***
	(10.69)	(7.12)	(9.67)	(9.68)
$Qualification_{t-1}$	1.452***	1.175**	0.943	1.410***
	(2.66)	(2.23)	(1.59)	(2.77)
$Enabling\ share_{t-1}$	9.287***	9.708***	6.677***	7.791***
	(9.26)	(11.34)	(7.04)	(8.76)
mc_{t-1}	-30.425***	-2.309***	-9.368***	-5.459***
	(-11.58)	(-4.16)	(-14.76)	(-10.52)
Industry × year FE	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes
Adj. R^2	0.063	0.049	0.055	0.046
N	48,333	48,378	48,372	48,386

Table OA15: Firm-level analysis of exits. This table reports panel regressions of firm-level exiting decision variables against donor benefits, recipient benefits, control variables, and fixed effects. *Exit* equals one if a firm is no longer affiliated and, consequently, the BG loses its presence in a county. *Labor-weighted exit* is calculated as the fraction of BG employees lost after exiting a county. All independent variables are lagged by one year. All eight variables relocation benefit are normalized to zero mean and unit standard deviation. All other variables are defined in Table A1 in the Appendix. Standard errors are clustered at the firm-level and t-statistics are presented in parentheses below the coefficients. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table OA15: Firm-level analysis of exits (continued).

Dep. var.	Exit(%)			Exit LW(%)		
	(1)	(2)	(3)	(4)	(5)	(6)
$Cost_{t-1}^{Don}$	0.159***	0.135***	0.129**	0.029**	0.024*	0.027**
	(3.17)	(2.68)	(2.57)	(2.29)	(1.83)	(2.09)
$Short_{t-1}^{Don}$	0.173***	0.191***	0.185***	0.017	0.017	0.020
	(3.37)	(3.69)	(3.56)	(1.33)	(1.29)	(1.50)
Fit_{t-1}^{Don}	0.193***	0.225***	0.219***	0.025*	0.040**	0.041***
	(3.60)	(3.93)	(3.82)	(1.88)	(2.54)	(2.63)
$Cost_{t-1}^{Rec}$	-0.141**	-0.151***	-0.150***	-0.038***	-0.040***	-0.040***
	(-2.56)	(-2.74)	(-2.73)	(-4.76)	(-5.06)	(-5.06)
$Short_{t-1}^{Rec}$	0.114**	0.112**	0.108*	-0.016**	-0.017**	-0.014*
	(1.99)	(1.96)	(1.88)	(-2.03)	(-2.07)	(-1.81)
Fit_{t-1}^{Rec}	0.162**	0.162**	0.160**	-0.014**	-0.014**	-0.013**
	(2.39)	(2.39)	(2.36)	(-2.42)	(-2.47)	(-2.34)
Agg_{t-1}^{Don}	0.443***	0.469***	0.461***	0.057***	0.060***	0.064***
	(8.08)	(8.49)	(8.32)	(4.04)	(3.96)	(4.18)
Agg_{t-1}^{Rec}	-0.075	-0.078	-0.082	-0.016***	-0.016***	-0.014***
	(-1.35)	(-1.39)	(-1.47)	(-3.30)	(-3.43)	(-2.86)
Size_{t-1}	0.044*	0.035	0.028	0.010	0.008	0.011*
	(1.83)	(1.45)	(1.17)	(1.57)	(1.25)	(1.66)
Age_{t-1}	-0.003**	-0.003***	-0.002**	0.000	0.000	0.000
	(-2.56)	(-2.58)	(-2.19)	(-1.11)	(-1.11)	(-1.41)
$Relative\ size_{t-1}$	-0.932***	-0.890***	-0.668***	-0.075**	-0.066*	-0.142***
	(-8.43)	(-8.07)	(-5.34)	(-2.12)	(-1.85)	(-3.42)
$Small\ firm_{t-1}$	-0.074	-0.049	-0.131	-0.042**	-0.035*	0.021
	(-0.78)	(-0.51)	(-1.22)	(-2.23)	(-1.93)	(1.07)
$Labor\ cost_{t-1}$		0.380	0.384		0.099	0.084
		(0.84)	(0.85)		(0.74)	(0.63)
$Labor\ short_{t-1}$		-9.732***	-9.562***		-1.083	-1.165
		(-2.81)	(-2.76)		(-1.09)	(-1.17)
$Labor\ fit_{t-1}$		0.337	0.328		0.208*	0.216*
		(0.87)	(0.85)		(1.84)	(1.90)
$Agglomeration_{t-1}$		0.143***	0.139***		0.022	0.023
		(2.74)	(2.67)		(1.52)	(1.55)
$Education_{t-1}$			0.004			0.004
			(0.02)			(0.11)
$Qualification_{t-1}$			0.277***			-0.008
			(2.59)			(-0.31)
$Enabling\ share_{t-1}$			-0.280*			-0.123***
			(-1.77)			(-3.05)
mc_{t-1}			-0.405***			0.153***
			(-4.09)			(3.90)
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes
County × year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.030	0.030	0.030	0.013	0.013	0.013
N	97,389	97,389	97,389	97,389	97,389	97,389

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