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Business Groups and Employment

Finance Working Paper N° 539/2017
Revised February 2020

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This paper can be downloaded without charge from:
https://doi.org/10.67929/ecgi-fin-539-2017

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ECGI Working Paper Series in Finance

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We thank three anonymous referees, an anonymous associate editor, Rajesh Aggarwal, Heitor Almeida, Giacinta Cestone, Christopher Hartwell, Kate Holland, Soojin Kim, Francis Kramarz, John McConnell, David Parsley, Geoffrey Tate, Deniz Yavuz, and seminar participants at the 2016 American Economic Association Meeting, the 2017 Western Finance Association Meeting, the 2018 Telfer Annual Conference on Accounting and Finance, the 2018 European Financial Management Association "Merton H. Miller" Doctoral Student Seminar, and at the University of Illinois at Chicago for comments.

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Abstract

Using a newly assembled 50 country firm-level database spanning 19 years, we document a “bright side” for employees of business group affiliated firms: less pronounced fluctuations in employment than unaffiliated firms in response to macroeconomic shocks. The results are robust to a variety of tests designed to mitigate endogeneity concerns, including propensity score matching and comparisons of successful and failed group integrations, and are present in both booms and recessions. Our results are most consistent with group internal labor markets rather than several alternative explanations (internal capital markets, a lower overall sensitivity to shocks in group firms, or agency problems).

Keywords: Business Groups; Employment; Business Cycles

JEL Classifications: G3; J6; K31; E32

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BUSINESS GROUPS AND EMPLOYMENT

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ABSTRACT

Using a newly assembled 50 country firm-level database spanning 19 years, we document a "bright side" for employees of business group affiliated firms: less pronounced fluctuations in employment than unaffiliated firms in response to macroeconomic shocks. The results are robust to a variety of tests designed to mitigate endogeneity concerns, including propensity score matching and comparisons of successful and failed group integrations, and are present in both booms and recessions. Our results are most consistent with group internal labor markets rather than several alternative explanations (internal capital markets, a lower overall sensitivity to shocks in group firms, or agency problems).

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Acknowledgments: We thank three anonymous referees, an anonymous associate editor, Rajesh Aggarwal, Heitor Almeida, Giacinta Cestone, Christopher Hartwell, Kate Holland, Soojin Kim, Francis Kramarz, John McConnell, David Parsley, Geoffrey Tate, Deniz Yavuz, and seminar participants at the 2016 American Economic Association Meeting, the 2017 Western Finance Association Meeting, the 2018 Telfer Annual Conference on Accounting and Finance, the 2018 European Financial Management Association "Merton H. Miller" Doctoral Student Seminar, and at the University of Illinois at Chicago for comments.

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Employment is a primary concern for politicians, individuals, and economists alike. For over half a century since Okun's (1962) seminal work, economists have investigated how employment fluctuates with output. The widely documented positive correlation between these two variables has become a staple of modern macroeconomic textbooks.[1]

In this paper we investigate how this relation varies across firms as a function of business group affiliation.[2] A large literature has highlighted a number of "dark sides" of group affiliation, including the expropriation of minority shareholders (e.g., Bae, Kang, and Kim, 2002, Baek, Kang, and Lee, 2006, Bertrand, Mehta, and Mullainathan, 2002, Cheung, Rau, and Stouraitis, 2006, and Johnson, La Porta, Lopez-de-Silanes, and Shleifer, 2000) and the possible negative effect on competition from concentrating economic power in the hands of a few influential tycoons (Kandel, Kosenko, Morck, and Yafeh, 2015). Other studies have highlighted "bright sides" of group affiliation, such as access to internal capital markets (Hoshi, Kayshap, and Scharfstein, 1991, Boutin, Cestone, Fumagalli, Pica, and Serrano-Velarde, 2013, Gopalan, Nanda, and Seru, 2014, and Almeida, Kim, and Kim, 2015). We extend this literature by examining a salient bright side of group affiliation enjoyed by a key stakeholder: the employees.

To investigate our question, we construct a new database of group affiliation among publicly traded firms from 50 countries during the period 1993-2011. Our results show that business group affiliated firms display substantially less pronounced fluctuations in employment than unaffiliated firms in response to economic shocks. That is, employees of group affiliated firms are, on average, significantly less likely to lose their jobs during recessions than employees of unaffiliated firms. At the same time, group affiliated firms on average hire fewer new employees during expansions.

Our results are present after taking numerous precautions to mitigate a variety of endogeneity concerns. First, our tests use a variety of control variables, along with industry-year fixed effects, country-year fixed effects (to control for unobserved country-level shocks that might correlate with economic

[1] Mankiw (2012) and Romer (2012) are two of many examples.
[2] Khanna and Yafeh (2007) define business groups as "legally independent firms…which are bound together by persistent formal (e.g., equity) and informal (e.g., family) ties."

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shocks), and firm fixed effects (to control for time-invariant firm level variables). We also find similar results in fixed effects regressions using a propensity score matched sample of group affiliated and unaffiliated firms constructed to have statistically insignificant differences in the economic shocks they experience and several key firm characteristics. Finally, when comparing two similarly-sized samples of successful and failed group integrations, we find evidence of less pronounced employment fluctuations only in the sample of successful integrations, reinforcing the idea that group affiliation (and not omitted variables) is directly related to the observed employment dynamics.

We investigate several possible explanations for our evidence. We start by investigating whether our results are consistent with internal labor markets (ILM) within business groups. The relocation of employees across group affiliated firms has been noted in numerous popular press articles (see Exhibit 1). Academic papers have investigated ILM within firms (Tate and Yang, 2015, and Giroud and Mueller, 2015) and within groups following *idiosyncratic* shocks in, at least, a few countries (Belenzon and Tsolmon, 2016, Cestone, Fumagalli, Kramarz, and Pica, 2017, Huneeus, Huneeus, Larrain, Larrain, and Prem, 2019).

Our data allows us to test the ILM hypothesis in several ways. First, we use information on the relative opportunity set of firms within groups (proxied by Tobin's Q) to find evidence consistent with efficient ILM within groups, where high-opportunity firms gain employment relative to low-opportunity firms to capitalize on economic booms and keep those employees in the group during recessions. These results are specific to relative opportunities *within groups* rather than more general proxies for opportunities. We also leverage our multi-country set of *systematic* shocks to directly test competing explanations for ILM formation. These results largely support the hypothesis that ILM exist to reduce employment costs in firms (Belenzon and Tsolmon, 2016, Khanna and Palepu, 1997), as our results are stronger in same-country (relative to cross-country) groups where moving employees across firms is presumably less costly and in countries where relocating employees is significantly less costly than firing employees. In contrast, while the "employment coinsurance" hypothesis of ILM predicts lower average wages in group affiliated firms as a trade-off for job security (Cestone *et al.*, 2017), we fail to find evidence

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of such lower wages. We also find no evidence that diversification in firms (rather than the group itself) is responsible for our results.

We also investigate several non-ILM explanations for our results, but find little support for these explanations. For example, the observed employment dynamics might simply be the byproduct of the Internal Capital Markets (ICM) and the reallocation of capital within business groups. However, while ICM might result in fewer employment reductions specifically during economic downturns, we also find evidence of diminished sensitivity to shocks during economic *booms*; since ICM is most useful during economic downturns when credit markets are constrained, our results cannot be fully explained by an ICM story. Additionally, while the value of ICM is presumably greater when external capital is more costly (as suggested by Almeida *et al.*, 2015), we find our results are no more pronounced during financial crises, when restrictions on cross-border financial transactions are greater, or when firms face more pronounced financial constraints.

A second alternative hypothesis is that our results may be explained by the *performance* of group firms being less sensitive to economic shocks than that of non-group firms. However, we find similar results when we allow the impact of macroeconomic shocks to vary across firms (by substituting GDP growth with industry-level and firm-level sales shocks).

A third alternative hypothesis is that lower sensitivity of employment changes to economic growth in group affiliated firms may be the result of agency conflicts in business groups. However, we find no evidence that reduced employment sensitivity to economic shocks in group firms is a result of over-hiring or "padding" of employment levels in general, and our results remain strong in countries with relatively high outside investor protection against expropriation.

Our paper contributes to the literature investigating the relation between employment and output. A number of authors have investigated how this relation varies across countries, though time, or as a function of specific firm characteristics (for example, Meyer and Tasci, 2012, Ball, Leigh, and Loungani, 2013, and Ball, Jalles and Loungani, 2014). In this paper we investigate how this relation varies across

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firms as function of their organizational form. In general, we contribute to and expand the existing literature on business groups and ILM by using multiple shocks over multiple country-years. By doing so, we show that the previous evidence can be generalized across a multitude of countries and that it extends to a series of *systematic* shocks. The implications of our results are especially important for two reasons. The first is the paramount importance of employment *per se*. Second, business groups represent a prevalent organizational form.[3] Decreased sensitivity of employment growth to economic shocks in group affiliated firms thus encompasses a large share of worldwide economic activity and employment. While business groups are sometimes criticized by academics, politicians, and members of the press,[4] our results suggest a new "bright side" of business groups that pertains to both shareholders and current employees: reducing costly fluctuations in employment in response to economic shocks.

I. Data and Variables

I.A. Group Classification

Data on group affiliation are constructed using information from *Worldscope* (for years 1993 through 2008) and *Thomson Reuters Ownership* (for 2004 through 2011)[5]. Those databases report the name and ownership percentage of large shareholders -- those who typically own 5% or more of a firm's equity.

Using these data, we classify firms in our sample to be group affiliated in two different ways. In the first, we consider a firm to be affiliated with a business group if at least one of the following criteria is met: (i) the firm's largest shareholder has a 20% or greater stake in more than one firm in our sample, (ii) the firm's largest shareholder is another firm in our sample, and this other firm has a 20% or greater ownership stake in the firm in question, (iii) the firm itself is the largest shareholder of another firm in our sample with a 20% or greater ownership stake, and (iv) the firm is identified as belonging to a large business

[3] See, for example, Almeida, Park, Subrahmanyam and Wolfenzon (2011), Almeida, Kim and Kim (2015), Gopalan, Nanda and Seru (2014), Khanna and Yafeh (2005, 2007), and Masulis, Pham and Zein (2011).
[4] For example, in the 1930s the U.S. introduced a number of policies (including the introduction of an intercorporate dividend tax) aimed at eliminating pyramidal business groups (Morck, 2005).
[5] *Worldscope* CDs were discontinued in early 2010. The *Thomson Reuters Ownership* database is no longer available for purchase.

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group in Claessens, Djankov, and Lang (2000) and its largest shareholder has a 20% or greater ownership stake. The assumption that control is achieved by at least 20% ownership is used in several other studies of ownership structures, with La Porta, Lopez-de-Silanes, and Shleifer (1999) as one notable example.

In order to account for firms that may be affiliated with a business group composed of firms *outside* of our sample, our second definition of "group affiliated" further includes firms where the largest shareholder is *any* corporate entity with a 20% or greater ownership stake. To identify if a particular shareholder is a "corporate entity", we examine whether the name of the largest shareholder contains a commonly-used word or abbreviation that would identify the shareholder as a corporation (such as "corporation", "limited", "Inc.", "GmbH", etc.[6]) Abbreviations indicating state or other non-corporate ownership (such as "government", "state", "foundation", etc.) result in a classification of "unaffiliated".[7]

For the purposes of our tests, we characterize the former definition of group affiliation (where firms meet one or more of the four criteria listed above) as our "narrow" definition of affiliation. We further characterize the latter definition of group affiliation (expanded to include any sample firm whose largest shareholder is a corporate entity with a 20% or greater stake) as our "broad" definition of affiliation. We classify any remaining firms that do not meet at least one of the three criteria above as unaffiliated. Our narrow classification procedure allows us to classify group affiliated firms with greater certainty, since we can observe two or more of the directly affiliated firms in our sample. It also allows us to identify whether firms within a particular group are located in the same country or different countries and the relative opportunity set of each firm within a group, key pieces of information we use in later tests. Because of these empirical advantages, most of our tests utilize the narrow definition of group affiliation. When the narrow definition of group affiliation is used in our tests, any firm that meets the broad definition of group affiliated

[6] Some words and abbreviations for corporate entities were gathered from Appendix A in Marchica and Mura (2013) and http://www.corporateinformation.com/Company-Extensions-Security-Identifiers.aspx. The remaining words and abbreviations were collected manually by the authors and the full list is available upon request.

[7] These firms are classified as "unaffiliated" regardless of whether their largest shareholder owns large stakes in more than one firm. In other words, this keyword procedure takes precedence over criterion (ii) in our classification process.

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but not the narrow definition is dropped from our sample, as treating such firms as unaffiliated (rather than dropping them) would misclassify a substantial proportion of our sample.

From this process, we create an indicator variable *Group Affiliated* that is equal to one if a particular firm-year observation is classified as part of a business group and zero otherwise. In the analyses that follow, we restrict our sample to firms with 500 or more employees (which account for more than 99% of all employees with group affiliation data available in our two data sources). We further restrict our sample based on both the quality and the availability of the data. Since group affiliation is fairly persistent in firms, we drop any firms whose affiliation status changes more than twice in our 19-year sample, as we assume that the classifications for these firms are more likely than normal to be erroneous. Our tests also require firms to have data available for our main control variables (outlined in the next section). Finally, if fewer than ten observations are present in a particular country-year, we drop those observations.

I.B. Variables and Summary Statistics

Accounting and stock price data are obtained from *Worldscope* and *Datastream*. Our dependent variable in most regressions is *Employment Growth*, calculated by dividing the current year's number of employees by the prior year's number of employees and subtracting one. The values of *Employment Growth* (and all other firm-level variables listed below) are trimmed at the 1st and 99th percentiles. To proxy for economic shocks, in the majority of our tests we use the annual change in Gross Domestic Product (GDP) by country, adjusted for inflation (*GDP Growth*). We obtain data on GDP from the World Bank website.

As our main test specifications examine the relationship between changes in employment and changes in output, our control variables include several changes in other firm characteristics. *Sales Growth* is calculated by dividing the current year sales by the prior year's sales and subtracting one. Other change variables are calculated by subtracting prior year values of these variables from the current year values. These change variables include changes in *Return on Assets* (*ROA*), where ROA is calculated by dividing net income by the average book value of assets (the sum of end of current year assets and end of prior year

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assets, all divided by two), changes in *Debt Ratio*, where *Debt Ratio* is calculated as the book value of debt divided by assets, the change in *Q*, where *Q* is calculated as the market value of equity plus the book value of liabilities, all divided by the book value of assets, the change in capital expenditures or *CapEx*, where *CapEx* is calculated as firm capital expenditures divided by the book value of assets, and the change in return volatility or *RetVol*, where *RetVol* is the volatility of weekly stock returns within a year. These controls are all lagged by one year in our tests. We also use two additional control variables related to employment: lagged *Employment Growth*, to control for recent trends that might affect the dependent variable, and the lagged natural log of employees (*Lag Log(Employees))*, to control for how size and scale differences might affect employment growth.

(INSERT TABLE 1 ABOUT HERE)

Since Tate and Yang (2015) document ILM within diverse business segments of a single firm, we include the number of product segments in a firm, *Number Segments*, to mitigate the possibility that our test results will reflect intra-firm (rather than intra-group) ILM. We also construct variables used in Siegel and Choudhury (2012) to proxy for strategic differences among group and non-group firms: *Exports* is the dollar value of a firm's exports scaled by sales, *Sales from Trading* is the (scaled) dollar value of trading account income, and *Excise Tax* is (scaled) excise/windfall profit tax. Since coverage of data for these three variables is limited, we set them to zero if data is missing and follow Fama and French (2012) (which sets an "R&D missing" indicator variable equal to one if a company's R&D is zero or not reported) and create three variables *Missing(Exports), Missing(Sales from Trading),* and *Missing(Excise Tax),* which are equal to one if data for the particular variables they reference is missing.

Table 1 presents, by country, the total number of observations and the fraction of firm-year observations that are classified as group affiliated over our entire sample period. The first column presents the total number of observations with ownership data available from 1993-2011. Using our "narrow" classification, we classify 8.2% of our firm-year observations as group affiliated (third column), and using our "broad" classification, 31.2% of our firm-year observations are group affiliated (fourth column).

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Table 2 presents mean and median summary statistics for group affiliated and unaffiliated firms in our sample. Both the mean and median employment growth measures are significantly lower in group affiliated firms than unaffiliated firms. Differences in the growth of other firm characteristics (such as sales growth, change in ROA, etc.) are generally not as pronounced as the difference in employment growth, although the differences in level variables are more pronounced. In the next section, we outline the various methods we use to control for observed and unobserved differences between group and non-group firms.

(INSERT TABLE 2 ABOUT HERE)

II. Main Empirical Results

II.A. Identification Strategy

To examine the different employment dynamics displayed by group affiliated firms in response to economic shocks, we employ *change regression* specifications. In those specifications, annual changes in employment at the firm-level (*Employment Growth*) are regressed on changes in GDP (*GDP Growth*), an indicator variable denoting whether a given firm is affiliated with a business group (*Group Affiliated*), and the interaction between these last two variables:

$$Employment\ Growth_{\ i,c,t} = \alpha + \beta \times GDP\ Growth_{c,t} + \gamma \times Group\ Affiliated_{i,c,t} +$$
$$+ \delta \times GDP\ Growth_{c,t} \times Group\ Affiliated_{i,c,t} +$$
$$+ \zeta \times Lag\ Controls_{i,c,t} + F_i + C_{c,t} + I_{i,t} + \varepsilon_{i,c,t}$$

In the model, *i* identifies firms, *c* identifies countries, and *t* identifies years. The coefficient of interest is δ, which reflects the different response displayed by group affiliated firms to a given economic shock.

As observed in Table 2, group affiliated and unaffiliated firms differ in terms of many firm characteristics. We take numerous steps to control for these and other potential differences in group affiliated and unaffiliated firms. We include firm fixed effects, F_i, to capture firm-level observable and unobservable time invariant variables in our tests. We also include country-year fixed effects, $C_{c,t}$, and industry-year fixed effects, $I_{i,t}$, to account for country-year and industry-year level shocks. (We also use

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country-industry-year fixed effects in a robustness test in our online appendix). When all of these controls are included, the coefficient δ in the equation above isolates the different response of group firms to the same shock to GDP, after accounting for time-invariant firm-specific and time-varying country- and industry-specific factors. While we don't include the level control variables (*Log(Sales), ROA, Q*, etc.) that correspond to our change control variables in most specifications to avoid collinearity issues, we also repeat the above regression in a propensity score matched sample of group affiliated and unaffiliated firms that are statistically similar across the remaining Table 2 characteristics (along with industry and firm age) that aren't already included as controls. Standard errors are double clustered at the country-year and firm levels to account for the potential correlation of the residuals.

II.B. Main Results

Specification (1) in Table 3, Panel A presents a simple model, without control variables or fixed effects, of the relationship between firm-level employment growth and *GDP Growth*. (In all specifications in Panel A, we use our narrow definition of group affiliation.) The results confirm a positive correlation between economic growth and employment growth, as documented in the macroeconomics literature. The magnitude of the coefficient is also in line with typical findings in the literature (see, for example, Mankiw, 2012, Ball *et al*., 2013). When compared to unaffiliated firms (using the 0.646 coefficient of *GDP Growth*), the response of employment growth to economic shocks appears to be only half as sensitive in group affiliated firms (evidenced by the -0.312 coefficient of the interaction term *GDP Growth * Group Affiliated*, producing an overall sensitivity of 0.646 – 0.312 = 0.334). These results indicate different employment dynamics of group affiliated firms following economic shocks, specifically a lower sensitivity of employment to economic shocks than unaffiliated firms.

In specification (2), we include our firm-level lagged change variables, our size proxy (the log of lagged employees), and other controls, along with firm and industry-year fixed effects. The inclusion of these control variables strengthens the results from the previous panel. In specification (3), we include all

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of the previous controls and add country-year fixed effects (this is the "main" specification we use for the remainder of the paper). Although we can no longer observe the uninteracted *GDP Growth* variable, since it is collinear with the country-year fixed effects, the coefficient of *GDP Growth * Group Affiliated* remains negative and significant. In specification (4), we further interact *GDP Growth* with each of the control variables to examine whether our earlier results occur because of factors correlated with group affiliation (rather than group affiliation itself). However, the majority of these interactions lack statistical significance, and the coefficient and significance of *GDP Growth * Group Affiliated* remains virtually unchanged.

(INSERT TABLE 3 ABOUT HERE)

In Table 3, Panel B, we repeat the tests in Panel A using our broad definition of group affiliation. Although this broad definition more than triples the number of firms we classify as group affiliated, our results and inferences are consistent with the Panel A results that use the more narrow definition of group affiliation. These results consistently indicate that, on average, group affiliated firms display less pronounced fluctuations in employment following economic shocks. In the paper's next three subsections, we expand the tests from Table 3 and examine their robustness in several different ways.

II.C. Propensity Score Matching Tests

Since Table 2 shows that group affiliated and unaffiliated firms differ across many dimensions, we repeat our main tests on a propensity score matched sample of group and non-group firms. To construct this sample, we estimate a probit selection model in each two-digit SIC industry to predict the probability of group affiliation. The variables used to predict group affiliation are *GDP Growth, Lag Employment Growth, Log(Employees)*, and level versions of our key controls (*Lag Log(Sales), Lag ROA, Lag Debt Ratio, Lag Q, Lag Capex/Assets (%), and Lag RetVol*).[8] To ensure that our matched firms are in similar stages of maturity, we also use the age of firms (obtained from *Capital IQ*, *Worldscope*, and *Datastream*)

[8] We do not match on three control variables (*Exports*, *Sales from Trading*, and *Excise Tax*) due to the amount of data missing in *Worldscope* and *Datastream* for those variables. We instead include those variables, along with the three indicators that denote when data for those variables is missing, as controls in the subsequent regressions of the propensity score matched sample.

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as an additional matching characteristic. *Firm Age* is the number of years since a firm's founding, trimmed at the 1st and 99th percentiles, and capped at 37 following Hadlock and Pierce (2010). We use the predicted probit results to find the nearest-neighbor (unaffiliated) firm for each group affiliated firm based on the procedure outlined in Leuven and Sianesi (2015). The resulting matched sample consists of 6,026 firms.

(INSERT TABLE 4 ABOUT HERE)

Next, we evaluate the quality of these matches by comparing the group and non-group firm variable values for the characteristics used in the matching procedure. Table 4, Panel A presents the mean values of these variables. Unlike our full sample results in Table 2, we find no statistically significant differences between the group and non-group firms in Table 4. This suggests that the propensity score matching procedure has mitigated several key differences in characteristics between group and non-group firms.

In Table 4, Panel B, we implement our key regression tests in this subsample of matched firms. In specification (1) we include all control variables from Table 3; the coefficient of the interaction *GDP Growth * Group Affiliated* remains negative and statistically significant at the 1% level. In specifications (2) through (4) we reintroduce our fixed effects (industry-year, country-year, and firm) one set at a time. Our conclusions remain unchanged. Overall, these tests suggest that our Table 3 results are not driven by inadequate matching.

II.D. Placebo and Counter-Placebo Sample Tests

Although we have thus far used a variety of methods to control for the heterogeneous characteristics of group affiliated and unaffiliated firms, the possibility remains that *omitted* variables that correlate with group affiliation (rather than affiliation itself) are responsible for our results. In Table 5 we mitigate this concern by constructing two similarly sized samples: a placebo sample of firms that were close to becoming part of a business group without actually joining the group, and a counter-placebo sample of successful group integrations that is close in sample size and characteristics to the placebo sample. We construct the placebo sample by examining all failed acquisitions from the *Thomson One* Mergers and Acquisitions

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database where the acquisition target is a firm in our sample. In order to maximize the size of this failed target sample, we only require these placebo observations to have data on *Employment Growth*, *GDP Growth*, and firm ownership.

For these failed targets, the variable *Placebo Group* is set equal to one in the year of the failed acquisition and all years afterward and set equal to zero for these firms in the years before the (failed) acquisition. To ensure that our sample is not affected by instances of *actual* group affiliation, we remove any observations where *Group Affiliated* = 1 prior to the acquisition attempt. We match 222 firms with failed acquisitions to *Worldscope* and *Datastream* to construct this firm-year sample of 1,175 observations and use this sample in specification (1) of Table 5.

(INSERT TABLE 5 ABOUT HERE)

Despite the more limited power in this small sample, the uninteracted coefficient of *GDP Growth* loads positivity and significantly, with a similar magnitude coefficient (0.675) as we find in Table 3, Panel A, specification (1) (0.646). If some omitted characteristic (correlated with group membership) that is common to failed and successful ownership transitions explains the diminished sensitivity of group firm employment fluctuations to economic shocks better than group membership itself, we would expect the coefficient of the interaction *GDP Growth * Placebo Group* to load negatively and significantly in the placebo test. However, the result of specification (1) shows that this is not the case, as the coefficient of *GDP Growth * Placebo Group* is statistically insignificant.

In specification (2), we use a counter-placebo sample composed of successful (rather than failed) integrations of previously unaffiliated firms into a business group. In contrast to our full-sample tests in the remainder of the paper, which typically have tens of thousands of firm-year observations, this sample is constructed to more closely match the (smaller) sample size and characteristics of the placebo sample used in Table 5. We construct this counter-placebo sample by screening observations on three criteria. First, we include only firms where the value of *Group Affiliated* switched from zero to one a single time in our sample. Second, we include only firms that share the same country-year with at least one placebo-treated

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observation. Third, we include only firms that share the same (two-digit SIC code) industry-year with at least one placebo-treated observation. The resulting counter-placebo sample consists of 979 firm-year observations. In contrast to the similarly-sized placebo sample, the coefficient of *GDP Growth * Group Affiliated* in the counter-placebo sample is negative and significant at the 1% level.

In specification (3), we combine both the placebo and counter-placebo samples in a single test that includes *Placebo Group*, *Group Affiliated*, and their interactions with *GDP Growth*. When combining the placebo and treated observations, we also re-introduce our standard fixed effects (firm, industry-year, and country-year). In specification (4) we further add *Lag Log(Employees)* as an additional control, as targets of failed and successful acquisitions are likely to differ by size. In specification (5) we include all of our standard control variables, which reduces our usable placebo sample. In each of these three tests, the coefficient of *GDP Growth * Placebo Group* remains insignificant and positive while the coefficient of *GDP Growth * Group Affiliated* remains significant and negative.[9] Overall, these findings suggest that these earlier results are unlikely to be driven by an omitted factor that *correlates* with group affiliation.

II.E. Tests Using Positive and Negative GDP Growth

In Table 6, we examine whether the reduced sensitivity of group-firm employment changes to economic shocks is present in both economic booms and recessions by introducing two new GDP-related variables: *GDP Growth Positive* is a variable equal to *GDP Growth* if that growth is positive and zero if growth is negative, and *GDP Growth Negative* is equal to zero if growth is positive and *GDP Growth* if growth is negative. Table 6, specifications (1) and (2) mirror similar tests from Table 3, Panel A,

[9] In Online Appendix Table A.1, we extend our placebo tests using various subsamples of observations and continue to find no negative and significant coefficients on the interaction term *GDP Growth * Placebo Group*. These tests, and all other Online Appendix Tables referenced in other footnotes, are described in more detail in the beginning of the Online Appendix.

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specifications (2) and (3); firm and industry-year fixed effects are used in Table 6, specification (1), and country-year fixed effects are added in specification (2).

In specification (1), the coefficient of the uninteracted variable *GDP Growth Positive* loads positively and significantly, while the coefficient *GDP Growth Negative* is positive but short of the 10% threshold for statistical significance (in unreported tests, *GDP Growth Negative* loads positively and significantly at the 1% level if firm fixed effects are excluded). These results are what is expected if employment in unaffiliated firms is procyclical with economic trends. However, in both specifications (1) and (2), the coefficients of the interaction terms *GDP Growth Positive * Group Affiliated* and *GDP Growth Negative * Group Affiliated* load significantly and negatively, suggesting that group affiliated firms exhibit a diminished employment sensitivity to economic shocks in both economic booms and recessions.[10] These results are inconsistent with one group firm "propping" up an affiliated firm's performance via non-loan resource transfers, since such transfers are more likely when businesses are struggling (Jia, Shi, and Wang, 2013). They are also inconsistent with internal capital markets, which we discuss in more detail in Section IV.A.

(INSERT TABLE 6 ABOUT HERE)

From the perspective of existing employees, these less pronounced fluctuations of employment to economic shocks represent a bright side of group affiliation. However, a question arises: why is this occurring? In the next two sections of our paper, we examine a variety of possible explanations and conduct additional tests intended to investigate the extent to which these explanations match the data.

III. Tests of the Internal Labor Markets Explanation for Group Employment Dynamics

Our first explanation posits that business groups may have a unique ability to *relocate* employees across firms as the business cycle changes using internal labor markets (the ILM hypothesis). A "bright

[10] In Online Appendix Table A.2, we separate our positive and negative GDP growth variables into "large" and "small" growth magnitude variables and find our main results are concentrated in periods with larger magnitude changes in GDP.

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side" view of business groups postulates that groups' ILM will increase job stability for existing employees. During good times, business groups may be able to transfer skilled workers to the highest-opportunity firms. With a greater pool of talent to select from inside of the group, affiliated firms have a lower risk of the "lemon" problem (Akerlof, 1970) and may therefore need to hire fewer employees to achieve the same productivity increases. Similarly, during bad times business groups may be able to redeploy employees away from the firms most negatively affected by the shock; non-group-affiliated firms, with no such mechanism for preserving employees and under economic and financial pressure, must instead fire the employees.

We explore this ILM hypothesis in greater detail in a series of tests in Table 7. First, we test for direct evidence of ILM and whether employees are reallocated within groups in an efficient, value-maximizing manner. We do this by exploiting two key facets of our data. First, our narrow definition of group affiliation identifies specific groups and their member firms, allowing us to calculate the *relative* current-year *Q* among each firm in a group-year. We are thus able to break down our affiliated firms into two separate indicator variables: *Group Affiliated with High Rel Q* (equal to one if a firm is both group affiliated and has an above-median *Q* relative to its other group affiliated firms in a particular year, and zero otherwise) and *Group Affiliated with Low Rel Q*. Second, if ILM are efficient, an interaction term between GDP growth and group affiliation should load differently depending on the *type* of economic shock experienced by firms. In the following paragraphs, we describe our ILM efficiency test and detail why and how these group-GDP interactions should differ for positive and negative economic shocks.

In Table 7, Panel A, specification (1) we regress employment growth on *Group Affiliated with High Rel Q*, *Group Affiliated with Low Rel Q*, and interactions of those variables with *GDP Growth Positive* and *GDP Growth Negative*. We also include *Q* for all firms, plus its interaction with the GDP variables, to mitigate the possibility that the group variables are picking up a more general (non-group specific) relationship between *Q*, employment growth, and economic shocks. During economic booms, an efficient ILM would transfer higher-value employees from low-opportunity affiliates to high-opportunity firms. This

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flow of employees from low to high-opportunity firms predicts that the hiring of the low-opportunity group firms (but not the hiring of high-opportunity group firms) should have a reduced employment sensitivity to growth opportunities. The results of specification (1) are consistent with this idea; of the two group variable interactions with *GDP Growth Positive*, only the coefficient of *Group Affiliated with Low Rel Q * GDP Growth Positive* is negative and statistically significant.

(INSERT TABLE 7 ABOUT HERE)

During recessions, high-value employees who can be "saved" through ILM should similarly move from low to high-opportunity firms within a group. However, since we expect overall employment levels to drop during a recession, this leads to a reversal of the predicted dynamic during booms. More specifically, high-opportunity group firms should have reduced employment sensitivity to the (negative) economic shock, while low-opportunity firms are more likely reduce headcount. Our results are again consistent with this prediction; of the two group variable interactions with *GDP Growth Negative*, only the coefficient of *Group Affiliated with High Rel Q * GDP Growth Negative* is negative and statistically significant. Overall, these results are consistent with the existence of efficient ILM within groups, where the high-opportunity firms in the group receive transfers of high-value employees (from low-opportunity affiliated firms) to capitalize on economic booms and keep those employees in the group during recessions.[11]

In the remainder of Table 7, we continue to test for direct and indirect evidence of ILM and examine competing explanations for the existence of ILM in business groups. Studies of different explanations for ILM date to at least Althauser (1989) and continue through Huneeus *et al.* (2019). A unique feature of our study is the ability to empirically test these explanations using numerous cross-country, systematic shocks.

We begin with the transaction cost hypothesis of ILM. In the presence of transaction costs related to labor for both hiring and/or layoffs,[12] business groups' ILM may allow group affiliated firms to adjust

[11] In Online Appendix Table A.3, we conduct several additional falsification tests of our ILM hypothesis and find no evidence that more general (i.e. not within-group) proxies for firm Q in both group and non-group firms can be used to obtain a similar result.
[12] See, for example, Williamson (1981), Tziner and Birati (1996), Abowd and Kramarz (2003), Blatter, Muehlemann, and Schenker (2012), Belenzon and Tsolmon (2016), and Cestone, Fumagalli, Kramarz, and Pica (2016).

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employment at a lower cost (compared with unaffiliated firms) in response to economic shocks. For example, some employees may possess group-specific human capital and skills (e.g., they are familiar with the business group and its culture) that are costly to develop. Althauser (1989) suggests that ILM themselves also aid in the development of otherwise scarce skills in employees. This makes retaining employees valuable for both the employees and the business group, and any skilled employees "saved" by ILM during downturns will reduce costs (and additional headcount) that would otherwise be needed to locate, hire, train, and develop similarly skilled employees during subsequent economic booms. Additionally, the business group might possess superior knowledge of the employees' skills and productivity or may be better able to identify employees who are likely to need less training and development. Group affiliated firms will therefore possess a better ability than unaffiliated firms in matching vacancies with the specific skills required (Greenwald, 1986).

Our second test in Table 7 exploits the heterogeneity of geographical concentration among our groups. Since moving employees across firms is likely to be costly, both in terms of tangible costs (such as relocation expenses) and intangible costs (employee resistance to moving is likely to increase as the distance of the move increases), the transaction cost hypothesis of ILM would suggest that employment dynamics should be more strongly impacted among same-country groups, given the lower "costs" of employee reallocation when compared to cross-country moves. (Belenzon and Tsolmon, 2016, make a similar assumption in their study of business groups). In Panel A, specification (2), *Same-Country Group* is equal to one if all of the sample firms within a particular business group reside in the same country, and zero otherwise, and *Cross-Country Group* is equal to one if at least two firms within a particular business group reside in different countries, and zero otherwise. We interact these two variables with *GDP Growth* and find that coefficient of *GDP Growth * Same-Country Group* is negative, more statistically significant, and appears larger in magnitude than the coefficient of *GDP Growth * Cross-Country Group* (which is just significant at the 10% level). Although the firms affiliated to same-country groups are all exposed to the

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same systematic GDP shock, their reaction is on average less pronounced (i.e., less procylical) than that of firms affiliated with cross-country groups as the transaction costs story predicts.

While the previous test provides *indirect* evidence in support of the transaction cost hypothesis of ILM, *direct* evidence can be found by focusing on specific ILM-related transaction costs. For this purpose, we borrow from Belenzon and Tsolmon (2016) and Huneeus *et al.* (2019) who point out that business groups' incremental advantage in transferring employees internally increases as the cost to firing workers increases, since business groups are typically exempted from these costs when transferring employees internally. Thus, if ILM-related transaction costs explain the diminished sensitivity of employment to economic shocks in business groups, our results should be stronger among group-firms operating in countries with more stringent labor laws. To test this, we follow Belenzon and Tsolmon (2016) and employ the *Employment Protection Laws* (*EPL*) index from the OECD. In countries with a higher EPL index, business groups have a greater cost advantage relative to unaffiliated firms. In Table 7, Panel A, specification (3), the indicator *High EPL* is equal to one if a country-year has an above-median value of the EPL index. The triple interaction term *GDP Growth * Group Affiliated * High EPL* has a negative and significant coefficient, indicating that the diminished sensitivity of employment growth to GDP growth exhibited by group affiliated firms is especially pronounced in countries where firing employees is relatively more costly than relocating employees within the group.

In Table 7's remaining tests, we explore other theoretical motivations for ILM. For example, ILM may function primarily as a "coinsurance" mechanism, providing unemployment insurance to employees by providing higher job security in exchange for lower wages (Cestone *et al.*, 2017). In Table 7, Panel A, specifications (4) and (5), we follow Cestone *et al.* and test this hypothesis using data on wages. The dependent variables are *Log(Relative Firm Wage)* and *Log(Average Firm Wage)*, respectively. *Average Firm Wage* is salary and benefits expenses divided by total employees. *Relative Firm Wage* is *Average Firm Wage* divided by the country-industry-year mean for *Average Firm Wage*. If the coinsurance hypothesis of ILM were true, we would expect the coefficient of *Group Affiliated* to load negatively and

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significantly. However, we find no significant difference in wages between group and non-group firms in either test.

In Table 7, Panel B, we explore whether ILM dynamics *other than group-level dynamics* can explain our results. More specifically, Giroud and Mueller (2015) document ILM across plants within a firm, and Tate and Yang (2015) document ILM within diverse business segments of a single firm. It could be the case that groups are more likely to contain firms with these particular dynamics, and it is instead these *intra-firm* dynamics (rather than group-level dynamics) that are responsible for the diminished employment sensitivity to economic shocks. To test this, we split our group indicator into two separate variables: *Diversified Group Firm* is equal to one if a firm is group affiliated and meets a particular definition of diversification, and *Nondiversified Group Firm* is equal to one if a firm is group affiliated but does not meet particular definition of diversification.

In specification (1), we use a *group-level* measure of diversification that takes the two-digit SIC Code industries and product segments of affiliated firms into account. This group-level measure uses a broad definition of diversification; only groups with all single product-segment firms and identical industries among firms are considered "non-diversified," while all other firms are considered "diversified". As a result, only 5% of group firms are classified as non-diversified in this specification.

The remaining specifications in Table 7, Panel B use *firm-level* definitions of diversification to allow for greater heterogeneity in our sample. For specifications (2) through (4) we redefine diversification at different cutoff levels for the number of firm product segments (where a firm is diversified if it has more than 2, 3, or 4 segments in specifications (2), (3), and (4), respectively). For specification (5), we construct a variable *ProductHHI*, which is the Herfindahl-Hirschman Index (HHI) of product segment sales in each firm-year (calculated as the sum of the squared fractions of each product segment's share of total sales for a particular firm-year) and classify a group firm as diversified if *ProductHHI* is below median (i.e. more

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diversified) among all of our sample firm-years.[13] The percentages of group firms classified as diversified in specifications (2) through (5) are 70%, 43%, 22%, and 53%, respectively.

In all five Table 7, Panel B specifications that bifurcate the group variable by diversification, the coefficient of *GDP Growth * Diversified Group Firm* is negative and statistically significant. These negative coefficients appear larger in magnitude than those of *GDP Growth * Nondiversified Group Firm*, suggesting that employment/output sensitivity might be especially diminished in diversified group firms. However, in specifications (2) through (5), the coefficients of *GDP Growth * Nondiversified Group Firm* are also negative and significant, suggesting that even relatively non-diversified group firms have a diminished employment sensitivity to economic shocks when compared with non-group firms. Overall, these results are consistent with the notion that firm-level diversification facilitates ILM (consistent with Tate and Yang), but diversification cannot completely explain the group employment dynamics we observe, since our key results remain in relatively non-diversified group firms.[14]

When we examine our Table 7 results together, we find both direct and indirect evidence of ILM, and our findings appear more consistent with the transaction cost hypothesis of ILM and less consistent with the coinsurance and diversification hypotheses of ILM. Importantly, we document these results in a sample of numerous *systematic* (rather than idiosyncratic) shocks, and we exploit the richness of our data to leverage heterogeneity within groups (in terms of opportunities), across groups (such as the geographic proximity of group firms and their relative wages and diversification), and across countries (using the EPL index) in our tests. The next section of our paper explores several non-ILM explanations for our results.

[13] We omit *Number Segments* as a control in these Table B tests, since it is likely to be highly collinear with these diversification-based group variables.

[14] Online Appendix Table A.4 reports results of regressions using a triple interaction specification with *GDP Growth, Group Affiliated*, and an indicator variable *Diversified* that is constructed using the same five approaches for diversification from Table 7, and Online Appendix Table A.5 uses only group affiliated observations to conduct similar diversification-related tests. These tests produce similar results and conclusions.

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IV. Tests of Other Explanations for Group Employment Dynamics

IV.A. Internal Capital Markets

The first potential non-ILM explanation for our results is internal capital markets (ICM) in business groups (Hoshi *et al.*, 1991, Boutin *et al.*, 2013, Gopalan *et al.*, 2014, and Almeida *et al.*, 2015). Since groups allow capital to move more freely and help blunt the impact of negative economic shocks on firm investment (Almeida *et al*., 2015), it may follow that labor patterns have a similar diminished sensitivity simply as a byproduct of capital reallocation within business groups. Notably, we have already uncovered results that are not easily explained by ICM; Table 6 shows evidence of reduced employment sensitivity in group firms during economic booms, while ICM are typically most useful when existing credit markets stop functioning during recessions (Boutin *et al.*, 2013; Almeida *et al.*, 2015). Nevertheless, we investigate whether ICM are a good fit for our results in Table 8 by repeating our main regressions in a variety of subsamples constructed using well-known factors that correlate with the use of ICM.

The first two specifications in Table 8 focus on different subsamples of years where ICM are more likely or less likely to play a role in group firm dynamics. In specification (1), we exclude observations from Asian countries (specifically China, Hong Kong, Indonesia, Japan, Malaysia, the Philippines, Singapore, South Korea, and Thailand) for three years in our sample (1997-1999) that were affected by the Asian financial crisis, and we also exclude *all* firms from 2008 and 2009, the two years most affected by the recent global financial crisis. Since certain credit markets stopped functioning in the wake of these crises, these should be periods when ICM were likely to be especially active within business groups (consistent with Almeida *et al.*, 2015). In contrast, specification (2) uses *only* observations during those credit crisis periods.

(INSERT TABLE 8 ABOUT HERE)

For the next two specifications, we construct subsamples using proxies for financial constraints found in other studies. More specifically, we construct the Size-Age (or SA) index from Hadlock and Pierce (2010), and we construct the Whited-Wu (or WW) index using the methodology in Whited and Wu

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(2006).[15] In both indexes, higher values indicate more financially constrained firms. Since the existence of ICM within business groups is well established, for group affiliated firms we calculate each index at the *group* level and assign those index values to each affiliated firm.[16] We follow Hadlock and Pierce (2010) and classify firms in the top tercile of each of the indices as financially constrained. In specification (3), we use the subsample of firms that are *not* financially constrained using both indices, and in specification (4) we use firms that are constrained using one or both indices.

Finally, Boutin *et al.* (2013) show that ICM are especially useful in environments where raising external capital is difficult. In our last two specifications, we proxy for such environments using the *Chinn-Ito Index* of capital account openness, constructed as in Chinn and Ito (2006). The index becomes higher as a country becomes more open to cross-border capital transactions. Specification (5) includes only firm-year observations in country-years where the value of the *Chinn-Ito Index* of capital openness is equal to its maximum value of one, while specification (6) includes all other observations.

Our key result, the negative and significant coefficient on *GDP Growth * Group Affiliated*, remains present in the three Table 8 specifications where ICM are *less likely* to play a role. For example, the coefficient of *GDP Growth * Group Affiliated* is more significant and more negative in years when credit markets were less constrained (specification (1)) rather than in more constrained years (specification (2)). Similarly, if the employment dynamics we observe are a byproduct of ICM within business groups, we would expect our results to be significantly weakened by excluding financially constrained firms (presumably the firms that would benefit the most from capital transfers). However, the *GDP Growth * Group Affiliated* coefficient remains similar in relatively unconstrained (specification (3)) and constrained

[15] Whited and Wu developed the WW Index by creating a structural model of intertemporal investment and financial constraints and estimating an Euler equation of characteristics associated with those constraints. Hadlock and Pierce developed the size-age (SA) Index by hand-gathering data on financial constraints from firm SEC filings and measuring their correlation to firm characteristics. The SA Index is constructed as (-0.737* ln(Assets)) + (0.043* ln(Assets)^2) - (0.040* Firm Age), and the WW Index is constructed as = (-0.091 * EBITDA/Assets) - (0.062 * Dividend Increase Indicator) + (0.021 * Long Term Debt Ratio) - (0.044 * ln(Assets)) + (0.102 * 3-digt SIC industry Sales Growth) - (0.035 * Firm Sales Growth). In the SA Index, Firm Age is capped at 37 years and Assets is capped at $4.5 billion. In both indices, higher (or less negative) values signify greater financial constraints.

[16] More specifically, we aggregate firm-level measures at the group level and recompute all key ratios and variables, with the exceptions of the Dividend Increase Indicator (set equal to one if any firm within a particular group increased its dividend), the 3-digt SIC industry Sales Growth (averaged across all of the firms in a particular group) and firm age (set equal to the age of the oldest firm within each group). We also retain the age and size caps used in the construction of the SA index.

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(specification (4)) firms and in firms from high capital openness (specification (5)) and low capital openness (specification (6)) countries.[17] Overall, the results of Table 8 show that the group dynamics we document are still present in periods, firms, and countries where credit markets are functioning *normally*, making it difficult to reconcile our earlier results solely with an ICM story.

IV.B. Group Firm Performance Insensitivity to Economic Shocks

The next alternative hypothesis we test is whether group-firms are less sensitive *in general* (rather than solely through an employment channel) to economic shocks than non-group firms. Our tests in Table 9 explore several ways in which such a general insensitivity may exist. First, we examine whether the use of *GDP Growth* is an appropriate proxy for measuring economic shocks, since changes in country-level growth are likely to affect firms within that country in heterogeneous ways.

(INSERT TABLE 9 ABOUT HERE)

In similar fashion to our prior tests, we interact more narrowly defined measures of shocks with group affiliation. In the first four specifications of Table 9, we replace *GDP Growth* in some specifications with a more general proxy for economic shocks called *Growth Shock*, set equal to different variables in different specifications. To test the ideas in the previous paragraph, *Growth Shock* is equal to firm-level sales growth in specification (1), industry-country-level sales growth in specification (2), and country-year total employment growth (with and without country-year fixed effects included) in specifications (3) and (4).[18] We find that the coefficients of the interaction term *Growth Shock * Group Affiliated* are negative and highly significant in each specification, indicating once again that the sensitivity of employment growth

[17] Consistent with this, Online Appendix Table A.5 finds that an interaction between *Group Affiliated* and *Constrained* (an indicator equal to one if a firm has a value in the top third of either the Whited-Wu or Hadlock-Pierce (size-age) financial constraints indices) is insignificant in tests using a group affiliated firm sample.

[18] We calculate this figure by using OECD country-year data. The country-level employment rate change is calculated as -1* (unemployment rate – lag(unemployment rate)), or -1 * the change in the country's unemployment rate.

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to shocks to productivity is lower, on average, in group affiliated firms (when compared to unaffiliated firms).[19]

It might also be the case that group firms have a large enough influence on their countries' economies that they are the main drivers of their countries' changes in GDP, and as such, those GDP changes would not be "exogenous" shocks for these firms. We attempt to mitigate this concern in two ways. First, in Table 9, specification (5) our sample includes only smaller firms, defined as those with below-median sales in a country-year. Second, in specifications (6) and (7) we drop firms in country-years where more than one-quarter of the total sales (in our available data) is attributable to group affiliated firms.[20] The coefficient of the interaction *GDP Growth * Group Affiliated* remains negative and statistically significant at the 1% level in all three tests. These results suggest that the impact of large groups on some countries' overall GDP is unlikely to explain our results. Overall, these Table 9 tests reinforce the idea that the reduced sensitivity to economic shocks we find for group affiliated firms is specific to *employment*, and not symptomatic of a more general insensitivity to shocks in group firms.

IV.C. Agency Conflicts in Group Firms

A well-known feature of business groups is that the presence of conflicts of interest between controlling shareholders and minority shareholders. Many studies of group firms (Bae *et al.*, 2002, Baek *et al.*, 2006, Bertrand *et al.*, 2002, Cheung *et al.*, 2006, Johnson *et al.*, 2000) document how group firm controlling shareholders "take advantage" of minority shareholders due to the unique ownership structure of groups. Our final alternative hypothesis is that agency conflicts in group affiliated firms lead group firm

[19] While the interaction term coefficients in the first four specifications in Table 9 are quite different (and different from the *GDP Growth * Group Affiliated* coefficients in Table 3), their standard deviations are also different. *GDP Growth*, firm-level sales growth, industry-level sales growth, and country-year sales growth have standard deviations of 0.0308, 0.1914, 0.1518, and 0.0092, respectively. We can use these standard deviations to calculate the economic impacts of the different shock proxies on employment growth; for example, a one standard deviation increase in *GDP Growth* in Table 3, Panel A, specification (3) applied to the interaction coefficient of -0.496 from that table results in a rate of employment that is, on average, -0.496 * 0.0308 = -0.0153 lower in group affiliated firms compared to unaffiliated firms. Repeating this process with firm-level sales growth in Table 9, specification (1), where the interaction coefficient is -0.080, leads to a nearly identical impact: -0.080 * 0.1914 = -0.0153. (The impacts for industry-level sales growth and country-level employment growth are -0.0115 and -0.0110, respectively).

[20] For the sake of conservatism, this sales calculation in specification (7) also includes the broadly-defined groups from Table 3, Panel B that are normally dropped from our tests.

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controlling shareholders to make suboptimal hiring and firing decisions, leading to the diminished sensitivity of employment changes to economic growth in these firms. While our first test in Table 7 provides evidence consistent with *efficient* labor dynamics, for the sake of robustness we design several more tests to detect whether inefficiency or malfeasance on the part of controlling shareholders can explain our results.

We begin with a simple question: could the diminished employment sensitivity to shocks in group firms simply reflect *over-hiring* on the part of group-firm controlling shareholders? To test this, the first two specifications of Table 10 change the dependent variable of interest to firm employees (scaled by sales) rather than changes in employment. If group firms have sub-optimally high staffing levels when compared to non-group firms, we would expect the coefficient of *Group Affiliated* to be positive and significant. However, the coefficient of *Group Affiliated* is highly insignificant, no matter whether *GDP Growth* is interacted with *Group Affiliated* (specification (1)) or not (specification (2)). These results suggest that base staffing levels are not materially different between group and non-group firms and therefore unlikely to explain the employment dynamics we observe.

(INSERT TABLE 10 ABOUT HERE)

In our other two tests in Table 10, we repeat our main tests focusing directly on subsamples where agency problems related to self-dealing and tunneling are more (or less) likely to be a factor in group owner decisions. Specifically, we segment our sample into two categories: firms in countries with an above-median (specification (3)) or below-median (specification (4)) value of the *Anti-Self-Dealing Index*, or *ASDI* (from Djankov *et al*., 2008). If the value of the *ASDI* is above median, this suggests that the laws of a firm's country do a relatively better job of protecting the rights of minority shareholders. If agency or self-dealing concerns are responsible for our results, we would expect the *GDP Growth * Group Affiliated* coefficient to be more pronounced in firms located in countries with relatively weak outside investor protection (i.e. below-median *ASDI*). Instead, we find that the coefficient of *GDP Growth * Group Affiliated* appears larger when examining the countries with above-median *ASDI*. Overall, while our tests

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and results don't comment directly on the presence or absence of agency conflicts in group firms, they show that such conflicts are unlikely to explain our key results.[21]

V. Conclusions

We document that business group affiliation enables firms to reduce fluctuations in employment following changes in the business cycle. In particular, we document that group affiliated firms decrease employment less than similar unaffiliated firms during downturns, while they increase employment less during economic expansions. We show that the results, based on a new database of group affiliation encompassing publicly traded firms from 50 countries during 1993-2011, are robust to the inclusion of a battery of controls, country-year, industry-year, and firm fixed effects. We also find similar results in a propensity score matched sample of group and non-group firms. When examining a placebo sample of failed acquisitions and a similarly sized sample of successful group integrations, we only find diminished employment sensitivity to output in the latter group where business groups are actually formed.

Our results appear most consistent with the use of internal labor markets, and specifically ILM designed to reduce transaction costs, in group affiliated firms. To the extent that group affiliated firms possess superior information about the quality of employees of other group members compared to outside firms, they are more capable of relocating high quality employees from struggling units to units facing better opportunities, of which we find evidence both during booms and during recessions. Also consistent with ILM, the results are more pronounced when the cost savings to the group affiliated firms are greatest, and when workers' opposition to relocation is likely to be lowest.

By documenting higher job security for current employees of group affiliated firms, we point to a non-trivial set of stakeholders who appear to enjoy a bright side of group affiliation.

[21] In Online Appendix Table A.6, we present several additional robustness tests (including alternative econometric specifications and falsification tests) that don't fit as obviously with a particular hypothesis; our results are robust to all of these alternative tests.

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Table 1: Data on Group Affiliation by Country

(Note: seven countries with fewer than 100 firm-year observations (Bermuda, Egypt, Iceland, Jordan, Luxembourg, New Zealand, and Sri Lanka) are summarized in a single line near the bottom of the table.)

	Firm-Years with ownership data	Firm-Years with all variable data	Percentage Group Affiliated, Narrow Definition	Percentage Group Affiliated, Broad Definition
Australia	1,506	838	2.4%	31.1%
Austria	603	369	16.8%	62.3%
Belgium	838	534	15.0%	60.7%
Brazil	1,105	388	5.1%	46.9%
Canada	2,285	1,147	3.3%	28.5%
Chile	377	191	14.0%	74.3%
China	10,314	4,086	7.6%	55.7%
Colombia	108	55	0.0%	61.8%
Czech Republic	166	31	14.3%	80.6%
Denmark	932	631	1.8%	20.0%
Finland	897	541	0.0%	20.0%
France	4,810	3,174	8.1%	43.3%
Germany	5,014	3,101	13.4%	55.1%
Greece	662	259	1.4%	19.7%
Hong Kong	4,303	1,967	16.6%	65.7%
Hungary	105	61	0.0%	44.3%
India	2,000	823	8.3%	44.0%
Indonesia	1,718	770	20.5%	61.3%
Ireland	518	265	0.8%	11.7%
Israel	570	201	23.3%	67.2%
Italy	1,852	1,121	9.9%	62.0%
Japan	26,702	16,014	16.8%	29.4%
Korea (South)	3,451	1,998	10.1%	31.1%
Malaysia	1,518	732	14.0%	44.7%
Mexico	466	212	0.6%	27.8%
Netherlands	1,259	848	7.7%	29.2%
Norway	912	451	4.2%	44.8%
Pakistan	168	82	4.4%	20.7%
Peru	243	98	4.9%	60.2%
Philippines	561	327	21.9%	59.6%
Poland	881	350	12.4%	53.7%
Portugal	394	244	6.0%	61.5%
Russian Federation	903	91	7.1%	57.1%
Singapore	922	431	31.7%	68.4%
Slovenia	114	62	4.5%	32.3%
South Africa	1,588	942	20.7%	56.6%
Spain	1,289	750	20.9%	55.1%
Sweden	1,722	1,002	7.6%	34.4%
Switzerland	1,733	1,162	3.7%	36.7%
Thailand	1,296	716	5.6%	26.8%
Turkey	880	369	12.9%	37.9%
United Kingdom	9,485	4,878	1.4%	13.5%
USA	26,748	15,924	0.8%	7.8%
7 other countries	459	192	4.2%	49.0%
Total	**124,377**	**68,428**	**8.2%**	**31.2%**

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Table 2: Descriptive Statistics for Group Affiliated and Unaffiliated Firms

This table presents information on the characteristics (and changes in characteristics) of our sample firms. Data for all sample firms are obtained from *Worldscope* and *Datastream*. Sample firms are classified as "non-group" or "group" firms based on the process outlined in Section I.A. t-statistics for mean differences between non-groups and groups and z-statistics (using Wilcoxon-Mann-Whitney tests) are presented in the fourth, fifth, ninth, and tenth columns, and ***, **, * denote statistical significance of these differences at the 1%, 5%, and 10% levels, respectively.

	Means							Medians						
	Non-group (NG)	Group (G) (narrow)	Group (G) (broad)	t-stat NG minus G (narrow)		t-stat NG minus G (broad)		Non-group (NG)	Group (G) (narrow)	Group (G) (broad)	z-stat NG minus G (narrow)		z-stat NG minus G (broad)	
Employment Growth	0.056	0.032	0.047	7.81	***	5.43	***	0.018	0.004	0.010	11.54	***	11.09	***
GDP Growth	0.025	0.021	0.032	8.35	***	-26.96	***	0.026	0.018	0.025	15.47	***	-14.54	***
Sales Growth	0.103	0.066	0.101	11.49	***	1.20		0.083	0.054	0.080	12.11	***	3.14	***
Δ *ROA*	-0.001	-0.001	-0.002	-0.46		1.23		0.000	0.000	0.000	0.24		1.57	
Δ *Debt Ratio*	-0.001	-0.003	-0.001	2.26	**	0.80		-0.001	-0.002	-0.001	1.31		-0.52	
Δ *Q*	-0.027	-0.016	-0.021	-1.80	*	-1.85	*	-0.007	-0.009	-0.006	0.54		-1.08	
Δ *Capex/Assets* (%)	-0.153	-0.216	-0.243	1.09		2.92	***	-0.010	-0.060	-0.050	3.00	***	3.77	***
Δ *RetVol*	0.000	0.000	0.000	0.10		0.44		-0.001	-0.001	-0.001	0.99		1.19	
Log(Employees)	10.598	8.936	7.611	4.71	***	17.56	***	2.632	2.924	2.443	-2.33	**	9.12	***
Number Segments	3.250	3.000	3.397	-6.24	***	-9.48	***	3.000	3.000	3.000	-6.97	***	-7.85	***
Scaled Exports	0.024	0.043	0.024	-11.80	***	-0.34		0.000	0.000	0.000	-19.26	***	5.82	***
Scaled Sales from Trading	0.001	0.000	0.001	0.50		-0.08		0.000	0.000	0.000	-2.63	***	-1.38	
Scaled Excise Tax	0.001	0.001	0.002	0.52		-10.98	***	0.000	0.000	0.000	-1.29		-11.74	***
Log(Sales)	13.558	13.739	13.269	-7.40	***	23.25	***	13.393	13.595	13.116	-8.82	***	21.92	***
ROA	0.037	0.027	0.034	11.98	***	8.71	***	0.034	0.022	0.030	15.71	***	10.07	***
Debt Ratio	0.234	0.216	0.234	6.01	***	0.08		0.217	0.191	0.218	6.73	***	0.29	
Q	1.404	1.190	1.311	19.15	***	16.41	***	1.175	1.044	1.113	23.17	***	19.28	***
Capex/Assets (%)	5.313	5.258	5.633	0.66		-7.44	***	3.910	3.950	4.120	-0.38		-7.87	***
RetVol	0.052	0.053	0.054	-3.27	***	-9.59	***	0.047	0.049	0.049	-5.05	***	-10.30	***

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Table 3: Regressions of Employment Growth on GDP Growth and Controls

Table 3 presents the results of OLS regressions where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one. *GDP Growth* is the annual change in Gross Domestic Product by country, adjusted for inflation. *Group Affiliated* is an indicator variable equal to one if we classify a firm as part of a business group in a particular year (and equal to zero otherwise). In Panel A, we use a narrow definition of group affiliation, where *Group Affiliated* equals one for firms where one of the following four criteria are met: (i) the firm's largest shareholder has a 20% or greater stake in more than one firm in our sample, (ii) the firm's largest shareholder is another firm in our sample, and this other firm a 20% or greater ownership stake in the firm in question, (iii) the firm itself is the largest shareholder of another firm in our sample with a 20% or greater ownership stake, and (iv) the firm is identified as belonging to a business group in Claessens, Djankov, and Lang (2000) and its largest shareholder has a 20% or greater ownership stake. This narrow definition excludes firms where the largest owner of shares is a corporate entity with 20% or greater stake in the company but is otherwise not directly affiliated with a different firm in our sample. In Panel B, we use a "broad" definition of group affiliation, where *Group Affiliated* equals one when a firm is identified as group affiliated in our "narrow" definition or when a firm's largest owner of shares is a corporate entity with 20% or greater stake in the company. In specification (4) of each panel, *GDP Growth* is additionally interacted with all control variables (other than lagged *Employment Growth*). All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively

Panel A: Narrow definition of *Group Affiliated*

Specification	(1)	(2)	(3)	(4)	
GDP Growth	0.646***	0.686***			
	[6.817]	[4.570]			
Group Affiliated	-0.015**	0.006	0.005	0.005	
	[-2.522]	[0.774]	[0.599]	[0.576]	
GDP Growth * Group Affiliated	**-0.312****	**-0.631*****	**-0.496*****	**-0.488*****	
	[-2.566]	**[-5.120]**	**[-3.733]**	**[-3.726]**	
Lag Employment Growth		-0.115***	-0.119***	-0.120***	
		[-7.269]	[-9.391]	[-9.361]	
				Uninteracted	Interacted w/ GDP Growth
Lag Sales Growth		0.072***	0.064***	0.064***	-0.124
		[5.117]	[7.043]	[7.043]	[-0.515]
Δ *Lag ROA*		0.094***	0.099***	0.099***	-2.213***
		[3.990]	[4.557]	[4.557]	[-3.333]
Δ *Lag Debt Ratio*		-0.034	-0.009	-0.009	-0.509
		[-1.532]	[-0.513]	[-0.513]	[-0.913]
Δ *Lag Q*		0.019***	0.015***	0.015***	-0.091
		[6.475]	[5.847]	[5.847]	[-1.091]
Δ *Lag Capex/Assets*		0.001***	0.001***	0.001***	0.002
		[4.398]	[4.508]	[4.508]	[0.201]
Δ *Lag RetVol*		-0.207***	-0.183***	-0.183***	2.001
		[-3.238]	[-3.158]	[-3.158]	[1.024]
Lag Log(Employees)		-0.004***	-0.004***	-0.004***	-0.008***
		[-10.634]	[-10.448]	[-10.448]	[-4.314]
Number Segments		0.003**	0.002**	0.002**	-0.008
		[2.359]	[2.042]	[2.042]	[-0.404]

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Exports		-0.020	-0.023	-0.023	0.089
		[-1.164]	[-1.330]	[-1.330]	[0.278]
Missing(Exports)		-0.003	-0.005	-0.005	0.005
		[-0.712]	[-1.002]	[-1.002]	[0.043]
Sales from Trading		0.670	0.537	0.537	-4.017
		[1.368]	[1.025]	[1.025]	[-0.293]
Missing(Sales from Trading)		-0.007	-0.005	-0.005	0.024
		[-0.479]	[-0.362]	[-0.362]	[0.087]
Excise Tax		-0.352	-0.438	-0.438	-17.506*
		[-0.817]	[-1.000]	[-1.000]	[-1.872]
Missing(Excise Tax)		-0.005	-0.001	-0.001	-0.696
		[-0.103]	[-0.028]	[-0.028]	[-0.739]
Intercept	0.040***				
	[8.407]				
N	51,255	48,939	48,914	48,914	
Fixed Effects?	No	Firm, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	
R-Squared	0.011	0.368	0.406	0.407	

Panel B: Broad definition of *Group Affiliated*

Specification	(1)	(2)	(3)	(4)	
GDP Growth	0.646***	0.656***			
	[6.818]	[4.992]			
Group Affiliated	-0.006*	0.000	-0.001	0.000	
	[-1.827]	[0.086]	[-0.118]	[0.002]	
GDP Growth * Group Affiliated	**-0.234****	**-0.209*****	**-0.163****	**-0.179****	
	[-2.964]	**[-2.822]**	**[-2.325]**	**[-2.519]**	
Lag Employment Growth		-0.104***	-0.109***	-0.110***	
		[-7.738]	[-10.674]	[-10.565]	
				Uninteracted	Interacted w/ GDP Growth
Lag Sales Growth		0.061***	0.053***	0.059***	-0.150
		[4.807]	[7.190]	[5.474]	[-0.796]
Δ *Lag ROA*		0.120***	0.123***	0.145***	-0.828
		[5.571]	[6.698]	[6.127]	[-1.386]
Δ *Lag Debt Ratio*		-0.006	0.018	0.010	0.242
		[-0.276]	[1.115]	[0.537]	[0.481]
Δ *Lag Q*		0.019***	0.016***	0.019***	-0.082
		[6.434]	[6.766]	[6.370]	[-1.110]
Δ *Lag Capex/Assets*		0.001***	0.001***	0.001***	-0.003
		[5.619]	[5.595]	[4.624]	[-0.402]
Δ *Lag RetVol*		-0.170***	-0.141***	-0.144**	0.062
		[-2.905]	[-3.015]	[-2.202]	[0.040]
Lag Log(Employees)		-0.004***	-0.004***	-0.004***	-0.009***
		[-11.195]	[-11.213]	[-10.946]	[-4.353]

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Number Segments		0.003***	0.002**	0.002*	0.021
		[2.902]	[2.330]	[1.651]	[1.195]
Exports		-0.032*	-0.036**	-0.035**	-0.055
		[-1.944]	[-2.342]	[-2.084]	[-0.181]
Missing(Exports)		-0.000	-0.004	-0.003	-0.020
		[-0.005]	[-0.819]	[-0.687]	[-0.195]
Sales from Trading		1.040***	0.955**	1.114**	-5.275
		[2.603]	[2.413]	[2.429]	[-0.468]
Missing(Sales from Trading)		0.008	0.011	0.010	0.042
		[0.596]	[0.810]	[0.681]	[0.192]
Excise Tax		-0.566	-0.659	-0.430	-6.111
		[-1.337]	[-1.556]	[-1.074]	[-0.821]
Missing(Excise Tax)		-0.012	-0.017	-0.010	-0.119
		[-0.278]	[-0.369]	[-0.248]	[-0.160]
Intercept	0.040***				
	[8.407]				
N	68,428	65,985	65,974	65,874	
Fixed Effects?	No	Firm, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	
R-Squared	0.010	0.344	0.378	0.378	

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Table 4: Tests Using Propensity Score Matched Group and Non-Group Firms

This table presents summary statistics and test results using a sample of propensity score matched (PSM) group affiliated (*Group Affiliated* = 1) and unaffiliated (*Group Affiliated* = 0) firms. We estimate a probit selection model in each two-digit SIC industry to predict the probability of (narrow) group affiliation. The variables used to predict group affiliation are *Firm Age, GDP Growth, Lag Employment Growth, Log(Employees), Lag Log(Sales), Lag ROA, Lag Debt Ratio, Lag Q, Lag Capex/Assets (%)*, and *Lag RetVol*. Using the procedure outlined in Leuven and Sianesi (2015), we use the predicted probit results to find the nearest-neighbor (unaffiliated) firm for each group affiliated firm. Panel A presents the mean values of the matching variables for each sample of firms and the magnitude and statistical significance of the differences of those means. Panel B presents OLS regression results where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one. *Group Affiliated* is an indicator variable equal to one if we classify a firm as part of a business group in a particular year (and equal to zero otherwise), using the narrow definition of business groups, as defined in Table 3. All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors in Panel B are double clustered at the firm and country-year levels and T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Panel A: Summary Statistics of Characteristics Used in Matching

	Group Firms		Non-Group Firms			t-stat
	N	Mean	N	Mean	Mean Diff	of diff
Firm Age	3,013	34.450	3,013	34.338	0.112	0.64
GDP Growth	3,013	0.014	3,013	0.014	0.000	-0.10
Lag Employment Growth	3,013	0.043	3,013	0.045	-0.001	-0.11
Log(Employees)	3,013	8.607	3,013	9.063	-0.455	-0.99
Lag Log(Sales)	3,013	13.804	3,013	13.799	0.005	0.12
Lag ROA	3,013	0.022	3,013	0.024	-0.001	-0.87
Lag Debt Ratio	3,013	0.220	3,013	0.222	-0.002	-0.41
Lag Q	3,013	1.147	3,013	1.147	0.000	0.00
Lag Capex/Assets (%)	3,013	5.251	3,013	5.173	0.078	0.62
Lag RetVol	3,013	0.054	3,013	0.054	-0.001	-1.23

Panel B: Multivariate Regressions in Matched Sample

Specification	(1)	(2)	(3)	(4)
GDP Growth	0.725***	0.707***		
	[4.586]	[3.824]		
Group Affiliated	0.006	0.005	0.007	0.007
	[1.346]	[0.986]	[1.397]	[0.539]
GDP Growth * Group Affiliated	**-0.506*** **	**-0.596*** **	**-0.421** **	**-0.626*** **
	[-3.674]	**[-3.428]**	**[-2.513]**	**[-2.674]**
N	6,026	5,880	5,750	4,283
Control Variables?	All	All	All	All
Fixed Effects?	No	Industry-Year	Industry-Year, Country-Year	Firm, Country-Year, Industry-Year
R-Squared	0.043	0.259	0.349	0.562

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Table 5: Placebo and Counter-Placebo Sample Tests

Table 5 presents the results of OLS regressions where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one. *GDP Growth* is the annual change in Gross Domestic Product by country, adjusted for inflation. This table includes tests of a sample of all firm-year observations associated with target firms of withdrawn mergers or acquisitions from 1995 to 2011 and a matched sample of firms that were successfully integrated into a group during our sample. Specification (1) uses "placebo observations," the firm-year observations associated with target firms of withdrawn mergers or acquisitions where data on *Employment Growth*, *GDP Growth*, and firm ownership is available. *Placebo Group* is an indicator variable equal to zero (one) in the period before (after) the withdrawn merger or acquisition. Specification (2) uses "counter-placebo observations," which are firms that were successfully integrated into a group during our sample where data on *Employment Growth*, *GDP Growth*, and firm ownership is available. *Group Affiliated* is an indicator variable equal to one if we classify a firm as part of a business group in a particular year (and equal to zero otherwise), using the narrow definition of business groups, as defined in Table 3. To construct an appropriate counter-placebo sample for comparison to the placebo sample, we include only firms where the value of *Group Affiliated* switched from zero to one only once in our sample, only firms that share the same country-year with at least one placebo-treated observation, and only firms that share the same (two-digit SIC code) industry-year with at least one placebo-treated observation. Specifications (3) through (5) use both the placebo and counter-placebo observations and include firm, industry-year, and country-year fixed effects. Specification (4) includes *Lag Log(Employees)*, while specification (5) includes all other control variables used in Table 3. Results of those control variables are omitted for space. All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Specification	(1)	(2)	(3)	(4)	(5)
Sample	All placebo observations	Matched counter-placebo observations	Placebo and counter-placebo observations	Placebo and counter-placebo observations	Placebo and counter-placebo observations
GDP Growth	0.675**	1.055***			
	[2.429]	[4.014]			
Placebo Group	0.016		-0.051	-0.041	-0.070
	[0.821]		[-1.549]	[-1.256]	[-1.213]
GDP Growth * Placebo Group	**0.471**		**0.905**	**1.058**	**1.437**
	[0.922]		**[1.317]**	**[1.636]**	**[1.480]**
Group Affiliated		0.008	0.035*	0.035*	0.015
		[0.517]	[1.824]	[1.832]	[0.960]
GDP Growth * Group Affiliated		**-0.724*** **	**-0.785** **	**-0.702** **	**-0.809** **
		[-2.638]	**[-2.276]**	**[-2.178]**	**[-2.349]**
Intercept	0.030**	0.028**			
	[2.020]	[2.071]			
N	1,175	979	1,789	1,789	1,789
Control Variables?	No	No	No	*Lag Log(Employees)*	All
Fixed Effects?	No	No	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year
R-Squared	0.020	0.014	0.574	0.579	0.709

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Table 6: Positive and Negative GDP Growth

Table 6 presents the results of OLS regressions where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one. *GDP Growth Positive* is a variable equal to *GDP Growth* if the value of that variable is positive and zero if the value of *GDP Growth* is negative. *GDP Growth Negative* is a variable equal to zero if the value of *GDP Growth* is positive and *GDP Growth* if the value of that variable is negative. *Group Affiliated* is an indicator variable equal to one if we classify a firm as part of a business group in a particular year (and equal to zero otherwise), using the narrow definition of business groups, as defined in Table 3. All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Specification	(1)	(2)
GDP Growth Positive	**0.762*** **	
	[3.524]	
GDP Growth Negative	**0.516**	
	[1.441]	
Group Affiliated	0.007	0.008
	[0.714]	[0.936]
GDP Growth Positive * Group Affiliated	**-0.633*** **	**-0.597*** **
	[-3.145]	**[-2.780]**
GDP Growth Negative * Group Affiliated	**-0.616*** **	**-0.344* **
	[-2.819]	**[-1.903]**
N	48,939	48,914
Control Variables?	All	All
Fixed Effects?	Firm, Industry-Year	Firm, Country-Year, Industry-Year
R-Squared	0.369	0.406

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Table 7: Internal Labor Markets Tests

Table 7 presents the results of OLS regressions where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one, in every specification except for Panel A, specification (4), where the dependent variable is *Log(Relative Firm Wage)* and specification (5), where the dependent variable is *Log(Average Firm Wage)*. *Average Firm Wage* is calculated by dividing salary and benefits expenses from *Datastream* and *Worldscope* (where available) by total employees. *Relative Firm Wage* is computed as *Average Firm Wage* divided by the country-industry-year mean for *Average Firm Wage. Q* is defined as the market value of equity plus the book value of liabilities, all divided by the book value of assets. *GDP Growth* is the annual change in Gross Domestic Product by country, adjusted for inflation. *GDP Growth Positive* is a variable equal to *GDP Growth* if the value of that variable is positive and zero if the value of *GDP Growth* is negative. *GDP Growth Negative* is a variable equal to zero if the value of *GDP Growth* is positive and *GDP Growth* if the value of that variable is negative. In Panel A, specification (1), *Group Affiliated with High (Low) Rel Q* equals one if a firm is both group affiliated and has above-median (below-median) *Q* among its affiliated firms and zero otherwise. In Panel A, specification (2), *Same-Country Group* is an indicator variable equal to one if all firm members of a particular group are incorporated in the same country (and equal to zero otherwise), and *Cross-Country Group* is an indicator variable equal to one if at least two firm members of a particular group are incorporated in different countries (and equal to zero otherwise). In Panel A, specification (3), *High EPL* is equal to one if a country-year has an above-median value of the *Employment Protection Laws* (*EPL*) *Index* from the OECD. The EPL index "measures the strictness of employee dismissal regulations in a country, ranging from 0 to 6, with 6 being the most difficult to dismiss an employee." The time-series average EPL index value is used for countries with missing data for certain years. In Panel B, specifications (1) through (5), *Diversified Group Firm* equals one if a firm is both group affiliated and fulfills the diversification criterion at the top of the table (and zero otherwise), and *Nondiversified Group Firm* equals one if a firm is group affiliated but does not fulfill the diversification criterion at the top of the table (and zero otherwise). In specification (1), a group firm is considered diversified if any firm in the group has more than one distinct product segment (as listed in *Datastream* and *Worldscope*) or at least two firms within the group have different primary two-digit SIC industry codes. The remaining specifications in Panel B use firm-level measures of diversification for group firms. In specifications (2) through (4), a group firm is considered diversified if it has more than two, three, or four product segments (respectively). In specification (5), a group firm is considered diversified if its product segment sales Herfindahl-Hirschman index is below-median among all firm-years in the sample. All group variables use the narrow definition of business groups, as defined in Table 3. Uninteracted GDP growth variables (*GDP Growth Positive* and *GDP Growth Negative* in the first specification and *GDP Growth* in the other nine) are omitted due to their perfect collinearity with country-year fixed effects when those fixed effects are used. The interaction term *GDP Growth * High EPL* is included in Panel A, specification (3) but omitted from the table. All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Panel A: Direct ILM Tests and Tests Using Labor-Related Costs and Frictions

Dependent Variable	*Employment Growth*	*Employment Growth*	*Employment Growth*	*Log(Relative Firm Wage)*	*Log(Average Firm Wage)*
Specification	(1)	(2)	(3)	(4)	(5)
Q	0.028***				
	[6.453]				
*GDP Growth Positive * Q*	-0.106				
	[-0.999]				
*GDP Growth Negative * Q*	-0.095				
	[-0.841]				

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Group Affiliated with High Rel Q	0.003				
	[0.308]				
Group Affiliated with Low Rel Q	0.011				
	[1.128]				
Same-Country Group		0.003			
		[0.373]			
Cross-Country Group		0.009			
		[0.691]			
GDP Growth				0.005	
				[0.048]	
Group Affiliated			**0.018***	**0.029**	**0.024**
			[1.899]	**[1.619]**	**[1.134]**
GDP Growth Positive	**-0.323**				
**** Group Affiliated with High Rel Q***	**[-1.212]**				
GDP Growth Positive	**-0.685*** **				
**** Group Affiliated with Low Rel Q***	**[-2.895]**				
GDP Growth Negative	**-0.696** **				
**** Group Affiliated with High Rel Q***	**[-2.453]**				
GDP Growth Negative	**0.025**				
**** Group Affiliated with Low Rel Q***	**[0.097]**				
GDP Growth * Same-Country Group		**-0.542*** **			
		[-3.475]			
GDP Growth * Cross-Country Group		**-0.344***			
		[-1.715]			
*GDP Growth * Group Affiliated*			-0.132		
			[-1.184]		
*Group Affiliated * High EPL*			-0.011		
			[-1.317]		
GDP Growth * Group Affiliated			**-0.572** **		
**** High EPL***			**[-2.451]**		
N	48,395	48,914	47,282	18,959	18,818
Control Variables?	All	All	All	All	All
Fixed Effects?	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm	Firm, Country-Year, Industry-Year
R-Squared	0.408	0.406	0.401	0.782	0.972

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Panel B: Test Using Diversified and Nondiversified Group Affiliated Firms

Dependent Variable	*Employment Growth*	*Employment Growth*	*Employment Growth*	*Employment Growth*	*Log(Average Firm Wage)*
Definition of Diversified Group Firm	Diversified if firm (or affiliate) has > 1 product segment or multiple industries represented in group	Diversified if firm has > 2 product segments	Diversified if firm has > 3 product segments	Diversified if firm has > 4 product segments	Diversified if ProductHHI is below sample median
Level of Diversification	Group-level	Firm-level	Firm-level	Firm-level	Firm-level
Specification	(1)	(2)	(3)	(4)	(5)
Diversified Group Firm	0.006	0.003	0.006	0.026*	0.003
	[0.695]	[0.339]	[0.602]	[1.690]	[0.369]
Nondiversified Group Firm	-0.012	0.009	0.004	-0.002	0.005
	[-0.573]	[0.902]	[0.405]	[-0.189]	[0.498]
GDP Growth * Diversified Group Firm	**-0.511*** **	**-0.505*** **	**-0.562*** **	**-0.969*** **	**-0.589*** **
	[-3.627]	**[-3.447]**	**[-3.656]**	**[-4.498]**	**[-4.352]**
GDP Growth * Nondiversified Group Firm	**-0.118**	**-0.475** **	**-0.430*** **	**-0.344** **	**-0.406** **
	[-0.257]	**[-2.499]**	**[-2.704]**	**[-2.408]**	**[-2.024]**
N	48,914	48,914	48,914	48,914	48,602
Control Variables?	All but *Number Segments*	All but *Number Segments*	All but *Number Segments*	All but *Number Segments*	All but *Number Segments*
Fixed Effects?	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year
R-Squared	0.406	0.406	0.406	0.406	0.406

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Table 8: Internal Capital Markets Tests

Table 8 presents the results of OLS regressions where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one. *GDP Growth* is the annual change in Gross Domestic Product by country, adjusted for inflation. *Group Affiliated* is an indicator variable equal to one if we classify a firm as part of a business group in a particular year (and equal to zero otherwise), using the narrow definition of business groups, as defined in Table 3. Uninteracted *GDP Growth* is omitted due to its perfect collinearity with the country-year fixed effects. In specification (1) the sample excludes firm-year observations from periods where credit markets were constricted (China, Hong Kong, Indonesia, Japan, Malaysia, the Philippines, Singapore, South Korea, and Thailand during the Asian Financial Crisis of 1997-1999 and all countries during the Worldwide Recession of 2008 and 2009), while specification (2) includes only these credit constriction years. In specification (3) the sample excludes firm-year observations from financially constrained firms, where we define "financially constrained" as having a value in the top third of either the Whited-Wu (WW) or Hadlock-Pierce (size-age or SA) financial constraints indices, while specification (4) includes only firms that are financially constrained. For group affiliated firms, the WW and SA indices are calculated at the group level and that group-level index value is used for every individual firm in the group. In specification (5) the sample include only observations where the value of the *Chinn-Ito Index* of capital openness is equal to its maximum value of one, while specification (6) includes only firms with a *Chinn-Ito Index* value of less than one. This variable is based on dummy variables that codify the restrictions on cross-border financial transactions reported in the IMF's AREAER (Annual Report on Exchange Arrangements and Exchange Restrictions). All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Sample	Excluding 1997-1999 (Asian countries), 2008, 2009	1997-1999 (Asian countries), 2008, 2009 only	Excluding financially constrained firms (group level)	Financially constrained firms only (group level)	High capital openness countries	Low capital openness countries
Specification	(1)	(2)	(3)	(4)	(5)	(6)
Group Affiliated	0.012	-0.011	-0.000	-0.002	0.012	-0.012
	[1.169]	[-0.580]	[-0.033]	[-0.091]	[1.226]	[-0.578]
GDP Growth * Group Affiliated	**-0.563****	**-0.349**	**-0.389****	**-0.643****	**-0.439*****	**-0.492***
	[-2.584]	**[-1.571]**	**[-2.198]**	**[-2.230]**	**[-2.744]**	**[-1.880]**
N	39,976	6,813	19,252	26,874	39,389	8,938
Control Variables?	All	All	All	All	All	All
Fixed Effects?	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year
R-Squared	0.434	0.690	0.496	0.449	0.411	0.511

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Table 9: Tests for Group affiliated Firm Sensitivity to Shocks

Table 9 presents the results of OLS regressions where the dependent variable is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one. *Group Affiliated* is an indicator variable equal to one if we classify a firm as part of a business group in a particular year (and equal to zero otherwise), using the narrow definition of business groups, as defined in Table 3. Specifications (1) through (4) use the full sample of firm-year observations. In specification (1), the key independent variable proxying for a growth shock is a firm's current year sales growth, calculated by dividing current year sales by prior year sales and subtracting one for individual firms. In specification (2), the growth shock proxy is a firm's current year 3-digit SIC code industry-level sales growth. In specifications (3) and (4), the growth shock proxy is country-level employment growth, calculated as -1 * (unemployment rate – lag(unemployment rate)), where unemployment rates are equal to the *Harmonised Unemployment Rate* variable from the OECD (where available). In specifications (5) through (7), the growth shock proxy is *GDP Growth*, as in our previous tables. Specification (5) uses the subsample of firms that have below-median sales among all firms in a particular country-year. Specification (6) uses the subsample of firms from country-years where less than 25% of sales from our sample observations are represented by group affiliated firms (using the narrow definition of group affiliation). Specification (7) uses the subsample of firms from country-years where less than 25% of sales from our sample observations are represented by group affiliated firms (using the broad definition of group affiliation). Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Proxy for *Growth Shock*	Firm-level sales growth	Industry-level sales growth	Country-year total employment growth	Country-year total employment growth	GDP Growth	GDP Growth	GDP Growth
Sample	Full	Full	Full	Full	Firms with below-median sales within country-year	Firms in country-years with < 25% sales represented by groups (narrow definition)	Firms in country-years with < 25% sales represented by groups (broad definition)
Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Growth Shock	0.406***	0.143***	1.757***				
	[20.261]	[9.063]	[4.887]				
Group Affiliated	0.003	0.001	-0.005	-0.005	0.019	0.004	0.009
	[0.364]	[0.077]	[-0.500]	[-0.473]	[1.083]	[0.420]	[0.958]
Growth Shock	**-0.080*** **	**-0.076*** **	**-1.195** **	**-0.811* **	**-0.689*** **	**-0.440*** **	**-0.450*** **
**** Group Affiliated***	**[-2.684]**	**[-3.401]**	**[-2.312]**	**[-1.736]**	**[-2.799]**	**[-3.470]**	**[-3.330]**
N	48,914	48,837	42,766	42,757	23,184	46,278	38,291
Control Variables?	All	All	All	All	All	All	All
Fixed Effects?	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year
R-Squared	0.491	0.410	0.363	0.399	0.490	0.404	0.409

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Table 10: Tests for Agency/Self-Dealing Explanations

Table 10 presents the results of OLS regressions where the dependent variable in specifications (1) and (2) are firm employees divided by firm sales (in $ millions), and the dependent variable in specifications (3) and (4) is *Employment Growth*, calculated by dividing the current year's employees by the prior year's employees and subtracting one. *GDP Growth* is the annual change in Gross Domestic Product by country, adjusted for inflation. *Group Affiliated* is an indicator variable equal to one if we classify a firm as part of a business group in a particular year (and equal to 0 otherwise), using the narrow definition of business groups, as defined in Table 3. In specification (3), the sample consists only of firms with above-sample-median values of the *Anti-Self-Dealing Index* (*ASDI*) developed by Djankov, La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2008), while specification (4) consists only of firms with below-sample-median values of the *ASDI*. Uninteracted *GDP Growth* is omitted due to its perfect collinearity with the country-year fixed effects. All specifications interact *GDP Growth* and *Group Affiliated* with the exception of specification (2). All firm-level non-indicator variables are trimmed at the 1st and 99th percentiles. Standard errors are double clustered at the firm and country-year levels. T-statistics are presented in parentheses below each coefficient. ***, **, * denote statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Sample	Full	Full	Above-Median *ASDI*	Below-Median *ASDI*
Dependent Variable	*Employees/Sales ($M)*	*Employees/Sales ($M)*	*Employment Growth*	*Employment Growth*
Specification	(1)	(2)	(3)	(4)
Group Affiliated	**-0.027**	**-0.161**	0.023	0.003
	[-0.171]	**[-0.899]**	[0.936]	[0.290]
GDP Growth * Group Affiliated	-5.854		**-0.658***	**-0.437*****
	[-1.631]		**[-1.949]**	**[-2.831]**
N	48,914	48,914	23,533	25,228
Control Variables?	All	All	All	All
Fixed Effects?	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year	Firm, Country-Year, Industry-Year
R-Squared	0.932	0.932	0.399	0.446

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Exhibit 1: Employee Relocations within Business Groups: Anecdotal Evidence

"As part of their rationalization efforts, **NTT** East Corp. and NTT West Corp. will move as many as 20,000 employees from their payroll to affiliates under a new job-transfer program, sources at the two companies told the Nihon Keizai Shimbun on Tuesday."

"… Employees will be transferred to group companies near their current workplaces…."

Source: Dow Jones International News, 10/17/2000, "Nippon Telegraph Companies To Move 20,000 From Payroll – Nikkei."

"Dutch consumer electronics group **Royal Philips Electronics NV** (PHG) told its French employee representatives that it will cut 1,235 jobs in France, the French daily Le Monde reported Tuesday."

"… However, the French subsidiary's management has committed to relocating some of the workers hit by the restructuring in other subsidiaries of the group, the report added."

Source: Dow Jones International News, 06/26/2001, "Philips to cut more than 1,200 jobs in France – Report."

"The 600 employees of the **Furama Hotel** in Central have been told that the hotel will close on December 1 to make way for an office redevelopment."

"We will try our best to relocate some employees to the group's two other hotels," said Mark Lee Po-on, director of Lai Sun Garment, parent of Furama co-owner Lai Sun Development."

"The other hotels are the Ritz-Carlton Hong Kong and the Majestic Hotel."

Source: South China Morning Post, 9/6/2001, "Dying Furama aims to save jobs."

"**NEC Kagoshima Ltd.** plans to cut 300 jobs by the end of next March through an early retirement program in line with shrinking output of liquid crystal displays amid an information technology slump, company officials said Monday."

"The display production unit of Japanese electronics giant NEC Corp. had been hoping to relocate redundant employees within group firms, but was forced to drop the plan due to sluggish performances inside the group, the officials said."

Source: Jiji Press English News Service, 12/17/2001, "NEC Kagoshima to Cut 300 Jobs thru Early Retirement."

"Debt-hobbled **Daiei Inc**, Japan's largest supermarket operator, said on Tuesday it aimed to cut 1,400 jobs in its parent company through voluntary retirement, 400 more than originally planned."

"… Job cuts at the parent could reach as many as 2,000 including natural attrition and the relocation of employees to group companies, Daiei said."

Source: Reuters News, 02/12/2002, "Daiei aims to cut 1,400 parent jobs."

"Finnish telecomms solutions provider **Nokia**'s multimedia division in Finland has reportedly concluded its personnel negotiations."

"As a result the company would dismiss 106 employees, down from the 250 announced at the beginning of the negotiations."

"Nokia said in a statement that it had managed to relocate employees within the group better than earlier estimated, reported the Finnish news agency STT."

Source: Nordic Business Report, 02/25/2005, "Nokia multimedia division to cut 106 jobs in Finland – Report."

"**Siemens Austria**, a subsidiary of German engineering group Siemens, will cut up to 250 jobs in its building services engineering unit Elin EBG Gebaeudetechnik, Siemens Austria CEO Brigitte Ederer said on May 3, 2006."

"Siemens will seek to relocate some of the laid-off workers to other units within the group, a Siemens spokesperson said."

Source: APA Economic News Service, 05/03/2006, "Siemens Austria to cut 250 jobs."

"**FIRST Choice Holidays**, the tour operator, is set to cut 200 jobs after it said that its profits would be affected by the bird flu scare and security alerts of the summer."

"First Choice said that it was planning to close its holiday operations in Portugal, and will scale back its German operations, with the loss of 50 jobs. In addition, the tour operator will outsource some of the back office functions from its mainstream UK holidays business, in a move that could create a further 150 redundancies."

"However, First Choice, which is in consultation over the job losses, said that it would try to relocate those employees within the group. It expects that restructuring will cost between Pounds 4 million and Pounds 6 million."

Source: The Times, 10/26/2006, "First Choice to cut 200 jobs after sales falter in high season."

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"The **Reliance Retail** has declined to renew contracts of 1200 employees, which implies that few employees of the chain will be sacked."

"As per sources, some of the Reliance Retail staffs being sacked are direct sales agents. The sources have also said that majority of Reliance Retail staffs are not on the payroll of the company."

"However, there is relief for some of the employees as the company is trying to relocate the permanent employees within company or the group and the Human Resource Department is also trying to find alternative jobs for some outside the group, said sources."

Source: NDTV, 10/15/2008, "Reliance Retail axes 1200 jobs: Sources."

"**Renesas Electronics Corp.** said Tuesday it will close a semiconductor assembly plant in the western Tokyo city of Ome at the end of March next year."

"The plant has been incurring losses for several years due to intensifying competition from overseas."

"The major Japanese chipmaker plans to relocate some 300 employees at the plant to group companies. Details will be discussed between labor and management, company officials said."

Source: Jiji Press English News Service, 28 June 2011, "Renesas to Close Chipmaking Plant in Tokyo."

"**VION Food Netherlands** is going to concentrate its pork activities. The activities of VION Druten will cease and will transfer to VION Boxtel and VION Groenlo. Retail production will largely be concentrated at VION Retail Groenlo. Due to market developments, changes will be made to Encebe Vleeswaren's production, range, and organisation. The overcapacity of logistics service provider Distrifresh Boxtel will be addressed. Indirect support departments will also be brought in line with the new production organisation. Together, all intended changes and investments are expected to affect employment for some 340 permanent staff. VION will look to relocate some of these employees. The Group Works Council of VION Food Netherlands has already been asked for its input."

Source: Just-Food, 6/19/2012, "NETHERLANDS: Vion unveils raft of European job cuts."

"**Wanzl UK** service, which owns the Gwent-based Symonds UK Limited, said the redundancies could be made at its factories in Rogerstone and Abercarn following the consolidation of warehousing and service operations at its other site."

"… The firm said every effort would be made to relocate employees within the Wanzl group or to transfer them to other sections of the business where there are vacancies."

Source: South Wales Argus, 1/8/2013, "Thirteen jobs could go in Rogerstone and Abercarn factories move."

"Trade unions fear that Belgian utility **Electrabel** plans fairly radical measures, Belgian media reported Thursday."

"Yesterday, the company said it will cut 245 jobs this year in a bid to reduce costs as the energy sector is undergoing profound changes and is affected by a difficult economic climate."

"The unions argued that lay-offs were not customary at Electrabel in the past, with the company managing in most cases to relocate employees within the group. Given the activities downsizing, however, that solution might be difficult to apply now."

Source: SeeNews Belgium, 1/24/2013, "Electrabel trade unions fear radical measures."

"Japanese consumer electronics company **Toshiba** has announced it will close down or sell some of its overseas television plants over the next six months. Thousands of jobs will be lost in a bid to raise profitability."

"… Toshiba said it would also try and relocate 1,000 workers in Japan itself within the group as a result of the structural reform in the visual products business, including liquid crystal display TVs and Blu-ray players and recorders."

Source: Deutsche Welle, 06/30/2013, "Toshiba to cut thousands of jobs at foreign TV plants."

"Spanish industrial group **Corporacion Mondragon** has managed to relocate 980 employees of its insolvent member Fagor Electrodomesticos so far."

"… Corporacion Mondragon intends to relocate the bulk of the 2,000 employees affected by the insolvency of Fagor Electrodomesticos and to increase its combined workforce in the next three or four years."

Source: Spanish Collection, 05/19/2014, "Mondragon relocates 980 employees of Fagor Electrodomesticos."

"**Samsung** is set to have wider-than-expected reshuffle on executives and business units of its affiliates focusing on the conglomerate's technology units for leaner business structure, according to officials, Wednesday."

"… "A process to relocate employees is also a part of group-wide efforts for better efficiency. Some researchers will be moved to a newly-opened building in Yangjae, southern Seoul," said another official."

Source: The Korea Times, 11/18/2015, "Samsung plans major executive reshuffle."

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