

MARKET FRICTIONS AND THE COMPETITIVE ADVANTAGE OF INTERNAL LABOR MARKETS

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Research summary: We show that frictions in labor and capital markets can be a source of competitive advantage for affiliates of corporate groups over stand-alone firms in environments where benefits from internal markets' flexibility are high. We argue that the advantage of flexibility in changing labor inputs is related to how difficult it is to change capital inputs. We predict that if substituting labor with capital is difficult, the group advantage of flexibly changing labor would be stronger in countries with high levels of financial development. Consistent with this prediction, we find a stronger competitive advantage for group affiliates in countries with rigid labor markets but flexible capital markets. In these environments, group affiliates are more prevalent and outperform stand-alone firms in terms of growth and profitability.

Managerial summary: This research shows that the capacity to redeploy workers across internal units of the firm can be a source of competitive advantage in countries that impose strict employment protection laws. We show that the strategic advantage of labor flexibility is affected by how difficult it is to change capital inputs and that labor flexibility is a stronger source of competitive advantage in countries where developed financial markets allow for more flexible capital adjustment. In these settings, strategies designed to lower costs of internal mobility (e.g., locations of greater geographic concentration between units and in regions with less competitive external markets), development of corporate culture supportive of frequent change, and personnel development through internal rotation can result in substantial financial payoffs. Copyright © 2015 John Wiley & Sons, Ltd.

INTRODUCTION

One of the fundamental domains of study for management scholars is understanding why firms exist. Although extant theories vary in their causal logic, the widespread consensus is around the notion that the *raison d'être* of firms is to substitute for market inefficiencies (Mahoney and Qian, 2013). Such inefficiencies may arise due to the nature of institutions (Coase, 1937), transactions (Williamson, 1975), or resources (Barney, 1986; Penrose, 1959). Along these lines, researchers have paid particular attention to the effects of development of financial

markets on the boundaries and structure of firms. A well-established finding is that “conglomerates” or “business groups” are prone to arise when financial markets are underdeveloped, as these structures can function as internal capital markets (e.g., Belenzon and Berkovitz, 2010; Gertner, Scharfstein, and Stein, 1994). Yet we still know little about how firms organize to overcome rigidities in other factor markets. Although human resources have been considered as key in determining competitive advantage (Chandler, 1962; Penrose, 1959), extant work has paid scant attention to how firms organize to address labor market rigidities. These can represent important challenges for firms, as they constrain firms' capacity to adjust their employment pool.

Scholars have noted that “business groups” create and utilize their internal labor markets by rotating workers across the multiple businesses that com-

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prise these organizations (Chang and Hong, 2000; Khanna and Palepu, 1997; Khanna and Rivkin, 2001). This can be costly, as it implies maintaining large, often cumbersome, structures.¹

Such costs, however, may be justified by the flexibility to address frictions in the external labor market. Focusing on employment protection laws (EPL hereafter) as the source of labor market frictions, this study takes place in the context of corporate groups—collections of legally independent firms that are controlled by the same ultimate owner (Leff, 1978)—and argues that in specific institutional environments internal labor markets can provide competitive advantage for group-affiliated firms. For example, if economic conditions require business “A” to downsize, excess workers can be transferred within the same group to business “B,” which faces a more favorable environment. Such flexibility is not available for firms without an internal labor market. These firms must either bear the costs imposed by EPL when downsizing is necessary or maintain costly slack in human resources. Similarly, observant of their lack of flexibility, such firms may keep a lean pool of workers, which can be problematic when the operational environment requires adding to the workforce (e.g., an unexpected hike in demand). All in all, the rigidities imposed by the EPL and the lack of internal flexibility translates into higher costs (costs of downsizing, keeping excess personnel, not having enough employees when needed, etc.) and, hence, into lower performance for firms without internal labor markets.

The restructuring efforts by the Volkswagen Group in Germany illustrate the binding effects of EPL (Hartz, 1994; Kothen, McKinley, and Scherer, 1999). In the early 1990s, the European automobile industry was in crisis due to declining demand and competitive pressure from Japanese automakers. By 1993, Volkswagen Group had more than 30,000 extra employees across its total 107,000 affiliates in Germany. It pursued a multi-prong solution to avoid dismissing employees. The group implemented pay cuts, encouraged early retirement, and shortened workdays to reduce employment costs directly. Moreover, it trained and transferred surplus employees to different job classifications and relocated employees geographically to different

production locations to even out imbalances in labor supply.

Our paper has two goals. The first is to show that internal labor markets can be a source of competitive advantage. Affiliates benefit from internal labor markets because, unlike stand-alone firms, they can reallocate workers to other affiliates of the group without incurring EPL penalties. A legal provision in Europe exempts intragroup labor adjustments from EPL, enhancing the competitive advantage of internal labor markets.² We expect that in environments where internal labor markets are a source of competitive advantage (e.g., EPL are strong and labor readjustment is frequent), corporate groups would be more prevalent and group affiliates would outperform stand-alone firms.

Our second goal is to show that the competitive advantage of internal labor markets depends on the development of country financial markets. We argue that the advantage of flexibility in internally changing labor inputs is affected by how difficult it is to change capital inputs and that the strength of this effect is related to the ease of substitution between labor and capital. Based on our theoretical discussion and building on evidence from the economic literature of low substitutability between labor and capital,³ we predict that the benefit of labor flexibility in groups should be larger when capital is also flexible. This prediction implies that internal labor markets are a stronger source of competitive advantage in countries where developed financial markets allow for more flexible capital adjustment.

Our empirical analysis is as follows. We begin by examining how the difference in the share of group affiliates between industries with high and low frequency of labor adjustments varies by country EPL. We expect this difference to increase with EPL. Our difference-in-difference empirical strategy is to use exogenous country and industry conditions and to test whether EPL have the strongest impact on group affiliation in industries where firms adjust their labor force more frequently (Rajan and Zingales, 1998). Using data from the United States (and other sources), we rank industries according to their level of labor turnover in relatively regulation-free labor markets to calculate each industry's average turnover rate. Then we rank the 15 Western

¹ Other costs include inefficient internal reallocation of resources from minority to controlling shareholders, known as “tunneling.”

² Official Journal of the European Union, L 018, January 21, 1997: pages 1–6.

³ See Chirinko (2008) for a detailed survey of the relevant macroeconomics literature.

European countries in our sample according to EPL. Our first econometric test is whether the difference between high and low industry labor turnover in group affiliates is higher in countries with high EPL than in countries with low EPL. We compare financial performance of group affiliates to that of stand-alone firms and study how the difference between the two relates to EPL and financial development. Lastly, we provide direct evidence on the use of internal labor markets in redeploying workers across group units in strong-EPL countries.

Our findings support the view that labor reallocation in groups can be a source of competitive advantage. We find that in environments where EPL are strong and labor redeployment is frequent, a greater share of resources is redeployed inside firms, leading to an expansion in firm boundaries and to more persistent differences in firm performance. Moving from the lowest to the highest decile of EPL increases the difference in group affiliation between high- and low-turnover industries by 3.5 percentage points, or 16 percent of the sample's average share of group affiliates. Financial development strongly moderates the EPL effect, supporting our prediction that internal labor markets are a stronger source of competitive advantage in countries with more developed capital markets.

To support our analysis further, we provide two sets of direct evidence of active internal labor markets in countries with strong EPL. First, we examine changes in employment in affiliated firms in response to negative industry shocks—the rise in Chinese import penetration. We find that affiliates increase their employment in response to a rise in Chinese imports to *other* affiliates in the group, consistent with active internal labor markets that reallocate workers from less profitable to more profitable units. Second, we compare the incidence of internal mobility of mid-level managers in groups that are located in low- and high-EPL countries. We find a substantially higher incidence of internal mobility in high-EPL countries.

These findings advance our understanding of why firms coalesce into groups in modern economies and flesh out the conditions under which internal labor markets can be a source of competitive advantage. We demonstrate that market frictions are an important force that drives competitive advantage and emphasize that these frictions are multidimensional and that their joint effect on competitive advantage is complex and sometimes counterintuitive. In particular, we show that EPL

drive the competitive advantage of group affiliates, especially in countries with developed financial markets. Understanding that the economic role of groups can be more pronounced when institutions are developed informs debates on the “dark” and “bright” sides of groups, and large organizations, more generally.

CORPORATE GROUPS AND EPL IN EUROPE

Central to our analysis is the substantial variation in EPL across European countries. EPL comprise a set of legal rules, administrative procedures, and compensatory payouts that apply to employee dismissals. Unlike unemployment benefits, which are funded through payroll taxes, EPL impose direct costs on the employer responsible for dismissals. For example, in Spain, individual dismissal procedures require a 30-day written notice with a statement of reasons for dismissal and a written notification to the worker's representatives at the workplace. Upon dismissal, Spanish employees are entitled to severance pay equivalent to 33 days' salary for each year of service. Similarly, Austrian workers with more than three years of service are entitled to eight weeks' notice and six months' salary as severance pay (OECD Employment Outlook, 2004). EPL vary widely in our sample of Western European countries. Greece, Spain, and France have the strictest EPL, whereas Great Britain, Ireland, and Switzerland have the fewest restrictions on dismissals.

The European Union (EU) is an ideal environment for examining the effect of varying institutional environments on firm structure, performance, and behavior for four main reasons. First, EU countries vary widely in EPL and level of financial market development; but at the same time, they exist within a narrow range of economic development,⁴ such that we can focus on developed

⁴ Average GDP per capita in our sample is \$53,781 (2010 estimates), with a median of \$49,489. Moving from the lowest quartile to the highest quartile of GDP per capita is associated with a relatively low increase of 28 percent. There are two “outliers” in our data in terms of GDP per capita: Norway on the high end with \$103,586 and Greece on the low end with \$34,832. To ensure that our results are not driven by specific countries, section “Removing outliers” reports robustness checks for excluding single and group countries from the sample. Table A1 in File S1 presents our main country measures. Examples of countries with different financial development but very similar economic development

economies and substantially reduce unobserved cross-country heterogeneity.

Second, EU countries share a clear and consistent definition of groups based on historical, institutional, and economic traditions. Corporate groups are an integral part of the economic landscape in the EU. The legal definition of a corporate group is based on the concept of control between parent and subsidiary companies as defined in Article 1 of the Seventh EU Directive (The European Parliament and the Council of the European Union, 1983: p. 1), and the EU Directive 96/71/EC utilizes this definition, granting exceptions to labor mobility within corporate groups (Official Journal L 018, January 21, 1997: p. 1–6). The presence of at least one of the following establishes control: holding the majority of the voting rights; a contract; or the ability to appoint and remove the majority of the board of directors (Forum Europaeum Corporate Group Law, 2000). Most of the academic work also utilizes the EU's control-based definition of corporate groups (Cestone and Fumagalli, 2005), where control is determined based on the ownership stakes the controlling shareholder has in each of the group affiliates (Windbichler, 2000). In this paper we identify a firm as a group affiliate if it is a subsidiary (i.e., has a controlling parent company), controls another firm, or has the same controlling shareholder as at least one other firm (Faccio and Lang, 2001; La Porta, Lopez-de-Silanes, and Shleifer, 1999).

Third, employment regulations apply only to labor readjustments that use external markets, not to ones inside corporate groups. EU law does not consider the mobility of workers within a corporate group a market transaction. Intragroup mobility is not subject to country labor-market regulations, and affiliates can transfer employees to a different affiliate without incurring EPL-based dismissal penalties. The European Union Directive 96/71/EC sets out to facilitate movement of human capital within and across the Member States and allows group affiliates to “post workers to an establishment or to an undertaking owned by the group in the territory of a Member State” (Official Journal L 018, January 21, 1997: p. 1–6). This

provision allows unilateral transfer of employees among affiliates without having to dismiss and rehire each transfer and thereby without being subject to employment-protection regulations. Our discussions and consultations with European labor law experts and human-resource executives have further validated the utility of this legal provision, which provides a clear advantage to firms affiliated with corporate groups.

Fourth, European countries exhibit substantial variation in EPL within countries with developed and underdeveloped financial markets. This variation is necessary in order to estimate separately the effects of EPL and financial development and their interaction with each other. Figure 1 plots the country-level OECD employment-protection regulation index and financial development measures for all 15 countries in our sample and shows that the correlation between EPL and financial development is low (-0.35, statistically insignificant).

An identification assumption in our analysis is that the way in which groups are distributed across industries within countries does not affect EPL. The File S1 provides a historical background of the origin of EPL for our sample countries. This background is important because it emphasizes that the prevalence of groups should not have played an important role in shaping policies toward greater stickiness of labor. Nonetheless, industrial labor relations are shaped in large part by laws that are often amended by different political and economic interests (Pagano and Volpin, 2005). Pagano and Volpin show that countries with electoral systems representing the overall majority tend to have stricter EPL. In our context, to make the reverse causality argument plausible (groups lobby for stricter EPL to enhance their competitive advantage over stand-alone firms), groups should represent the majority interests and lobby intensely in countries where groups *disproportionately concentrate in industries with high labor turnover*. To our knowledge, there is no evidence suggesting this scenario is likely.

THE INTERACTION BETWEEN EPL AND FINANCIAL DEVELOPMENT

This section discusses how the advantage of flexibility in changing labor inputs is affected by how

include France and Great Britain, with similar levels of GDP per capita (\$37,870 and \$38,450, respectively), but Great Britain has a substantially higher level of financial development (3.79 vs. 1.33; column 7 of Table A1, File S1). The Netherlands and Germany also have similar levels of GDP per capita (\$46,300 vs. \$44,470), but the Netherlands is more financially developed than Germany (2.39 vs. 1.02).

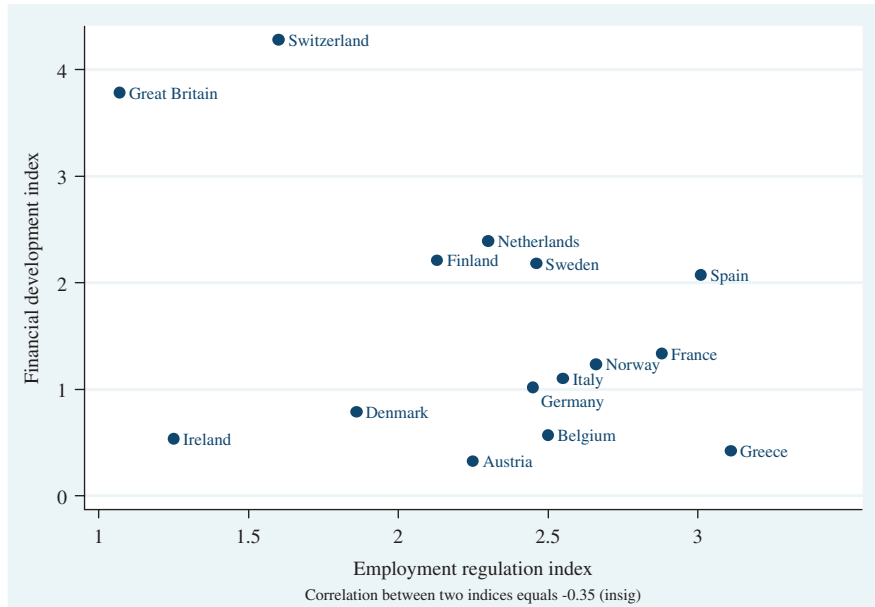


Figure 1. Distribution of indices for EPL and level of financial development. *Notes:* This graph plots country-level financial development and EPL indices for all 15 countries in our sample. The EPL level is the average OECD employment dismissal protection index in 1998–2008. The financial development index is the ratio of stock market total value traded in the country to the country's GDP in 2007. The correlation between the two indices is -0.35, which is insignificant at p -value of 0.05

difficult it is to change capital inputs.⁵ We argue that the advantage of labor flexibility is affected by how difficult it is to adjust capital, and we relate the strength of this effect to the ease of substitution between labor and capital. The ease of substitution determines the extent to which stand-alone firms can mitigate rigidities by substituting away from the more rigid input toward the more flexible one.

To simplify our discussion, we assume that group affiliates can always rely on their internal markets for labor and capital (that is, affiliates are unaffected by frictions in external markets).⁶ Stand-alone firms, on the other hand, are constrained by market frictions in their ability to adjust labor and capital. Figure 2 presents the different cases we consider with respect to labor and capital flexibility.

In Figure 2, F_{CM} denotes the case where capital market institutions are well developed (capital is flexible), and R_{CM} denotes the case where capital market institutions are not well developed (capital is rigid). F_{LM} and R_{LM} are similarly defined for

labor markets. $\pi_{GA}(\cdot)$ and $\pi_{SF}^*(\cdot)$ denote profits for group affiliates and stand-alone firms, respectively. Because we assume that group affiliates are unaffected by external markets, our discussion will focus only on stand-alone firms.

We wish to establish whether the benefits of labor market flexibility for stand-alone firms are synergistic with capital market flexibility or whether the two types of flexibility are substitutes. More specifically, we explore whether moving from cell A to cell B (from flexible to rigid labor with flexible capital) is associated with a bigger reduction in profitability than moving from cell C to cell D (from flexible to rigid labor with rigid capital). Because group affiliates obtain the same level of profits in each institutional environment, we only need to check whether the following condition holds for stand-alone firms:

$$\begin{aligned} \pi_{SF}(F_{CM}, F_{LM}) - \pi_{SF}(F_{CM}, R_{LM}) \\ \geq \pi_{SF}(R_{CM}, F_{LM}) - \pi_{SF}(R_{CM}, R_{LM}) \end{aligned} \quad (1)$$

The advantage of flexibility

Consider a world with uncertain demand where inflexibility of inputs means that labor and capital must be deployed before demand is realized. In

⁵ A formal and extended version of this discussion is available upon request.

⁶ Our logic remains unchanged if we assume instead that group affiliates are also affected by external market conditions, but to a lesser extent than stand-alone firms.

	Flexible labor markets (Weak EPL)	Rigid labor markets (Strong EPL)
High financial development (Flexible capital)	<p>A. Group affiliates and stand-alone firms face flexible labor and capital</p> <p>Payoffs:</p> <p>Group affiliate: $\pi_{GA}(F_{CM}, F_{LM})$ Stand-alone firm: $\pi_{SF}(F_{CM}, F_{LM})$</p>	<p>B. Group affiliates face flexible labor and capital. Stand-alone firms face rigid labor, but flexible capital</p> <p>Payoffs:</p> <p>Group affiliate: $\pi_{GA}(F_{CM}, R_{LM})$ Stand-alone firm: $\pi_{SF}(F_{CM}, R_{LM})$</p>
Low financial development (Rigid capital)	<p>C. Group affiliates face flexible labor and capital. Stand-alone firms face rigid capital, but flexible labor</p> <p>Payoffs:</p> <p>Group affiliate: $\pi_{GA}(R_{CM}, F_{LM})$ Stand-alone firm: $\pi_{SF}(R_{CM}, F_{LM})$</p>	<p>D. Group affiliates face flexible labor and capital. Stand-alone firms face rigid capital and rigid labor</p> <p>Payoffs:</p> <p>Group affiliate: $\pi_{GA}(R_{CM}, R_{LM})$ Stand-alone firm: $\pi_{SF}(R_{CM}, R_{LM})$</p>

Figure 2. Labor and capital rigidities for group affiliates and stand-alone firms

this setting, the competitive advantage of group affiliates stems from their ability to deploy inputs after demand is realized. Market frictions may cause stand-alone firms to forgo business opportunities that they would have pursued had inputs been flexible. The prospect of profits in the high-demand state may not be sufficient to compensate them for the losses they may incur in the low-demand state, where some resources would be wasted. Rigidities in this case inefficiently reduce a stand-alone's investment and profits relative to a group affiliate.

We next explain how the advantage of labor flexibility is affected by capital flexibility and how this effect is moderated by the ease of substitution between labor and capital.

Low substitution between labor and capital

Imagine that labor and capital must be used in fixed proportions. For stand-alones, when labor and capital cannot be easily substituted, flexibility in one input alone is of little advantage. That is, the cost of labor inflexibility when capital is flexible is large (moving from cell A to cell B) because both labor and capital are required to produce. By contrast, the cost of labor inflexibility when capital is also inflexible is relatively small (moving from cell C to

cell D), because production is already constrained by rigid capital. A single friction is enough to constrain profits severely when inputs are nonsubstitutable and flexibility in both input markets may be necessary for stand-alones to operate profitably. This implies that labor market frictions are particularly costly to stand-alones when financial markets are developed. To the extent that group affiliates are unaffected by imperfections in input markets, one source of market friction is enough to advantage affiliates over stand-alones. Imperfections in the other input market add little to the relative advantage of group affiliates.⁷

High substitution between labor and capital

When capital and labor can easily be substituted, however, labor market imperfections are not very

⁷ To further flesh out the relationship between labor and capital flexibility, it is useful to consider the following special case; suppose that a firm decides whether or not to invest in a risky business opportunity. For inequality (1) to hold, moving from zero frictions to a single friction (left-hand side of the inequality) has to be more costly than moving from a single friction to two frictions (right-hand side of the inequality). Because stand-alone firms choose not to invest when expected profits are negative, if a single friction pushes profits close to zero, the second friction will not have a large effect on profits, because profits are bound from below by zero.

detrimental to stand-alones when capital is flexible, because labor adjustment will be borne by capital. Stand-alone firms will substitute rigid labor with flexible capital, eliminating the labor flexibility advantage of group affiliates. Similarly, capital market imperfections are not very detrimental when labor is flexible. Only when labor and capital markets are both underdeveloped is stand-alones' performance seriously impaired. It follows that, for stand-alones, the cost of labor inflexibility when capital is flexible tends to be small (moving from cell A to cell B), while the cost of labor inflexibility when capital is inflexible tends to be large (moving from cell C to cell D). Consequently, labor market imperfections lead to a larger competitive advantage for group affiliates, vis-à-vis stand-alones, when capital markets are underdeveloped. Therefore, whether we expect labor market imperfections to provide a larger competitive advantage for group affiliates relative to stand-alone firms in developed capital markets depends on the ease with which labor can be substituted by capital.

An important literature in macroeconomics is dedicated to estimating the elasticity of substitution between labor and capital. This literature strongly suggests that the elasticity of substitution between labor and capital is low. In a comprehensive survey, Chirinko (2008) surveys more than 30 studies that conclude that the elasticity of substitution ranges from 0.4 to 0.6.⁸ To put these estimates in perspective, when inputs are used in fixed proportions (perfect complements), the implied elasticity is zero, whereas when inputs can be freely substituted (linear production function), the implied elasticity of substitution is infinity. The familiar Cobb-Douglas production function has an elasticity of substitution equal to 1. The consensus in the literature, therefore, is that labor cannot be substituted easily with capital.⁹ Consistent with this consensus, examining labor intensity patterns in our sample (ratio between

number of employees and fixed assets) reveals that stand-alones tend not to replace labor with capital when labor becomes more rigid (arguably, stronger EPL is equivalent to raising the relative cost of labor). In strong EPL countries, the ratio between labor and capital is 0.152 and in weak EPL countries this ratio is 0.155.

Our theoretical discussion and the empirical stylized facts on the ease of substitution between labor and capital lead to the prediction that *because substituting labor with capital is often difficult, the group advantage of flexibility in changing labor would be stronger in high-financial-development countries.*

DATA

We construct our sample from the Bureau van Dijk's (BvDEP) Amadeus ownership and financial database, which provides wide and representative coverage of both private and public companies in Europe. BvDEP standardizes financial items across the various countries' filing regulations and captures a wide range of firm sizes. Our data include three main sections, which we describe in detail below: ownership, country measures of labor regulations and financial development, and industry employment measures. Table 1 provides information on the main variables used in the analysis.

Ownership

Our data include detailed ownership links between European firms from the 2007 version of Amadeus. Amadeus provides information on equity links between firms in Europe. We determine which of these inter-firm dyadic ownership links represent a controlling interest. We follow Belenzon *et al.* (2013) and define a corporate group as a collection of at least two legally distinct firms in which one is a controlling ultimate shareholder, where control is identified according to the equity links

⁸ Notable works in this literature include (Chirinko and Mallick, 2014; Hamermesh, 1993; Mairesse, Hall, and Mulkay, 1999; Oberfield and Raval, 2014).

⁹ Our theoretical discussion assumes that the elasticity of substitution is a technical characteristic of the production function and is unaffected by the institutional environment. However, a concern is that within Europe, the elasticity of substitution is higher in countries where external capital can be accessed more easily. Importantly, this is inconsistent with estimates from the literature indicating low substitution even for the United States, where external capital is easily accessible. Thus, it is unlikely that within our European sample, firms that operate in countries with relatively developed financial markets face a high elasticity of substitution.

More generally, there is no evidence that the elasticity of substitution rises with financial development. In his survey of the literature, Chirinko (2008) presents elasticity estimates for the U.S., Great Britain, and the Euro area (Table 1). The evidence is inconsistent with higher elasticity of substitution in more financially developed countries: estimates for Great Britain, the U.S., and the Euro area are 0.32–0.42, 0.4–0.6 and 0.7, respectively.

Table 1. Variable descriptions

Variables	Description	Source
Corporate group affiliate	A firm that controls or is controlled by another firm through equity ties	Amadeus 2007
Employee dismissal protection index (EPL)	Level of cost and difficulty for a firm to dismiss individual employees on regular contracts (index range 0–6; low to high)	Organisation for Economic Cooperation and Development (OECD) (1997–2007)
Labor market expenditures	Percent of GDP spent by countries on labor market expenditures, such as unemployment insurance and training	OECD (1997–2007)
Rigidity of employment index	Country-level index of rigidity of employment (index range 0–1; least rigid to most rigid)	The World Bank Indicators (2004–2007)
Flexibility in hiring and firing workers	Country-level index of flexibility to hire and fire workers (index range 1–7; from flexibly determined by employer to impeded by regulation)	Executive Opinion Survey (2008–2009)
Firing costs	Country-level measure of firing costs in terms of weeks of wages paid (natural log)	Executive Opinion Survey (2008–2009)
Industry labor turnover	Average annual fluctuation in U.S. total establishment-level employment within an industry	Bureau of Labor Statistics, Current Employment Statistics (1977–2003)
Country financial development index	The ratio of the total stock market value traded in the country to the country's GDP	The World Bank indices for financial development
Industry dependence on external financing	Industry average of the ratio between firm capital expenditures minus cash flow from operations and capital expenditures	COMPUSTAT firms (1980–2000)
Chinese import penetration	Industry-level share of the value of imports originating from China of total imports in an industry and country	UN Comtrade database and Eurostat Prodcum database (1999–2006)
Group geographical concentration	Group-level measure of average geographical distance between cities affiliates are located in	Longitude and latitude data for each city

described above. A firm is classified as a group affiliate if (1) the firm has a controlling parent company (it is a subsidiary), (2) it is a parent company of another firm (it has a subsidiary), or (3) it has the same controlling shareholder as at least one other firm.¹⁰ We exclude firms with missing ownership information.¹¹ Later we explore the dynamics of corporate group affiliation using time-series ownership data. These data are collected by joining

together cross-sectional ownership data for each publication year from 2007 to 2011.

Country employment regulations and financial development

Employment protection laws (EPL). Our main measure of country EPL is the OECD employment dismissal protection index for the 1998–2008 period. This index measures the difficulty of dismissing workers across countries. It includes different procedural inconveniences, severance pay, and overall difficulty of dismissal for economic and performance reasons. The index ranges from 0 to 6, with higher values indicating stricter regulations.

¹⁰ Details on the methodology used to construct ownership links are summarized in Belenzon and Berkovitz (2010).

¹¹ In the Robustness Analysis section we show that our results are robust to including firms with missing ownership information and classifying these firms as stand-alones.

We use the average annual dismissal protection index for each country in our sample. EPL vary widely across countries, from highly protected countries, such as Greece (3.11) and Spain (3.01), to the least-protected countries, such as the Great Britain (1.07) and Switzerland (1.60).

Labor expenditures

Besides dismissal regulations, we utilize the OECD's data on a country's labor expenditures (labor expenditures over GDP) to measure employment protection. Labor expenditures are another way countries can protect employees from dismissals: countries tax employers and provide benefits, such as unemployment insurance, from a common pool. The main difference is that firms bear the costs of labor expenditures regardless of whether they dismiss employees, whereas EPL apply to each dismissal. We expect no effect of employment expenditures on the likelihood of group affiliation and financial performance, as this protection does not impose costs on labor readjustment across markets.¹²

Alternative measures of employment protection laws

We utilize several alternative country measures as robustness checks of the main EPL measure: rigidity of employment index, flexibility in hiring and firing workers, and firing costs.¹³ Table 1 and Table A2 in File S1 provide information on how these measures are constructed and their value by country. These measures are strongly correlated with our primary EPL variable. The correlation between EPL and rigidity of employment index is 0.81, and the correlation between EPL and flexibility in hiring

and firing workers is 0.66. However, the correlation between EPL and firing costs is lower, at 0.25. This suggests firing costs comprise only one dimension in the overall employment-protection index, and different mixes of policies exist in our sample countries. We aim at capturing this variation through the above different employment protection measures.

Financial development

To measure a country's financial development, we use the World Bank indices for financial development and rank countries according to the ratio of the total stock market value traded in the country to the country's GDP (Beck, Demirgüç-Kunt, and Levine, 2000; Belenzon *et al.*, 2013). Countries ranked highest in their level of financial development include Great Britain and Switzerland, and among countries with lowest ratio of stock value traded in terms of their GDP are Austria and Greece. Table A1 in File S1 presents the complete set of values for our sample countries.

Industry employment measures

We rank industries by their level of labor turnover using U.S. data. The U.S. market is likely the least regulated market in the developed world; thus U.S.-specific employment regulations are not likely to affect firing and hiring decisions significantly. Additionally, groups are less common in the United States, so U.S. labor turnover should be a good measure of the frequency of labor readjustment in stand-alone firms. Lastly, U.S. industry data are separate from European firms' data, but major industries are structurally similar, so a U.S. industry's labor turnover is likely to be a good measure of that industry's turnover in Europe.

We make two main assumptions on the nature of the industry measures: the first is that structural reasons (as opposed to, for example, local demand and supply conditions) explain why some industries have higher labor turnover than others, and the second is that these differences persist across countries.

The main reasoning for the structural factors affecting the turnover of entire industries rests on the composition of occupations in an industry. If the share of an industry's total employment is dominated by a certain occupational group of workers, then their turnover would drive the industry's turnover rates.

¹² Country spending on labor expenditures varies widely. Denmark spent the largest share (4.15%) of its GDP on labor-market expenditures, whereas the UK spent the smallest share (0.58%).

¹³ Rigidity of employment index is from the World Bank's Doing Business ranking publication for 2004–2007. The index is an average of three sub-indices for difficulty of hiring on fixed-term contracts, rigidity of work-hour restrictions, and difficulty of terminating redundant employees. This index ranges from 0 to 1, where higher values indicate more rigid employment regulations. Flexibility in hiring and firing workers is from the Executive Opinion survey (2008–2009) and measures local business executives' perceptions of labor regulations. This index ranges from hiring and firing decisions being flexibly determined by employers (1) to being strictly constrained by regulations (7). Firing costs is from the World Bank's Doing Business report (2009). It is the number of weeks of wages paid as severance to dismissed employees.

For example, in our sample, industries with the highest turnover rates include apparel stores (0.087) and transportation services (0.079), and industries with lowest turnover are printing and publishing services (0.020) and paper products (0.019). According to the Bureau of Labor Statistics' (BLS) Occupational Employment Statistics breakdown of each industry employment by occupations, the apparel stores industry labor force consists predominantly of sales occupations (87.95%), such as retail sales workers and their first-line supervisors.¹⁴ According to the *Economist*, a survey by the National Retail Federation estimated turnover of full-time retail workers at 74 percent.¹⁵

The next largest occupational group in the industry is office and administrative support workers, which comprise 8.07 percent of the labor force in the industry. These numbers suggest that the apparel store industry turnover is driven by the turnover of retail sales workers, which is a more structural factor than anything a single firm could overcome easily with a proper strategy.¹⁶ On the other hand, 51.98 percent of the labor force in the printing and publishing industry consists of printing production workers, such as printing press operators and print binding and finishing workers.¹⁷ In the paper products industry, 54.55 percent of workers are paper goods machine setters, operators, tenders, and printing and cutting workers. It is likely that these production workers require a greater industry-specific skill set that is not as easily transferrable as sales and driving skills.

Our main industry variable is *labor turnover*. We construct labor turnover for each industry using annual establishment-level employment data from the BLS's Current Employment Statistics Survey (1977–2003). This employment series data includes employment figures for all employees on payroll, including production, construction, and

nonsupervisory employees. Following Autor *et al.* (2007) and Bozkaya and Kerr (2013), we calculate firm-level labor-turnover rate as the average of absolute change in annual employment at the firm, divided by the average firm employment across two years. The industry labor-volatility measure is the average of firm turnover rate in each two-digit SIC industry.^{18,19}

Prevalence of collective labor agreement contracts may influence the U.S.-based turnover rates, as union contracts may act as a substitute for country employment regulations. We use the Current Population Survey data from the Bureau of Labor Statistics between 2003 and 2007 to determine industries with higher shares of employees covered by labor union contracts. All reported specifications exclude industries with labor union membership of more than 25 percent of the labor force in the U.S. Our results are not sensitive to the specific threshold of industry unionization.

To further test our assumption that industries in the U.S. are structurally similar in turnover rates to industries in Europe, we construct industry-level turnover measure using all the firm-level data in our European sample countries between 1997 and 2007. The raw correlation between the U.S.-based turnover measure and Europe-based measure is about 0.40. In the econometric analysis we present results using the European labor turnover measure.²⁰

¹⁸ Industries with the highest labor turnover include apparel (SIC 23) with 0.087 and transportation services (SIC 42) with 0.079; industries ranked with the lowest turnover rates include paper products (SIC 26) with 0.019 and printing and publishing (SIC 27) with 0.020. Table 3 presents more examples of high- and low-turnover industries.

¹⁹ Our empirical approach of using U.S. industry turnover rates for European firms is based on two main assumptions. First, the turnover characteristics of an industry depend on the industry's occupational composition, which should be comparable across countries. Second, the ranking of the industry turnover should hold within a country—even if the overall turnover rates are higher in U.S. than in the EU, industry turnover should maintain similar ranking within a country from low to high. We compare the structural composition of select industries in the U.S. and Germany and rank industry turnover rates within Germany to provide additional evidence for the comparability we argue for. We thank an anonymous reviewer for the suggestion of using Germany as an example due its unique labor practices. Detailed analyses are available upon request.

²⁰ The European-based measure is subject to endogeneity concerns because aggregate economic conditions that affect labor turnover in Europe are also likely to affect firm performance in our sample. However, it is important to note that the European labor turnover measure is based on millions of firms and thus is unlikely to be affected by firm-specific shocks.

¹⁴ http://www.bls.gov/oes/current/naics4_812100.htm, accessed on August 10, 2014

¹⁵ <http://www.economist.com/node/5988>

¹⁶ Similarly, in the transportation industry, the largest occupational group of workers consists of various motor vehicle operators (56.37% of the industry's labor force). This group includes occupations such as freight truck drivers, couriers and express delivery workers, bus transportation workers, laborers and material movers, and flight attendants (http://www.bls.gov/oes/current/naics2_48-49.htm). It is likely that motor vehicle operators are quite mobile and can move easily across firms.

¹⁷ http://www.bls.gov/oes/current/naics3_323000.htm

Table 2. Summary statistics for main firm and group variables

Variable	# firms/groups	Mean	Std. dev.	Distribution		
				10th	50th	90th
Firm level						
<i>Sales</i> (\$,'000)	1,213,681	25,744	763,338	177	1,134	16,282
<i>Employment</i>	897,808	92	1,947	1	8	75
<i>Assets</i> (\$,'000)	720,811	44,834	1,339,466	108	934	22,673
<i>Firm age</i>	1,200,956	17	19	2	11	36
<i>Employment growth</i>	428,263	0.051	0.278	−0.124	0.000	0.249
<i>Investment</i>	264,835	0.096	0.322	−0.200	0.082	0.412
<i>Return on assets</i>	313,484	2.035	1.399	0.667	1.737	3.678
<i>Labor productivity</i>	486,049	5.117	0.868	4.161	5.009	6.247
<i>Sales growth</i>	460,038	0.051	0.361	−0.225	0.072	0.353
Corporate group level						
<i># of affiliates</i>	68,137	4	10	2	2	6
<i>Sales</i> (\$, mm)	68,137	592	8,413,815	1	18	338
<i>Assets</i> (\$, mm)	68,137	1,082	36,300,000	1	10	271
<i>Employment</i>	68,137	973	10,840	2	55	789
<i>Industry concentration index (HHI)</i>	68,137	0.74	0.23	0.43	0.77	1

Notes: This table provides summary statistics on main firm and group variables in the estimation sample. In the upper panel, the unit of observation is a firm; in the lower panel, the unit of observation is a corporate group. Investment is the annual change in the natural log of firm's fixed assets. Return on assets is calculated as firm sales over its total assets. Labor productivity is equal to the natural log of firm's sales per employee. Sales growth is the difference in the natural log of annual sales.

Descriptive statistics

Table 2 presents summary statistics for firms and groups in our sample. The average firm has 92 employees (a median of 8) and generates \$25.7 million in annual sales (\$1.1 million median). Twenty two percent of the firms are affiliated with one of the 68,137 corporate groups in our sample. The average group has a total of four affiliates (with a 90th percentile of 6). The average group holds around \$1 billion in assets; however, groups at the highest end of the distribution seem to drive this magnitude, because the median is \$10 million, and the 90th percentile is \$271 million. Affiliates tend to be larger in terms of sales, total assets, and the number of employees, but similar to stand-alone firms in terms of age (Table A2, File S1). Interestingly, we find that affiliates have much higher turnover than stand-alone firms, consistent with the basic premise of this paper of higher labor-adjustment costs for stand-alone firms.

ECONOMETRIC SPECIFICATION

We build on the notion that firms encompass multiple businesses inside their boundaries to create internal markets and examine the effects of labor markets frictions on the way firms organize

and on how well they perform. Our first empirical specification estimates the effect of EPL on the likelihood of group affiliation. We estimate a linear probability model (LPM) where the dependent variable is a dummy that receives the value of 1 for firms that are affiliated with a corporate group and 0 for stand-alone firms.²¹ The econometric specification is given as:

$$\begin{aligned} \Pr(\text{Affiliate} = 1)_i = & \alpha_1 \text{Sales}_i + \alpha_2 \text{EPL}_c \\ & \times \text{Turnover}_j + \alpha_3 \text{FinDev}_c \\ & \times \text{ExtDep}_j + \phi_j + \eta_c + \varepsilon_i \quad (2) \end{aligned}$$

Where i denotes firms – the unit of observation, Sales is annual sales for the most recent available year, EPL_c is employment regulation for country c , Turnover_j is a measure of labor turnover for industry j , ϕ_j and η_c are complete sets of industry and country dummies, respectively, and ε_i is an iid error term. To ensure the EPL effect is not picking up the effect of country financial development, we control for the

²¹ Our preferred estimation method is LPM because of the ease with which coefficient estimates on interaction terms can be interpreted. Table A10 in File S1 presents coefficient estimates for equivalent Probit specifications and Figure A1 in File S1 shows how the effect of EPL on the probability of group affiliation increases with higher industry labor turnover.

Table 3. Percentage of group affiliates in high- and low-turnover industries by EPL

	(1) Countries with low EPL	(2) Countries with high EPL	(3) High EPL minus low EPL
Examples of high-turnover industries (% of group affiliates)			
Health and personal care services	18.5	59.0	40.5
Transportation services	20.7	50.5	29.8
Management services	24.2	49.6	25.4
Insurance carriers	23.6	46.8	23.2
Apparel stores	11.4	33.8	22.4
Examples of low-turnover industries (% of group affiliates)			
Chemicals	51.1	57.3	6.2
Heavy construction	21.5	30.0	8.5
Wholesale trade	21.9	35.0	13.1
Printing and publishing	32.6	46.7	14.1
Paper products	36.4	52.8	16.4

Notes: This table presents patterns of affiliation in selected industries with high and low labor turnover in countries with high and low EPL. The EPL measure is the average OECD employment dismissal protection index in 1998–2008. Industry labor turnover is the average of the firm-level turnover rate in each two-digit SIC industry, calculated as the average of absolute change in annual employment at the firm divided by the average firm employment across two years. Columns 1 and 2 present the share of affiliates by industry and country. Column 3 reports the difference between the share of affiliates in countries with low and high EPL after partialling out industry and country effects.

interaction between country financial development and industry external dependence (Belenzon *et al.*, 2013).

Consistent with the prediction that the difference in share of affiliated firms between high- and low-labor-turnover industries would be larger in countries with higher EPL, we expect $\tilde{\alpha}_2 > 0$. $\tilde{\alpha}_2$ measures how much higher the likelihood of affiliation is at a high level of industry labor turnover compared with an industry with low labor turnover, when the industry is located in a country with high EPL rather than in one with low EPL. In all regressions, we report $\Delta P = \tilde{\alpha}_2 \Delta EPL \times \Delta Turnover$, where industry and country differences are computed by moving from the lowest to the highest quartile.²²

Building on our theoretical discussion from section “The interaction between EPL and financial development”, we expect α_2 to vary by country financial development. To test this, we split the sample at the median level of country financial development (the ratio of stock market value traded in the country to the country’s GDP) and test for differences in α_2 between the two subsamples.

Table 3 illustrates our empirical approach. This table presents the highest and lowest ranked industries with respect to labor turnover for countries with high and low EPL (split by median). Columns 1 and 2 present the share of group affiliates in each industry by two levels of EPL: low and high, respectively. Column 3 presents the difference in group affiliation in respective industries between countries with high and low EPL, after removing country and industry effects. A clear difference in group affiliation is present between industries with the highest and lowest turnover: a larger share of firms in industries with the highest turnover are affiliates, especially in countries with stricter (above the median) EPL. The difference in affiliation ranges from 22.4 to 40.5 percent in industries with the highest turnover; in industries with the lowest turnover, the difference between high- and low-EPL countries is much smaller, between 6.2 and 16.4 percent.

Our second empirical specification investigates how the difference in financial performance between group affiliates and stand-alone firms relates to EPL and financial development, as follows:

$$y_{it} = \beta_1 Affiliate_i + \beta_2 Affiliate_i \times EPL_c + Z' \beta + \phi_j + \eta_c + \varepsilon_{it} \quad (3)$$

²² Taking the first difference in probability of affiliation with respect to labor turnover, holding fixed country EPL, yields $\Delta P_c = \beta_2 EPL_c \times \Delta Turnover$. Next, taking the difference in ΔP_c between high and low country labor regulation yields $\Delta P = \beta_2 \Delta EPL \times \Delta Turnover$.

where y_{it} denotes measures of firm performance (sales and employment growth, return on assets, profit margin) and Affiliate_i is a dummy variable that receives the value of 1 for group affiliates and 0 for stand-alone firms. Our interest lies at how the benefit of group affiliation varies with EPL, captured by the estimate $\hat{\beta}_2$. Our theory predicts that β_2 varies by country financial development. To test this theory, we split the sample at the median level of country financial development (the ratio of stock market value traded in the country to the country's GDP) and test for differences in $\hat{\beta}_2$ between the two subsamples for each firm performance measure. We expect β_2 to be larger in the subsample of financially developed countries.

RESULTS

Likelihood of group affiliation

Table 4 presents the estimation results for the effect of EPL on the likelihood of group affiliation. As expected, we find that group affiliation is more likely in countries with stronger EPL, especially in industries with high labor turnover ($\alpha_2 > 0$). Based on the estimates from column 1, the differential effect of ILMs redeployment, ΔP , is 3.5 percentage points: the difference between the highest and lowest deciles of industry labor turnover rises by 3.5 percentage points (or 16% of the sample average share of group affiliates) when moving from the lowest to the highest EPL country.²³ Figure 3 presents the results by country and shows that the differences in the likelihood of group affiliation between the lowest and highest deciles of industry labor turnover increase with country EPL from 4.4 percent in Great Britain to 12.7 percent in Greece.

Column 2 adds the OECD index of labor expenditures. The measure of country labor expenditures is not related to firm-specific firing or hiring decisions and thus should not affect group affiliation. As expected, the coefficient estimate of labor expenditures is zero.

Column 3 further tests our theory by including all possible interactions of country EPL and

financial development with industry labor turnover and external finance dependence. As expected, the interactions of EPL with external finance dependence and financial development with industry labor turnover are statistically insignificant. The estimated coefficient on the key interaction of interest between EPL and industry labor turnover remain robust. This pattern of results reassures us that combining our country-industry measures is indeed consistent with our proposed mechanism.

In columns 1–3, industry labor turnover data are from the U.S. BLS Current Employment Statistics Survey. To test the concern that U.S. data do not capture well worker mobility patterns in Europe, we use an alternative European data source on employment turnover. We follow the same procedure using all firms in our sample countries in Amadeus (1997–2007). The correlation between our primary U.S.-based industry labor-turnover measure and Europe-based alternative measure is about 0.40. Column 4 presents the estimation results for the alternative industry labor turnover measure using employment turnover rates based on firms in Europe. The results remain robust.²⁴

Having established a strong positive effect of EPL on the likelihood of group affiliation, we turn to examine how this effect varies by country financial development. If labor cannot be easily substituted for capital, we expect a stronger EPL effect in countries with more developed financial markets. Columns 5–6 split the sample by high and low levels of country financial development and present results that are consistent with this conjecture. The estimated coefficient on the country-industry interaction term for high financial development subsample is large, positive, and significant (column 5) compared to the smaller and statistically insignificant estimated coefficient for the low financial development sample (column 6). We reject the null

²³ The unreported results of the level effects for industry labor turnover indicate group affiliation is more likely in industries with more turnover (estimated coefficient on industry labor turnover is positive and significant).

²⁴ Our industry ranking by labor turnover may be noisy, because turnover also includes voluntary labor separations, which are not subject to EPL. To test the robustness of our results, we create a measure for industry involuntary labor turnover by using the data on employer-initiated separations from the BLS's Job Openings and Labor Turnover Survey (2003–2007). Using monthly industry-level data on layoffs and involuntary dismissals due to reorganizations, elimination of positions, and firings, we calculate industry-level involuntary labor turnover rate as average rate of layoffs. Because EPL do not apply to voluntary separations, this measure provides a potentially "cleaner" ranking of industries by separating voluntary from involuntary turnover. Using this alternative industry ranking yields very similar estimates to those presented in column 1.

Table 4. The effect of EPL on group affiliation

Dependent variable: <i>dummy for group affiliation</i>						
	(1)	(2)	(3)	(4) EU labor turnover	(5) Financial development >Median	(6) Financial development ≤Median
<i>EPL × industry labor turnover</i>	0.967** (0.372)	1.028** (0.420)	0.931* (0.457)	0.439** (0.182)	1.277** (0.337)	0.553 (0.696)
<i>Country labor expenditures × industry labor turnover</i>		−0.079 (0.226)			Different at $p < 0.01$	
<i>Country financial development × industry finance dependence</i>	−0.070* (0.032)	−0.072* (0.032)	−0.118** (0.034)	−0.080** (0.032)		
<i>EPL × industry finance dependence</i>			0.005 (0.003)			
<i>Country financial development × industry labor turnover</i>			0.021 (0.259)			
ln(<i>Sales</i>)	0.074** (0.003)	0.074** (0.003)	0.077** (0.003)	0.074** (0.003)	0.108** (0.004)	0.048** (0.002)
Country dummies (15)	Yes	Yes	Yes	Yes	Yes	Yes
Two-digit SIC dummies (74)	Yes	Yes	Yes	Yes	Yes	Yes
Differential in affiliation probability (EPL) (%):	3.5	3.7	3.4	2.8	8.1	
% affiliated:	21.9	21.9	23.2	21.9	34.3	13.7
R ²	0.270	0.270	0.259	0.270	0.280	0.220
Observations	1,188,524	1,188,524	824,646	1,188,524	502,419	693,663

*Significant at 5%; **significant at 1%

Notes: This table presents the estimation results of linear probability models that examine the effect of EPL on corporate group affiliation. *EPL* is the average OECD employment dismissal protection index over the period 1998–2008. *Industry labor turnover* is the average of the firm-level turnover rate in each two-digit SIC industry, calculated as the average of absolute change in annual employment at the firm divided by the average firm employment across two years. *Country financial development* is the ratio of stock market value traded in the country to the country's GDP. *Industry external dependence* is the average of the ratio between firm capital expenditures minus cash flow from operations and capital expenditures for COMPUSTAT firms over the period 1980–2007. Column 4 uses alternative industry turnover measure calculated using data from all firms in our sample EU countries (1997–2007). All regressions are cross-sectional, at the firm level, and are based on 2007 ownership structure. Sales data are for 2006 or the most recent year for which data are available. *Differential in affiliation probability* calculates how much higher the likelihood of affiliation is at the 90th percentile level of industry labor turnover with respect to an industry at the 10th percentile level when it is located in a country at the 10th percentile of EPL rather than in one at the 90th percentile of EPL. Standard errors (in brackets) are robust to arbitrary heteroskedasticity and allow for serial correlation through clustering by country and industry.

hypothesis that these two coefficients are equal to one another (p -value < 0.01).

We further test our prediction that internal labor markets induce a stronger competitive advantage in environments where external capital is flexible by splitting industries by their dependence on external finance. We expect that the ability to readjust capital externally should matter more in industries with greater dependence on external finance. Our results are consistent with this view. Table A3 in File S1 shows that the EPL effect is stronger in industries with above median value of external dependence

(column 1) and that this result is driven by countries with high financial development (column 3).

FINANCIAL PERFORMANCE

Table 5 examines how the effect of group affiliation on financial performance varies with EPL and financial development. We expect the competitive advantage of group affiliation due to higher labor flexibility to be stronger in countries with high financial development. This prediction is confirmed using multiple measures of financial performance.

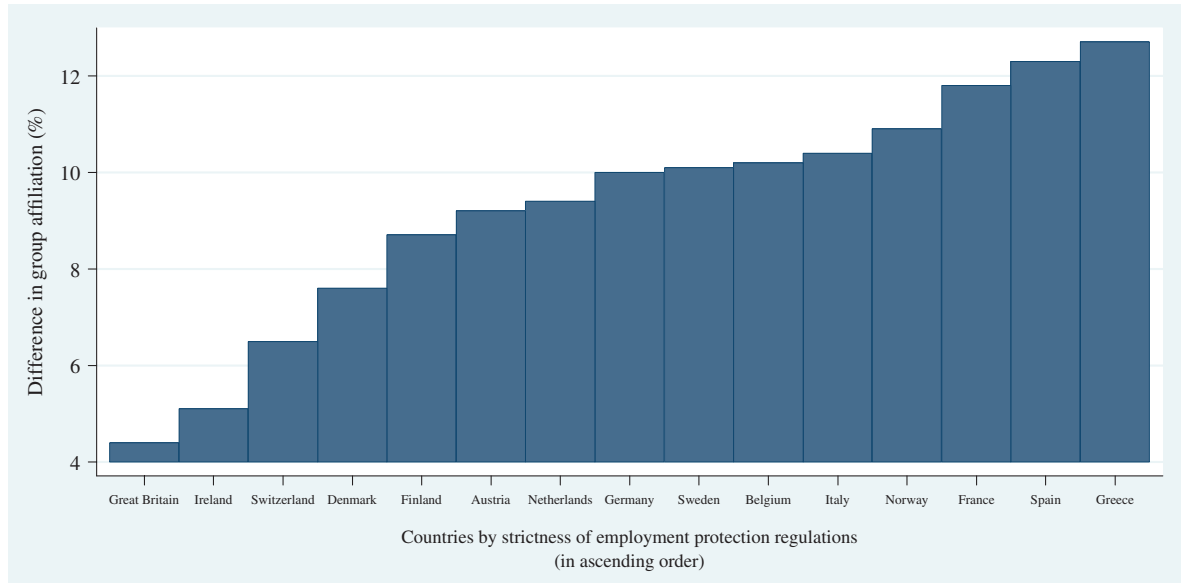


Figure 3. Incidence of group affiliation between industries with high and low labor turnover by country EPL. *Notes:* This graph plots the differential in affiliation for firms at the 90th percentile level of industry labor turnover with respect to firms at the 10th percentile of industry turnover for all 15 countries in our sample. The industry-level turnover rate is the absolute change in firm's annual employment divided by the average firm employment across two years, averaged at the two-digit SIC industry. The strictness of EPL is ranked using the average OECD index of country employment protection in 1998–2008. The estimated coefficients are from the main specification in Table 4 (column 1). The difference in the share of firms affiliated with corporate groups is on the vertical axis. The horizontal axis lists the countries in the ascending order according to the strictness of their EPL

Columns 1–6 estimate growth specifications. When pooling all countries together, there is no difference in growth rates between affiliates and stand-alone firms, and this does not vary with EPL (column 1). However, splitting the sample by countries with below- and above-median values of financial development uncovers substantial variation. Group affiliates grow faster than stand-alone firms, especially in strong-EPL countries with high financial development (column 2); however, there is no difference in growth rates in low financial development countries (column 3). The range of the effect is large. Based on the estimates from column 2, moving from weakest to strongest EPL country doubles the difference in growth rates between affiliates and stand-alone firms (the coefficient estimate on group affiliation dummy rises from 0.021 to 0.043). Relative to the sample average, these estimates imply that group affiliates grow 29 percent faster than stand-alones in the lowest EPL country (Great Britain) and at a rate of 48 percent faster in the strongest EPL country (Greece).

Similar effects hold for measures of firm profitability (columns 7–12) and labor productivity

(columns 13–15). In all cases the effect of group affiliation rises with EPL in high financial development countries, but not in low financial development countries.

EVIDENCE ON INTERNAL REDEPLOYMENT

We complement our findings that internal labor markets can be a source of competitive advantage with direct evidence on the prevalence of internal labor markets in strong-EPL countries. First, we investigate whether group affiliates redeploy workers to other affiliates when industry shocks prompt readjustment of labor. Second, we juxtapose the incidence of internal and external managerial mobility in conditions of higher EPL. The patterns of within-group labor redeployment in response to industry shocks, together with the direct evidence of internal managerial mobility, provide important confirmation of intrafirm labor redeployment—a phenomenon particularly evident in countries with high EPL.

Table 5. Group affiliation and firm outcomes by EPL and financial development

Dependent variable <i>Country financial development:</i>	(1) Sales growth ($\Delta \ln Sales$)		(2) >Median		(3) ≤Median		(4) Employment growth ($\Delta \ln Employment$)		(5) >Median		(6) ≤Median		(7) Profit margin ($EBIDTA/Sales$)		(8) >Median		(9) ≤Median		(10) Return on assets ($EBIDTA/Assets$)		(11) >Median		(12) ≤Median		(13) Labor productivity ($\ln(Sales/Employment)$)		(14) >Median		(15) ≤Median	
	All		All		All		All		All		All		All		All		All		All		All		All		All		All		All	
<i>Group affiliation dummy</i> × <i>EPL</i>	0.008 (0.006)		0.011** (0.002)		-0.018 (0.052)		0.002 (0.004)		0.005** (0.001)		-0.044 (0.054)		0.006** (0.002)		0.006** (0.001)		-0.029 (0.015)		0.003 (0.003)		0.004** (0.001)		-0.081 (0.077)		0.083** (0.017)		0.092** (0.014)		-0.081 (0.296)	
<i>Group affiliation dummy</i>	0.030 (0.017)		0.021** (0.004)		0.098 (0.133)		0.029 (0.018)		0.013* (0.004)		0.166 (0.142)		-0.027* (0.011)		-0.020** (0.003)		0.075 (0.037)		-0.016 (0.012)		-0.009* (0.004)		0.205 (0.200)		0.013 (0.073)		-0.018 (0.050)		0.434 (0.777)	
$\ln(Sales_{t-1})$	-0.057** (0.005)		-0.062** (0.005)		-0.051** (0.007)								0.039* (0.017)		0.040 (0.023)		0.036* (0.012)		0.049* (0.020)		0.060 (0.025)		0.018 (0.013)							
$\ln(Employment_{t-1})$							-0.064** (0.011)		-0.049** (0.011)		-0.088** (0.008)														-0.055* (0.019)		-0.060 (0.030)		-0.053** (0.009)	
$\ln(Assets_{t-1})$													-0.031* (0.013)		-0.031 (0.018)		-0.032* (0.010)		-0.039** (0.011)		-0.046* (0.014)		-0.022 (0.009)							
$\ln(Firm\ age)$	-0.049** (0.008)		-0.058** (0.010)		-0.037** (0.006)		-0.032** (0.005)		-0.036** (0.007)		-0.026** (0.002)		0.008** (0.001)		0.008** (0.001)		0.010* (0.003)		0.021 (0.015)		0.024 (0.019)		0.008* (0.002)		0.024 (0.013)		0.039 (0.018)		0.008 (0.005)	
Country dummies (15)	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
SIC dummies (287)	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Year dummies (9)	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Sample average:	0.106		0.114		0.096		0.051		0.053		0.049		0.033		0.032		0.037		0.063		0.060		0.074		5.149		5.165		5.130	
R ²	0.186		0.188		0.189		0.087		0.075		0.112		0.016		0.018		0.016		0.001		0.001		0.010		0.373		0.362		0.400	
Observations	1,893,704		1,073,708		819,996		1,733,176		974,003		759,173		1,209,371		949,866		259,505		1,209,193		949,693		259,500		1,733,176		974,003		759,173	

*Significant at 5%; **significant at 1%.

Notes: This table presents OLS estimation results (firm-year) for the difference in performance between group affiliates and stand-alone firms by country EPL and financial development. The sample period is 1998–2006. *Country financial development* is the ratio of stock market value traded in the country to the country's GDP. *EPL* and ownership data are based on 2007 data. All regressions include a complete set of year dummies. Standard errors (in brackets) are robust to arbitrary heteroskedasticity and allow for serial correlation through clustering by country and industry.

Intragroup labor mobility and Chinese import penetration

As industry conditions change, corporate group structure is advantageous because affiliates can shift resources within groups more efficiently than through external markets. We examine how affiliate employment size changes in response to negative shocks in the industry. We use changes in the industry level of imports from China as an exogenous trigger of redeployment and examine changes in affiliate employment size when imports increase for the focal affiliate industry and for the rest of the group. Following Bloom *et al.* (2011), we calculate the level of Chinese import penetration as the share of the value of imports originating from China of total imports in an industry and country from 1999 to 2006.²⁵ We observe a significant rise in imports from China over time across industries: import rates more than double from an average of two percent in 1999 to five percent in 2006.²⁶

We distinguish between two types of Chinese import penetration for each affiliate: the share of imports from China to the focal affiliate's industry and the share of imports to industries of other group affiliates that do not operate in the focal affiliate's industry. We also use annual changes in the share of imports from China to measure changes in import penetration to the focal affiliate's industry, and we use the largest change in the share of imports from China to industries of other group affiliates to measure industry shocks in the rest of the group for that year. We estimate the relationship between these two types of import penetration and the affiliate's employment size, controlling for group and year effects.

Table 6 presents the estimation results. Our findings are consistent with internal labor redeployment. As Chinese imports increase in the focal affiliate's industry, employment size in that affiliate drops, but as Chinese imports increase in industries

in which the rest of the group is operating, the focal affiliate's employment size increases (column 1). These results suggest affiliates are shifting labor across the group as their industry conditions deteriorate and are absorbing labor when other affiliates need to restructure. Next, in columns 2 and 3, we split the sample by the country-level median of EPL. Consistent with the main predictions, we find ILMs are active primarily in high-EPL countries (column 2).

Columns 4–5 provide more fine-grained evidence on the group internal labor markets. Groups in our sample vary by their geographical scope. Presumably, mobilizing workers should be more costly in dispersed groups. Thus, consistent with worker mobility, we expect Chinese import penetration to be a stronger trigger of mobility in groups that are more geographically concentrated. We obtain a city location for each affiliate in the group and compute a group-level measure of geographical concentration.²⁷ We split the sample into collocated and dispersed groups by median group distance. As expected, we find a stronger Chinese penetration effect on worker mobility in geographically concentrated groups (column 4). Moreover, if the mobility of low-skilled labor is more sensitive to moving costs than that of high-skilled labor, our evidence also suggests that the Chinese import effect is driven by lower skilled labor.

We next examine the prevalence of internal markets for high-skilled labor—managers of group affiliates.

Managerial mobility

We proceed to examine direct mobility patterns of individual workers—managers of group affiliates. We document the prevalence of internal labor markets for managers of group affiliates and show that this internal market is more active in countries with higher EPL. Extending the worker mobility analysis to affiliate managers enriches our study by showing that internal labor markets are important not only to lower skilled labor, which is likely to be affected by Chinese import penetration, but also to higher ranked mid-level managers in the group. Our data provide information on firms' upper management, so we select managers for whom we have complete employment information between 2002 and

²⁵ The import data is from the UN Comtrade database, which tracks annual bilateral import and export trade volumes between pairs of countries. We aggregate the trade value between China and countries in our sample to industry four-digit SIC level from the six-digit product level, and normalize the Chinese imports by domestic production figures from Eurostat's Prodcom database. See Bloom *et al.* (2011) for more details.

²⁶ The industry-level correlation between the import penetration measure and the share of group affiliates in the industry is -0.09 and insignificant. The weak relationship provides assurance that the import shock is exogenous to the share of firms affiliated with groups in the industry.

²⁷ The File S1 describes how we construct the group geographic concentration measure.

Table 6. Chinese import penetration and internal labor redeployment

Variables	Dependent variable: $\Delta \ln \text{Employment}$				
	(1)	(2)	(3)	(4)	(5)
	All	EPL		Geographical concentration of group affiliates	
		>Median	≤Median	>Median	≤Median
$\Delta \text{Chinese import to focal affiliate industry}$	−0.092** (0.034)	−0.096* (0.052)	−0.027 (0.045)	−0.223* (0.093)	−0.077 (0.080)
$\Delta \text{Chinese import to the rest of the group}$	0.137* (0.072)	Different at $p < 0.01$ 0.258** (0.099)		Different at $p < 0.01$ 0.319* (0.161)	
$\ln(\text{Employment}_{t-1})$	−0.018** (0.001)	−0.023** (0.001)	−0.013** (0.001)	−0.015** (0.001)	−0.011** (0.001)
Group dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
R ²	0.179	0.179	0.206	0.032	0.038
Observations	170,582	114,608	55,974	34,948	44,956

*Significant at 5%; **significant at 1%

Notes: This table presents OLS estimation results for the effect of industry import penetration on the annual change in employment in group affiliates in 1999–2006. The sample includes all group affiliates based on 2007 ownership structure. $\Delta \text{Chinese import to the focal affiliate industry}$ is the change in the share of imports from China to the industry of the focal affiliate, normalized for domestic industry production. $\Delta \text{Chinese import to the rest of the group}$ is the largest change to Chinese import penetration to industries of the other affiliates in the group, weighted by the share of group's sales. Columns 4 and 5 include groups in countries with above median EPL value (as in column 2). Collocated and dispersed groups have affiliates located within and beyond median geographic dispersion distance measure for each group, respectively. Robust standard errors are in brackets.

2007 to determine managerial mobility patterns. Within each corporate group, we track whether a particular manager stayed with the same affiliate (nonmover), moved to another affiliate within a group (within-group mover), or moved out of the group between 2002 and 2007 (out-of-group mover).

We identify 259,748 unique managers who worked for 53,501 corporate groups in the period 2002–2007, of which 12.8 percent moved internally. Using a share of internal moves in each corporate group, Table 7 shows a clear pattern of higher internal mobility in large groups of strong EPL countries. We use the share of within-group moves to test the difference between managerial moves in countries with high and low EPL (by median). Consistent with the ILMs theory, we expect the share of intragroup mobility to be higher when a group operates in countries with high EPL. The results confirm this. The comparison-of-means test shows a consistently higher share of internal moves for affiliate managers in countries with high versus low EPL. The difference grows with the size of the group: for small groups, the

difference in means is 0.8 percent; for the largest groups, the difference is highly significant at 12.9 percent.

Our analysis underscores the prevalence of internal labor markets, both for general workers and for affiliate managers, especially in countries with strong EPL. Showing that internal labor markets are an important instrument to mobilize workers within groups supports our view that internal labor markets can be a source of competitive advantage when labor is rigid.

The dynamics of group affiliation

In this section we explore how EPL affect the dynamics of group affiliation. We are interested in how the origin of groups is related to EPL. Specifically, we investigate how many of the firms we classify as stand-alones in 2007 change their affiliation and become part of a group by 2011. For the sample of stand-alone firms in our 2007 sample, we collect updated information from the 2012 ownership version of Amadeus (which provides ownership information for 2011). We focus on

Table 7. Internal managerial mobility by group characteristics and EPL

	(1) Countries with below- median EPL (%)	(2) Countries with above- median EPL (%)	(3) Difference in means (%)
All groups	12.6	20.2	7.6**
<i>Group size by assets</i>			
Small groups	10.5	11.2	0.80
Medium groups	9.6	20.7	11.1**
Large groups	15.1	28.0	12.9**
<i>Group size by sales</i>			
Small groups	9.5	12.5	3.0**
Medium groups	9.4	19.4	10.0**
Large groups	15.5	27.8	12.3**

**Difference in means between comparison samples is significant at the 1% level

Notes: This table provides direct evidence of intrafirm managerial mobility within corporate groups. Columns 1 and 2 report the percentage of internal managerial mobility out of all managerial moves (the sum of within-group and out-of-group mobility) between 2002 and 2007 in our sample groups. The *EPL* measure is the average OECD employment dismissal protection index in 1998–2008. Group size by assets and sales is determined by distribution tertiles. The unit of observation is a manager.

stand-alone firms with fewer than 50 employees in 2007 to trace the extent to which their growth pattern is associated with group affiliation, either by joining existing groups or by forming new ones. We find considerable changes in ownership: 7.2 percent of stand-alone firms become group affiliates by 2011, most of which joined existing groups. A major driver of ownership change is growth. The average employment growth rate between 2007 and 2011 is –1.1 percent. This negative growth rate is driven mostly by stand-alone firms that did not become part of groups, with an average growth rate of –2.4 percent, as compared to positive growth of 5.9 percent for firms that joined groups as of 2011. Importantly, the ability and willingness of stand-alone firms to grow may be a central mechanism that explains the long-term distribution of group affiliation across countries and industries. Table A4 in File S1 summarizes these ownership change patterns.²⁸

²⁸ We observe 31,823 stand-alone firms in 2011 that are classified as parent companies with at least one subsidiary (this number comprises 39.5% of all firms that changed affiliation). Next, we classify firms that join existing groups, by using the 2011 ownership structure and identifying those that were acquired between

Table 8 presents the estimation results for the effect of EPL on the likelihood of transitioning from stand-alone to group affiliation. Consistent with our previous findings, transitioning to affiliates is more likely when EPL are strong and labor turnover is high (column 1). Moreover, this effect is driven by high-growth stand-alone firms, implying that the process by which groups emerge is related not only to the flexibility of external labor markets, but also to the need to grow sales (columns 2–3).

Lastly, we explore how changes in EPL affect transitioning to group affiliation. There have been substantial changes in EPL during that period, with most countries strengthening EPL. We use the change in the rigidity of the employment index from the World Bank between 2004 and 2010 to construct a measure of each country's increase in EPL. We construct an indicator that equals 1 if the rigidity index in a country increased between 2004 and 2010 and equals 0 if the index stayed the same or decreased in strictness. We observe that change toward affiliation is higher in countries that have increased their EPL and in industries with higher turnover (column 4), and the results are comparably strong for firms that formed new groups (column 5) and firms that joined existing groups (column 6). These results provide new insights on how EPL affect the formation of corporate groups over time.

ROBUSTNESS ANALYSIS

We performed additional robustness checks, which we summarize in this section. The full estimation results for these tests are included in File S1.

Linearity in industry ranking

We check the sensitivity of our results to nonlinear effects of industry turnover. We divide industry turnover into quartiles and interact each with EPL in order to check for nonlinear industry effects, as well as to have a more stable classification of industries by turnover level. The results show the country–industry effect is quite monotonic,

2007 and 2011 using BvD's Zephyr database, or were listed as subsidiaries in the 2011 ownership database. We determine that 48,683 firms joined existing groups between 2007 and 2011 (this number represents 60.5% of firms that changed ownership).

Table 8. From stand-alone to corporate group affiliate: 2007–2011

Dependent variable: dummy for $\Delta\text{Group affiliation} = 1$						
Variables	(1) All	(2) High growth	(3) Low growth	(4) All	(5) Form new groups	(6) Join existing groups
<i>EPL</i> \times <i>industry labor turnover</i>	0.523* (0.197)	0.940** (0.167)	0.480 (0.294)			
	Different at $p < 0.01$					
Dummy for $\Delta\text{EPL} > 0 \times \text{industry labor turnover}$				0.587** (0.168)	0.485** (0.137)	0.485** (0.109)
Dummy for $\Delta\text{EPL} > 0$				−0.012 (0.045)	−0.010 (0.042)	−0.010 (0.031)
<i>Country financial development</i> \times <i>industry external dependence</i>	0.027 (0.030)	0.059 (0.036)	0.054 (0.027)	0.086 (0.070)	0.071 (0.064)	0.052 (0.047)
$\ln(\text{Sales})$	0.030** (0.008)	0.040** (0.012)	0.026* (0.010)	0.064** (0.011)	0.055** (0.011)	0.033** (0.007)
Country dummies (15)	Yes	Yes	Yes	No	No	No
Two-digit SIC dummies (74)	Yes	Yes	Yes	Yes	Yes	Yes
Differential in affiliation probability (%):	1.9	3.4	1.7	0.3	0.2	0.2
% affiliated	7.5	8.9	6.6	9.4	9.2	5.8
R ²	0.150	0.158	0.143	0.110	0.097	0.054
Observations	641,091	120,023	123,004	459,831	525,200	506,017

*Significant at 5%; **significant at 1%

Notes: This table presents the estimation results of linear probability models that examine the effect of EPL on change in ownership from stand-alone to affiliate. The sample includes all stand-alone firms in 2007 for which we have ownership information in 2011. *Dummy for $\Delta\text{EPL} > 0$* is a dummy variable that equals 1 if the rigidity index in a country increased between 2004 and 2010. $\Delta(\text{Group affiliation}) = 1$ when a firm is classified as a stand-alone in 2007 and as a group affiliate in 2011. Columns 2 and 3 split the sample by high and low growth based on the first and fourth quartiles of sales growth over the period 2005–2007. Standard errors (in brackets) are robust to arbitrary heteroskedasticity and allow for serial correlation through clustering by country.

with the strongest effect for the highest quartile of industry turnover. Column 1 of Table A5 in File S1 presents the estimation results.

Alternative employment protection laws

Columns 2–4 of Table A5 in File S1 present estimation results to alternative EPL measures: employment rigidity, flexibility in hiring and firing, and firing costs. Our results continue to hold for all of these employment protection measures.

Unit of observation

In our main specification, the unit of observation is the individual firm. We check the sensitivity of our results for unit-observation selection by estimating a collapsed model in which the unit of observation is

country–industry.²⁹ As shown in column 5 of Table A5 in File S1, this estimation yields a comparable estimated EPL effect.

Acquired affiliates

Evidence suggests that acquired units are less likely to take part in intragroup mobility of talent (Belenzon *et al.*, 2014) and that managers are less likely to be deployed to acquired units, because their firm-specific expertise is more valuable in internally developed units (Karim and Williams, 2012). Using Bureau van Dijk's Zephyr database, we identify

²⁹ For each country and industry, we calculated the average share of affiliates and collapsed the data to the country–industry level, resulting in 3,457 observations for 288 three-digit SIC industries in 15 countries (some countries have fewer industries represented than others).

acquired affiliates and exclude them from the sample. The results continue to hold (column 6, Table A5, File S1).

Removing outliers

A concern is that our results are sensitive to including very small or very large firms in our estimation sample. We limit the estimation sample to firms with a number of employees between the 1st and 99th percentile of the employment distribution to drop the smallest firms, which usually are not subject to EPL, and the largest firms, which are likely to have internal labor markets and thus are less likely to be affected by labor rigidity. The results remain robust (column 7, Table A5, File S1).

Missing ownership information

Thus far, we have excluded firms with no ownership information. We check the sensitivity of our results to dropping these firms by including all firms with missing ownership information as stand-alones. We assume firms are stand-alones unless we have information indicating group membership. This procedure more than doubles the number of observations in our estimation sample, and the results are robust to the inclusion of firms with no ownership information (column 8, Table A5, File S1).

Removing individual countries

Table A6 in File S1 checks whether individual country drives our results, by removing individual countries from the sample and reestimating our model separately for each subsample of excluded country. Our results continue to hold. The estimate of the coefficient on the interaction between industry labor turnover and EPL is always positive and significant.³⁰

Firm size

We examine how the effect of EPL on group affiliation varies by firm size. Large stand-alone

firms are likely to have their own internal labor markets and therefore should be less sensitive to country regulations than small stand-alone firms with limited employment pools from which to draw. Thus, we expect the effect of ILMs redeployment to be more pronounced when comparing smaller stand-alone firms with affiliated firms of similar size. Columns 1–2 of Table A7 in File S1 confirm this prediction when splitting the sample by firms with above and below 50 employees. Results are robust to alternative employment cutoffs.

Group characteristics

We proceed to examine how our results vary by group characteristics. Columns 3–11 of Table A7 in File S1 present the estimation results for distinguishing between groups that are small or large, diversified or specialized, family held or widely held, and domestic or multinational. Larger groups have more internal resources to maintain steady growth and to offer their workforce less risky employment prospects. Diversified groups can provide an additional insurance from external business fluctuations and redistribute labor as needed. The results support this view (columns 3–7).

Next, family-owned groups, which account for five percent of the groups in our sample, are likely to have different considerations of internal promotions than widely held groups. Family-controlled groups may appoint managers to key positions not by merit but by family relation, which can reduce opportunities and incentives for high-quality personnel (Bertrand and Schoar, 2006). We find larger effects for widely held firms than for family-held firms (columns 8–9).

Involuntary turnover and layoffs

We create a measure for industry involuntary labor turnover by utilizing the data on employer-initiated dismissals from the Bureau of Labor Statistics Job Openings and Labor Turnover Survey (2003–2007).³¹ Using monthly industry-level data on layoffs and involuntary dismissals due to reorganizations, elimination of positions, and

³⁰ The differential effect varies from a low of 2.9 percent when we exclude France, to a high of 6.2 percent when we exclude Great Britain (this constitutes about 14.2% of the sample average share of group affiliates when we exclude France and a much stronger effect of 31.2% without Great Britain).

³¹ Coverage of involuntary turnover and layoff is more limited and covers about half of our sample. Data is available at: <http://www.bls.gov/jlt/data.htm>

firings, we calculate industry-level involuntary labor turnover rate as average rate of layoffs. Since employment protection regulations do not apply to voluntary separations, such as quits and retirements, this measure provides additional ranking of industries by separating voluntary and involuntary turnover. The interaction between EPL and involuntary turnover is positive and significant with a differential effect of 4.4 (as compared to an effect of 3.5 using the aggregate turnover measure from column 1 in Table 4).

DISCUSSION AND CONCLUSION

This paper examines the competitive advantage of internal labor markets in environments where external labor rigidities constrain the ability of stand-alone firms to compete by adjusting their human resources when economic conditions change. We build on the notion that firms encompass multiple businesses inside their boundaries to create internal markets and study how frictions in external markets for labor and capital induce a competitive advantage for corporate group affiliates. Our findings underscore the importance of market frictions for strategy scholarship and emphasize that these frictions are multidimensional and that their joint effect on competitive advantage is complex and sometimes counterintuitive.

We make several contributions. First, by underscoring the environmental conditions that make internal labor markets more important to competitive advantage, we draw implications to the strategic human capital literature. Unlike physical assets, workers can freely leave the firm (Coff, 1997). For that reason, employees must be motivated, either directly by sharing firm profits or indirectly by allowing them to perform tasks that are suboptimal to the firm (Gambardella *et al.*, 2015). Such costly motivations reduce the strategic value of labor, because the rents workers generate are consumed by their higher wages and perks. While labor stickiness can lower the “price” of human capital, it also raises the costs of readjusting labor. We show that access to “external” internal labor markets can be a source of competitive advantage for group affiliates, because those internal markets allow affiliates to readjust their workforce cheaply, while still maintaining the strategic benefits of “stickiness” at the group level. Additionally, some of these “external” internal markets may have lower operational

costs to impart competitive advantage to groups. If some groups face lower costs of mobility, their internal labor markets should lead to a stronger competitive advantage relative to groups that must compensate workers’ mobility more aggressively. There are several reasons for why some groups can face more favorable internal mobility conditions, including geographical dispersion (internal mobility should be cheaper in more geographically concentrated groups), stronger workers’ motivation due to more cohesive organizational culture and better interest alignment (Gottschalg and Zollo, 2007), more favorable internal structure configuration (Belenzon *et al.*, 2014), and less competitive external labor markets. A promising direction for future work is studying how these conditions moderate the competitive advantage of internal labor markets.

Second, we demonstrate that market frictions affect the competitive advantage of firms. These market frictions are multidimensional and their joint effect on competitive advantage is complex and sometimes counterintuitive. In particular, we show that EPL benefit group affiliates, especially in countries with developed financial markets. This means that groups can be an efficient organizational form that mitigates rigidities born by EPL, even when groups do not provide any financing advantages to their affiliates.

Third, we extend the perspective that groups are a response to missing country institutions. Unlike previous papers that focus on emerging markets (e.g., Chang, Chung, and Mahmood, 2006; Mahmood and Mitchell, 2004), our work shows that groups also exist in economies where institutions are relatively developed. Our findings are consistent with the more general TCE view that groups, rather than markets, can be a more efficient way to organize production, even in modern economies. When market frictions are significant, the costs of moving resources internally could be lower than the costs of moving the same resources across markets. This efficiency argument suggests that the role of groups in the economy may be quite similar to that of any other large organization in advanced economies. Understanding that groups are not a phenomenon restricted to underdeveloped markets and that their economic role may be actually more pronounced when (financial) institutions are developed can inform debates of whether groups, or more generally large organizations, are “paragons” or “parasites” (Khanna and Yafeh, 2007).

Fourth, this paper extends our understanding of how firms can organize to remain flexible and adapt to changing market conditions. An important stream of research has placed particular attention on the construction of buffers to manage the ebbs and flows of inputs critical to the firm (Cyert and March, 1956). Recent studies conceptually argue and empirically show that under certain conditions it may be profitable to maintain excess workers or “human resource slack” when the nature of the operational environment makes it difficult for firms to estimate their internal demand for labor (Lecuona and Reitzig, 2014). Our findings expand this notion by presenting groups as an alternative to maintain flexibility without having to bear the full costs of maintaining idle or slack workers. Future studies can examine the extent to which heterogeneity in the composition of the worker pool across business groups facilitates the movement of labor across units and, hence, reduces the frictions inherent of this internal mechanism.

Lastly, our theoretical discussion from section “The interaction between EPL and financial development” generates predictions and insights that can inspire future work. Our main prediction relates to the elasticity of substitution between labor and capital, which plays a central role in determining how the strategic value of labor flexibility varies with capital flexibility. Future work can further test our logic by classifying industries by how easy it is to substitute labor with capital. Using the 2008 financial crisis as an exogenous shock to the relative price of capital should be a promising empirical framework to study how the strategic value of labor flexibility has changed after capital markets have become more rigid. This line of inquiry can also shed light on how the competitive advantage of groups changes with economic downturns or upturns.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

File S1. Online Appendix.