

**Gaining Competitive Advantage from Human Capital:**

**Role of Markets and Firm Structure**

by

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Duke University

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Dissertation submitted in partial fulfillment of  
the requirements for the degree of Doctor of Philosophy in  
Business Administration in the Graduate School  
of Duke University

2015

ABSTRACT

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## **Abstract**

This dissertation develops new theory and evidence to show that human-capital based competitive advantage of firms depends on the ability of firms to reallocate human capital and thereby can vary with external markets, firm structure, and firm openness to factor markets. The dissertation includes three empirical studies.

The first study examines how labor market frictions due to strict employment protection regulations can be a source of competitive advantage for affiliates of corporate groups over standalone firms due to greater internal labor market flexibility of groups. These effects are more pronounced in environments where benefits from internal market flexibility are high. Utilizing the variation in labor laws and capital market development across 16 West-European countries, the study finds 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 they outperform standalone firms in terms of growth and profitability.

The second study examines how structural features of a firm and the nature of managerial resources interact to influence top managerial mobility in corporate groups. Using a novel dataset on intragroup managerial mobility, the study documents decreased internal redeployment of managers to affiliates with minority shareholders, especially if those managers are high-performing. These results are driven by hired

managers. In contrast, family-related managers, who are related to the controlling shareholders, are more likely to be deployed to partly-owned, strategically peripheral and affiliates operating in regions where societal trust levels are low. These results suggest the importance of trust as a managerial attribute.

The third study examines how disclosure of firm performance affects top manager mobility into and out of firms. Using managerial mobility data for 610,000 managers in over 32,000 corporate groups across Europe, the study shows the key tradeoffs in managerial markets associated with disclosure: disclosing firms lose more managers, especially if firms are performing well. Importantly, those departing managers leave to larger firms and to positions of greater responsibility. However, the results suggest that disclosing firms are better able to acquire new managers from other high-performing firms. Further, survey evidence suggests that disclosing firms can mitigate managerial outflows by implementing better human capital management practices. The study contributes to understanding how firms can capture value from strategic human capital, while protecting and refreshing sources of competitive advantage that are embodied in firm's top management.

Taken together, these three studies contribute to understanding conditions under which firms can capture value from mobility of strategic human capital, and the key tradeoffs associated with accumulating and protecting knowledge resources while tapping into external knowledge flows.

## **Dedication**

To my loving family—my husband and life companion Sod and my wonderful children Temuulen and Misheel—who always make me feel I can do no wrong.

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# 1 Introduction

Human capital is an important input in firm production and a key source of competitive advantage (Penrose, 1959; Castanias & Helfat, 1991; 2001; Coff, 1997). How can firms gain competitive advantage from human capital? In this dissertation, I develop new theory and evidence to argue that mobility of human capital both within and into and out firms can play a central role in creating competitive advantage for firms. Key to sustainable competitive advantage is in the ability to orchestrate resources to match the changing demands of the market (Penrose, 1959; Helfat et al., 2007), and to disseminate knowledge, social networks, and values across different parts of the firm (Kogut and Zander, 1992; Grant, 1996; Galunic and Rodan, 1998). I examine the role of market frictions in constraining or facilitating mobility of key human capital resources. Market frictions can be broadly defined as “the costs of running the economic system” (Arrow, 1969: 48). Market frictions make it costly to move resources within and across firms, which provide opportunities for some firms to gain advantage over other firms (Mahoney and Qian, 2013). In particular, I examine market frictions created by employment protection legislations, which make hiring and firing people costly; internal frictions created by shared ownership, which distort incentives to share resources within a firm; and the interaction of internal and external frictions, through which firm openness to external managerial markets affects the reallocation of managers within and across firms. Across three studies, I find evidence that competitive advantage varies

with external markets, firm structure, and firm openness to markets. These findings contribute to understanding conditions under which firms capture value from strategic human capital, and the key tradeoffs associated with accumulating and protecting knowledge while tapping into external knowledge flows.

### ***1.1 Evidence from Three Essays***

In the first study (Chapter Two), I explore how firm competitive advantage varies with labor market frictions, which can limit the ability of firms to freely adjust labor. I examine the effects of Employment Protection Legislation (EPL) on the likelihood of corporate group affiliation and on performance differences between group affiliates and standalone firms. Countries in Western Europe vary in how restrictive their EPL are with respect to hiring and firing workers. EPL raises labor adjustment costs for firms associated with hiring and firing workers; however, standalone firms are disproportionately constrained to adjust labor compared to corporate group affiliates, because mobility between affiliates is exempted from EPL. I find that group affiliation is more likely when EPL is high, especially if the need for labor redeployment is frequent. Further, with higher EPL, group affiliates outperform standalone firms. The competitive advantage of groups is greater in highly developed financial markets, where high EPL can crowd out external sources of financing.

In the second study (Chapter Three), I ask how within-firm frictions influence the rate and type of redeployment of managerial talent within large firms. Specifically, I

examine how the presence of minority owners affects the ability of corporate groups to redeploy managerial resources internally. Firms differ with respect to their ownership structure. Corporate groups can share ownership of affiliates with minority owners. Presence of minority owners in an affiliate can reduce group's incentives to share valuable resources with that affiliate due to divergent interests and dispersed control. We find that most productive managers are less likely to transfer to partly-owned affiliates. In contrast, family-related managers are more likely to move to partly-owned affiliates. This trend is especially strong in environments of lower trust, thus emphasizing the difference in ways managers can bring value to firms: through ability and trust.

In the third study (Chapter Four), I examine the interaction of internal and external labor markets and ask whether firm's openness to strategic factor markets compromises its competitive advantage. More specifically, I examine how a firm's disclosure of performance affects the flow of its top managers into, within and out of firms. I show that some firms reveal more information than others through financial performance disclosure. I investigate whether disclosing firms have different patterns of managerial mobility than non-disclosing firms. I find that firms that disclose high performance lose more managers. However, disclosing high-performing firms hire more managers from other high-performing firms, and are better able to transfer more managers internally than non-disclosing firms. The results suggest that firms that reveal

more information about their top management through disclosure of financial performance make their managerial markets more open. Firm's openness to factor markets implies a tradeoff: it can compromise its competitive advantage through higher input prices and outflow of resources, but can also attract fresh resources and encourage knowledge inflows from external markets.

## **2 Market Frictions and the Competitive Advantage of Internal Labor Markets**

### ***2.1 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 (Penrose, 1959; Barney, 1986). 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., Gertner, Scharfstein, and Stein, 1994; Belenzon and Berkovitz, 2010). Yet we still know little about how firms organize to overcome rigidities in other factor markets. Namely, despite the fact that 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 rigidities in the market for labor. Labor market rigidities can represent important challenges for firms, as these 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 comprise these organizations (Khanna and Palepu, 1997; Khanna and Rivkin, 2001; Chang and Hong, 2000). This form of organization can be costly, as this implies maintaining large, often cumbersome, structures.<sup>1</sup>

Such costs, however, may be justified when having multi-business infrastructure provides the firm with flexibility to address frictions in the external market for labor. Focusing on employment protection laws (EPL hereafter) as the source of labor market frictions, the present 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 be a source of competitive advantage for group affiliated firms. For example, if economic conditions require business "A" to downsize, these excess workers can be transferred to another business "B" within the same group which faces a more favorable environment. Such flexibility is not available for firms that lack an internal labor market. When the environment calls for downsizing, these firms have to either bear the costs imposed by EPL when shedding workers or maintain costly slack in human resources. Similarly, observant of their lack of flexibility, firms without internal labor market may keep a lean

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<sup>1</sup> Other costs include inefficient internal reallocation of resources from minority to controlling shareholders, known as "tunneling" (e.g., Shleifer and Vishney, 1997).

pool of workers, which can be problematic when the operational environment requires increasing the size of 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, costs of keeping excess personnel, costs of not having enough employees when needed) and, hence, into lower performance for firms without internal labor markets.

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 standalone firms, they can reallocate workers to other affiliates of the group without incurring EPL penalties. Importantly, a legal provision in Europe exempts intra-group labor adjustments from EPL, enhancing the competitive advantage of internal labor markets.<sup>2</sup>

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 standalone 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

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<sup>2</sup> Official Journal of the European Union, L 018, 01/21/1997: pages 1--6.

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<sup>3</sup>, 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 differences 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. Using data from the United States (and from other sources), we rank industries according to their level of labor turnover in relatively regulation-free labor markets to calculate average turnover rate for each industry. Then we rank the 15 Western European countries in our sample according to their EPL. Our first econometric test is whether the difference between high

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



and low industry labor turnover in group affiliates is higher in countries with high EPL than in countries with low EPL. Our analysis proceeds by comparing financial performance of group affiliates to that of standalone firms and studying 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 further support our analysis, 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 countries with strong EPL.

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.

## ***2.2 Corporate Groups and EPL in Europe***

Central to our analysis is the presence of substantial variation across European countries in EPL. EPL comprise a set of legal rules, administrative procedures, and compensatory payouts that apply to employee dismissals. In contrast to 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 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 3 years of service are entitled to 8 weeks' notice and 6 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 employee 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<sup>4</sup>, such that we can focus on developed 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

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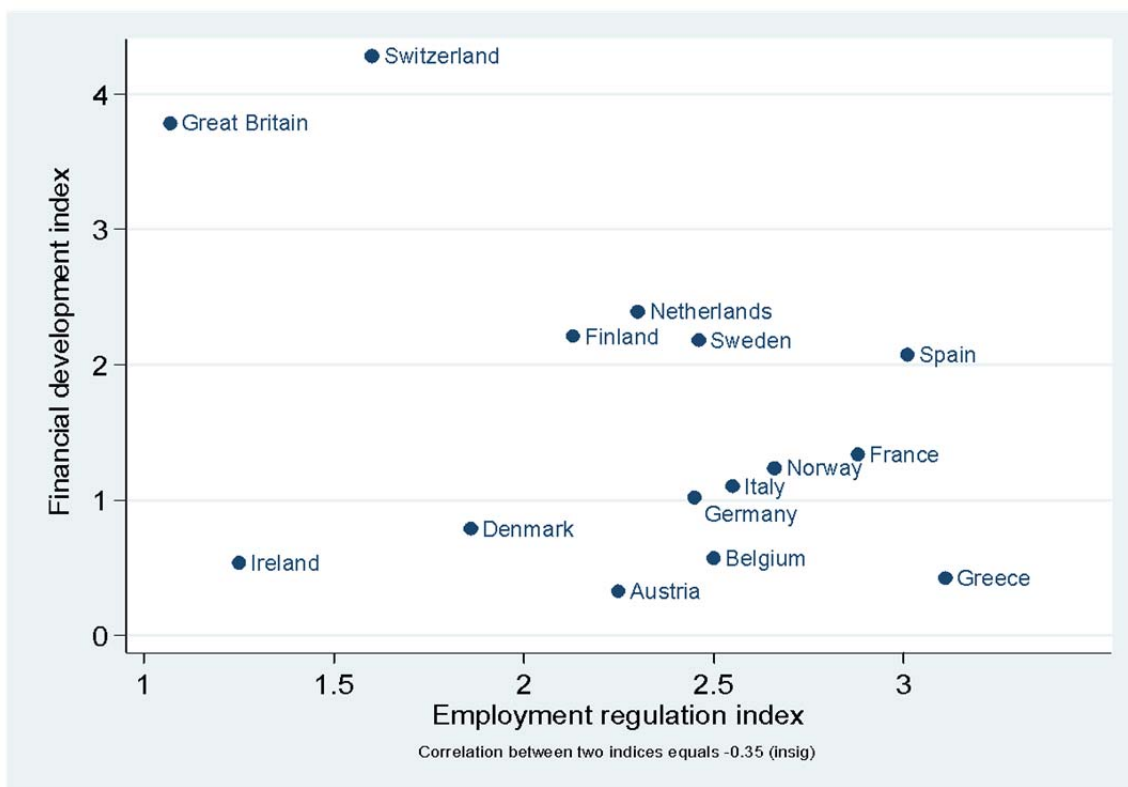
<sup>4</sup> Average GDP per capita in our sample is \$53,781 (2010 estimates), with a median of \$49,489. Moving from the lowest quartile to the highest quartile of GDP per capita is associated with a relatively low increase of 28%. There are two "outliers" in our data in terms of GDP per capita: Norway on the high end with \$103,586 and Greece in the low end with \$34,832. To ensure that our results are not driven by specific countries, Section 6.5 reports robustness checks for excluding single and group of countries from the sample.

1 of the Seventh EU Directive (Official Journal L 193, 07/18/1983 p.1), and the EU Directive 96/71/EC utilizes this definition, granting exceptions to labor mobility within corporate groups (Official Journal L 018, 01/21/1997 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., it has a controlling parent company), if it controls another firm, or if it 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 and not to ones that occur inside corporate groups. EU law does not consider the mobility of workers within a corporate group a market transaction. Therefore, intra-group mobility is not subject to country labor-market regulations, and affiliates can transfer employees to a different affiliate without incurring dismissal penalties set by employment-protection regulations. 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, 01/21/1997 p. 1--6). This provision, granted to group affiliates, 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 provision for the purpose of unfettered mobility of personnel between affiliates of a corporate group. This legal provision provides a clear advantage to firms that are 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 each country in our sample and shows that the correlation between EPL and financial development is low (- 0.35, statistically insignificant).



**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.

Lastly, an identification assumption in our analysis is that the way in which groups are distributed across industries within countries does not affect EPL. The online appendix 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 standalone 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.

### ***2.3 The Interaction between EPL and Financial Development***

This section discusses how the advantage of flexibility in changing labor inputs is affected by how difficult it is to change capital inputs.<sup>5</sup>

We argue that the advantage of labor flexibility is affected by how difficult it is to adjust capital, and relate the strength of this effect to the ease of substitution between labor and capital. The ease of substitution determines the extent to which standalone 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

---

<sup>5</sup> A formal and extended version of this discussion is available upon request.

external markets).<sup>6</sup> Standalone 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.

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

**Figure 2: Labor and Capital Rigidities for Group Affiliates and Standalone Firms**

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 standalone firms, respectively. Because we assume that group affiliates are unaffected by external markets, our discussion will focus only on standalone firms.

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<sup>6</sup> Our logic remains unchanged if we assume instead that group affiliates are also affected by external market conditions, but to a lesser extent than standalone firms.



We wish to establish whether the benefits of labor markets flexibility for standalone firms are synergistic with capital markets flexibility or whether the two types of market flexibilities 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 compared to 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 standalone firms:

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

*The advantage of flexibility.* To fix idea, consider a world with uncertain demand where inflexibility of inputs means that labor and capital must be deployed before demand is realized. In this setting the competitive advantage of group affiliates stems from their ability to deploy inputs after demand is realized. Market frictions may cause standalone firms to forgo business opportunities which would have been 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 standalone'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 standalones, 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 severely constrain profits when inputs are non-substitutable and flexibility in both input markets may be necessary for standalones to profitably operate. This logic implies that labor market frictions are particularly costly to standalones 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 standalones. Imperfections in the other input market add little to the relative advantage of group affiliates.<sup>7</sup>

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<sup>7</sup> 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 to invest 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

*High substitution between labor and capital.* The logic is different when capital and labor can easily be substituted. In that case, labor market imperfections are not very detrimental to standalones when capital is flexible, because labor adjustment will be borne by capital. That is, standalone 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. It is only when labor and capital markets are both underdeveloped that standalones' performance is seriously impaired. It follows that, for standalones, 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 standalones, when capital markets are underdeveloped.

Therefore, whether we expect labor market imperfections to provide a larger competitive advantage for group affiliates relative to standalone 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

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inequality). Because standalone 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.

the elasticity of substitution between labor and capital is low. In a comprehensive survey, Chirinko (2008) surveys over thirty studies that conclude that the elasticity of substitution ranges from 0.4 to 0.6.<sup>8</sup> 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 equals to one. The consensus in the literature, therefore, is that labor cannot be substituted easily with capital.<sup>9</sup> Consistent with this consensus, examining labor intensity patterns in our sample (ratio between number of employees and fixed assets) reveals that standalones 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.

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<sup>8</sup> Notable works in this literature include Hamermesh, 1993; Mairesse, Hall, and Mulkey, 1999; Oberfield and Raval, 2014; and Chirinko and Mallick, 2014.

<sup>9</sup> 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 concern 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 United States, 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, United States and Euro area are 0.32-0.42, 0.4-0.6 and 0.7, respectively.

Our theoretical discussion and the empirical stylized facts on the ease of substitution between labor and capital leads 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.

## **2.4 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 26 (in Appendix B) provides additional information on the main variables used in the analysis.

### **2.4.1 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 described above. A

firm is classified as a group affiliate if (i) the firm has a controlling parent company (it is a subsidiary), (ii) it is a parent company of another firm (it has a subsidiary), or (iii) it has the same controlling shareholder as at least one other firm.<sup>10</sup> We exclude firms with missing ownership information.<sup>11</sup> Later in the paper 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.

## **2.4.2 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. 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).

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

<sup>11</sup> In the robustness section we show that our results are robust to including firms with missing ownership information and classifying these firms as standalones.

*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. Instead of letting firms internalize the costs of turnover, countries tax employers and provide benefits, such as unemployment insurance, from a common pool. The main difference between labor expenditures and EPL is that firms bear the costs of the former regardless of whether they dismiss employees, whereas the latter apply to each dismissal occurrence. We expect no effect of employment expenditures on the likelihood of group affiliation and financial performance, because this protection does not impose costs on labor readjustment across markets.<sup>12</sup>

*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.<sup>13</sup> Tables 25 and 26 provide information on how these measures are constructed and their value by country. These measures are strongly correlated with our primary EPL variable. The

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<sup>12</sup> 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%).

<sup>13</sup> 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. The 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.

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 relationship 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, 2007; 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 26 presents the complete set of values for our sample countries.

### **2.4.3 Industry Employment Measures**

We follow the methodology first used by Rajan and Zingales (1998) and rank industries according to their level of labor turnover. We use U.S. data for ranking industries because the U.S. market is likely the least-regulated market in the developed world; thus U.S.-specific employment regulations are not likely to significantly affect firing and hiring decisions. Additionally, groups are less common in the United States,



which means that U.S. labor turnover should be a good measure of the frequency of labor readjustment in standalone 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. For example, in our sample, industries with the highest turnover rates include apparel stores and transportation services, and industries with lowest turnover are printing and publishing services and paper products. According to the Bureau of Labor Statistics' 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.<sup>14</sup> According to the

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<sup>14</sup> [http://www.bls.gov/oes/current/naics4\\_812100.htm](http://www.bls.gov/oes/current/naics4_812100.htm), accessed on August 10, 2014

Economist, a survey by the National Retail Federation estimated turnover of full-time retail workers at 74%.<sup>15</sup>

The next largest occupational group in the industry is office and administrative support workers, which comprise 8.07% 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.<sup>16</sup>

On the other hand, 51.98% 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.<sup>17</sup> In the paper products industry, 54.55% 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' Current Employment Statistics Survey (1977--2003). This employment series data includes

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

<sup>16</sup> Similarly, in the transportation industry, the largest occupational group of workers consists of various motor vehicle operators (56.37% of the labor force in the industry). 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](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.

<sup>17</sup> [http://www.bls.gov/oes/current/naics3\\_323000.htm](http://www.bls.gov/oes/current/naics3_323000.htm)

employment figures for all employees on payroll, including production, construction, and non-supervisory employees. Following Autor, Kerr, and Kugler (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.<sup>18 19</sup>

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 share of employees covered by labor union contracts. All reported specifications exclude industries with labor union membership of over 25% of the labor force in the U.S. Our results are not sensitive to the specific threshold of industry unionization.

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<sup>18</sup> 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 2 presents more examples of high- and low-turnover industries.

<sup>19</sup> Our empirical approach of using US industry turnover rates for European firms is based on two main assumptions. First, the turnover characteristics of an industry depend on the occupational composition of the industry, which should be comparable across countries. Second, the ranking of the industry turnover should hold within a country---that is, even if the overall turnover rates are higher in US versus in the EU, within a country, industry turnover should maintain similar ranking from low to high. We compare the structural composition of select industries in the US 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.

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.<sup>20</sup>

#### **2.4.4 Descriptive Statistics**

Table 1 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). 22% of the firms are affiliated with one of the 68,137 corporate group 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 standalone firms in terms of age (Table 27). Interestingly, we find that affiliates have much higher

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<sup>20</sup> The European-based measure of labor turnover 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 it is unlikely to be affected by firm specific shocks.

turnover than standalone firms, consistent with the basic premise of this paper of higher labor-adjustment costs for standalone firms.

**Table 1: Summary Statistics for Main Firm and Group Variables**

Variable	# firms/ groups	Mean	Std. Dev.	Distribution		
				10 <sup>th</sup>	50 <sup>th</sup>	90 <sup>th</sup>
Panel A: 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
Panel B: 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.

## **2.5 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 where the dependent variable is a dummy that receives the value of one for firms that are affiliated with a corporate group, and zero for standalone firms. The econometric specification is given as:

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

Where  $i$  denotes firms, the unit of observation,  $\text{Sales}_i$  is annual sales of firm (for most recent available year),  $\text{EPL}_c$  is employment regulation for country  $c$ ,  $\text{Turnover}_j$  is a measure of labor turnover for industry  $j$ ,  $\varphi_j$  and  $\eta_c$  are complete sets of industry and country dummies, respectively, and  $\varepsilon_i$  is an iid error term. To ensure the EPL effect is not picking up the effect of country financial development, we control for the 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  $\hat{\alpha}_2 > 0$ .  $\hat{\alpha}_2$  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 a high level of EPL rather than in one with a low level of EPL. In all regressions, we report  $\Delta P = \hat{\alpha}_2 \Delta \text{EPL} \times \Delta \text{Turnover}$ ,

where industry and country differences are computed by moving from the lowest to the highest quartile.<sup>21</sup>

Our model from Section 3 predicts that  $\alpha_2$  varies by country financial development. To test this prediction, 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  $\hat{\alpha}_2$  between the two subsamples.

Table 2 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 percent to 40.5 percent in industries with the highest turnover; in industries with

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<sup>21</sup> Taking the first difference in probability of affiliation with respect to labor turnover, holding fixed country EPL, yields  $\Delta P_c = \hat{\beta}_2 \text{EPL}_c \times \Delta \text{Turnover}$ . Next, taking the difference in  $\Delta P_c$  between high and low country labor regulation yields  $\Delta P = \hat{\beta}_2 \Delta \text{EPL} \times \Delta \text{Turnover}$ .

the lowest turnover, the difference between high- and low-EPL countries is much smaller, between 6.2 percent and 16.4 percent.

**Table 2: Percentage of Group Affiliates in High- and Low-Turnover Industries by EPL**

	(1)	(2)	(3)
	Countries with Low EPL	Countries with High EPL	High EPL Minus Low EPL
Panel A: 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
Panel B: 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.

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

$$y_{it} = \beta_1 \text{Affiliate} + \beta_2 \text{Affiliate} \times \text{EPL}_c + Z' \beta + \varphi_j + \eta_c + \varepsilon_{it} \quad (3)$$



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 one for group affiliates and zero for standalone 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  $\beta_2$  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  $\hat{\beta}_2$  to be larger in the subsample of financially developed countries.

## **2.6 Results**

### **2.6.1 Likelihood of Group Affiliation**

Table 3 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 ( $\hat{\alpha}_2 > 0$ ). Based on the estimates from column 1, the differential effect of ILMs redeployment,  $\Delta P$ , is 3.5 percentage points. This result means the difference between the highest and lowest deciles of industry labor turnover rises by 3.5 percentage points, or 16 percent of the sample average share of group affiliates, when moving from the lowest to the highest

EPL country.<sup>22</sup> Figure 3 presents graphically 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. It is possible that U.S. data do not capture well worker

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<sup>22</sup> 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).

mobility patterns in Europe. To test this concern, we use an alternative European data source on employment turnover. We follow the same procedure to construct industry labor-turnover measure 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.<sup>23</sup>

Having established a strong positive effect of EPL on the likelihood of group affiliation, we turn next to examine how this effect varies by country financial development. Consistent with our theory, 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

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<sup>23</sup> 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 utilizing the data on employer-initiated separations from the BLS' 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.

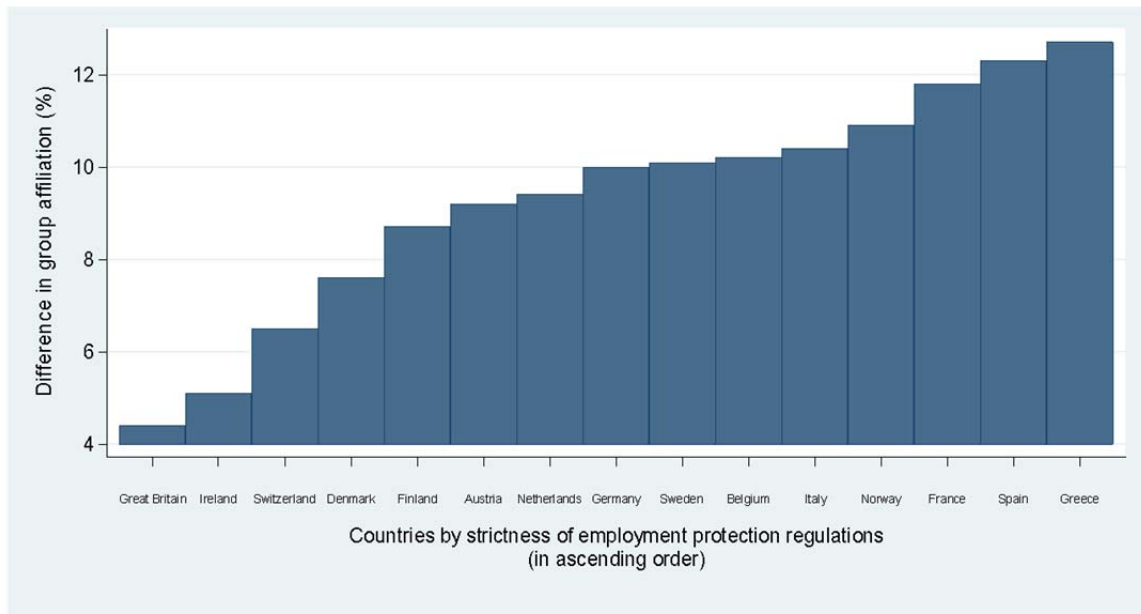
statistically insignificant estimated coefficient for the low financial development sample (reported in column 6). We reject the null hypothesis that these two coefficient are equal to one another (p-value<0.01).

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 externally readjust capital should matter more in industries with greater dependence on external finance. Our results are consistent with this view. Table 28 shows 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).

**Table 3: The Effect of EPL on Group Affiliation**

Dependent Variable: <i>Dummy for Group Affiliation</i>						
	(1)	(2)	(3)	(4)	Financial development	
				EU labor turnover	>Median	≤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)				
<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 <sup>2</sup>	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

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



**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 3 (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.

## 2.6.2 Financial Performance

Table 4 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.

Columns 1-6 estimate growth specifications. When pooling all countries together, there is no difference in growth rates between affiliates and standalone firms, and this difference 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 standalone firms, especially in strong EPL countries in high-financial-development countries (column 2). On the other hand, 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 standalone 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 standalone 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.





### **2.6.3 Evidence on Internal Redeployment**

We proceed to 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.

#### **2.6.3.1 Intra-Group Labor Mobility and Chinese Import Penetration**

As industry conditions change, corporate group structure provides an advantage because affiliates can shift resources within groups more efficiently than when relying on 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, Draca, and Van Reenen (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.<sup>24</sup> We observe a significant rise in imports from China over time across industries: import rates more than double from an average of 2 percent in 1999 to 5 percent in 2006.<sup>25</sup>

We distinguish between two types of Chinese import penetration for each affiliate. One is the share of imports from China to the focal affiliate's industry. The other is the share of imports to industries of other affiliates in the group that do not operate in the focal affiliate's industry. For our final measures of industry shocks, we 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 affiliates in the group 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 5 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

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<sup>24</sup> The import data is from the UN Comtrade database that 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. Please see Bloom, Draca, and Van Reenen (2011) for more details.

<sup>25</sup> 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.

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.<sup>26</sup> We split the sample into collocated and dispersed groups by median

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<sup>26</sup> The detailed process of constructing the measure is as follows. We first obtain the latitude and longitude coordinates of each city our sample firms are located in. Then, for each corporate group, we calculate its geographic mean position by determining the mean X and Y coordinates and then calculating the radius of the great-circle by using the squared coordinate deviates. The radius of the great-circle is analogous to one standard deviation. To calculate the distance between the location of each firm and group's geographic mean, we use the haversine method (Sinnott 1984; Fotheringham et al 2000).. If  $x_1$  and  $x_2$  are the latitudes and  $y_1$  and  $y_2$  are longitudes of two points on the surface of the earth in radians, then the haversine of the central angle  $\theta$  between the points is given by:  $hav(\theta) = hav(x_2 - x_1) + \cos(x_1) \cdot \cos(x_2) \cdot hav(y_2 - y_1)$ , where the haversine of angle  $\theta$  is defined as:  $hav(\theta) = \sin^2(\frac{\theta}{2})$ . The value for  $\theta$  can be obtained by solving:  $\theta = 2 \cdot atan2(\sqrt{hav(\theta)}, \sqrt{1 - hav(\theta)})$ , where  $atan2(x,y)$  denotes the four-quadrant inverse tangent function of  $x$  and  $y$ . Once  $\theta$  is known, the distance between the two points,  $d$ , is equal to:  $d = R \cdot \theta$

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

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The final measure of group's geographic dispersion is given by the linear standard distance formula:

$$\text{Linear Standard Distance}_j = \frac{\sum_{i=1}^n d_i}{n}$$

**Table 5: Chinese Import Penetration and Internal Labor Redeployment**

Dependent Variable: $\Delta \ln Employment$					
	(1)	(2)	(3)	(4)	(5)
		EPL		Geographical concentration of group affiliates	
Variables	All	>Median	≤Median	>Median	≤Median
<i>ΔChinese import to focal affiliate industry</i>	-0.092** (0.034)	-0.096* (0.052)	-0.027 (0.045)	-0.223* (0.093)	-0.077 (0.080)
		different at p<0.01		different at p<0.01	
<i>ΔChinese import to the rest of the group</i>	0.137* (0.072)	0.258** (0.099)	0.002 (0.103)	0.319* (0.161)	0.144 (0.177)
		different at p<0.01		different at p<0.01	
$\ln(Employment_{t-1})$	-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 <sup>2</sup>	0.179	0.179	0.206	0.032	0.038
Observations	170,582	114,608	55,974	34,948	44,956

*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. *ΔChinese 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. *ΔChinese 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. \* significant at 5%; \*\* significant at 1%.

### 2.6.3.2 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 provides information on firms' upper management, so we select managers for whom we have complete employment information between 2002 and 2007 to determine managerial mobility patterns. Within each corporate group, we track whether a particular manager stayed with the same affiliate (non-mover), 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 that work 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 6 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 intra-group mobility to be higher when a group operates in countries with high EPL. The results confirm our theory. 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.

**Table 6: Internal Managerial Mobility by Group Characteristics and EPL**

	(1)	(2)	(3)
	Countries with Below-Median EPL	Countries with Above-Median EPL	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%**

*Notes:* This table provides direct evidence of intra-firm 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. \*\* implies the difference in means between comparison samples is significant at the 1% level.

## 2.6.4 The Dynamics of Group Affiliation

In this section we extend our analysis to 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 standalones in 2007 change their affiliation and become part of a group by 2011. For the sample of standalone firms in our 2007 sample, we collect updated information about their ownership structure from the 2012 ownership version of Amadeus (which provides ownership information for 2011). We focus on standalone 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 forming new ones. We find considerable changes in ownership: 7.2 percent of standalone 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 standalone 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 became part of groups as of 2011. Importantly, the ability and willingness of standalone firms to grow may be a central mechanism that explains the long-term distribution of group affiliation across countries and industries. Table 29 summarizes these ownership change patterns.<sup>27</sup>

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<sup>27</sup> We observe 31,823 standalone 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 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 7 presents the estimation results for the effect of EPL on the likelihood of transitioning from standalone 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 standalone 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 the increase in EPL in each country. We construct an indicator for the increase in EPL 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.

**Table 7: From Standalone to Corporate Group Affiliate: 2007 to 2011**

Dependent Variable: Dummy for $\Delta Group\ affiliation=1$						
Variables	(1) All	(2) High growth	(3) Low growth	(4) All	(5) Form new groups	(6) Join existing groups
<i>EPL</i> × <i>Industry labor turnover</i>	0.523* (0.197)	0.940** (0.167)	0.480 (0.294)			
		different at p<0.01				
Dummy for $\Delta EPL > 0$ × <i>Industry labor turnover</i>				0.587** (0.168)	0.485** (0.137)	0.485** (0.109)
<i>Dummy for <math>\Delta EPL &gt; 0</math></i>				-0.012 (0.045)	-0.010 (0.042)	-0.010 (0.031)
<i>Country financial development</i> × <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( <i>Sales</i> )	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 <sup>2</sup>	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

*Notes:* This table presents the estimation results of linear probability models that examine the effect of EPL on change in ownership from standalone to affiliate. The sample includes all standalone firms in 2007 for which we have ownership information in 2011. *Dummy for  $\Delta EPL > 0$*  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 standalone 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. \* significant at 5%; \*\* significant at 1%.

## 2.6.5 Robustness Checks

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

*Linearity in industry ranking.* We check the sensitivity of our results to non-linear effects of industry turnover. We divide industry turnover into quartiles and interact each with EPL in order to check for non-linear 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, with the strongest effect for the highest quartile of industry turnover. Column 1 in Table 30 presents the estimation results.

*Alternative employment protection laws.* Columns 2-4 in Table 30 present estimation results to alternative EPL measures: employment rigidity, flexibility in hiring and firing, and firing costs. Table 25 provides explanations about their constructions and Table 26 provides information about their values by country. 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.<sup>28</sup> As shown in column 5 of Table 30, this estimation yields a comparable estimated EPL effect.

*Acquired affiliates.* Evidence suggests acquired units are less likely to take part in intra-group mobility of talent (Belenzon et al., 2014), and 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 acquired affiliates and exclude them from the sample. The results continue to hold (column 6, Table 30).

*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 30).

*Missing ownership information.* In our analysis thus far, we exclude firms that do not have ownership information. We check the sensitivity of our results to dropping these firms by including all firms with missing ownership information as standalones. We assume firms are not affiliated with groups, unless we have information indicating

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<sup>28</sup> 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).

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 30).

*Removing individual countries.* Table 31 checks whether individual country drives our results, by removing individual countries from the sample and re-estimating our model separately for each subsample of excluded country. We confirm that our results continue to hold. The estimate of the coefficient on the interaction between industry labor turnover and EPL is always positive and significant.<sup>29</sup>

*Firm size.* We examine how the effect of EPL on group affiliation varies by firm size. Large standalone firms are likely to have their own internal labor markets and therefore should be less sensitive to country regulations than small standalone firms that have limited employment pools from which to draw when readjusting labor. Thus, we expect the effect of ILMs redeployment to be more pronounced when comparing smaller standalone firms with affiliated firms of similar size. Columns 1--2 in Table 32 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 in Table 32 present the estimation results for

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<sup>29</sup> 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).

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 5 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).<sup>30</sup> 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. Since employment protection regulations do not

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<sup>30</sup> 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>

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 3).

## ***2.7 Conclusion and Discussion***

This paper examines the competitive advantage of internal labor markets in environments where external labor rigidities constrain the ability of standalone 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 which make internal labor markets a more important source of competitive advantage, we draw implications to the strategic human capital literature. The challenge of managing workers is that, unlike physical assets, workers can freely leave the firm (Coff, 1997). For that reason, employees need to be motivated, either directly by sharing

firm profits, or indirectly by allowing them to perform tasks that are suboptimal to the firm (Gambardella, Panico, and Valentini, 2013). 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 when economic conditions change. In our context, 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. For instance, geographically concentrated groups can move labor from one affiliate to another at a lower cost than a more geographically dispersed group. Expanding the strategic human capital framework to internal labor markets of groups is a promising avenue for future theoretical and empirical work.

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 result 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., Mahmood and Mitchell, 2004; Chang, Chung, and Mahmood, 2006), 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 that is 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 that are critical to the firm (Cyert and March, 1956). Namely,

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 focus on examining 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 3 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 test further 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.

## **3 Managerial Redeployment, Ownership Structure, and Family Ties**

### ***3.1 Introduction***

The resource-based view rationale for a multi-business organization is based on sharing strategic resources and capabilities among units to achieve economies of scale and scope (Penrose, 1959; Teece, 1982; Teece, Pisano, and Schuen, 1997; Mahoney and Pandian, 1992; Peteraf, 1993). Thus, the ability to timely redeploy and recombine resources to new opportunities is key to competitive advantage of firms (Eisenhardt and Martin 2000; Capron and Mitchell 1998; Williams and Mitchell, 2004; Helfat et al., 2007). Among different strategic resources, managerial resources are especially vital (Penrose, 1959; Hambrick and Mason, 1984; Kogut and Zander, 1992; Coff, 1997; Castanias and Helfat, 1991, 2001; Adner and Helfat, 2003); however, limited empirical work has systematically analyzed how firms redeploy and share their managerial resources internally. In this paper, we examine how characteristics of managerial resources and organizational structure interact to shape patterns of managerial redeployment in large multi-unit organizations.

Managerial mobility can be triggered by several factors, such as managerial preferences, learning about individuals' abilities, and new investment opportunities. When new information becomes available or new opportunities emerge, organizations can benefit from rematching their managerial resources to new uses. Although shared strategic assets provide the economic foundation for resource-based argument for multi-

unit firms, organizational structure and resource characteristics can both affect the extent of resource redeployment between units.

Organizational structure--in particular the ownership structure of an organization---may influence in systematic ways the recombinative efforts of a firm. Property-rights theory, for instance, suggests that headquarters may be reluctant to redeploy high-performing managers (or valuable assets more generally) from wholly-owned affiliates to partly-owned affiliates, as minority shareholders would appropriate some of the returns (Grossman and Hart, 1986; Hart and Moore, 1990; Darr et al., 1995; Baum and Ingram, 1998). On the other hand, headquarters may have an incentive to redeploy low-performing managers from wholly-owned affiliates to partly-owned affiliates, in order to share their cost with minority shareholders.

How trustworthy a particular manager is can also affect where he or she will be redeployed. Because honest and trustworthy managers can be relied on to promote the interests of the firm and extend control of the dominant shareholder (Leff, 1978), they may tend to be redeployed to units where ensuring control is more important or difficult. These environments may include firms in which control is distributed and units are strategically more distant and peripheral.

We examine patterns of managerial mobility within Western European corporate groups. Corporate groups are collections of legally distinct entities controlled by an ultimate owner, typically a wealthy individual, a family, a widely-held corporation, or

the State (Almeida and Wolfenzon, 2006; Belenzon and Berkovitz, 2010). Many if not most large corporations belong to corporate groups according to our definition, as large companies typically control other legally independent firms (as their subsidiaries). Groups are an ideal setting to study patterns of managerial redeployment because their structures and operations resemble in important ways those of any large multi-unit organization, such as a conglomerate or a multidivisional firm. As in large firms, a key function of the group is to perform an intermediation role in markets subject to frictions (Leff, 1978; Khanna and Yafeh, 2007). However, unlike their multidivisional counterparts, characteristics of individual affiliates are readily observable to researchers due to the stricter and more comprehensive financial reporting requirements associated with incorporation. Another major advantage is that organizational structure varies significantly among corporate groups. Specifically, the degree of integration and interrelatedness between units vary: some affiliates are wholly-owned, while others have minority owners; moreover, some groups are more diversified, while others are relatively specialized and strategically related. We exploit this variation by examining patterns of top managerial mobility across units that are more and less core to the group, and to affiliates that are wholly-owned and partly-owned.

We construct a novel dataset on intragroup managerial mobility using top managers' employment histories between 2002 and 2007. We define internal mobility (or redeployment) as a transfer of personnel from one group affiliate to another. We find

substantial internal mobility in our sample: 15.5% of the 209,436 top managers for which we have a complete employment history move at least once from one group affiliate to another. Consistent with property-rights theories, we find that managers are less likely to be redeployed to affiliates that are partly-owned, especially if managers are high-performing. Then, we distinguish managerial attributes into primarily skill-based and trust-based resource by classifying managers related to the controlling family as trust-based managers and unrelated managers as primarily professional or skill-based managers. We find that managers with higher trust attributes are more likely to be redeployed to units where control is arguably most important; that is, to affiliates that have minority shareholders, more strategically distant, and located in regions where societal trust is lower.

Overall, our analysis confirms the presumption that ownership structure contributes to shape redeployment patterns by affecting headquarters' incentives to share resources with subsidiaries. In addition, the study deepens our understanding of the nature of managerial resources. The value of human assets may not be confined to skills and knowledge, but may be extended to incorporate frequently overlooked issues such as loyalty and trust. These factors often play an important role in facilitating decentralization and empowerment, thus permitting organizational growth.

## **3.2 Theory and Hypotheses**

### **3.2.1 Managers as Strategic Resources**

The resource-based view conceptualizes the firm as a collection of resources and capabilities, and a key resource of the firm is the human capital that is embodied in its senior management (Penrose, 1959; Barney, 1991; Castanias and Helfat, 1991, 2001). The upper echelon perspective also emphasizes the important role of the top management team on firm processes and performance (Hambrick and Mason, 1997; Carpenter et al., 2004). Empirical work demonstrates that managers are a key determinant of firm performance. For instance, Bennedsen et al. (2010, 2011) show that when CEOs cannot attend to corporate matters because of exogenous shocks, firms suffer significant declines in profitability, investment, and sales growth. CEOs' characteristics and previous experiences also strongly influence the strategic direction of the firm, for instance its internationalization strategy and choice of partners (Sambharya, 1996; Reuber and Fischer, 1997; Geletkanycz and Hambrick, 1997). Bertrand and Schoar (2003) directly estimate individual managers' impact on various firm policies and find significant relationships between individual effects and strategic policies they pursue in each firm they manage -- each manager seems to have her own "style" of managing, which persists with mobility across firms.

Managers can add value to their organizations for at least two conceptually distinct reasons. First, individuals vary with respect to skills and abilities, and talented

managers may be difficult to find and replace. Even though certain managerial skills are generic and interchangeable, firm-specificity of the knowledge possessed by managers makes them valuable to the firm (Coff, 1997; Wang and Barney, 2006). A manager's skills and talents may be complementary to those of his or her colleagues, thus being part of a unique bundle that may be difficult for other firms to poach or replicate (Galunic and Rodan, 1998). Because of their talent and skills, therefore, managers can be important "skills-based" resources to their organizations.

Second, managers can be a source of value because of their trustworthiness (a "trust-based" resource). The separation between ownership and control creates the potential of agency conflicts within organizations (Jensen and Meckling, 1976); however, if managers can be trusted, internal cohesion can be improved (Ghoshal and Bartlett, 1994). A firm believes its manager is trustworthy when it has confidence beyond formal contracts and controls that the manager will not exploit firm's weaknesses for personal gain (Barney and Hansen, 1994). Thus managerial trustworthiness can be expected to reduce direct opportunism costs such as managerial expropriation and misallocation of corporate resources. More importantly perhaps, organizations that trust their managers can afford less internal bureaucracy and red tape: decision rules can be simplified, control systems can be tuned down, and even the intensity of incentives, which often leads to unwanted behaviors, can be reduced. Indeed, a growing literature emphasizes the advantages of informal and implicit agreements over formal contracts in situations



where the link between effort and outcomes is difficult to establish (Williamson, 1975; Macneil, 1985; Baker et al., 1994a, 1994b; Levin, 2003; Bertrand, 2004; Gibbons and Henderson, 2012). Without trust, many scholars argue, large-scale cooperation and organizational growth beyond a minimum scale would not even be possible (Arrow, 1974; Fukuyama, 1995; Bloom et al., 2012). Thus, in some contexts, managers who are trustworthy may be more important than managers who possess superior skills (Barney and Hansen, 1994).

### **3.2.2 Managerial Redeployment**

The sharing and redeployment of strategic resources is one of the main reasons for the existence of multi-unit organizations. Managerial talent, especially firm-specific and tacit knowledge, is difficult to acquire externally and takes significant time and investment to develop internally (Kogut and Zander, 1992; Wang and Barney 2006; Castanias and Helfat, 1991, 2001). As Penrose notes: "existing managerial personnel provide services that cannot be provided by personnel newly hired from outside the firm, not only because they make up the administrative organization which cannot be expanded except by their own actions, but also because the experience they gain from working within the firm and with each other enables them to provide services that are uniquely valuable for the operations of the particular group with which they are associated" (1959, p. 46).

Managerial redeployment within organizations allows effective reallocation of knowledge, skills and social capital within organizational boundaries. Managerial mobility can foster knowledge exchange and intra-organizational interactions (Burt, 1992; Farjoun, 1998; Gelatkanycz, Boyd, and Finkelstein, 2001). Managers can bring with them their internal and external connections, thus extending social networks and propagating shared organizational culture (Schein, 1990; Kostova, 1999). Recent work on managerial cognition also suggests that top management's mental models can significantly affect the effectiveness and timeliness of firm response to environmental changes (Eisenhardt and Martin, 2000; Tripsas and Gavetti, 2000; Kaplan et al., 2003). Therefore, managerial rotation can infuse fresh cognitive models and focus attention on less path-dependent and "myopic" options (Levinthal and March, 1993), and result in introducing variation and innovation to managerial processes. As such, managerial mobility may constitute a "higher-order" routine designed to tackle novel challenges and arbitrary events and increase firm's evolutionary fitness (Winter, 2003).

Specifically in the context of corporate groups, the redeployment of high-level management across business lines has long been deemed an important source of competitive advantage. As Leff (1978) notes, in groups: "Economies of scale to entrepreneurship can be appropriated as able individuals are utilized to their full potential in the group's large and diversified activities. In addition [...], the groups increase entrepreneurial mobility, for they can deploy entrepreneurial resources to

specific intragroup companies as opportunities arise" (p. 670). Khanna and Palepu's (1999) study of business group evolution in Chile and India provides some support for Leff's argument. Khanna and Palepu find that during periods of significant deregulation, business groups repositioned themselves to take advantage of new opportunities. Their evidence points to group advantages in the labor and product markets, rather than in financial markets, as the main factor behind group expansion. Resource-based scholars similarly view managerial slack and redeployment as an important precondition for corporate expansion and diversification (Penrose, 1959; Prahalad and Bettis, 1986). Further, evidence from the U.S. points to internal managerial mobility as a key driver of productivity differences across plants and firms. Using plant-level data, Schoar (2002) finds that productivity increases following acquisition by a diversified conglomerate. This result appears to be driven by the fact that more capable management is reallocated to the new plants. Hortaçsu and Syverson (2009) find that the plants of vertically integrated U.S. firms have higher productivity levels than the plants of non-vertically integrated firms. These productivity differences are not related to intra-firm movements of goods, which are extremely small. Rather, in line with Chandler's (1977) visible hand argument, integration appears to be a more efficient mechanism for the transfer of intangible inputs such as managerial oversight.

Although organizations need the flexibility to redeploy existing managerial resources in a timely manner, managerial mobility within organizational boundaries can

be hindered by the complex structure of multi-unit firms. The units can vary in strategic orientation and scope and can be connected through complex and extensive social and economic ties. Even though the fundamental role of headquarters in these structures is to reallocate resources and facilitate cooperation among units, the willingness of resource stewards to engage in the transfer, sharing and recombination of resources can affect patterns of managerial redeployment. Incentives to share resources are dictated largely by alignment of objectives pursued across different units, appropriability from reallocation and social considerations, such as social ties, interpersonal conflict and politics (Alchian and Demsetz, 1972; Jensen and Meckling, 1976; Williamson, 1975; Bourgeois III, 1980; Bourgeois III and Eisenhardt, 1988; Kaplan, 2008). Unique language and divergent cognitive models in specialized units can further increase costs of identifying opportunities for sharing, executing exchanges and managing coordination (Lawrence and Lorsch, 1967; Prahalad and Bettis, 1986; Grant, 1996).

An important organizational structure element that can affect the incentives to share resources is the degree of integration. Units that are organized more independently and rely less on corporate resources are more likely to have greater discretion over their own resources, which can significantly reduce their incentives to share resources with other units. Incentives to redeploy resources from the center to the periphery are often affected by ownership considerations. For example, multinational firms are often reluctant to transfer technological or human resources to foreign

subsidiaries that are not fully owned (Pérez-González, 2005). In the case of human resources, a further complication arises because transfer requires the consent not only of the firm owners, but also of the workers or managers involved (Coff, 1997). In the next section, we review the role of organizational structure in the context of corporate groups and provide predictions for managerial mobility patterns by exploiting the variation in group structure.

### **3.2.3 Managerial Mobility in Multi-Unit Firms**

Corporate groups are a common organizational form, especially outside the U.S., and provide an ideal setting for studying the effects of organizational structure on internal combinative capabilities. Corporate groups are collections of firms controlled by the same ultimate shareholder, which has authority to allocate resources among member firms, or group affiliates (Belenzon and Berkovitz, 2010; Belenzon and Tzolmon, 2015). The group structure can be quite complex: some affiliates are more decentralized than others, and interrelatedness among affiliates can also vary. In particular, the degree of integration can vary, with controlling and minority shareholders holding different proportions of equity in different affiliates. The distinctive feature of corporate groups, as far as ownership structure is concerned, is not that they can have minority shareholders (many large corporations do as well), but that minority shareholders are not homogeneously distributed across affiliates. Some group affiliates can be wholly-owned by the group controlling shareholder, while others may only be partly-owned.

Thus, corporate groups provide an ideal setting for studying how heterogeneity in ownership structure may affect managerial redeployment and mobility.

### **3.2.3.1 Ownership Structure**

While internal managerial markets of groups may provide more efficient allocation of resources than external markets, complex ownership structure of corporate groups may affect the flow of resources among affiliates. Incentive problems are particularly salient when affiliates are more decentralized and their ownership structure less integrated. With centralized control, headquarters or the controlling shareholder makes resource reallocation decisions and units operate with resources provided by the headquarters. When units are more decentralized, they have greater control and discretion over their own resources, which reduces their incentives to share them with other units. Corporate group structure can vary along the centralization continuum. The most apparent distinction between centralized and decentralized structure in corporate groups is reflected through their ownership structure. Partly-owned affiliates are much more decentralized than wholly-owned affiliates due to regulatory protection of minority shareholders, which makes moving resources away and to partly-owned affiliates more difficult, and because incentives to share resources with minority shareholders is lower.

The property rights theory of the firm (Grossman and Hart, 1986; Hart and Moore, 1990) examines how ownership affects incentives to invest resources in common

ventures. The theory predicts that shared ownership should inhibit unilateral resource transfers, because the cost of redeployment is borne solely by the owner of the asset while the benefits are shared. Thus, to the extent that redeployment of resources is critical to sustained competitive advantage, these firms will be relatively disadvantaged due to stunted internal mobility of resources. Consistent with this notion, Pérez-González (2005) finds that the transition to full ownership by foreign affiliates after Mexico lifted foreign majority ownership restrictions not only resulted in greater investment in affiliates by the owners but also significantly improved productivity in those affiliates.

In the context of corporate groups, the property rights theory suggests that presence of minority shareholders in one unit should be negatively associated with the probability of internal managerial reallocation to that unit. This effect should be larger for high performing managers, and for managers that move from wholly-owned affiliates to partly-owned affiliates, since in those cases their talent and skills would partly benefit minority shareholders, while the cost would be borne entirely by the controlling shareholder.

***Hypothesis 1.** The presence of minority shareholders in an affiliate is negatively related to the probability that high performing managers will be redeployed to that affiliate. The effect should be stronger when mobility originates from a wholly-owned affiliate than when mobility originates from a partly-owned affiliate.*

Not all managers, however, are "valuable assets". Some managers consistently underperform, perhaps because they lack the required leadership or cognitive skills. An obvious organizational response in those cases would be to fire the underperforming managers. This solution, however, may not always be feasible. Contractual obligations and/or social norms may to some extent protect underperforming managers from termination. An alternative strategy may be to redeploy the managers to tasks that are perceived as less important or valuable. In particular, the controlling shareholder may transfer the low-performing managers from subsidiaries in which they hold large equity stakes to subsidiaries in which they hold small equity stakes, thus opportunistically sharing these "bad assets" with minority shareholders. While the corporate governance literature has extensively documented the importance of these agency problems, at least among developing countries' corporate groups, some have argued that in developed markets like Europe, reputational concerns may mitigate expropriative incentives and induce controlling shareholders to behave more fairly. Thus, we only tentatively propose the following.

***Hypothesis 2.** The presence of minority shareholders in an affiliate is positively related to the probability that low-performing managers will be redeployed to that affiliate. The effect should be stronger when mobility originates from a wholly-owned affiliate than when mobility originates from a partly-owned affiliate.*



### **3.2.3.2 Managers as Trust- and Skill-Based Resource**

As noted above, managers can be a source of value to their organizations not only as repositories of skills and talent (a "skills-based" resource), but also as repositories of trust and social capital (a "trust-based" resource). In the spirit of the upper echelons perspective, we argue that observable managerial characteristics offer some indication of which of these two qualities -- skills or fidelity -- are preponderant in a given manager. Specifically, we argue that family-related managers -- those that are related through family ties to the group's controlling shareholders -- will on average rank higher on the trust dimension than non-family, professional managers

Family-related managers are common around the world. More than two thirds of all businesses worldwide are family-owned (Gersick et al., 1997) and because family owners typically want to run their own businesses, family management is correspondingly widespread. Traditionally, however, scholars have questioned the efficiency of such family-based governance mechanisms. Family management, in particular, has often been perceived as ineffectual, the result of privilege and nepotism. Consistent with this view, research has documented that family firms favor family members in succession decisions, and that these decisions result in poor performance (Pérez-González, 2006; Bennedsen et al., 2007; Bloom and Van Reenen, 2007).

In the last few decades, however, a more balanced perspective has begun to emerge. Family capitalism has been credited with several potential advantages relative

to widely-held, public corporations, such as a longer-term perspective, a stronger emotional commitment to the firm by family owners, and reduced agency problems between managers and shareholders thanks to family involvement in the running the company (Bertrand and Schoar, 2006). Family-related managers may act in the interests of their firm (or, more precisely, if there are minority shareholders, in the interest of the family shareholders) because they are intrinsically loyal to their family and/or because they have a large personal stake in their company's success. Loyalty in turn strengthens a sense of control in the organization and promotes cooperation (Aghion and Tirole, 1997; Das and Teng, 1998; Rousseau et al., 1998). Burkart et al. (2003) develop a theory of family firms that incorporates some of these ideas. In their model, delegating managerial responsibilities to family members is detrimental to performance because professional managers are on average better managers. On the other hand, professional managers may expropriate family and non-family investors. Burkart et al. emphasize the degree of legal protection of outside shareholders from expropriation as a key factor shaping the balance between these forces.

Building on these literatures, we suggest that professional (non-family) managers often rank higher than family-related managers on the "skills dimension", while family managers often rank higher than professional managers on the "trust dimension". Because both skills and trustworthiness are both valuable traits, we make no claim that professional managers are better than family-related managers, or vice versa. However,

because trustworthiness is likely to be especially valuable in settings where control is more important or difficult, we expect that over time family-related managers will be redeployed to this type of business opportunities. In the following, we discuss three factors that make the trust dimension more salient.

The first factor is the presence of minority shareholders in a group affiliate. In most jurisdictions, managers have a fiduciary duty to protect the interests of the shareholders of their company, not the group as a whole. In some situations, however, the interests of the company and those of the group may conflict. In these cases, a professional manager may be inclined to protect the interests of the affiliate and its shareholders. A family-related manager, on the other hand, may put greater weight on the welfare of the group as a whole and, in particular, on the interests of the family controlling shareholders. Thus, we may expect family-related managers to be redeployed to affiliates with minority shareholders, to strengthen control over these affiliates.

Trust is also more important in environments where managerial performance is more difficult to assess. Managerial performance in peripheral affiliates -- those that only loosely related to the group's core business -- is likely to be particularly hard to benchmark and monitor. Family ties can mitigate the concern that managers will use weaknesses in performance evaluation systems to their own advantage. Thus, we may

expect family-related managers to be frequently redeployed to peripheral (non-core) affiliates.

Finally, the trustworthiness of a particular individual may be related to general level of trust in society. Two types of trust can be distinguished: particularized trust and generalized trust. Particularized trust is observed when people place more trust in those within their close networks and relations. Thus, this type of trust would typically contribute to efficient coordination within closely-related groups or communities, but not outside these groups. On the other hand, generalized trust is the belief that most people, including strangers, are generally trustworthy (Uslaner 2000). When generalized trust is high, coordination between groups and units is facilitated. La Porta et al. (1997) find that higher levels of generalized trust encourage cooperation and performance in large organizations (see also Bloom et al., 2012). Similarly, Knack and Keefer (1997) determine that higher level of trust and lower levels of corruption in the country has positive effect on economic performance through lowering transaction costs. Generalized and particularized trust are likely to be substitutes (Fukuyama, 1995). In regions with lower generalized trust, professional managers will not be trusted as much. Thus the redeployment of family managers may be necessary to ensure effective coordination and control.

We summarize this discussion in the hypothesis below.

**Hypothesis 3.** *Family-related managers are more likely to be redeployed to affiliates (i) with minority shareholders, (ii) that are peripheral or non-core, (iii) and operate in regions where levels of generalized trust is low.*

### **3.3 Data**

To test our predictions, we develop a new dataset on managerial mobility. We use Bureau van Dijk's (BvDEP) Amadeus database to extract information on top management, ownership and accounting information for both private and public firms in 15 Western European countries.<sup>1</sup>

BvDEP standardizes financial and management information across different filing requirements of each country and provides comprehensive data on firms of different sizes. Management and ownership information is available only cross-sectionally for each publication of Amadeus. Thus, we use several publications of Amadeus to construct our dataset for the period from 2002 to 2007. Our final sample consists of 209,436 managers in 99,357 firms belonging to 46,306 corporate groups.

#### **3.3.1 Ownership Structure**

We focus on managers of firms belonging to *corporate groups*. Corporate group is a common organizational structure in Europe. Corporate groups are organizations composed of at least two legally independent firms controlled by the same ultimate

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<sup>1</sup> The countries include Austria, Belgium, Denmark, Germany, Finland, France, Great Britain, Greece, Ireland, Italy, Netherlands, Norway, Spain, Sweden and Switzerland.

shareholder (Almeida and Wolfenzon, 2006; Belenzon and Berkovitz, 2010; Belenzon et al., 2012). The legal definition of corporate groups in Europe relies on the concept of control, obtained by ownership or majority of voting rights and power to appoint and remove the majority of administrative, management and supervisory body (Seventh Council Directive 83/349/EEC). Corporate groups play an integral role in European economy. Affiliates of corporate groups can take advantage of internal capital and labor markets (Belenzon et al., 2012; Belenzon and Tzolmon, 2013). While strict employment protection regulations impose significant labor adjustment costs on employers in some European countries, under European Union law, corporate groups can transfer their employees within the group without being subject to dismissal regulations (European Union Directive 96/71/EC). Thus, corporate group structure benefits group affiliates who can adjust their labor without penalty by tapping into group's internal labor markets. This exception, afforded to European corporate group affiliates, allows us to examine internal managerial mobility within groups and make comparisons to internal mobility in multi-business firms where country employment dismissal regulations do not apply.

*Presence of minority shareholders.* We use the 2007 ownership information from Amadeus to infer group structure, and supplement this information with historical data to capture ownership changes (divestitures and acquisitions). For each affiliate in 2007, the dataset provides information about the share of equity which is held, directly or indirectly, by the group's controlling shareholder. For each affiliate we also have

information on its historical ownership structure as inferred from the historical publications of Amadeus.<sup>2</sup> An affiliate is classified as having *minority shareholders* if minority shareholders own some equity in the affiliate. These affiliates are considered to be *partly-owned* due to the presence of minority shareholders. *Wholly-owned* affiliates are those that do not have minority shareholders.

### **3.3.2 Managerial Mobility**

Amadeus data on top management includes consolidated and standardized information from nearly 70 sources on companies' CEOs and other top managers. While countries in our sample differ in corporate governance reporting requirements, BvDEP collects information on firms' key officers and shareholders from both public and private sources, which include country regulatory bodies and private credit information agencies. Common titles for the managers in our sample include Chief Executive Officer, Manager, Managing Director and General Manager. On average there are 2.1 managers per corporate group affiliate in our sample. We look at the mobility of any of those managers. Results are robust when we restrict attention to affiliates where only information on their CEO is provided.

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<sup>2</sup> We infer group structure from dyadic control relationships. We say that a firm (or an individual) controls a private firm if the former firm owns more than 50% of the latter firm's voting rights (excluding non-voting shares). Following La Porta et al. (1999) and Faccio and Lang (2002), we set this threshold at 20% for public firms since these firms usually have a more dispersed ownership (all our results are robust to different plausible specifications of these thresholds). An algorithm then builds control chains and creates group structures by merging together all the chains controlled by the same ultimate shareholder (a firm or an individual). Details on the algorithm are provided in Belenzon and Berkovitz (2010).

For each manager observed in the 2002 publication of Amadeus, we track the manager's subsequent employment history until 2007 using annual Amadeus publications. The main challenge in developing this data is to assign unique identification codes to managers across publication years. That is, our analysis hinges on our ability to determine whether two observations at different companies and in different years are actually the same manager. We employ a direct name matching algorithm which uses a secondary phonetic matching routine to handle misspellings.<sup>3</sup> The final data includes a unique identification code for each manager, year of employment (the year of the relevant Amadeus publication), and an identification code for the manager's firm(s).

*Mobility.* To capture mobility, we restrict the manager sample to include only managers who are employed in group affiliates and for which we have complete employment history from 2002 to 2007. For each manager in 2002, we ask whether he or she was managing a different affiliate of the same group during the 2003-2007 period. If the manager was managing a different affiliate, then the manager is classified as *redeployed or moved internally*. If the manager was managing the same affiliate during the entire sample period, then the manager is classified as *non-moving or staying*. If the

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<sup>3</sup> Information on the name matching algorithm is available upon request.



manager in 2002 is observed in a firm not belonging to the same group in the subsequent years, then the manager is classified as *exited or moved externally*.<sup>4</sup>

Because the sample comprises managers with complete employment history for the period 2002-2007, two potentially important types of transitions are excluded. First, a manager can join a group from an outside firm (entry). If a transition occurs from an outside firm to a group affiliate, this transition is not included in our main analysis. Second, we exclude the observation if a manager disappears from the data: a manager may leave the group to join a venture outside the scope of the data coverage, leave the labor force by retiring or dying. Thus our analysis restricts attention to managers who

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<sup>4</sup> A number of issues can arise when examining mobility. In some cases, multiple firms are associated with the same manager in a single year. In such cases we have multiple employment histories. For example, suppose that manager *i* manages company A in 2005-2007. In 2002-2004, however, there are three observations to which we assign the same identification code as manager *i*. Suppose these observations refer to three affiliates of the same group: firms A, B, and C. Has manager *i* been redeployed in 2004? A 2002-2004 employment history that included only firms B and C would lead us to conclude that manager *i* has been redeployed, while a history that included only firm A would lead us to conclude that manager *i* has not been redeployed. We adopt the following convention. We say that a manager was redeployed if and only if the firm he or she manages in 2007 is not part of his or her employment history in one or more years between 2002 and 2006. In the above example, manager *i* is classified as a staying manager because firm A is part of manager *i*'s employment history in every year between 2002 and 2006.

A second issue is how to deal with external mobility. In the example above, suppose the 2002-2004 employment history includes only firms B and C. Suppose further that firm B is an affiliate of the same group as firm A (the 2007 affiliate), whereas firm C belongs to a different group. Clearly manager *i* moves in 2004, but is this an example of internal or external mobility? We classify mobility as internal (and hence manager *i* as redeployed) if at least one firm in manager *i*'s 2002-2004 employment history belongs to the same group as firm A. Thus, in this example manager *i* is classified as redeployed because firm B belongs to the same group as A. However, if neither B and C had been part of firm A's group, then this transition would have been classified as external.

Finally, we use historical ownership information to identify instances of redeployment involving firms that either join or leave the group during the 2002-2007 period, or are no longer active in 2007.

either stay in the same group affiliate, redeploy within the group, or join another firm during the 2002-2007 period.<sup>5,6</sup>

### 3.3.3 Manager Types

In order to determine whether managers represent different types of resources, we distinguish between family-related and professional managers. A manager is classified as a *family-related manager* if his or her last name is the same as the last name of any shareholders that hold at least 5 percent of the group's equity. Managers who do not share the same last name with a shareholder are classified as *non-family managers*.

### 3.3.4 Group Structure

We distinguish between core and peripheral affiliates based on the group sales share in the three-digit SIC of the affiliate. An affiliate is classified as *core* if the group shares in its three-digit SIC (excluding the focal affiliate's sales) lie in the fourth quartile of the industry sales shares distribution. An affiliate is classified as *peripheral* if the group industry share is in the first quartile of the industry sales distribution. We construct two additional measures of relatedness of an affiliate to the group. First, we use the Robins-Wiersema (1995) index of relatedness, which is the weighted measure of similarity between paired industries, based on similarity in category and proportion of technology

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<sup>5</sup> We combine disappearances with identified exits for robustness checks, and our results hold.

<sup>6</sup> Although promotions within an affiliate could be construed as an internal move, we do not track changes in titles within the same affiliate due to data limitations--while the identity of managers is quite comprehensive, information on titles, age and other details is not uniformly available across different edition of Amadeus publications.

flows in the US manufacturing sector. Second, we use the Fan-Lang (2000) indices based on US input-output commodity flow data from the Bureau of Economic Analysis. There are four distinct measures: forward and backward vertical relatedness indices (degree to which one industry can employ the other's products and services as inputs for its own production or supply output as the other's input ) and forward and backward complementarity indices (whether two industries can procure inputs jointly or share marketing and distribution networks). These additional measures are used for robustness checks for specifications distinguishing between core and periphery affiliates, and the results hold when using these alternative measures of relatedness.

### **3.3.5 Regional Trust**

While family-related managers may represent trust-based assets of a firm, we also develop a measure of generalized trust, based on the perceptions of general trust by the people in the region where the group affiliate is located. We use two surveys which cover a wide range of social variables, and focus on trust-related questions. The European Social Survey (ESS) covers almost 30 countries and is funded by the European Commission, the European Science Foundation and participating countries. The second survey, the European Values Study (EVS), is a cross-national and longitudinal study updated every nine years since 1981 by the University of Tilburg and GESIS, Leibniz Institute for Social Science. The ESS measures trust by asking to rate on a scale of 0 to 10 on the question: "Generally speaking, would you say that most people can be trusted, or

that you cannot be too careful in dealing with people?" The survey responses are aggregated to one- or two-digit NUTS levels and we match them to the locations of affiliates in our sample by their corresponding NUTS codes.<sup>7</sup> Score of 0 means that one cannot be too careful and 10 means that most people can be trusted. The EVS asks the same question as the ESS for trust, but respondents are asked to answer with either "most people can be trusted" or "cannot be too careful." We transform each survey score to a *trust index* ranging from 0 to 1, with value of 1 indicating the greatest level of generalized trust. The two survey measures are highly correlated (0.88). We use the index based on ESS survey scores as our primary trust measure and check for robustness using the EVS scores. The regions located in Denmark, Sweden and Finland are perceived by the respondents as most trustworthy, while in some regions of Spain and France, people do seem to put a lot of trust in others.

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<sup>7</sup> The NUTS classification (Nomenclature of Territorial Units for Statistics) is a hierarchical system for dividing up the geographic territory of the EU by major socio-economic regions. The classification is similar to the Metropolitan Statistical Area (MSA) system in the U.S.

**Table 8: Summary Statistics**

<b>Panel A: Managers By Move Type</b>								
	All		Internal movers		Non-moving managers		External movers	
	Average	Median	Average	Median	Average	Median	Average	Median
Number of managers	209,436	209,436	32,393	32,393	146,453	146,453	30,590	30,590
% Internal Move	15.5	0	-	-	-	-	-	-
Dummy for Minority Shareholders	0.47	0	0.36	0	0.55	0	0.3	0
% Minority shareholders	18.4	0	14.0	0	21.6	0	9.7	0
Year of incorporation	1979	1986	1983	1989	1978	1985	1978	1985
Group sales (\$, mm)	208,062	119	359,932	601	176,236	87	222,345	122,715
Number of affiliates	89	7	130	20	88	6	79	8
Affiliate sales (\$, '000)	136,723	7,356	198,750	9,999	110,367	7,359	123,810	9,999
Manager's age	55	55	53	53	56	56	55	55
<b>Panel B: Managers by Family Ties and Affiliate Characteristics</b>								
	Family-related managers		Non-family managers		Core affiliate managers		Peripheral affiliate managers	
	Average	Median	Average	Median	Average	Median	Average	Median
Number of managers	23,573	23,573	185,863	185,863	50,297	50,297	50,300	50,300
% Internal Move	15.3	0	15.5	0	7.4	0	20.3	0
Dummy for Minority Shareholders	0.45	0	0.47	0	0.50	0	0.47	0
% Minority shareholders	16.0	0	18.7	0	18.6	0	19.7	0
Year of incorporation	1981	1987	1979	1986	1979	1985	1981	1987
Group sales (\$, mm)	3,689	25	233,983	162	2,314	14	535,373	4,305
Number of affiliates	10	4	98	8	6	2	180	42
Affiliate sales (\$, '000)	58,407	4,305	146,429	7,869	42,420	5,982	39,913	4,773
Manager's age	54	54	55	55	55	54	55	55

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*Notes:* This table provides summary statistics for managers, affiliates and groups in our sample. Information on affiliates is for 2007. Internal movers are redeployed managers that moved at least once from one group affiliate to another during the sample period (2002-2007). Non-movers are managers who stayed with the same affiliate for all five years. External movers are managers who left the group during the sample period. % Minority shareholders refers to the total holdings, direct and indirect, that minority shareholders have in an affiliate. A manager is classified as a family-related manager if his or her last name is the same as the last name of a shareholder that holds at least 5% of the group's equity. An affiliate is classified as core if the group shares in its three-digit SIC (excluding the focal affiliate's sales) lie in the fourth quartile of the industry sales shares distribution. An affiliate is classified as peripheral if the group industry shares is in the first quartile of the group industry sales distribution. Information on Manager's age is available for a subsample of 49,964 managers.

### **3.3.6 Descriptive Statistics**

Table 8 presents descriptive statistics for our sample managers. Our sample includes 209,436 top managers for which we have complete employment history for the period 2002-2007. 32,393 (15.5%) of these managers have moved at least once internally: from an affiliate to a different affiliate of the same group. The average group generates \$208 billion in annual sales (but the distribution is highly skewed, with median group sales of \$119 million), and has 89 affiliates (a median of 7). The average affiliate is quite large with \$137 million in annual sales (a median of \$7 million).

Minority shareholders hold, on average, 18.4% of the affiliates' equity (minority shareholders are all the shareholders different from the group's controlling shareholder). Shared ownership is less common in affiliates that are run by redeployed managers: 14.0% of the equity of affiliates run by redeployed managers is held by minority shareholders, as compared to 21.6% for non-moving managers. Mobility also appears to be more prevalent in larger groups. For a redeployed manager, average group sales are \$360 billion (a median of \$601 million). For non-moving managers, the same figure is \$176 billion (a median of \$87 million).

We distinguish between family-related and non-family managers. 23,573 (11.3%) managers are classified as family-related managers. While there is no difference in average mobility between family and non-family managers, there are substantial differences in the types of firms they run and groups they belong to. In particular, family-related managers tend to work in affiliates and for groups that are much smaller than those for which non-family managers work. Groups with family-related managers have much smaller sales (\$3.7 billion on average and a median of \$25 million), than groups without family-related managers (average \$234 billion and median of \$162 million). For groups with family-related managers, minority shareholders own, on average, 16% of affiliate's equity. For affiliates with non-family managers this figure is 18.7%.

The share of affiliates with minority shareholders is distributed very evenly across core and peripheral affiliates: among peripheral affiliates, 47% have minority shareholders, and among core affiliates, 50% are partly-owned. Mobility is much higher in peripheral affiliates than in core: 20.3% of managers in peripheral affiliates move compared to 7.4% of managers in core affiliates. Core affiliates on average generate slightly more sales than peripheral affiliates.

Table 9 reports the percentage of redeployed managers by affiliate type. Young and acquired affiliates are much more likely to experience internal mobility than mature or internally generated affiliates. In young affiliates (first quartile of affiliate age

distribution), 26.1% of managers are redeployed, as compared to 14.9% in mature affiliates (fourth quartile of affiliate age distribution). In acquired affiliates, 31.4% of managers are redeployed, as compared to only 14.5% of managers of internally generated affiliates.

We also make a distinction (not reported in the table) between top-down, bottom-up and horizontal mobility within a group. Mobility is classified as top-down if the manager moves from a company to one of its direct or indirect subsidiaries. Bottom-up mobility refers to situations when a manager moves from a subsidiary to a firm that, directly or indirectly, controls it. Mobility is classified as horizontal if the manager moves from a group affiliate to another affiliate of the same group, and neither holds a direct or indirect equity stake in the other. Horizontal mobility is the most common form of mobility in our sample with 65% of total mobility. 30% of mobility is top-down, and the remaining 5% is bottom-up.

In Table 10, we distinguish between internal and external mobility by group and manager characteristics. External moves are moves by managers to firms not belonging to the focal group. 50,752 managers (14.6%) move externally by leaving to a different firm. Overall, there is a significant amount of movement: 30.1% of all managers move either externally or internally. Large (by sales and number of affiliates), diversified and multinational groups have higher mobility, with managers moving especially at a higher rate internally. As well, mobility is generally higher in affiliates that are wholly-owned



than in affiliates with minority shareholders. More managers move in peripheral affiliates than in core (20.3% versus 7.4%, respectively). Interestingly, there is no difference in internal and external mobility between family-related managers and non-family managers, although in the empirical analysis, we find striking differences in their mobility patterns by group structure and levels of regional trust. We further investigate how often same managers move internally (not reported in the tables). Of 32,393 managers who moved internally at least once in five years, 52.5% moved once, 28.4% moved twice, 9.7% moved three times, 8.0% moved four times, and 1.5% moved every year within the group. Our results remain robust to the exclusion of very frequent movers—potentially "turnaround experts"—whose jobs entail frequent mobility.

**Table 9: Summary Statistics for Redeployed Managers**

% of managers who moved internally							
Affiliate Types							
	All	Young	Mature	Acquired	New internal	Wholly-owned	Partly-owned
All Managers	15.5	26.1	14.9	31.4	14.5	18.8	11.8
Family-Related Managers	15.3	16.5	14.5	40.5	15.0	17.3	12.9
Non-Family Managers	15.5	28.6	15.0	31.0	14.5	18.9	11.7

*Notes:* This table provides summary statistics for the percentage of redeployed managers. Young affiliates are affiliates that fall in the first quartile of the affiliate age distribution. Mature affiliates are affiliates that fall in the fourth quartile of the affiliate age distribution. A manager is classified as a family-related manager if her last name is the same as the last name of a shareholder that holds at least 5% of the group's equity. Non-family managers are all the managers that are not classified as family-related managers.

**Table 10: Patterns of Managerial Mobility**

		<i>Patterns of mobility by group and manager characteristics</i>																					
		Group size, by sales						Group size, by number of affiliates						Group characteristics					Ownership structure		Group structure		Manager type
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)							
All	Small	Medium	Large	Small	Medium	Large	Diversified	Specialized	Multinational	Domestic	Source wholly-owned	Source partly-owned	Core	Periphery	Family-related	Non-family							
Total managers	209,436	69,815	69,820	69,801	79,116	61,205	69,115	112,754	96,682	78,500	130,936	110,745	98,691	50,297	50,300	23,573	185,863						
Move internally (%)	15.5	8.8	15.2	22.4	7.1	17.3	23.5	18.7	15.1	18.1	13.9	18.8	11.8	7.4	20.3	15.3	15.5						
Move externally (%)	14.6	14.5	15.0	14.4	13.0	16.2	15.1	14.2	11.7	15.5	14.1	20.2	8.3	14.2	15.8	15.1	14.5						
Stay (%)	69.9	76.7	69.8	63.3	79.9	66.6	61.4	67.1	73.3	66.4	72.0	61.0	79.9	78.3	63.8	69.5	70.0						

*Notes:* This table reports pattern in different types of managerial mobility by group and manager characteristics. Internal moves are moves from one affiliate to another within the same group. External moves are outgoing moves to firms that do not belong to the group. Staying managers stay with the same affiliate for the entire 5 year period. Diversified group's sales are below the median level of industry HHI. At least one affiliate in a multinational group operates in a different country from the rest. Groups hold 100% ownership in wholly-owned affiliates, and share ownership in partly-owned affiliates. Core and peripheral affiliates are classified at the 4th and 1st quartiles of the distribution of the group sales share in the three-digit SIC of the affiliate, respectively. A manager is classified as a family manager if his or her last name is the same as the last name of a shareholder that holds at least 5% of the group's equity.

## **3.4 Econometric Specifications**

### **3.4.1 Mobility Types**

Determinants and conditions of managerial moves are complex and interrelated: unlike physical assets, managers are not owned by their employers and can leave their firms on their own volition. Since managerial quality varies, activities such as hiring, monitoring and measuring performance are fraught with different degrees of information asymmetries. Decisions by managers to stay or move are a combination of the availability of external and internal opportunities. Thus, managerial redeployment closely involves the interplay between internal and external markets. We examine the probability of moves by the variation in affiliate performance which can trigger mobility.<sup>8</sup> We explore different types of mobility and provide evidence on the relationship between the types of mobility and characteristics of internal markets. We compare the relative probabilities of three types of mobility: stays, internal and external moves. A manager can choose to stay with the same firm, or she can move to a different

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<sup>8</sup> A closely-related paper (Belenzon and Tsoimon, 2015) examines the effects of external labor markets on ability of firms to adjust their labor. If external labor markets have frictions, matching a manager with external opportunities is more costly, so a manager is likely to stay with the same firm or seek internal opportunities. Labor market regulations impose costs on firms for readjusting their labor. Some countries in our sample have very strict dismissal regulations. Higher degree of regulations generally stifles labor markets by making it costly to adjust labor and increasing the reluctance of firms to hiring from outside and motivating them to promote and reallocate labor within firms. In this paper, we do not explicitly examine the external labor market conditions as they pertain to the internal reallocation of managers. In all specifications, we control for country and industry to account for these variations in external labor markets.

unit within the same firm, or she can leave her firm for external opportunities with a different firm.

Managerial quality, as observed through firm performance, can trigger mobility (Tsolmon, 2015). High performing managers are likely to be recruited both internally and externally. Thus, we examine the relative probability of different categories of mobility across different levels of firm performance.

The empirical analysis compares pairwise probabilities of three mobility types as a function of affiliate characteristics using multinomial logistic model. We are interested in whether pre-mobility affiliate sales growth changes the relative probabilities of stays, internal and external moves. The estimation data is cross-sectional for 2007. Our empirical specification is:

$$\Pr(MobilityType_{i(j)} = 1) = F(\beta_1 SalesGrowth_j + X'_j \beta_2) \quad (1)$$

where  $i$  denotes a manager and  $j$  denotes the affiliate this manager manages in the most recent sample year (2007).  $MobilityType_{i(j)}$  is a categorical outcome variable that receives the value of 1 if manager  $i$  stays in the same affiliate  $j$  for the entire sample period, equals 2 if manager  $i$  moves to affiliate  $j$  from another affiliate in the same group, and equals 3 if manager  $i$  leaves affiliate  $j$  to a firm outside the group.  $SalesGrowth_j$  is average sales growth in affiliate  $j$  in the pre-mobility period of 1999-2002.  $X'_j$  is a set of affiliate controls (year of incorporation and share of group sales in the three-digit SIC of

the affiliate). We compute standard errors clustered at the group level, which allows the error term to be correlated across affiliates and managers of the same group.

We expect higher propensity of managers to stay and move internally than to move externally when an affiliate is performing well:  $\beta_1 < 0$ .

### 3.4.2 Ownership Structure

Our second empirical specification focuses on internal redeployment of managers and examines the relationship between ownership structure and propensity for redeployment. We compare the probability of a manager being redeployed internally to the probability of a manager staying with the same affiliate during the sample period. Our prediction is that the presence of minority shareholders in an affiliate is negatively related to the probability of high-performing managers being redeployed to that affiliate, especially when the mobility originates from a partly-owned affiliate.

The empirical analysis focuses on the relationship between group, affiliate, and managerial characteristics and probability of internal redeployment. We are interested in whether the presence of minority shareholders in a focal affiliate reduces the likelihood that a group manager is redeployed to that affiliate, especially if the manager is high-performing. Our main empirical specification for the linear probability model is:

$$\Pr(\text{InternalMobility}_{i(j)} = 1) = F(\beta_1 \text{MinorityShare}_j + X'_j \beta_2 + Z'_g \beta_3) \quad (2)$$

where  $i$  denotes a manager,  $j$  denotes the affiliate this manager manages in the most recent sample year (2007), and  $g$  denotes the corporate group.  $\text{InternalMobility}_{i(j)}$

is a dummy variable that receives the value of one if manager  $i$  is redeployed to affiliate  $j$  from another group affiliate in the period 2002-2007, and zero if manager  $i$  manages the same affiliate  $j$  for the entire sample period.  $MinorityShare_j$  is the share of equity in affiliate  $j$  which is held by shareholders that are different from the group controlling shareholder. The share of equity by minority shareholders includes both direct and indirect equity ownership.  $X_j'$  is a set of affiliate controls (year of incorporation, sales, share of group sales in the three-digit SIC of the affiliate<sup>9</sup>, and a complete set of two-digit SIC code dummies) and  $Z_g'$  is a set of group controls (group sales, number of affiliates, and ultimate owner country dummies). The estimation data is cross-sectional for 2007. We compute standard errors clustered at the group level, which allows the error term to be correlated across affiliates and managers of the same group.

We expect partly-owned affiliates to experience lower levels of managerial redeployment than wholly-owned affiliates:  $\beta_1 < 0$ .

### 3.4.3 Types of Managers

Our final empirical specification investigates how the nature of managerial assets is related to the probability of redeployment. We argue that family-related managers represent in large part trust-based asset rather than skill-based asset. To examine the

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<sup>9</sup> There is no relationship between core and periphery status of an affiliate and the presence of minority shareholders in that affiliate: the share of equity held by minority ownership in core affiliates is 0.201, whereas in peripheral affiliates it is 0.209. However, we control for the share of group sales in affiliate industry in all specifications.

qualitative differences between family-related and non-family managers, we collect information on a random subset of managers in firms located in the UK, France and Italy from LinkedIn. We search for managers' employment and demographic information by matching their name and firm name with LinkedIn profiles. We collect information for almost 2,000 managers. We obtain their education and employment history and determine whether they have a degree in management and business-related fields, and use both Amadeus and LinkedIn information determine whether the managers were promoted at least once in the current company. In Table 11, we report the difference in means test. The results indicate that larger share of non-family managers have business education and non-family managers are more likely to be promoted into the current position. This difference suggests that family-related managers may offer value through means other than education, skill and experience. In this section, we explore this proposition more systematically.

**Table 11: Family-Related vs. Non-Family Managers**

Difference in means test for education and internal promotion				
	N (% family)	Family-related managers	Non-family managers	Difference**
Business education %	1,391 (15.9%)	9.95	15.13	-5.18*
Internal promotions %	1,924 (15.1%)	8.97	14.38	-5.41**

*Notes:* This table compares the differences in education and internal promotion between family-related and non-family managers for a random subsample of managers from the data using LinkedIn profile information. Business education equals one if a manager attended a business school. Internal promotion equals one if a manager was promoted at the current company at least once. \* implies significance at 5% and \*\* at 1%



The empirical specification is as follows:

$$\Pr(\text{InternalMobility}_{i(j)} = 1) = F(\beta_1 \text{Fam}_i + \beta_2 \text{IC}_j + \beta_3 \text{Fam}_i * \text{IC}_j + X_j' \beta_4 + Z_g' \beta_5) \quad (3)$$

where  $i$  denotes a manager,  $j$  denotes the affiliate this manager manages in the most recent sample year (2007), and  $g$  denotes the corporate group.  $\text{InternalMobility}_{i(j)}$  is a dummy variable that receives the value of one if manager  $i$  is redeployed to affiliate  $j$  from another group affiliate in the period 2002-2007, and zero if manager  $i$  manages the same affiliate  $j$  for the entire sample period.  $\text{Fam}_i$  is the indicator variable for whether manager  $i$  is family-related or non-family.  $\text{IC}_j$  is an affiliate and region-level variable characterizing the likelihood of greater need for informal control: *presence of minority shareholders* in an affiliate  $j$ , whether affiliate  $j$  is a *peripheral or core affiliate*, and whether affiliate  $j$  is located in a region of *low or high levels of trust*.  $X_j'$  is a set of affiliate controls (year of incorporation, sales, share of group sales in the three-digit SIC of the affiliate, and a complete set of two-digit SIC code dummies) and  $Z_g'$  is a set of group controls (group sales, number of affiliates, and ultimate owner country dummies). We expect family-related managers to be more likely to be redeployed than non-family managers to affiliates that are partly-owned, peripheral and located regions with low trust:  $\beta_3 > 0$ . The estimation data is cross-sectional for 2007. The standard errors are clustered at the group level to allow the error term to be correlated across affiliates and managers of the same group.

### **3.5 Estimation Results**

#### **3.5.1 Mobility Types: Stays vs. Internal vs. External Moves**

In Table 12, we report the results from the comparison between the propensity of three categories of managerial mobility across different firm performance levels. The results show that internal mobility is more likely than external mobility from units with sales growth in the highest third tertile of the sales growth distribution (column 1), and that both internal and external mobility is more likely than staying in high-performing units (columns 2 and 3). Results are similar when firm sales growth is relative to its industry growth, calculated as the average of annual excess sales growth over the industry's mean level of sales, which excludes the focal firm's sales (columns 4-6).<sup>10</sup>

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<sup>10</sup> In all specifications, we test for the independence of irrelevant alternatives (IIA) using Hausman test (Hausman, 1978; Hausman and McFadden, 1984). The results confirm that IIA assumption was not violated. We also use multinomial Probit to relax the IIA assumption. The results remain robust.

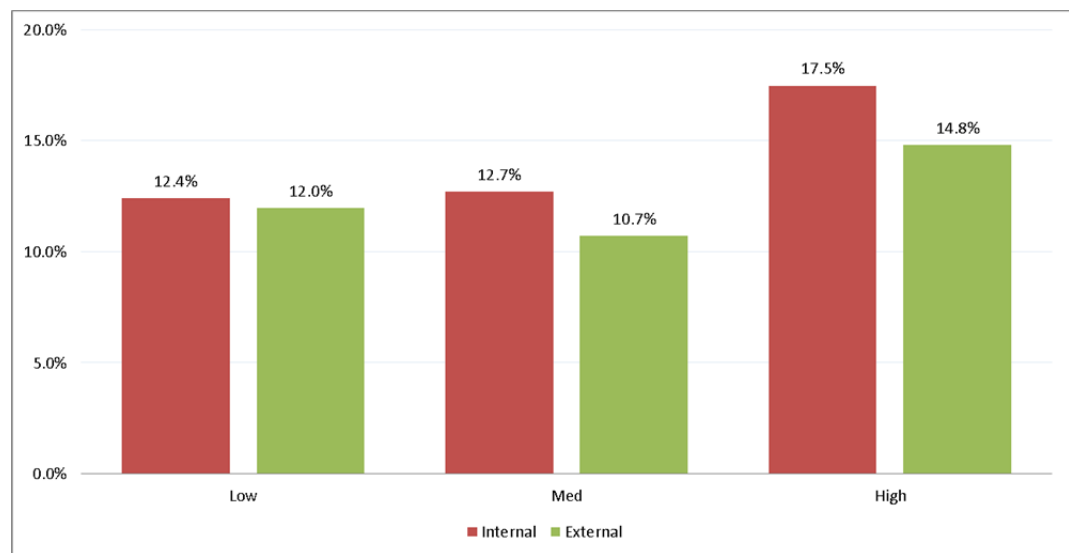
**Table 12: The Relationship Between the Probability of Managerial Mobility and Firm Performance**

<i>Dependent variable: Indicator for managerial mobility type. Multinomial Logistic Model.</i>						
	(1)	(2)	(3)	(4)	(5)	(6)
	Firm Absolute Sales Growth			Firm Relative Sales Growth		
	Internal	Internal	External	Internal	Internal	External
	vs.	vs. Stay	vs. Stay	vs.	vs. Stay	vs. Stay
	External			External		
Firm sales growth						
2nd Quartile	0.1465** (0.026)	-0.0047 (0.021)	-0.1512** (0.019)	0.2195** (0.035)	0.1392** (0.026)	-0.0804** (0.026)
3rd Quartile	0.3224** (0.025)	0.5090** (0.020)	0.1866** (0.019)	0.1525** (0.033)	0.4931** (0.0256)	0.3406** (0.025)
<i>Core industry</i>	-1.1055** (0.027)	-1.1872** (0.021)	-0.0817** (0.019)	-1.5625** (0.037)	-1.5545** (0.029)	0.0079 (0.027)
<i>ln(Year of incorporation)</i>	0.0046** (0.001)	0.0040** (0.001)	-0.0006 (0.001)	0.0055** (0.001)	0.0050** (0.001)	-0.0005 (0.001)
R <sup>2</sup>	0.0202	0.0202	0.0202	0.0298	0.0298	0.0298
Observations	154,750	154,750	154,750	88,950	88,950	88,950

*Notes:* This table reports the results of multinomial logistic regressions that examine the relationship between the propensity of different categories of managerial mobility and firm-level growth. In columns 1-3, firm absolute sales growth is average growth in sales in 1999-2002 period for the affiliates from which internal moves originate from or the last affiliate a manager is observed in for external movers and non-movers. In columns 4-6, firm relative sales growth is average growth in sales in 1999-2002 period after subtracting average industry sales for the affiliates from which internal moves originate from or the last affiliate a manager is observed in for external movers and non-movers. The results are robust to using destination firm sales growth for the internal moves instead. All models include controls for core and peripheral affiliates as indicated by the group sales share in the three-digit SIC of the affiliate and for affiliate age. Change in the predicted probabilities of each type of mobility is for an increase from the minimum to the maximum value of each independent variable, while holding all other independent variables constant at their means. Standard errors (in brackets) are clustered at the group level. \* significant at 5%; \*\* significant at 1%.

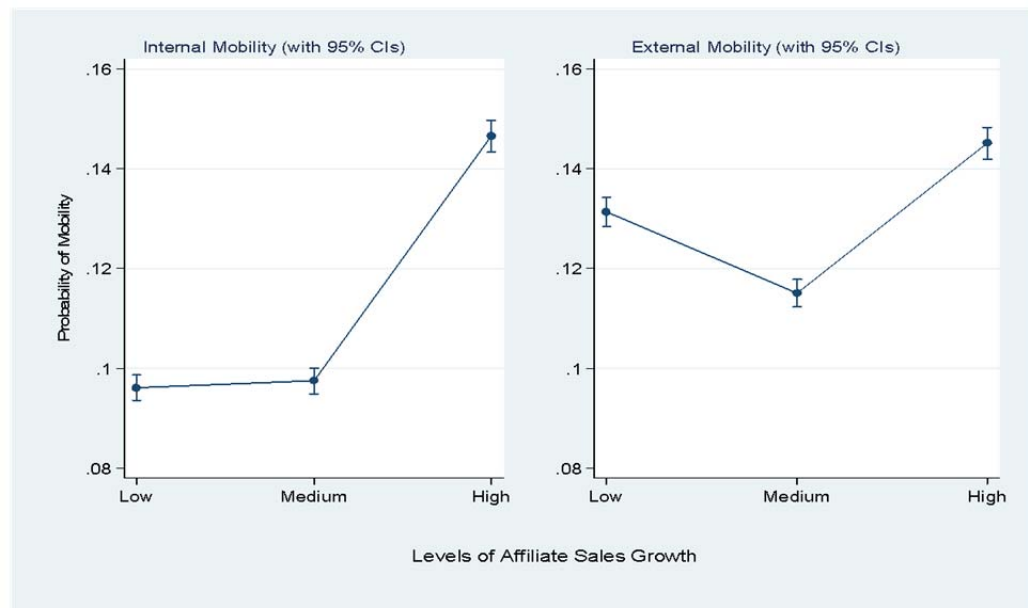
Next, In Figure 4, we plot the shares of internal and external mobility by levels of firm sales growth: low, medium and high. It is clear from the figure that both mobility

types are higher in affiliates that experience high sales growth. In Figure 5, we plot the probability of a manager moving internally and leaving a firm by levels of pre-mobility firm-level sales growth. The propensity of mobility is compared across three levels of absolute sales growth, calculated as the changes in sales from previous year. Consistent with the expectations, the probability of internal redeployment increases significantly for managers whose units were in the highest third of sales growth distribution in the years prior to redeployment. A manager is more likely to leave their firm if the performance is either in the lowest or highest third of the sales growth distribution. The results are same when using employment growth in place of sales growth. These results suggest that high-performing managers are recognized as valuable resources within firms and are actively redeployed within the firm, consistent with the resource-based view of the firm.



**Figure 4: Share of Internal and External Mobility by Firm Sales Growth**

Notes: This graph plots the distribution of internal and external managerial moves by firms' level of sales growth. Managers who move externally leave the focal affiliate to work in a firm not affiliated with the focal group. Managers who move from one affiliate to another within the same group are internal movers. Affiliate sales growth is the average rate of growth in origin affiliate in 1998-2002 period. Sales growth is classified into low, medium and high according to the tertiles of sales growth distribution (horizontal axis).



**Figure 5: Predicted Probabilities of Internal and External Managerial Mobility for Different Levels of Firms' Absolute Sales Growth**

Notes: This graph plots predicted probabilities for internal and external mobility for different levels of pre-mobility firm-level sales growth. Managers who move externally leave the focal affiliate to work in a firm not affiliated with the focal group. Managers who move from one affiliate to another within the same group are internal movers. Affiliate sales growth is the average rate of growth in origin affiliate in 1998-2002 period. Sales growth is classified into low, medium and high according to the tertiles of sales growth distribution (horizontal axis). The predicted probabilities are from the multinomial logit specification in Table 12 (column 4) and are graphed with corresponding 95% confidence intervals. The predicted probability of mobility is on the vertical axis.

### 3.5.2 Ownership Structure: Presence of Minority Shareholders

Table 13 reports the estimation results for the relationship between internal mobility and presence of minority shareholders. Our first specification (column 1) includes a dummy for whether the firm of a recently redeployed manager has minority

shareholders. Consistent with Hypothesis 1, the coefficient on the minority shareholders dummy is negative and significant (an estimated coefficient of -0.0250 and a standard error of 0.002). Thus the presence of minority shareholders appears to reduce the probability of managerial mobility. Column (2) uses a continuous measure: the share of equity held by minority shareholders. The coefficient estimate is also negative and highly significant. A two standard deviation increase in the share of equity held by minority shareholders (0.504) is associated with a decrease of 16.4% in the likelihood of mobility ( $-0.0520 \times 0.504 / 0.160$ ).

Columns (3) and (4) distinguish between mobility from wholly-owned affiliates and mobility from partly-owned affiliates. The property rights view suggests that assets that are wholly-owned are less likely to be shared with minority shareholders. Consistent with this argument, we find that minority shareholders have a stronger effect on mobility when the source affiliate is wholly-owned. By contrast, we find much smaller and less significant effect of minority shareholders when the source affiliate is partly-owned.

The key identification problem we face is that the presence of minority shareholders may be correlated with opportunities for redeployment. For instance, if partly-owned affiliates are systematically of low quality, and low-quality affiliates are unlikely to benefit from redeployment opportunities, then a negative relationship between minority shareholders and redeployment may emerge.

First, we check for differences in quality between partly- and wholly-owned affiliates. Partly- and wholly-owned affiliates are quite similar in terms of average profitability: the differences in average returns on assets (EBITDA over total assets) and average profit margins (EBITDA over sales) over the period of 1997-2007 are very small and statistically insignificant. These results (not reported in the tables) provide some assurance that partly-owned affiliates are not systematically of lower relative quality. However, because wholly-owned affiliates are substantially bigger than partly-owned affiliates (average total assets are \$94 million for wholly-owned affiliates, and only \$47 million for partly-owned affiliates), we always control for affiliate size (as measured by sales). Since partly- and wholly-owned affiliates may still differ in some other characteristics unobservable in the data, we examine different subsamples to rule out alternative explanations based on unobserved characteristics of the destination affiliate alone (e.g., low profitability).

Second, since we do not observe what triggers redeployment (e.g., exit of old managers, initial misallocation, etc.), we check the robustness of our results in a subsample of firms that have recently joined the group (new firms and acquisitions). For these firms, the trigger of redeployment -- gaining access to the group's pool of managerial talent -- is quite clear. Our results continue to hold.

Next, we repeat the analyses by different levels of managerial performance, as indicated by managers' unit sales growth. To examine the relationship between manager

performance and mobility patterns to an affiliate with minority shareholders, we include dummies indicating the managerial quality (high or low) and interact the dummies with the share of equity held by minority shareholders. Consistent with Hypothesis 1, the results show that high performing managers are less likely to move to affiliates with minority shareholder (column 5), especially when mobility originates from a wholly-owned affiliate (column 6). The coefficients on the interaction with the lowest performing manager dummy is positive and significant (column 8), with the results driven by mobility originating from wholly-owned affiliates (column 9). This result is consistent with the predictions in Hypothesis 2, which states that low performing managers are more likely to move to affiliates with minority shareholders, and this effect is driven by mobility originating in wholly-owned affiliates.



Table 13: Minority Shareholders and Managerial Mobility

<i>Dependent variable: Dummy for Internal Managerial Mobility. Linear Probability Model.</i>										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	All managers				By Manager Performance					
	All	All	Source is wholly-owned	Source is partly-owned	All	Source is wholly-owned	Source is partly-owned	All	Source is wholly-owned	Source is partly-owned
<i>Dummy for minority shareholders</i>	-0.0250**									
	(0.002)									
<i>Shares by minority shareholders × Dummy for high managerial performance</i>					-0.0403**	-0.0400**	-0.0096			
					(0.011)	(0.010)	(0.007)			
<i>Shares by minority shareholders × Dummy for low managerial performance</i>								0.0263**	0.0314**	-0.0004
								(0.008)	(0.007)	(0.005)
<i>Dummy for high managerial performance</i>					0.0029	0.0029	-0.0048*			
					(0.004)	(0.003)	(0.002)			
<i>Dummy for low managerial performance</i>								-0.0170**	-0.0158**	-0.0023
								(0.003)	(0.003)	(0.002)
<i>Shares by minority shareholders</i>		-0.0520**	-0.0583**	0.0049	-0.0369**	-0.0416**	0.0014	-0.0584**	-0.0658**	-0.0001
		(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.006)	(0.006)	(0.004)
<i>Core industry</i>	-0.0304**	-0.0303**	-0.0147**	-0.0215**	-0.0515**	-0.0297**	-0.0312**	-0.0520**	-0.0301**	-0.0314**
	(0.003)	(0.003)	(0.003)	(0.002)	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)
<i>ln(Year of incorporation)</i>	2.5764**	2.5917**	2.1943**	0.7549**	1.8815**	1.5066**	0.6074**	1.8030**	1.4392**	0.5705**
	(0.086)	(0.086)	(0.080)	(0.049)	(0.103)	(0.092)	(0.064)	(0.103)	(0.092)	(0.064)
<i>ln(Affiliate sales)</i>	-0.0001	0.0001	0.0005	-0.0008*	-0.0498**	-0.0423**	-0.0245**	-0.0496**	-0.0422**	-0.0242**
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
<i>ln(Group sales)</i>	-0.0059**	-0.0059**	-0.0042**	-0.0025**	0.0166**	0.0159**	0.0063**	0.0164**	0.0157**	0.0062**
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
<i>ln(Number of affiliates)</i>	0.0365**	0.0367**	0.0288**	0.0124**	-0.0041*	-0.0077**	-0.0020	-0.0036*	-0.0073**	-0.0017
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)
<i>Two-digit SIC dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>R<sup>2</sup></i>	0.1230	0.1230	0.1240	0.0466	0.1834	0.1724	0.0817	0.1835	0.1726	0.0815
<i>Observations</i>	181,447	181,447	175,603	159,112	90,606	87,329	82,049	90,606	87,329	82,049
<i>% of movers</i>	14.0	14.0	11.5	3.3	12.8	9.8	3.7	12.8	9.8	3.7

Notes: This table reports the results of linear probability regressions that examine the relationship between managerial mobility and minority shareholders. An affiliate is classified as core if the share of group sales in the same three-digit SIC as the affiliate (excluding the affiliate's sales) is in the fourth quartile of the group sale share distribution for that industry. An affiliate is peripheral if the same share is in the first quartile of the group sale share distribution for that industry. Column 3 excludes movements where source affiliates have minority shareholders. Column 4 excludes movements where source affiliates are wholly-owned. Columns 5-7 examine the relationship between high performing managerial mobility and minority shareholders; dummy for managerial performance equals 1 if a manager is a high-performing manager. Columns 8-10 examine the relationship between low performing managerial mobility and minority shareholders; dummy for managerial performance equals 1 if a manager is a low-performing manager. High and low performing managers are managers in origin affiliates with pre-mobility sales growth levels in the top and first tertiles of the sales growth distribution, respectively. Standard errors (in brackets) are clustered at the group level. \* significant at 5%; \*\* significant at 1%.

### 3.5.3 Types of Managers: Family-Related Managers

In Table 14, we examine the relationship between the mobility of family-related managers and the presence of minority shareholders (columns 1-3). In column 1, the model introduces an indicator for family-related managers and share held by minority shareholders separately. The coefficient on the dummy variable for family-related manager is positive and significant, while the coefficient on the variable for the shares held by minority shareholders is negative and significant, as expected. Column 2 adds an interaction term between minority shares held and family manager dummy. The coefficient on the interaction term is positive and significant, which indicates that family-related managers are more likely to move to affiliates with minority shareholders, where control by dominant owners is lower (consistent with predictions in Hypothesis 3(i)).<sup>11,12</sup> The results reported in column 3 are from the model that uses group fixed effects for robustness and the results remain the same.

In columns 4-6, we examine the relationship between manager type and whether an affiliate is core or peripheral in the group. In column 4, the coefficient on the

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<sup>11</sup> Results are robust to alternative manager classifications. We classify managers as family managers if they have the same last name as the group ultimate owner or a shareholder that holds at least 20% of group sales. 19,780 managers fall in this category. Results hold when managers are classified as family when they have the same last name as the group ultimate owner or a shareholder that owns at least 10% of group assets.

<sup>12</sup> We conduct several robustness checks to examine the sensitivity of our results to the absence of shareholder names, in which case we cannot determine whether a manager is family-related or not. On average, we cannot identify shareholders for 5% of affiliates' equity. We estimate the specification in column (2) only for managers for which we have information on identity of all the firm shareholders. Results are robust.

interaction between family manager dummy and dummy for core affiliates is negative and significant, indicating that family-related managers are less likely to move to core affiliates than to peripheral affiliates. Columns 5 and 6 split the sample into core and peripheral affiliates, and the coefficient on family-related manager dummy is positive and larger in magnitude for peripheral affiliates (column 6). These results are consistent with predictions in Hypothesis 3(ii).

Next, we test whether mobility of family-related managers is a mechanism to facilitate trust within the organization. Columns 7-8 report results from the model that estimates the likelihood of family-related manager moving to an affiliate located in regions with higher or lower generalized trust. The negative and significant coefficient on the interactions between the dummy for family-related managers and regional trust indicates higher probability of family-related managers moving to affiliates located in regions with lower trust than to affiliates located in regions with higher trust (column 7). The results are not sensitive whether a family-related manager is moving from partly- or wholly-owned affiliate (columns 8 and 9). These results provide support to Hypothesis 3(iii).

**Table 14: Mobility of Family-Related Managers**

<i>Dependent variable: Dummy for Internal Managerial Mobility. Linear Probability Model.</i>									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Wholly- vs. Partly-Owned			Core vs. Periphery			High vs. Low Trust		
	All	All	Group fixed-effects	All	Core affiliate	Peripheral affiliate	All	Firm is wholly-owned	Firm is partly-owned
<i>Family manager dummy x Shares by minority shareholders</i>		0.0830** (0.014)	0.0607** (0.018)						
<i>Family manager dummy × Core</i>				-0.0455** (0.0100)					
<i>Family manager dummy × Regional Trust</i>							-0.1885** (0.019)	-0.1982** (0.024)	-0.1185** (0.032)
<i>Family manager dummy</i>	0.0378** (0.003)	0.0242** (0.004)	0.0260** (0.006)	0.0610** (0.0093)	0.0142** (0.0041)	0.0556** (0.0094)	0.1008** (0.007)	0.1033** (0.010)	0.0811** (0.010)
<i>Shares by minority shareholders</i>	-0.0461** (0.006)	-0.0541** (0.007)	-0.0491** (0.011)				-0.0450** (0.007)		-0.0186* (0.009)
<i>Regional Trust</i>							0.1091** (0.016)	0.0631** (0.020)	0.2016** (0.027)
<i>Regional GDP</i>							-0.0605** (0.015)	-0.0546** (0.020)	-0.0511** (0.017)
<i>Regional Size</i>							-0.0220** (0.003)	-0.0186** (0.004)	-0.0190** (0.004)
<i>Regional Population</i>							0.0357** (0.003)	0.0443** (0.004)	0.0148** (0.004)
<i>Core industry</i>	-0.0284** (0.004)	-0.0272** (0.004)	-0.0219** (0.007)	-0.0346** (0.0064)			-0.0266** (0.004)	-0.0305** (0.006)	-0.0234** (0.005)
<i>ln(Year of incorporation)</i>	2.4867** (0.118)	2.4387** (0.120)	2.2785** (0.188)	2.5747** (0.1733)	1.2721** (0.1687)	3.7778** (0.2814)	2.3976** (0.125)	2.7529** (0.186)	1.9986** (0.162)
<i>ln(Affiliate sales)</i>	0.0000 (0.000)	-0.0005 (0.001)	-0.0012 (0.001)	-0.0007 (0.0013)	-0.0139** (0.0020)	0.0033* (0.0015)	-0.0004 (0.001)	-0.0015 (0.001)	0.0001 (0.001)
<i>ln(Group sales)</i>	-0.0058** (0.001)	-0.0054** (0.001)		-0.0067** (0.0017)	0.0061** (0.0022)	-0.0093** (0.0025)	-0.0074** (0.001)	-0.0098** (0.002)	-0.0033* (0.002)
<i>ln(Number of affiliates)</i>	0.0381** (0.003)	0.0378** (0.003)		0.0361** (0.0036)	0.0606** (0.0054)	0.0363** (0.0052)	0.0421** (0.003)	0.0512** (0.004)	0.0312** (0.003)
<i>Two-digit SIC dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Ultimate-owner country dummies</i>	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
<i>Group dummies</i>	No	No	Yes	No	No	No	No	No	No
<i>R<sup>2</sup></i>	0.0975	0.0977	0.4427	0.1087	0.1156	0.0844	0.0995	0.1114	0.0816
<i>Observations</i>	181,447	181,447	181,447	91,583	45,042	46,541	175,680	90,857	84,823
<i>% of movers</i>	14.0	14.0	14.0	13.89	7.44	20.34	13.8	25.2	5.2

Notes: This table explores the relationship between mobility of family managers, wholly-owned and partly-owned affiliates, core and peripheral affiliates, and levels of regional trust. A manager is classified as a family manager if his or her last name is the same as the last name of a shareholder that holds at least 5% of the group's equity. Wholly-owned affiliates do not have minority shareholders. An affiliate is classified as core if the share of group sales in the same three-digit SIC as the affiliate (excluding the affiliate's sales) is in the fourth quartile of the group sale share distribution for that industry. An affiliate is peripheral if the same share is in the first quartile of the group sale share distribution for that industry. Regional trust index ranges from 0 to 1, with 0 indicating the lowest level of generalized trust and 1 indicating the highest level of generalized trust. Column 3 reports the estimation results of a group fixed-effect specification. Standard errors (in brackets) are clustered at the group level. \* significant at 5%; \*\* significant at 1%.

### 3.5.4 Robustness Checks

We explore whether the relationship between mobility and ownership structure is sensitive to manager type: family and non-family managers. Specifically, we examine whether the decreased likelihood of mobility for high-performing managers to affiliates with minority shareholders is driven by family-related or non-family managers. In Table 15, we run the main specification and break down the analysis of family-related manager mobility by manager performance. The results demonstrate that the share of equity held by minority shareholders does not relate to family-related managers (column 1), or to family-related managers originating from wholly-owned affiliates (column 2). However, family-related managers are more likely to move between partly-owned affiliates (column 3). The coefficients on the interaction between shares held by minority shareholders and dummy for high-performing managers are insignificant for the family-related managers (columns 4-6). Moreover, the coefficient on the interaction between the shares by minority shareholders and dummy for managerial performance is driven by low-performing family-related managers (column 7). These results indicate that the relationship between mobility and manager performance relationship is sensitive for non-family managers, whose value is created primarily through their skills and experience. We further examine the nature of managerial resources through differences in mobility patterns of family-related and non-family managers.

Table 15: Robustness Checks: Family-Related Managers

<i>Dependent variable: Dummy for Internal Managerial Mobility. Linear Probability Model.</i>									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All family-related managers			By Manager Performance					
	All	Source wholly-owned	Source partly-owned	All	Source wholly-owned	Source partly-owned	All	Source wholly-owned	Source partly-owned
<i>Shares by minority shareholders × Dummy for high managerial performance</i>				0.0314 (0.031)	0.0265 (0.027)	0.0009 (0.023)			
<i>Shares by minority shareholders × Dummy for low managerial performance</i>							-0.0395 (0.025)	-0.0230 (0.022)	-0.0187 (0.018)
<i>Dummy for high managerial performance</i>				-0.0424** (0.009)	-0.0326** (0.008)	-0.0237** (0.006)			
<i>Dummy for low managerial performance</i>							0.0049 (0.007)	-0.0018 (0.007)	0.0085 (0.005)
<i>Shares by minority shareholders</i>	0.0104 (0.013)	-0.0062 (0.012)	0.0208** (0.008)	0.0168 (0.014)	0.0077 (0.012)	0.0121 (0.010)	0.0443* (0.018)	0.0260 (0.016)	0.0223 (0.014)
<i>Core industry</i>	-0.0256** (0.010)	-0.0196* (0.009)	-0.0062 (0.005)	-0.0573** (0.013)	-0.0438** (0.012)	-0.0119 (0.009)	-0.0576** (0.013)	-0.0445** (0.012)	-0.0118 (0.009)
<i>ln(Year of incorporation)</i>	2.6449** (0.297)	2.0198** (0.270)	0.9553** (0.182)	2.0373** (0.320)	1.4772** (0.272)	0.8223** (0.217)	1.8586** (0.320)	1.3167** (0.272)	0.7432** (0.217)
<i>ln(Affiliate sales)</i>	-0.0080** (0.002)	-0.0032 (0.002)	-0.0072** (0.002)	-0.0809** (0.004)	-0.0576** (0.004)	-0.0593** (0.004)	-0.0801** (0.004)	-0.0569** (0.004)	-0.0584** (0.004)
<i>ln(Group sales)</i>	-0.0028 (0.003)	-0.0074** (0.003)	0.0057** (0.002)	0.0440** (0.004)	0.0290** (0.004)	0.0343** (0.003)	0.0435** (0.004)	0.0283** (0.004)	0.0342** (0.003)
<i>ln(Number of affiliates)</i>	0.0693** (0.006)	0.0560** (0.006)	0.0220** (0.004)	-0.0156** (0.004)	-0.0120* (0.005)	-0.0174** (0.004)	-0.0143* (0.006)	-0.0107 (0.005)	-0.0168** (0.004)
Two-digit SIC dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ultimate-owner country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.1630	0.1837	0.0453	0.3151	0.3282	0.1562	0.3132	0.3268	0.1543
Observations	22,831	22,144	20,301	9,190	8,831	8,399	9,190	8,831	8,399
% of movers	14.1	28.3	4.9	11.6	8.6	3.5	11.6	8.6	3.5

Notes: This table explores the interaction between minority shareholders and family managers. A manager is classified as a family manager if his or her last name is the same as the last name of a shareholder that holds at least 5% of the group's equity. Family-owned groups are groups where the ultimate owner is an individual or a family. An affiliate is classified as core if the share of group sales in the same three-digit SIC as the affiliate (excluding the affiliate's sales) is in the fourth quartile of the group sale share distribution for that industry. An affiliate is peripheral if the same share is in the first quartile of the group sale share distribution for that industry. Columns 4-6 examine the relationship between high performing managerial mobility and minority shareholders for family-related managers; dummy for managerial performance equals 1 if a manager is moving from a high-performing unit Columns 7-9 examine the relationship between low performing managerial mobility and minority shareholders for family-related managers; dummy for managerial performance equals 1 if a manager is moving from a low-performing unit High and low performing managers are managers in origin affiliates with pre-mobility sales growth levels in the top and first tertiles of the sales growth distribution, respectively. Standard errors (in brackets) are clustered at the group level. \* significant at 5%; \*\* significant at 1%.

A limitation of the main analysis is that we do not directly observe what drives mobility. One concern is that the initial allocation of managers to affiliates might exert a subtle influence on the probability of subsequent redeployment. For instance, if partly-owned affiliates are systematically assigned low-skilled managers who cannot be easily be moved or fired, then partly-owned affiliates might remain 'stuck' with their management for a long period of time. We can imagine an inexperienced family-related manager being allowed to manage a partly-owned affiliate in order to give her private benefits (e.g., a high salary).

We explore the robustness of our findings in a setting where initial conditions are not likely to be very important: the subsample of firms that have only recently joined a group. This subsample includes both firms that have recently been incorporated (new internal affiliates) and firms that have recently joined the group (acquired affiliates).

We construct the sample as follows. We use our manager and ownership panel to gather data on the original management team and ownership structure (the shares held by minority shareholders at the incorporation year). For the new internal affiliates sample, we keep only firms that were incorporated between 1999 and 2007. This procedure leaves 155,242 managers and 94,162 firms. For the acquired affiliates sample, we include all firms that were acquired by groups in our sample between 2000 and 2006. For each of these firms we observe its managers in 2007 and compare this management

team to the management team of the same firm at the acquisition year (ownership structure is for 2007). Table 16 reports the estimation results.

Columns 1-4 focus on new internal affiliates. We use two plausible proxies for low-skilled managers: family-related managers and inexperienced managers (managers that have not previously managed any firm in the sample). We find no evidence that partly-owned new affiliates are systematically assigned family-related managers (columns 1-3) or inexperienced managers (column 4). Thus, it is unlikely that our main results are driven by an initial allocation of low-skilled managers to partly-owned affiliates.

Next, we look at firms that have recently been acquired and face the same trigger for redeployment: gaining access to the group's pool of managerial talent. We explore how the presence of minority shareholders in the acquired firm is related to the probability of receiving at least one new manager (column 5) and the probability that all the managers in the acquired firm's original team are replaced (column 6). The results indicate that the presence of minority shareholders is negatively related to the likelihood of managerial redeployment post-acquisition.

Further, origins of minority ownership may hold important clues as to why managers are deployed less frequently to those affiliates. In order to determine the nature of relationship between the group and affiliates with minority shareholders, we identified affiliates with minority shareholders that were acquired by our groups



between 1999 and 2007 using Amadeus' Zephyr M&A database. We constructed a sample of over 1,000 acquisitions and traced whether acquisition conditions were friendly or hostile by carefully reviewing details on each deal description, cross-checking with Factiva, SDC Platinum and Capital IQ databases and searching news clippings on each deal announcement on Lexus-Nexus. We find that less than 1% of transactions in our sample are classified as hostile, thus almost all acquisitions are completed on friendly terms.

We also controlled for managers' experience (as proxied by manager's age) and measures of organizational similarity (common apex directors, common parent name, and same SIC as parent).<sup>13</sup>

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<sup>13</sup> We also more finely distinguished between different types of mobility (top-down, horizontal, and bottom-up). Results are reported in Table 35. Most of the new controls turn out to be significant and with the expected signs. For instance, the common parent name dummy is generally positive and significant, indicating that redeployment is more likely among firms with similar names. Overall, we find that the results on mobility and minority shareholders tend to be very robust.

**Table 16: Robustness Checks: Allocation of Managers in New Affiliates**

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>New internal affiliates</i>				<i>Acquired affiliates</i>	
<i>Dependent variable:</i>	<i>Family-related managers</i>			<i>First-time managers</i>	<i>New management</i>	
<i>Dummy for</i>	All	Family owned	Non-family Owned	All affiliates	At least one new manager	All managers are new
<i>Shares by minority shareholders</i>	-0.0207** (0.0030)	-0.0034 (0.0088)	-0.0231** (0.0032)	-0.0616** (0.0111)	-0.0538** (0.0178)	-0.1989** (0.0203)
<i>ln(Year of incorporation)</i>	-6.734** (1.496)	-4.464 (4.123)	-5.530** (1.607)	-6.124** (1.614)	0.0524 (0.4945)	-0.0698** (0.0280)
<i>ln(Affiliate sales)</i>	-0.0071** (0.0008)	0.0025 (0.0025)	-0.0086** (0.0009)	0.0072** (0.0016)	0.0069* (0.0033)	0.0030 (0.0035)
<i>ln(Group sales)</i>	-0.0076** (0.0013)	-0.0098 (0.0079)	-0.0082** (0.0012)	-0.0018 (0.0017)	0.0163** (0.0040)	0.0024 (0.0044)
<i>ln(Number of affiliates)</i>	-0.0390** (0.0029)	-0.0193 (0.0196)	-0.0391** (0.0026)	0.0141** (0.0038)	-0.0222** (0.0080)	-0.0004 (0.0088)
Two-digit SIC dummies	Yes	Yes	Yes	Yes	Yes	Yes
Ultimate-owner country dummies	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.1962	0.1747	0.2115	0.0657	0.1997	0.0687
Observations	155,242	14,525	140,566	155,242	24,301	24,301
% of managers	10.9%	12.5%	10.7%	52.1%	49.7%	26.0%

Notes: This table investigates the allocation of managers to newly established and acquired group affiliates. The sample includes only affiliates that were incorporated or acquired in the period 1999-2007 and for which we have information on their original management team and minority shareholders when incorporated or acquired. Standard errors (in brackets) are clustered at the group level. \* significant at 5%; \*\* significant at 1%.

### **3.6 Conclusion and Discussion**

In his seminal 1937 article, Ronald Coase set to investigate what determines where firm boundaries are drawn. While this question has been the subject of a fair

amount of empirical work, a perhaps even more fundamental question -- Do firm boundaries matter at all in allocating resources? -- has been largely neglected. We exploit variation in business group structure to explore how organizational factors affect internal managerial mobility. And because managers are important repositories of organizational knowledge, hopefully our study can also shed light on the "mechanisms through which organizational boundaries affect knowledge transfer" (Argote et al., 2003).

The purpose of this study is to advance our understanding of the factors that influence managerial redeployment in multi-unit organizations. Resource redeployment, and in particular the redeployment of managerial assets, has long been regarded as a distinguishing feature of the firm and as an important source of competitive advantage (Penrose, 1959; Leff, 1978; Kogut and Zander, 1992; Capron, 1999). It is also widely acknowledged that managers' beliefs, traits and previous experiences exert a significant influence on firm strategy and performance (Prahalad and Bettis, 1986; Romanelli and Tushman, 1994; Harris and Helfat, 1997; Williams and Mitchell, 2004; Sambharya, 1996; Karim and Williams, 2012). However, the determinants of intra-organizational managerial redeployment have so far been left largely unexplored.

Our results indicate that both structural features of the organization and the nature of managerial resources affect the likelihood of intra-group managerial mobility. Greater subsidiary integration, measured as a lack of minority shareholders in a

particular group affiliate, is positively related to the probability of managerial redeployment toward that affiliate. Strategic similarity between affiliates, however, does not appear to increase the propensity of redeployment. These patterns are contingent on the nature of the managerial resources. Our results are driven by non-family managers, those that do not appear to have family ties to the group dominant shareholders. Family managers exhibit a very different pattern: they are more likely to be redeployed to units that are less integrated, strategically distant, and located in regions where societal trust is low.

Our main contributions are threefold. First, consistent with Leff (1978), we document a substantial amount of high-level managerial redeployment inside business groups, especially following the acquisition or creation of new ventures. Thus, the availability of managerial resources appears to be an important driver of organizational growth, as emphasized by the resource-based view (Penrose, 1959). Second, intra-group mobility appears to be hindered by the presence of minority shareholders. We find particularly strong support for the property-rights argument that shareholders have little incentive to deploy their own resources to partly-owned ventures. Third, our results underscore the importance of distinguishing between family and non-family managers. Our key results are driven by non-family managers. Family managers, by contrast, tend to be redeployed to affiliates where trust is especially important. Trustworthiness, not just ability, appears to be a key managerial attribute. Together, our

findings corroborate the view that hybrid organizations such as groups perform a useful role in mobilizing and recombining highly heterogeneous, are thus difficult to market efficiently, human resources.

These findings inform perspectives on resource redeployment in strategy, economics and finance. Research on post-acquisition integration has identified characteristics of the acquiring and target firms such as strategic similarity and resource asymmetries as key determinants of resource redeployment (Shelton, 1988; Seth, 1990; Capron et al., 1998; Capron et al., 2001). We do not find strategic similarity, measured as industry relatedness, to have a significant effect in our context. This is perhaps not surprising since the job of top managers, on which we focus, arguably requires more the use of general or interpersonal skills than of industry specific skills. The insignificant result especially casts doubt on non-efficiency mechanisms thought to facilitate redeployment. For instance, intra-group mobility may be regarded to be more likely between similar units because managers in these units are more aware of opportunities. Our evidence indicates that this mechanism may have limited purchase.

A second strand of the literature on resource redeployment builds on transaction-cost economics and the property-rights view of the firm and emphasizes incentive and ownership issues. Transaction-cost economics suggests that parent companies that provide greater resources to their subsidiaries will often acquire greater ownership stakes in these subsidiaries as a way to strengthen control and mitigate

concerns about opportunistic behavior (Williamson, 1975; Pisano, 1989; Nakamura and Yeung, 1994). The property-rights view highlights an externality problem: headquarters may have limited incentives to redeploy their own resources to partly owned affiliates because the benefits would in part accrue to minority shareholders, while the cost would be fully borne by headquarters. Our finding that shared ownership hinders redeployment especially when the source affiliate is wholly-owned provides stronger support for the property-rights view. Also casting doubt on the transaction-cost economics argument is the finding that redeployment is most unlikely when an affiliate has small (individual) minority shareholders. These shareholders are less likely to be involved in governance than corporate minority shareholders. Thus, concerns about disagreement with minority shareholders seem unlikely to drive our results.

The results on ownership complement previous findings by Darr et al. (1995) and Baum and Ingram (1998). These authors have shown that knowledge and best practices spread faster across establishments that are owned by the same parent company or that are affiliated through the same chain or franchise than across independent organizations. The present study suggests that managerial mobility is an important vehicle of knowledge transfer in large organizations such as business groups.

Spurred by research documenting the ubiquity of business groups around the world, financial economists have also in recent years started to investigate the effects of group structure on governance. By and large, this research stream has depicted groups

in a negative way. Pyramidal ownership chains in groups have been viewed as a way to separate ownership and control and create vast "empires". This separation, in turn, has been associated with agency problems. Controlling shareholders have in fact incentives to transfer resources from firms where they have low equity stakes to firms where they have large equity stakes, thereby expropriating minority shareholders. Our results provide no support for the expropriation view. We find no evidence that group controlling shareholders opportunistically move managers trained in partly-owned affiliates to wholly-owned affiliates.

At a broader level, our findings support a key tenet of resource- and knowledge-based views of the firm. These theories hold that an important reason why firms exist is that they are able to recombine and redeploy "soft" assets such as knowledge and know-how more effectively and securely than markets. We find that managerial redeployment is greater when group subsidiaries are wholly-owned than when group subsidiaries are partly-owned. Thus, internal managerial mobility appears to be enhanced when affiliates more closely resemble divisions of a Chandlerian, multi-divisional firm.

In documenting striking differences in the redeployment patterns of non-family and family managers, the present work advances our understanding of the nature of managerial resources. While the importance of management has been widely acknowledged, most research tends to emphasize cognitive factors, personal traits and previous experiences as drivers of managerial heterogeneity. The importance of trust

between managers and shareholders, despite the work of writers such as Barnard (1975) and Freeland (2001), who have pointed out the limitations of formal incentive systems as a way to induce managers to behave in a consummate rather than perfunctory fashion, has frequently been overlooked. Our results suggest that family ties between managers and shareholders are as a useful indicator of trust. Indeed, family managers are redeployed precisely to those affiliates where trust appears to be more important. It is worth noting that many have argued that family managers tend on average to be of lower ability than professional (non-family) managers (Bertrand and Schoar, 2006). In evaluating the performance effect of different types of managers, this work highlights the importance of controlling for the endogeneity of the manager's position. Family managers may be located in firms where formal controls are particularly ineffective, and hence non-family managers would perform worst.

The present work has several limitations. First, managerial mobility is just one particular type of resource redeployment. Clearly, it would be interesting to test the robustness of our results to other types of redeployment, such as the transfer of marketing or R&D resources. Second, the choice of ownership structure is endogenous and may be correlated with redeployment. We attempted to address this issue by examining specific causal mechanisms, for instance by focusing on characteristics of the source affiliate and by distinguishing between different types of minority shareholders. However, much more remains to be done. In particular, examining managerial



redeployment in a natural experimental setting where ownership restrictions exogenously change, as in Perez-Gonzales (2005), is certainly an important avenue for future research. A third issue is that managerial redeployment is not just driven by shareholders' incentives, but also by managers' preferences. For instance, if managers were reluctant to deal with minority shareholders, then our key observation---that managers tend to move from wholly-owned affiliates to other wholly-owned affiliates---could be rationalized. The disaggregated redeployment patterns, however, cast doubt on this interpretation. The managers that are most likely to have a 'cozy' relationship with controlling shareholders are the family managers. And yet the wholly-owned-to-wholly-owned mobility pattern is strong especially for non-family managers. This indicates that controlling shareholders' approval is likely to be a key determinant of top managerial redeployment in business groups.

The present work has implications for firm performance and innovation. Lower levels of managerial redeployment in partly-owned affiliates suggest that these affiliates have more stable management teams than wholly-owned affiliates. Although internal recombination is usually associated with knowledge transfer, managerial stability can also have advantages. Indeed, Cannella and Hambrick (1993) document negative effects of executive departures on the performance of acquired firms. These negative effects could be especially large for activities that require long-term planning and commitment such as research and development. This is consistent with the findings by Belenzon et al.

(2010), who find that a substantial share of innovation takes place in partly-owned affiliates in Europe, especially in industries such as pharmaceuticals and chemicals, where long-term planning is more likely to be important.

Our findings have also value for professional managers contemplating to work for firms belonging to business groups. Nowadays employees want to know not just the characteristics of their prospective new job, but also how their career within the organization can progress. Weber (1958) goes so far as to suggest that organizations should develop rules based on a combination of merit and seniority to eliminate elements of randomness from the promotion process. Chandler (1956) argues that a key advantage of the multidivisional firm is that it can provide better opportunities for professional development to middle management. Our work suggests that in business groups the availability of these opportunities may differ depending on group ownership structure. Managers working or planning to work in a business group affiliate should be aware that fragmented group ownership may constrain opportunities of future redeployment.

## **4 The Role of Firm Openness in the Markets for Managers**

### ***4.1 Introduction***

The resource-based view (RBV) holds that protecting firm resources from external markets is fundamental to gaining strategic advantage (Wernerfelt, 1984; Barney, 1991). Among strategic resources of the firm, human capital and managerial talent in particular are key determinants of competitive advantage (Penrose, 1959; Hambrick and Mason, 1984; Castanias and Helfat, 1991, 2001; Peteraf, 1993; Adner and Helfat, 2003), but human assets present distinct challenges for retention, because, unlike other resources, employees can choose to leave (Coff, 1997). The strategic human capital literature, drawing on the RBV protection logic, implies that firms should create barriers that limit the ability of external agents from hiring away valuable managerial talent (Coff, 1999; Wezel et al., 2006; Somaya et al., 2008; Campbell et al., 2012; Carnahan et al., 2012; Ganco, 2013). However, work in the open innovation and knowledge transfer literature shows that barriers that inhibit the flow of resources across firm boundaries can also limit the benefits from external knowledge flows (e.g., Cohen and Levinthal, 1989; Chesbrough, 2003; Rosenkopf and Almeida, 2003; Singh and Agrawal, 2011). Thus, the question of whether firm openness to strategic factor markets for human resources compromises its competitive advantage warrants further investigation.

In this study, I address this gap by focusing on a particular barrier to managerial mobility--the degree of firm openness--which can be used to infer information about managerial ability. I examine how a firm's openness to managerial markets affects the flow of its top managers into and out of the firm. Firms that make their business unit performance information available are more open to transactions with external managerial markets, because firm performance information allows inference about the ability of its top managers, and facilitates re-matching of firms and managers. To determine the link between openness and managerial mobility, I develop a theoretical framework to derive predictions about the effect of openness on top manager mobility in terms of information availability.

I classify firms that publicly disclose financial performance through filing of financial statements as open and non-disclosing firms as closed. I argue that firm's greater transparency allows external employers infer managerial ability from firm performance information, and subsequently facilitate top manager reallocation across firms to most productive use (Coase, 1937; Becker, 1973; Abowd et al., 1999; Bandiera et al. 2014). Specifically, if firm performance is high, markets use this information to infer high ability of firm's top managers, and reallocate these managerial resources to where they are expected to create most value.

I predict that firms that disclose business unit performance information and perform well are more likely to lose more of their top managers than firms that do not

disclose. Specifically, managers leaving high-performing disclosing firms are more likely to get promotions in other firms: they go to manage more assets and to take positions with greater responsibility than managers in non-disclosing firms. To the extent that firm performance information facilitates reallocation of top managers to where they can create most value, I predict that disclosing firms are more likely to attract managers from other high-performing firms. Hence, I predict the following tradeoff associated with firm openness: whereas firm performance disclosure results in greater exit of their top managers, disclosure also increases the rate of external hiring from other high-performing firms.

I test these predictions using managerial mobility data for about 610,000 top managers in 32,196 European corporate groups. Corporate groups are large organizations, comprising a set of separate, legal entities tied together by common ownership. Corporate groups are a prevalent organizational form in Europe and many countries in emerging markets. The corporate group setting permits an examination of unit managers' mobility, because groups consist of affiliates that are legal entities, each with its own top management team, and group structure closely resembles that of a large multi-unit organization. The apex firm (the ultimate owner) controls the affiliates and acts as the headquarters, while affiliates are representative of internal units. The corporate group headquarters is responsible for the strategic goals of the group and

makes resource reallocation decisions among the units (Chang and Hong, 2000; Khanna and Rivkin, 2001; Belenzon and Berkovitz, 2010).<sup>1</sup>

I determine disclosure of unit (affiliate) financial performance statements in each group by observing whether a unit has filed its profit and loss (P&L) statements with their local regulatory agencies.

Consistent with traditional arguments that firm openness jeopardizes retention of key talent, I find a systematically greater rate of managerial exit from firms that are more open, with exit being especially high from disclosing firms with better financial performance. Specifically, top managers leave better performing and disclosing firms to manage larger firms and to take positions of greater responsibility. This result is consistent with the notion that firm performance disclosure facilitates reallocation of top managers to firms in which they are expected to produce more value. Moreover, extending the traditional view, I find that open firms also attract and hire more top managers that originate from other high performing firms than closed firms. Specifically, I find that disclosing firms with better financial performance attract a greater proportion of their external top managers from other high-performing firms than non-disclosing firms. Thus, firm openness presents a set of tradeoffs: more managers are likely to leave but firms are also better able to refresh managerial talent.

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<sup>1</sup> Disclosure of financial statements is a group-level decision to the extent that country-level regulations allow. For example, in Germany, the apex firm can decide to take advantage of disclosure exemptions for its German affiliates by reporting consolidated statements instead of disclosing affiliate-level information.

To further examine these findings, I ask whether firm management practices aimed at retention and development of internal talent moderate the rate of top manager exit in disclosing firms. I use firm-level management practices survey data (Bloom et al., 2007; 2010) to match to my sample firms, and I find that even though disclosing and non-disclosing firms do not differ in terms of their human capital management practices scores, disclosing firms with higher human capital management scores have fewer exits than disclosing firms with lower scores. This evidence suggests that internal management practices in open firms may help mitigate the outflow of productive managerial resources.

To deal with unobserved confounding factors that may influence both firm disclosure and mobility, I use exogenous variation in disclosure to construct an alternate measure of firm openness to instrument for actual disclosure. I determine each unit's legal requirement to disclose its financial statements by using European Union (EU)-wide and country-level variation in disclosure regulations based on unit's legal form, size, and type. I take advantage of significant cross-country variation in regulations governing the disclosure of firms' financial statements in 16 Western European countries in my sample. For example, while almost all firms in Portugal are required to file financial statements with the governing bodies, almost none of the firms in Switzerland are obligated to issue financial statements. The regulations in other countries provide various exemptions to firms based on their legal form and size. The results remain

robust when using a measure of exogenous variation in disclosure. Overall, the results suggest that firms disclose for a number of reasons; however, top managerial mobility is an unintended consequence of disclosure.

The study contributes to understanding how firm openness is related to the flow of resources across firms, and to understanding how firms capture value from strategic human capital, while protecting and refreshing sources of competitive advantage embodied in firm's top management. This study supplements the traditional wisdom regarding the risks of openness for human capital strategy by showing that the availability of firm performance information that increases the firm openness to managerial markets can also be advantageous for firms through opportunities to renew its managerial resources by attracting high-quality managers externally. I extend the strategic human capital theory by incorporating characteristics of firm interactions with managerial factor markets and underscoring the main tradeoffs associated with being more open.

The paper is organized as follows. Section 4.2 provides theoretical background on the role of openness in markets for managers. Section 4.3 presents a theoretical framework for linking firm performance disclosure to managerial mobility. Section 4.4 describes the sample and construction of the main variables. Section 4.5 introduces the empirical specification. Section 4.6 presents the empirical analyses and results. Section 4.7 discusses the implications and concludes.



## **4.2 Background: Firm Performance and Markets for Managers**

This section provides theoretical background and empirical evidence for the close relationship between firm performance and its managers' marketability. First, I show that firm performance information is a key decision factor in managerial labor markets. Second, I describe two reasons for why managerial markets rely primarily on firm performance information: information cost and legitimacy.

### **4.2.1 What Do Firms Look for When Hiring a Top Manager?**

The process through which firms identify and select their top managers from external markets has been opaque to both firm insiders and external observers. Khurana (2002) provides rich and detailed accounts of executive hiring processes across many large publicly held corporations using extensive field data and personal interviews. Hiring practices revealed during the study are decidedly stable and close to universal across firms. He notes that boards of directors operate under severe informational, time, and legitimacy constraints throughout the executive search process. Although the selection process is "an information-intensive decision", these decisions are based on limited information, exacerbated by the requirement of confidentiality during the search process (p. 102). Thus, boards rely on readily available and credible information:

*"... the typical corporate board engaged in an external CEO search is essentially flying blind,...and attempting to adapt to the attendant uncertainty with the only ready means it finds at its disposal" (p. 118).*

Such information is predominantly at the firm-level:

*"In defining and narrowing the pool of candidates, directors evaluate the prospective CEOs based not on their individual abilities and achievements but according to a set of essentially extraneous criteria..." (p. 118).*

Specifically, the board evaluates candidates based on criteria that typically include three metrics: 1. The current position of the candidate---current leadership position as a reliable signal of leadership abilities; 2. The performance of candidate's current firm---an indicator of manager quality; 3. The reputation of candidate's current firm---a signal of candidate's legitimacy, which is a function of firm performance. As such, a defining factor of executive selection reflects candidate's current firm performance.

Although the extant theoretical work assumes that labor markets use firm performance as an indicator of managerial ability (Fama, 1980; Holmström, 1982), empirical evidence on this relationship has been limited. Recent empirical work in the accounting and finance literature support this assumption and affirm the role of firm performance in hiring of top managers described in qualitative accounts. For example, Fee and Hadlock (2003) find that boards are more likely to hire executives from high-performing firms and their compensation reflects the firm performance. Murphy and Zbojnik (2007) find that managers from top performing firms receive higher wages, because their ability is reflected in firm performance and expected to be transferred to

their new firm. Cazier and McInnis (2010) further confirm that externally hired executives come predominantly from high-performing firms.

The empirical evidence linking firm high-performance and managerial mobility is mostly from US publicly traded firms, for which disclosure of financial performance is mandatory and therefore, financial performance information is readily available. However, availability of firm performance information is limited for most private firms in the US, while financial performance disclosure requirement varies widely in other countries. To the extent that firm performance information is instrumental for top manager mobility, heterogeneity in availability of performance information suggests that firm exposure to managerial labor markets also varies with disclosure. In the following section, I introduce the concept of firm openness to managerial markets to indicate the degree to which firms expose their managerial talent to external labor markets through disclosure of firm performance. But, first, I outline the main reasons for why firm performance information is instrumental and practical for inferring individual-level ability.

#### **4.2.2 How Does Firm Performance Signal Its Top Managers' Ability?**

Since markets for managers face many information-related frictions and operate under coarse signals of ability, firm performance information has become a key source of information from which to infer the ability of the top managers. The literature

suggests two main reasons for why external markets use firm performance to gauge managerial ability: information costs and legitimacy.

First, when firms look to hire a new manager, they must incur two primary costs: costs to identify (search costs) and costs to evaluate candidates (uncertainty costs). The importance of information costs has long been recognized. Indeed, Coase (1937) noted that the information costs are fundamental:

*"The most obvious cost of "organizing" production through the price mechanism is that of discovering what the relevant prices are." (p. 390).*

The costs to gathering and evaluating information about individual ability can be partially overcome by firm performance information.<sup>2</sup> Readily-available firm performance information helps identification and evaluation of individual managers in terms of their expected productivity, thus facilitating the pricing of their services.

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<sup>2</sup> Imperfect knowledge underlies the incompleteness of markets, and these information-related transaction costs are well-known to prevent efficient trade of labor resources across markets (Coase, 1937; Williamson, 1975). Costs associated with search and uncertainty are two main information costs that create labor market frictions. First, search costs related to information gathering are non-trivial (Coase, 1937; Stigler, 1961). Second, uncertainty about quality increases the risk premium related to potential poor matches. Information costs that arise because of imperfect information (Radner, 1968; Arrow, 1974) can result in asymmetries of information (Akerlof, 1970; Spence, 1973; Stiglitz, 1975), which then can affect actions of organizations and individuals both within and across firms. Uncertainties related to potential adverse selection (Akerlof, 1970), moral hazard (Arrow, 1963) and agency problems (Jensen and Meckling, 1976) can be reduced through greater transparency and access to information.

Second, firm performance information is more credible and legitimate than many other sources of information that reveal managerial ability.<sup>3</sup> Boards, when selecting top management teams, are concerned not only about the expected productivity and fit of the new managers, but also about the need to justify their selection to the relevant stakeholders for broad external support. A board director describes the process as follows:

*"The first hurdle for myself is the laugh test: if we actually named this guy and told the employees and shareholders that he was the new boss, what would they think? Then there is the tendency to find people who look like the job. You start by whacking down the job to a set of alternatives. So you consider things like performance ... the company they are coming from, who they have worked with. From there you start to find people who look like the position."* (Khurana 2002, p. 104).

Thus, boards rely on observable objective performance metrics when making their selection decisions. Financial statements provide a readily-available, credible, and systematic evaluation of a firm's performance and subsequently carry most relevant

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<sup>3</sup> There are several ways external markets can obtain information about managerial activity. Managers can release their resumes to recruiting organizations, social media, and professional organizations, or information about managers can circulate through informal networks. Also, firms can release information about their managers through formal press releases on various firm activities and events, such as new product introductions, acquisition announcements, performance announcements, and the like. Similarly, firms can inadvertently disclose information about managerial value through internal promotions and assignments (Waldman, 1984), thus signaling which managers are productive.

information about its top management. Whereas self-disclosed information and sporadic and subjective elements of information through press releases and social networks can be important sources of information about firms and their management, financial statements provide credible, standardized and systematic flow of information to the entire market. Moreover, unlike selective release of information by firms, financial statements are disclosed regardless of the information content. Hence, both negative and positive information is revealed through financial disclosure.

While the academic literature is careful about deconstructing the factors contributing to firm performance, in practice, executive hiring committees commonly do not question the link between firm performance and executive ability.<sup>4</sup> Khurana (2002) reports that boards typically do not attempt to distinguish extraneous factors that might explain firm performance, such as industry dynamics, environment, or even luck:

*"It is difficult to convey to the reader how deeply rooted this belief in the dependent relationship between CEO quality and firm performance is among members of corporate boards, who hold it with virtually religious conviction. To openly question it is taboo." (p. 110).*

In the next section, I develop predictions linking the availability of firm performance information to mobility of top managers by distinguishing firms by their degree of openness: firms that have readily-available performance information are more

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<sup>4</sup> Studies on the effects of individual managers on firm outcomes include notable works by Bertrand and Schoar (2003) and Crossland and Hambrick (2007).

open to managerial markets, and as a result, risk losing their managerial talent to external labor markets.

### ***4.3 Theory and Hypotheses***

#### **4.3.1 Openness and Markets for Managers**

The core idea of firm openness to managerial markets refers to the ease of access to market-based relationships between a firm and external managerial markets. Open firms are those that have fewer barriers to transactions with external markets. For instance, firms are more open if search costs and uncertainty are lower, so that market participants can easily price and compare managerial services being traded. In turn, once managerial services are priced, lower managerial mobility costs can also make firms more open to managerial markets and facilitate trade. The boundaries between a firm and its environment are more permeable; talent can easily transfer inward and outward. Thus, open firms are exposed to a greater degree to competition among potential employers in the labor market.

In contrast, firms that are closed to managerial markets have greater restrictions on employee access to outside employment opportunities. The idea of closed markets reflects the logic of the traditional strategic human capital theory, which suggests that successful human capital strategy entails accumulation, retention, and development of managerial resources (Osterman, 1987; Peteraf, 1993; Coff, 1997). The focus on the importance of resource protection in the strategic human capital literature underscores

the challenges associated with firm openness: higher input prices, greater need for incentives to retain talent, higher internal instability, loss of social capital, and potential knowledge outflows (e.g., Harris and Helfat, 1997; Aime, Johnson, Ridge, and Hill, 2010; Almeida and Kogut, 1999; Shaw, Duffy, Johnson, and Lockhart, 2005; Campbell, Ganco, Franco, and Agarwal, 2012). Thus, the paradigm of closed firms is consistent with the notion that successful human capital strategy requires control and stability to ensure investment in firm-specific knowledge (Coff, 1999; Wang, He, and Mahoney, 2009; Younge, et al., 2014).

However, the emphasis on benefits of closed firms in the extant strategic human capital literature overlooks the propensity to hire top managers externally, and underestimates the benefits of firm openness. Firms now commonly hire outsiders rather than promote from inside to fill their leadership ranks: whereas only 15% of CEO vacancies in S&P 1,500 firms were taken by outsiders in 1975, by 2005, almost 42% of incoming CEOs were hired externally (Murphy and Zabojsnik, 2007, Falato et al., 2014). The frequent preference for external candidates for top leadership positions suggests there may be strategic considerations associated with openness to external markets.

Although a limited number of studies have begun to explore the tradeoffs associated with interfirm mobility, they do not examine the organizational antecedents or patterns of mobility, and use single-industry or single-firm data, which makes it more challenging to infer systematic patterns and generalizable outcomes. The most-related



results in the literature concern the benefits from mobility of talent across firms accruing to the origin firm.

A set of papers examine the role of mobility on the creation and transfer of social ties between firms. Corredoira and Rosenkopf (2010) examine patent citation patterns in the semiconductor industry post inventor mobility and find that firms tend to cite patents of firms they lost an inventor to. The results suggest a bidirectional flow of knowledge facilitated by employee mobility. Somaya et al. (2008) find that the mobility of patent law attorneys to and from client firms (between collaborators as opposed to competitors) increases opportunities for further economic exchange between the firms, suggesting that gains and losses from employee mobility depend on types of firms workers move to. Further, Bidwell (2011) uses rich personnel data in an investment banking firm, and compares quality characteristics, pay and performance of external and internal hires. He finds that external hires are significantly more experienced and better educated than internal hires, even though external hires perform worse than internal transfers, despite their higher compensation.

I build on this literature, which examines the mobility of knowledge workers and talent throughout the firm, by developing predictions about top managers. Senior executives are highly relevant to study--they have important impact on their firms, the proposed mechanisms are accentuated, and data is available. I extend the extant literature by developing a theory that explains the antecedents of top management

mobility in terms of firm openness, and predicts patterns of inflows and outflows of talent. I use a novel and comprehensive dataset to show systematic patterns consistent with my predictions.

In the following section, I propose a mechanism through which information availability about firm performance facilitates departures of top managers to other firms. Then, I will examine how performance information affects replacement choices for exited managers.

### **4.3.2 Firm Disclosure and Exit of Top Managers**

A manager moves from one firm to another, because she is expected to create more value in her new firm. Both demand- and supply-side factors are at play: a manager is offered a position and she is willing to leave her current employer. The desirability of a manager to external employers depends on the expected productivity of the manager, commonly inferred from firm performance. A manager is willing to change employers if the overall compensation for her services is higher in the new firm.<sup>5</sup>

Thus, disclosure of performance information shapes the expected productivity of a manager by external employers, which influences the perceived value of a manager, and, subsequently, her decision to stay or leave.

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<sup>5</sup> For simplicity, I assume wages incorporate the value of both pecuniary and non-pecuniary compensation, such as salary, stock options, benefits, working conditions, titles, greater responsibilities, future marketability, and others.

A manager can create greater value for her new firm in two main ways. First, a good manager can produce more economic value by managing more assets, thereby achieving economies of scale by overseeing greater output (e.g., Radner, 1992; Garicano and Hubbard, 2007). Second, proven managers can raise prestige and legitimacy of the firm. By hiring a "superstar" executive, firms can increase their social status and reputation, which in turn can boost greater investor confidence and attract growth prospects (Rindova and Fombrun, 1999; Khurana, 2002).

How valuable a manager is to external employers depends on the way markets update their expectations of managerial productivity from disclosed firm performance and non-disclosure. When a firm performs well and discloses its performance, markets perceive the management to be of high quality. In contrast, when a firm performs poorly and discloses, it is unlikely that the external employers would raise their assessment of managerial quality. At best, market perception of managers from low-performing and disclosing firms would be on a par with managers from non-disclosing firms, for whom external employers do not have information to update their knowledge of managerial quality.<sup>6</sup> Thus, managers in disclosing firms that are high-performing are expected to produce greater value than managers in other firms.

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<sup>6</sup> In Appendix E, I formally show through a simple model that markets expect managers from low-performing and disclosing firms to be of lower quality than managers in non-disclosing firms.

With disclosure of firm performance, new information about managerial value becomes available to the market and re-matching of managers to firms is likely to occur (Becker, 1973; Jovanovic, 1979). In particular, theory and evidence suggests that high ability managers are likely to move to larger firms, where they are more productive (Abowd et al., 1999; Bandiera et al., 2014).<sup>7</sup>

Thus, I predict that:

***Hypothesis 1A:** Disclosing firms that perform well will have higher exit of top managers than non-disclosing firms.*

Specifically, if managerial high ability is inferred from high firm performance, exits are likely to be promotions for managers that move from high-performing disclosing firms. Managers are likely to move to other firms in which they are expected to create more value, for example, by managing more assets. The supply-side considerations also predict higher rate of external promotions for managers in high-performing firms. Career progression can be an important impetus in individual mobility decisions. Thus, because opportunities for promotions are more numerous with a move to an external firm than opportunities provided internally due to pyramidal

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<sup>7</sup> One of the main mechanisms through which the literature suggests managerial ability is tied to mobility is through market wages. Wage determination and mobility models show that the expected productivity of workers is related to their market wages: higher perceived ability implies higher expected productivity, which is then reflected in higher market wages (e.g., Gibbons and Katz, 1991; Farber and Gibbons, 1996; Schönberg, 2007). In Appendix E, I follow the same logic and show that managers in disclosing high-performing firms will receive the highest wage offers, followed by managers in non-disclosing firms, and managers in disclosing low-performing firms receive the lowest wage offers.

structure of organizational hierarchy and "slot constraints"---fewer managers get promoted at each progressive level (Fee et al., 2006), and because external promotions typically result in larger wage jumps than internal promotions (Bidwell, 2011), disclosure also raises the probability that managers will accept external promotions.

Thus, I predict that:

***Hypothesis 1B:** Disclosing firms that perform well will have more managers leaving to accept external promotions than non-disclosing firms.*

If information released by firms shapes the market expectation of managerial productivity, then we should see these patterns accentuated in environments in which uncertainty is higher. In these settings, disclosed information should matter more. Thus, I expect that the effect of disclosing high-performance information on managerial exit is greatest in external markets with higher informational uncertainty.<sup>8</sup>

### **4.3.3 Firm Disclosure and Hiring of Top Managers**

Whereas firm openness to managerial markets results in greater exit of firm's managers, openness should also affect firm access to factor markets. In this section, I

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<sup>8</sup> I focus on high-performing and disclosing firms in my predictions; however, theory also predicts that all disclosing firms should have on average higher exit rates than non-disclosing firms. I formally derive this prediction in Appendix E.

derive predictions on the effect of firm disclosure on managerial talent acquisition patterns.<sup>9</sup>

By extending the matching logic from the exit predictions, it follows that entry patterns should reflect re-matching patterns that maximize the joint surplus of firms and new managers. I make two assumptions. First, high-ability managers prefer disclosing over non-disclosing firms, because high ability managers prefer more transparency. To the extent that future career opportunities determine managerial choices (Fama, 1980; Holmström, 1982; Bidwell et al., 2014), high-ability managers prefer disclosing firms, because transparency of firm performance increases future marketability of the managers.

Second, high-ability managers prefer high-performing firms, in which the likelihood of their high performance is greater. The expected joint surplus from matching high-ability managers to better firms can stem from complementarities (Abowd et al., 1999; Bandiera et al., 2014). In support of this view, recent empirical papers show that higher performing firms are better able to attract employees. Bidwell, Won, Barbulescu, and Mollick (2014) find that high status investment banking firms are better able to attract high ability employees. Their results suggest that future career opportunities are the determining factor for workers in choosing successful firms.

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<sup>9</sup> Firms can hire managers both externally and internally. I do not develop theory about disclosure and internal transfers in this paper, but in supplemental analyses (available upon request from the author) I find that disclosing firms have greater rate of internal promotions than non-disclosing firms.

Similarly, Rider and Tan (2014) show that high-status firms in the legal services industry hire more workers from high-performing competitors.<sup>10</sup>

Hence, I predict that:

*Hypothesis 2: Disclosing firms that perform well will hire more managers from other high-performing firms than non-disclosing firms.*

#### **4.4 Data**

The company-level ownership, financial and manager information is from the Bureau van Dijk's (BvD) Orbis database. The BvD collects company-level data from regulatory agencies and private data companies around the world on both public and private firms. The BvD verifies, standardizes, and provides comprehensive data on firm financials, ownership structure and management over a period of time. I construct the sample by selecting companies in Europe that are part of a corporate group, which is defined as a collection of at least two legally distinct entities connected by and controlled through equity links by an ultimate shareholder (Belenzon and Tsolmon, 2014).<sup>11</sup>

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<sup>10</sup> A potential contrasting hypothesis could suggest that high-ability managers can create greatest value in firms in which the marginal contribution of a good manager is higher. For example, opportunities of rapid growth attract external top managers to start-up firms, low-performing, and undervalued firms (e.g., Hellman and Puri, 2002; Brav et al., 2008). I do not believe this to be a prevalent enough phenomenon for a formal hypothesis.

<sup>11</sup> A firm is an affiliate of a corporate group if: (i) it is a subsidiary, (ii) it has a subsidiary, or (iii) it shares a common shareholder with at least one other firm. Please see Belenzon and Berkovitz (2010) for details on the methodology for constructing ownership links.

Corporate groups in Europe provide an ideal setting for my analysis for several reasons. First, a corporate group structure is representative of a multi-unit firm, the apex firm (ultimate owner) is the headquarters, and its affiliates represent the internal units. Unlike many large multi-unit firms, internal units of a corporate group are visible to researchers because they are legally incorporated entities that are subject to country registration and financial filing regulations, but are still subject to the controlling ownership of its ultimate owner. Second, European countries in my sample share a consistent legal definition of corporate groups<sup>12</sup> and enjoy the EU provision that exempts the movement of human capital among the affiliates of the same group from country-level employment protection regulations (Belenzon and Tsoolmon, 2014).<sup>13</sup> Third, while the affiliates operate in the narrow range of economic development level in the EU, they are subject to differing financial filing regulations, which allows me to take advantage of the variation to examine the effect of disclosure on markets for managers. For each firm I observe whether: (i) it discloses profit and loss (P&L) statements in 2003-2007 period, and (ii) its top managers move to another firm by 2007.

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<sup>12</sup> The legal definition of a corporate group in Europe is based on the degree of control between the parent and subsidiary (Article 1 of the Seventh EU Directive in the Official Journal L 193, 07/18/1983 p.1)

<sup>13</sup> The European Union Directive 96/71/EC allows group affiliates to "post workers to an establishment or to an undertaking owned by the group in the territory of a Member State" without invoking employment-protection regulations (Official Journal L 018, 01/21/1997 p. 1--6). Thus, internal reallocation of labor among affiliates closely resembles the freedom in functioning of internal labor markets of other closely integrated firms.



The resulting sample consists of 32,196 groups (firms) representing 203,880 affiliates (units) in 16 European countries in the period of 2003 to 2007.<sup>14</sup> The data has two main elements as described below: manager mobility and firm financial disclosure. Hereafter I refer to groups as firms and to affiliates as the internal units.

#### **4.4.1 Main Variables**

##### **4.4.1.1 Top Manager Mobility**

My main dependent variable is mobility of top managers. To determine mobility of top managers in each firm, I use annual publications of BvD's Amadeus database from 2003 to 2007 to construct employment history of each manager. The main challenge in determining mobility across years is in assigning unique identification to each unique manager. Because manager information is available only in annual publications, to track managers across time and firms, I implemented direct and probabilistic matching algorithm by using manager names, address, age and other available information. Appendix F provides details on the matching process.

Then, I determined for each firm three types of mobility: exits, exits as promotions, and entry. A manager in 2003 *exits* the firm if she works for another company not affiliated with the current firm by 2007. A manager is *promoted* if she

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<sup>14</sup> The 16 countries in my sample include: Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland.

moves from a non-CEO title to a CEO-level title,<sup>15</sup> or if she retains the same level title (either CEO or non-CEO) but moves to manage a larger company in terms of total assets or number of employees. A manager *enters* a firm in 2007 if she did not work for this group and worked in a company not affiliated with the group in 2003.<sup>16</sup> I track mobility of over 610,000 top managers between 2003 and 2007. An average group has total of 19 managers (about 3 per affiliate). Within the five-year period, an average group loses 6 managers, gains about 3 new managers, and 1 in every 4 departing managers leave to a larger firm or to a more lucrative position.

#### **4.4.1.2 Firm Financial Disclosure**

My main measure of firm openness is disclosure of performance information through firm's filings of its financial statements with regulatory bodies in compliance with country disclosure regulations. Financial statements report the economic position of a firm at the end of an accounting period and changes in that position over the previous period. Firm financial information is useful to many stakeholders, such as

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<sup>15</sup> The data has information on position titles managers hold in each firm, which I used to classify into CEO and non-CEO categories using designation conventions in each country in my sample. CEO category includes the very top executives, such as "CEO", "Company President", "Le Directeur-Général" and equivalent; and non-CEO category includes titles, such as "Chief Financial Officer", "VP of Operations", and the like.

<sup>16</sup> Since my data is limited to affiliate top managers, I do not observe within-unit upward internal mobility of mid-managers being promoted to top management, so I limit my 2007 entry to those managers I observe employed elsewhere in 2003. Similarly, I use known exits, which are identified if I observe the manager working in another firm by 2007. For robustness checks, I include unknown entries and exits to calculate total entries and exits, and results remain robust.

investors, creditors, government officials, employees, and competitors, as they use the information to evaluate the firm's economic position, performance, and its prospects.

Disclosure of financial statements is a good measure for the degree of firm openness because of three main reasons. First, financial statements provide a credible, standardized, and, recurrent source of firm performance information to the entire market. Corporate financial statements are prepared in accordance with general rules, known as the generally accepted accounting principles (GAAP), and are frequently verified by third party independent audits in order to facilitate meaningful evaluation of the information (Bromwich, 1992). Although diverse users of firm financial information may need the information for different reasons, financial statements provide a common benefit--numbers they can trust.

Second, there is wide variation in disclosure across and within countries and industries in my sample. Firms disclose financial statements in response to exogenous country-level disclosure regulations and in response to stakeholders, such as investors. Because country-level financial disclosure regimes have developed in the context of different regulatory governance systems, legal institutions, national culture, economic history and characters of financial markets, there is a marked diversity in financial reporting regulations across countries (Botzem, 2012).<sup>17</sup>

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<sup>17</sup> Please see Appendix G for details on disclosure regulations in Europe.

Further, differences in disclosure regulations relate to factors such as listing status, size, legal form, ownership structure, industry, and enforcement strength of regulations.

Third, disclosure status of firms does not change significantly over time in my sample. Once a firm commits to disclosing financial statements, it is highly likely it will keep disclosing in the following years, while firms that do not disclose are likely to remain non-disclosing. Over 81 percent of all firms in my sample either disclose or do not disclose financial performance for all five years; 14 percent start disclosing, and 5 percent stop disclosing.<sup>18</sup>

I construct a dummy variable for *firm-level disclosure* that equals 1 if half and more of its affiliates have sales data in the BvD and equals to 0 if less than half of group affiliates have no sales information in 2003-2007 period.<sup>19</sup> Over 25 percent of firms (8,070 groups) in my sample are disclosing.

Table 37 lists and describes all the main variables.

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<sup>18</sup> The breakdown is nearly identical for the population of firms in the Bureau van Dijk database during the same time period.

<sup>19</sup> I consulted with the Bureau van Dijk's data specialists to determine whether lack of recorded sales information was due to firms not filing financial statements or other systematic omissions not related to filing regulations. The Bureau confirmed that firms missing financial information did not file their financial statements with regulatory agencies.

#### 4.4.2 Descriptive Statistics

The final estimation sample consists of 32,196 corporate groups for which there is non-missing ownership information and full employment history of its affiliates' top managers in 2003-2007 period. Table 17 provides summary statistics for the main group variables. Panel A reports summary statistics for the entire sample. Panels B and C split the sample groups by their legal requirement to disclose, as defined in the robustness check section. The main insight from the table is that firms do not differ significantly on observables by disclosure and exogenous measure of disclosure. Columns (1) to (4) report summary statistics for disclosing firms. Columns (5)-(8) report summary statistics for non-disclosing firms. Column 9 reports the comparison of means test results between disclosing and non-disclosing groups for each variable. About 25 percent of groups have more than half of its affiliates reporting financial performance information. Disclosing and non-disclosing groups do not differ statistically in terms of sales growth or whether they are multinational or diversified. The disclosing groups on average have 3.3 more affiliates, and the median number of affiliates for both disclosing and non-disclosing groups is 3.

Table 18 reports the variance decomposition of disclosure by country and industry (3-digit SIC). Most variation in disclosure is within country and industry: 87 percent of variation is within-country, and almost 97 percent of variation in disclosure is within-industry (column 2).

Table 19 provides summary statistics for the main mobility variables. There is significant mobility of top managers in the five-year period: 24 percent of managers exited and 17 percent are new managers. About 8 percent of exiting managers leave to accept promotions with another firm, and 44 percent of all new managers come from other high-performing firms.

**Table 17: Summary Statistics for Main Group Variables**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables	# groups	Mean	Median	Std. Dev.	# groups	Mean	Median	Std. Dev.	Disclosing-Non-Disclosing
<b>Panel A. All Groups</b>									
<i>Sales Growth</i>	8,070	0.12	0.10	0.33	24,126	0.12	0.11	0.38	0.01
<i>Number of Affiliates</i>	8,070	8.8	3	24.90	24,126	5.5	3	9.20	3.3**
<i>Sales per Affiliate</i>	8,070	32,130	4,945	144,365.3	24,126	33,164	6,295	209,516.20	1,034
<i>Assets per Affiliate</i>	8,070	77,162	4,553	792,432.2	24,126	88,281	6,200	3,186,134	11,118
<i>Multinational</i>	8,070	0.21	0	0.40	24,126	0.23	0	0.42	-0.02
<i>Diversified</i>	8,070	0.86	1	0.35	24,126	0.85	1	0.36	0.01
<b>Panel B. Groups Required to Disclose</b>									
<i>Sales Growth</i>	7,795	0.12	0.10	0.33	22,709	0.12	0.11	0.38	0.00
<i>Number of Affiliates</i>	7,795	8.9	3	25.11	22,709	5.7	3	9.43	3.2**
<i>Sales per Affiliate</i>	7,795	31,021	4,834	131,321.30	22,709	31,776	6,306	190,266.40	755
<i>Assets per Affiliate</i>	7,795	74,097	4,475	788,031.50	22,709	63,659	6,064	763,700.10	-10,438
<i>Multinational</i>	7,795	0.20	0	0.402	22,709	0.23	0	0.42	-0.03
<i>Diversified</i>	7,795	0.86	1	0.347	22,709	0.86	1	0.35	0.00
<b>Panel C. Groups Not Required to Disclose</b>									
<i>Sales Growth</i>	275	0.14	0.09	0.33	1,417	0.13	0.11	0.46	0.01
<i>Number of Affiliates</i>	275	6.6	2	21.45	1,417	2.9	2	4.20	3.7**
<i>Sales per Affiliate</i>	275	63,566	8,195	349,543.50	1,417	55,417	6,160	408,430.80	-8,149
<i>Assets per Affiliate</i>	275	164,050	7,075	905,668.70	1,417	482,876	8,464	12,800,000	318,826
<i>Multinational</i>	275	0.27	0	0.45	1,417	0.23	0	0.42	0.04
<i>Diversified</i>	275	0.77	1	0.420	1,417	0.78	1	0.41	-0.01

Notes: This table reports summary statistics for the main group variables and mean comparison tests for disclosing and non-disclosing groups by group requirement to disclose. The unit of observation is a group. Panel A reports summary statistics for groups in which all affiliates are required to disclose (the requirement measure equals one). Panel B reports summary statistics for groups in which some affiliates are not required to disclose (the requirement measure is less than one). \*\* implies the difference in means between disclosing and non-disclosing firms is significant at the 1% level.

**Table 18: Variance Decomposition by Country and Industry**

	(1)	(2)	(3)	(4)	(5)	(6)
	One-Way Analysis of Variance					
Source:	Sum of Squares	%	df	Mean Square	F	p-value
<i>Dependent Variable: Group Financial Performance Disclosure</i>						
<i>Country</i>						
Between	788.04	13.0%	15	52.54	321.46	p<0.001
Within	5,259.19	87.0%	32,180	0.16		
Total	6,047.23		32,195	0.19		
<i>Industry</i>						
Between	121.45	3.1%	309	0.39	2.10	p<0.001
Within	3,779.56	96.9%	20,159	0.19		
Total	3,901.02		20,468	0.19		

Notes: This table reports analysis of variance estimates for the group financial performance disclosure variable by country and industry.

**Table 19: Summary Statistics for Main Mobility Variables**

Variable	(1) # groups	(2) Mean	(3) Median	(4) Std. Dev.
<i>Number of manager exits</i>	32,196	5.9	2	18.6
<i>Share of exits (all exits/all managers)</i>	32,196	0.24	0.2	0.23
<i>Number of manager exits as promotions</i>	32,196	0.25	0	1.14
<i>Share of manager exits as promotions (promotions./all exits)</i>	27,061	0.08	0	0.22
<i>Number of new managers</i>	32,196	2.5	0	8.85
<i>Share of new managers (all new/all managers)</i>	32,196	0.17	0	0.55
<i>Share of new managers from high performing firms (number of new managers from other high performing firms /all new managers)</i>	9,985	0.44	0.33	0.42
<i>Total number of managers in a group</i>	32,196	18.92	8	47.48

Notes: This table reports summary statistics for the main mobility variables. The unit of observation is a group.



## **4.5 Econometric Specification**

To estimate the effect of performance information disclosure on managerial mobility, I utilize non-parametric propensity score matching (PSM) methodology (Rosenbaum and Rubin, 1983; Heckman, Ichimura, and Todd, 1998). The matching method evaluates the average treatment effect of a treatment (in this case, disclosure) on managerial mobility patterns by creating a comparable control group from the non-treated pool. The PSM methodology is most suitable for estimating the effects of disclosure because it has a close link to the experimental context and allows dealing with a possible selection bias in my sample. By constructing a control group that is similar to the treated group on all relevant observable pre-treatment characteristics, the estimated difference in the outcomes between the groups can be attributed to the treatment.<sup>20</sup> I estimate nearest neighbor matching estimator, for which the matched pairs are chosen in terms of closest propensity scores.<sup>21</sup> The PSM estimator for the average treatment effect on the treated is the mean difference in outcomes over the common support.

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<sup>20</sup> In all specifications, I ran the balance test on covariates, which shows very small (less than 5%) and insignificant bias after matching

<sup>21</sup> For robustness, I used more than one nearest neighbor ("oversampling") and also obtained the estimators using kernel matching. Kernel matching estimators use weighted averages of all the members in the control group to construct the counterfactual, and therefore have the advantage of obtaining lower variance estimator compared to nearest-neighbor matching. The results hold when these alternative methods of matching are used.

$$\beta_{ATT} = E_{P(X|D=1)} \{ E[Y(1)|D=1, P(X)] - E[Y(0)|D=0, P(X)] \} \quad (1)$$

where  $D_i$  is the treatment and equals one if firm  $i$  is disclosing and zero if the firm is non-disclosing. The potential outcome—the number of managers moved—is defined as  $Y_i(D_i)$  for each firm  $i$ , where  $i=1, 2, \dots, N$  and  $N$  denotes the total number of firms in the sample.  $X$  is a vector of all the relevant covariates, and  $P(X)=P(D=1 | X)$  is the probability that a firm belongs in the treatment group given the observed covariates  $X$ . A positive and statistically significant  $\beta_{ATT}$  would suggest a positive effect of disclosure on mobility.

## **4.6 Estimation Results**

### **4.6.1 Disclosure and Exit**

Table 20 presents the estimation results of the PSM estimation for determining the effects of disclosure on managerial exit. The dependent variable in the first-stage Probit estimation is the dummy variable for firm-level disclosure and all the specifications include controls for group size (number of affiliates), and industry and country controls, which indicate activity by affiliates in each three-digit SIC industry and country.<sup>22</sup>

The dependent variable in the PSM estimation is a group-level manager mobility variable. The reported coefficient is the difference in the effect of information disclosure

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<sup>19</sup> As robustness check, I also include controls for group sales growth, and results remain same.

on managerial exit between disclosing and non-disclosing groups. A positive and statistically significant difference would suggest a positive effect of disclosure on mobility.

The specification in column (1) is the baseline model and includes all firms. The dependent variable is the number of managers who exited the group. The estimate for the difference is positive and highly significant, indicating 25.6 percent more managers leaving disclosing firms than non-disclosing firms.

Next, columns (2) and (3) report the results for the differences in exit rates for managers by high and low firm performance, respectively. High and low performance cutoffs correspond to positive and negative average group sales growth.<sup>23</sup> The comparison in column (2) is between high-performing disclosing groups and non-disclosing groups, and between low-performing disclosing and non-disclosing groups in column (3). The results are consistent with Hypothesis 1A--27.2 percent more managers exit the disclosing firm if it is high-performing than a non-disclosing firm (column 2). The difference is small and not statistically significant for firms that are of low performance (column 3).

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<sup>20</sup> I use several alternative ways to measure group performance. First, I split high and low performing groups by the top and bottom third of the group sales growth distribution. Further, I use the average group excess growth measure relative to each affiliate's industry by demeaning each affiliate's sales growth by its industry average and aggregating it at the group level. Also, I used unit survival information within 2-, 3-, and 4-year windows after 2007 as an alternate measure of firm performance and results hold. Finally, I used pre-mobility period unit sales information (prior to 2003) to compare mobility between disclosing and non-disclosing firms during the sample period. Results remain robust to these alternative performance cutoffs.

Hypothesis 1B predicts that more exits from high-performing disclosing firms should be promotions. I define any mobility as a promotion if a manager moves from a non-CEO title to a CEO title, or moves to a larger firm (determined by assets or number of employees) with the same level title (i.e, as non-CEO in small firm to non-CEO to large firm, and as CEO in small firm to non-CEO in large firm). The results reported in columns (4)-(6) confirm this prediction. The dependent variable in this specification is the share exits as promotions, which is the number of exits as promotions out of all exits in each group. The estimated difference is larger and statistically significant in firms that are performing well (column 5), whereas the difference is not statistically different from zero for low-performing firms. The results indicate that 36.5 percent more departing managers from disclosing firms take up an external promotion if the recent employer is high-performing than exiting managers from non-disclosing firms (column 5).

Columns (7) and (8) report results of further tests of the disclosure mechanism. First, the results for managerial exits from high-performing disclosing firms should be stronger in environments where external information is lower, because disclosed credible information would have more impact in those settings. I use industry-level analyst disagreement scores, averaged for each group, as the measure of how uncertain

of an environment a group is operating in.<sup>24</sup> High level of disagreement indicates greater uncertainty regarding future performance and lack of consensus due to asymmetry of information. I define low and high information environment if the analyst disagreement score for a group is above and below the median of the analyst disagreement score distribution. The dependent variable is the share of exits as promotions. The magnitude of the estimated coefficient in the low information environment specification is positive and statistically significant (column 7), which translates into 36.7 percent more exits as promotions for high-performing disclosing firms in low information environment compared to statistically zero difference in the share of promotions in high information environment (column 8).

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<sup>24</sup> The data on analysts' earnings estimates are from the Institutional Brokers Estimate System (I/B/E/S). I follow the methodology described in Diether et al. (2002) to calculate the degree of dispersion in analyst forecasts for each 3-digit SIC industry. Analyst earnings forecast dispersion refers to the disagreement among analysts about the expected earnings per share of a given firm. The dispersion is defined as the ratio of the standard deviation of analysts' current forecasts to the absolute value of the mean forecast.

**Table 20: Propensity Score Matching: Disclosure and Managerial Exit**

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All Exits			Exits as Promotions/All Exits			Exits as Promotions/All Exits	
Sample:	All	High	Low	All	High	Low	Low	High
							Information Environment	Information Environment
Difference between Disclosing and Non-Disclosing groups	1.394** (0.281)	1.486** (0.417)	0.846 (0.520)	0.026** (0.007)	0.027** (0.010)	0.008 (0.007)	0.011** (0.004)	0.002 (0.004)
Number treated	8,048	6,375	1,635	6,381	5,044	1,335	2,266	2,698
<b>Quantification of the effects</b>	<b>25.6%</b>	<b>27.2%</b>	-	<b>33.3%</b>	<b>36.5%</b>	-	<b>36.7%</b>	-
Difference between models	different at p<0.001							
Dependent variable (first-stage): Dummy for group-level disclosure	different at p<0.001							
Legal Requirement to Disclose	0.305** (0.068)	0.277** (0.073)	0.295** (0.113)	0.274** (0.073)	0.242** (0.084)	0.239** (0.081)	0.114 (0.111)	0.334** (0.119)
Group controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of groups	32,196	30,450	25,005	27,012	25,669	21,257	13,939	13,422

*Notes:* This table reports the results of non-parametric propensity score-matching estimation of the relation between disclosure and managerial exit. The dependent variable in the first stage is a dummy variable for groups with more than 50% affiliates disclosing financial performance information. The first-stage matching estimations include controls for Group Size, Industry, and Country. The dependent variable in the second stage is the number of managers exiting the group in Models 1-3; and the share of exits as promotions in Models 4-8. Low performing firms have an average negative or no growth in sales. High performing firms display an average positive growth in sales. Promotions are defined if a manager moves to a different group from non-CEO to CEO position, or to a larger firm (by assets or number of employees) with the same level title (as non-CEO or CEO). Low and high information environment is measured by industry analyst disagreement levels at above and below the median. Standard errors are reported in parentheses. \*\* p<0.01; \* p<0.05.

## 4.6.2 Disclosure and Hiring

Table 21 reports the estimation results for the effect of disclosure on the differences in hiring patterns between disclosing and non-disclosing firms. Hypothesis 2 predicts higher levels of external hires from other high-performing firms for high-performing disclosing firms than for non-disclosing firms. Column (1) reports positive and significant estimated difference in external hires between disclosing and non-disclosing firms, which indicates larger share of incoming managers from high-performing firms in disclosing groups than in non-disclosing groups. On average, disclosing firms hire 8.4 percentage points more managers from high-performing firms than non-disclosing firms (column 1). This difference is statistically significant and is driven mainly by disclosing firms that are performing well (column 2). There is no difference in external hiring patterns for low-performing disclosing and non-disclosing firms (column 3). These results support the prediction stated in Hypothesis H2—on average, disclosing firms that perform well have 7.3 percent higher share of external managerial hires coming from firms that are high-performing compared to non-disclosing firms.

**Table 21: Propensity Score Matching: Disclosure and Managerial Hires**

	(1)	(2)	(3)
Dependent variable:	<i>External Hires from High Performing Firms/All External Hires</i>		
Sample:	All firms	Firm Performance	
		High	Low
Difference between Disclosing and Non-disclosing groups	0.037** (0.013)	0.032** (0.014)	0.005 (0.023)
Number treated	1,875	1,462	412
<b>Quantification of the effects</b>	<b>8.4%</b>	<b>7.3%</b>	<b>-</b>
Difference in coefficients between Models (2) and (3)	different at p<0.001		
Dependent variable (first-stage Probit): Dummy for group-level disclosure			
Legal Requirement to Disclose	0.359** (0.134)	0.263 (0.145)	0.464* (0.226)
Group controls	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes
Country controls	Yes	Yes	Yes
Number of groups	9,925	9,491	7,795

*Notes:* This table reports the results of non-parametric propensity score-matching estimation of the relation between disclosure and managerial hires. The dependent variable in the first stage is a dummy variable for groups that with more than 50% affiliates disclosing financial performance information. The first-stage matching estimations include controls for Group Size, Industry, and Country. The dependent variable in the second stage is the share of external hires from high performing firms out of total managers hired externally. Promotions are defined if a manager moves to another unit from non-CEO to CEO position, or to a larger unit (by assets or number of employees) with the same level title (as non-CEO or CEO).\*\* p< 0.01; \* p< 0.05.

### 4.6.3 Human Capital Management Practices

In this section, I examine firm-specific variation in human capital management practices to determine whether effective retention practices moderate the effect of disclosure on top managerial exit. I use firm-level survey data on management practices worldwide (World Management Survey) and match the surveyed firms to my sample



(Bloom and Van Reenen, 2007; 2010).<sup>25</sup> As a result, I obtain management practice scores for 606 groups in my data.

The World Management Survey collects firm-level information on 18 different management practices within 4 general management practice types: operations, monitoring, targets, and incentives. The survey asks senior managers to rate the degree of emphasis the firm places on each of the management practices on a scale from 1 (low emphasis) to 5 (high and active emphasis).<sup>26</sup> I focus on management practices aimed specifically at managing human capital, such as retaining and attracting high performers. I calculated the Overall Management and Human Capital Management scores for each group as the average of all management practice scores and scores pertaining only to the management of human capital, respectively.<sup>27</sup>

Table 22 presents the results from comparison of means test for disclosing and non-disclosing firms on average and sub-category scores on Human Capital Management and Overall Management Practices scores. There is no statistically significant difference in management practices between disclosing and non-disclosing firms (column 3). These results suggest that there is no material difference in the

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<sup>25</sup> There are several waves in the survey collection efforts. I use the 2006 data, which reflects the contemporaneous management practices in firms in which I observe performance (non)disclosure and mobility.

<sup>26</sup> Please see Bloom and Van Reenen (2007, 2010) and <http://worldmanagementsurvey.org> for detailed survey methodology.

<sup>27</sup> The Human Capital Management practices include: overall talent management practices; utilizing incentives and performance appraisals; replacing underperformers; developing and promoting high performers; attracting new talent into organization; and retaining existing talent.

management of disclosing and non-disclosing firms. In order to determine the relationship between management scores and mobility, I estimate the relation between mobility and human capital management practices for disclosing firms. If disclosing firms implement better human capital management practices in order to retain managers, the estimated coefficient on the management score variable should be negative and significant for exits.

Table 23 reports the results from the OLS estimation. The dependent variable is the share of managerial exits as promotions. Columns (1)-(3) report the estimated coefficients on overall human capital management scores. Consistent with expectations, negative and significant coefficients for disclosing firms indicate that disclosing firms that have higher human capital management scores have 60.9 percent lower rate of exits as promotions than disclosing firms with lower scores (column 2). There are no statistically different exit rates for non-disclosing firms associated with human capital management scores. Next, I estimate the same specification for human capital management practice scores aimed specifically at retaining existing talent (columns 4-6). Similarly, the estimated coefficient on the management score variable is negative and significant for disclosing firms (column 5), which implies that disclosing firms with higher human capital retention practice scores have 37 percent fewer exits than disclosing firms with lower scores. The estimated coefficient in the specification for non-disclosing firms is not significant (column 6).

The evidence from the rich survey data provides further support to the effect of disclosure on managerial exits and suggests HR (human resource) practices as a potential moderator to top management turnover due to firm openness. Specifically, if disclosing firms emphasize HR practices to mitigate the disclosure-related managerial turnover, disclosing firms with higher human capital management practice scores effectively can reduce the number of managerial exits. The results suggest the general importance of management practices in retention efforts of firms.

**Table 22: Human Capital Management Practice Scores by Firm Disclosure**

	(1)	(2)	(3)
	Disclosing Firms	Non-Disclosing Firms	Difference in Means
Average Human Capital Management Scores	2.954	2.870	0.084
Overall talent management practices	2.763	2.616	0.147
Utilizing incentives and performance appraisals	2.712	2.537	0.175
Replacing underperformers	3.269	3.191	0.078
Developing and promoting high performers	3.323	3.194	0.129
Attracting new talent into organization	3.246	3.107	0.139
Retaining existing talent	2.780	2.690	0.090
Overall Management Scores	3.167	3.072	0.095
Number of firms	139	467	

*Notes:* This table provides comparison of means between disclosing and non-disclosing firms in their management practices scores. The score ranges from 1 to 5: score of 1 means low emphasis on particular management practice in the organization, and score of 5 indicates very high and active emphasis on the management practice. Columns 1 and 2 report the average score of HR-related management practice scores for disclosing and non-disclosing firms in the estimation sample, respectively. The Overall Management Score is the average of aggregate scores for all management practices, including Human Capital, Operations, Strategic Goals, and others. \*\* implies the difference in means between comparison samples is significant at the 1% level.

**Table 23: The Relationship between Exits and Human Capital Management Practices by Disclosure**

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	<i>Exits as Promotions/All Exits</i>					
Sample firms:	All	Disclosing	Non-Disclosing	All	Disclosing	Non-Disclosing
Overall Human Capital Management Score	-0.006 (0.006)	-0.027* (0.013)	-0.006 (0.006)			
HR Practices to Retain Existing Talent				-0.006 (0.004)	-0.017* (0.008)	-0.005 (0.004)
ln( <i>Number of Affiliates</i> )	0.004 (0.005)	-0.000 (0.008)	0.001 (0.006)	0.004 (0.005)	-0.000 (0.008)	0.001 (0.006)
ln( <i>Group Sales</i> )	-0.016 (0.010)	-0.063 (0.036)	-0.006 (0.010)	-0.018 (0.010)	-0.075* (0.035)	-0.007 (0.010)
ln( <i>Group Assets</i> )	0.014 (0.008)	0.057** (0.020)	0.008 (0.008)	0.015 (0.008)	0.061** (0.020)	0.009 (0.008)
Dummy for Multinational Group	0.019* (0.010)	-0.012 (0.022)	0.014 (0.010)	0.018 (0.010)	-0.019 (0.022)	0.012 (0.010)
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.432	0.814	0.506	0.433	0.814	0.507
Observations	606	139	467	606	139	467
<b>Quantification of the effects</b>	-	<b>-60.9%</b>	-	-	<b>-37.0%</b>	-

*Notes:* This table reports the results of OLS estimation of the relation between managerial mobility and firm-level human capital management scores by disclosing and non-disclosing firms. The Overall Human Capital Management Score is the average of all management practice scores pertaining to the management of human capital talent. HR Practices to Retain Existing Talent is the subset of the Overall Human Capital Management score. \*\* significant at 1%; \* significant at 5%.

#### 4.6.4 Robustness Checks

The main findings reported above are: (1) disclosing firms that perform well have greater rate of managerial exit, (2) these exits are more likely to be promotions, and (3) disclosing firms attract more managers from high-performing firms. In this section, I

discuss how I deal with potential issues that might influence my results and my interpretation of the results.

#### **4.6.4.1 Addressing Potential Endogeneity of Disclosure**

I construct and use group-level measure of legal requirement to disclose as an instrument for disclosure to alleviate concerns about unobservables that might be driving both disclosure and mobility patterns. I exploit the wide variation in the EU-wide and country-level disclosure regulations to determine a driver of disclosure that is exogenous to managerial turnover.

For every affiliate in my sample I determine whether it is subject to financial disclosure regulation and whether it discloses financial information. In constructing these variables, I used EU-wide and country-specific regulations to file P&L (profit and loss) statements with local regulatory agencies based on entity's legal form and size, and determined any exemptions afforded by local regulations.<sup>28</sup> The affiliate-level correlation between the requirement to disclose and actual disclosure is 0.58.<sup>29</sup>

To construct a measure of firm-level legal requirement to disclose, I calculate the share of affiliates in each corporate group subject to financial statement filing requirements as described above. The measure ranges from 0 to 1. Higher value in legal

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<sup>28</sup> Appendix G contains details on specific regulations and exemptions in each country. Due to very complex nature of accounting regulations, I consulted with several financial audit professionals in these countries to ensure the accuracy in my coding.

<sup>29</sup> Table 38 presents the rates of legal requirement to disclose and actual disclosure at affiliate-level in my sample groups, by country.

requirement to disclose variable indicates greater mandate to disclose unit performance for each firm.<sup>30</sup>

In Table 24, I report the results from IV estimations, with firm-level legal requirement to disclose as my instrument for disclosure. The IV approach estimates an average treatment effect of disclosure with the first-stage Probit estimation, in which actual disclosure is treated as an endogenous binary treatment variable and instrumented by the measure of legal requirement to disclose. The IV results are consistent with the main results. The dependent variable in columns (1)-(3) is the number of exits. The estimated coefficient on disclosure variable is positive and significant for the model with all firms (column 1) and for high-performing firms (column 2). Next, I estimate the effect of disclosure on share of exits as promotions and find similar patterns: disclosure has positive and significant effect on exits as promotions (column 4), and this effect is driven by disclosure of high performance (column 5). Finally, columns (7)-(9) present the estimated coefficients on disclosure for the share of external hires from other high-performing firms. The positive and significant estimates on disclosure are driven by high-performing disclosing firms (columns 7 and 8). Overall,

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<sup>30</sup> Table 39 reports the cross-tabs of the rates of legal requirement to disclose and actual disclosure at the group-level. Most firms that are required to disclose comply with regulations (62 percent). There is also some evidence of strategic choice in disclosure: 57 percent of groups not required to disclose performance do, and 38 percent of groups with higher share of affiliates required to disclose do not. Supplementary analyses (not reported) show that the mobility results are stronger for firms that are non-compliant within each disclosure regime—more mobility in those that disclose voluntarily and less in those that avoid disclosure.

the IV estimation results suggest that the effect of disclosure on top managerial mobility is largely driven by exogenous variation in disclosure.

**Table 24: Instrumental Variables Estimation: Disclosure and Managerial Mobility (Exits and Hires)**

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	All Exits			Exits as Promotions/All Exits			External Hires from High Performing Firms/All External Hires		
	All	High	Low	All	High	Low	All	High	Low
<i>Dummy for Disclosure</i>	1.765** (0.330)	1.664** (0.369)	0.809 (0.617)	0.025** (0.005)	0.010* (0.005)	-0.002 (0.003)	0.275** (0.084)	0.213** (0.079)	0.178 (0.105)
Group controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of groups	32,196	30,544	25,769	27,058	20,984	20,984	9,589	9,208	8,261
<b>Quantification of the effects</b>	<b>30.0%</b>	<b>28.4%</b>	-	<b>32.1%</b>	<b>14.4%</b>	-	<b>62.1%</b>	<b>48.1%</b>	-

IV first-stage dependent variable: Dummy for group-level disclosure

*Legal Requirement to Disclose* 0.303\*\* (0.067) 0.275\*\* (0.071) 0.294\*\* (0.113) 0.275\*\* (0.024) 0.206\*\* (0.083) 0.207\*\* (0.083) 0.370\*\* (0.136) 0.266\* (0.148) 0.505\* (0.232)

*Notes:* This table reports the results of instrumental variables estimation of the relation between disclosure and managerial exit and entry. The dependent variable in the first stage is a dummy variable for groups with more than 50% affiliates disclosing financial performance information. The dependent variable in the second stage is the number of managers exiting the group in Models 1-3; share of exits as promotions in Models 4-6; and share of entries from other high-performing firms in Models 7-9. Low performing firms have an average negative or no growth in sales. High performing firms display an average positive growth in sales. Promotions are defined if a manager moves to a different group from non-CEO to CEO position, or to a larger firm (by assets or number of employees) with the same level title (as non-CEO or CEO). The Wald test of independent equations strongly rejects the null of exogeneity. Robust standard errors are reported in parentheses for the average treatment effects and first-stage results. \*\* p<0.01; \* p<0.05.



#### 4.6.4.2 Reverse Causality

The relationship I propose with my theory is causal, and the empirical results support the causal argument that firm performance disclosure leads to higher rates of managerial exit and entry. A common concern with causal statements is the possibility of reverse causality--that heightened risk of managerial mobility might influence firm decision to disclose. To rule out reverse causality, I first note that almost 80 percent of my sample firms do not change their disclosure status during the sample period, which suggests that disclosure is a long-term commitment not easily changed by managerial turnover fluctuations. Then, I check whether firms that performed well in the pre-2003 period (and thus should have experienced higher rates of top manager turnover) change to non-disclosure later to prevent managerial exits. Only 5 percent of my firms stop disclosing. I find no evidence that disclosing firms that performed well in the past decide to stop disclosing firm performance at a greater rate than any other sub-category of firms. Then, I re-run the analyses by excluding young affiliates (less than 5 years old by 2003, using the date of incorporation), which may have faced more recent disclosure decisions, and results (unreported) remain robust.

Vast literature in accounting and financial economics on antecedents and degree of corporate disclosure examines a host of factors focusing mainly on investor protection and capital market considerations (see Healy and Palepu, 2001 and Beyer et al, 2010 for review). In all my specifications I control for industry and group characteristics that

correlate with firm dependence on external capital markets. The existing empirical patterns from accounting and finance literature and anecdotal evidence from corporate board rooms suggest that the potential risk of managerial turnover is an unlikely driver of corporate disclosure.

#### **4.6.4.3 Change in Disclosure Regulations**

I exploit an exogenous change in disclosure regulations to test whether firms that are subject to more extensive disclosure requirements have higher managerial mobility. In an effort to harmonize accounting practices across the European Union, all companies listed on stock exchanges of European member states have been required by the EU Commission to report their financial statements using the International Financial Reporting Standards (IFRS) starting in 2005 (also known as International Accounting Standards (IAS)). Companies located in Norway and Switzerland were allowed to adopt the new standards voluntarily, and companies trading debt securities, or trading securities in the U.S. and filing their financial statements using the U.S. GAAP (Generally Accepted Accounting Principles) were given until 2007 to comply. This regulation affected about 7,000 firms (Armstrong et al., 2010). The IFRS requires more detailed disclosure of firm financial position and performance. I exploit this arbitrary and tiered targeting of listed firms and the underlying variation to strengthen the causal inferences I make between disclosure and mobility.

The BvD keeps track of each firm's accounting reporting practices, so I can observe in each year whether a firm filed its financial statements using local GAAP or have adopted the IFRS guidelines and thus disclosed more. I compare the rate of managerial exits and entries by firm performance between affiliates that disclosed more in compliance with IFRS and affiliates that did not use IFRS, while controlling for relevant observables, such as affiliate size, sales growth, age, and share of other affiliates disclosing in the group, and group, industry, and country effects. Results (unreported) show that affiliates that disclosed more according to new regulations lose and gain more managers than affiliates that are not subject to new regulations, and that the effect is driven by affiliates that performed well.

#### **4.6.4.4 Empirical Precision and Levels of Analysis**

Note that conceptually the comparison is between a high-performing disclosing group and matching non-disclosing group, and between a low-performing disclosing group and a non-disclosing group. The theory assumes the markets are competing on managers their current firms want to retain. However, firings and replacements related to poor performance, which often occur in low-performing firms, are likely to be captured in the exit rates empirically. The rate of involuntary turnover due to performance should not be related to disclosure, as both disclosing and non-disclosing firms use internal information to reallocate poor performers. I am not able to differentiate these types of exits, but to deal with this issue, I can compare groups by

their performance. Results are robust, and the contrast is indeed stronger when I differentiate non-disclosing groups by their performance (using consolidated group sales growth information of the ultimate owner), and compare a high-performing disclosing group and high-performing non-disclosing group, and correspondingly for low-performing disclosing and non-disclosing groups.

Next, I check whether results hold at the affiliate-level and use the within-group variation. I repeat the analyses at the affiliate level and use group controls for size, sales growth, and the share of other affiliates disclosing. The dependent variable is the managerial exit and entry at the affiliate level and performance is differentiated at the affiliate-level. The results (unreported) are robust and show that affiliate-level disclosure affects managerial turnover rates.

#### ***4.7 Conclusion and Discussion***

This paper investigates how firm openness to managerial markets through disclosure of firm financial performance is related to the flow of top managers across firms. Firm performance disclosure allows external markets to infer ability of firm's top managers, which facilitates their reallocation to other firms in which the managers are expected to create more value. I find a tradeoff associated with disclosure of good firm performance and mobility of top managers. Firms that disclose high performance lose more of their managers, who leave to manage larger firms and to take positions of greater responsibility. However, firms that disclose high performance also hire greater

share of their new managers from other high-performing firms. Further, survey evidence suggests that effective human capital management practices can help mitigate potential losses of managerial talent associated with information disclosure.

To address concerns that unobserved factors might affect both firm financial disclosure decisions and mobility patterns of top managers, I exploit the cross- and within-country variation in legal requirements to disclose, and instrument the exogenous driver of disclosure for actual disclosure with the same results. Overall, the empirical evidence points to the importance of firm-level information in managerial markets for re-matching of managers to firms.

This study contributes to our understanding of the antecedents of top manager mobility. I extend the traditional protection-centered view of strategic human capital theory and shed light on the tradeoffs associated with firm openness. The theory and evidence presented in the paper suggest that information about firm performance can open firm's managerial resources to external markets and facilitate their re-matching with other firms. At first blush, it appears that open firms lose their most productive managers, but these firms are also able to attract high-quality managers from external markets. The extent to which the higher churn of high-ability managers in open firms impacts their competitiveness remains an intriguing question.

This paper points to at least two interesting paths of inquiry. First, the literature has studied various retention mechanisms firms use to increase incentives for managers

to stay. Firm retention strategies for its top managers can include targeted compensation structure, also known as "golden handcuffs" (Mehran and Yermack, 1999; Bloom and Michel, 2002); legal restrictions in the form of non-compete agreements (Marx, Strumsky, and Fleming, 2009) and intellectual property (IP) enforcement (Agarwal, Ganco, and Ziedonis, 2009); and internal career opportunities (Doeringer and Piore, 1971; Lazear and Rosen, 1981). However, evidence shows that firms are not always successful at "locking-in" their best managers. Golden handcuffs appear to have limited impact on mobility (Fee and Hadlock, 2003), legal enforcement of non-compete agreements and IP protection is often weak (Fallick, Fleischman, and Rebitzer, 2006), and firms face "slot constraints" for internal career progressions (Fee, Hadlock and Pierce, 2006). Thus, because firms' supply-side constraints are not infallible, the degree to which firm openness may dampen the efficacy of resource retention strategies is an important question.

Second, openness to external managerial markets is a paradigm that is based on the assumption that firms cannot afford to rely entirely on their own know-how, but should instead acquire and refresh managerial talent pool from external markets. Indeed, the main idea of openness parallels the work in open innovation literature, which emphasizes the importance of external sources of knowledge for a successful innovation strategy (e.g., Cohen and Levinthal, 1989; Chesbrough, 2003; Lewis and Yao, 2006). Accordingly, advantages of being open to managerial markets may include access

to fresh ideas and knowledge, as well as connectivity with external markets in terms of social networks and expertise. Also, internal resources not being optimized in a firm's business can be easily reallocated to the market, thus providing opportunities to refresh managerial talent. Thus, greater rate of churn in high-quality personnel may be an important feature of firm strategy under certain conditions.

Although not within the scope of this paper, performance implications of firm openness to managerial markets and potential moderators of top management mobility associated with firm openness are important elements of future work in this area.

## 5 Summary

This dissertation sets out to examine conditions under which firms can gain and sustain competitive advantage based on human capital. The main argument of the research centers around the idea that the ability of firms to access, redeploy, and refresh their labor resources is key to firm competitiveness. I examine the role of market frictions in the external markets, within-firm frictions associated with firm structure, and interactions of internal and external markets as characterized by firm's openness to strategic factor markets in defining patterns of labor mobility and its impact on firm outcomes. One of the focal contributions of the dissertation is in utilizing big data to establish systematic patterns associated with labor mobility and firm characteristics and outcomes.

As initial endowments of valuable and rare resources erode due to factors such as depreciation, imitation and change, firms that are able to refresh and repurpose their key resources survive and outperform in the dynamics of competitive environments. In the case of human capital, both external and internal factors determine the ability of firms to adjust and redeploy their labor. Understanding different forces shaping mobility of labor resources can help firms develop strategies aimed at managing the flow of resources.

The first essay in the dissertation examines factors in external labor markets that affect firm's ability to manage its human capital resources. Frictions in external labor markets can raise costs of adjusting labor, for instance, in response to demand



fluctuations. Inability of firms to scale labor upwards or downwards (rigidity in hiring and firing employees) with changes in opportunities can result in making suboptimal investments or carrying of costly slack. The results of the study show that flexibility in adjusting labor in the presence of external labor market frictions can result in relatively superior performance for firms that can accomplish it at a lower cost. A key implication of this insight is related to firm growth. Firms on a high growth trajectory require greater flexibility in expanding and contracting their size—they should be able to invest and divest in a timely manner. External frictions raise the costs of these transactions, thus cutting away at the profitability. Without internal labor markets from which to draw from and fall back on, smaller firms on growth trajectories would be disproportionately affected in the presence of external labor market frictions. Thus, vulnerability of small and new firms on the labor supply side can be a significant factor to their survival and growth.

Labor market frictions can also exist in the internal labor markets. Because changing investment opportunities require reshuffling and re-matching of resources to their next best use, internal flexibility to redeploy labor can be an important way firms gain competitive advantage. Essay 2 of the dissertation explores potential sources of internal frictions. Internal frictions created by structural features can prevent resources being deployed to where they can create most value for the firm. The study suggests, though, that these internal constraints can be overcome by utilizing binding elements of social dynamics, such as interpersonal trust and organizational loyalty and commitment.

The main implication of the study is for firms that require frequent and effective internal redeployment due to rapidly changing investment opportunities. The ability to match human capital resources to opportunities that maximize their joint value—both at lower cost and lower risk of losing talent—can be key to sustained competitive advantage of firms.

The flexibility of firms to adjust labor depends critically on the interaction of external and internal labor market factors. Competition for valuable resources in the factor markets can affect competitive position of firms. Any firm action that reduces external labor market frictions for other firms can drain valuable resources from the firm. Essay 3 of the dissertation suggests that firms can reduce information-related labor market frictions for other firms by revealing information about its labor resources. By opening their resources to external transactions, firms can inadvertently increase the outflow of their valuable human capital. However, firms can leverage the decreased market frictions to attract new talent and to retain and redeploy the existing talent. The important implication of this study is that firms should understand the consequences of opening up their internal markets and adjust their human capital management strategy accordingly. Future work can explore and inform whether and conditions under which the net benefit from increased flow of talent through the firm can justify its blurred boundaries with external markets.

Taken together, the three essays in the dissertation indicate the importance of firm's management of their human capital. Active firm awareness of external and

internal factors affecting its ability to access, redeploy, and orchestrate human resources in accord with other firm resources can help firms develop thoughtful strategies to manage human capital and increase their competitiveness. Whether constrained by external environment, internal structure, or unintended results of other firm actions, firms can develop human resource management strategies to align with the overall firm strategy.

## Appendix A: The Origin of EPL

Since the industrial revolution, the role of labor has evolved due to the confluence of different organizing paradigms and values rooted in each country's political organization, and shaped the degree of government involvement in the functioning of labor markets (O'Sullivan, 2003; Botero et al., 2004; Pagano and Volpin, 2005). Different systems of capitalism emphasized to varying degrees the roles of economic efficiency, scope of government regulation, and separation of ownership and control. Economies that emphasize competitive markets have lower EPL, whereas countries that emphasize non-market coordination have higher EPL (Hall and Soskice, 2001).

Comparative political economics literature distinguishes between Anglo-Saxon capitalism (also known as "liberal market economies"), centered on economic efficiency, and Rhenish capitalism (also called "coordinated market economies"), characterized by concerns about social welfare and collective action (Albert, 1993; Hall and Soskice, 2001; Dore, Lazonick, and O'Sullivan, 2003). Great Britain and Ireland belong to the Anglo-Saxon type of capitalism due to their primary reliance on competitive markets and organizational hierarchy. Accordingly, levels of EPL in these countries are low. Northern and Western European countries, such as Germany, Switzerland, Belgium, Sweden, Norway, Finland, Austria, and Denmark, function in the Rhenish type of capitalism, which is characterized by the prevalence of non-market, network-based

coordination. These countries have stricter EPL than countries with liberal market economies.

In Great Britain, the development of Anglo-Saxon managerial capitalism mirrored that of the United States in the 1920s by extending control to managers; however, managers in Great Britain, keeping traditional social-class distance, were far removed from the production floor, thus yielding significant control to shop floor supervisors (Dore et al., 2003). This extension of control led to increased organizing and to a strengthening of production workers' bargaining power, and by the 1960s, national productivity and competitiveness had severely declined due to massive increases in strikes and labor conflict. This decline prompted drastic reforms to reduce the influence of organized labor, dismantle EPL, and allow firms to more easily fire employees (O'Sullivan, 2003). As a result, careers marked by labor-market mobility replaced lifelong employment.

On the other hand, Germany, the Netherlands, Denmark, and Sweden have supported the institution of codetermination, which ensures worker representation on the supervisory boards of firms and encourages workers and management to cooperate in planning and addressing changes in the direction and nature of business. State support for non-market coordination provides workers with increased involvement in decision-making and allows conflict resolution within organizations. Rhenish capitalism often results in a high degree of employment protection, which in turn leads to comparatively long periods of employment tenure.

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 out of its total 107,000 across its affiliates in Germany. It pursued a multi-prong solution to avoid dismissing employees. First, the group implemented cuts in pay, encouraged early retirement, and shortened workdays to reduce employment costs directly. Second, it trained and transferred surplus employees to different job classifications. Third, it relocated extra employees geographically to different production locations to even out imbalances in labor supply.

Development of labor relations in France reflects another variation of institutional influence. Although the state has always played a central role in ownership and control of business enterprise, as in Great Britain, workers and unions have been removed from corporate resource-allocation decisions, regardless of state-mandated creation of work councils and pro-union incentives to encourage collaborative coordination, known as the "Aurux Laws" of the 1980s (O'Sullivan, 2003). Although the French were not able to achieve the same level of labor-management collaboration as in Rhenish forms of capitalism, the system for social democracy has ensured higher protection for employees than Anglo-Saxon capitalism.

## Appendix B: Additional Tables for Section 2

Table 25: 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	Organisation for Economic Cooperation and Development (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 Prodcom 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

**Table 26: Country Measures**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Country	Number of Firms	EPL	Labor Expenditures	Rigidity of Employment Index	Flexibility in Hiring and Firing Workers	Firing Costs	Financial Development
Austria	9,651	2.25	1.93	0.36	4.70	1.10	0.32
Belgium	13,544	2.50	3.43	0.26	5.00	2.83	0.57
Denmark	9,539	1.86	4.15	0.10	2.10	0.00	0.79
Finland	2,201	2.13	3.10	0.56	4.30	3.30	2.21
France	252,351	2.88	2.60	0.67	5.20	3.50	1.33
Germany	529,215	2.45	3.13	0.70	5.50	4.25	1.02
Great Britain	115,944	1.07	0.58	0.12	3.90	3.14	3.79
Greece	5,394	3.11	0.51	0.65	5.00	3.22	0.42
Ireland	2,363	1.25	1.85	0.20	4.20	2.94	0.54
Italy	28,258	2.55	1.25	0.47	5.50	2.48	1.10
Netherlands	4,602	2.30	3.38	0.54	5.00	2.89	2.39
Norway	107,028	2.66	1.34	0.47	5.10	2.64	1.24
Spain	114,916	3.01	2.21	0.66	5.30	4.04	2.07
Sweden	21,901	2.46	2.90	0.50	4.80	3.30	2.18
Switzerland	2,665	1.60	1.53	0.20	2.40	2.64	4.28
Average	81,305	2.27	2.26	0.43	4.53	2.82	1.62

*Notes:* This table presents measures of EPL for the countries in our sample. Columns 2 and 3 present measures from OECD averaged for 1997–2007. EPL measures the strictness of employee dismissal regulations in a country, ranging from 0 to 6, with 6 being the most difficult to dismiss an employee (column 2). The labor expenditures measure is the percent of GDP spent by countries on labor-market expenditures, which primarily comprise unemployment benefits (column 3). Column 4 presents the World Bank's annual measure of rigidity of employment, averaged over 2004–2007 (range 0–1, 0 being the most flexible and 1 being the most rigid). Column 5 presents a measure of firm flexibility in hiring and firing employees (based on answers to the question "How would you characterize the hiring and firing of workers in your country?" (1=flexibly determined by employers; 7=impeded by regulation)) from the 2008–2009 Executive Opinion Survey. Column 6 presents a measure of firing costs in terms of weeks of wages paid (natural log), from the World Bank's Doing Business rankings (2009). Column 7 presents country financial development measure from the World Bank, calculated as the ratio of the total stock market value traded in the country to the country's GDP.



**Table 27: Comparison of Means for Main Firm Characteristics: Affiliates vs. Standalone Firms**

Variable	Affiliates				Standalones			
	# Firms	Mean	Median	Std. Dev.	# Firms	Mean	Median	Std. Dev.
<i>Sales</i> (`000)	269,202	93,289	5,037	1,582,324	944,479	6,492	868	182,921
<i>Employees</i>	207,450	314	27	3,965	690,358	26	6	433
<i>Assets</i> (`000)	237,008	122,206	4,567	2,321,344	483,803	6,931	523	170,093
<i>Firm Age</i>	265,748	18.2	13	19.2	935,208	16.4	11	19.3
<i>Employment turnover</i>	137,726	0.164	0.120	0.148	386,195	0.130	0.095	0.138
<i>Sales growth</i>	1,288,739	0.061	0.072	0.391	1,697,965	0.043	0.072	0.337

*Notes:* This table presents mean comparison tests for affiliates and standalones. The unit of observation is a firm. \*\* implies the difference in means between affiliates and standalones is significant at the 1% level.

**Table 28: The Effect of EPL on Group Affiliation by Industry External Dependence**

Dependent Variable: <i>Dummy for Group Affiliation</i>						
	(1)	(2)	(3)	(4)	(5)	(6)
	All countries		High financial development		Low financial development	
Industry external dependence	>Median	≤Median	>Median	≤Median	>Median	≤Median
<i>EPL × Industry total labor turnover</i>	1.364** (0.526)	0.722 (0.525)	1.431** (0.400)	0.826 (0.620)	1.032 (1.246)	0.449 (1.135)
	different at p<0.01		different at p<0.01			
ln( <i>Sales</i> )	0.071** (0.005)	0.078** (0.003)	0.105** (0.007)	0.112** (0.004)	0.046** (0.002)	0.051** (0.002)
Country dummies (15)	Yes	Yes	Yes	Yes	Yes	Yes
SIC dummies (74)	Yes	Yes	Yes	Yes	Yes	Yes
Differential in affiliation probability (%):	8.6	4.6	9.0	5.2	6.5	2.8
% Affiliated	19.9	24.2	30.5	34.3	12.7	16.4
R <sup>2</sup>	0.281	0.259	0.297	0.263	0.226	0.216
Observations	622,297	566,227	252,026	248,976	370,271	317,251

*Notes:* This table presents the results of linear probability model regressions that examine the effect of EPL on corporate group affiliation by industry external dependence and country financial development. Country financial development is the ratio of the total stock market value traded in the country to the country's GDP. *Industry external dependence* is the average ratio between firm capital expenditures minus cash flow from operations and capital expenditures for Compustat firms over the period 1980–2007. The estimation is cross-sectional (at the firm level) and is based on the 2007 ownership structure. Sales data are for 2006 or the most recent year for which data are available. *Differential in affiliation probability* measures 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 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. \* significant at 5%; \*\* significant at 1%.

**Table 29: From Standalone to Corporate Group Affiliate: 2007 to 2011 (%)**

	All	Low Growth	High Growth
Affiliated with a group in 2011 (%)	7.2	6.5	8.5
Formed new group	2.7	2.4	3.3
Joined a group	4.7	4.3	5.5

*Notes:* This table presents the share of firms that are classified as standalones in 2007, but as group affiliates in 2011 of total standalone firms in 2007. Firms formed new groups by either creating or acquiring subsidiaries. Firms joined existing groups by getting acquired. Low-growth companies are firms that experience growth in the first quartile of the sales growth distribution in 2005–2007. High-growth companies are firms that experience growth in the fourth quartile of the sales-growth distribution in the same period.

**Table 30: Robustness Checks: Alternative EPL Measures and Sample Construction**

	Dependent Variable: <i>Dummy for Group Affiliation</i>							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Sample:</i>	All	Employment rigidity	Flexibility in hiring and firing	Firing costs	Country-industry estimation	Excluding acquired affiliates	Excluding employment outliers	Inc. missing ownership
<i>EPL × Industry labor turnover</i>		3.872** (0.949)	1.270** (0.262)	0.725** (0.207)	1.505** (0.434)	1.136** (0.355)	1.176** (0.404)	1.003** (0.134)
<i>Industry labor turnover, Interacted:</i>								
2nd quartile	-0.006 (0.017)							
3rd quartile	0.025 (0.015)							
4th quartile	0.052** (0.015)							
<i>ln(Sales)</i>	0.074** (0.003)	0.074** (0.003)	0.074** (0.003)	0.074** (0.003)		0.071*** (0.003)	0.085*** (0.003)	0.065** (0.009)
Country dummies (15)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIC code dummies (74)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Differential in affiliation probability (%)	5.3	8.0	7.2	4.1	5.4	4.1	4.3	1.9
% Affiliated	22.2	22.2	22.2	22.2	45.8	21.1	23.9	11.8
R <sup>2</sup>	0.272	0.272	0.272	0.271	0.520	0.251	0.313	0.224
Observations	1,213,681	1,213,681	1,213,681	1,213,681	3,457	1,196,405	791,131	2,779,622

*Notes:* This table examines the robustness of the effect of EPL on group affiliation to alternative measures of EPL and sample construction assumptions. The estimation is cross-sectional (at the firm level) and is based on the 2007 ownership structure. Sales data are for 2006 or the most recent year available. Columns 2–4 report estimates from using alternative EPL measures. The rigidity of employment ranges from not rigid (0) to more rigid (1). The measure of the flexibility in hiring and firing workers measure ranges from very flexible (1) to constrained by regulation (7). Firing costs are the number of weeks of severance wages paid after dismissal. Column 5 presents the estimation results of collapsing the data to the three-digit SIC-country level. Column 6 excludes acquired affiliates. Column 7 drops firms below the 1st and above the 99th percentile of employment distribution. Column 8 includes firms with missing ownership information and assumes that those firms are standalones. Standard errors (in brackets) are robust to arbitrary heteroskedasticity and allow for serial correlation through clustering by country. \* significant at 5%; \*\* significant at 1%.

**Table 31: Robustness Checks: Excluding Individual Countries**

Removing Country:	Dependent Variable: <i>Dummy for Group Affiliation</i>															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Austria	Belgium	Switzerland	Germany	Denmark	Spain	Finland	France	Great Britain	Greece	Ireland	Italy	Netherlands	Norway	Sweden	Spain, France, Greece
<i>EPL × Industry labor turnover</i>	1.133** (0.355)	1.156** (0.353)	1.116** (0.355)	1.319** (0.311)	1.101** (0.356)	1.185** (0.393)	1.144** (0.354)	0.854* (0.362)	1.693* (0.811)	1.146** (0.356)	1.150** (0.357)	1.144** (0.350)	1.161** (0.353)	1.166** (0.370)	1.192** (0.347)	0.948** (0.359)
<i>ln(Sales)</i>	0.074** (0.003)	0.075** (0.003)	0.074** (0.003)	0.091** (0.003)	0.074** (0.003)	0.073** (0.003)	0.074** (0.003)	0.065** (0.003)	0.066** (0.003)	0.074** (0.003)	0.074** (0.003)	0.076** (0.003)	0.074** (0.003)	0.076** (0.003)	0.074** (0.003)	0.065*** (0.003)
Country dummies (14)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIC code dummies (74)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Differential in affiliation probability (%)	4.1	4.2	4.0	4.8	4.0	4.3	4.1	3.1	6.1	4.1	4.2	4.1	4.2	4.2	4.3	3.4
% Affiliated	22.2	21.7	22.1	33.0	22.0	22.4	22.1	20.4	19.9	22.2	22.1	21.4	22.0	21.9	21.5	19.5
R <sup>2</sup>	0.272	0.265	0.270	0.241	0.269	0.283	0.270	0.283	0.247	0.272	0.272	0.273	0.268	0.292	0.267	0.276
Observations	1,204,114	1,200,239	1,211,019	685,064	1,204,164	1,100,478	1,211,490	962,983	1,099,125	1,208,402	1,211,327	1,185,423	1,209,110	1,106,800	1,191,796	935,819

*Notes:* This table examines the robustness of our results for excluding individual countries from the sample. In column 16, we remove Spain, France, and Greece—countries known for large conglomerates—to rule out alternative group affiliation incentives in these countries. Standard errors (in brackets) are robust to arbitrary heteroskedasticity and allow for serial correlation through clustering by ultimate owner. \* significant at 5%; \*\* significant at 1%.

**Table 32: Robustness Checks: Firm Size and Group Characteristics**

		Dependent Variable: <i>Dummy for Group Affiliation</i>											
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
		Firm employment			Assets			Industry diversification			Ownership type		
		≤50	>50	Small	Medium	Large	Specialized	Diversified	Family-held	Widely-held	Multinationals	Domestic	
<i>EPL × Industry labor turnover</i>		1.651** (0.602)	-0.033 (0.214)	0.286 (0.215)	0.861* (0.353)	0.747* (0.346)	0.153 (0.291)	1.177** (0.366)	0.386 (0.246)	1.030** (0.332)	0.800* (0.327)	0.843* (0.383)	
		different at p<0.01			different at p<0.01			different at p<0.01			different at p<0.01		
ln(Sales)		0.060** (0.003)	0.083** (0.003)	0.022** (0.001)	0.046** (0.003)	0.057** (0.003)	0.018** (0.002)	0.071** (0.003)	0.005** (0.001)	0.074** (0.003)	0.054** (0.003)	0.057** (0.003)	
Country dummies (15)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Two-digit SIC dummies (74)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Differential in affiliation		5.8	-0.1	1.4	3.2	2.7	0.5	4.3	3.1	3.7	4.6	4.3	
probability (%):		17.1	62.0	8.7	8.7	8.9	3.5	19.9	1.2	21.5	8.9	15.8	
% Affiliated		0.227	0.256	0.099	0.191	0.284	0.061	0.268	0.051	0.270	0.263	0.183	
R <sup>2</sup>		773,698	118,609	1,034,374	1,034,048	1,034,217	979,138	1,179,022	955,814	1,202,346	1,036,352	1,121,808	
Observations		Notes: This table presents the estimation results of linear probability models that examine how the effect of countries' EPL on corporate group affiliation varies by firm and group characteristics. The estimation is cross-sectional (at the firm level) and is based on 2007 ownership structure. Standard errors (in brackets) are robust to arbitrary heteroskedasticity and allow for serial correlation through clustering by country. * significant at 5%, ** significant at 1%.											

**Table 33: Robustness Checks for EPL Computation Period**

Dependent Variable: <i>Dummy for Group Affiliation</i>						
	(1)	(2)	(3)	(4)	(5)	(6)
	3-year Average EPL			5-year Average EPL		
	Financial development			Financial development		
	High		Low	High		Low
<i>EPL × Industry labor turnover</i>	0.941** (0.385)	1.338** (0.343)	-0.348 (0.751)	0.938** (0.385)	1.319** (0.343)	-0.301 (0.789)
<i>Country financial development × Industry dependence on external financing</i>	-0.072* (0.032)			-0.072* (0.032)		
<i>ln(Sales)</i>	0.074** (0.003)	0.108** (0.004)	0.048** (0.002)	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 for labor (%):	3.4	8.5	-2.2	3.4	8.3	-1.9
Differential in affiliation probability for capital (%):	-3.4	-	-	-3.4	-	-
% Affiliated	21.9	34.3	13.7	21.9	34.3	13.7
R <sup>2</sup>	0.270	0.280	0.220	0.270	0.280	0.220
Observations	1,188,524	502,419	693,663	1,188,524	502,419	693,663

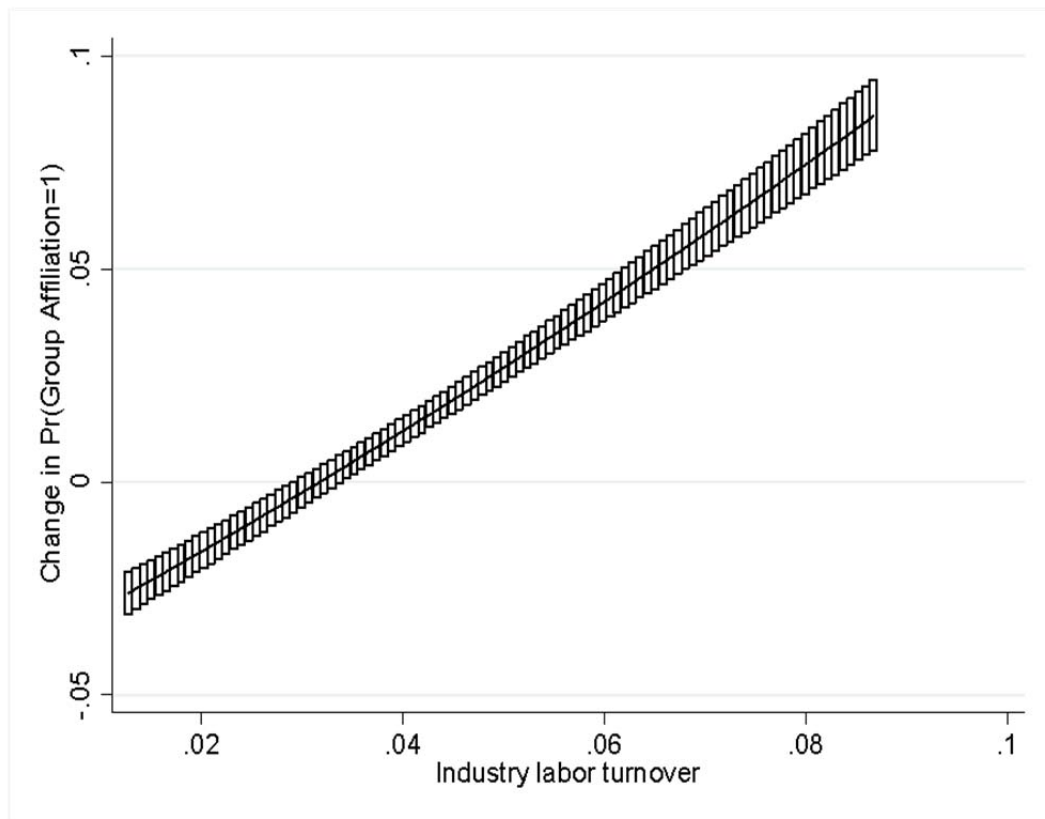
*Notes:* This table presents robustness checks for the time period used to calculate EPL. In columns 1-3, EPL is the average OECD employment dismissal protection index for 2006-2008, and in columns 4-6 it is the average for 2004-2008. Standard errors (in brackets) are robust to arbitrary heteroskedasticity and allow for serial correlation through clustering by country and industry. \* significant at 5%; \*\* significant at 1%.

**Table 34: Excluding Young Firms**

Dependent Variable: <i>Dummy for Group Affiliation</i>			
	(1)	(2)	(3)
	Excluding affiliates by age		
	<1 year old	<3 years old	<5 years old
<i>EPL</i> × <i>Industry labor turnover</i>	0.960** (0.370)	0.932** (0.355)	0.846** (0.346)
<i>Country financial development</i> × <i>Industry finance dependence</i>	-0.071* (0.030)	-0.067* (0.027)	-0.059* (0.025)
ln( <i>Sales</i> )	0.075** (0.003)	0.074** (0.003)	0.074** (0.003)
Country dummies (15)	Yes	Yes	Yes
Two-digit SIC dummies (74)	Yes	Yes	Yes
Differential in affiliation probability ( <i>EPL</i> ) (%):	3.5	3.4	3.1
% Affiliated:	22.2	22.7	23.1
R <sup>2</sup>	0.275	0.287	0.304
Observations	1,121,176	1,002,192	882,897

*Notes:* This table presents the estimation results of linear probability models to check the robustness of the results to excluding young firms. *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. \* significant at 5%; \*\* significant at 1%.





**Figure 6: The Difference in Predicted Probabilities of Group Affiliation Associated with an Increase in Country EPL at Different Levels of Industry Labor Turnover**

## Appendix C: Additional Tables for Section 3

**Table 35: Robustness Checks: Managerial Mobility Direction**

	<i>Dependent variable: Dummy for Internal Managerial Mobility, Linear Probability Model.</i>										
	<i>Top-Down</i>			<i>Horizontal</i>				<i>Bottom-Up</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		Non-family managers	Family managers	All	Non-family managers	Family managers	wholly-owned	partly-owned	All	Non-family managers	Family managers
<i>Shares by minority shareholders</i>	-0.0122** (0.003)	-0.0143** (0.003)	0.0130 (0.008)	-0.0292** (0.006)	-0.0322** (0.006)	0.0013 (0.011)	-0.0328** (0.006)	0.0028 (0.002)	-0.0162** (0.002)	-0.0167** (0.002)	-0.0099* (0.005)
<i>Family manager dummy</i>	0.0250** (0.002)			0.0176** (0.003)	0.0079** (0.003)		0.0111** (0.002)		0.0022* (0.001)		
<i>Core industry</i>	-0.0122** (0.002)	-0.0114** (0.002)	-0.0113 (0.007)	-0.0187** (0.004)	-0.0163** (0.004)	-0.0140 (0.009)	-0.0088** (0.003)	-0.0103** (0.002)	-0.0023 (0.001)	-0.0018 (0.001)	-0.0034 (0.003)
<i>ln(Year of incorporation)</i>	0.8385** (0.063)	0.7891** (0.064)	1.2908** (0.207)	1.8643** (0.106)	1.8946** (0.112)	1.4260** (0.257)	1.5199** (0.097)	0.4987** (0.047)	0.2732** (0.054)	0.2426** (0.057)	0.5574** (0.116)
<i>ln(Affiliate sales)</i>	-0.0047** (0.001)	-0.0046** (0.001)	-0.0056** (0.002)	-0.0037** (0.001)	-0.0035** (0.001)	-0.0097** (0.002)	-0.0021* (0.001)	-0.0021** (0.000)	0.0088** (0.000)	0.0090** (0.001)	0.0068** (0.001)
Group size controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.0433	0.0359	0.1321	0.0937	0.0933	0.1426	0.1002	0.0212	0.0405	0.0399	0.0573
Observations	181,109	160,055	21,054	190,633	169,442	21,191	186,490	177,094	175,847	155,982	19,865
% of movers	5.0	4.7	7.5	10.4	10.6	8.3	8.3	2.4	1.8	1.9	1.3

*Notes:* This table reports the results of linear probability regressions that examine the relationship between the presence of minority shareholders in an affiliated firm and managerial mobility. Group size controls include group sales and number of affiliates. Top-down mobility refers to mobility from a parent firm its direct or indirect subsidiaries. Bottom-up mobility refers to mobility from a subsidiary to its direct or indirect parent companies. Horizontal mobility is mobility between affiliates of the same group that do not hold any direct or indirect equity stakes in one another. Standard errors (in brackets) are clustered at the group level. \* significant at 5%; \*\* at 1%.

**Table 36: Robustness Checks: Hazard Model**

<i>Dependent variable: Dummy for Internal Managerial Mobility</i>						
	(1)	(2)	(3)	(4)	(5)	(6)
	All	All	Family managers	Non-family managers	Core affiliates	Periphery affiliates
<i>Shares by minority shareholders</i>	-0.7069** (0.064)	-0.4260** (0.057)	0.0850 (0.113)	-0.4625** (0.061)	-0.4457** (0.125)	-0.4507** (0.083)
<i>Core industry</i>		-0.3757** (0.036)	-0.2942** (0.075)	-0.3651** (0.039)		
<i>ln(Year of incorporation)</i>		28.0430** (1.719)	30.2564** (4.392)	27.4572** (1.810)	25.7718** (4.689)	33.2035** (2.837)
<i>ln(Affiliate sales)</i>		0.0097 (0.007)	-0.0174 (0.015)	0.0131 (0.007)	-0.1174** (0.019)	0.0192* (0.009)
<i>ln(Group sales)</i>		-0.0490** (0.010)	-0.0325 (0.021)	-0.0434** (0.010)	0.0275 (0.025)	-0.0425** (0.014)
<i>ln(Number of affiliates)</i>		0.2763** (0.021)	0.4401** (0.044)	0.2787** (0.022)	0.4949** (0.062)	0.1786** (0.029)
Two-digit SIC dummies	No	Yes	Yes	Yes	Yes	Yes
Ultimate-owner country dummies	No	Yes	Yes	Yes	Yes	Yes
Observations	770,792	748,013	85,455	662,558	193,671	180,578
Hazard rate	-3.5%	-2.1%	0.4%	-2.3%	-2.2%	-2.2%

*Notes:* This table reports the results of semiparametric Cox hazard model regressions that examine the relationship between managerial mobility and minority shareholders. Columns 2-6 cluster standard errors at the group level. Hazard rates indicate the effect of a 5 percent increase in shares held by minority shareholders on the probability of intra-group moves. \* significant at 5%; \*\* significant at 1%.

## Appendix D: Additional Tables for Section 4

**Table 37: Variable Descriptions**

Variables	Description	Source
Firm disclosure	A firm with more than 50% of its units filing annual financial statements with a regulatory agency	Bureau van Dijk 2003-2007
Manager exits	Number of managers leaving to work in another firm by 2007	Bureau van Dijk 2003-2007
Manager promotions	Number of managers leaving to work in another larger firm at the same level position or with a higher title; or manager leaving to another firm to a position with a higher title by 2007	Bureau van Dijk 2003-2007
Manager external hires	Number of new managers in 2007	Bureau van Dijk 2003-2007
Firm performance	Average group sales growth in 2003-2007. Low performance firms have on average zero or negative sales growth. High performing groups have on average positive sales growth.	Bureau van Dijk 2003-2007
Information environment	Degree of industry analyst disagreement at 3-digit SIC calculated as the ratio of the standard deviation of analysts' current forecasts to the absolute value of the mean forecast. Higher value of the measure indicates greater uncertainty regarding future performance within the industry.	Institutional Brokers Estimate System (I/B/E/S)
Legal requirement to disclose	Whether a company is subject to country-level regulation to file financial reports (P&L statements), based on legal form, type, and size. A group-level measure is the share of the affiliates required to disclose financial performance. Ranges from 0 to 1.	Bureau van Dijk 2003-2007; EU Directives; Country regulations
Human Capital Management Practice Score	The HCM score is the average of the following management practices sub-categories: overall talent management practices; utilizing incentives and performance appraisals; replacing underperformers; developing and promoting high performers; attracting new talent into organization; and retaining existing talent. Each sub-score ranges from 1 (low emphasis) to 5 (high and active emphasis). The total HCM score for the group is the average of the aforementioned sub-category scores.	World Management Survey (Bloom and Van Reenen, 2007; 2010)

**Table 38: Within-Country Variation in the Share of Group Affiliates' Financial Disclosure Requirement and Actual Disclosure**

Country	Number of Affiliates	Share of Group Affiliates Required to Disclose Financial Performance			Share of Group Affiliates Disclosing Financial Performance		
		Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
Austria	2,616	0.41	0.44	0.245	0.29	0.30	0.156
Belgium	3,133	0.45	0.48	0.255	0.46	0.41	0.273
Denmark	2,572	0.64	0.63	0.264	0.18	0.15	0.135
Finland	1,375	0.45	0.47	0.237	0.33	0.28	0.212
France	31,485	0.84	0.92	0.208	0.81	0.83	0.173
Germany	14,381	0.68	0.67	0.227	0.32	0.29	0.179
Great Britain	106,119	0.86	0.95	0.188	0.32	0.28	0.214
Greece	548	0.39	0.37	0.186	0.29	0.26	0.151
Ireland	1,719	0.57	0.56	0.259	0.32	0.29	0.192
Italy	4,613	0.70	0.71	0.247	0.57	0.53	0.250
Netherlands	2,691	0.63	0.63	0.212	0.29	0.28	0.169
Norway	10,517	0.88	1	0.196	0.66	0.70	0.256
Portugal	1,683	0.85	1	0.246	0.64	0.66	0.284
Spain	10,129	0.56	0.52	0.266	0.43	0.38	0.252
Sweden	8,576	0.63	0.65	0.300	0.21	0.18	0.170
Switzerland	1,723	0.43	0.45	0.208	0.32	0.31	0.170
<b>Total</b>	<b>203,880</b>	<b>0.62</b>			<b>0.40</b>		

*Notes:* This table provides summary statistics on group requirement to disclose and actual disclosure of financial performance by country at affiliate level for 32,196 groups in my sample. Affiliate-level requirement to disclose equals 1 if the affiliate is required to file financial statements by EU- and national-level regulations. The group's requirement to disclose is the share of its affiliates required to disclose. Affiliate-level actual disclosure equals 1 if an affiliate discloses sales information in 2003-2007 period. The group's disclosure is the share of affiliates disclosing performance information.

**Table 39: Summary of Group Affiliates' Financial Disclosure Requirement and Actual Disclosure**

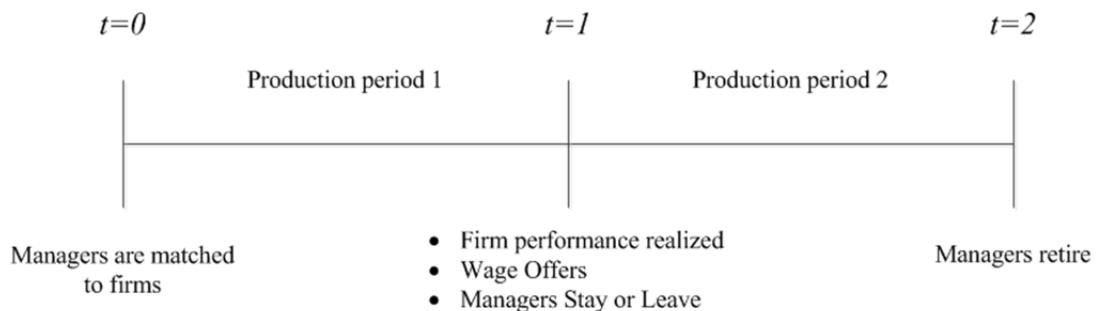
	<u>Required to Disclose</u>	<u>Not Required to Disclose</u>	<u>Total</u>
Disclosing	15,694	3,914	19,608
Not Disclosing	9,651	2,957	12,608
<b>Total</b>	<b>25,345</b>	<b>6,871</b>	<b>32,216</b>

*Notes:* This table provides summary statistics on group requirement to disclose and actual disclosure of financial performance for 32,196 groups in my sample. The group's requirement to disclose equals 1 if over half of its affiliates are required to file financial statements by EU- and national-level regulations. The group's actual disclosure is determined after partialling out group size, industry and country effects from the group share of affiliates that are disclosing sales information in 2003-2007 period.

## Appendix E: Market Wage and Exit Model

In the following framework, I show that managers in disclosing high-performing firms are expected to receive the highest wage offers, because their expected productivity inferred from high performance is highest. The next highest wages are followed by managers in non-disclosing firms, and managers in low-performing disclosing firms receive the lowest market wages. As a result, managers from disclosing firms that perform well are more likely to change employers than managers from non-disclosing or low-performing disclosing firms.<sup>1</sup>

### Market Wage Framework



**Figure 7: The Model Timeline**

Consider two different types of firms: *disclosing firms* that reveal performance information and *non-disclosing firms* that do not reveal performance. For simplicity, I

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<sup>1</sup> The model is adapted from the classical wage model by Gibbons and Katz (1991) and the recent extensions by Schönberg (2007) and Kahn (2013).

assume that revealed performance information is the only channel through which firm performance is visible to external observers. Firm performance information identifies managers and increases the precision of match quality. In other words, open firms reduce search and uncertainty costs for external employers through disclosure. External employers are able to infer quality of the firm's managers from observed firm performance information.

Next, suppose there are two types of managers: *high-quality* and *low-quality managers*. Low-quality managers can only produce low firm performance, whereas high-quality managers can produce both high and low performance with corresponding probabilities.<sup>2</sup>

## Information Structure

Consider a two-period production. At the beginning of the first period, firms and managers do not know the manager type, and managers are sorted randomly into firms. During the first period, firms produce outcomes and infer their managers' ability from performance. If firm performance is high, then firm infers managerial ability to be high. If firm performance is low, then manager can be either low ability or high ability.<sup>3</sup> At the

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<sup>2</sup> Firm performance is a function of several factors, which includes managerial quality. When other factors do not perform well, even the best management can produce low performance.

<sup>3</sup> This assumption is consistent with Leo Tolstoy's Anna Karenina Principle: "Happy families are all alike; every unhappy family is unhappy in its own way". For a family to be happy, suggests Tolstoy, a large number of complex interrelated factors need to work well together: health, financials, relationships, and others. A happy family is one that is able to resolve all of these issues, and a family that fails to handle any



end of the first period, disclosing firms reveal their performance. Markets make the same inference about managerial ability as disclosing firms based on their performance: manager is high quality if disclosed firm performance is high, and manager type is uncertain if disclosed firm performance is low. Non-disclosing firms do not reveal their performance, so markets cannot infer manager ability, so they are also uncertain of the ability for managers in non-disclosing firms.<sup>4</sup>

At the beginning of the second period, external employers compete on managers incumbent firms would like to retain.<sup>5</sup> Potential employers make wage offers based on the expected productivity of the manager in the new firm, which is a function of the managerial perceived ability. High ability managers are expected to produce more than low ability managers, so the market wage offers for high quality managers is higher than for low quality managers (Farber and Gibbons, 1996).<sup>6</sup> Hence, managers in disclosing

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one of these multiple issues will likely be unhappy, but each due to its own set of failures. Thus, it is possible to fail in many ways but there is only one way to succeed. Similarly for firms: for a firm to be high performing, all factors need to be functioning well, including the quality of its management; whereas an under-performing firm can be ineffective in its own way, its management may not be the failing factor.

<sup>4</sup> Information on managerial quality after the first period is symmetric between firm and manager; and symmetric between firm and external market for disclosing firms.

<sup>5</sup> I allow firms to dismiss any manager. Firms use internal information to discern the quality of their own managers, thus information disclosure should not affect the rate of involuntary exits, such as firings. Also, managers can leave for exogenous reasons after the first period. Exogenous reasons for departure, such as due to personal preferences, family circumstances, and others are assumed to be random across firms.

<sup>6</sup> Although not modeled explicitly into the wage equation, the main assumption for market wage offers is that wages are a function of expected productivity of the manager and characteristics of the new firm. Thus, wages reflect the expected joint surplus from matching managerial ability with firm production capabilities.

high-performing firms will receive the highest wage offers, followed by managers in non-disclosing firms, and managers in low-performing firms that disclose their performance receive lowest wage offers.<sup>7</sup>

## **Mobility**

Current employers observe these wage offers and can make counteroffer to match market wages in order to retain their managers. Managers then take the highest wage offer at the beginning of the second period. Managers retire at the end of period 2. The timeline is summarized in Figure 7.

Higher external wage offers increase the probability of a manager leaving their current employer. For low performing disclosing firms, since the market wage offers reflect the expected productivity, the difference between what the firm values the manager at and what markets value is likely to be very small. Thus, the exit rates from low-performing firms that disclose their performance may not be very high. However, to the extent that high quality managers are scarce and create more value elsewhere, the markets may bid up wages to the level where the incumbent firm may not be able to match. Hence, managers from high-performing firms that disclose are most likely to change employers.

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<sup>7</sup> This result is consistent with evidence from studies on stigma associated with dismissed workers show that publicly-known firm low performance can depress their subsequent re-employment wages (Gibbons and Katz 1991; Stevens 1997). The mechanism is generally the same as I describe here.

## The Setup

Let  $q$  be the probability that a manager is *high-ability* or "*good*" ( $G$ ), then a manager is of *low-ability* or "*bad*" ( $B$ ) with a probability  $(1 - q)$ . Firms can disclose ( $D$ ) their performance or not disclose ( $ND$ ). Then, we assume that a high-ability manager can produce high firm performance ( $HP$ ) with probability  $p$  and low firm performance ( $LP$ ) with probability  $(1 - p)$ . Low-ability managers can only produce low-performance:

$$\Pr(LP|B) = 1 \text{ and } \Pr(HP|B) = 0.$$

Then, a firm produces *high-performance* with probability:

$$\Pr(HP) = \Pr(HP|G) \Pr(G) + \Pr(HP|B) \Pr(B) = (1 - p)q \quad (1)$$

The probability of a firm producing *low-performance* is:

$$\Pr(LP) = \Pr(LP|G) \Pr(G) + \Pr(LP|B) \Pr(B) = pq + (1 - p) \quad (2)$$

With *disclosed high performance* of a firm, external markets are certain that a manager is of high-ability:

$$\Pr(G|HP) = 1 \quad (3)$$

With *disclosed high performance* of a firm, external markets are also certain that a probability of a *manager being low-ability* is:

$$\Pr(B|HP) = 0 \quad (4)$$

With *disclosed low performance* of a firm, external markets infer that a probability that a *manager is high-ability* as:

$$\Pr(G|LP) = \frac{\Pr(LP|G)\Pr(G)}{\Pr(LP)} = \frac{pq}{pq + (1 - q)} \quad (5)$$

With *disclosed low performance* of a firm, external markets infer that a probability that a *manager is low-ability* is:

$$\Pr(B|LP) = \frac{\Pr(LP|B)\Pr(B)}{\Pr(LP)} = \frac{1 - q}{pq + (1 - q)} \quad (6)$$

Without *disclosure* of firm performance, external markets infer that a probability that a *manager is high-ability* is:

$$\Pr(G|ND) = \Pr(G|LP) \Pr(LP) + \Pr(G|HP) \Pr(HP) = q \quad (7)$$

Without *disclosure* of firm performance, external markets infer that a probability that a *manager is low-ability* is:

$$\Pr(B|ND) = 1 - q \quad (8)$$

## Market Wages

External markets offer  $\bar{w}$  to G-type managers and  $\underline{w}$  to B-type managers, where  $\bar{w} > \underline{w}$ . Then, managers from disclosing and high-performing firms get wages equal to  $\bar{w}$ .

Managers from disclosing and low-performing firms get:

$$\bar{w}(\Pr(G|LP)) + \underline{w}(\Pr(B|LP)) = \bar{w} \left( \frac{pq}{pq + (1 - q)} \right) + \underline{w} \left( \frac{1 - q}{pq + (1 - q)} \right) \quad (9)$$

Managers from non-disclosing firms get the same wage offer, because markets cannot infer their ability from firm performance:

$$\bar{w}(\Pr(G|ND)) + \underline{w}(\Pr(B|ND)) = \bar{w}(q) + \underline{w}(1 - q) \quad (10)$$

## Market Wage Ordering

Table 40 summarizes market wages for managers from disclosing and non-disclosing firms by high and low firm performance. Results (1) and (2) imply that managers from disclosing firms that perform well receive highest market wage offers, followed by managers from non-disclosing firms, and managers from disclosing and poorly-performing firms receive the lowest market wage offers. Then, Result (3) shows that, on average, managers from disclosing firms receive higher market wage offers than managers from non-disclosing firms. Next, I derive Results (1)-(3).

**Result (1):**  $Wages(HP) > Wages(ND)$

**Proof:** This result follows from the fact that  $\bar{w}(\Pr(G|ND)) + \underline{w}(\Pr(B|ND))$  is a weighted average of  $\bar{w}$  and  $\underline{w}$ , which is smaller than  $\bar{w}$ .

**Result (2):**  $Wages(ND) > Wages(LP)$

**Proof:** Suppose that  $Wages(LP) > Wages(ND)$ :

$$\bar{w} \left( \frac{pq}{pq + (1 - q)} \right) + \underline{w} \left( \frac{1 - q}{pq + (1 - q)} \right) > \bar{w}(q) + \underline{w}(1 - q)$$

then rearranging the terms

$$\begin{aligned} \bar{w} \left( \frac{pq}{pq + (1 - q)} \right) - \bar{w}q &> \underline{w}(1 - q) + \underline{w} \left( \frac{1 - q}{pq + (1 - q)} \right), \\ \bar{w} \left( \left( \frac{pq}{pq + (1 - q)} \right) - q \right) &> \underline{w} \left( (1 - q) - \left( \frac{1 - q}{pq + (1 - q)} \right) \right), \\ \bar{w} \left( \frac{pq - pq^2 - q + q^2}{pq + (1 - q)} \right) &> \underline{w}(1 - q) \left( 1 - \frac{1 - q}{pq + (1 - q)} \right), \end{aligned}$$

$$\bar{w} \left( \frac{q(p - pq - 1 + q)}{pq + (1 - q)} \right) > \underline{w}(1 - q) \left( \frac{pq - q}{pq + (1 - q)} \right),$$

$$\bar{w}q(p - pq - 1 + q) > \underline{w}(1 - q)(pq - q),$$

$$\bar{w}q(p - 1)(1 - q) > \underline{w}(1 - q)(p - 1)$$

Since  $(p - 1)$  is negative, the inequality sign reverts, thus yielding

$$\bar{w} < \underline{w}$$

which is a contradiction.

So, it must be that  $Wages(ND) > Wages(LP)$ . Then, it follows from Results (1)

and (2) that

$$Wages(HP) > Wages(ND) > Wages(LP) \quad (11)$$

**Result (3):**  $Wages(D) > Wages(ND)$

**Proof:** Suppose that  $Wages(D) < Wages(ND)$ :

$$\bar{w} + \bar{w} \left( \frac{pq}{pq + (1 - q)} \right) + \underline{w} \left( \frac{1 - q}{pq + (1 - q)} \right) < 2\bar{w}q + 2\underline{w}(1 - q)$$

then rearranging the terms

$$\bar{w} \left( 1 + \frac{pq}{pq + (1 - q)} - 2q \right) < \underline{w} \left( 2(1 - q) - \left( \frac{1 - q}{pq + (1 - q)} \right) \right),$$

$$\bar{w} \left( \frac{pq + 1 - q + pq - 2pq^2 - 2q + 2q^2}{pq + (1 - q)} \right) < \underline{w} \left( \frac{2pq + 2 - 2q - 2pq^2 - 2q + 2q^2 - 1 + q}{pq + (1 - q)} \right),$$

since the denominator is positive

$$\bar{w}(2pq + 1 - 3q - 2pq^2 + 2q^2) < \underline{w}(2pq + 1 - 3q - 2pq^2 + 2q^2),$$

since the terms in the brackets are positive, we get

$$\bar{w} < \underline{w}$$

which is a contradiction. So, it must be that

$$Wages(D) > Wages(ND).$$

**Table 40: Summary Predictions for Market Wage Offer Ordering**

	Disclosing Firm		Non-Disclosing Firm	
High-Performing Firm	$\bar{w}$	>	$\bar{w}(\Pr(G ND)) + \underline{w}(\Pr(B ND))$	(Result 1)
Low-Performing Firm	$\bar{w}(\Pr(G LP)) + \underline{w}(\Pr(B LP))$	<	$\bar{w}(\Pr(G ND)) + \underline{w}(\Pr(B ND))$	(Result 2)
All Firms	$\frac{1}{2}[\bar{w} + \bar{w}(\Pr(G LP)) + \underline{w}(\Pr(B LP))]$	>	$\bar{w}(\Pr(G ND)) + \underline{w}(\Pr(B ND))$	(Result 3)

### Managerial Exit Propositions

The Results (1)-(3) yield the following main propositions:

**Proposition 1:** *Managers from disclosing firms are more likely to leave than managers from non-disclosing firms.*

**Proposition 2:** *Managerial exit from disclosing firms is driven by managers leaving firms that are performing well.*

## **Appendix F: Manager Mobility Data Construction**

### ***Data Cleaning***

The data for managers comes from annual publications of Orbis database from the Bureau van Dijk. To construct the complete employment history of top managers in each firm, I combine publications for each year in the 2003-2007 period for 16 countries in Europe. The countries in my sample include Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland. The main challenge in this task is to assign unique identification to each individual managers, because BvD did not assign personal ids to managers for these years. In each year's records and by each country, I standardize manager names by removing and replacing country-specific characters with standard characters. Then, I remove various titles preceding personal names, such as Mr., Mme, and the like. Then, I separate first, last and middle names if combined in a single field. The data includes, in some instances, external board members as well. I remove all non-managerial members of the board by filtering position titles. I categorize all the titles in each native language for each country into external board members and top management team. After removing external board members from the sample, I categorize titles into CEO and non-CEO positions.



## **Matching Process**

On standardized names, I use direct, approximate, and probabilistic matching algorithms within each country across the years. I utilize record linking algorithm developed and implemented by Blasnik (2010), which uses bigram comparison methodology (Frakes and Baeza-Yates, 1992) to calculate matching scores for each pair of string comparisons. The process is reiterative. I improve the precision by manually inspecting the matches and adjusting the matching scores to reduce the number of false positives. On multiple matches on a same popular name, I use probabilistic matching algorithm by managers' date of birth, home address, schooling, degrees, and any other relevant information to narrow down to unique individuals. Figure 8 illustrates an example of multiple records with the same name, and how year of birth information was used to distinguish the otherwise identical records.

Year of birth	Age	Full name	Temporary unique id	New unique id
1974	38	GEORGE EFSTRATIADIS	164	164
1974	38	GEORGE EFSTRATIADIS	164	164
1974	38	GEORGE EFSTRATIADIS	164	164
1966	46	GEORGE EFSTRATIADIS	164	165
1966	46	GEORGE EFSTRATIADIS	164	165
1974	38	GEORGE EFSTRATIADIS	164	164

**Figure 8: Assigning Unique ID's to Manager Records**

Following this methodology, I assign unique ids to about 4.3 million managers in 4.1 million companies. My final estimation sample in this study includes 610,000 managers in 32,196 corporate groups for which I have complete employment history between 2003 and 2007.

## Appendix G: Corporate Financial Reporting in Europe

This section provides an overview of financial reporting regulations in European Union and its individual Member States. Appropriate accounting and financial information is critical for successful management of an enterprise. Accounting information is an important source of information for owners, investors, managers and other stakeholders of a firm. Financial disclosure of firms in Europe is governed by diverse set of national and EU-wide reporting regulations. For Member States, firm financial reporting regulations in European Union are comprised of complex medley of legislation at the EU and national levels. Financial reporting legislation is aimed at establishing high level of transparency and comparability of financial reporting for better functioning of capital markets and protection of investors. At the EU-level, the International Accounting Standards (IAS)/International Financial Reporting Standards (IFRS) regulate financial reporting of listed companies since 2005. The Fourth Directive (78/660/EEC) and the Seventh Directive (83/349/EEC) are applied by Member States into their national accounting legislation. Member States may also provide exemptions to firms of certain size and legal form from reporting financials statements or allow them to report simplified financial statements.

Even though the European Commission has strived to harmonize the financial disclosure standards for firms across the EU member states, the country-level regulations remain differentiated due to persisting national regulatory structures. The

EU Directives that govern the financial disclosure regulations provide a general framework with a set of minimum requirements that member states should comply with. The most important EU Directives governing the financial disclosure of firms are: the Fourth (Company Law) Directive of 1978, which regulates the accounts of limited liability companies; the Seventh Directive of 1983, which specifies rules for consolidated statements; and other directives aimed at banks, insurance companies, and small and medium-sized enterprises (SMEs). The goal of the Directives is to facilitate compatibility of rules across member states rather than imposition of the same set of rules. Hence, country-level regulations dictate the specific rules, such as disclosure requirements and exemptions, and thus, regulations vary widely across member states. Importantly, the EU does not have any rules specified regarding the enforcement of accounting and disclosure regulations, which makes enforcement of disclosure regulations a national matter (Benston et al., 2006). Because countries vary in enforcement, it provides further variation in disclosure.

**Table 41: Overview of Firm Financial Disclosure Regulations and Exemptions by Country**

Country	National Law	Requirements to file financial statements	Exemptions
Austria	Austrian Commercial Code §§ 189-216	AG, GmbH	Private companies
Belgium	Belgian Company Code; Royal Decree of January 30, 2001; Accounting Law of July 17, 1975	SA, SPRL, Soc. Coop., SCS, SNC, GIE	None
Denmark	Danish Bookkeeping Act (Consolidation Act no 648 of June 15, 2006); Danish Financial Statements Act (Consolidation Act no 647 of June 15, 2006)	All limited (A/S), Private limited companies (ApS), Limited partnerships by shares (P/S), Limited and general partnerships	All others
Finland	Finnish Corporate Governance Code	All joint-stock companies; all co-operatives; limited liability companies; public limited liability companies; European groups	All others and limited partnerships, partnerships and private firms, which meet two of the following three conditions: - turnover under 7.30 million EUR; - balance sheet total under 3.65 million EUR; - number of personnel under 50
France	CoC, Book I, Title II; Book II, Title II & III; PCG	SA, SARL, SCA, SCACS, SAS, EURL, SA DIR, SNC of which the partners are not individuals.	Firms with under 50 emp if Société en nom collectif (SNC); or Société en commandite simple (SCS); SNC, Affaires Personnelles, Coopératives, SCI, Administration, Associations, GIE
Germany	Handelsgesetzbuch (German Trade Law)	Corporate enterprises (AG, GmbH) and cooperatives (e.G).	Partnerships exempt: OHG, KG; Coops e.G: under 50 emp; Private

			companies as subsidiaries
Great Britain	Section 442 of the UK Companies Act 2006	Limited	Unlimited
Greece	Commercial Law: Article 18 ff (18 -50); Law 3190/1955: Article 50a and 22; Law 1667/1986: Article 9 par. 3.	Societe Anonyme and Limited Liability Companies.	General Partnerships, Limited Partnerships, Sole Proprietorships
Ireland	Companies Act 1963	Limited	Unlimited
Italy	Italian Civil Code (Royal Decree. no 262 of March 16, 1942); Presidential Decree no 600 of September 29, 1973.	S.p.A. (Società per Azioni), S.r.l. (Società a responsabilità limitata), Sapa (Società in accomandita per azioni), Società Cooperative, Società Consortili, G.e.i.e, Società di persone (only consolidated accounts), Consorzi con qualifica di Confidi	Sole proprietorships
Netherlands	Dutch Civil Code, Book 2, Title 9; Dutch Accounting Standards.	All limited companies (B.V.s and N.V.s) and some sole traders and cooperations.	Sole proprietorships; Sole Traders, Federations, Foundations and participations, which are consolidated in holding and companies for which a liability guarantee is filed
Norway	(Accounting Act of July 17, 1998 no 56 section 8-2).	Limited	Sole proprietorships
Portugal	Portuguese Commercial Code; Decree Law no 8/2007; Portuguese Companies Code	All the companies	None
Spain	Spanish Code of Commerce: articles: 25 to 30; 34 to 41. Spanish Corporation Act: articles: 171 and 172, 202 to 210 and 218 to 220. Royal Decree no 1514/2007 and	S.A., S.L., Sociedad comanditaria simple; Sociedad colectiva; Sociedades cooperativas (S. Coop.); Empresario individual.	Cooperatives, association, general and limited partnership.

Royal Decree no  
1515/2007. Act no  
16/2007.

Sweden	Annual Accounts Act (SFS 1995:1554) chapter 8	Limited; HB, KB (Handelsbolag, HB; Kommanditbolag, KB)	Unlimited
Switzerland	Schweizerisches Obligationenrecht (Swiss Code of Obligations)	None	All

Firms may not report their financials because either they are exempt or they decide not to disclose regardless of requirements. Non-compliance with reporting requirements is not uncommon and may not be necessarily as a result of lack of enforcement. For example, in Portugal, many firms decide to pay a fine rather than file reports. In Germany, affiliated firms are exempt from filing financial reports if the group's ultimate owner (apex firm) includes individual affiliate statements in the group's consolidated statements. Figure 9 presents a notice of exemption page from SaltzgitterAG Group's 2012 Annual Report, which lists affiliates that take advantage of this exemption. The notice reads: "The following fully consolidated domestic subsidiaries have fulfilled the conditions required under Section 264 para.3 or Section 264 b, German Commercial Code (HGB), and are therefore exempted from disclosure of their financial statements and from the obligation to prepare a management report".

The variation in disclosure regulations and the complex interplay of national and industry factors result in large variation in disclosure both within and across countries,

industries and firms. In my sample, disclosing firms are reporting firm performance (P&L accounts), and non-reporting firms have missing firm performance (P&L) accounts in 2003-2007. About 25 percent of firms disclose their financial performance during 2003-2007 period.

I also determine at the affiliate-level whether a company is subject to filing requirements by applying EU- and country-level regulations and exemptions based on firm legal form, type, size, and industry. I consult with financial audit professionals in several of my sample countries to confirm the accuracy of my coding. Although my final measure may not capture with all the legal nuances of disclosure regulations, it provides an alternate and exogenous way to measure disclosure. Table 38 summarizes the distribution of requirements to disclose and actual disclosure across and within countries.

**(47) Waiver of Disclosure and Preparation of a Management Report in Accordance with Section 264 b, German Commercial Code (HGB)**

The following fully consolidated domestic subsidiaries have fulfilled the conditions required under Section 264 para.3 or Section 264 b, German Commercial Code (HGB), and are therefore exempted from disclosure of their financial statements and from the obligation to prepare a management report:

- Salzgitter Mannesmann GmbH, Salzgitter
- Salzgitter Klöckner-Werke GmbH, Salzgitter
- Salzgitter Stahl GmbH, Salzgitter
- Salzgitter Flachstahl GmbH, Salzgitter
- Peiner Träger GmbH, Peine
- Ilseburger Grobblech GmbH, Ilseburg
- HSP Hoesch Spundwand und Profil GmbH, Dortmund
- Salzgitter Europlatinen GmbH, Salzgitter
- Salzgitter Bauelemente GmbH, Salzgitter
- Glückauf Immobilien GmbH, Peine
- SZST Salzgitter Service und Technik GmbH, Salzgitter
- Hansaport Hafenbetriebsgesellschaft mbH, Hamburg
- SIT Salzgitter Information und Telekommunikation GmbH, Salzgitter
- GESIS Gesellschaft für Informationssysteme mbH, Salzgitter
- telcat multicom GmbH, Salzgitter
- telcat Kommunikationstechnik GmbH, Salzgitter
- DEUMU Deutsche Erz- und Metall-Union GmbH, Peine
- Salzgitter Mannesmann Forschung GmbH, Salzgitter
- Salzgitter Mannesmann Handel GmbH, Düsseldorf
- Hövelmann & Lueg GmbH, Schwerte
- Salzgitter Mannesmann International GmbH, Düsseldorf
- Salzgitter Mannesmann Stahlhandel GmbH, Düsseldorf
- Stahl-Center Baunatal GmbH, Baunatal
- Universal Eisen und Stahl GmbH, Neuss
- Mannesmannröhren-Werke GmbH, Mülheim
- Salzgitter Mannesmann Großrohr GmbH, Salzgitter
- Salzgitter Mannesmann Line Pipe GmbH, Siegen
- Salzgitter Mannesmann Rohr Sachsen GmbH, Zeithain
- Salzgitter Mannesmann Präzisionsrohr GmbH, Hamm
- Salzgitter Mannesmann Precision GmbH, Mülheim
- Salzgitter Mannesmann Grobblech GmbH, Mülheim
- Salzgitter Mannesmann Stainless Tubes GmbH, Mülheim
- Salzgitter Mannesmann Stainless Tubes Deutschland GmbH, Remscheid
- KHS GmbH, Dortmund
- Klöckner PET-Technologie GmbH, Salzgitter
- Klöckner DESMA Elastomertechnik GmbH, Fridingen
- Klöckner DESMA Schuhmaschinen GmbH, Achim
- KHS Corpoplast GmbH, Hamburg
- KHS Plasmax GmbH, Hamburg
- Salzgitter Automotive Engineering Beteiligungsgesellschaft mbH, Osnabrück
- Salzgitter Automotive Engineering GmbH & Co. KG, Osnabrück
- Salzgitter Automotive Engineering Immobilien GmbH & Co. KG, Osnabrück
- Salzgitter Hydroforming GmbH & Co. KG, Crimmitschau

**Figure 9: Notice of Disclosure Exemption for Consolidated Affiliates in a German Corporate Group**



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## **Biography**

Ulya Tsolmon is a Doctor of Philosophy candidate in Strategy at the Fuqua School of Business. She holds a BSc in International Business Management with Economics minor from Brigham Young University in Hawaii, joint Masters Degrees in Organizational Behavior from Marriott School of Management and in International and Area Studies from the Kennedy Center at Brigham Young University, and a Master of Public Policy degree with emphasis in Economics and Research Methods also from Brigham Young University. Her research interests focus on firm competitiveness derived from human capital management and innovation strategy. She received the Graduate Student Fellowship from Duke University, Mary Lou Fulton and Culbert Laney Memorial Scholarships from Marriott School of Management, and the Student of the Year award from the Kennedy Center for International Studies at Brigham Young University. She will join the Strategy Department at Olin Business School, Washington University in St. Louis as an Assistant Professor of Strategy in July 2015.