Essays in Ownership Structure and Corporate Governance

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ABSTRACT

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This dissertation delves into ownership structure and corporate governance. The first chapter investigates the causal link between business group affiliation and new firms' profitability. To overcome selection issues related to group affiliation, I focus on ownership changes at least two levels away in the ownership chain that lead to a change in group affiliation. I provide evidence suggesting that these "unintentional" changes are likely exogenous. I find that business group affiliation leads to a 12% increase in new firms' profitability during the first six years. I further present evidence consistent with two channels. First, new firms quickly increase revenues and expand market shares after joining business groups, possibly leveraging on groups' marketing networks. Second, group affiliation triggers a higher ratio of top manager turnover and leads to more experienced top managers and more productive employees. It is possible that business groups provide a talent pool of managers and better monitor new firms' labor force. Results suggest that business groups parallel the role of venture capital firms in sponsoring new firms in economies with concentrated equity ownership.

The second chapter examines the impact of input and product market competition on private benefits of control (PBC), as measured by the voting premia between shares with differential voting rights. The main findings are three. First, increases in the intensity of competition lead to lower estimates of PBC. Second, competition significantly reduces the dispersion in the voting premia, affecting especially the top of the PBC distribution. Third, competition effects are particularly prominent in weak-rule-of-law countries, in manufacturing industries and in less-profitable firms. Overall, the results show that competition leads

to a meaningful reduction in the level and dispersion of PBC.

The third chapter directly examines the correlation between insider trading and executive compensation at the firm level. Using panel data on US firms from 1992 to 2011, we find that 1% decrease in cash compensation leads to a 21.7 percentage points increase in 6-month buy-and-hold excess returns, as well as a large increase in trading profits. These results indicate that insiders are using insider trading as a substitute to cash compensation, and keeping the total direct compensation level less volatile than previous research relied on. This effect is robust to exogenous shock to insider trading return, such as Sarbanes-Oxley Act of 2002. The result suggests the importance to take into account of insider trading profit in context of executive compensation.

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Chapter 1

Business Group Affiliation Improves New Firms' Profitability

Fangzhou Shi

1.1 Introduction

Business groups that function as legally independent firms and that are connected with common concentrated equity ownership are a dominant structure outside of the United States.[1] Several studies show that such groups are also widespread in the new firm sector (Rosa and Scott, 1999; Iacobucci, 2002; Bena and Ortiz-Molina, 2013). As shown in this chapter, business groups are a pervasive ownership structure for new firms across industries in European countries.[2] Its dominant role dwarfs other common ownership structures for new firms, such as venture capital (VC).

The total effect of business group affiliation is controversial. On the one hand, business group affiliation could be beneficial to group members by providing financing advantages, improving operating efficiency,[3] promoting R&D investment and knowledge spillovers,[4] and creating an internal labor market (Khanna and Palepu, 1999; Belenzon and Andrea, 2011). On the financing advantage, group members can leverage the group's internal capital market[5] and reputation (Khanna and Palepu, 2000; Gomes, 2000), receive contingent support,[6] and share risk among group members (Khanna and Yafeh, 2005). All of these benefits make the business group an ideal ownership structure for new firms, which tend to be financially constrained, vulnerable to financial shocks, highly risky, but active in innovation. On the other

[1]For both empirical evidence and theoretical background, refer to La Porta et al. (1999); Claessens et al. (2000); Khanna (2000); and Morck et al. (2005).

[2]In the period from 1999 to 2008, 11.2% of new firms belonged to business groups. These group affiliated new firms account for 50.6% of total assets, 46.3% of total revenues, and 38.9% of employees in the new firm sector. Detailed statistics are shown in Table A.1, Table A.2, and Table A.3.

[3]Hamelin (2011), Lechner and Leyronas (2009), and Iacobucci and Rosa (2005).

[4]Sea-Jin et al. (2006), Belenzon and Berkovitz (2010), and Hsieh et al. (2010).

[5]Almeida and Wolfenzon (2006), Almeida et al. (2011), and Masulis et al. (2011).

[6]Morck and Nakamura (1999), Gopalan et al. (2007), and Gopalan et al. (2014).

hand, certain disadvantages of group affiliation may be more severe for new firms. Among the various means of expropriation by the ultimate owner, the most notorious phenomenon is tunneling. New firms usually gravitate to the bottom of the ownership chains, where the diversion incentives are larger.

In this chapter, I aim to establish a causal link between business group affiliation and new firms' profitability, based on comprehensive ownership and financial data about new firms from 24 European countries. I also aim to provide evidence on the contributing mechanisms of the profitability change.

Regarding the causal effect of business group affiliation on firms, appropriately addressing selection is perhaps the most important task. In an ideal setting, new firms are assigned to groups or non-groups randomly. However, this cannot be realized since acquisitions (spin-offs) are not random. Instead, I propose a quasi-experimental setting, where the group status change is an unintentional result of ownership changes above the parent shareholder level. Intuitively, when a firm at the top of the ownership chain is acquired by a business group, holding other ownership links constant, firms at the bottom of the ownership chain (subsidiaries, sub-subsidiaries, etc.) also join the business group unintentionally. The same logic applies to firms that unintentionally leave business groups. More precisely, I require the ownership stake in the new firm from any parent shareholder to be constant during the group status change. In this setting, the unintentional claim is motivated by two facts. First, new firms are much smaller compared to the groups and parent shareholders. Therefore, they are expected to take a negligible weight in the acquisition decision. Second, if the acquirer's major incentive is to share cash flows of the bottom firm, the weakly dominant strategy is to acquire the bottom firm directly, instead of acquiring the bottom firm through its parent shareholder. I present an example in Appendix A.2 to clarify this setting. A new firm Active Audio was partially owned by Electronatec. In 2006, Electronatec was acquired by

ECA, which belonged to a huge family controlled business group. During the acquisition, Electronatec did not change its stake in Active Audio at all. As a result, Active Audio also became a member of the same business group. It is noteworthy that Active Audio was a tiny part of Electronatec and rarely mentioned as one of the acquisition incentives. In fact, its business was not directly related to the synergies claimed in the filing.[7] All of these observations suggest that Active Audio's group affiliation was unintentional.

I provide two sets of tests to investigate the validity of this setting. First, since any new firm with corporate parent shareholder(s) is a candidate for unintentional change, I check the ex-ante difference between new firms that unintentionally change group status, and other new firms with parent shareholder(s). Results show that these two sets of firms are similar, in terms of common observable characteristics such as size, growth rate, and profitability. Second, I check whether group effects vary by the relative importance of new firms. If changes in ownership above the parent level are driven by the new firm at the bottom, more important new firms are expected to take on increased weight in the acquisition decisions. Therefore, group effects should be stronger for them. I use the relative size of the new firm to the group or parent shareholder(s) as a proxy for importance. After splitting the sample into joining groups (group affiliation) and leaving groups (group detachment), I find that the group affiliation effect is actually driven by less important firms, while the group detachment effect does not vary. Results of these tests justify the unintentional claim for identification.

Using the above quasi-experimental setting, I carry out a difference-in-differences analysis, through investigating the change of profitability based on both non-parametric matching and multivariate OLS regressions. My studies show that group affiliation leads to a 12% increase in profitability, while group detachment has an insignificant effect. Comparing the results across models shows that selection issues are against the group affiliation and the

[7]ECA Group Annual Report, 2006.

group detachment effect. That is, less profitable firms are acquired by business groups, while more profitable firms are spun off, after controlling for observable characteristics. Without addressing selection issues, comparison of group versus non-group firms would underestimate the group affiliation effect, and overestimate the group detachment effect.

After establishing the positive group affiliation effect on a new firm's profitability, I investigate and present two major mechanisms. First, similar to VC firms, business groups may draw on their networks to support group members and help them increase revenue. Consistent with this projection, I find that revenue (scaled by the lagged total assets) increases by 5% upon joining a group. With a stable gross profit margin, this growth in revenue translates to growth in gross profit and accounts for 44% of the increase in profitability. Meanwhile, a new firm's market share in its industry increases by 14%. Additionally, the expansion magnitudes double when the business group has a higher market share in the same industry. Consistent with the revenue-oriented growth, I find that the group affiliation effect is more significant in the retail and wholesale sector. All of these effects are comparable to the VC's role in supporting portfolio companies (Gorman and Sahlman, 1989; Hochberg et al., 2007).

The second potential channel is that group affiliation might provide the new firm with better quality labor. Indeed, my studies show that joining a group doubles the top manager turnover ratio. About 30% of those new managers are from other firms within the same group. Management experience, measured by the tenure of the top managers across different firms, increases by 24%. In addition, monitoring, training, and even replacement are not restricted to the top managers. The average productivity of employees also improves significantly, captured by revenue generated per employee (13%), profit generated per employee (18%), and the marginal productivity of labor measure (Larrain and Stumpner, 2013) (7%) for the manufacturing sector. Again, these results suggest that business groups parallel the role of VC in cultivating new firms (Gorman and Sahlman, 1989; Hellmann and Puri, 2002).

Overall, my results contribute to three strands of research. First, this chapter documents the comprehensive role of business groups in sponsoring new firms and their causal effect on new firms' profitability. Although there is a vast literature about group effects on general firms, less attention has been given to its effects on new firms. Existing research on new firms are limited as they either focuses on one country (Rosa and Scott, 1999) or one industry (Iacobucci, 2002; Bena and Ortiz-Molina, 2013). I show that business groups are a dominant structure for new firms across 24 countries and 21 two-digit NAICS industries. The quasi-experimental setting helps establish the causal link and fills the void of methods addressing selection for new firms. Extensive research studying correlations between group affiliation and performance is based on comparisons of group firms versus non-group firms. Khanna and Yafeh (2007) point out that these "comparisons are plagued with selection issues, the most obvious one being the assumption that group affiliation is exogenous." Several methods have been proposed to address the selection issue but none of them can be applied to studies of new firms. For example, some research studies use a firm's idiosyncratic risk as the instrument (Himmerlberg et al., 1999; Villalonga and Amit, 2006; Masulis et al., 2011). Unfortunately, this could only be applied to public firms that have available market price. New firms tend to be dominated by private firms. Alternatively, leveraging the exogenous change of inter-corporate tax policy is appealing (Morck, 2005; Sautner and Villalonga, 2010). Nevertheless, there are three barriers to applying it in my setting. First, there is the limited variation of tax policy, in particular the inter-corporate dividend tax, during the same period in Europe. Second, the change of inter-corporate policy may take a long time to affect a firm's ownership structure (Kandel et al., 2013). Third, new firms are less sensitive to the change of these tax policies as they rarely generate dividends during their early years. Spin-offs from business groups are biased towards more established firms. Therefore, neither inter-corporate dividend tax nor capital gain tax has a strong effect on the new firm's affiliation

status. In fact, in-sample investigation shows that variations of inter-corporate tax rates are weakly correlated with one specific new firm's affiliation decision, after controlling for other firm level characteristics.

Second, the two mechanisms proposed extend the discussion of business group affiliation benefits. The expansion of revenue and market shares are consistent with the operating benefits of group affiliation. An improvement of labor quality is related to both the direct managerial support from business groups and the internal labor market created by the business groups. Third, my research findings are related to the research on corporate venture capitalists (CVC). Ivanov and Xie (2010) emphasize that the positive role of CVCs lies on a strategic fit between new firms and the parent companies of CVCs. This is consistent with my finding that operating synergies are a major part of affiliation benefits during the early years.

1.2 Methodology

In this section, I first discuss the group construction procedure. Then I propose the quasi-experimental setting used to establish causal link. Finally, I describe major specifications used.

1.2.1 Identification of business groups

I use a similar method as Almeida et al. (2011) to identify business groups, based on inter-corporate ownership links.[8] This method takes into account all of the ownership links among

[8]While each firm (including every corporate shareholder) has a unique BvD identification number in the database, individual shareholders can only be identified by name. Therefore, I only focus on inter-corporate ownership links to precisely construct business groups. As a result, all of the ultimate owners are firms instead of individual investors.

group members. Business groups are identified in two steps: firms are assigned to different clusters; further restrictions are imposed to qualify clusters as business groups. Specifically, for a pre-selected cutoff value α, firms are identified as either one of the following two types:

1. Ultimate owner of a cluster. This kind of firm does not have any corporate shareholder with ownership stakes more than α. Each ultimate owner k belongs to a different cluster C_k.

2. Cluster member. A cluster C_k is defined as a biggest-possible fixed point:

$$C_k(\alpha) = \{i : \sum_{j \in C_k(\alpha), j \neq i} s_{ji} \geqslant \alpha\}$$
$$\nexists C_m(\alpha) : C_k(\alpha) \subset C_m(\alpha), \forall m$$
$$C_m(\alpha) \cap C_n(\alpha) = \emptyset, \forall m, n$$

   where s_{ji} is the ownership stakes of shareholder j in firm i. That is, a firm i is a member of cluster C_k as long as the sum of stakes from all other cluster members, including the ultimate owner, exceeds the threshold value α. The cluster also has to be the biggest possible one so that no other clusters could fully contain it. Last but not least, clusters are mutually exclusive.[9]

Business groups are defined as clusters with more than five firms and non-PE ultimate owner. The former criterion ensures that there are enough members in each group. The latter one ensures that group effects are not driven by portfolio companies of independent VCs. Major results in this chapter are based on $\alpha = 30\%$. Clusters are constructed through iterations.

[9] Appendix A.1 shows an example of cluster construction.

1.2.2 Quasi-experimental Setting

To establish causal link between group affiliation and profitability, it is crucial that firms exogeneously change the group affiliation status. Simple comparison of group versus non-group firms may be intuitive. Nevertheless, instead of being random, selection into (and out of) a group is generally determined on both observable and unobservable variables. Therefore, it is inappropriate to attribute any difference based on simple comparison to merely a distinct affiliation status (Khanna and Yafeh, 2007). Alternatively, comparisons of profitability before and after group affiliation only partially address this issue, by controlling for time-invariant firm characteristics. The difference based on comparison may still be driven by other time-variate variables. In a nutshell, in the setting to investigate causal effect, the selection of group affiliation cannot be correlated with any other variables besides controlled characteristics.

In this chapter, I propose a quasi-experimental setting where the change of affiliation status is unintentional. In this setting, none of the parent shareholders change their stake in the new firm. The change in group status is due to ownership changes at least two levels away in the ownership chain. For example, when a group acquires the parent company without changing its stake in its subsidiary, the subsidiary joins the group unintentionally. The acquisition decision is less likely to be driven by characteristics of the subsidiary. In fact, if the characteristic of a firm affects the decision of acquisition, changing ownership through its parent shareholder is weakly dominated by changing the ownership stake in it directly. Generally, the ownership change may occur well above the parent level, e.g., firms owning the parent firm may be acquired by the business group.

To be precise, a firm experiences an unintentional status change if:

1. There is an affiliation status change. The firm either joins a group or leaves a group;

2. None of its first layer parent shareholders change their stake in the firm;

3. Neither the firm nor any layer of subsidiary change its stake in its subsidiary.

The common trade-off between causality identification and local effect also applies in my setting. Since the definition of unintentional change implicitly requires that new firms already have at least one parent firm, estimation results are based on non-stand-alone firms. Essentially, I push the selection issue between the parent firm and the new firm back to the beginning of the sample. An example is presented in Appendix A.2 to clarify the definition.

1.2.3 Main Specifications

I use the above quasi-experimental setting to do a difference-in-difference analysis. Since both joining a group and leaving a group suffer the selection problem, I first split the sample into these two parts to make the inference econometrically feasible. For each part, I keep the firm in the sample up to one (unintentional) group status change.[10] Effects of joining a group are referred as group affiliation effects, while effects of leaving a group are referred as group detachment effects. Then I carry out the difference-in-differences analysis in two settings.

The first setting is based on the non-parametric comparison between the treatment sample and control sample.[11] For each firm that unintentionally joins (leaves) a business group, I find a control sample of firms which never (always) belong to a business group. This set of firms is matched exactly on the incorporation country, industry, year, age and legal form.[12] Besides,

[10]Major analysis through the chapter requires this change to be unintentional. To investigate the selection issues, I also release this requirement for a general change in section 1.4.2.

[11]Following the experimental terminology, I call firms that experience group status change "treatment sample", while the set of matched firms "control sample".

[12]I implement the exact matching using the STATA command "psmatch2" of Egger et al. (2003). Results

since any new firm with parent shareholder(s) is a candidate for unintentional change, the matched firms are further required to have at least one parent shareholder. I then calculate the average change of profitability before and after unintentionally joining (leaving) business groups, and repeat the calculation for the control sample. Finally I compare the difference in changes across two samples.

The second setting is an OLS multivariate regression model on a panel of firm level observations. The panel data helps control time-invariant observations. I run following regressions:

$$DepenVar_{it} = \alpha + \beta \cdot GroupDummy_{it} + \lambda' FirmControls_{i,t-1} + \delta_{ct} + \mu_i + \epsilon_{it} \qquad (1.1)$$

where *GroupDummy* is a binary variable taking value 1 if firm i belongs to a group at year t, and 0 otherwise; *FirmControls* are one year lagged firm level variables; δ_{ct} is the country by year fixed effect; μ_i is the firm fixed effect; and ε_{it} is the error term. My measure of reported profitability, which captures a new firm's ability to generate pledgeable cash flows, is operating income before interest, taxes, depreciation, and amortization scaled by the lagged total assets ($EBITDA/Total\ Assets_{t-1}$). I control for a set of firm level characteristics correlated with the acquisition decision, including firm size (*ln of Total Assets*), leverage ratio, tangibility (tangible asset scaled by total assets), age, and legal incorporation form.[13] A positive coefficient β indicates that the dependent variable is bigger when the firm is in the group.

I run this specification on three different sub-samples. The first sub-sample includes firms

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are based on 7 nearest neighbor matching, and robust to 5 or 10 nearest neighbor matching.

[13]Since these control variables are not available for all firms in the sample, I imputed a value equal to country-industry-year average to the missing observations and also included dummies for each variable that equals one if the observation had been imputed. In this way, I do not lose observations, but can include the controls. The results are similar if I do not impute the missing observations.

originally non-group (group) affiliated, but eventually join (leave) a group. Because entries to (exits from) groups are staggered, these firms are both control and treatment firms. For a firm that joins (leaves) a group, the control category includes non-group (group) firms which would eventually become group (non-group) firms. The second sub-sample adds firms that are never (always) group affiliated to the first sub-sample. Since any new firms with corporate parent shareholder(s) are candidates for the unintentional change, I introduce a dummy variable $LagParentInd$ to indicate whether the firm has at least one corporate shareholder one year before (taking value 1) or not (taking value 0). The third sub-sample further adds firms always (never) belonging to groups. Adding the latter two sub-samples only indirectly affects the identification of β through estimations of other coefficients.

1.3 Data

1.3.1 Data source

I use the Bureau Van Dijk (BvD) Amadeus database that contains data on private and public companies spanning all industries in 42 European countries. BvD collects data from different vendors across European countries. The data vendor of each country collects data from firms' filings. Public companies are required to file accounts, while private company's filing may not be obligatory, depending on the incorporation country, legal form and size.[14] Although the coverage is not comprehensive due to filing requirements, in the 24 countries used, it is comparable to and representative of the population of firms reported in aggregate data by the European CommissionArellano et al. (2012).[15]

[14]Detailed country level criteria are available in Table 12 of Klapper et al. (2006).

[15]According to Egger et al. (2013b), specifically to French data, Farid Toubal provided evidence on this on the occasion of a discussion of Egger et al. (2013a), at the "Globalization and Labor Market Outcomes:

The advantage of Amadeus is that it covers young private firms, and contains detailed ownership and accounting data. There are four major categories of data used in this chapter: ownership information, profile information, top manager information,[16] and accounting information. For each firm, the ownership information includes shareholder names, ownership stakes, and shareholder types for both corporate shareholders and individual shareholders. Profile information has the firm's name, incorporation date, and industry classification. Accounting data reports 50 items from the standard balance sheet and income statement. And manager information contains each top manager's name, function and date of birth.

All four categories are linked through a unique BvD identification number for each firm. A company appears in Amadeus as long as its filing is available. And it is kept in the database up to four years after its last filing. For the first three categories, each update of Amadeus reports the most recent information. For accounting information, only the most recent ten years' data is contained. To construct a set of panel data and overcome the survival bias, I use ten Amadeus DVD updates: June 2000 (the first Amadeus DVD produced), June 2001, June 2002, June 2003, June 2004, June 2005, June 2006, June 2007, June 2008, and June 2009. The resulting panel data gives a unique breadth of cross-sectional coverage since Amadeus started to collect information (1995) to 2008.

1.3.2 Sample construction

The sample construction includes three steps: identification of business groups, identification of new firms, and merging with other information. Since Amadeus significantly expanded coverage in 1998, I focus on observations from 1999 to 2008.

Recent Advance" conference at Banque de France on May 16-17, 2013.

[16]Top managers are identified as managers with positions of "CEO", "Chief Manager", "Chief Executive Officer", "Person In Charge", "Firm Manager", "Managing Director", and "President".

Business groups are identified based on all available inter-corporate ownership links available in Amadeus during the sample period (42 countries and 9.6 million links). I take into account a cross-border link even though the shareholder is in a country that is excluded from the sample later. This aims to more precisely identify business groups, as cross-border links are common among European firms.

To have enough observations for panel analysis, I identify new firms as those with ages 1-6 years old. This also takes into account that new firms may take 1 or 2 years after incorporation to reach the threshold of filing financial statements, and therefore appear in the Amadeus database. Since the major profitability measure uses lagged assets to scale the profit, for each firm there are up to five observations in the sample.

Starting with all of the new firms with available ownership information, I further impose the following criteria: First, I exclude the countries of the former Republic of Yugoslavia (Bosnia-Herzegovina, Croatia, former Yugoslav Republic of Macedonia, Federal Republic of Yugoslavia, Serbia, and Montenegro), which were at war during the sample period and where company identification numbers changed frequently. Second, I exclude Cyprus, Liechtenstein, Moldova, Malta, Slovenia, and Slovakia, which have a very small number of new firms covered (less than 50 firms annually). Third, similar to Bena and Ortiz-Molina (2013), I exclude Sweden and the Netherlands, which have incomplete information for small firms. Fourth, I exclude Belarus, since it did't enter the Amadeus database until 2006. Fifth, I exclude Lithuania where the profitability measure is not available. Finally, I further exclude the Ukraine and Russia where group affiliated firms tend to be dominated by state-owned enterprises. These restrictions exclude 264,706 firms over ten years (6.05% of total new firms identified). At last I merge unconsolidated financial information and top manager information. The final sample includes 1,048,782 firms and 2,059,688 observations.

1.3.3 Summary statistics

Table 3.1 and Table 3.2 report the summary statistics of major variables used. They display three general patterns: the sample has a good coverage of new firms; new firms are very small; and there are significant differences between group firms and non-group firms. To better understand the difference across group status, I decompose the sample into three sub-samples: always group firms, always non-group firms and firms ever change group status. All variables are winsorized at the 1% level.

[Insert Table 3.1 here] [Insert Table 3.2 here]

Statistics in Table 3.1 and Table 3.2 show that firms enter the sample at a young age. On average, a firm enters into the sample between the second and third year. Firms that ever change their group status, which are key to the identification, enter the sample even earlier. The average age is about three, equal to the mid-range of the sample. The unreported median level of age shows an even younger profile.

A great portion of new firms are very small. The average total assets are only 2.96 million, and the average revenue is 10.24 million. Additionally, new firms hire less people, on average with 21 employees. At last, new firms have limited market share in their industry, indicated by the mean at 0.72‰. Unreported medians show even smaller magnitudes and suggest the sample is skewed to smaller firms.

There are also significant differences between group firms and non-group firms. Group firms are bigger but less profitable. Across the three measures, *Total Assets*, *Fixed Assets* and *Revenue*, group firms are more than ten times bigger than non-group firms. They also have seven times more employees. Nevertheless, they are ten times less profitable, measured either by $EBITDA/Total\ Asset_{t-1}$ or $EBIT/Total\ Asset_{t-1}$. Group firms not only generate less revenue per unit of asset, but also have a lower gross profit margin. The differences between group and non-group firms are also extended to other measures, such as revenue,

wage, and labor productivity.

The above differences confirm that group firms are fundamentally different from non-group firms. Group firms require more investment but have less pledgeable cash flow (Almeida and Wolfenzon, 2006). The differences also suggest that a simple comparison of group firms versus non-group firms is inappropriate to document the group affiliation effect.

1.4 Results

1.4.1 Group affiliation improves profitability

As a benchmark for the effect of business group affiliation on profitability, I start by investigating the difference-in-differences for firms unintentionally joining (leaving) business groups based on nonparametric matching. Table 3.3 presents the results. It shows that compared to control sample, unintentionally joining business groups significantly improves firm's profitability (Panel A), while unintentionally leaving business groups (Panel B) has an insignificant effect. Panel A, Column I reports the average profitability two years before unintentionally joining groups. It indicates that forthcoming group members, though less profitable compared to general new firms, are not significantly different from their matched firms ex-ante. Column II reports the average profitability two years after joining groups, and Column III reports the difference between the first two columns. Based on the difference, profitability of forthcoming group members would increase by 0.028 (17.33% compared to the sample average) after joining groups. Since common shocks (in the level of country, industry, year, age and etc.) may affect profitability, it is inappropriate to attribute the whole difference to group affiliation change. The control sample serves to ferry out those common shocks. After taking out the same change for the control sample, the difference-in-differences

statistic (based on mean) in the third column indicates that joining a group leads to 0.018 increase in profitability, which is both statistically significant at 1% level and economically significant (11.14% compared to the sample average). The significant difference across two samples is further confirmed by the Mann–Whitney statistic. Panel B repeats the test for firms unintentionally leaving business groups. Although previous group members also on average experience an increase in profitability after leaving the group, group detachment insignificantly contributes to the change.

Figure 3.1 visualizes the difference-in-differences setting and confirms the findings from Table 3.3. It shows that the average profitability level from two years before to two years after firms joining business groups. The solid line, indicating firms unintentionally joining business groups, ascends in a bigger magnitude compared to the dashed line, indicating firms in the matched sample. Additionally, the increasing trend is not reverting after two years.

[Insert Figure 3.1 here]

Table 3.4 further confirms the significant effect of group affiliation (Panel A) and insignificant effect of group detachment (Panel B) in a regression setting using specification 1.1. Panel A, Column I shows that joining a group leads to 0.015 (9.47%) increase in profitability compared to the base category, which includes firms not belonging to a group but would join groups later. Column II adds firm level control variables and shows that the group affiliation effect is in similar magnitude (7.68%). Column III and Column IV repeat the tests by adding firms always non-group affiliated into the base category. Column V and VI further add firms always group affiliated into the sample. Through all of the specifications and samples, group affiliation effects are significant, varying from 0.018 (10.83%) to 0.022 (13.37%). Panel B reports the set of results for firms leaving business group. Across specifications, group detachment effects are insignificant. It is partially due to limited observations, as fewer firms leave groups within the first six years. In a nutshell, results in Table 3.4 indicate that the

positive effect of group affiliation on profitability is significant and robust.

1.4.2 Tests of identification strategy

In this section, I first show that selection creates bias in the estimated group effect. Then I provide evidence that the quasi-experimental setting is appropriate to correct the bias.

Selection issues are against group effects

To capture the effect of selection on estimates, I repeat tests in Table 3.4 in a general setting, where selection into (out of) groups is not necessary to be unintentional. Firms are kept in the sample up to one group affiliation change, regardless of being unintentional or not. In this setting, *GroupDummy* may be correlated with the error term in specification 1.1. This would create a bias in the estimate for the coefficient of *GroupDummy*.

Table 3.5 reports results in this general setting. Compared to Table 3.4, group affiliation effect is downward biased (Panel A), while group detachment is upward biased (Panel B). In Panel A, estimates of group affiliation effects are smaller across different specifications, compared to Table 3.4, Panel A. This indicates that selection is against group affiliation. Controlling for other variables, less profitable firms are selected into business groups. Therefore we would under-estimate the group affiliation effect, without appropriately addressing the selection issue. In Panel B, estimates of group detachment are bigger and more significant compared to estimates in Table 3.4, Panel B. This indicates that leaving groups is correlated with an increase in profitability. But this is due to the fact that more profitable firms are spun off from business groups.

The adverse selection I find is both intuitive and consistent with previous research. Intuitively, more profitable firms would prefer to be standalone, while less profitable firms may sacrifice self-control for group affiliation benefits. It also confirms the proposition that

simple comparison between group versus non-group firms would lead to an underestimate of the group affiliation effect (Masulis et al., 2011; Bena and Ortiz-Molina, 2013). Theoretically, The direction of selection is jointly determined by supply of investment opportunities and demand from investors. Gompers and Lerner (2000) shows that money is chasing for limited good opportunity among new firms. Therefore entrepreneurs have more bargaining power than investors. Consequently, on average, less profitable firms are acquired by business groups.

To sum up, selection issue is severe for group status change. It is critical to remedy it for unbiased estimates. The quasi-experimental setting aims to address this issue. I will provide evidence to justify the setting in the next section.

Unintentional group status change is exogenous

The causal link presented above lies on the validity of the quasi-experimental setting. It assumes that unintentional selection into (out of) groups is exogenous to other omitted variables, either observable or unobservable to econometrician. Although this assumption cannot be directly tested, I provide two sets of tests to support this assumption.

The first set of tests investigates the observable difference between forthcoming (previous) group members and other candidates for the unintentional change, right before the former join (leave) business groups. Table 3.3, Column I already shows that the average profitability of forthcoming (previous) group members is not significantly different from that of other new firms with same matching criteria. I further investigate the difference by running following regression:

$$DepenVar_{it} = \alpha + \beta \cdot TreatSample_{it} + \lambda' FirmControls_{it} + \delta_{ct} + \mu_i + \epsilon_{it} \tag{1.2}$$

on all non-group (group affiliated) firms with parent shareholder. $TreatSample$ is a binary dummy variable. It equals to 1 if the firm indirectly joins (leaves) the group in the following year, and 0 otherwise. The coefficient of $TreatSample$ captures the difference between the treatment sample and control sample ex-ante. I focus on the difference in revenue, profitability, sales growth, total asset growth and number of employees.

Table 3.6 and Table 3.7 report the estimation results for non-group firms with corporate shareholder(s) and group affiliated firms respectively. Through the two tables, $TreatSample$ dummy is insignificant. That is to say, controlling for firms' observable characteristics, firms unintentionally joining (leaving) business groups are similar to other non-group (group) firms with parent shareholder ex-ante.

The second set of tests provides evidence to falsify the counter-argument of the unintentional assumption. In particular, I check whether the group affiliation (detachment) effect varies by the importance of new firms. If the unintentional group change is endogenous, subsidiary new firms would affect acquisition decision of the parent firms, even after controlling for observable characteristics. The more important of the new firm, the higher weight it takes. Therefore, the group affiliation (detachment) effect should be stronger for more important new firms.

I use two measures to capture the importance: the relative size of a new firm to the group, and the average relative size to its parent group shareholders. I use total assets as the proxy for size. I introduce a binary dummy variable to indicate whether the relative size is higher than the median level (taking value 1) or not (taking value 0). Then I include the cross term between $GroupDummy$ and the dummy into the regression. The coefficient of this cross term indicates additional group affiliation (detachment) effect for important new firms.

Table 3.8 shows that group affiliation effect, rather strengthens, actually weakens for more

important firm. Panel A shows that new firms are small relative to the forthcoming business groups and first layer parent shareholder. The average relative size to the group is 11.41% and the median level is 6%. The average relative size to the first layer parent shareholders is 25.9% and the median level is 17%. Panel B indicates that the group affiliation effect is almost completely driven by less important firms. For a new firm indirectly joining a group, profitability may increase by up to 0.041 (25.07%) if its relative size to the group is lower than sample median. While there is barely no effect on the profitability for firms with relative size higher than median. Similar pattern exists when the relative size to the parent shareholders are used.

Regarding to the group detachment, Table 3.9 shows that the insignificant effect does not vary by the relative importance of new firms. Again, this may be attributed to the fewer observations in the sample.

Results in Table 3.8 and Table 3.9 contradict the endogeneity argument. Unreported tables deliver similar results when revenue is used as the proxy for size. They all indicate that unintentional changing group status satisfy the identification assumption. The quasi-experimental setting is valid to establish causal link.

Since group detachment has an insignificant effect, following discussions would focus on group affiliation effect. Results of group detachment are available upon request.

1.5 Mechanisms

In this section, I present two major mechanisms contributing to the the increase in profitability: revenue increase and market share expansion; and labor quality improvement.

1.5.1 Revenue increase and market share expansion

Within the short period after joining business groups, the most significant change is the fast growth in revenue. This growth is mainly driven by the quantity instead of the pricing power, evidenced by the expansion in market share and unchanged gross profit margin.

Table 3.10 presents the change of revenue (scaled by the lagged total assets), gross profit margin, gross profit (scaled by the lagged total asset) and the market share upon group affiliation. The first two columns show that scaled revenue increases by 5%. Since there is insignificant change in the gross profit margin, as the next two columns show, the increase in revenue almost completely translates to the increase in gross profit (5.4%), evidenced by the significant magnitude in the fifth and sixth column. The 5.4% increase in gross profit margin accounts for 44% of the increase in profitability documented earlier. In the last two columns, I checked the market share of new firms, which is the new firm's revenue relative to the total revenue generated in the same country, year and industry. Results show that on average new firm's market increase by 14%.

If the new firm leverage on the marketing network of the business group, affiliation with a more powerful group would strengthen the above effects. This is in the same spirit of Hochberg et al. (2007)'s finding about VC firms. Table 3.11 investigate this projection by introducing the group's market share. It is calculated as the sum of revenue generated by group members in the same country and industry, over the total revenue in the respective country and industry. Panel A reports the summary statistics of the group market share. On average, the business group has a market share nine times of the new firm. Specifications in Panel B add an interaction term between the *GroupDummy* and a dummy variable in the specification. The dummy variable indicate whether the group's market share lies in the top quartile. Results show that joining a group with a top quartile market share would double the group affiliation effect on the revenue, gross profit and the market share.

Given that revenue growth is the first order effect of group affiliation, we would expect the increase in profitability is more significant in a revenue oriented sector. Table 3.10 Column V confirms this projection by focusing on retail and wholesale trade industry. Compared to results in Table 3.4 Panel A, the magnitudes of group affiliation effect are 60% higher across specifications.

1.5.2 Labor quality improves

Another important mechanism is that new firms' labor quality improves upon group affiliation. It is reflected in both the top manager level and average employee level.

Top manager turnover and increase in experience

Results in this section show that joining a business group triggers a greater chance of management turnover; a large portion of new top managers comes from other group members; and on average managers become more experienced afterward.

Table 3.12 presents the cumulative top manager turnover ratio up to three years after joining business groups. Panel A shows results for unintentional group affiliation. One year after unintentionally joining groups, 13.25% of firms experience at least one manager turnover. The ratio doubles the sample average (5.76%) and further increases to 19.56% within three years after joining business groups. The cumulative percentage of new managers displays a similar patter, gradually increasing from 9.30% to 14.69% within the three years.

It is noteworthy that business group consistently supply a great portion of new managers. More than 28% of new managers are from other firms within the same business group. This ratio is stable regardless of the year turnover happened.

Results in Panel A carry over to Panel B where joining a group is either unintentional or not. Compared to firms directly acquired by business groups, firms unintentionally joining

a group may be less visible to group owners. Therefore, explicit reforms, such as manager turnover, may lag behind and occur less frequently. Consistent with the intuition, magnitudes are bigger across different measures in Panel B. Again, business groups are an important source of new managers.

The difference-in-differences results in Table 3.13 shows that there are significant changes of new manager ratio and average management experience, compared to the control sample. Matching criteria are same as those used in Table 3.3. Panel A confirms that proportion of new managers significantly increase by 0.022 (53.1% of sample mean) after joining a business group. Panel B investigate the average manager experience, which is measured as the total tenure as top managers across all of the positions. Average change of experience is about three years higher (26.1% of sample mean) compared to the control sample. Panel C focuses on the experience within the same industry. The change of 2.979 years is still both statistically significant and economically significant (27.7% of sample mean).

Results in Table 3.14 confirm the above findings in a regression setting. To capture any lagged turnover after the event year, I use cumulative number of new managers. The first two columns show that group affiliations leads to more than 0.082 (58% of sample mean) increase in this number. It suggest that there are significant turnovers triggered by group affiliation. The following four columns investigate top manager experience. On average, manager's total tenure increases by 2.2 years (24.2% of sample mean), and same-industry tenure increases by 2 years (24.2% of sample mean).

More productive employees

Besides the top manager, another part of the labor force is other employees. Active monitoring from business groups may also involve replacements of underperformed employees, more professional training, and more effective incentive package. Although I do not directly

observe this change, I investigate the realized productivity of employees, measured by revenue generated per employee, profit generated per employee, and the logarithm of marginal productivity of labor as (Larrain and Stumpner, 2013) for manufacturing firms.[17]

Table 3.15 shows that the average productivity of employees significantly increases across three measures. Compared to the sample average, revenue generated per employee increases by 13%, profit generated per employee increases by 17%, and marginal productivity of labor increases by 7% in the manufacturing sector.

To better understand the change, I further investigate another three labor related measures in Table 3.16: number of employees, average yearly wage, and ratio of wage expense against total revenue. Results show that group affiliation leads to slightly more employment and higher wage per person. Also, more revenue are generate by per dollar of wage. Results in Table 3.15 and Table 3.16 signal a more effective incentive pay: on average employees get higher wage, while they are better motivated to generate even higher revenue and deliver a higher profit.

1.6 Robustness Check

My major results about profitability in previous section are robust to alternative sample compositions, alternative group measures (definitions), estimation horizon, industry trends, alternative profitability measure, and other concerns.

[17]It is inappropriate to model productivity based on neoclassical production function outside manufacturing sector.

1.6.1 Robust to the sample composition and survival bias

One concern is that above results may be based on a biased sample. Generally there are three potential channels contributing to this bias. First, filing criteria vary by countries and time. Under-performed firms may drop off from the sample due to more stringent criteria. Second, data providers in different countries may have agency problem in collecting firms' filings. If it requires more effort to collect information of under-performed firms, better-performed firms are more likely to be included. This concern is severer when filing is not obligatory. Third, if firms ever change group status have a higher failure rate during the first six years, the remaining treatment sample would come from the upper tail of the population distribution of all firms. Thus, long-lived firms occupy the sample.

To address the first two concerns, I first exclude countries ever change filing criteria (Switzerland, Italy) during the sample period, and report the results in Table A.4. Then I only focus on countries where all public and private limited companies are required to file statement (exclude Bulgaria, Finland, and Poland). Results are reported in Table A.5. In both tables, group affiliation effects are similar to the results based on the whole sample. In unreported tables, I repeat estimations by excluding one country each time and find similar results.

The third issue has already been partially addressed, as regressions based only on firms ever change group status generate similar results. To directly investigate it, I check the survival duration of all three samples: always group firms, always non-group firms, and firms ever change group status. I find no significant difference in the survival probability among these three sub-samples.

1.6.2 Robust to alternative group measure and definitions

Through out the chapter, I use a binary dummy variable indicating group affiliation. This only picks up the average homogenous group effect, regardless of the bonding strength among group members. In this section, I show that since new firms are closely owned by groups, using binary dummy is appropriate. The same set of test also shows that results are robust to alternative group definitions.

I ran three sets of tests in total. First, I find results are not sensitive to the number of group members. Second, I replace the $GroupDummy$ with the total group stakes $GroupTotal$ (between 0.3 and 1) in the specification 1.1. Table 3.17, Panel A reports the summary statistics of the group stake, and Panel B presents results of regressions. The total group stake is highly skewed to 1 when new firms belong to groups. Therefore the continuous measure deliver a similar results as the binary dummy. Third, I change the ownership stake cutoff value α from 15% to 50% and construct business groups respectively. Table 3.18 presents the result and shows robust results across different definitions. Again, this is due to the high total group stakes in the new firm. Therefore a small cutoff value of α is not binding for most of the new firms.

1.6.3 Group affiliation effect is beyond the event year

Another concern is that the profitability measure may be tarnished around the group status change. On the one hand, acquisition of parent shareholders may be associated with recognition or write-off of total assets. The denominator of my profitability measure may change due to its parent shareholder's ownership change. On the other hand, private firms profit may suffer from manipulation. To address this concern, I did two sets of tests.

First, I carry out an event study around group status change. In Table 3.19, I replace the

GroupDummy with dummies indicating the year since firms unintentionally join business groups. Because in total up to five year observations are available, four dummies are generated indicating the event year to three years after group affiliation ($t+3$). Not only dummies indicating the event years are significant, but also dummies indicating further years after the affiliation. Results show that group affiliation effect is not restricted to the event year, but extends to two years after.

Second, in unreported results, I exclude event year observations from the regressions and still find a significant group affiliation effect.

1.6.4 Robust to industry trends

In the specification 1.1, the country by year fixed effects should absorb any policy variations and trends at the country level. To further control variations in the industry level, I replace it with country-industry-year fixed effects, and report the results in Table 3.20. Magnitudes of group affiliation effects are similar to those in Table 3.20.

1.6.5 Other robustness check

I would describe other robustness check I did. Firstly, I use an alternative measure of profitability, EBIT (earnings before interest and tax) scaled by lagged total assets, and reports the result in Table 3.21. Second, I only keep firms with at least three-year consecutive observations in the sample. Third, I add parent shareholder characteristics as control variables in the specifications. Results are robust across different specifications.

1.7 Conclusion

Motivated by the widespread role of business groups in sponsoring new firms, this chapter aims to establish causal link between group affiliation and new firms' profitability. Using a comprehensive database of financial and ownership information for firms in 24 European countries, I find that group affiliation leads to 12% increase in the profitability, based on a quasi-experimental setting where firms change group status unintentionally. Further investigations show two major mechanisms contributing to the improvement in profitability. Possibly leveraging the marketing networks of group members, new firms quickly expand revenue and market share in the industry. They also gain more experienced managers and productive employees upon joining groups.

Results of this chapter suggest that business groups parallel the role of venture capital firms in sponsoring new firms in Europe. Business groups not only provide financing by directly investing in new firms, but also cultivating the new firms by sharing operation synergy and promoting labor force productivity. The results are consistent with a Coasian view on firm organization form. As mentioned in Morck (2003),"in an economy with weak institutional support for markets, business groups may be desirable as an optimal 'second best' approach to organizing economic activity in the sense of Coase (1937) and Williamson (1973)."

Consistent with this view, my findings shed light on the lagged development of VC in Europe (Hall and Lerner, 2010). Due to less maturity and a smaller network, European VCs are thought to provide limited benefit to new firms. Raising the âĂIJabilityâĂİ (Bottazzi and Da Rin, 2002) or power of VCs might be urgently needed. Meanwhile, it is an open question whether VCs or group affiliation are a better instrument to foster growth of new firms.

The results in this chapter may also suggest a positive role of conglomerates in cultivating new firms. As the counterpart of business groups in the U.S., conglomerates consist of fully owned subsidiaries instead of legally independent firms. Public information of subsidiaries is not widely available, and as a result there is limited research on the subsidiary level. Although the differences in legal status may lead to different affiliation effects in other dimensions,[18] the independent status is not crucial in this chapter. In fact, since new firms are closely owned by the group members, the positive effect of group affiliation is expected to carry forward to new firms in conglomerates.

For future research, an interesting starting point is to study the incentive and effect of group affiliation from the perspective of business groups. Black and Gilson (1998) attributes the success of venture capital in US to the implicit contract over future control, that is permitted by the availability of exit through an IPO. Compared to its counterpart in the U.S., venture capital is much less active in Europe (Hall and Lerner, 2010). There are also less IPO opportunities in Europe. Results in this chapter show that entrepreneurs may benefit from group affiliation other than IPO. Further investigation may focus on the implicit contract between business groups and entrepreneurs.

[18] e.g. Belenzon and Berkovitz (2010) document a positive effect of group affiliation on innovation, while Seru (2014) finds that conglomerates stifle innovation.

Chapter 2

Competition and Private Benefits of Control

Maria Guadalupe, Francisco Perez-Gonzalez, and Fangzhou Shi

2.1 Introduction

A widespread view in finance and economics is that competition improves efficiency. Yet, this disciplining force is often overlooked in the corporate governance literature.[1] A common argument for the importance of competition is natural selection. Competition, it is argued, would tend to drive inefficient firms out of the market (Alchian, 1950; Stigler, 1958). This threat, according to Shleifer and Vishny (1997), is "probably the most powerful force towards economic efficiency in the world." While these arguments are appealing, the theoretical foundations for the link between competition and corporate governance have been difficult to establish.[2] For example, in their seminal paper, Jensen and Meckling (1976) argue that firms would tend to face identical agency costs irrespective of competitive pressures in the market place.

Empirically, it has also been challenging to document the impact of competition because both the intensity of competition and the quality of governance arrangements are difficult to measure. Endogenously determined industry characteristics, such as concentration ratios may result from intensive competitive pressures rather than from competitive slack (Demsetz, 1973; Baumol, 1982). Consistent with this concern, recent industry trends provide stark examples where concentration-based indexes, such as the Herfindahl-Hirschman Index (HHI), do not reflect the intensity of competition in the cross-section or over time.[3] As a result, these indexes are difficult to interpret as direct measures of competition (Demsetz, 1973;

[1]See Shleifer and Vishny (1997); Becht et al. (2003). Notable exceptions include Morck et al. (1998), Dyck and Zingales (2004), and, more recently, Giroud and Mueller (2010).

[2]See Scharfstein (1988); Holmstrom and Tirole (1989); Hermalin (1992); Raith (2003); among others.

[3]For example, the general merchandise industry is highly concentrated around industry leaders, such as Wal-Mart and Target, and at the same time extremely competitive. Similarly, the textile products industry has more than doubled its HHI index in the last decade, while the industry has faced one of the most challenging competitive environments in history derived from foreign imports. Source: `http://www.census.gov/econ/concentration.html`.

Baumol, 1982).

In this chapter, we test for the effect of competition on governance using variation from two internationally comparable indexes of product and input market regulation developed by the Organization for Economic Cooperation and Development (OECD). The product market regulation (PMR) index tracks formal barriers to entrepreneurship, restrictions to foreign trade and investment, and direct state control of business activities at the country level (Conway et al., 2005). Product market regulations are the most direct restrictions affecting the extent to which a market is "contestable" (Baumol, 1982).

The regulatory impact (RI) index captures government restrictions affecting input markets. The focus on input regulations is a generalization of Rajan and Zingales (1998)'s idea that inputs are crucial catalysts for the process of creative destruction (Schumpeter, 1934). Intuitively, if input markets are subject to sharp regulatory barriers, competitive forces would tend to be weaker. Moreover, recent studies have shown a direct link between input deregulation and competition.[4] The four key inputs that the RI index tracks are: financial services, energy, transport and communications, and retail distribution. The restrictions include entry regulations, licenses, ownership barriers, pricing controls and quotas. The RI index weights input regulations by its input share per industry. As such, each industry has its own time-varying index.

We investigate the impact of competition on one measure of private benefits of control (PBC): the voting premium between shares with differential voting rights. The relative price of these dual-class shares has been widely used as a measure of the PBC enjoyed by controlling shareholders.[5] The logic for using this measure is that beyond the common

[4]See for example, Cetorelli and Strahan (2006); Bertrand et al. (2007); Francois and Wooton (2008).

[5]Lease et al. (1983); DeAngelo and DeAngelo (1985); Barkalay and Holderness (1989); Zingales (1994, 1995); Nenova (2003); Doidge (2004).

cash-flow rights, higher voting shares confer the ability to affect control contests. If control is valuable, the voting premium could be used to estimate the value of private benefits of control (Zingales, 1995).[6] Furthermore, the fact that the voting premium varies over time within firms allows us to control for firm unobserved heterogeneity.

To test for the effect of competition on the voting premium, we use data on dual-class firms from DATASTREAM, with matching competition information from the OECD. To identify dual-class firms, we follow Doidge (2004) in selecting firms with dual-class structures, between 1990 and 2008. On the whole, we use information on 866 dual-class firms in 16 countries.

Our empirical strategy has three important advantages relative to pre-existing studies linking competition and governance outcomes. First, it focuses on the key artificial impediments to competition that result from government regulation (Baumol, 1982). Second, these regulations follow government actions, which are more likely to be exogenous to individual firm decision-making, facilitating inference. Third, these regulations, along with the voting premium, vary over time, allowing us to provide sharper tests of the effects of competition on governance.[7]

Using these measures and data, we test for two crucial predictions of competition as a disciplinary force in the market (Stigler, 1963):

First, we assess whether competition reduces the level of inefficiency inside organizations. If competition were to improve governance outcomes, we would expect that increasing competition would lead to lower private benefits of control. In other words, with intense

[6]The value of a vote is also affected by the probability that a vote is marginal in a control contest. In the absence of adequate data to control for such probabilities, the bulk of the tests in this chapter examine within-firm changes in the voting premium, implicitly assuming that those probabilities are held constant.

[7]Pre-existing studies rely on time-invariant measures of competition, such as cross-country (Dyck and Zingales, 2004) or industry-wide measures (Giroud and Mueller, 2010).

competition the ability of insiders to redirect corporate resources (Jensen and Meckling, 1976; Zwiebel, 1995) and use inside information for personal gain (Dyck and Zingales, 2004) would decline. In consequence, if private benefits decline, we would expect the estimated voting premium to fall as competition increases.

Second, we investigate whether higher levels of competition lead to changes in the dispersion in the voting premia within countries and industries. A growing literature in economics has emphasized the importance of competition for explaining the degree of within industry dispersion in productivity (Bartelsman and Doms, 2000; Syverson, 2004a,b). Moreover, dispersion in outcomes is often identified as an important puzzle in organizational economics (Gibbons and Henderson, 2011). Competition may affect the level of dispersion in private benefits by disciplining incumbent firms or by forcing them to exit. Interestingly, the effect of competition on the dispersion of governance outcomes has not been studied in the literature. As a result this chapter provides, to the best of our knowledge, the first direct test linking competition and the dispersion of governance outcomes.

The main findings of the chapter are three.

First, higher levels of competition are correlated with statistically and economically lower estimates of private benefits of control. This result holds across countries, but most importantly, within countries, and holding other country variables constant. The economic magnitude of these estimates is substantial. For example, moving from Italy's level of product market competition to France's level in 2003 would lead to a reduction of 0.26 in the voting premium, or 31 percent of the standard deviation of private benefits.

Second, competition is crucial to understanding the dispersion in the estimated private benefits of control. Using quantile regressions, we first document that more than half of the overall dispersion in the voting premium is within country - i.e. not explained by country- or industry- fixed effects. More revealing, we find striking evidence that competition signifi-

cantly reduces the dispersion of private benefits, in particular, by reducing private benefits in the top quantiles of the PBC distribution.

Third, we exploit the panel dimension of the data to show that changes in the intensity of competition lead to lower estimates of private benefits of control, not only across countries and industries but also within firms. In terms of inference, this result is important because it provides the first direct test to date that changes in competition reduce the level of private benefits of control within firms.[8] This result implies that for PBC, firm turnover is not the only driver of efficiency following deregulation events, but rather that product market competition leads to a significant disciplinary effect on incumbent firms.

We also show that the negative relationship between competition and PBC is significantly larger in countries with weaker rule-of-law environments. That the average PBC estimate is lower for firms in high rule-of-law countries is not surprising given the existing literature (Nenova, 2003; Dyck and Zingales, 2004; Doidge, 2004). The fact that, conditional on a weak legal environment, competition is strongly correlated with lower PBC suggests that, competition can potentially reduce insiders' wasteful behavior. More broadly, the chapter contributes to the growing literature that seeks to understand the dispersion in the quality of governance, holding legal origin constant (La Porta et al., 1998). Previous studies have emphasized the importance of cross-listing for governance and firm outcomes (Coffee Jr (1998); Stulz (1999); Reese and Weisbach (2002); Doidge (2004); Hail and Leuz (2009), among others); the relevance of independent directors (Dahya et al., 2008), or foreign institutional investors (Gillan and Starks, 2003; Aggarwal et al., 2011), among other forces.

Taken together, the evidence highlights the importance of competition for the allocation of resources. The results provide empirical support for the idea that competition is a unique

[8]The closest related study is Giroud and Mueller (2010), which examines the effect of changes in the external governance environment (not changes in the intensity of competition), for firms in industries with high and low levels of industry concentration.

disciplinary force in the economy and one that has received scant attention in the governance literature. The focus on the dispersion of governance emphasizes that learning about the entire distribution of governance characteristics may be important both to unveil new empirical results and to provide sharper tests for existing theories linking competition and governance.

2.2 Empirical Strategy and Predictions

In this section, we briefly outline the main empirical specifications used and describe the main hypotheses linking competition and the level and dispersion of private benefits of control.

2.2.1 The Effect of Competition on the Level of Private Benefits of Control

The main challenge in testing for the effect of competition on governance is finding proxies for competition that are both conceptually relevant, and that vary over time.

Since Demsetz (1973), it has been widely understood that "outcome" measures of competition, such as concentration indexes, are difficult to interpret as measures of competition. In the absence of barriers to entry, "concentration of an industry's output in a few firms could only derive from their superiority in producing and marketing products."[9] Subsequent analysis has further echoed this critique (e.g. see Baumol (1982); Schmalensee (2007)). For example, the main conclusions of the "contestable markets" theory of competition are two. First, high concentration indexes may be "signs of virtue, not of vice" in a market. Second, artificial impediments to entry, such as those arising from government restrictions, are un-

[9]Demsetz (1973), p. 1.

desirable.[10] The corollary of these ideas is the analysis of competition should emphasize the actual barriers limiting entry and competition.

Recent studies provide empirical support to the idea that competition may be a crucial force in corporate governance. Dyck and Zingales (2004) show that country-level measures of product market competition are negatively correlated with the prices paid for controlling blocks, a common proxy for private benefits of control. Similarly, Giroud and Mueller (2010) document that industry-level competition may keep managers incentivized even after the passage of anti-takeover legislation. Specifically, they find that regulations that make takeovers difficult lead to higher costs, but only in concentrated industries. These studies, however, rely on measures of competition that are either endogenous or that do not change over time. As a result, they do not provide direct tests for the effect of changing competition on private benefits of control.

Dyck and Zingales (2004) use a survey-based measure of the level of competition across countries. Survey tools are attractive in that they can potentially assess the combined effect of regulations affecting entrants and antitrust policy constraining incumbents. Yet, they are based on subjective evaluations rather than objective measures of competition policy. Furthermore, in Dyck and Zingales (2004) the competition variable used does not vary over time. As a result, other cross-country variables may complicate inference. Similarly, the measure of PBC used in the chapter–the price paid for controlling blocks–is based on transactions that rarely occur more than once for a given firm. In consequence, the nature of such data makes it difficult to evaluate the within-firm effect of competition on the level of PBC.

Giroud and Mueller (2010) proxy competition using the Herfindahl-Hirschman index (HHI) of concentration across industries. As previously argued, the HHI index has important

[10] Baumol (1982), p. 14.

limitations as a measure of competition. Furthermore, the HHI index used in that paper is time-invariant. As a result, it is difficult to assess if the results reported capture the direct effect of competition or confounding effects that make optimal firm size relatively large. Finally, Giroud and Mueller (2010) do not directly test for the effect of changes in competition on their measures of managerial slack since the main focus of the study is on measuring the effects of changes in anti-takeover legislation on governance.

In this chapter, we focus on measures of the intensity of competition that are based on actual government regulations affecting product and input markets as motivated by theory. More specifically, we start by estimating the following specification:

$$PBC_{ist} = \alpha + \beta Comp_{st} + X'_{ist}\vartheta + d_c + d_t + \varepsilon_{ist} \tag{2.1}$$

where PBC_{ist} are private benefits of control for firm i, in industry s at time t, and $Comp_{st}$ is a proxy for competition at a given industry s and year t, and the variation in this variable reflects government restrictions to competition (the lower the restrictions, the higher the competition index). If competition disciplines firms, we expect to be negative and significant.

Country dummies d_c control for any permanent differences across countries that may affect the level of PBC. Time dummies or d_t are included to control for aggregate time trends. X'_{ist} is a vector of firm-level characteristics and country-level controls. The firm-level variables control for a set of firm characteristics, including firm size (ln of firm assets), growth opportunities (market to book ratio), and profitability (net income to sales). We also include two variables that may affect the voting premium directly: a measure of the relative liquidity of the high and low voting shares (measured as the ratio of the total number of firms traded in a year of each type of share); and the ratio of the dividends per share of the

high relative to the low voting rights security.[11] We will also allow for a set of variables to control for possible omitted time-varying country characteristics (GDP growth, the ratio of the market capitalization of traded securities to GDP, the ratio of foreign direct investment (FDI) to GDP, and unemployment). The potential cost of using these controls is that if time-varying firm and country controls are endogenous to changes in competition, then we cannot separately identify their impact on PBC. We do not include those time-varying characteristics in the main and preferred specifications. Yet, we show the robustness of the results to the inclusion of those variables.

It is well known that countries differ systematically in an array of ways, and country variation tends to be very important empirically (Doidge et al., 2007). La Porta et al. (1998), for example, documents important correlations between the degree of investors' legal protection and measures of corporate governance. Roe (2003), however, argues that such cross-country correlations may be driven by other non-legal institutions, such as, product market competition. The use of country fixed-effects allows us to empirically investigate whether competition affects the level and dispersion of private benefits of control, holding country-characteristics, such as their legal origin, antitrust laws or other important variables, constant.

Finally, to the extent that competition variables are measured imprecisely, the reported estimates are likely to suffer from attenuation bias.

[11] Since these control variables are not available for all firms in the sample, we imputed a value of zero to the missing observations and also included dummies for each variable that equals one if the observation had been imputed. In this way, we do not lose observations, but can include the controls. The results are similar if we do not impute the missing observations.

2.2.2 Competition and the Dispersion of Private Benefits of Control: Quantile Regressions

The effect of competition on the dispersion in governance has, thus far, remained unexplored in the literature. Such an omission is surprising for a number of reasons. First, if competition were to indeed discipline insiders, it would necessarily put a lower bound on the level of inefficiency (Stigler, 1963). Second, a number of recent studies have indeed shown that competition leads to lower dispersion in output. Syverson (2004a,b), for example, shows a wide dispersion in total factor productivity levels, particularly in less competitive markets. Third, and more generally, the focus on the entire distribution of private benefits–not only its mean–allows the econometrician to potentially uncover new facts and to provide sharper tests of alternative theories of competition and private benefits of control.[12]

We test for the effect of competition on the dispersion of private benefits of control using quantile regressions (Koenker and Bassett Jr, 1978; Koenker and Hallock, 2001). Quantile regressions are commonly used to characterize the entire conditional distribution of a dependent variable given a set of exogenous variables or, alternatively, as robustness tests. In the finance literature, however, its use is typically restricted to outlier tests.[13]

We use quantile regressions to investigate whether increases in the intensity of competition affect the level of private benefits differently for lower or upper quantiles of the PBC distribution, holding other covariates constant. As a result, we can determine (a) if dispersion is changing as the result of competition, and (b) which specific quantiles are driving

[12]The focus on the entire empirical distributions has grown over time in several fields of economics. In labor economics, for example, the focus on dispersion has been shown to be crucial in understanding the structure of wages (Chamberlain, 1994) or the evolution of income inequality (Piketty and Saez, 2003). For example, mean time series analysis fails to capture the drastic increase in inequality in the last 30 years: average incomes have remained virtually unchanged in the U.S. while the income shares of the top one percent of earners have increased dramatically (Piketty and Saez, 2003).

[13]See, for example, Gompers et al. (2003) and Almeida et al. (2004).

the changes in dispersion (i.e. higher or lower quantiles). This is in contrast to an ordinary least squares regression (OLS) that solely provides information on the effect of competition on the average level of private benefits. Formally, we estimate quantile regressions, at the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} quantiles (Q) of the PBC distribution:

$$PBC_{ist} = \alpha^{Q} + \beta^{Q} Comp_{st} + d_c^{Q} + d_t^{Q} + d_s^{Q} + \varepsilon_{ist} \tag{2.2}$$

The coefficients β^{Q} for each of the selected quantiles tell us the extent to which PBC changes with competition at each selected quantile Q. Therefore, by comparing the difference between these estimates, we can assess how the dispersion of private benefits changes with competition. For example, $\beta^{Q=90} - \beta^{Q=10}$ measures the extent to which the distance between the 90^{th} and the 10^{th} percentiles of PBC changes with higher competition. If competition has a larger negative effect at the 90^{th} than at the 10^{th} quantile, we would expect this difference to be negative: the larger the gap, the larger the decline in dispersion as competition increases. Finally, to test for statistical significance of these effects, we use simultaneous quantile regressions and bootstrap standard errors (with 500 repetitions of the bootstrap at each percentile).

In terms of predictions, we expect that higher levels of competition would lead to significant reductions in the dispersion of PBC. That is, the effect of competition should be more (less) pronounced for the upper (lower) quantiles of the PBC distribution.

2.2.3 Competition and Private Benefits of Control. Firm-level Analysis Using Panel Data

To provide a sharper test for the effect of competition on governance, we use the panel structure of the data to assess whether changes in competition lead to lower estimates of

private benefits of control within firms. Within-firm tests also help in disentangling the selection and disciplinary effects of competition.[14] Competition can lead to lower PBC by forcing inefficient firms out of the market or by inducing existing firms to operate more efficiently. The existing total factor productivity literature suggests that both effects may be important. Foster et al. (2006), for example, document that productivity gains may be solely explained by entry and exit decisions. Schmitz Jr (2005), in contrast, documents large within-firm productivity gains in response to higher competitive pressures.

Formally, we evaluate the following specification:

$$PBC_{ist} = \alpha + \beta Comp_{st} + X'_{ist}\vartheta + d_i + d_t + \varepsilon_{ist} \tag{2.3}$$

where (d_i) are firm fixed-effects and the rest of the variables are defined as in 2.1 and 2.2 above. In 2.3, we expect β to be negative and significant.

In sum, this section highlights the main departures of this chapter relative to the extant literature. The chapter provides the first empirical tests linking the key structural parameters affecting competition and governance outcomes. It also presents the first tests of the effects of competition on the entire distribution of private benefits of control. We currently know little about the dispersion in governance outcomes and its determinants, and this chapter provides an attractive setting to assess these issues. Last but not least, the chapter provides the first arguably causal tests on the effect of changes in competition on governance variables.

In the following section, we describe the data and the key variables of interest.

[14]The use of within-country or industry variation in competition allows us to rule out the confounding effect of time-invariant country, industry or firm characteristics, which is a concern in the existing literature. Prominent cross-sectional results, such as those in the ownership concentration literature (Morck et al., 1998) disappear when analyzing firm fixed-effects specifications (Himmelberg et al., 1999).

2.3 Private Benefits and Competition: Data Description

2.3.1 Dual-Class Share Firms and Estimates of Private Benefits of Control (PBC)

Following Zingales (1995) and Doidge (2004), we estimate PBC using the voting premia between dual-class shares, adjusting for the relative voting power of securities:

$$PBC = \frac{P_H - P_L}{P_L - rv * P_H} \tag{2.4}$$

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Where P_H is the price of a high voting-right share, P_L is the price of a low voting-right share, and $rv$is the relative number of votes of the low voting-rights share compared to the high voting-rights securities. In the special case of non-voting shares,2.4 above collapses to $\frac{P_H - P_L}{P_L}$.

Using the ratio of dual-class securities as a measure of private benefits has both advantages and disadvantages. The voting premium is appealing because it is based on security prices that reflect investors' valuations for being in control, which are related to PBC. It is a useful way to measure phenomena that are usually unobservable. Additionally, if both high- and low-voting securities are entitled to the same cash flow rights, estimates in this ratio will not be affected by changes in expected distributions: i.e. they will only capture the value of the differential voting rights. Lastly, we can estimate this ratio at different points in time, which allows us to focus on within-firm analysis. In terms of inference, fixed-effects models help in ruling out the effect of time-invariant firm, industry and country characteristics on the results.

A drawback of the dual-shares methodology to estimate PBC is that it is only available

for firms that have self selected into the pool of firms with two or more classes of shares, a decision that is likely to be correlated with high PBC to begin with.[15] Furthermore, dual-class shares are prohibited in some countries (e.g., Japan), which prevents us from estimating PBC in those settings. An added shortcoming is that the ratio above requires both classes of shares to be traded. These concerns may limit the relevance of the results to non-sample firms.

Potentially more challenging for the tests, the voting premia may vary over time, even when the true private benefits are held constant. Time-varying voting premia can reflect that dual-class shares, for example, may not be identical in terms of their cash-flow or other characteristics, and these traits may evolve over time. To address such concerns, we limit the analysis to firms in which cash-flow distributions are linked across shares, and in the empirical specifications, we include controls for these variables. Alternatively, the estimated voting ratio may vary over time as a function of changes in the probability of control contests (Zingales, 1995). As earlier papers that have used this variable (e.g., Doidge (2004)), we have no information on the ownership structure of the firms in the sample. However, the fact that–in contrast with earlier work–we are able to introduce firm fixed-effects allows us to control for the probability of having a pivotal vote, provided that this probability is constant over time. In addition, to control for the possibility that the probability of control contests varies over time, in some specifications we introduce time varying controls for the level of foreign direct investment and the value of the market capitalization of local firms, variables that are likely to be correlated with such events. To identify firms with dual-class shares that are less exposed to the concerns outlined above, we follow Doidge (2004) in including all

[15]Similarly, other measures of PBC such as those based on acquisitions of controlling interests (Barkalay and Holderness, 1989; Dyck and Zingales, 2004), share similar concerns as they are only available for firms that are the target of acquisitions, which are also non-random. In particular, they are likely to be less successful or efficient than their bidders.

DATASTREAM firms that meet the following criteria: (1) They have at least two types of shares with differential voting rights; (2) individual securities must be publicly traded and listed on a domestic exchange. The price of shares listed in different markets may vary as a function of local market conditions (Rosenthal and Young, 1990); (3) the low-voting class security is not convertible into the high-voting share; and (4) neither share receives a fixed dividend independent of the other class. In addition, we use Mergent Online and the Securities and Exchange Commission's Edgar resource to assess which firms meet (1) to (4) above. We obtain stock price information from DATASTREAM. To be included in the sample, we require firms to have security price information for both shares for at least 15 days per year.[16] In order to minimize the impact of outliers, we focus on securities with trading prices of at least one half of a unit of the local currency and we winsorize the data at the 1st and 99th percentiles of the distribution. We also require that the relative dividend distributions to high- and low-voting securities are within the 1st and 99th percentiles. The measure of PBC is, then, the median voting premium for the year. We retain those with at least one matching competition measure from the OECD. As a result, the final sample includes 866 firms and 7219 firm-year observations in 16 countries.[17]

Table 3.22 presents the summary statistics. The average estimated voting premium is 0.319, while the sample median is 0.053. The average (median), high-voting shares have 5.116 (1) votes. In contrast, the average (median) number of votes per low-voting share is 0.222 (0) votes. The average (median) ratio of votes for low-to-high voting securities (rv in equation 2.4) is 0.035 (0), indicating that most firm pairings match a non-voting with a voting share. Similarly, the relative vote-per-dollar-of-dividend has an average (median)

[16]The results are not sensitive to this sampling requirement.

[17]The difference between 22 and 16 countries is explained by Brazil, Chile, Colombia, Peru, South Africa and Venezuela, which are not OECD members.

value of 5.229 (0.997). Both statistics are consistent with the sample selection criteria in Doidge (2004), where firms are included as long as they have differential voting rights, and their dividends rights are not independent from each other.

A potential drawback of requiring matching dual-class and competition information is that the firms in the sample may not be representative of the average of dual-class share firms. In Table 3.23, we report the mean voting premium by country from the sample firms (Column II), for firms that meet all the screening tests other than having matching competition information from the OECD (Column IV) and for the firms included in Doidge (2004) (Column V). We obtain other security-level information, such as volume and dividends from DATASTREAM. We use MERGENT Online and web searches to obtain industry classifications under the Standard Industrial Classification (SIC) system. We use other country-level variables that vary over time, such as GDP growth, the ratio of the market capitalization of traded securities to GDP, the ratio of foreign direct investment (FDI) to GDP, and unemployment numbers, all from the World Bank's World Development Indicators. Finally, we obtain several variables on the quality of the legal institutions from La Porta et al. (1998), such as the rule of law, accounting standards and anti-director rights indexes.

2.3.2 Measuring the Intensity of Competition: Regulation of Product and Input Markets

To capture the effect of competition on the voting premia, we use the product market regulation (PMR) and the regulatory impact (RI) indexes developed by the OECD (see Conway et al. (2005), and Conway et al. (2006), respectively for details).

The product market regulation index (PMR) measures the level of countrywide product market regulations in the final-goods markets. This index summarizes information on 139

specific regulations that impose: (a) barriers to entrepreneurship (administrative burdens, permits, licenses and fees, etc), (b) restrictions to foreign trade and investment (tariffs, quotas, ownership and investment restrictions, etc) and (c) direct state control of business activities (price controls, public ownership, and other command and control provisions). The index is comparable across countries and has a scale of 0 to 6, where 0 (6) is the most (least) competitive. The index is available for 1998, 2003, and 2008 and its variation reflects changes in the underlying government restrictions, the classic and fundamental parameter of competition. As a result, it is ideally suited to evaluate the effect of product market competition on the voting premia.

Given that we are interested in the effect of competition on the voting premium, we define the variables "product" and "input" market competition indexes as the negative of the PMR and RI indexes, respectively. As a result, higher values of these product and input competition indexes correspond to fewer regulations and higher levels of competition.

Table 3.22 shows that the average product market regulation (PMR) index is -1.61. Since the index was introduced in 1998, countries such as the United Kingdom (U.K.), Australia, and the United States, exhibit relatively few market restrictions while countries such as Greece and Italy, display significant burdens to competition. Interestingly, while comparable institutional analysis often characterizes Anglo-Saxon economies as providing more efficient economic environments (La Porta et al. (1998), and others), the PMR index varies over time, so we can examine its effect holding legal environments constant. In 1998, the least competitive OECD country in the sample was Italy (-2.8), and the U.K had the fewest barriers to competition in product markets (-1.1). In 2003, Mexico had the most barriers to product market competition (-2.2), while Australia and the U.K. had the least (-0.9).

The input market regulation index (RI) is an internationally comparable indicator that

captures the importance of government regulations in industries whose main output is an intermediate input for other industries. These key industries are (a) financial services, (b) energy, (c) transport and communications, and (d) retail distribution. For each of these industries, the OECD quantifies the level of competition by analyzing a similar set of barriers to entry as those included in the PMR index (e.g. licensing and registration requirements, ownership restrictions, pricing restrictions, protection to incumbents; Conway et al. (2006)). The RI index was developed to empirically assess the impact of those regulations on other industries. For example, financial services regulations would tend to limit competition, particularly in industries that rely on external sources of financing (Rajan and Zingales, 1998). The RI index generalizes this idea to other industries by computing industry-specific RI indexes using, for each final-goods industry, the input weights from input-output matrices from these intermediary industries. Time-series variation in the RI index results from changes in government regulation affecting the competitive environment of input producing sectors. As the PMR index, the RI index is computed in the 0-6 scale, where lower average values correspond to the least restrictive environments.

Interestingly, recent empirical evidence provides direct evidence that input deregulation affects the intensity of competition. Cetorelli and Strahan (2006) show that lower restrictions to U.S. banks lead to increasing competition in the product markets of other industries. Similarly, Bertrand et al. (2007) document that banking deregulation in France led to increased rates of entry and higher levels of restructuring of incumbent firms. Beyond financing, Francois and Wooton (2008) show that regulation in non-traded services affects the performance of exporters. Arnold et al. (2008) show that markets where input regulations are high are correlated with slower rates of technology adoption and higher survival rates of inefficient firms.

Table 3.22 shows that the mean input competition, measured as the negative of the

Regulatory Impact index, (-RI) is -0.136. The least competitive input markets are faced by the water and air transportation industries in Italy in 1990, with RI scores of -0.847. On the other extreme, 186 firm-year observations had RI scores of zero, which are indicative of no barriers to input competition. Firms operating in such industries were located in countries as diverse as Canada, Finland, France, Germany, Italy, Sweden, Switzerland and the United Kingdom.

2.4 The Effect of Competition on the Level and Dispersion of PBC

2.4.1 Competition and the Level of Private Benefits of Control

As a benchmark for the effect of competition on private benefits of control, we start by reporting differences-in-means tests for firms in the most and least competitive environments. To facilitate inference, we collapse voting premia and competition variables at the firm level and report only one observation per firm.

Table 3.24 splits sample firms into two groups as a function of the intensity of competition. We define as "highly" ("less") competitive (Columns II and III, respectively) firms those that do business in markets that, relative to the sample, are less (more) heavily regulated. The first and second rows in Table 3 classify firms based on the intensity of product market and input competition, respectively.

Using product market competition, Column II shows that the mean voting premium in competitive environments is 0.235. In contrast, the average voting premium in less competitive settings is 0.615. The difference of 0.38 is statistically significant at the five-percent

level.[18] In economic terms, moving from a non-competitive to a highly competitive setting implies a reduction of 61.8 percent in the estimated level of PBC.

Using input competition (Table 3.24, second row) yields similar results: the average voting premium is 0.172 higher in more competitive industries, consistent with the idea that input competition limits the level of PBC. In economic terms, the difference of means across groups is also substantial. Highly competitive firms exhibit a voting premium that is 37.4 percent lower relative to the less competitive group. Both for product and input competition indexes, the Mann-Whitney test indicates that the distributions of private benefits in the low and high competition samples are significantly different from each other.

While differences of means are intuitive, the reported disparity in the level of private benefits may potentially reflect the influence of important omitted firm, industry or country characteristics. As stated in Section 2.1, a widespread criticism of only relying on cross-country variation is that countries differ in many dimensions, complicating inference. A crucial advantage of the tests below is that we can overcome such criticism in at least three ways. First, by introducing country-fixed effects, we ensure that the results shown are not driven by time-invariant country characteristics, such as the countryâĂŹs legal origin. Second, controlling for firm-fixed effects ensures that the results are not driven by firm unobserved heterogeneity. Third, by focusing on an arguably exogenous source of variation in product and input competition, we provide a tighter link between competition and the voting premium.

In Table 3.25, Column I, we report the effect of product market competition on the voting premium, without any controls. Given that the product competition index varies at the country level, standard errors are clustered at the country level. The results in

[18]Standard errors are clustered at the relevant source of variation: country level (product market competition) and industry-country level (input competition).

Column I show that increasing competition leads to lower levels of PBC. A one-standard deviation reduction in policies that inhibit competition leads to a decline of 0.328 in the voting premium.

In Table 3.25, Columns II to Column IV, we first address whether time-invariant cross-industry characteristics may be capturing the effect of competition on the voting premium. Specifically, we introduce two-digit industry-fixed effects and an array of firm controls. Column II reports that the effect of product market competition on PBC is economically and statistically large. The effect of product market competition on private benefits is significant at the one-percent level.

To test whether certain firm characteristics may be capturing the reported effect of competition on the voting premium, in Table 3.25, Column III, we also include firm level controls. The effect of product market competition continues to be large and significant. In Column IV, we introduce country-fixed effects. Including these controls allows us to control for potential omitted variables. However, using these controls may come at a cost: the estimated coefficients in the regression that includes the controls are difficult to interpret if these "control" variables are themselves endogenous to competition. The specification that does not include these controls is the reduced form effect of competition on PBC. In what follows, we show both sets of results, with and without controls.

In Table 3.25, Columns V to VIII, we examine the effect of input competition on the voting premium. The input competition index (- RI) captures the effect of anti-competitive regulations on input markets. Column V shows the effect of input competition without controls. The point estimate of -1.21 suggests that a one-standard deviation movement in this index (0.101) is associated to a decline in the voting premium of 0.122. Column VI shows that introducing country and year effects diminishes the magnitude and statistical significance of the input competition effect. The estimated coefficient is -0.996, now significant at the

1 percent level. In Columns VII and VIII, we introduce industry controls and industry, country and firm controls, respectively. The results indicate that, relative to the effect of product market competition, the link between input competition and the voting premium is robust in the aggregate.

Overall, Tables 3.24 and 3.25 provide evidence that competition can lead to significantly lower levels of PBC. We show that the results are not driven by time-invariant country characteristics. This finding is important given the preexisting evidence that country characteristics are extremely important for corporate governance outcomes (La Porta et al. (1998); Doidge et al. (2007), and others). However, it does not help us determine whether competition leads to lower PBC due to a reduction in the voting premia of incumbent firms or due to selection effects, an issue that is addressed in Section 2.4.3.

2.4.2 Competition and Dispersion in Private Benefits of Control

The summary statistics reported in Tables 3.22 and 3.23 document a significant dispersion in the voting premia for firms in the sample. Such dispersion is, by itself, not surprising. Doidge et al. (2007), for example, document a substantial dispersion in governance outcomes and emphasize the crucial role of country characteristics in explaining it.

In this section, we investigate whether competition limits the dispersion of private benefits of control. We proceed in two steps. First, we use quantile regressions to investigate the importance of the within-country relative to the cross-country dispersion in PBC. Second, we extend the quantile analysis to test whether competition plays a role in limiting the within-country dispersion in the voting premia.

In Table 3.26, Panel A, we report the conditional 90^{th}, 75^{th}, 50^{th}, 25^{th}, and 10^{th} quantiles, when we only condition on year dummies. As expected, we document a large dispersion in PBC in the sample. Table 3.26, Panel A, reports that the 90^{th} and 75^{th} percentiles of PBC

are 0.90 and 0.21, respectively, significant at the one-percent level. On the other extreme, the 25th and 10th percentiles are 0.01 and -0.09, respectively. The resulting differences between the 90th and the 25th and 10th percentiles are 0.888 and 0.992, respectively, confirming the large dispersion in PBC reported both in the literature and in this chapter.

To investigate the importance of within-country dispersion in PBC, we include country dummies in the quantile regressions analysis. The results are reported in Table 3.26, Panel B. The estimates at all quantiles fall, indicating that a significant fraction of the dispersion is indeed driven by country differences, as suggested by the earlier literature. Nonetheless, there is still significant within country variation that is not captured by country dummies. For example, the difference between the 90th and the 25th and 10th percentiles is 0.42 and 0.46 respectively, suggesting that 40 to 50 percent of the overall dispersion (from Panel A) is explained by country dummies, but the remainder 60 percent is within country variation. This is an important result: a substantial degree of dispersion in PBC is not explained by time-invariant country characteristics.

We examine whether the dispersion in PBC can be linked to the intensity of competition using quantile regressions. We are specifically interested in evaluating whether the effect of competition is similar for upper and lower quantiles of the PBC distribution. Table 3.27 examines the effect of the proxy for product market competition at different points of the PBC distribution. In Panel A, we report quantile regressions that include year and country dummies and the product market competition index. The results show a significantly larger effect of competition in the upper quantiles of the PBC distribution. The 90th percentile conditional effect is -1.22, significant at the one-percent level while the 10th percentile estimated effect is -0.889.

In 3.27, Panel B, we examine the robustness of these results to the introduction of industry dummies. The conditional effects of product competition on the voting premia are

-1.149, -0.923, -0.477, -0.262 and -0.494 at the 90^{th}, 75^{th}, 50^{th}, 25^{th}, and 10^{th} quantiles, respectively. These results confirm the idea that stiffer competition leads to an economically large and statistically significant reduction in the voting premia, and that the effect is larger at the higher quantiles of PBC. For all panels, we report F-tests of whether each coefficient is significantly different from the 90^{th} percentile coefficient to test whether the dispersion significantly falls with competition, which is supported empirically.

Finally, in Panel C, we use the natural logarithm of the voting premium as an alternative dependent variable.[19] This formulation allows us to test whether PBC changed proportionately more at the top end of the PBC distribution. The results confirm that product competition reduces the dispersion in private benefits. In words, not only do PBC fall more at the top quantiles, they also fall more than proportionally relative to the lower end of the distribution.

In Table 3.27 we turn to test for the impact of input competition at different quantiles of the PBC distribution. Panel A shows a large effect of -0.41 in the 90^{th} quantile and -0.14, -0.03, -0.02 and -0.06 at the remaining quantiles. Once we include industry controls (Panel B) we find that the conditional effect of input competition is concentrated in the top quantiles. The estimated coefficients at the 90^{th} and 75^{th} quantiles are -2.443 and -0.434, respectively. The effect of input competition is indistinguishable from zero at the 90^{th} and lower quantiles. The estimated coefficients reported in Table 3.27 replicate the pattern of economically and statistically large effects of competition on the upper quantiles, and the less significant effects in the bottom quantiles of the PBC distribution. The F-tests confirm that the high-to-low quantile estimated coefficients are indeed statistically different from

[19]Since the voting premium is not bounded by zero as Nenova (2003) (pp. 334) and Doidge (2004) have previously highlighted, and given that a logarithm transformation can only be applied to positive numbers, whenever we use the logarithm of the voting premium we add a constant to the voting ratio such that the lowest observation in the sample has a value of one (zero in the log scale).

each other. These results are consistent with the idea that competition limits the dispersion in the voting premium. The results in Panel C using the natural logarithm of the voting premium as the dependent variable, confirm that PBC fall more than proportionately at the top of the distribution.

A natural extension is, therefore, to examine the effect of output and input competition on the entire distribution of the voting premia. Figures 3.2 and 3.3 present such results. Each point represents the estimated effect of competition on the voting premia at each percentile of the PBC distribution, conditional on year, country and industry dummies. These figures confirm the results from Table 3.28. Namely, that competition leads to a compression of private benefits.

Figures 3.2 and 3.3 also provide an interesting insight into the relative effect of product and input market competition on PBC. Figure 3.2 documents a nearly across-the-board effect of product competition in limiting the level of PBC, especially for the 50th and higher quantiles. Figure 3.3, in contrast, shows that for the bottom half of the PBC distribution, the conditional effect of input competition is fairly flat and close to zero. Input competition, also has a large effect on PBC at the top quantiles, particularly in the top quartile of the PBC distribution. Such results suggest that input markets may only bind as disciplinary devices in settings where the level of managerial waste is sufficiently large.

More generally, the graphical representation of Figures 3.2 and 3.3 highlight the relevance of quantile regressions. These figures show that competition does not equally affect the voting premia at every point of its distribution. The larger competitive effects at the top quantiles and the lower estimated coefficients for the lower end of the PBC distribution imply that competition leads to a reduction in the dispersion of private benefits. Quantile regressions allow us to unveil such insights, which would be potentially ignored had we examined only the average effects of competition on the voting premia. Beyond the setting of this chapter, the

results suggest that quantile regression techniques may be useful in a broad range of topics in corporate finance, such as capital structure, investment, etc. In general, we know little about dispersion in corporate finance. Our analysis suggests that focusing on distributions rather than solely on means may be helpful to uncover new results or to provider sharper tests for existing theories.

Overall, this section has documented a large dispersion in the voting premia that is not explained by time-invariant country variables. We have provided consistent and robust evidence that increases in product and input competition lead to significant reductions in the dispersion of voting premia. We have shown that while product and input markets affect the average voting premium in different ways, they both limit the dispersion in private benefits of control.

2.4.3 Unleashing Competition: Does Competition Lead to Lower PBC?

The evidence thus far presented has demonstrated that competition is a key determinant in shaping the level and dispersion of private benefits of control, both within countries and industries. While such results are new in the literature, they do not provide direct evidence that changes in competition do indeed discipline managers. As previously noted, competition can induce existing firms to become more efficient, but competition may also affect the selection of surviving firms. In consequence, the results may by be alternatively explained by changes in the composition of firms or by the disciplinary role of competition on incumbent firms. To test for the direct disciplinary effect of competition on the voting premium, we introduce firm-fixed effects, which allow us to assess whether stiffer competition lead to changes in the level of PBC, holding firm-time invariant characteristics constant.

Table 3.29 presents the results of product market competition on the voting premium. Column I shows that, within firms, higher levels of product competition lead to lower estimates of the private benefits of control. Moving from Italy's product market competition index to FranceâĂŹs in 2003âĂŤa 0.2 change in the indexâĂŤwould lead to a reduction of 0.268 in the voting premium, significant at the one-percent level. In other words, the quality of corporate governance within firms can be directly and drastically affected by deregulation of product markets.

Table 3.29, Column II, introduces firm-level controls that capture firm, size, profitability, investment opportunities, relative dividend payments and volume. The estimated effect of product market competition on the voting premium is largely unchanged both in economic and statistical terms. The estimated coefficient is -1.988, significant at the one-percent level.

In Table 3.29, Columns III and IV, we investigate the effect of competition on the subsample of manufacturing firms. Manufacturing firms have lower price-to-cost markups in every country for which OECD data exists (Christopoulou and Vermeulen, 2012), suggesting that the degree of product differentiation in manufacturing is substantially lower. Product differentiation is important because it may limit the extent to which competing firms may discipline incumbents. In Column III, the estimated coefficient for the manufacturing subsample is -1.34, significant at the one-percent level. In Column IV, we include the same firm-level controls as those in Column II, and the reported effect of competition on the voting premium is larger. Finally, Column V shows the results for a subsample of firms where actual dividend payouts are equal for both high- and low-voting securities, confirming that the effect of competition is not driven by different dividend distributions for high- and low-voting rights shares.

Table 3.30 explores the effect of input competition on PBC. Column I shows that once we control for time-invariant firm characteristics, the effect of input competition on PBC, while

negative, is only significent at ten percent level. In Table 3.30, Column II, we reexamine whether the effects of competition are relatively more relevant for manufacturing firms. The estimated coefficient reported in Column II shows a significant effect of competition in limiting PBC in manufacturing activities.

A concern with the estimated coefficients reported in Columns I and II of Table 3.30 is that the effect of input competition on PBC is difficult to establish in the panel specification because input competition does not vary substantially from year to year. The input competition index is available at the annual frequency, while the product competition index captures a ten-year variation between 1998 and 2008. To investigate this concern, in Table 3.30, Columns III to VIII, we test for relatively "large" changes in the input competition index within the manufacturing sector. We proceed in two steps. First, we create a scaled version of the index that compares each annual input competition observation to the average for each firm and test for its effect on PBC in Column III to VI. Second, we explore whether "large" deviations from the firm average trigger significant changes in the voting premium (Columns VII and VIII).

Column III in Table 3.30 shows that higher levels of input competition lead to lower estimates of private benefits of control. In Columns VII and VIII we test for the symmetry of this effect for sufficiently large changes in input competition. Specifically, we include indicator variables for cases in which the input competition index is larger or lower than its mean by a given percent threshold. Column VII reports that when input market competition increases by at least 2 percent, PBC decreases by 0..034. Small year-on-year decreases in input competition, however, have no significant effect on PBC. In contrast, large increases in input competition do affect PBC significantly (Column VIII).

Taken together, Tables 3.29 and 3.30 demonstrate that competition leads to lower estimates of private benefits of control. The effect of product market competition is large

and robust across specifications and subsamples, indicating that the pressure from product markets is crucial for private benefits. The impact of input market competition, in contrast, is predominantly important for relatively large changes in RI and for firms in manufacturing settings. If we follow the pre-existing literature in interpreting the voting premia as a measure of inefficiency inside the firm, the results indicate that product and input market competition do, indeed, discipline insiders.

We further test for this disciplinary channel by interacting the competition indexes with a proxy for the degree of a firmâĂŹs efficiency. Specifically, we use the first observation per firm to test whether more profitable firms are affected differentially by competition. If profitability (net income to sales) captures relative efficiency, we would expect profitable firms to be less sensitive to competition. In Table 3.31, Columns I to III, we show the interaction between a dummy variable equal to one if the firm is in the top quartile in terms of profitability and the competition indexes.

We find that the voting premium is more (less) responsive to product market competition in firms that are least (most) profitable (Column I). The interactions with the input competition index in Columns II and III are not statistically different from zero, but the sign of the coefficients follows that of the results from the product market analysis. The results from Column I are consistent with the idea that competition disciplines insiders by increasing their default probabilities.

An alternative test for the disciplining effect of competition is to investigate the interaction between competition and the quality of the domestic legal environment. Building on the work of La Porta et al. (1998), several studies have documented that countries with stronger rule-of-law environments tend to display lower private benefits of control (Nenova, 2003; Dyck and Zingales, 2004; Doidge, 2004). As such, the effect of competition would be expected to be larger in settings where legal provisions are less effective. To test for

this idea, we interact the two competition indexes with an indicator variable equal to one whenever the country has a higher than median rule-of-law index, and zero otherwise. The results are presented in Table 3.31, Columns IV and V. For both measures, we find that the effect of competition is predominantly larger in countries with relatively weaker rule-of- law environments.

These findings are consistent with the earlier reported result that competitive pressures have a larger effect on the voting premia at higher levels of the private benefits of control distribution. Furthermore, the results are potentially informative for policy debates. While the legal tradition that a given country inherited is difficult and costly to change, deregulation of product and input markets is potentially easier and cheaper to implement. In sum, competition is a powerful and potentially cost-effective tool to discipline insiders of publicly-traded corporations.

2.5 Conclusion

A central tenet in financial economics is that competition improves resource allocation and performance. While this view dates back to Smith (1937), there has been little systematic evidence for the link between changing competition and the quality of governance institutions inside firms.

In this chapter, we examine the impact of competition on the level and the dispersion of private benefits of control enjoyed by the firm's controlling shareholders. We estimate private benefits of control using the voting premium between shares with differential voting rights. To capture the intensity of competition, we use two indexes of government regulations directed at limiting product and input market competition. These indexes vary over time, allowing us to examine the within-country relationship between competition and the voting

premia. Furthermore, their time-series variation is arguably exogenous to individual firms' decision-making, facilitating inference.

We find that the intensity of product market competition significantly and consistently affects the estimates for the value of being in control. The results indicate that stiffer competition may limit the scope of managerial waste and sharpen insiders' incentives to perform. These competitive effects are particularly large for poorly run firms and for firms operating in countries with weak legal environments.

The evidence also shows that competitive forces lead to a significant reduction in the dispersion in private benefit consumption within industries and countries. We find that both product and input competition play a determining role in limiting the dispersion in the voting premia. Surprisingly, the impact of competition on the dispersion of governance outcomes has, thus far, been ignored in the governance literature.

Overall, the results demonstrate that competition policy can have a crucial influence on corporate governance. Furthermore, we think that the direct link between the intensity of competition and measures of the quality of corporate governance, financial development and economic growth is a fruitful research agenda.

Chapter 3

Insider Trading Profits and Executive Compensation–Are They Really Substitutes?

Tao Li and Fangzhou Shi

3.1 Introduction

Executive compensation of U.S. firms has provoked massive concerns, arguments, political outrages and restrictive regulations. At the same time, regulations concerning insider trading by status quo executives also never leave the spot light of finance world. The seemingly two parallel issues in real world indeed have a fundamental connection: they both are ways executives to get pecuniary benefit from their jobs. In this chapter, we provide empirical evidence on the relation between insider trading return and executive compensation: less cash compensation is correlated with more informative insider trading with a larger transaction volume, generating a higher insider trading profit.

The theoretical argument that insider trading can be viewed as an alternative form of compensation dates back at least to Manne (1966). Carlton and Fischel (1983) support this view by claiming that remuneration contracts taking into account insider trading can make managers less risk-averse, thus better align the interests of shareholders and managers. Baiman and Verrecchia (1996) note that investors "subsidize" managers through insider trading profits–with the release of valuable insider information, managers will demand a higher explicit compensation. Nevertheless, the empirical evidence has been mixed.[1].

In this chapter, we extend the discussion by directly examining the correlation between insider trading return and compensation at the firm level. Both cash compensation and insider trading profits are direct compensation executives get form the firm. Using panel data on US firms from 1992 to 2011, we find strong evidence that insider trading profits and executive direct compensation are negatively correlated-a one percent decrease in cash compensation leads to a 21.7% increase in 6-month buy-and-hold excess returns, controlling for firm characteristics. Further investigation shows that the higher profit is driven by both

[1]See Kato and Hebner (1997); Roulstone (2003); Zhang et al. (2005); Denis and Xu (2013); Trapani (1990); Brenner (2011)

higher excess trading return and a higher trading volume. We find that for the average firm, a one percent (or $6,358) decrease in cash compensation leads to a $13,611 increase in 6-month buy-and-hold excess profits, and 16200 more shares traded.

Another contribution of this chapter is to study the effect of the Sarbanes-Oxley Act of 2002 (SOX) on the aforementioned relationship. The shorter reporting requirement requested by SOX encroached the relative information advantage of insider trading by letting market learn the transaction detail earlier. We find that the increase in 6-month buy-and-hold excess returns is 4.8 percentage points lower after 2002 when cash compensation decreases by 1%, reflecting the loss of information advantage due to increased regulatory oversight. However, the drop in insider trading profits is small in dollar amounts and there is no significant change in trading volume. This implies that the substitution effect of insider trading on executive compensation is persistent and not weakened by exogenous shock in insider trading return. In fact, trading volume is not sensitive to compensation level post SOX. Increase in excess return is the only channel to raise compensation through insider trading.

Our work is related to two strands of research on insider trading: the relationship between insider trading and compensation, and the information content of insider trading. First, it is related to Manne (1966) well-established argument that insider trading returns are an efficient means of rewarding managers for their efforts. A growing literature has indirectly examined if insider trading regulation affects executives' compensation. Kato and Hebner (1997) find that executives in firms with more insiders receive more compensation because expected trading profits tend to decrease with a higher number of insiders. Executives need to be compensated for the expected loss of insider trading profits. Roulstone (2003) shows that managers receive higher levels of compensation in companies with self-imposed insider trading restrictions, compared with those in firms without such policies. He also finds that firms restricting insider trading use more incentive compensation. Zhang et al.

(2005) provide evidence on the relationship between the intensity of insider trading activities and compensation through pay-performance sensitivity analysis. They find an increased (a decreased) level of insider trading is associated with a decreased (an increased) pay-performance sensitivity. This suggests that companies take into account insider trading profits when negotiating compensation contracts. Denis and Xu (2013) study the relationship between insider trading restrictions and executive compensation across 40 countries. They find that top executive compensation is significantly higher and contains a larger fraction of equity payments in countries with stronger insider trading restrictions. This supports their claim that insider trading is an implicit form of compensation. Aboody et al. (2011) examine the association between insider trading returns and firm performance. They discover a significant positive correlation between insider trading returns and contemporaneous changes in firms' operating income, supporting the view that companies may gain short-run incentive alignments from insiders profiting on their trades. However, they also show evidence that this benefit does not extend beyond 12 months.

On the other hand, some research directly investigate the relationship but do not find significant result, either based on incomplete and dated data. Trapani (1990) finds no relation between insider trading profits and executives' cash compensation, contradicting the view that insider trading and explicit compensation are substitute forms of compensation. Brenner (2011) looks at changes in German CEOs' compensation after insider trading was banned in 1994, and finds no correlation between compensation and insider trading returns. We build on results based on the updated data about insider trading and executive compensation.

Second, our study is related to studies on the information content of insider trading. Most recent empirical analysis show that insider purchases earn positive abnormal returns but "insider selling that is motivated by private information is dominated by portfolio re-

balancing for diversification purposes" (Lakonishok and Lee, 2001).[2] For this reason, our analysis focuses on the open market purchase of stocks by corporate insiders.

Several studies have further examined the impact of SOX on insider trading and information content suggested by insider trading. Carter et al. (2003) look at information leakage of insider trading and its implications for outside investors. Using data in the early 1990s, they find that information leakage is positively associated with reporting lags–those who mimic insider buys earn greater abnormal returns between transaction date and SEC date if reporting lags are longer. And information leakage for CEOs and other officers differ only marginally. Heron and Lie (2007) study the impact of SOX on profitability of option grants. They find that average abnormal return during the week before (after) unscheduled option grants is roughly 6(5) times larger for the period before SOX was implemented, which reduced the reporting lag for option grants from 45 days to 2 days. Brochet (2010) finds evidence that filings of insider purchases are significantly more informative after SOX within a three-day window. In terms of types of insiders, Ravina and Sapienza (2010) analyze directors' trading returns, and find that independent directors are informed about the firm, both in good times and bad news. Wang et al. (2012) find that CFOs' trades are more informative than CEOs' trades. Taking together, these studies suggest insiders have discretion to arbitrage on information, and this discretion still exists after SOX.

Results in this chapter suggest that insider trading profits are an important substitute for executive compensation in that a small decrease (increase) in compensation leads to a large increase (decrease) in trading returns or profits. The evidence supports the well-established argument Manne (1966) that insider trading is an efficient form of compensation. We also document an unintended consequence of the Sarbanes-Oxley Act–it dampens the buffer effect of insider trading on executive compensation in terms of excess returns. But its impact on

[2]Related articles include Friederich et al. (2002); Jeng et al. (2003); Fidrmuc et al. (2006).

trading profits is minimal.

3.2 Methodology

Taking same measures used by other research in insider trading, we use holding-period excess profits and returns as our dependent variable. We focus on the 180-day holding-period profit measure, as according to "Short-swing Rule" any insider trading profit generating from a round transaction within six months has to be returned to the company. We also look at 30-day, 60-day and 90-day holding-period profits for consistency checks.

Our first test investigates how changes in lagged compensation would change executives' trading behavior and profits. We use the following specification:

$$ExRet_{it} = \alpha_i + \lambda_t + \gamma ln(Comp_{i,t-1}) + X'_{it}\beta + \varepsilon_{it} \tag{3.1}$$

The average holding-period excess profit for firm i in year t is a function of: the logarithm of average compensation in firm i in year $t-1$; major firm-level attributes X_{it} include firm size–the logarithm of assets, the logarithm of R&D expenditures and Tobin's Q; company fixed effect α_i; and year fixed effect λ_t. Standard errors are clustered at the industry level. If a decrease in lagged compensation leads insiders to trade more aggressively on insider information, then $\gamma < 0$. We also use the logarithm of excess profit as dependent variable, and interpret γ as the elasticity of excess profit with regard to changes in lagged compensation.

One goal of the Sarbanes-Oxley Act of 2002 is to decrease information advantages of insiders and make the stock market more transparent. After 2002, insiders only had 2 days to file with SEC regarding their trading position, while they had up to 45 days to disclose this information prior to the law was put in place. However, this restriction may induce

insiders to change the trading behavior by exploiting more valuable private information. We add an interaction term to equation 3.1:

$$ExRet_{it} = \alpha_i + \lambda_t + \gamma ln(Comp_{i,t-1}) + \delta ln(Comp_{i,t-1}) \times PostSOX + X'_{it}\beta + \varepsilon_{it} \quad (3.2)$$

where $PostSOX$ equals to 1 after 2002 and 0 before. If $\delta < 0$, then after 2002, insiders would have an incentive to exploit their private information, and as a result, the sensitivity of excess trading profit with regard to a change in compensation would be higher. This would be beneficial for company insiders in that the substitution effect between insider trading and compensation is stronger, and shocks to compensation can be better compensated by the ability to gain a higher trading return. However, if $\delta > 0$, it may indicate that insiders became more difficult to generate excess return after SOX and executives were not able to offset the declines in their compensation by the more aggressive trading behavior.

3.3 Data and Descriptive Statistics

3.3.1 Data

We collect from ExecuComp annual compensation data on companies' top five highly paid executives for the period 1992 to 2011. Variables used in this chapter include total compensation, cash compensation (salary and bonus), restricted stock grant, and name of the executive. We take the average of executives' compensation at the firm level.

Insider trading data is obtained from Thomson Reuters's Insider Filing Data Feed (IFDF) which is designed to capture all U.S. insider activity as reported on Forms 3, 4, 5, and 144. Our sample includes all open-market purchases and sales made by company officials over the period 1992 to 2011. It includes transaction date, SEC filing date, transaction price,

the number of shares transacted, name and role of the insider (executive, director, or block holder) and other company level information. We also exclude transactions in which the share price is below $1 to avoid liquidity issues in our estimation.[3] We merge this dataset with ExecuComp by name of the executive at the company level. So for each firm, we have insider trading data for at most five executives. If an executive has multiple same-day purchases (or sales), we aggregate them as one transaction.

Daily stock returns for companies listed on NYSE/AMEX/Nasdaq are from the Center for Research in Security Prices (CRSP) database. We also obtain value-weighted market return for each stock. Then we match CRSP with the Insider Trading/ExecuComp dataset using CUSIP. 30-day, 60-day, 90-day and 180-day holding-period returns and their corresponding value-weighted market returns are calculated for each trade. The difference between the trade-level holding-period return and market return is the excess return. Multiplying it with the number of shares traded, we obtain the excess profits. Then we compute the average 30-day holding-period excess return for each company in each year. Average company-level 60-day, 90-day and 180-day holding-period excess returns are calculated in the same fashion.

Supplemental firm-level control variables are obtained from the Compustat database. They include value of the firm's assets, market capitalization, the book-to-market ratio, Tobin's Q, industry code. Our final sample consists of 8842 company-year observations.

3.3.2 Descriptive Statistics

Table 3.32 shows the breakdown of the sample for compensation and firm characteristics before and after 2002, in which the Sarbanes-Oxley Act was enacted. Comparing executive compensation in Panel A and that in Panel B, we do see an increase in compensation levels

[3]Lakonishok and Lee (2001).

after 2002, both for cash and total compensation. Both mean and median total compensation levels almost doubled after 2002; however, cash compensation only increased by around 20%, reflecting the general trend that firms were beginning to award more incentive compensation to executives, in the form of restricted stocks and option grants. After 2002, there was greater dispersion in cash compensation, as well as a more skewed distribution–the 99th percentile cash compensation was 8 times the median, versus 6 for the period 1992-2002.

Firms are getting larger, measured by the value of their assets and market capitalization (or R&D expenditures). The value of firms' assets was also more right-skewed. It may be due to better coverage of the data or the fact more bigger firms' insiders involved in insider transaction. For the median firm, its asset value and market capitalization were roughly the same, for both periods. The average market capitalization was larger than the average asset value, reflecting the influence of very big firms which tended to have larger market capitalization than asset since previous research has shown the size of the firm has a significant effect on insider trading, we control it in our analysis.

Table 3.33 provides buy-and-hold excess returns, profits and trading volume for various holding periods. Panel A shows summary statistics for the period 1992-2002. Average buy-and-hold excess returns increased from 3.8% to 12.7% when the holding period was extended from 30 days to 180 days. However, there was no clear pattern for the median excess returns. This indicates that there was a much larger dispersion in excess returns when the holding period increased. The same pattern holds true for holding-period excess profits. Panel B provides descriptive statistics for buy-and-holding excess returns and profits for the period 2003-2011. We see that 90-day and 180-day excess returns were higher for the period 2003-2011, and the dispersion was somewhat lower. On the other hand, trading volume significantly decreased after the SOX reform. This can be important to our study: if the lower dispersion was indeed due to the inability to explore more valuable private

information, an executive would not be able to make up the loss by insider trading when his or her paycheck shrank. Holding period excess profits were similar across Panel A and B, with the dispersion lower in Panel B.

It is noteworthy that insider trading profit does not account for a big portion of executive's compensation. During 1992-2002, the average 180-day excess profit was only 0.84% of average cash compensation, and 0.32% of total compensation. While for 2003-2011, the average 180-day excess profit was only 0.53% of average cash compensation, and 0.13% of total compensation. However, this does not translate to the ignorance of insider trading profit, as the latter one is the most direct compensation executives can get wholly at their discretion. Therefore we expect a strong relationship between insider trading profit and cash compensation.

3.4 Empirical Results

In this section, we report empirical results on the correlation between insider trading and compensation for the period of 1992-2011, as well as the impact of SOX on this relationship. We start with the univariate analysis in Section 3.4.1, and multivariate analysis in Section 3.4.2 and 3.4.3.

3.4.1 Univariate Analysis

As a first step, we are interested in the time series correlation between insider trading and executive compensation. We begin by taking annual averages of insider trading returns across all firms in our matched sample. We also take annual averages of lagged cash compensation and total compensation for all firms. Figure 3.4 shows the time series pattern between average insider trading returns and lagged cash compensation (in millions). There

is a strong negative correlation between these two variables after 2000. Cash compensation reached the peak around mid-2000, while 180-day buy-and-hold excess returns were among the lowest. The evidence supports our hypothesis that amid lower cash compensation, executives are more likely to explore more valuable private information to gain a higher stock return. Note that cash compensation became flat after 2008, partly due to regulators effort to curb cash compensation, and award executives more incentive compensation to better align management and shareholders' interests.

Figure 3.5 plots the time series relationship between average insider trading returns and lagged total compensation (in millions). The negative correlation is even more pronounced here. Average total compensation reached local maximums in 1993, 2000 and 2006, while average excess returns reached local minimums in 1994, 2001 and 2007. The evidence again supports our view that insider trading and executive compensation are substitutes. One caveat in this plot is that lower total compensation may automatically lead to higher excess returns next period due to mean reversion of stock prices. Since stock grants typically were a large part of the compensation package, a lower stock price contributes to lower compensation, while it may also lead to a higher return next period due to mean reversion of prices.

The similar pattern between trading volume and lagged compensation can be seen in Figure 3.6. Trading volume touched the trough when lagged compensation reached the peak in 2006. The correlation pattern is more significant for cash compensation.

3.4.2 Insider Trading Returns and Executive Compensation

The univariate analysis above only provides evidence that insider trading excess returns are negatively correlated with executive compensation on average. However, we are interested in exploring cross-sectional variation in insider trading as well as compensation. Since

macroeconomic trends or firm characteristics may affect both insider trading and executive compensation, we need to control these variables to eliminate omitted variable bias. To achieve this, we take advantage of our panel dataset, and estimate multivariate panel regressions in which the dependent variable is insider trading excess returns, trading volume and profits. The variable of interest is the logarithm of executive compensation. The baseline specification also includes a firm fixed effect and year fixed effect. The firm fixed effect controls for firm level unobservable heterogeneity, while the year fixed effect controls for time trends.

Columns (1), (3), (5) and (7) of Table 3.35 show evidence that cash compensation and insider purchase excess returns are negatively related, suggesting that executives tended to explore more valuable private information when their cash income dropped. The coefficients of interest in Column (5) and (7) are statistically significant at the 5% level. And all four coefficients are economically large. A 1% decrease in cash compensation leads to 3.7 percentage points increase in the 30-day buy-and-hold excess return for the period 1992-2011. Considering the average 30-day buy-and-hold excess return in this period is only 3.8 percent, this is quite substantial.

We also find that the longer the holding period, the greater the increase in excess returns given one percent increase in cash compensation. We are most interested in the relationship between the 180-day buy-and-hold excess return and cash compensation, because executives are not allowed to sell their stocks within 6 months after they purchase stocks. Column (7) of Table 3.35 shows that 1% decreases in cash compensation leads to 21.7 percentage points increase in the 180-day buy-and-hold excess return for the whole sample. This is greater than the sample average 180-day buy-and-hold excess return of 12.7 percent.

3.4.3 Insider Trading Dollar Profits and Executive Compensation

To test whether insider trading profits do vary significantly as a substitute of cash compensation, we regress holding-period excess profits on the logarithm of annual total compensation on the firm level, controlling for firm fixed effects and time trends. Column (1), (3), (5) and (7) of Table 3.36 show that a decrease in cash compensation leads to an increase in excess trading profits. The increase in profits is larger with a longer holding period. Most results are statistically significant at 10% level. The magnitude is also economically significant. Column (7) indicates that a 1% decrease in cash compensation leads to a $13,611 increase in the 180-day buy-and-hold excess trading profit, while the increase in the 30-day buy-and-hold excess profit is only $2,806. Since the average cash compensation for the sample is $635,800, this suggests that for an average firm, a $6,358 decrease in cash compensation would lead to a $13,611 increase in the 180-day buy-and-hold excess trading profit. The fact that excess trading profit increases much more than the decrease in cash compensation suggests that executives may be more likely to take advantage of their private information when they see a lower explicit pay package.

3.4.4 Effect of the Sarbanes-Oxley Act

SOX Act can be considered as an exogenous shock to insider trading return, as the shorter reporting lag contributes to the transmission of private information to public. Theoretically, this weakens the role of insider trading as a valid substitute for explicit compensation. The coefficient for the interaction term δ in 3.2 will be of interest. Following discussions focus on the 180-day buy-and-hold excess returns or profits

As shown in Column (8) of Table 3.35, the substitution effect of insider trading became less significant after SOX was put in place. Before 2002, 1% decrease in cash compensation

leads to 21.1% increase in trading returns; while after 2002, the same decrease leads to %14.2 increase in trading returns. The coefficient is statistically significant at 5%. Column (8) of Table 3.37 confirms the finding. The increase in trading returns is 4.8% lower after 2002 when total compensation decreases by 1%.

In terms of dollar amount in trading profits, the results are much less significant. Column (8) of Table 3.36 indicates that increase in trading profits is only $2.98 lower after 2002 when cash compensation decreases by 1%. The effect of SOX is even smaller and not statistically significant when total compensation changes, as shown in Column (8) of Table 3.37.

These results show that the substitution effect between cash compensation and insider trading return is robust to decreasing excess insider trading return. The insignificant effect on total dollar amount may be due to the accordingly adjustment of transaction volume. That is to say, as the relative information advantages weaken, executives can adjust the transaction amount to finally reach the same effect of substitution.

3.4.5 Transaction Volume

We have documented that executives' insider trade generate more profit after cash compensation decreased. To better understand how important the role of informative trading, measured by the insider trading return, we have to take into account of another choice variable by executives: transaction volume.

As indicated in Table 3.39, average insider trading volume increased by 16200 shares after 1% drop in cash compensation. However, this channel has been shut down after SOX Act put in place. Therefore, after the reform in 2002, almost all of the substitution effect comes from the more informative insider trading.

3.4.6 Total Compensation

Both cash compensation and insider trading profits are explicit compensation. We would expect most of the substitution effect is within this category, and insider trading profit is less sensitive to change in total compensation. However, as the variation of cash compensation account for most variation of total compensation, the insider trading return should still be sensitive to total compensation.

As indicated in Columns (1), (3), (5) and (7) of Table 3.37, all coefficients on the logarithm of total compensation are statistically significant at least at 5%. Column (1) indicates that 1% decrease in cash compensation leads to 2.5% increase in the 30-day buy-and-hold excess return, while Column (7) shows that 1% decrease in cash compensation leads to 15.9% increase in the 180-day buy-and-hold excess return for the whole sample. These results again confirm our hypothesis that insider trading and executive compensation are substitutes.

Columns (1), (3), (5) and (7) of Table 3.38 confirm above results, although only the coefficient in Column (7) is statistically significant at 5%. We find that a 1% decrease in total compensation leads to a \$6,800 increase in the 180-day buy-and-hold excess trading profit. For the average firm, this indicates that a \$19,997 decrease in total compensation induces an increase of \$6,800 over the 6-month period. Trading profit is less sensitive to changes in total compensation than changes in cash compensation, but extra trading profits still make up 1/3 of the losses in total compensation.

Cautious should be taken when we measure the relationship between total compensation and insider trading return. The negative relationship may be artificial due to mean reversion of stock prices, as we point out in Section 4.1. Since stock and option grants made up a large part of the compensation package, a change in stock price may induce opposite changes in total compensation and future returns

3.5 Robustness Tests

We perform additional tests to ensure that our inquiries are correctly specified.

In evaluating the correlation between insider trading and total compensation in Section 3.4, we define total compensation as cash plus stock grants and net value of options exercised (variable TDC2 in Execucomp). Here we use an alternative measure, which replaces net value of options exercised with total value of options granted using the Black-Scholes formula (variable TDC1 in Execucomp). Results from fitting equations (1) and (2) are shown in Table A.1. Comparing the results with those in Table 3.37 and 3.38, similar patterns exist. Overall, the negative relation between insider trading and total compensation is somewhat more pronounced for the alternative compensation measure.

We also use the industry return as our benchmark return. Results will are consistent.

3.6 Discussion

Both cash compensation and insider trading profits are forms of direct compensation. The latter one is better controlled by executives themselves, compared to other form of compensation. Our findings, although partially conclusive given our reliance on the assumption that any unobservable characterizes are time invariant and captured in firm fixed effect, provide evidence that executives actively make adjustment of insider trading behavior to counteract any exogenous shock to other component of compensation.

Existing regulation concerning insider trading emphasize the importance of limiting chances to profit from private information. On the other hand, policies concerning compensation are narrowed in the explicit compensation contract. Unless we can completely shut down the prior channel, which is unreasonable and inefficient by existing research, executives can always get around of the regulation and motivate them to exploit more private

information. Based on our result, this effect is both sensitive and significant.

The weakened effect is not only restricted to policy regulation. Shareholder proposals or vote against management compensation has been showed to effectively impact on executives' compensation level. It is intriguing to see whether the seemingly effect is compromised once taken into account of the insider trading profit. On the other hand, previous research linking compensation structure and other Corporate Governance measures may be revised as the variance of direct compensation part may not be as volatile as originally calculated. This can be a good starting point for future research.

Tables

Table 3.1: SUMMARY STATISTICS FOR FINANCIAL VARIABLES

Firms in the sample are categorized as always non-group affiliated, ever change group status during the first six years, and always group affiliated. For each variable, the mean level is reported, and the standard deviation is shown in the parenthesis. *Tangibility* is the ratio of tangible fixed asset over total asset. *Leverage* is the total asset over equity. The total asset growth rate and total revenue growth rate are gross growth rates, calculated as level at t over the level at $t-1$. Market share is calculated as the ratio of revenue over the total revenue generated in the respective country, industry (4-digit NAICS 2007 codes) and year.

	Always Non-group	Ever Change Group Status	Always Group	All
Number of Observations	1770524	115523	173641	2059688
Number of Firms	927987	39267	81528	1048782
Total Assets (in millions)	1.375	11.308	13.568	2.960
	(5.781)	(18.808)	(20.621)	(9.999)
Fixed Assets (in millions)	0.526	4.545	5.359	1.159
	(2.638)	(8.652)	(9.493)	(4.500)
Tangibility	0.245	0.215	0.210	0.240
	(0.284)	(0.297)	(0.2971)	(0.286)
Revenue (in millions)	3.119	47.295	63.613	10.236
	(465.6)	(1147.4)	(700.4)	(544.6)
Revenue/Total Assets$_{t-1}$	2.628	1.819	1.760	2.516
	(2.823)	(2.172)	(2.190)	(2.762)
Gross Profit/Total Assets	1.326	0.673	0.648	1.238
	(1.875)	(1.156)	(1.214)	(1.824)
Gross Profit Margin (%)	50.291	37.379	39.831	48.784
	(33.626)	(31.339)	(32.741)	(33.692)
EBITDA/Total Assets$_{t-1}$	0.185	0.025	0.013	0.162
	(0.609)	(0.419)	(0.411)	(0.588)
EBIT/Total Assets$_{t-1}$	0.125	−0.032	−0.040	0.102
	(0.702)	(0.495)	(0.483)	(0.678)
Leverage	6.298	8.424	9.691	6.703
	(21.931)	(28.848)	(33.330)	(23.555)
Total Assets Growth Rate	1.481	1.503	1.464	1.481
	(1.407)	(1.623)	(1.636)	(1.446)
Revenue Growth Rate	1.487	1.641	1.591	1.506
	(1.565)	(1.993)	(1.95)	(1.635)
Market Share (4 digit NAICS) (‰)	0.522	2.072	1.962	0.718
	(2.157)	(4.655)	(4.604)	(2.666)

Table 3.2: SUMMARY STATISTICS FOR PROFILE AND LABOR CHARACTERISTICS

Firms in the sample are categorized as always non-group affiliated, ever change group status during the first six years, and always group affiliated. For each variable, the mean level is reported, and the standard deviation is shown in the parenthesis. $Legalform$ code indicates the incorporation form is public limited company (1), private limited company (2), or other forms (3). ln(Marginal Productivity of Labor) is the logarithm of marginal productivity of labor as Larrain and Stumpner (2013) for manufacturing firms. Top Manager Tenure for each manager indicates the total years serving as a top manager across positions. The firm average is reported in the table. Top Manager Tenure (same industry) further requires the experience is in the same industry (2-digit NAICS 2007 codes).

	Always Non-group	Ever Change Group Status	Always Group	All
Age	2.914	3.058	3.088	2.937
	(1.448)	(1.383)	(1.430)	(1.444)
Age (first enter sample)	2.358	2.004	2.474	2.354
	(1.466)	(1.209)	(1.473)	(1.460)
$Lagalform$ Code	1.947	1.812	2.004	1.944
	(0.508)	(0.658)	(0.677)	(0.535)
Number of Employees	13.301	62.187	70.936	21.4
	(38.629)	(104.502)	(111.873)	(58.484)
Wage per Employee	26.626	55.365	55.922	31.032
(in thousands, per year)	(31.673)	(39.619)	(39.837)	(34.630)
Revenue per Employee	181.104	434.956	464.220	221.302
(in thousands, per year)	(406.454)	(741.028)	(783.361)	(486.928)
Profit per Employee	6.576	7.903	8.116	6.794
(in thousands, per year)	(37.605)	(71.248)	(73.038)	(44.571)
Wage Expense/Revenue (%)	24.708	31.757	32.060	25.714
	(24.010)	(30.273)	(30.135)	(25.161)
ln(Marginal Productivity of Labor)	4.443	5.754	5.871	4.665
(manufacturing sector only)	(1.578)	(1.125)	(1.066)	(1.593)
Number of Top Managers	1.237	1.271	1.2641	1.243
	(0.527)	(0.592)	(0.593)	(0.540)
Proportion of New Manager	0.046	0.106	0.119	0.058
	(0.193)	(0.285)	(0.302)	(0.217)
Top Manager Tenure	7.360	13.541	18.906	9.084
	(16.469)	(22.029)	(29.452)	(19.148)
Top Manager Tenure (Same Industry)	6.887	12.630	17.725	8.499
	(15.061)	(20.642)	(27.690)	(17.698)

Table 3.3: CHANGE OF PROFITABILITY AROUND THE GROUP STATUS CHANGE: DIFFERCEN-IN-DIFFERENCE ANALYSIS BASED ON NONPARAMETRIC MATCHING

This table shows the change of EBITDA/Total Assets$_{t-1}$ two years around firms unintentionally join (Panel A) and leave (Panel B) business groups. In Panel A, firms in the treatment sample unintentionally join business groups. The control sample includes always non-group firms exactly matched with the age, legal incorporation form, country, industry, and year. In Panel B, firms in the treatment sample unintentionally leaves business groups. The control sample includes always group firms exactly matched with the age, legal incorporation form, country, industry, and year. Column I reports the average level of EBITDA/Total Assets$t-1$ two years before the group status change. Column II reports the average level two years after the change. The third column reports the profitability change, calculated by the difference between the first two columns. The Diff-in-Diff statistics are differences of the profitability change across the treatment sample and control sample. Standard deviation is reported in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of EBITDA/Total Asset$_{t-1}$. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	EBITDA / Total Assets$_{t-1}$			
	Two Years Before (I)	Two Years After (II)	Difference Across Time (II) - (I)	
Panel A. Unintentionally Joining Business Groups				
Treatment Sample (T)	0.017	0.045	0.028***	
	(0.004)	(0.004)	(0.004)	
Control Sample (C)	0.023	0.033	0.010***	
	(0.002)	(0.002)	(0.002)	
			Diff-in-Diff	Mann Witney $\|z\|$
Difference Across Samples (T - C)	-0.006		**0.018*** **	2.362***
	(0.004)		(0.005)	
			[11.11%]	
Panel B. Unintentionally Leaving Business Groups				
Treatment Sample (T)	0.018	0.032	0.014***	
	(0.005)	(0.005)	(0.005)	
Control Sample (C)	0.028	0.041	0.013***	
	(0.002)	(0.003)	(0.003)	
			Diff-in-Diff	Mann Witney $\|z\|$
Difference Across Samples (T - C)	-0.010		**0.001**	0.308
	(0.006)		(0.006)	
			[0.62%]	

Table 3.4: GROUP AFFILIATION / DETACHMENT EFFECT ON THE PROFITABILITY – UNINTENTIONAL CHANGE OF GROUP STATUS

Panel A and B report results for the group affiliation and group detachment respectively. Column I and II are based on firms ever unintentionally join (leave) business groups. Column III and Column IV add firms always non-group (group) affiliated. Column V and Column VI further add firms always (never) group affiliated. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. *LagParentInd* is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Through all of the columns, firm fixed effects and country-year dummies are controlled. Column II, IV, and VI further control the firm level variables, including one year lagged ln(total assets), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Dependent Variable	EBITDA / Total Assets$_{t-1}$					
	(I)	(II)	(III)	(IV)	(V)	(VI)
Panel A. Unintentionally Joining Business Groups						
GroupDummy	**0.015*** **	**0.012** **	**0.020*** **	**0.022*** **	**0.018*** **	**0.019*** **
	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
	[9.26%]	[7.41%]	[12.35%]	[13.58%]	[11.11%]	[11.73]
LagParentInd			0.001	0.003	0.000	0.002
			(0.004)	(0.004)	(0.004)	(0.004)
Sample	Ever join group	Ever join group	Ever join group Always non-group	Ever join group Always non-group	Ever join group Always group Always non-group	Ever join group Always group Always non-group
Observations	37447	36160	945169	945129	1042655	1042589
Number of firms	12866	12827	502952	502933	552164	552133
R-squared (Within)	0.011	0.017	0.015	0.015	0.014	0.015
R-squared (All)	0.646	0.653	0.827	0.828	0.827	0.827
Panel B. Unintentionally Leaving Business Groups						
GroupDummy	**-0.001**	**-0.003**	**-0.001**	**-0.006**	**-0.009**	**-0.009**
	(0.008)	(0.008)	(0.005)	(0.006)	(0.006)	(0.006)
	[-0.62%]	[-1.85%]	[-0.62%]	[-3.70%]	[-5.56%]	[-3.70%]
LagParentInd					-0.001	0.001
					(0.004)	(0.004)
Sample	Ever leave group	Ever leave group	Ever leave group Always group	Ever leave group Always group	Ever leave group Always group Always non-group	Ever leave group Always group Always non-group
Observations	18136	17780	191777	111509	1029338	1029300
Number of firms	7019	7004	88547	55981	546669	546656
R-squared (Within)	0.015	0.017	0.006	0.005	0.005	0.010
R-squared (All)	0.717	0.723	0.750	0.784	0.828	0.829
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls		Yes		Yes		Yes

Table 3.5: GROUP AFFILIATION / DETACHMENT EFFECT ON THE PROFITABILITY – GENERAL CHANGE OF GROUP STATUS

Panel A and B report results for the group affiliation and group detachment respectively. Column I and II are based on firms ever join (leave) business groups. Column III and Column IV add firms always non-group (group) affiliated. Column V and Column VI further add firms always (never) group affiliated. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. *LagParentInd* is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Through all of the columns, firm fixed effects and country-year dummies are controlled. Column II, IV, and VI further control the firm level variables, including one year lagged *ln*(total asset), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Dependent Variable	EBITDA / Total Asset$_{t-1}$					
	(I)	(II)	(III)	(IV)	(V)	(VI)
Panel A. Joining Business Groups						
GroupDummy	**0.008*** **	**0.005**	**0.015*** **	**0.016*** **	**0.014*** **	**0.015*** **
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
LagParentInd			0.001	0.003	0.000	0.001
			(0.004)	(0.004)	(0.003)	(0.003)
Sample	Ever join group	Ever join group	Ever join group Always non-group	Ever join group Always non-group	Ever join group Always group Always non-group	Ever join group Always group Always non-group
Observations	97118	94192	991083	991036	1088569	1088496
Number of firms	38086	37964	527217	527193	576429	576393
R-squared (Within)	0.010	0.014	0.014	0.015	0.011	0.013
R-squared (All)	0.686	0.693	0.827	0.828	0.826	0.827
Panel B. Leaving Business Groups						
GroupDummy	**-0.010** **	**-0.009***	**-0.007***	**-0.008** **	**-0.010***	**-0.011** **
	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)
LagParentInd					-0.001	0.001
					(0.004)	(0.004)
Sample	Ever leave group	Ever leave group	Ever leave group Always group	Ever leave group Always group	Ever leave group Always group Always non-group	Ever leave group Always group Always non-group
Observations	73526	72775	247167	240184	1079468	1079428
Number of firms	36366	36329	117894	115680	575605	575590
R-squared (Within)	0.008	0.011	0.006	0.008	0.003	0.009
R-squared (All)	0.754	0.758	0.754	0.758	0.827	0.828
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls		Yes		Yes		Yes

Table 3.6: EX-ANTE DIFFERENCE BETWEEN FUTURE GROUP FIRMS AND OTHER NON-GROUP FIRMS

This table investigates the ex-ante difference between firms that would unintentionally join business groups next year, and other non-group firms. Regressions are based on all non group firms with at least one parent corporate shareholder. $TreatSample$ is a dummy variable which takes value 1 if the firm would unintentionally join a business group next year, and 0 otherwise. The total asset growth rate and total revenue growth rate are gross growth rates, calculated as level at t over the level at $t-1$. $Tangibility$ is the ratio of tangible fixed asset over total asset. $Leverage$ is the total asset over equity. $Legal form$ code indicates the incorporation form is public limited company (1), private limited company (2), or other forms (3). Firm fixed effects and country-year dummies are controlled. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Dependent Variables	Revenue (Million) (I)	Revenue Growth (II)	EBITDA/TOAS$_{t-1}$ (III)	EBIT/TOAS$_{t-1}$ (IV)	Asset Growth (V)	No. of Employees (VI)
$TreatSample$	**-11.368**	**-0.323**	**0.016**	**0.012**	**-0.202**	**0.213**
	(9.944)	(3.029)	(0.041)	(0.046)	(0.401)	(0.523)
ln(Total Assets)	0.835*	11.69***	0.694***	1.319***	1.039***	5.223***
	(0.481)	(3.716)	(0.144)	(0.285)	(0.021)	(0.223)
$Leverage$	0.013**	-0.109	-0.002***	-0.003***	0.013***	-0.003
	(0.007)	(0.074)	(0.000)	(0.001)	(0.000)	(0.004)
Age	14.871***	10.470	-0.027	-0.025	0.128	3.100
	(4.393)	(10.020)	(0.033)	(0.060)	(0.133)	(3.442)
$Tangibility$	1.574	0.517	-0.958***	-1.392***	-0.474***	4.566***
	(1.506)	(10.770)	(0.323)	(0.403)	(0.074)	(0.854)
$LagalForm$	47.275	3.307	0.162	0.255	-0.133	-3.000
	(48.479)	(2.049)	(0.100)	(0.167)	(0.160)	(5.365)
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Sample	All Non-group Firms with Corporate Parent Shareholder					
Observations	235671	125651	306834	306802	171603	187081
Number of firms	125597	69889	156462	156445	92931	101149
R-squared (Within)	0.005	0.009	0.012	0.016	0.170	0.072
R-squared (All)	0.992	0.889	0.751	0.604	0.693	0.979

Table 3.7: EX-ANTE DIFFERENCE BETWEEN FUTURE NON-GROUP FIRMS AND OTHER GROUP FIRMS

This table investigates the ex-ante difference between firms which would leave business groups unintentionally next year, and other group firms. Regressions are based on all group firms. $TreatSample$ is a dummy variable which takes value 1 if the firm would unintentionally leave a business group next year, and 0 otherwise. The total asset growth rate and total revenue growth rate are gross growth rates, calculated as level at t over the level at $t-1$. $Tangibility$ is the ratio of tangible fixed asset over total asset. $Leverage$ is the total asset over equity. $Legal form$ code indicates the incorporation form is public limited company (1), private limited company (2), or other forms (3). Firm fixed effects and country-year dummies are controlled. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Dependent Variables	Revenue (Million) (I)	Revenue Growth (II)	EBITDA/TOAS$_{t-1}$ (III)	EBIT/TOAS$_{t-1}$ (IV)	Asset Growth (V)	No. of Employees (VI)
TreatSample	**-6.414**	**9.288**	**-0.206**	**-0.207**	**-0.051**	**0.056**
	(5.371)	(5.796)	(0.158)	(0.158)	(0.055)	(0.744)
ln(Total Assets)	0.525	36.55*	-1.246	-0.865	1.029***	11.720***
	(1.033)	(19.460)	(1.339)	(1.346)	(0.026)	(0.524)
Leverage	-0.003	-0.107	-0.003	0.002	0.002***	-0.021***
	(0.028)	(0.066)	(0.003)	(0.003)	(0.000)	(0.007)
Age	6.692**	-16.930**	0.329	0.231	-1.359***	-1.904
	(3.400)	(6.891)	(0.334)	(0.0334)	(0.061)	(2.127)
Tangibility	40.277***	29.72	4.087	4.587	-0.485***	15.880**
	(10.081)	(45.460)	(4.659)	(4.670)	(0.115)	(2.470)
LagalForm	-218.731	608.200	0.256	0.259	0.310	-49.830*
	(141.144)	(586.3)	(0.291)	(0.285)	(0.328)	(27.010)
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Sample			All Group Firms			
Observations	150781	81019	178058	178007	97618	104316
Number of firms	73658	42334	85748	85728	50721	152169
R-squared (Within)	0.010	0.006	0.005	0.004	0.180	0.079
R-squared (All)	0.936	0.645	0.948	0.968	0.651	0.976

Table 3.8: GROUP AFFILIATION EFFECT IS STONGER ON RELATIVELY SMALLER FIRMS

This table investigates the variation of group affiliation effect, based on firms unintentionally join groups. Panel A reports summary statistics for the relative size of new firms, against the forthcoming business group and first layer parent shareholders. Total assets is used as the proxy for size. Panel B reports regression results. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. $I_{\text{rel. group size} > \text{median}}$ indicates whether the relative size (against group) is bigger than the median level reported in the Panel A. $I_{\text{rel. parent size} > \text{median}}$ indicates whether the relative size (against first layer parent shareholder) is bigger than the median level. Through all of the columns, firm fixed effects, country-year dummies and firm-level control variables are included. Firm controls include one year lagged ln(total assets), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Panel A. Summary Statistics

	No. of Firms	Min.	Median	Max.	Mean	S.D.
Total Assets / Group Total Assets	12866	0	6.1%	98%	11.4%	14.1%
Total Assets / Parent Average Assets	12866	0	17.0%	99%	25.9%	25.5%

Panel B. Regression Results

	Dependent Variable: EBITDA / Total Asset$_{t-1}$					
	(I)	(II)	(III)	(IV)	(V)	(VI)
GroupDummy	**0.028*** **	**0.039*** **	**0.037*** **	**0.019*** **	**0.029*** **	**0.026*** **
	(0.008)	(0.004)	(0.005)	(0.007)	(0.008)	(0.008)
GroupDummy × $I_{\text{rel. group size} > \text{median}}$	**-0.030*** **	**-0.032*** **	**-0.033*** **			
	(0.008)	(0.011)	(0.011)			
GroupDummy × $I_{\text{rel. parent size} > \text{median}}$				**-0.016*** **	**-0.019*** **	**-0.020*** **
				(0.008)	(0.010)	(0.010)
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Ever Join group	Ever Join group Always non-group	Ever Join group Always non-group Always group	Ever Join group	Ever Join group Always non-group	Ever Join group Always non-group Always group
Observations	36162	945150	1042615	36162	945150	1042615
Number of firms	12827	502946	552151	12827	502946	552151
R-squared (Within)	0.017	0.015	0.015	0.017	0.015	0.015
R-squared (All)	0.653	0.828	0.827	0.653	0.828	0.827

Table 3.9: GROUP DETACHMENT EFFECT IS HOMOGENEOUSLY INSIGNIFICANT

This table investigates the variation of group detachment effect, based on firms unintentionally leave groups. Panel A reports summary statistics for the relative size of new firms, against the previous business group and first layer parent shareholders. Total assets is used as the proxy for size. Panel B reports regression results. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. $I_{\text{rel. group size} > \text{median}}$ indicates whether the relative size (against group) is bigger than the median level reported in the Panel A. $I_{\text{rel. parent size} > \text{median}}$ indicates whether the relative size (against first layer parent shareholder) is bigger than the median level. Through all of the columns, firm fixed effects, country-year dummies and firm-level control variables are included. Firm controls include one year lagged ln(total asset), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Panel A. Summary Statistics

	Num. of Firms	Min.	Median	Max.	Mean	S.D.
Total Assets / Group Total Assets	7004	0	6.1%	98.9%	15.5%	21.9%
Total Assets / Parent Average Assets	7004	0	20.9%	99.9%	39.2%	38.9%

Panel B. Regression Results

	Dependent Variable: EBITDA / Total Assets$_{t-1}$					
	(I)	(II)	(III)	(IV)	(V)	(VI)
GroupDummy	**-0.011**	**-0.010**	**-0.013***	**-0.010**	**-0.009**	**-0.012***
	(0.008)	(0.007)	(0.007)	(0.009)	(0.007)	(0.007)
GroupDummy × $I_{\text{rel. group size} > \text{median}}$	**0.009**	**0.008**	**0.010**			
	(0.008)	(0.008)	(0.008)			
GroupDummy × $I_{\text{rel. parent size} > \text{median}}$				**0.009**	**0.011**	**0.010**
				(0.009)	(0.009)	(0.008)
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Ever Leave group	Ever Leave group Always group	Ever Leave group Always group Always non-group	Ever Leave group	Ever Leave group Always group	Ever Leave group Always group Always non-group
Observations	17780	185189	1029300	17780	185189	1029300
Number of firms	7004	86352	546656	7004	86352	546656
R-squared (Within)	0.018	0.008	0.009	0.018	0.008	0.009
R-squared (All)	0.723	0.754	0.829	0.723	0.754	0.829

Table 3.10: GROUP AFFILIATION LEADS TO REVENUE-DRIVEN GROWTH

Regressions are based on all firms unintentionally joining business groups and firms always non-group affiliated. Column I to IV focus on all industries, while Column V only focus on the retail and wholesale trade sectors (NAICS code 42, 44 and 45). Market share is calculated as the ratio of revenue over the total revenue generated in the respective country, industry (4-digit NAICS 2007 codes) and year. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. *LagParentInd* is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Through all of the columns, firm fixed effects, country-year dummies, and firm level variables are included. Firm controls include one year lagged ln(total assets), leverage ratio, tangibility, age, and legal incorporation form. TOAS stands for Total Assets. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Dependent Variables	Revenue/TOAS$_{t-1}$ (I)	Gross Profit Margin (%) (II)	Gross Profit/TOAS$_{t-1}$ (III)	Market Share (‰) (IV)	EBITDA/TOAS$_{t-1}$ (V)
GroupDummy	**0.125*** **	**0.103**	**0.067** **	**0.115*** **	**0.032*** **
	(0.025)	(0.556)	(0.030)	(0.035)	(0.011)
	[4.97%]	[0.21%]	[5.41%]	[16.02%]	[19.81%]
LagParentInd	0.011	0.352***	0.022	0.000	-0.002
	(0.018)	(0.058)	(0.017)	(0.002)	(0.008)
Country×year dummies	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes
Industry	All	All	All	All	Retail and Wholesale Trade
Sample			Ever Join group + Always non-group		
Observations	852615	825046	825046	852378	237169
Number of firms	458063	449436	449436	457992	128925
R-squared (Within)	0.045	0.033	0.034	0.050	0.029
R-squared (All)	0.873	0.941	0.896	0.920	0.779

Table 3.11: AFFILIATION WITH POWERFUL GROUPS FURTHER INCREASES REVENUE AND MARKET SHARE

Panel A shows the summary statistics of the group's market share one year before the new firm unintentionally joins the group. It is calculated as the ratio of total revenue generated by all group members within the same industry as the new firm, over the total revenue generated in the respective country, industry (4-digit NAICS 2007 codes) and year. In Panel B, a cross term between *GroupDummy* and an indicator dummy is introduced in the regressions. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. $I_{\text{group share} > 75^{\text{th}} \text{ pctl.}}$ is equal to 1 if the group share is higher than the 75^{th} percentile, and 0 otherwise. Through all of the columns, firm fixed effects, country-year dummies, and firm level variables are included. Firm controls include one year lagged ln(total assets), leverage ratio, tangibility, age, and legal incorporation form. TOAS stands for Total Assets. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Panel A. Summary Statistics

		Percentile				
	No.	25th	50th	75th	Mean	S.D.
Group's Market Share (‰)	12843	0.069	0.353	1.970	6.462	28.224

Panel B. Regression Results

Dependent Variables	Revenue/TOAS$_{t-1}$	Gross Profit/TOAS$_{t-1}$	Market Share (‰)
	(I)	(II)	(III)
GroupDummy	0.091***	0.059*	0.100***
	(0.030)	(0.031)	(0.035)
	[3.62%]	[4.77%]	[13.93%]
GroupDummy $\times I_{\text{group share} > 75^{\text{th}} \text{ pctl.}}$	0.077***	0.079***	0.095**
	(0.038)	(0.033)	(0.047)
	[3.06%]	[6.38%]	[13.23%]
Country×year dummies	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes
Sample	Ever Join group + Always non-group		
Observations	852273	825003	852372
Number of firms	457991	449425	457990
R-squared (Within)	0.049	0.033	0.040
R-squared (All)	0.877	0.897	0.933

Table 3.12: CUMULATIVE MANAGER TURNOVER RATIO AFTER GROUP AFFILIATION

This table presents the average cumulative turnover ratios of top managers. Panel A shows the statistics for firms unintentionally join business groups. The first row reports the accumulative ratio of firms with at least one turnover, up to three years after joining business groups. The second row reports the accumulative ratio of new managers. The third row reports the percentage of new managers worked as top managers at other firms within the same group, among all new managers. Panel B repeat the statistics for firms join business groups, either unintentionally or not.

	Years After Joining Business Groups		
	First Year	Within Two Years	Within Three Years
Panel A. Unintentionally Join Business Groups			
Ratio of Firms With at least One Turnover[4]	13.25%	17.77%	19.56%
Ratio of New Managers[5]	9.30%	13.10%	14.69%
Ratio of New Managers from the Forthcoming Group	28.21%	28.56%	28.67%
Panel B. Generally Join Business Groups			
Ratio of Firms With at least One Turnover	15.78%	20.36%	22.14%
Ratio of New Managers	10.76%	14.72%	16.40%
Ratio of New Managers from the Forthcoming Group	35.37%	34.13%	33.84%

[4] On average, 7.52% of firms have at least one top manager turnover each year.

[5] On average, 5.8% of top managers are new managers.

Table 3.13: CHANGES OF TOP MANAGERS' CHARACTERISTICSS UPON UNINTENTIONAL GROUP AFFILIATION: DIFF-IN-DIFF ANALYSIS

This table shows the change of proportion of new managers (Panel A), management tenure (Panel B), and management tenure within the same industry (Panel C) two years around firms unintentionally joins business groups. The treatment sample includes firms unintentionally join business groups. The control sample includes always non-group firms exactly matched with the age, legal incorporation form, country, industry, and year. Column I reports the average level of two years before the group status change. Column II reports the average level two years after the change. The third column reports the change of relative variable, calculated by the difference between the first two columns. The Diff-in-Diff statistics are differences of the above changes across the treatment sample and control sample. Top Manager Tenure for each manager indicates the total years serving as a top manager across positions. The firm average level is reported in the table. Top Manager Tenure (same industry) further requires the experience is in the same industry (2-digit NAICS). ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Two Years Before (I)	Two Years After (II)	Difference Across Time (II) - (I)	
Panel A. Proportion of New Managers				
Treatment (T)	0.061	0.101	0.040***	
	(0.002)	(0.002)	(0.003)	
Control (C)	0.058	0.076	0.018***	
	(0.001)	(0.001)	(0.001)	
			Diff-in-Diff	Mann Witney $\|z\|$
Difference Across Samples (T - C)	0.003		**0.022*** **	**3.594*** **
	(0.002)		(0.003)	
Panel B. Top Manager Tenure (*position* × *year*)				
Treatment (T)	13.384	18.909	5.525***	
	(0.209)	(0.250)	(0.078)	
Control (C)	12.831	15.301	2.470***	
	(0.099)	(0.120)	(0.031)	
			Diff-in-Diff	Mann Witney $\|z\|$
Difference Across Samples (T - C)	0.553		**3.055*** **	**18.389*** **
	(0.275)		(0.080)	
Panel C. Top Manager Tenure within the Same Industry (*position* × *year*)				
Treatment (T)	12.279	17.530	5.521***	
	(0.191)	(0.250)	(0.082)	
Control (C)	11.938	14.210	2.272***	
	(0.090)	(0.120)	(0.033)	
			Diff-in-Diff	Mann Witney $\|z\|$
Difference Across Samples (T - C)	0.341		**2.979*** **	**21.671*** **
	(0.197)		(0.084)	

Table 3.14: CHANGES OF TOP MANAGERS' CHARACTERISTICSS UPON UNINTENTIONAL GROUP AFFILIATION: REGRESSION ANALYSIS

The dependent variable is the Cumulative Number of New Managers (Column I and II), the Top Manager Tenure (Column III and IV), and the Top Manager Tenure within the same industry (Column V and VI). Top Manager Tenure for each manager indicates the total years serving as a top manager across positions. The firm average level is used in the analysis. Top Manager Tenure (same industry) further requires the experience is in the same industry (2-digit NAICS). Regressions are based on firms unintentionally join business groups, and all non-group firms. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. *LagParentInd* is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Through all of the columns, firm fixed effects, country-year dummies, and firm level variables are included. Firm controls include one year lagged *ln*(total assets), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Cum. No. of New Manager		Top Manager Tenure		Top Manager Tenure (Same Industry)	
	(I)	(II)	(III)	(IV)	(V)	(VI)
GroupDummy	**0.082*** **	**0.081*** **	**2.205*** **	**2.202*** **	**2.064*** **	**2.060*** **
	(0.007)	(0.007)	(0.109)	(0.109)	(0.117)	(0.117)
	[58.43%]	[57.72%]	[24.27%]	[24.24%]	[24.28%]	[24.24%]
LagParentInd	0.018***	0.018***	0.359***	0.352***	0.377***	0.368***
	(0.004)	(0.004)	(0.058)	(0.058)	(0.067)	(0.06)
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls		Yes		Yes		Yes
Sample			Ever Join Group + Always Non-group			
Observations	379129	379123	379129	379123	378357	378351
Number of firms	200662	200660	200662	200660	200076	200074
R-squared (Within)	0.140	0.141	0.336	0.336	0.273	0.274
R-squared (All)	0.891	0.891	0.975	0.975	0.975	0.975

Table 3.15: CHANGES OF LABOR PRODUCTIVITY UPON UNINTENTIONAL GROUP AFFILIATION: REGRESSION ANALYSIS

The dependent variable is Revenue per Employee (Column I and II), Profit per Employee (Column III and IV), and the ln(Marginal Productivity of Labor) (Column V and VI). ln(Marginal Productivity of Labor) is the logarithm of marginal productivity of labor as Larrain and Stumpner (2013) for manufacturing firms. Regressions are based on firms unintentionally join business groups, and all non-group firms. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. *LagParentInd* is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Through all of the columns, firm fixed effects, country-year dummies, and firm level variables are included. Firm controls include one year lagged ln(total assets), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Revenue Per Employee		Profit Per Employee		ln(Marginal Productivity of Labor)	
	(I)	(II)	(III)	(IV)	(V)	(VI)
GroupDummy	**28.34*** **	**28.06*** **	**1.174*** **	**1.195*** **	**0.290*** **	**0.304*** **
	(7.122)	(7.114)	(0.465)	(0.466)	(0.011)	(0.011)
	[12.81%]	[12.68%]	[17.28%]	[17.59%]	[6.22%]	[6.52%]
LagParentInd	10.62**	9.915**	0.340	0.374	-0.006	-0.008
	(4.536)	(4.534)	(0.602)	(0.603)	(0.019)	(0.019)
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls		Yes		Yes		Yes
Industry	All	All	All	All	Manufacturing	Manufacturing
Sample	Ever Join Group + Always Non-group					
Observations	487619	487613	533446	533440	75281	75281
Number of firms	270130	270128	293338	293336	41788	41788
R-squared (Within)	0.051	0.054	0.009	0.009	0.128	0.132
R-squared (All)	0.932	0.933	0.817	0.817	0.965	0.965

Table 3.16: CHANGES OF LABOR CHARACTERISTICS UPON UNINTENTIONAL GROUP AFFILIATION: REGRESSION ANALYSIS

The dependent variable is number of employees (Column I and II), average wage (Column III and IV), and the percentage of wage expense over total revenue for the firm (Column V and VI). The average wage is the yearly average at per employee level, and in thousands. Regressions are based on firms unintentionally join business groups, and all non-group firms. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. *LagParentInd* is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Through all of the columns, firm fixed effects, country-year dummies, and firm level variables are included. Firm controls include one year lagged ln(total assets), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Number of Employees		Average Wage		Wage / Revenue (%)	
	(I)	(II)	(III)	(IV)	(V)	(VI)
GroupDummy	**0.840****	**0.814****	**1.468*****	**1.452*****	**-1.068*****	**-1.076*****
	(0.401)	(0.399)	(0.373)	(0.373)	(0.280)	(0.280)
	[3.93%]	[3.8%]	[4.73%]	[4.68%]	[-4.15%]	[-4.18%]
LagParentInd	0.281	0.201	0.623**	0.589*	-0.006	-0.008
	(0.225)	(0.225)	(0.314)	(0.314)	(0.019)	(0.019)
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls		Yes		Yes		Yes
Sample	Ever Join Group + Always Non-group					
Observations	533368	533362	515029	515023	624819	624813
Number of firms	293304	293302	293338	293336	337572	337570
R-squared (Within)	0.026	0.036	0.139	0.142	0.047	0.048
R-squared (All)	0.978	0.978	0.935	0.935	0.896	0.896

Table 3.17: GROUP AFFILIATION EFFECT ON THE PROFITABILITY - USING GROUP'S TOTAL HOLDING

This table shows the results when group's total holding is used to capture group affiliation. Panel A shows the summary statistics for Group Total Holding, which is total ownership stakes on the new firm from all group members. Panel B shows the regression results. Column I is based on firms ever unintentionally join business groups. Column II adds firms always non-group affiliated. Column III further adds firms always group affiliated. *GroupTotal* is equal to the group total holding when the firm is in a business group and 0 otherwise. *LagParentInd* is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Through all of the columns, firm fixed effects and country-year-industry (2-digit NAICS) dummies are controlled. Column II, IV, and VI further control the firm level variables, including one year lagged ln(total assets), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Panel A. Summary Statistics

	No. of Obs.	Min.	Median	Max.	Mean	S.D.
Group Total Holding	12827	0.328	0.980	1	0.865	0.226

Panel B. Regression Results

	Dependent Variable: EBITDA / Total Assets$_{t-1}$		
	(I)	(II)	(III)
GroupTotal	0.014***	0.027**	0.023***
	(0.007)	(0.006)	(0.006)
LagParentInd		0.005	0.003
		(0.004)	(0.004)
Country×year	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes
Sample	Ever Joining group	Ever Joining group Always non-group	Ever Joining group Always non-group Always group
Observations	36162	945140	1042608
Number of firms	12827	502936	552138
R-squared (Within)	0.025	0.020	0.015
R-squared (All)	0.652	0.828	0.827

Table 3.18: GROUP AFFILIATION EFFECT IS ROBUST TO DIFFERENT DEFINITIONS OF BUSINESS GROUPS

This table shows regression results when different cut-off values (α) for total group holding are imposed. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. *LagParentInd* is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Through all of the columns, firm fixed effects and country-year (2-digit NAICS) dummies, and firm-level control variables are included in the regression. Firm-level controls include one year lagged ln(total assets), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Dependent Variable	EBITDA / Total Assets$_{t-1}$							
	$\alpha = 15\%$	$\alpha = 20\%$	$\alpha = 25\%$	$\alpha = 30\%$	$\alpha = 35\%$	$\alpha = 40\%$	$\alpha = 45\%$	$\alpha = 50\%$
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
GroupDummy	**0.019*** **	**0.019** **	**0.020*** **	**0.022*** **	**0.020*** **	**0.022*** **	**0.022*** **	**0.021*** **
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)
	[11.76%]	[11.76%]	[12.38%]	[13.62%]	[12.38%]	[13.62%]	[13.62%]	[13.00%]
Country×year dummies	Yes							
Firm fixed effects	Yes							
Firm controls	Yes							
Sample	Ever Joining Group + Always Non-group							
Observations	910019	913177	917831	945129	929807	932447	936043	940310
Number of firms	483911	485419	487761	502933	493548	494801	496551	498621
R-squared (Within)	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.014
R-squared (All)	0.829	0.829	0.829	0.828	0.828	0.828	0.828	0.828

Table 3.19: GROUP AFFILIATION EFFECT IS BEYOND THE EVENT YEAR

The dependent Variable is EBITDA/Total Assets$_{t-1}$. $I_{group,t=k}$ take value of 1 if the firm is group affiliated and the observation is at k years after indirectly joining the group, and 0 otherwise. $LagParentInd$ is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Column I and II are based on firms ever unintentionally join business groups. Column III and Column IV add firms always non-group affiliated. Column V and Column VI further add firms always group affiliated. Through all of the columns, firm fixed effects and country-year (2-digit NAICS) dummies are controlled. Column II, IV, and VI further control the firm level variables, including one year lagged ln(total assets), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent Variable: EBITDA / Total Assets$_{t-1}$					
	(I)	(II)	(III)	(IV)	(V)	(VI)
$I_{group,t=0}$	0.017***	0.016***	0.019***	0.020***	0.017***	0.018***
	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
$I_{group,t=1}$	0.012**	0.012**	0.023***	0.028***	0.020***	0.023***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
$I_{group,t=2}$	0.006	0.006	0.021**	0.022**	0.021**	0.024**
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
$I_{group,t=3}$	-0.056	-0.034	0.007	0.001	0.001	0.004
	(0.071)	(0.074)	(0.017)	(0.017)	(0.017)	(0.017)
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls		Yes		Yes		Yes
Sample	Ever Joining group	Ever Joining group	Ever Joining group Always non-group	Ever Joining group Always non-group	Ever Joining group Always non-group Always group	Ever Joining group Always non-group Always group
Observations	37447	36162	1042608	945140	1042655	1042608
Number of firms	12866	12827	552138	502936	552164	552138
R-squared (Within)	0.026	0.026	0.013	0.019	0.015	0.015
R-squared (All)	0.646	0.653	0.827	0.829	0.827	0.811

Table 3.20: GROUP AFFILIATION EFFECT ON THE PROFITABILITY IS ROBUST TO INDUSTRY TRENDS

Regressions in this table further include country level industry trends. Column I and II are based on firms ever unintentionally join business groups. Column III and Column IV add firms always non-group affiliated. Column V and Column VI further add firms always group affiliated. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. *LagParentInd* is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Through all of the columns, firm fixed effects and country-year-industry (2-digit NAICS) dummies are controlled. Column II, IV, and VI further control the firm level variables, including one year lagged ln(total assets), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent Variable: EBITDA / Total Assets$_{t-1}$					
	(I)	(II)	(III)	(IV)	(V)	(VI)
GroupDummy	**0.014*** **	**0.011** **	**0.019*** **	**0.021*** **	**0.017*** **	**0.018*** **
	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
	[8.67%]	[6.81%]	[11.76%]	[13.00%]	[10.52%]	[11.14%]
LagParentInd			0.001	0.004	-0.001	0.000
			(0.004)	(0.004)	(0.004)	(0.004)
Country×year ×industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls		Yes		Yes		Yes
Sample	Ever Join group	Ever Join group	Ever Join group Always non-group	Ever Join group Always non-group	Ever Join group Always non-group Always group	Ever Join group Always non-group Always group
Observations	37447	36162	945169	945140	1042608	1042608
Number of firms	12866	12827	502952	502936	552138	552138
R-squared (Within)	0.083	0.087	0.014	0.015	0.013	0.014
R-squared (All)	0.672	0.678	0.828	0.829	0.827	0.828

Table 3.21: GROUP AFFILIATION EFFECT ON PROFITABILITY IS ROBUST TO ALTERNATIVE PROFITABILITY MEASURE

The dependent variable is EBIT/Total Assets$_{t-1}$. Column I and II are based on firms ever unintentionally join business groups. Column III and Column IV add firms always non-group affiliated. Column V and Column VI further add firms always group affiliated. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. *LagParentInd* is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Through all of the columns, firm fixed effects and country-year (2-digit NAICS) dummies are controlled. Column II, IV, and VI further control the firm level variables, including one year lagged ln(total assets), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Dependent Variable	EBIT / Total Assets$_{t-1}$					
	(I)	(II)	(III)	(IV)	(V)	(VI)
GroupDummy	**0.013****	**0.012****	**0.019*****	**0.021*****	**0.016*****	**0.018*****
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
	[12.72%]	[11.74%]	[18.59%]	[20.54%]	[15.65%]	[17.61%]
LagParentInd			0.002	0.004	0.001	0.003
			(0.005)	(0.005)	(0.005)	(0.005)
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls		Yes		Yes		Yes
Sample	Ever Joining group	Ever Joining group	Ever Joining group Always non-group	Ever Joining group Always non-group	Ever Joining group Always non-group Always group	Ever Joining group Always non-group Always group
Observations	37446	36165	945125	945119	1042586	1042568
Number of firms	12865	12827	502930	502928	552132	552125
R-squared (Within)	0.010	0.015	0.014	0.015	0.014	0.014
R-squared (All)	0.639	0.646	0.822	0.823	0.821	0.822

Table 3.22: SUMMARY STATISTICS

This table presents summary statistics for firms with dual-class shares with differential voting rights and matching competition information from the OECD for at least one year between 1990 and 2008. The voting premium is defined as $(P_H - PL)/(P_L - rv * P_H)$ where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. Votes per shares, high and low, are the per-share votes of the higher and lower rights shares, respectively. Votes low-to-high ratio is the firm ratio of votes of the low-to- high voting securities. Votes low-to-high per dividends is the ratio of votes of the low voting security per dollar of dividend divided by the votes of the high voting security per dollar of dividends. Product market regulation (PMR) is an OECD index (scale: 0 to 6) of the degree to which government policies restrict competition in product markets at the country level, available for 1998 and 2003. Regulatory impact (RI) is an OECD index that measures the degree of government regulation (scale: 0 to 6) affecting input markets. RI varies by industry and country and is available until 2003. Product and input market competition indexes are the negative of PMR and RI, respectively: Higher values indicate higher levels of competition. *Lnassets* is the natural logarithm of assets in U.S. dollars. Market-to-book ratio is the market value of equity plus the total value of assets minus the book value of equity divided by the value of assets. Net income/sales is the ratio of net income relative to the value of sales. Relative dividends is the ratio of the annual per-share dividend payments for the low-voting share to the annual per- share dividend payments to the high-voting security. GDP growth is the rate of growth in the gross domestic product. Market capitalization to GDP is the ratio of the total market value of listed companies to GDP. FDI inflow to GDP is the ratio of foreign direct investments (net inflows) relative to the value of GDP. Unemployment rate is the fraction of the labor force that is unemployed.

Variable	Number Firm-Year	Average	Median	Standard Deviation
Voting premium (ratio)	7599	0.319	0.053	0.978
Votes per share, high voting share	7599	5.116	1	32.816
Votes per share, low voting share	7599	0.222	0	2.017
Votes low-to-high ratio	7599	0.035	0	0.084
Votes low-to-high per dividends	4979	5.229	0.997	40.481
Product market competition index	1373	-1.61	-1.48	0.5
(-) Product market regulation (PMR) index				
Input competition index	7219	-0.136	-0.086	0.101
(-) regulatory impact (RI) index				
Ln assets (in millions, US dollars)	6783	7.241	7.104	3.361
Market to book (ratio)	6735	1.294	1.072	0.726
Net income / sales (ratio)	6757	0.023	0.034	0.288
Relative dividends (ratio)	4979	5.229	0.997	40.481
GDP growth (in percent)	7599	2.759	2.803	2.497
Market capitalization to GDP (ratio)	7599	75.583	62.038	46.028
FDI inflow to GDP (ratio)	7599	2.167	1.324	3.067
Unemployment rate (rate)	7576	6.586	6.1	2.667

Table 3.23: COUNTRY-LEVEL SUMMARY STATISTICS

Column I contains the total number of firm-year observations with dual-class shares and matching competition information. Column II presents country-level mean private benefit of control (PBC) as measured by the voting premium and defined in equation 2.4 in the text. Column III shows the standard deviation of the voting premium. Column IV shows the PBC for all dual-class firms, including those for which competition information was not available. Column V reports the average PBC by country estimated by Doidge (2004). Column VI and VII show the mean values of the indexes of product and input market competition, respectively. (-) Product Market Regulation (PMR) is the negative of the index of product market barriers from the OECD. (-)Regulatory Impact (RI) is the negative of the index of restrictions in four strategic industries whose main output is an intermediate input for other industries, also from the OECD. We use (-) PMR and (-) RI so that higher values indicate more competition. Columns VIII, IX and X report the country-level indexes of anti-directors rights, accounting standards and rule-of-law enforcement, all from La Porta et al. (2000). The correlation coefficient between the average voting premia and the average country-level variables is reported in the last row.

Country	Number of Observations in Sample	Estimated Voting Premium	Standard Deviation	Estimated Voting Premium	Voting Premium Doidge (2004)	(-) Product Market Regulation	(-) Regulatory Impact	Anti-Director	Acct. Stds	Rule of Law
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
Australia	49	0.066	0.149	0.066	0.155	-1.303	-0.061	4	75	10.00
Austria	156	0.269	0.555	0.269	0.366	-1.924	-0.139	2	54	10.00
Brazil	.	.	.	0.101	0.253	.	.	3	54	6.32
Canada	931	0.170	0.760	0.170	0.119	-1.156	-0.129	5	74	10.00
Chile	.	.	.	0.067	0.085	.	.	5	52	7.02
Colombia	.	.	.	0.181	0.295	.	.	3	50	2.08
Denmark	303	0.128	0.397	0.128	0.088	-1.337	-0.127	2	62	10.00
Finland	169	0.394	1.229	0.394	0..072	-1.264	-0.159	3	77	10.00
France	155	0.272	0.443	0.272	0.404	-2.036	-0.173	3	69	8.98
Germany	765	0.144	0.559	0.144	0.155	-1.629	-0.137	1	62	9.23
Italy	797	0.574	1.311	0.574	0.491	-2.062	-0.225	1	62	8.33
Korea	1576	0.589	1.193	0.632	0.67	-1.915	-0.109	2	62	5.35
Mexico	93	0.007	0.406	-0.071	0.008	-2.068	-0.162	1	60	5.35
Norway	194	0.333	1.118	0.333	0.042	-1.627	-0.225	4	74	10.00
Portugal	30	0.029	0.356	0.029	0.065	-2.042	-0.156	3	36	8.68
South Africa	.	.	.	0.048	0..076	.	.	5	70	4.42
Sweden	817	0.046	0.368	0.046	0.045	-1.566	-0.112	3	83	10.00
Switzerland	194	2.130	3.423	2.130	0.162	-2.012	-0.135	2	68	10.00
United Kingdom	128	0.649	1.375	0.649	0.157	-0.823	-0.129	5	78	8.57
United States	1242	0.123	1.017	0.118		-1.068	-0.111	5	71	10.00
Venezuela	.	.	.	0.063	0.134	.			40	6.37

Table 3.24: INTENSITY OF PRODUCT AND INPUT MARKET COMPETITION AND THE VOTING PREMIA: DIFFERENCES OF MEANS

This table shows the mean voting premia for firms with matching competition information. The voting premium is defined as $(P_H - PL)/(P_L - rv * P_H)$ where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. The first row reports data for firms with matching product market regulation (PMR) information from the OECD. The second row reports data for firms with matching regulatory impact (RI) information from the OECD. PMR and RI capture the level of anti-competitive regulations affecting, respectively, product and input markets. PMR captures regulations at the country level, while RI denotes country-industry-level restrictions. Column I shows mean voting premia for all firms. Columns II and III divide firms into two groups: "highly" and "less" competitive, respectively. A firm is classified as being in a highly competitive environment if the firm is subject to below median levels of anti-competitive regulation. The firm is classified as "less competitive" if regulatory restrictions are above the sample median. Standard errors are reported in parentheses. Standard errors are clustered at the country (PMR) and country-industry (RI) level. The number of firms used to compute the average is reported in squared brackets. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Measures of Competition	All Firms	Highly Competitive	Less Competitive	Difference (II)-(III)	Mann Whitney |z|
	(I)	(II)	(III)	(IV)	(V)
Product market competition	0.432**	0.235**	0.615**	-0.380**	5.920***
	(0.172)	(0.0915)	(0.219)	(0.178)	39.03%
	[708]	[342]	[366]		
Input competition	0.375***	0.288***	0.460***	-0.172*	1.768*
	(0.048)	(0.057)	(0.078)	(0.096)	38.36%
	[866]	[427]	[439]		

Table 3.25: BEYOND CROSS-COUNTRY REGRESSIONS: THE EFFECT OF THE INTENSITY OF PRODUCT AND INPUT MARKET COMPETITION ON THE VOTING PREMIUM

The dependent variable is the voting premium between shares of differential voting rights. The voting premium is defined as $(P_H - PL)/(P_L - rv * P_H)$ where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. Product and input market competition indexes are the negative of the product market regulation (PMR) and regulatory impact (RI) anti-competition regulation indexes, respectively: Higher values indicate higher levels of competition. PMR is an OECD index that captures the degree to which government policies restrict competition in product markets at the country level. RI is an OECD index that measures the degree of government regulation affecting input markets. RI varies by industry and country. Columns (I) and (V) report the pooled impact of the relevant competition measure on the voting premium. Columns (II) includes year controls and industry (two-digit ISIC)-fixed effect. Column (III) pluses the following yearly firm and country controls: ln firm assets, market-to-book ratio, net income to sales, the relative liquidity relative ratio of shares traded) and dividends of the high- and low-voting shares. Columns (V) includes year controls and country-fixed effects. Columns (VI) pluses industry fixed effect. Column (VII) includes the same controls as in Columns (IV) plus , GDP growth, the market capitalization of the domestic stock exchanges to GDP ratio, the ratio of foreign direct investment to GDP, and the unemployment rate. Standard errors are clustered at the country (Columns I to IV) and country-industry Columns V to VIII) level. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium							
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
Product market competition index	-0.655**	-0.623**	-0.512***	-1.519**				
(- PMR)	(0.288)	(0.217)	(0.116)	(0.615)				
Input competition index					-1.210***	-0.996***	-2.002*	-2.248***
(- RI)					(0.393)	(0.364)	(1.047)	(1.091)
Year dummies		Yes	Yes	Yes		Yes	Yes	Yes
Country dummies				Yes		Yes	Yes	Yes
Industry dummies		Yes	Yes	Yes			Yes	Yes
Firm controls			Yes	Yes				Yes
Country level controls								Yes
Observations	1373	1373	1373	1373	7173	7173	7173	7150
R-squared	0.073	0.131	0.178	0.254	0.011	0.120	0.172	0.194

Table 3.26: THE DISPERSION OF THE VOTING PREMIA WITHIN COUNTRIES

The dependent variable is the voting premium between shares of differential voting rights. The voting premium is defined as $(P_H - PL)/(P_L - rv * P_H)$ where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. All coefficients are obtained using quantile regressions estimated at different quantiles (90^{th}, 75^{th}, 50^{th}, 25^{th} and 10^{th} percentiles, respectively) of the voting premium distribution. Panel A shows the dispersion in the voting premia without additional controls. Panel B presents the dispersion in voting premia after controlling for country fixed effects. Bootstrapped standard errors are in parentheses. ***, ** and * denote significance at the 1, 5, an 10 percent levels, respectively.

	Dependent variable: voting premium				
	(I)	(II)	(III)	(IV)	(V)
	90th Conditional Percentile	75th Conditional Percentile	50th Conditional Percentile	25th Conditional Percentile	10th Conditional Percentile
Panel A:	0.902***	0.205***	0.085***	0.014***	-0.0895
	(0.208)	(0.045)	(0.021)	(0.005)	(0.071)
Year dummies	Yes	Yes	Yes	Yes	Yes
Observations	7599	7599	7599	7599	7599
Panel B:					
	0.452***	0.248***	0.112***	0.037**	-0.010
	(0.117)	(0.049)	(0.026)	(0.015)	(0.056)
Year dummies	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes
Observations	7599	7599	7599	7599	7599

Table 3.27: PRODUCT MARKET COMPETITION AND THE DISPERSION OF THE VOTING PREMIA

The dependent variables are the voting premium between shares of differential voting rights (Panels A and B) and the natural logarithm of the voting premium (Panel C). The voting premium is defined as $(P_H - PL)/(P_L - rv * P_H)$ where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. All coefficients are obtained using quantile regressions estimated at different quantiles (90^{th}, 75^{th}, 50^{th}, 25^{th} and 10^{th} percentiles, respectively) of the voting premium distribution. The panels below show the conditional effect of product market competition on the voting premium at each quantile of the voting premium distribution. The product market competition index is defined as the negative of the product market regulation (PMR) index: higher values indicate higher levels of competition. PMR is an OECD index that captures the degree to which government policies restrict competition in product markets at the country level. Panel A includes country and year dummies, and Panels B and C include country, year and industry (two-digit ISIC) dummies. Bootstrapped standard errors are in parentheses. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium				
	(I)	(II)	(III)	(IV)	(V)
	Percentile				
	90th	75th	50th	25th	10th
Panel A:					
Product market competition index	-1.217***	-0.870***	-0.464***	-0.234***	-0.889***
(- PMR)	(0.439)	(0.157)	(0.107)	(0.080)	(0.318)
F-Test: Coefficient different from 90th percentile					
Country and year dummies	Yes	Yes	Yes	Yes	Yes
Observations	1373	1373	1373	1373	1373
Panel B:					
Product market competition index	-1.149***	-0.923***	-0.477***	-0.262***	-0.494**
(- PMR)	(0.296)	(0.148)	(0.106)	(0.102)	(0.201)
F-Test: Coefficient different from 90th percentile		0.89	5.65**	9.05***	3.81*
Country and year dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
Observations	1373	1373	1373	1373	1373
Panel C:	Dependent variable: ln(voting premium)				
Product market competition index	-0.511***	-0.513***	-0.373***	-0.251**	-0.843
(- PMR)	(0.151)	(0.078)	(0.072)	(0.098)	(0.753)
F-Test: Coefficient different from 90th percentile		0	0.82	2.45	0.19
Country and year dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
Observations	1373	1373	1373	1373	1373

Table 3.28: INPUT MARKET COMPETITION AND THE DISPERSION OF THE VOTING PREMIA

The dependent variable is the voting premium between shares of differential voting rights (Panels A and B) and the natural logarithm of the voting premium (Panel C). The voting premium is defined as $(P_H - PL)/(P_L - rv * P_H)$ where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. All coefficients are obtained using quantile regressions estimated at different quantiles (90^{th}, 75^{th}, 50^{th}, 25^{th} and 10^{th} of the voting premium distribution. The panels below show the conditional effect of input competition on the voting premium at each quantile. Input market competition is defined as the negative of the Regulatory Impact (RI) index: higher values indicate higher levels of competition. Regulatory Impact (RI) is an OECD index that measures the degree of government regulation affecting input markets. RI varies by industry and country. Panel A includes country and year dummies, and Panels B and C include country and industry (two-digit ISIC) indicator variables. Bootstrapped standard errors are in parentheses. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium				
	(I)	(II)	(III)	(IV)	(V)
	Percentile				
	90th	75th	50th	25th	10th
Panel A:					
Input competition index	-0.408**	-0.142**	-0.034**	-0.018	-0.052*
(- RI)	(0.160)	(0.057)	(0.018)	(0.012)	(0.031)
F-Test: Coefficient different from 90th percentile					
Country and year dummies	Yes	Yes	Yes	Yes	Yes
Observations	7219	7219	7219	7219	7219
Panel B:					
Input competition index	-2.443***	-0.434***	-0.110	-0.102	-0.0819
(- RI)		20.25***	20.14***	22.32***	21.9***
F-Test: Coefficient different from 90th percentile					
Country and year dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
Observations	7219	7219	7219	7219	7219
Panel C:	Dependent variable: ln(voting premium)				
Input competition index	-1.574***	-0.462***	-0.121	-0.151***	-0.171
(- RI)	(0.471)	(0.159)	(0.083)	(0.058)	(0.124)
F-Test: Coefficient different from 90th percentile		7.53***	10.36***	9.48***	9.09***
Country and year dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
Observations	7219	7219	7219	7219	7219

Table 3.29: PRODUCT MARKET COMPETITION AND THE VOTING PREMIUM: WITHIN-FIRM ANALYSIS

The dependent variable is the voting premium between shares of differential voting rights. The voting premium is defined as $(P_H - PL)/(P_L - rv * P_H)$ where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. The product market competition index is defined as the negative of the product market regulation (PMR) regulation index: higher values indicate higher levels of competition. PMR is an OECD index that captures the degree to which government policies restrict competition in product markets at the country level. All specifications include firm- and year-fixed effects. Columns (I) and (II) report within-firm estimates for all firms in the sample. Columns (III) and (IV) show within-firm estimates only for manufacturing firms. Column (V) reports estimated coefficients for firms for which both dual-class shares were reported as having equal dividends. Columns (II) and (IV) to (V) include the following firm-level yearly controls: ln firm assets, market-to-book ratio, net income to sales, the relative liquidity (relative ratio of shares traded) and dividends of the high- and low-voting shares. Standard errors are clustered at the country level. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium				
	(I)	(II)	(III)	(IV)	(V)
Product market competition index	-1.339**	-1.988***	-1.338*	-2.324***	-1.910***
(- PMR)	(0.494)	(0.509)	(0.687)	(0.676)	(0.475)
Sample	All	All	Manuf.	Manuf.	All
					Same divs.
Year dummies	Yes	Yes	Yes	Yes	Yes
Firm fixed-effects	Yes	Yes	Yes	Yes	Yes
Firm controls		Yes		Yes	Yes
Observations	1373	1373	1373	1373	1373
R-squared	0.227	0.330	0.270	0.397	0.367

Table 3.30: INPUT COMPETITION AND THE VOTING PREMIUM: WITHIN-FIRM ANALYSIS

The dependent variable is the voting premium between shares of differential voting rights. The voting premium is defined as $(P_H - PL)/(P_L - rv * P_H)$ where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. The input competition index is defined as the negative of the regulatory impact (RI) index: higher values indicate higher levels of competition. RI is an OECD index that measures the degree of government regulation affecting input markets. RI varies by industry and country. Input competition relative index is the ratio of the input competition index relative to its firm sample average. Input competition relative decline (increase) 2% (15%) is an indicator variable equal to one if the relative index has declined (increased) by 2% (15%) or more, zero otherwise. All specifications include firm- and year-fixed effects. Columns (I) reports within-firm estimates for all firms in the sample. Columns (II) through (VIII) show within-firm estimates only for manufacturing firms. Column (VI) reports estimated coefficients for firms for which both dual-class shares were reported as having identical dividends irrespective of industry. Columns (IV) includes the following firm-level yearly controls: ln firm assets, market-to-book ratio, net income to sales, the relative liquidity (relative ratio of shares traded) and dividends of the high and low voting shares. Column (V) to (VIII) also include the following country-level controls: GDP growth, the market capitalization of the domestic stock exchanges to GDP ratio, the ratio of foreign direct investment to GDP, and the unemployment rate. Standard errors are clustered at the country and industry level. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium							
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
Input competition index	-3.202*	-10.31***						
(- RI)	(1.876)	(2.315)						
Input competition relative index			-1.029***	-1.163***	-1.074***	-1.012***		
			(0.237)	(0.307)	(0.294)	(0.308)		
Input competition relative decline 2%							0.022	
							(0.031)	
Input competition relative increase 2%							-0.034**	
							(0.014)	
Input competition relative decline 15%								0.050*
								(0.029)
Input competition relative increase 15%								-0.040***
								(0.014)
Sample:	All	Manuf.	Manuf.	Manuf.	Manuf.	Manuf. Same divs.	Manuf.	Manuf.
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls				Yes	Yes	Yes	Yes	Yes
Country controls					Yes	Yes	Yes	Yes
Observations	7219	3618	3618	3618	3604	2624	3208	3208
R-squared	0.079	0.133	0.131	0.138	0.257	0.128	0.069	0.070

Table 3.31: PRODUCT AND INPUT MARKET COMPETITION AND THE VOTING PREMIA: INTERACTIONS

The dependent variable is the voting premium between shares of differential voting rights. The voting premium is defined as $(P_H - PL)/(P_L - rv * P_H)$ where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. Product and input market competition indexes are the negative of the product market regulation (PMR)and regulatory impact (RI) anti-competitive regulation indexes, respectively: Higher values indicate higher levels of competition. PMR is an OECD index that captures the degree to which government policies restrict competition in product markets at the country level. RI is an OECD index that measures the degree of government regulation affecting input markets. RI varies by industry and country. All specifications include firm- and year-fixed effects. High profitability is an indicator variable equal to one if the firm's net income to sales in the first year the firm appears in the sample is above the 25th percentile of such profitability variable for the entire sample. High rule of law is a dummy equal to one if the firm is in a country with above-median rule of law La Porta et al. (2000). Standard errors are clustered at the country level (Columns (I) and (IV)) and country and industry level (Columns (II), (III) and (V). ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium				
	(I)	(II)	(III)	(IV)	(V)
Product market competition index	-1.348***			-0.861***	
(- PMR)	(0.182)			(0.152)	
Input competition index		-4.095	-11.71***		-7.801***
(- RI)		(2.589)	(2.457)		(1.716)
High profitability * product market competition index	0.685***	3.277	7.124***		
	(0.137)	(2.070)	(2.065)		
High profitability * input competition index					
High rule of law * product market competition index				1.241***	
				(0.161)	
High rule of law * input competition index					9.064***
					(1.802)
Sample:	All	All	Manuf.	All	All
Year dummies	Yes	Yes	Yes	Yes	Yes
Firm fixed-effects	Yes	Yes	Yes	Yes	Yes
Observations	1373	7219	3618	1373	7219
R-squared	0.237	0.082	0.135	0.281	0.107

Table 3.32: SUMMARY STATISTICS - COMPENSATION AND FIRM CHARACTERISTICS

	Number	Mean	Stand Dev.	1st pencentile	Median	99th percentile
Panel A: 1992-2002						
Annual cash compensation (in thousands)	5064	588.2	596.7	134.7	441.9	2412.5
Annual total compensation (in thousands)	5064	1532.2	3545.6	155.9	710.6	13367.8
Value of assets (in millions)	5062	4512.5	19902.9	35.6	860.4	48343.0
Market capitalization (in millions)	5062	6020.2	24872.6	27.3	865.7	101024.9
R&D expenditures (in millions)	3111	170.1	607.3	0	19.0	3505.0
Tobin's Q	5056	2.8	3.7	0.62	1.8	16.1
Panel B: 2003-2011						
Annual cash compensation (in thousands)	3778	721.0	896.3	182.9	515.2	4007.6
Annual total compensation (in thousands)	3778	2891.6	7240.9	219.2	1417.3	22297.2
Value of assets (in millions)	3723	7916.8	36403.7	51.9	1344.4	104912.0
Market capitalization (in millions)	3723	8349.5	26607.3	34.7	1312.6	135278.1
R&D expenditures (in millions)	2360	239.5	861.2	0	22.4	4900.0
Tobin's Q	3723	2.4	2.5	0.59	1.8	11.2

Table 3.33: SUMMARY STATISTICS - INSIDER TRADING RETURN AND PROFIT

	Number	Mean	Stand Dev.	1st pencentile	Median	99th percentile
Panel A: 1992-2002						
30-day holding-period excess return	5078	0.038	0.322	-0.634	0.016	0.905
60-day holding-period excess return	5072	0.071	0.402	-0.652	0.029	1.25
90-day holding-period excess return	5065	0.083	0.478	-0.736	0.022	1.51
180-day holding-period excess return	5064	0.127	0.710	-0.816	0.014	2.41
30-day holding-period excess profit (in thousands)	5078	1.69	3494	-11.75	0.022	34.29
60-day holding-period excess profit (in thousands)	5072	2.24	38.93	-14.11	0.043	50.10
90-day holding-period excess profit (in thousands)	5065	2.97	42.90	-18.15	0.031	61.06
180-day holding-period excess profit (in thousands)	5064	4.94	61.90	-26.71	0.016	115.65
Panel B: 2003-2011						
30-day holding-period excess return	3781	0.042	0.209	-0.479	0.020	0.755
60-day holding-period excess return	3780	0.073	0.328	-0.497	0.031	1.21
90-day holding-period excess return	3780	0.093	0.429	-0.523	0.032	1.57
180-day holding-period excess return	3778	0.171	0.751	-0.614	0.039	3.07
30-day holding-period excess profit (in thousands)	3781	1.28	17.05	-6.18	0.025	26.76
60-day holding-period excess profit (in thousands)	3780	1.66	21.85	-8.44	0.039	47.29
90-day holding-period excess profit (in thousands)	3780	2.03	21.82	-10.19	0.037	51.75
180-day holding-period excess profit (in thousands)	3778	3.83	40.18	-12.38	0.036	104.09

Table 3.34: SUMMARY STATISTICS - INSIDER TRADING VOLUME

	Number	Mean	Stand Dev.	1st pencentile	Median	99th percentile
Panel A: 1992-2002						
Volume at trade level (1000 shares)	5080	15.5	93.5	0.039	2.9	214.5
Per Trade Volume / Total Daily Volume	5039	0.048	0.094	0.00003	0.012	0.462
Panel B: 2003-2011						
Volume at trade level (1000 shares)	3783	14.0	86.9	0.033	2.3	198.2
Per Trade Volume / Total Daily Volume	3771	0.022	0.060	0.00002	0.003	0.293

Table 3.35: EXCESS RETURN AND LAGGED CASH COMPENSATION

	Dependent variable: excess return							
	30-day excess return		60-day excess return		90-day excess return		180-day excess return	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln(Cash Comp)	-0.037	-0.030	-0.094*	-0.091**	-0.118**	-0.109**	-0.217**	-0.211***
	(0.022)	(0.019)	(0.051)	(0.035)	(0.056)	(0.040)	(0.093)	(0.065)
ln(Cash Comp)*PostSOX		-0.006		0.027*		0.022		0.069**
		(0.013)		(0.014)		(0.016)		(0.029)
ln(MV) (million)		0.343		-1.200		-1.370*		-2.930**
		(0.289)		(0.750)		(0.741)		(1.12)
Tobin's Q		0.013***		0.032***		0.044***		0.068**
		(0.003)		(0.009)		(0.008)		(0.011)
Constant	0.265	0.297***	0.613*	0.601**	0.793**	0.743***	1.446**	1.073**
	(0.159)	(0.086)	(0.332)	(0.223)	(0.376)	(0.226)	(0.608)	(0.393)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8518	8457	8512	8451	8504	8443	8500	8439
R-squared	0.31	0.32	0.28	0.32	0.29	0.33	0.28	0.32

Table 3.36: INSIDER TRADING PROFIT AND LAGGED CASH COMPENSATION

	Dependent variable: excess return							
	30-day Profit		60-day Profit		90-day Profit		180-day Profit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln(Cash Comp)	-2.81*	-2.63**	-5.52	-4.98*	-7.82*	-7.38**	-13.61*	-12.41**
	(1.54)	(1.22)	(3.80)	(2.49)	(4.34)	(3.56)	(7.22)	(5.42)
ln(Cash Comp)*PostSOX		0.000		0.000		0.001		0.003**
		(0.001)		(0.001)		0.000		(0.001)
ln(MV) (million)		-5.010		-76.05		-100.04		-220.2
		(50.3)		(94.01)		(88.21)		(140.0)
Tobin's Q		1.07**		2.60*		3.01**		6.10***
		(0.50)		(1.40)		(1.21)		(2.05)
Constant	1.73	1.30	34.72	16.15	49.29*	26.93	87.15*	56.72
	(4.58)	(11.42)	(23.57)	(17.59)	(26.91)	(21.36)	(44.60)	(31.89)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8518	8457	8512	8451	8504	8443	8500	8439
R-squared	0.19	0.20	0.22	0.25	0.24	0.28	0.21	0.27

Table 3.37: EXCESS RETURN AND LAGGED TOTAL COMPENSATION

	Dependent variable: excess return							
	30-day excess return		60-day excess return		90-day excess return		180-day excess return	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln(Total Comp)	-0.025**	-0.024**	-0.054**	-0.059***	-0.086***	-0.086***	-0.159***	-0.170***
	(0.011)	(0.010)	(0.025)	(0.016)	(0.030)	(0.020)	(0.046)	(0.027)
ln(Total Comp)*PostSOX		-0.003		0.023*		0.026		0.048*
		(0.011)		(0.013)		(0.017)		(0.029)
ln(MV) (million)		-0.195		-0.945		-0.925		-1.98
		(0.259)		(0.649)		(0.616)		(0.898)
Tobin's Q		0.013***		0.033***		0.044***		0.069***
		(0.003)		(0.009)		(0.008)		(0.010)
Constant	0.223**	0.268***	0.423**	0.473**	0.646**	0.649***	1.258***	1.082***
	(0.094)	(0.058)	(0.194)	(0.200)	(0.241)	(0.209)	(0.367)	(0.330)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8511	8450	8505	8444	8497	8436	8493	8432
R-squared	0.31	0.32	0.29	0.32	0.29	0.34	0.29	0.33

Table 3.38: INSIDER TRADING PROFIT AND LAGGED TOTAL COMPENSATION

	Dependent variable: Profit							
	30-day Profit		60-day Profit		90-day Profit		180-day Profit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln(Total Comp)	-0.63	-0.22	-2.18	-1.57	-3.42	-2.95*	-6.80**	-6.44***
	(0.64)	(0.60)	(2.03)	(1.45)	(2.21)	(1.65)	(2.99)	(1.54)
ln(Total Comp)*PostSOX		-0.000		-0.000		-0.000		0.000
		(0.000)		(0.000)		(0.000)		(0.000)
ln(MV) (million)		-0.200		-61.00		-83.20		-190.01
		(50.4)		(-92.12)		(85.01)		(130.23)
Tobin's Q		0.97***		2.61*		3.03**		6.14***
		(0.14)		(1.40)		(1.21)		(2.03)
Constant	4.51	1.07**	1.64	-1.73	25.80	4.24	52.42**	28.35**
	(4.58)	(502.3)	(14.43)	(13.51)	(15.79)	(12.69)	(21.55)	(10.84)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8511	8450	8505	8444	8497	8436	8493	8432
R-squared	0.19	0.20	0.21	0.25	0.24	0.28	0.21	0.27

Table 3.39: INSIDER TRADING VOLUME

	Dependent variable: Trading Volume			
	(1)	(2)	(3)	(4)
ln(Currency Comp)	-16.2**	-16.2**		
	(6.6)	(5.9)		
ln(Currency Comp)*PostSOX		17.2**		
		(5.3)		
ln(Total Comp)			-6.2**	-6.3**
			(3.0)	(2.6)
ln(Total Comp)*PostSOX				2.2
				(2.9)
ln(MV) (thousand)		-0.293**		-0.283***
		(0.130)		(0.134)
Tobin's Q		0.287		0.372*
		(0.214)		(0.210)
Constant	111.3**	89.1*	56.1**	30.3
	(41.5)	(48.1)	(23.0)	(27.9)
Firm Fixed Effect	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes
Observations	8517	8456	8517	8456
R-squared	0.26	0.26	0.26	0.26

Figures

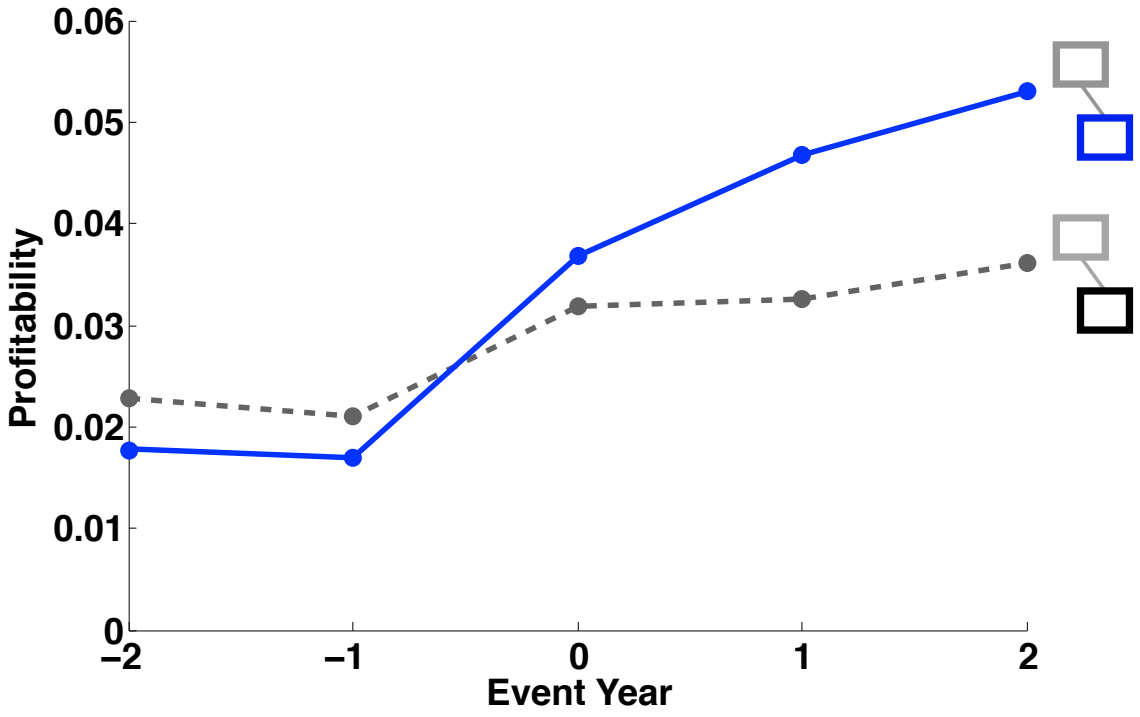


Figure 3.1: CHANGE OF THE PROFITABILITY UPON UNINTENTIONALLY JOINING BUSINESS GROUPS

This figure shows the change of EBITDA/Total Assets$_{t-1}$ two years around firms unintentionally join business groups. For each firm unintentionally joins business group at event year = 0, a control sample of always non-group firms is constructed, based on exact matching with the age, legal incorporation form, country, industry, and year. The solid line indicates firms unintentionally join business groups, while the dashed line indicates firms in the control sample.

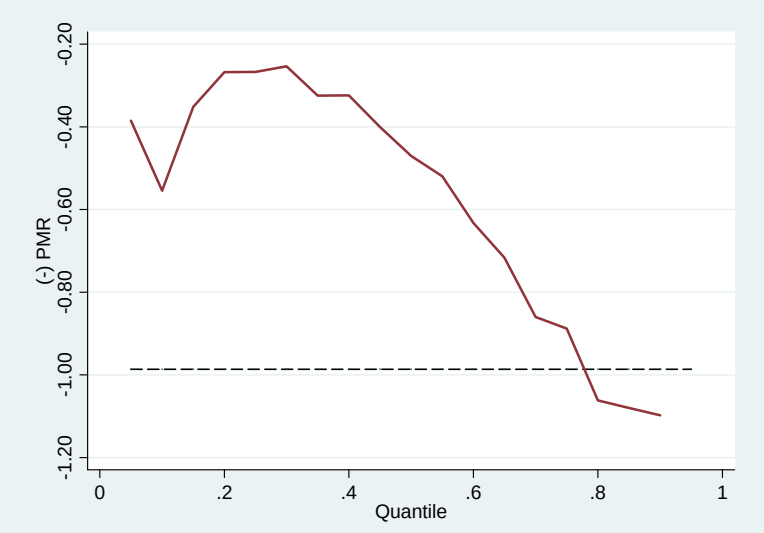


Figure 3.2: EFFECT OF PRODUCT MARKET COMPETITION ON THE VOTING PREMIUM

This figure shows the conditional effect of product market competition as measured by the negative of the product market regulation index (PMR) on the voting premium, the estimate of private benefits of control (PBC) used in this paper, at each point of the PBC distribution. The X-axis shows the quantile of the PBC distribution. The Y-axis shows the magnitude of the conditional effect of product market competition. The solid line plots the estimated conditional effect of product market competition on the voting premium at each percentile of the voting premium distribution, controlling for country, industry and year dummies.

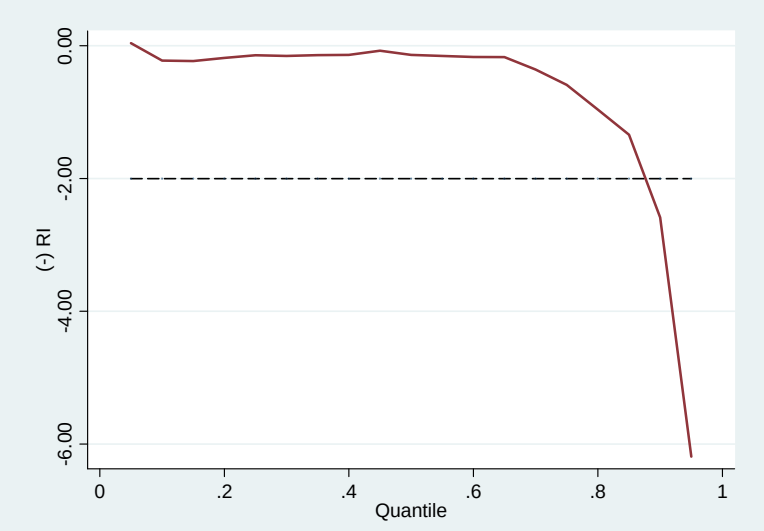


Figure 3.3: EFFECT OF INPUT COMPETITION (- RI) ON THE VOTING PREMIUM

This figure shows the conditional effect of input competition as measured by the negative of the regulatory impact index (RI) on the voting premium, the estimate of private benefits of control (PBC) used in this paper, at each point of the PBC distribution. The X-axis shows the quantile of the PBC distribution. The Y-axis shows the magnitude of the conditional effect of input competition. The solid line plots the estimated conditional effect of input competition on the voting premium at each percentile of the voting premium distribution, controlling for country, industry and year dummies.

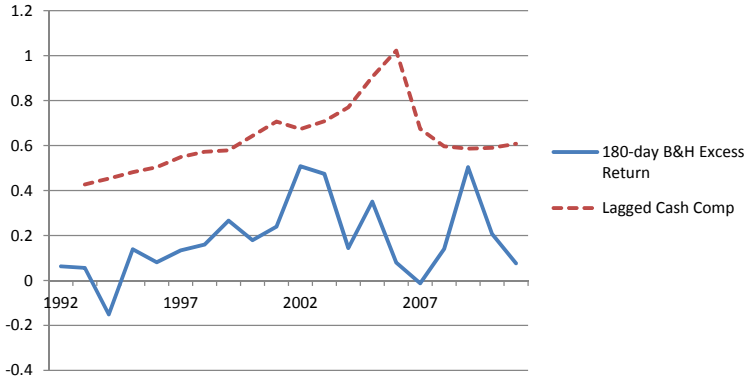


Figure 3.4: AVERAGE 180-DAY B&H EXCESS RETURN and LAGGED CASH COMPENSATION

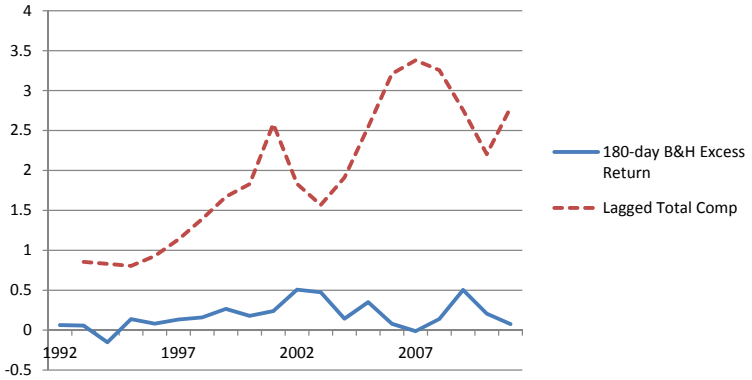


Figure 3.5: AVERAGE 180-DAY B&H EXCESS RETURN and LAGGED TOTAL COMPENSATION

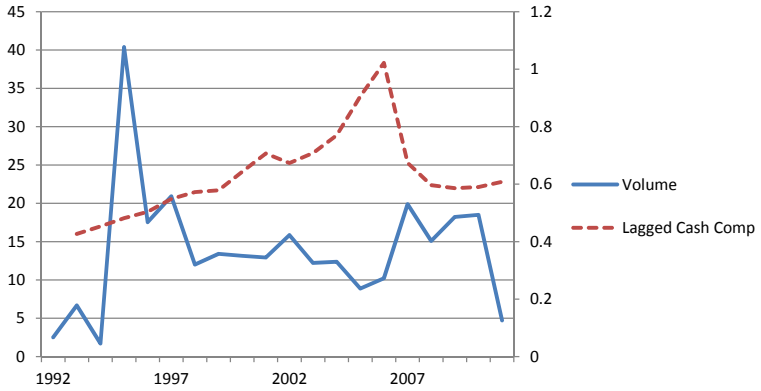


Figure 3.6: AVERAGE TRADING VOLUME and LAGGED CASH COMPENSATION

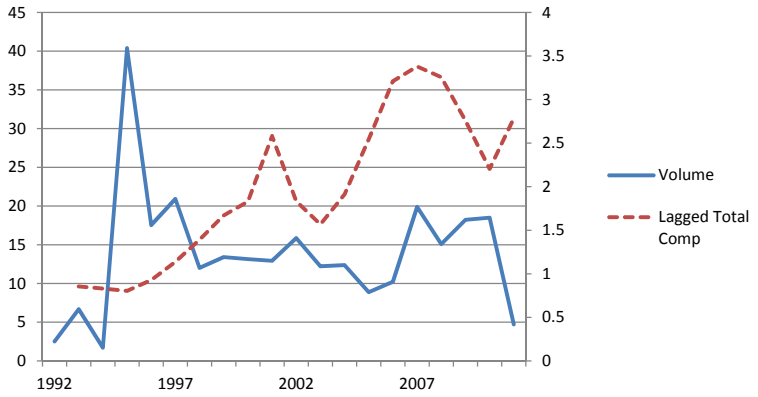


Figure 3.7: AVERAGE TRADING VOLUME and LAGGED TOTAL COMPENSATION

Bibliography

Aboody, D., Hughes, J., Ke, R., Ross, N., 2011. Executive talent, insider trading, and firm performancen. Working Paper .

Aggarwal, R., Erel, I., Ferreira, M., Matos, P., 2011. Does governance travel around the world? evidence from institutional investors. Journal of Financial Economics 100, 154–181.

Alchian, A. A., 1950. Uncertainty, evolution, and economic theory. The Journal of Political Economy pp. 211–221.

Almeida, H., Campello, M., Weisbach, M. S., 2004. The cash flow sensitivity of cash. The Journal of Finance 59, 1777–1804.

Almeida, H., Park, S. Y., Subrahmanyam, M. G., Wolfenzon, D., 2011. The structure and formation of business groups: Evidence from Korean chaebols. Journal of Financial Economics 99, 447–475.

Almeida, H. V., Wolfenzon, D., 2006. A theory of pyramidal ownership and family business groups. Journal of Finance 61, 2637–2680.

Arellano, C., Bai, Y., Zhang, J., 2012. Firm dynamics and financial development. Journal of Monetary Economics 59, 533–549.

Arnold, J., Nicoletti, G., Scarpetta, S., 2008. Regulation, allocative efficiency and productivity in oecd countries. OECD Publishing .

Baiman, S., Verrecchia, R. E., 1996. The relation among capital markets, financial disclosure, production efficiency, and insider trading. Journal of accounting research pp. 1–22.

Barkalay, M., Holderness, C., 1989. Private benefits of control of public corporation. Journal of Financial Economics .

Bartelsman, E. J., Doms, M., 2000. Understanding productivity: lessons from longitudinal microdata. Finance and Economics Discussion Series 2000-19, Board of Governors of the Federal Reserve System (U.S.).

Baumol, W. J., 1982. Contestable Markets: An Uprising in the Theory of Industry Structure. American Economic Review 72, 1–15.

Becht, M., Bolton, P., Roell, A., 2003. Corporate governance and control. Handbook of the Economics of Finance 1, 1–109.

Belenzon, S., Andrea, P., 2011. Managerial redeployment, ownership structure, and family ties. Working paper .

Belenzon, S., Berkovitz, T., 2010. Innovation in business groups. Management Science 56, 519–535.

Bena, J., Ortiz-Molina, H., 2013. Pyramidal ownership and the creation of new firms. Journal of Financial Economics 108, 798–821.

Bertrand, M., Schoar, A., Thesmar, D., 2007. Banking deregulation and industry structure: Evidence from the french banking reforms of 1985. The Journal of Finance 62, 597–628.

Black, B. S., Gilson, R. J., 1998. Venture capital and the structure of capital markets: banks versus stock markets. Journal of Financial Economics 47, 243–277.

Bottazzi, L., Da Rin, M., 2002. Venture capital in europe and the financing of innovative companies. Economic Policy 17, 229–270.

Brenner, S., 2011. On the irrelevance of insider trading for managerial compensation. European Economic Review 55, 293–303.

Brochet, F., 2010. Information content of insider trades before and after the sarbanes-oxley act. The Accounting Review 85, 419–446.

Carlton, D. W., Fischel, D. R., 1983. The regulation of insider trading. Stanford Law Review pp. 857–895.

Carter, M. L., Mansi, S. A., Reeb, D. M., 2003. Quasi-private information and insider trading. Financial Analysts Journal 59, 60–68.

Cetorelli, N., Strahan, P. E., 2006. Finance as a barrier to entry: Bank competition and industry structure in local us markets. The Journal of Finance 61, 437–461.

Chamberlain, G., 1994. Quantile regression, censoring, and the structure of wages. In: *Advances in Econometrics: Sixth World Congress*, vol. 2, pp. 171–209.

Christopoulou, R., Vermeulen, P., 2012. Markups in the euro area and the us over the period 1981–2004: a comparison of 50 sectors. Empirical Economics 42, 53–77.

Claessens, S., Djankov, S., Lang, L. H., 2000. The separation of ownership and control in east asian corporations. Journal of Financial Economics 58, 81–112, special Issue on International Corporate Governance.

Coase, R. H., 1937. The nature of the firm. Economica 4, 386–405.

Coffee Jr, J. C., 1998. Future as history: The prospects for global convergence in corporate governance and its implications. Nw. UL Rev. 93, 641.

Conway, P., Janod, V., Nicoletti, G., 2005. Product market regulation in oecd countries. OECD Publishing .

Conway, P., Rosa, D. D., Nicoletti, G., Steiner, F., 2006. Regulation, competition and productivity convergence. OECD Publishing .

Dahya, J., Dimitrov, O., McConnell, J. J., 2008. Dominant shareholders, corporate boards, and corporate value: A cross-country analysis. Journal of Financial Economics 87, 73–100.

DeAngelo, H., DeAngelo, L., 1985. Managerial ownership of voting rights: A study of public corporations with dual classes of common stock. Journal of Financial economics 14, 33–69.

Demsetz, H., 1973. Industry structure, market rivalry, and public policy. Journal of Law and economics pp. 1–9.

Denis, D. J., Xu, J., 2013. Insider trading restrictions and top executive compensation. Journal of Accounting and Economics 56, 91–112.

Doidge, C., 2004. Us cross-listings and the private benefits of control: evidence from dual-class firms. Journal of financial economics 72, 519–553.

Doidge, C., Karolyi, G. A., Stulz, R. M., 2007. Why do countries matter so much for corporate governance? Journal of Financial Economics 86, 1–39.

Dyck, A., Zingales, L., 2004. Private benefits of control: An international comparison. The Journal of Finance 59, 537–600.

Egger, H., Egger, P., Kreickemeier, U., 2013a. Trade, wages, and profits. European Economic Review 64, 332–350.

Egger, P. H., Erhardt, K., Lassmann, A., 2003. Psmatch2: Stata module to perform full mahalanobis and propensity score matching, common support graphing, and covariate imbalance testing. Unpublished Working Paper V. 4.0.6 (`http://ideas.repec.org/c/boc/bocode/s432001.html`).

Egger, P. H., Erhardt, K., Lassmann, A., 2013b. Productivity and r&d as drivers of exports and domestic sales: Semiparametric evidence from french firm-level data. Working Paper .

Fidrmuc, J. P., Goergen, M., Renneboog, L., 2006. Insider trading, news releases, and ownership concentration. The Journal of Finance 61, 2931–2973.

Foster, L., Haltiwanger, J., Krizan, C. J., 2006. Market selection, reallocation, and restructuring in the us retail trade sector in the 1990s. The Review of Economics and Statistics 88, 748–758.

Francois, J. F., Wooton, I., 2008. Market structure and market access. World Bank Policy Research Working Paper .

Friederich, S., Gregory, A., Matatko, J., Tonks, I., 2002. Short-run returns around the trades of corporate insiders on the london stock exchange. European Financial Management 8, 7–30.

Gibbons, R., Henderson, R., 2011. Relational contracts, managerial practices, and organizational capabilities. Handbook of Organizational Economics, eds. R. Gibbons and J. Roberts .

Gillan, S., Starks, L. T., 2003. Corporate governance, corporate ownership, and the role of institutional investors: A global perspective. Journal of applied Finance 13.

Giroud, X., Mueller, H. M., 2010. Does corporate governance matter in competitive industries? Journal of Financial Economics 95, 312–331.

Gomes, A., 2000. Going public without governance: Managerial reputation effects. Journal of Finance 55, 615–646.

Gompers, P., Ishii, J., Metrick, A., 2003. Corporate governance and equity prices. The Quarterly Journal of Economics pp. 107–155.

Gompers, P., Lerner, J., 2000. Money chasing deals? the impact of fund inflows on private equity valuation. Journal of Financial Economics 55, 281–325.

Gopalan, R., Nanda, V., Seru, A., 2007. Affiliated firms and financial support: Evidence from indian business groups. Journal of Financial Economics 86, 759–795.

Gopalan, R., Nanda, V., Seru, A., 2014. Internal capital market and dividend policies: Evidence from business groups. Review of Financial Studies 27, 1102–1142.

Gorman, M., Sahlman, W. A., 1989. What do venture capitalists do? Journal of Business Venturing 4, 231–248.

Hail, L., Leuz, C., 2009. Cost of capital effects and changes in growth expectations around U.S. cross-listings. Journal of Financial Economics 93, 428–454.

Hall, B. H., Lerner, J., 2010. Chapter 14 - the financing of r&d and innovation. In: Hall, B. H., Rosenberg, N. (eds.), *Handbook of The Economics of Innovation, Vol. 1*, North-Holland, vol. 1 of *Handbook of the Economics of Innovation*, pp. 609–639.

Hamelin, A., 2011. Small business groups enhance performance and promote stability, not expropriation. evidence from french smes. Journal of Banking & Finance 35, 613 – 626.

Hellmann, T., Puri, M., 2002. Venture capital and the professionalization of start-up firms: Empirical evidence. The Journal of Finance 57, 169–197.

Hermalin, B. E., 1992. The effects of competition on executive behavior. The RAND Journal of Economics pp. 350–365.

Heron, R. A., Lie, E., 2007. Does backdating explain the stock price pattern around executive stock option grants? Journal of Financial Economics 83, 271–295.

Himmelberg, C. P., Hubbard, R. G., Palia, D., 1999. Understanding the determinants of managerial ownership and the link between ownership and performance. Journal of financial economics 53, 353–384.

Himmerlberg, C. P., Hubbard, R. G., Palia, D., 1999. Understanding the determinants of managerial ownership and link between ownership and performance. Journal of Financial Economics 53, 353–384.

Hochberg, Y. V., Ljungqvist, A., Lu, Y., 2007. Whom you know matters: Venture capital networks and investment performance. The Journal of Finance 62, 251–301.

Holmstrom, B. R., Tirole, J., 1989. The theory of the firm. Handbook of Industrial Organization 1, 61–133.

Hsieh, T.-J., Yeh, R.-S., Chen, Y.-J., 2010. Business group characteristics and affiliated firm innovation: The case of taiwan. Industrial Marketing Management 39, 560–570.

Iacobucci, D., 2002. Explaining business groups started by habitual entrepreneurs in the italian manufacturing sector. Entrepreneurship & Regional Development 14, 31–47.

Iacobucci, D., Rosa, P., 2005. Growth, diversification, and business group formation in entrepreneurial firms. Small Business Economics 25, 65–82.

Ivanov, V. I., Xie, F., 2010. Do corporate venture capitalists add value to start-up firms? evidence from ipos and acquisitions of vc-backed companies. Financial Management 39, 129–152.

Jeng, L. A., Metrick, A., Zeckhauser, R., 2003. Estimating the returns to insider trading: A performance-evaluation perspective. Review of Economics and Statistics 85, 453–471.

Jensen, M. C., Meckling, W. H., 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of financial economics 3, 305–360.

Kandel, E., Kosenko, Konstantin, Morck, R., Yafeh, Y., 2013. Business groups in the united states: A revised history of corporate ownership, pyramids and regulation, 1930-1950. Maurice Falk Institute for Economic Research in Israel. Discussion paper series. .

Kato, T., Hebner, K. J., 1997. Insider trading and executive compensation: Evidence from the us and japan. International Review of Economics & Finance 6, 223–237.

Khanna, T., 2000. Business groups and social welfare in emerging markets: Existing evidence and unanswered questions. European Economic Review 44, 748–761.

Khanna, T., Palepu, K., 1999. Policy shocks, market intermediaries, and corporate strategy: The evolution of business groups in chile and india. Journal of Economics & Management Strategy 8, 271–310.

Khanna, T., Palepu, K., 2000. Is group affiliation profitable in emerging markets? an analysis of diversified indian business groups. Journal of Finance 55, 867–891.

Khanna, T., Yafeh, Y., 2005. Business groups and risk sharing around the world. Journal of Business 78, 301–340.

Khanna, T., Yafeh, Y., 2007. Business groups in emerging markets: Paragons or parasites? Journal of Economic Literature 45, 331–372.

Klapper, L., Laeven, L., Rajan, R., 2006. Entry regulation as a barrier to entrepreneurship. Journal of Financial Economics 82, 591–629.

Koenker, R., Bassett Jr, G., 1978. Regression quantiles. Econometrica: journal of the Econometric Society pp. 33–50.

Koenker, R., Hallock, K., 2001. Quantile regression: An introduction. Journal of Economic Perspectives 15, 43–56.

La Porta, R., Lopez-De-Silanes, F., Shleifer, A., 1999. Corporate ownership around the world. The Journal of Finance 54, 471–517.

La Porta, R., Lopez-de Silanes, F., Shleifer, A., Vishny, R., 2000. Investor protection and corporate governance. Journal of financial economics 58, 3–27.

La Porta, R., Lopez-de Silanes, F., Shleifer, A., Vishny, R. W., 1998. Law and finance. The Journal of Political Economy 106, 1113–1155.

Lakonishok, J., Lee, I., 2001. Are insider trades informative? Review of financial studies 14, 79–11.

Larrain, M., Stumpner, S., 2013. Financial reforms and aggregate productivity: The microeconomic channels. Working Paper .

Lease, R. C., McConnell, J. J., Mikkelson, W. H., 1983. The market value of control in publicly-traded corporations. Journal of Financial Economics 11, 439–471.

Lechner, C., Leyronas, C., 2009. Small-business group formation as an entrepreneurial development model. Entrepreneurship: Theory & Practice 33, 645–667.

Manne, H. G., 1966. Insider trading and the stock market. Free Press.

Masulis, R. W., Pham, P. K., Zein, J., 2011. Family business groups around the world: Financing advantages, control motivations, and organizational choices. Review of Financial Studies 24, 3556–3600.

Morck, R., 2003. Why some double taxation might make sense: The special case of intercorporate dividends. NBER Working Papers .

Morck, R., 2005. How to eliminate pyramidal business groups: The double taxation of intercorporate dividends and other incisive uses of tax policy. NBER/Tax Policy & the Economy (MIT Press) 19, 135–179.

Morck, R., Nakamura, M., 1999. Banks and corporate control in japan. Journal of Finance 54, 319–339.

Morck, R., Wolfenzon, D., Yeung, B., 2005. Corporate governance, economic entrenchment, and growth. Journal of Economic Literature 43, 655–720.

Morck, R. K., Stangeland, D. A., Yeung, B., 1998. Inherited wealth, corporate control and economic growth: The canadian disease. Tech. rep., National Bureau of Economic Research.

Nenova, T., 2003. The value of corporate voting rights and control: A cross-country analysis. Journal of Financial Economics 68, 325–351.

Piketty, T., Saez, E., 2003. Income inequality in the united states, 1913-1998. The Quarterly Journal of Economics pp. 1–39.

Raith, M., 2003. Competition, risk, and managerial incentives. American Economic Review pp. 1425–1436.

Rajan, R. G., Zingales, L., 1998. Financial dependence and growth. American Economic Review pp. 559–586.

Ravina, E., Sapienza, P., 2010. What do independent directors know? evidence from their trading. Review of Financial Studies 23, 962–1003.

Reese, W. A., Weisbach, M. S., 2002. Protection of minority shareholder interests, cross-listings in the united states, and subsequent equity offerings. Journal of Financial Economics 66, 65–104.

Roe, M. J., 2003. Political determinants of corporate governance: Political context, corporate impact. Oxford University Press.

Rosa, P., Scott, M., 1999. The prevalence of multiple owners and directors in the sme sector: implications for our understanding of start-up and growth. Entrepreneurship & Regional Development 11, 21–37.

Rosenthal, L., Young, C., 1990. The seemingly anomalous price behavior of royal dutch/shell and unilever nv/plc. Journal of Financial Economics 26, 123–141.

Roulstone, D. T., 2003. The relation between insider-trading restrictions and executive compensation. Journal of Accounting Research pp. 525–551.

Sautner, Z., Villalonga, B., 2010. Corporate governance and internal capital markets. Working Paper .

Scharfstein, D., 1988. Product-market competition and managerial slack. The RAND Journal of Economics pp. 147–155.

Schmalensee, R., 2007. Handbook of industrial organization, vol. 3. Elsevier.

Schmitz Jr, J. A., 2005. What determines productivity? lessons from the dramatic recovery of the us and canadian iron ore industries following their early 1980s crisis. Journal of Political Economy 113, 582–625.

Schumpeter, J. A., 1934. The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle, vol. 55. Transaction publishers.

Sea-Jin, C., Chi-Nien, C., Mahmood, I. P., 2006. When and how does business group affiliation promote firm innovation? a tale of two emerging economies. Organization Science 17, 637–656.

Seru, A., 2014. Firm boundaries matter: Evidence from conglomerates and R&D activity. Journal of Financial Economics 111, 381–405.

Shleifer, A., Vishny, R. W., 1997. A survey of corporate governance. The journal of finance 52, 737–783.

Smith, A., 1937. An Inquiry into the Nature and Causes of the Wealth of Nations. ğšğÚğáğàğÝ ğňğÝğÑğãğãğÚğÜ.

Stigler, G. J., 1958. The economies of scale. Journal of Law and Economics 1, 4.

Stigler, G. J., 1963. Capital and rates of return in manufacturing industries. NBER Books .

Stulz, R. M., 1999. Golbalization, corporate finance, and the cost of capital. Journal of applied corporate finance 12, 8–25.

Syverson, C., 2004a. Market structure and productivity: A concrete example. Journal of political economy 112, 1181–1222.

Syverson, C., 2004b. Product substitutability and productivity dispersion. Review of Economics and Statistics 86, 534–550.

Trapani, T., 1990. The relationship between ceo compensation and ceo trading profits. Ph. D. Dissertation, University of Kansas .

Villalonga, B., Amit, R., 2006. How do family ownership, control and management affect firm value?. Journal of Financial Economics 80, 385–417.

Wang, W., Shin, Y.-C., Francis, B. B., 2012. Are cfosą́ trades more informative than ceosą́ trades? Journal of Financial and Quantitative Analysis 47, 743–762.

Williamson, O. E., 1973. Markets and hierarchies: Some elementary considerations. The American Economic Review 63, 316–325.

Zhang, W., Cahan, S. F., Allen, A. C., 2005. Insider trading and pay-performance sensitivity: An empirical analysis. Journal of Business Finance & Accounting 32, 1887–1919.

Zingales, L., 1994. The value of the voting right: A study of the milan stock exchange experience. Review of financial Studies 7, 125–148.

Zingales, L., 1995. What determines the value of corporate votes? The Quarterly Journal of Economics pp. 1047–1073.

Zwiebel, J., 1995. Block investment and partial benefits of corporate control. The Review of Economic Studies 62, 161–185.

Appendices

Appendix A

Appendix for Chapter 1

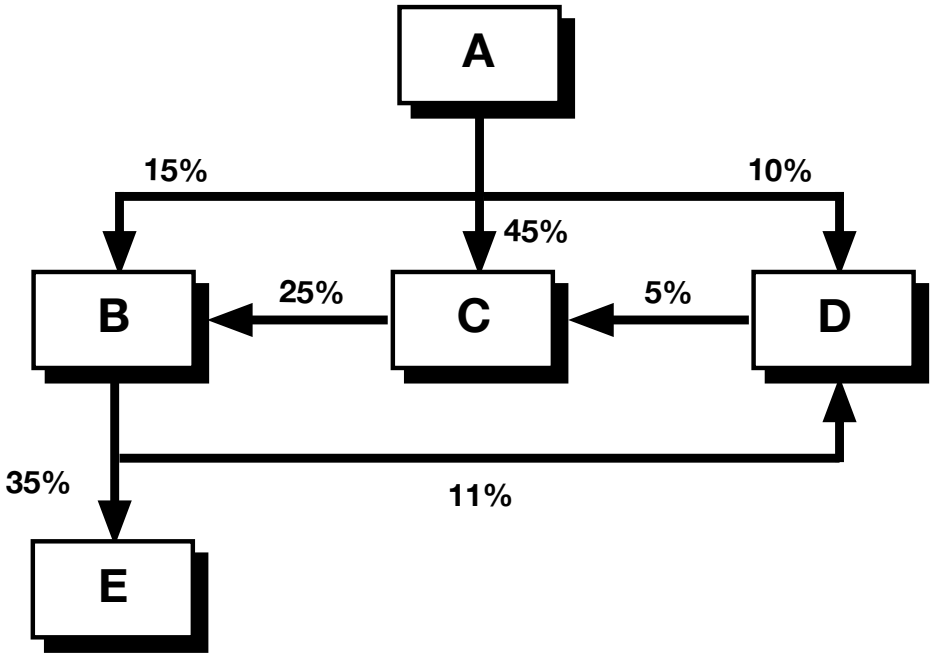
A.1 An Example of Cluster Construction

In this section, I present an example of cluster construction through iterations. For a given sample of firms, I first identify potential ultimate owners. Then starting from the bottom of the ownership chain, I assign firms to different clusters by checking the fixed point requirements. When a firm has multiple parent shareholders, it will be assigned to the cluster with highest total cluster holding.

In the above graph, A, B, C, and D are four firms. Arrows are pointing from shareholders to subsidiaries. Numbers beside arrows indicate ownership stakes. Given the preset cutoff value $\alpha = 30\%$, clusters are constructed after three rounds.

- Iteration 1: Firm A, B and D do not have any corporate shareholder with ownership stake more than 30%. They are potential ultimate owners. For firm C, the total stake from cluster formed by A is 45%, while the total stake from cluster formed by D is 5%. Thus, C is assigned to Cluster A.[1] Firm E only has one corporate shareholder B. It is

[1]The cluster with ultimate owner X is referred to "Cluster X".



assigned to Cluster B. Therefore, after the first iteration, the five firms are assigned to three different clusters:

$$A, C \rightarrow \text{Cluster } A$$

$$B, E \rightarrow \text{Cluster } B$$

$$D \rightarrow \text{Cluster } D$$

- Iteration 2: Firm A is still the ultimate owner. Firm B has two corporate shareholders, A and C. Notice that firm C has been assigned to Cluster A. Therefore the total holding from the cluster formed by A is 15%+25% = 40% > 30%. Thus B is assigned to Cluster A. Nothing changed for firm C. Firm D has two corporate shareholders, A and B. They belong to Cluster A and Cluster B respectively. The total holding from cluster A is 10% < 30%. The total holding from cluster B is 11% < 30%. Therefore it is still assigned to the cluster formed by itself. For firm E, since firm B was identified as a potential ultimate owner in the last round, the firm E is still assigned to Cluster B.

After the second iteration, the five firms are still assigned to three different clusters:

$$A, B, C \rightarrow \text{Cluster } A$$

$$E \rightarrow \text{Cluster } B$$

$$D \rightarrow \text{Cluster } D$$

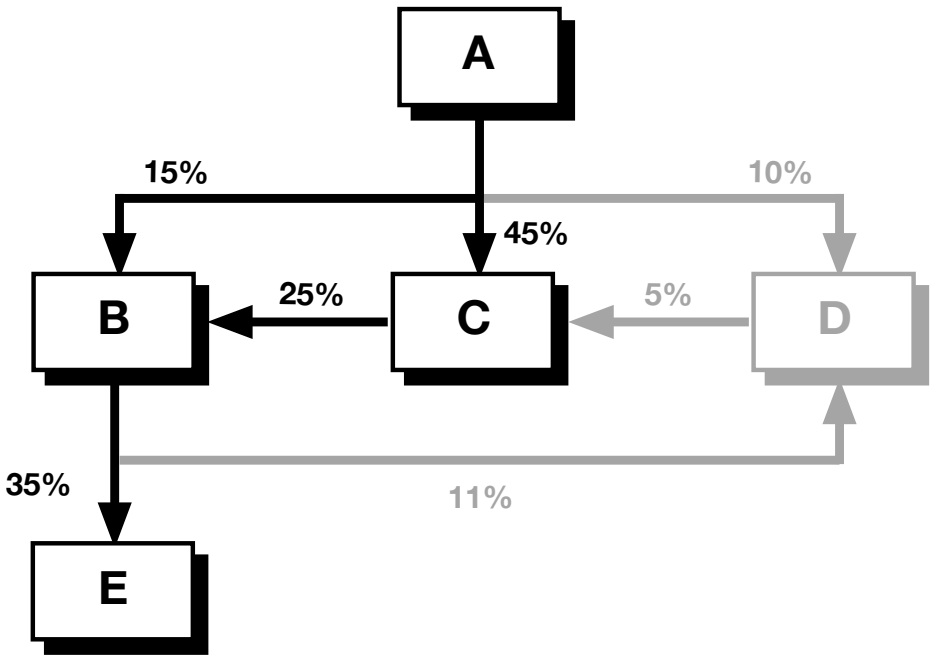
- Iteration 3: Nothing changed for firm A, B, C. For firm E, since B was assigned to Cluster A, the total holding from the Cluster A is $35\% > 30\%$. B is also assigned to cluster A. For firm D, its two corporate shareholders, A and B, both belong to cluster A. The total holding from Cluster A is $10\% + 11\% = 21\% < 30\%$. Thus, it is still assigned to Cluster D. After this round, five firms are assigned to two clusters.

$$A, B, C, E \rightarrow \text{Cluster } A$$

$$D \rightarrow \text{Cluster } D$$

Following calculations double check the total cluster holdings for each firms:

- Firm A: the ultimate owner for Cluster A.
- Firm B: $15\% + 25\% = 40\% > 30\%$.
- Firm C: $45\% > 30\%$.
- Firm E: $45\% > 30\%$.
- Firm D: the ultimate owner for itself.


A
15%
10%
45%
B
25%
C
5%
D
35%
11%
E

A.2 An Example of Unintentional Group Affiliation – Active Audio

Active Audio is founded in 2002 by Xavier Meynial, at that time Professor and researcher at the Acoustics Laboratory of the UniversitÃĺ du Maine (France). Active Audio's objective was to create a commercial application of research work patented under âĂIJRÃĺflecteur Sonore ActifâĂİ, which can be applied to the Public Address system.

Before 2005, Active Audio was jointly owned by Electronatec (33% of ownership stake), the founder, and other private individual investors. Electronatec, including its other subsidiaries, has considerable expertise in power electronics, motor design and piloting of ships.

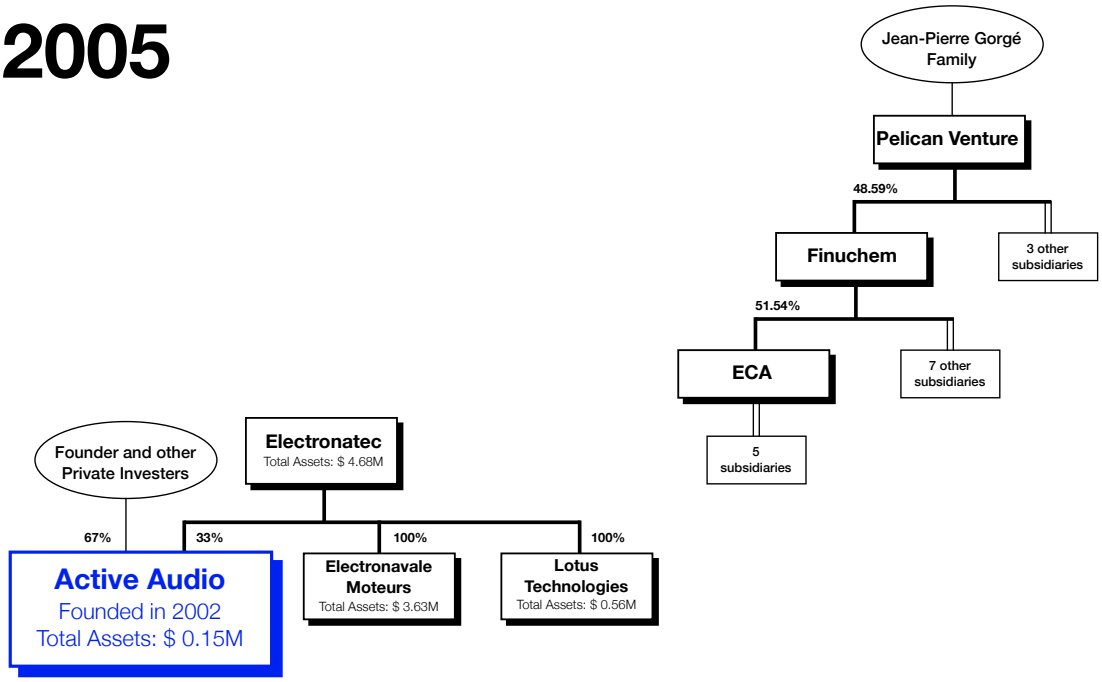
In 2006, Electronatec was acquired by ECA, a leader in the market of intelligence robotics. ECA is a subsidiary of Finuchem. Finuchem is a major player in the intelligent safety system. They both belonged to a huge business group held by Jean-Pierre George family, through its family holding company Pelican Venture. One side effect of this acquisition is that Active Audio also joins the big business group.

According to ECA's filing, the acquisition is driven by the synergies between ECA and Electronatec. Electronatec was very present on the market for naval facilities in France, a sector in which ECA wanted to develop. Conversely, little Electronatec exported its solutions. ECA would help achieve the export growth particulary in the framework of the European shipbuilding industry. Active Audio was very small compared to Electronatec and its other subsidiaries. Besides, Active Audio was not mentioned as any part of the stated acquisition synergies.

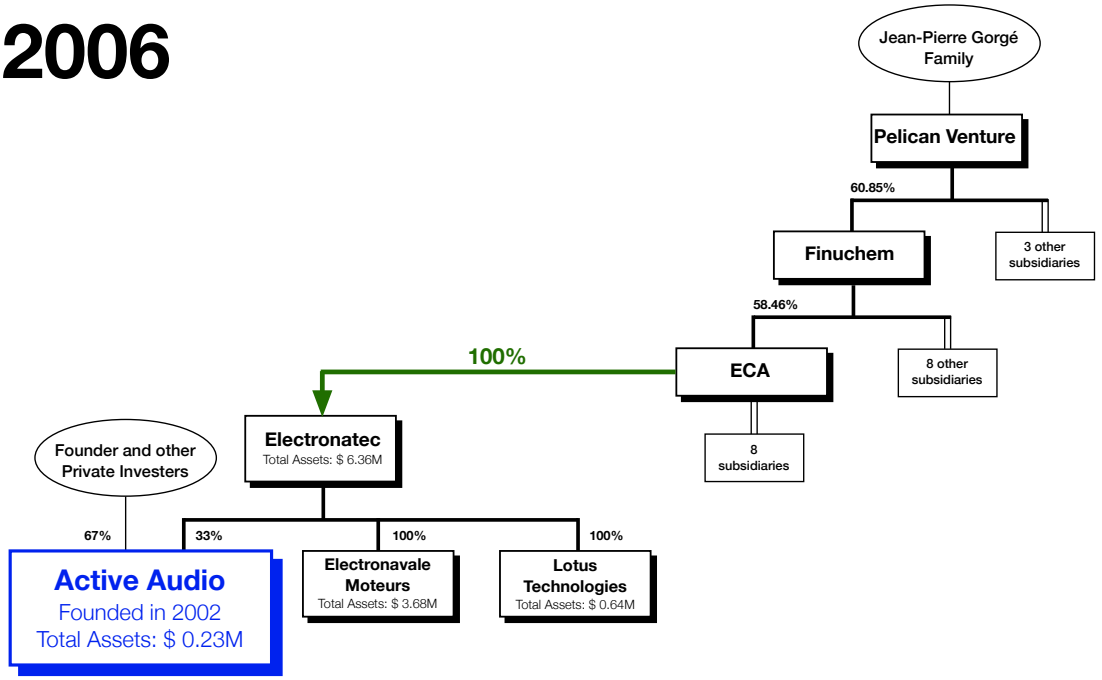
Two years after unintentionally joining the group, Active Audio's profitability doubled. Its adjusted revenue and market share tripled.

The graph in the next page shows the ownership structures in 2005 and 2006.

2005


Jean-Pierre Gorgé Family
Pelican Venture
48.59%
Finuchem
3 other subsidiaries
51.54%
ECA
7 other subsidiaries
5 subsidiaries
Founder and other Private Investers
Electronatec
Total Assets: $ 4.68M
67%
33%
100%
100%
Active Audio
Founded in 2002
Total Assets: $ 0.15M
Electronavale Moteurs
Total Assets: $ 3.63M
Lotus Technologies
Total Assets: $ 0.56M

2006


Jean-Pierre Gorgé Family
Pelican Venture
60.85%
Finuchem
3 other subsidiaries
58.46%
100%
ECA
8 other subsidiaries
8 subsidiaries
Founder and other Private Investers
Electronatec
Total Assets: $ 6.36M
67%
33%
100%
100%
Active Audio
Founded in 2002
Total Assets: $ 0.23M
Electronavale Moteurs
Total Assets: $ 3.68M
Lotus Technologies
Total Assets: $ 0.64M

A.3 Supplemental Tables

Table A.1: BUSINESS GROUP IS THE DOMINANT OWNERSHIP STRUCTURE FOR NEW FIRMS ACROSS COUNTRIES

This table show the contributions of business groups affiliated firm-year observations across countries. The second column shows the total number of firm-year observations across countries. The third column reports ratios of group affiliated firm-year observations. The fourth column is the sum of group affiliated firms' total assets over the sum of all new firms' total assets for the respective country. The last two columns show the similar ratios using total revenue and number of employees.

		Percentage Contributed by Group Affiliated Observations			
Country	No. of Obs.	No. of Obs.	Total Assets	Total Revenue	No. of Employees
Austria	1,925	43.48%	56.69%	56.23%	55.34%
Belgium	41,600	31.73%	58.83%	63.97%	54.79%
Bulgaria	9,958	6.09%	21.92%	17.34%	13.52%
Czech Republic	15,884	5.41%	33.29%	30.70%	22.10%
Crotia	3,295	14.90%	36.21%	39.98%	34.18%
Denmark	120,668	11.20%	42.94%	55.61%	33.88%
Estonia	7,362	6.32%	24.15%	21.07%	19.12%
Finland	6,323	45.52%	68.51%	65.80%	64.10%
France	313,177	20.22%	62.69%	53.11%	52.60%
Germany	75,541	23.05%	50.49%	48.42%	50.14%
Greece	29,149	6.90%	20.98%	19.99%	14.70%
Hungary	8,855	4.21%	23.22%	21.58%	15.47%
Hungary	750	10.67%	22.76%	20.17%	14.40%
Iceland	2,064	8.38%	27.95%	24.62%	17.11%
Italy	26,389	39.49%	43.19%	39.15%	41.18%
Luxemburg	347	19.02%	35.65%	36.07%	30.19%
Latvia	66	24.24%	40.59%	52.05%	39.29%
Norway	234,165	10.06%	40.65%	32.79%	24.61%
Poland	14,969	8.63%	29.91%	24.57%	23.06%
Portugal	89,542	2.79%	30.92%	24.82%	13.31%
Romania	385,711	0.85%	15.69%	13.33%	5.88%
Spain	254,775	13.39%	48.19%	41.06%	32.97%
Switzeland	283	37.46%	40.38%	38.34%	61.26%
United Kindom	416,890	9.58%	56.58%	53.01%	56.48%
Total	2,059,688	11.24%	50.57%	46.28%	38.85%

Table A.2: BUSINESS GROUP IS THE DOMINANT OWNERSHIP STRUCTURE FOR NEW FIRMS ACROSS YEARS

This table show the contributions of business groups affiliated firm-year observations across years. The second column shows the total number of firm-year observations across years. The third column reports ratios of group affiliated firm-year observations. The fourth column is the sum of group affiliated firms' total assets over the sum of all new firms' total assets for the respective year. The last two columns show the similar ratios using total revenue and number of employees.

		Percentage Contributed by Group Affiliated Observations			
Year	No. of Obs.	No. of Obs.	Total Assets	Total Revenue	No. of Employees
1999	52,270	12.85%	36.87%	33.71%	28.44%
2000	146,747	9.44%	45.37%	40.83%	31.36%
2001	162,418	13.01%	52.41%	49.39%	39.03%
2002	175,255	13.43%	54.92%	51.54%	41.46%
2003	226,217	11.61%	53.54%	49.56%	41.29%
2004	321,052	9.27%	50.12%	45.49%	38.36%
2005	391,810	9.71%	52.16%	47.62%	39.00%
2006	258,663	14.05%	51.82%	47.45%	44.13%
2007	298,953	10.98%	48.15%	43.42%	38.39%
2008	26,303	11.52%	52.66%	49.18%	48.45%
Total	2,059,688	11.24%	50.57%	46.28%	38.85%

Table A.3: BUSINESS GROUP IS THE DOMINANT OWNERSHIP STRUCTURE FOR NEW FIRMS ACROSS INDUSTRIES

This table show the contribution of business groups affiliated firm-year observations across industries. The second column shows the total number of firm-year observations across industries. The third column reports ratios of group affiliated firm-year observations. The fourth column is the sum of group affiliated firms' total assets over the sum of all new firms' total assets for the respective industry. The last two columns show the similar ratios using total revenue and number of employees. Industry is categorized as 2-digit NAICS (2007) codes.

		Percentage Contributed by Group Affiliated Observations			
Industry (NAICS 2 digits)	No. of Obs.	No. of Obs.	Total Assets	Total Revenue	No. of Employees
Accommodation and Food Services	76,832	9.51%	49.18%	46.28%	36.92%
Administrative and Support and Waste Management and Remediation Services	141,826	11.97%	55.39%	50.75%	44.58%
Agriculture, Forestry, Fishing and Hunting	41,522	4.99%	26.11%	27.05%	14.37%
Arts, Entertainment, and Recreation	27,994	10.37%	44.86%	42.96%	40.67%
Construction	279,715	7.53%	46.71%	41.10%	28.36%
Educational Services	13,060	8.40%	38.28%	32.81%	31.13%
Finance and Insurance	40,261	23.73%	53.62%	48.16%	47.16%
Health Care and Social Assistance	29,874	12.69%	40.27%	35.32%	37.35%
Information	68,220	16.46%	55.86%	54.01%	50.60%
Management of Companies and Enterprises	34,451	41.75%	66.44%	66.38%	67.17%
Manufacturing	258,344	11.40%	47.84%	48.04%	36.53%
Mining, Quarrying, and Oil and Gas Extraction	7,652	19.94%	50.92%	56.21%	38.53%
Professional, Scientific, and Technical Services	239,488	9.93%	51.23%	49.39%	43.99%
Public Administration	1,844	13.23%	36.73%	38.58%	44.80%
Other Services (except Public Administration)	62,829	6.87%	48.08%	42.53%	36.53%
Real Estate and Rental and Leasing	131,109	17.91%	49.73%	51.14%	41.68%
Retail Trade	231,265	6.23%	39.18%	34.64%	29.29%
Transportation and Warehousing	82,647	12.86%	53.47%	50.81%	43.63%
Utilities	15,331	39.80%	60.22%	61.38%	49.86%
Wholesale Trade	268,626	9.50%	40.98%	37.48%	32.95%
Other	6,798	25.49%	58.27%	55.34%	58.60%
Total	2,059,688	11.24%	50.57%	46.28%	38.85%

Table A.4: GROUP AFFILIATION EFFECT IS ROBUST IN THE SUMSAMPLE WHERE DATA COLLECTION CRITERIA DID NOT CHANGE

This table presents results based on countries where data collection criteria did not change during the sample period. The dependent variable is EBITDA/Total Assets$_{t-1}$. Column I and II are based on firms ever unintentionally join business groups. Column III and Column IV add firms always non-group affiliated. Column V and Column VI further add firms always group affiliated. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. *LagParentInd* is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Through all of the columns, firm fixed effects and country-year (2-digit NAICS) dummies are controlled. Column II, IV, and VI further control the firm level variables, including one year lagged ln(total assets), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Dependent Variable	EBITDA / Total Assets$_{t-1}$					
	(I)	(II)	(III)	(IV)	(V)	(VI)
GroupDummy	**0.016*** **	**0.013*** **	**0.020*** **	**0.021*** **	**0.017*** **	**0.018*** **
	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
	[9.90%]	[8.05%]	[12.38%]	[13.00%]	[10.52%]	[11.14%]
LagParentInd			0.001	0.003	0.000	0.002
			(0.004)	(0.004)	(0.004)	(0.004)
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls		Yes		Yes		Yes
Sample	Ever Joining group	Ever Joining group	Ever Joining group Always non-group	Ever Joining group Always non-group	Ever Joining group Always non-group Always group	Ever Joining group Always non-group Always group
Observations	36780	35509	940768	940762	1035274	1035266
Number of firms	12583	12545	499598	499596	546527	546523
R-squared (Within)	0.011	0.016	0.014	0.015	0.013	0.014
R-squared (All)	0.646	0.652	0.827	0.827	0.826	0.827

Table A.5: GROUP AFFILIATION EFFECT IS ROBUST IN THE SUM-SAMPLE WHERE ALL PUBLIC AND PRIVATE FIRMS ARE REQUIRED TO FILE FINANCIAL STATEMENT

This table presents results based on countries where all public and private firms are required to file financial statements. The dependent variable is EBITDA/Total Assets$_{t-1}$. Column I and II are based on firms ever indirectly join business groups. Column III and Column IV add firms always non-group affiliated. Column V and Column VI further add firms always group affiliated. *GroupDummy* is equal to 1 when the firm is in a business group and 0 otherwise. *LagParentInd* is equal to 1 if the firm had at least one parent corporate shareholder one year before, and 0 otherwise. Through all of the columns, firm fixed effects and country-year (2-digit NAICS) dummies are controlled. Column II, IV, and VI further control the firm level variables, including one year lagged *ln*(total assets), leverage ratio, tangibility, age, and legal incorporation form. The standard deviation is clustered at country-industry (2-digit NAICS), and is presented in the parenthesis. The number in the bracket indicates the ratio of the estimator over the sample average of the dependent variable. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Dependent Variable	EBITDA / Total Assets$_{t-1}$					
	(I)	(II)	(III)	(IV)	(V)	(VI)
GroupDummy	**0.016*** **	**0.013** **	**0.021*** **	**0.022*** **	**0.018*** **	**0.019*** **
	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
	[9.90%]	[8.05%]	[13.00%]	[13.62%]	[11.14%]	[11.76%]
LagParentInd			0.001	0.003	0.000	0.002
			(0.004)	(0.004)	(0.004)	(0.004)
Country×year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls		Yes		Yes		Yes
Sample	Ever Joining group	Ever Joining group	Ever Joining group Always non-group	Ever Joining group Always non-group	Ever Joining group Always non-group Always group	Ever Joining group Always non-group Always group
Observations	36833	35570	933984	933978	1029589	1029571
Number of firms	12654	12616	496439	496437	544653	544646
R-squared (Within)	0.011	0.016	0.014	0.015	0.013	0.014
R-squared (All)	0.646	0.652	0.827	0.828	0.826	0.827

Appendix B

Appendix for Chapter 3

Table A.1: INSIDER TRADING PROFIT AND ALTERNATIVE TOTAL COMPENSATION MEASURE

	Dependent variable: Profit							
	30-day		60-day		90-day		180-day	
	Excess Return	Profit	Excess Return	Profit	Excess Return	Profit	Excess Return	Profit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln(Total Comp2)	-0.021**	-0.068	-0.057***	-0.929	-0.084***	-3.64*	-0.176***	-7.64**
	(0.009)	(0.406)	(0.019)	(1.57)	(0.025)	(2.21)	(0.040)	(3.36)
ln(Total Comp2)*PostSOX	-0.003	-0.000	0.018	-0.000	0.017	-0.000	0.021	0.000
	(0.012)	(0.000)	(0.013)	(0.000)	(0.017)	(0.000)	(0.028)	(0.000)
ln(MV) (million)	-0.37	-4.5	-1.3	-77	-1.3	-98	-2.7**	-210
	(0.32)	(55)	(0.86)	(100)	(0.85)	(96)	(1.3)	(160)
Tobin's Q	0.015***	1.15*	0.038***	2.92*	0.048***	3.15*	0.075***	5.74*
	(0.004)	(0.655)	(0.013)	(1.75)	(0.011)	(1.63)	(0.017)	(2.97)
Constant	0.252***	13.16**	0.484**	-6.16	0.692**	-9.61	1.33***	38.53*
	(0.082)	(7.61)	(0.240)	(12.66)	(0.254)	(16.48)	(0.431)	(2.33)
Firm Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8321	8321	8316	8316	8308	8308	8304	8304
R-squared	0.32	0.20	0.33	0.25	0.34	0.28	0.34	0.27