

Pyramids: Empirical Evidence on the Costs and Benefits of Family Business Groups around the World*

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Abstract: We analyze whether family-controlled business groups (often structured as pyramids), are a means to facilitate better access to capital or to expropriate minority shareholders. Using a sample of 28,039 firms from 45 countries, we find that family groups tend to consist of large, established and high-dividend-paying firms. Although group-affiliated firms on average have weaker performance indicators than their unaffiliated peers, we find that after controlling for endogeneity in group membership choice, group structure helps improve firm value (Tobin's Q). Within each group, firm performance rises down the pyramidal chain and increases with the direct shareholding of the group in a member firm. These results indicate that expropriation risk is outweighed by the funding, reputation and corporate control benefits provided by a family business group, similar to a venture capitalist in a developed market. At the country level, the prevalence of groups is more related to access to outside funding than the strength of the corporate governance environment. Overall, our evidence suggests that family business groups exist and grow because of their critical roles in supporting investment opportunities that might not otherwise be funded by external investors, especially in underdeveloped capital markets.

Concentrated ownership in the hands of wealthy families or individuals is a common feature among listed firms in many economies. A popular way in which families can control multiple firms is through a business group, where member firms are connected through common ownership ties to a controlling family by means of pyramids and other cross-shareholding structures. Such conglomerate structures have been an important and persistent phenomenon throughout the development of capital markets around the world. In the US, pyramidal groups were quite popular until the introduction of double taxation of inter-corporate dividends ended their expansion in the 1930s (Morck (2005)). In other parts of the world, recent studies document that the proportion of pyramidal or group firms (mostly controlled by families) in each market relative to total listed firms is about 39 percent for East Asian countries (Claessens, Djankov, and Lang (2000)), 19 percent for Western European countries (Faccio and Lang (2002)), and 42 percent for emerging markets (Khanna and Yafeh (2005)). Further, some of the oldest and largest firms in world stock markets are controlled by family business groups.¹ Despite the prevalence and longevity of business groups, worldwide evidence regarding their functions and characteristics is still lacking.

In this study, we conduct the first systematic examination into family business groups around the world.² Utilizing a new hand-collected dataset of 870 family-controlled business groups consisting of 2,711 firms from 45 countries, our analysis identifies significant differences between family-group firms and other firms and examines how group-firm characteristics change with respect to their placement within the group structure. Our evidence highlights the

¹ A few examples of well-known corporations that can be considered part of a family business group include Fiat (Italy), Ford (US), Hutchison Whampoa (Hong Kong), News Corp (Australia), Overseas Chinese Banking Corp (Singapore), Samsung (South Korea). These firms are all among the largest 15 firms by total assets in their respective markets. Many family groups also have an impressive historical presence. The Jardine Matheson group (Hong Kong/Singapore) and the Bolloré family group (France), for example, were founded more than 150 years ago.

² For brevity, we henceforth refer to family business groups as simply 'business groups' or 'groups'.

importance of the funding and corporate control roles played by family business groups and offers new insights into why they continue to appeal to minority investors.

Existing research has identified both important benefits and costs of business groups (family-controlled and otherwise).³ On the one hand, Khanna and Palepu (2000) find that group affiliation in emerging markets is associated with better performance. They argue that group reputation substitutes for underdeveloped legal and regulatory mechanisms that leave outside investors vulnerable to expropriation risks and information asymmetries in the market. Hoshi, Kashyap and Scharfstein (1991), Khanna and Yafeh (2005) and Gopalan, Nanda and Seru (2007) also document that the internal capital markets created by business groups facilitates risk-sharing and intra-group financial support, as a way to overcome external capital constraints. On the other hand, studies such as Fogel (2006), Morck, Wolfenzon and Yeung (2005), and Stulz (2005) argue that family groups can acquire economic dominance by cultivating powerful political influence, which enable them to entrench their market positions at the expense of economic, institutional and capital market development. Most importantly, Johnson, La Porta, Lopez-de-Silanes and Shleifer (2000), Bertrand, Mehta and Mullainathan (2002), Bae, Kang and Kim (2002), Joh (2003) and Baek, Kang, and Lee (2006) suggest that business groups can facilitate expropriation of minority shareholders through various tunnelling activities.

While the impact of family business groups remains a matter of academic debate, their prevalence and longevity implies that despite expropriation risks, minority shareholders continue to co-invest along side controlling families, pointing to the value the investors place on the monetary, human, and reputational capital provided by these families. Our study presents empirical evidence that confirms the importance of these benefits. Our comparison of group and

³ See Khanna and Yafeh (2007) for a review.

non-group firms reveals that in general, group firms do not exhibit characteristics that render them likely candidates for expropriation of minority shares. In particular, group firms tend to be older, larger, pay more dividends, have more intangible assets and receive greater analyst coverage than non-group firms. Firms at the bottom of a pyramidal group appear even less likely to be targets of expropriation, despite predictions that their low cash-flow rights leave them vulnerable. Within each group, we find that firm performance actually rises down the pyramidal chain. Firms at the bottom of pyramidal groups also exhibit higher growth prospects than those at the top, reflected in their higher Tobin's Q and higher capital expenditures. This indicates that these firms are of a capital-intensive, low free cash flow type, where expropriation is difficult.

We also examine the performance of group versus non-group firms in a multivariate regression framework. In a simple OLS regression, group-affiliated firms have lower average Tobin's Q and return on assets (ROA). However, controlling for potential endogenous selection biases (e.g. the possibility that certain firm types are more likely to be part of a group), we find that the result with respect to Tobin's Q is reversed. It appears that while firms in business groups on average have a lower market value than non-group firms, this may simply reflect that most high-value projects can overcome information asymmetries to obtain external funding and do not require the support of a business group's internal funds or reputation. In contrast, projects with lower value (or higher information asymmetry) may find it impossible to be independently funded in less developed capital markets and may require the support of a group structure. Having accounted for this endogenous selection (treatment effect), we find that the group's cheaper internal funding (relative to the cost of capital from external markets) and certification benefits help to enhance firm value. Overall, this finding is more consistent with an internal capital market explanation than an expropriation explanation for the existence of family groups.

We also examine performance variations within groups using a multivariate regression analysis. Consistent with our univariate results, we find that firm performance (both Tobin's Q and ROA) increases down the pyramidal chain, where the ultimate owner's cash flow rights are low. The Tobin's Q evidence is consistent with Almeida and Wolfenzon's (2006) argument that firms established through a pyramid structure possess a financing advantage over firms in a horizontal group (holding structure) because they can access the retained earnings of their parents. For the ROA evidence, the positive impact of group placement appears to be driven mainly by relatively older firms at the bottom of the pyramid that begin to realise their growth potential by generating superior operating returns.

More importantly, we find that the direct shareholding in each group firm by its immediate parent (and affiliates) is significantly positively related to performance. In interpreting this finding, we argue that the upper echelons of the ownership chain(s) connecting each firm in the pyramid to the ultimate owner are previously chosen in an optimal manner or are difficult to alter. As a result, it is the group's direct ownership stake in a newly formed or acquired firm (the final link in the chain of control) that provides the most appropriate channel to examine the ultimate owner's motivations for expanding a business group, while controlling the firm on the lowest rung of the pyramid. This link is also important because it generally defines a group's level of control as well as the amount invested in a junior firm, and thus signals the group's commitment to the new firm.⁴ Given that our previous result shows that bottom-tier firms have substantial funding requirements, the direct investment made by the immediate parent and group affiliates are an attractive source of funding to meet the junior firm's capital needs and to overcome information asymmetry. Such funding also allows the parent to hold significant control

⁴ Direct ownership can differ from voting control if a firm does not follow the one-share-one-vote rule. However, our results on the importance of the final link remain robust when direct ownership is computed based on voting rights.

rights in the junior firm so as to offset the potentially large moral hazard problem associated with being an outside investor with limited minority shareholder protections. This is the same rationale for giving superior control rights to venture capitalists.⁵ Overall, the positive relation between this direct ownership link and firm value indicates that to minority shareholders, the benefits provided by the group in terms of funding, certification of quality and corporate control/monitoring appear to outweigh the cost of potential expropriation.

Finally, using the sample of 45 countries, we examine country-level characteristics that may explain the prevalence of family-controlled business groups. These are broadly categorised as characteristics that facilitate private benefits of control (e.g. corruption, weak investor protections etc), characteristics related to poor access to capital, and other regulatory factors. In general, we find country-level factors related to private benefits of control have weak explanatory power. Measures of access to capital seem to be more important in explaining the prevalence of family groups, reflecting their ability to utilise internal capital markets when access to external capital markets is very limited (Almeida and Wolfenzon (2006)). In addition, tax transparency and acquisition rules requiring tender offers apply to all shareholders help explain the prevalence of groups.

Overall, our findings are consistent with the importance of internal capital market benefits that family-control business groups facilitate. These findings are in line with Gopalan, Nanda and Seru (2008), who find that dividend payments amongst group firms in Asia and Europe, are a means of distributing funds in an internal capital market. Our results are also consistent with the finding in Almeida *et al.* (2008) for Korean business groups that firms with high investment requirements are more likely to be set up in pyramids. In terms of existing theories, we find

⁵ See Gompers and Lerner (1996) and Kaplan and Stromberg (2003) for discussions of control rights held by venture capital investors.

support for Almeida and Wolfson's (2006) proposition that beyond simply enhancing control, arranging firms in a pyramidal structure provides a financing advantage, because group firms can tap into a larger pool of retained earnings. Our results also support Gomes (2000) and Gopalan, Nanda and Seru (2007) who show that reputation is a key element in attracting funding in the presence of weak investor protection. More broadly, our evidence on the importance of internal capital markets created by family business groups echoes Stein's (1997) theoretical explanation that large business conglomerates exist because they play a vital role in allocating scarce internal capital in the presence of information asymmetries.

The rest of the paper is structured as follows. Section I describes our ownership data and business group construction procedures. Section II presents our firm-level empirical analysis of the characteristics of group firms as well as how performance differs between group and non-group firms and within each group. Section III examines potential country-level determinants of the prevalence of family business groups. Finally, section IV summarizes our conclusions.

I. Ownership Data and Group Construction

To construct business groups we begin by collecting ownership data for each of our sample firms across the 45 sample countries. To ensure maximum coverage, we use two primary sources being the *Osiris* database from *Bureau Van Dijk* and the *Worldscope* database from *Thomson Reuters*. Despite the use of multiple databases, we find that ownership information is missing for a large number of firms. Missing ownership data introduces biases if a sample country only has a small number of listed firms and if firms with missing data belong to ownership chains that are potentially part of a group. To minimize such biases, we resort to a manual search to collect ownership figures of individual firms from *Dunn and Bradstreet's Who*

Own's Whom database, Reuter's *OneSource* database and various information providers in *LexisNexis* (e.g. *the Major Companies database*) and *Factiva* (e.g. *the Taiwan Economic Journal* database of Asian companies). In addition, ownership information is obtained from stock exchange and securities regulator websites (e.g., Belgium, Chile, Colombia, India, Indonesia and Italy) and directly from company annual reports obtained from the *Mergent Online* database and company websites (the latter constitutes a significant portion of ownership information for firms in Mexico, Malaysia, Pakistan, Sri Lanka, Singapore, Thailand and Israel).⁶ Due to the large sample size and complexity of ownership identification, we focus on the year 2002. However, for a small number of firms for which 2002 ownership data is unavailable from any of our sources, we use the earliest ownership information available in the 2003-2006 period. In total, we collect ownership information for 28,039 firms.

Based on the ownership data we collect, the first stage of the group construction process is to distinguish between widely-held (independent) firms and those that are controlled. As a starting point, we define control as holding at least 20 percent of a firm's voting rights and then use this criterion to identify firms with a controlling shareholder. We lower this threshold to 10 percent if the largest shareholder (owning more than 10 percent) also holds other forms of control such as being a firm's founder, CEO or chairman of the board.

One main complication in the application of this definition is that the shareholdings of the controller are often spread out across a number of other entities such as private holding companies, family members, and other group firms. Thus, to determine whether firms are ultimately controlled, we individually examine the shareholder data of firms with a large number

⁶ Multiple data sources also allow us to cross-check outlying observations.

of scattered shareholdings to identify if any of the above ownership patterns exist.⁷ We limit this manual search to markets where beneficial ownership is not disclosed in our primary ownership databases. As a first step, we refer to the company's annual report and/or stock exchange websites, to confirm whether the fragmented shareholdings are vehicles used by controlling shareholders. When such information is not available, our second step is to identify the largest owners in the shareholder lists, and search for them in the shareholder lists of other firms in the same country. Observing the holdings of these entities in other firms, often allows us to establish their common ultimate controlling shareholder.

The next stage of our group construction process establishes the type of entity that is in control of each of our sample firms since we need to distinguish family from non-family control.⁸ We do this by establishing a unique identity for a controlling family, so that firms controlled by the same family can be grouped together, and firms that are controlled by government, other widely held firms, and widely held financial institutions can be eliminated. When a public company is the controlling shareholder, we then investigate its largest shareholders until we can identify the ultimate owner at the top of the chain of control. When a private company is the controlling shareholder, we investigate who is the ultimate owner in control of this entity, similar to the process described above.⁹ This is primarily done through company websites, annual reports

⁷ In many cases the procedure is straightforward as individual shareholders have the same last name, or can be quickly identified as the spouse of the controller.

⁸ A number of related research papers examine the motivations behind business groups in general (Hoshi, Kashyap and Scharfstein (1991), Perotti and Gelfer (2001)). We focus instead on family-controlled business groups because other groups may not possess the same incentives to maintain their reputations. For example, Japanese Keiretsus have often been criticised as being "headless bodies" because there is no dominant shareholder who bears responsibility for the actions of the group.

⁹ Where possible we identify the cash flow rights held in the private company (for example, we occasionally find that the controlling family has 50/50 partnership in a private company which subsequently controls a public company.)

and through media articles accessed via the Google search engine or Factiva.^{10,11} In some cases, we find that an allied group of individuals ultimately owns a firm (such as the GEA Group of Colombia and the Shrem Fudim Group of Israel). We also find cases where a coalition of families, sometimes joined through marriage, are in control (such as the Boel, Solvay & Janssen families in Belgium). In both cases, we classify the firms as being family-controlled. The above process allows us to assign to each of our family-controlled firms a unique identifier based on the specific identity of the family in control. In the next step we make use of these identifiers to group together firms with a common controlling family. When two or more firms in the same market are linked together by one common controlling family, we define this as a family-controlled business group. We allow a controlling family to be foreign-based provided they hold two or more firms in the same market.

The next stage in our process is to ensure that the family-controlled groups are constructed as accurately as possible. To do this we re-examine the ownership of each firm belonging to each group to identify if any cross-holdings exist between member firms. Furthermore, once a group has been identified, we check with a number of other data sources to improve the completeness and accuracy of our group construction.

The sources we use to cross check the completeness of our business groups include *Forbes World Billionaires*, a list of the world largest family firms from *Family Business* magazine and various countries' richest person lists to ensure that wealthy individuals and families, who are often behind these groups, are accounted for. Our group information is also

¹⁰ The identification of the controlling family is made easier by examining the boards of directors of these firms, because the CEO or Chairman is often a member of the controlling family. This narrows our list of suspected families which makes their control much easier to confirm.

¹¹ In some cases where we cannot identify the individuals behind a private company, but this company controls multiple firms, we assume that it is controlled by a family.

verified using country level data sources: Rabelo and Vasconcelos (2002) for Brazil, the *Inter-Corporate Ownership* publication for Canada, Majluf, Abarca, Rodriguez and Fuenes (1998) for Chile, Sato (2004) for Indonesia, Kosenko (2007) for Israel, the Korean Fair Trading Commission website for Korea, Shimizu (2004) for Peru, the *Taiwan Economic Journal* database for Taiwan, data collected by Yupana Wiwattanakantang for Thailand, and data from Lins (2003) for emerging markets, Claessens *et al.* (2000) for East Asian countries and Faccio and Lang (2002) for Western European countries. For many groups, information on member firms and their ownership structures are disclosed on their websites, or can be obtained through the Internet or Factiva articles about the groups. These sources allow us to catch any additional group firms that were overlooked in our initial classification procedure. In total our group construction procedure identifies 870 family-controlled groups, comprising of 2711 firms from 45 countries.

Our coverage of firms is far greater than other studies that examine business groups. To our knowledge, this is the first paper to document the prevalence of family-controlled business groups across 5 continents, and in developed as well as developing markets. For example Khanna and Yafeh (2005), look at only 15 emerging economies, in which our coverage of sample firms is significantly higher for most countries.¹² Claessens, Djankov and Lang (2000) and Faccio and Lang (2002) document the extent of pyramid control as a means of separating cash flow and control rights among 9 East Asian and 13 Western European economies respectively. Similarly, La Porta, Lopez, Shliefer and Vishny (1999) document the popularity of control pyramids and cross-shareholdings based on the largest 20 listed firms across the 27 richest economies. However, apart from a number of illustrative examples, they do not examine the dynamics of

¹² On average we cover 93% of total listed firms in each market and 95% of market capitalization as reported in Datastream. We cover an average 79% of listed firms and 83% of market capitalization when using base figures reported by the *World Bank*. These figures however, include many firms (such as trusts) that are excluded from our sample.

group structure and exclude less developed markets where groups are especially pervasive. Finally, Almeida *et al.* (2008) develop comprehensive measures of business group structures, though their study is limited to South Korea. We also examine many of the same measures.

A. Constructing Cash Flow and Control Rights for Group Firms

The above process allows us to map out the structure of each group and calculate the position, ownership structure, and ultimate cash-flow interests (and control rights) of the ultimate controlling family for every group firm. We illustrate the calculation of these measures using a business group in our sample. Figure 1 illustrates the structure of the *Arab Malaysian Group of Malaysia*, controlled by Azman Hashim in a pyramid structure.

[INSERT FIGURE 1 HERE]

The first measure is the *direct* percentage ownership a group holds in the member firm. For example, Azman Hashim (the controlling owner) holds shares in *Global Carriers* through two shareholding chains. First, *AMMB Holdings* holds 64 percent in *AMFB Holdings* which in turn holds 37 percent of *Global Carriers*. Second, *AMMB* directly owns 12 percent of *Global Carrier*. In this situation, the direct percentage ownership of *Global Carriers* attributable to the group is $37 + 12 = 49$ percent. This measure reflects the degree of control a business group has over a member firm and how much capital is funded through the internal capital market.¹³

The second measure is the ultimate cash flow rights of the controlling family in each group firm, defined as the former's total claim on each dollar of earnings generated by the latter. This is calculated by summing the cash flow rights across all of the chains of shareholdings through which the controlling shareholder establishes its interest in the group firm. For each

¹³ We also calculate the direct ownership measure as a percentage of voting rights. This could be considered the direct voting rights of the family if it has effective control along every ownership link of a pyramid. Both measures are not significantly different from each other, and our results are qualitatively similar across the two alternatives.

chain, the cash flow rights are the product of all observed percentage shareholdings connecting various firms along the chain. In the above example, the ultimate cash flow rights of Azman Hashim in *Global Carriers* is: $(0.35*0.34*0.64*0.37) + (0.35*0.34*0.12) = 0.042$ or 4.2 percent.

The third measure is the strength of control of the ultimate controlling shareholder exerts in each group firm through various ownership chains, following La Porta *et al.* (1999) and Claessens *et al.* (2000). For each chain, the control rights are the smallest percentage voting interests (the weakest link) observed along the chain.¹⁴ Where multiple control chains exist we sum the voting rights across all of the chains to arrive at the total control rights. In the above example, all group firms issue shares with equal voting rights, and thus the ultimate the control rights are equal to: 34 (weakest link along the first chain) + 12 (weakest link along the second chain) = 46 percent. If, for example, *Global Carriers* issued a certain number of shares with superior voting rights to *AMMB Holdings*, so that it actually controlled 50 percent of its votes, then the ultimate control rights are equal to: 34 (weakest link along the first chain) + 34 (weakest link along the second chain) = 68 percent. This weakest-link definition reflects the risk that the ultimate owner may lose control of a shareholding chain, where voting rights are the lowest.

Finally, we measure the position of each firm in the group. In particular, we count how many layers of listed firms exist above each group firm along each shareholding chain and take the maximum of this figure across all of the chains. In the above example, this position measure would be equal to three for *Global Carriers*, two for *AMFB Holdings*, one for *AMMB Holdings* and zero for *Arab Malaysia Corporation*. *Global Carriers* however, is controlled through two firms that are at different positions in the pyramid and thus its position is not unambiguous. To

¹⁴ We obtain information on percentage ownership of voting rights from Worldscope. In cases where this information is not available, but we know that the firm issues multiple classes of shares with different rights (i.e. from the Datastream or Mergent Online database), we assume that all of the superior voting shares belong to the controlling shareholder / parent.

address this situation, we adopt the positioning measure developed by Almeida *et al.* (2008). This measure accounts for the number of listed firms that exist above each group firm, along multiple chains of control. Each chain of control is weighted by the ultimate cash flow rights it provides to the ultimate owner to determine its position. In our example *Global Carriers* is in layer 3 of the pyramid underneath *AMFB Holdings* and provides 2.8 percent ($0.35*0.34*0.64*0.37$) of its cash flow rights to the ultimate owner through this chain. *Global Carriers* can also be considered as a layer 2 firm underneath *AMMB Holdings* where it provides 1.4 percent ($0.35*0.34*0.12$) of its cash flow rights to the ultimate owner. Therefore its weighted average position is $(2.8/4.2)*3 + (1.4/4.2)*2 = 2.66$. We label this variable *Weighted Position*.

One issue that complicates the calculation of these measures arises when group firms own shares in each other (i.e., cross-shareholdings). For example, ultimate owner A owns 40 percent of Firm B, B in turns owns 30 percent of Firm C and 20 percent of Firm D. In addition, C and D each own 20 percent in each other, creating a cross-shareholding layer. In such a case, the cross-shareholding between two firms means that each effectively owns some shares in itself. For every one dollar of earnings generated by Firm C in the above example, C itself has an interest in $0.2*0.2 = 0.04$ or 4 cents of its own earnings. This is similar to the situation where a company has just conducted a share buyback or owns treasury stock, and thus means that each shareholder has $1/(1-0.04)$ share of cash-flow rights more than the level implied by his or her nominal percentage shareholding. Thus, in the presence of cross-holdings, we rescale our ownership and ultimate cash-flow-rights measures to account for circular ownership using the above method. We also include the unscaled voting rights associated with each cross-shareholding stake into a firm in the calculation of the control rights measures (in the above example, A controls 50 and 40 percent of voting rights of C and D, respectively). Table I summarizes the definition of our main ownership

and control variables, and defines all other variables used in our analyses.

[INSERT TABLE I HERE]

B. Country-Level Descriptive Statistics

Our construction of family business groups allows us to calculate several country-level measures of business group importance. The first measure is calculated as the percentage of all listed firm in the market that belong to family business groups, and is labelled *% Group*. We are also interested in the use of pyramid structures as a means of arranging a business group, as the prevalence of such structures has been heavily scrutinized in the literature. A pyramid group is defined as a group in which there is at least one firm indirectly held by the ultimate controlling shareholder (i.e. there are at least two layers of firms below the controlling shareholder). We measure the use of such structures by calculating the percentage of all listed firms in the market that are pyramid-controlled group firms (*% Pyramid*). While this measure allows us to ascertain the frequency of the use of pyramid structures in family business groups, it does not indicate the extensiveness (or depth) of the pyramids. Thus, for each country we calculate an *Average Pyramid Score* variable. In the same manner as the group position variable described above, we assign a number to each firm in a family business group corresponding to the number of listed firms that separate it from the ultimate owner. If a firm is not held in a pyramid, its score is zero. We then sum the pyramid score of every firm in each market and divide by the total number of listed firms in the market to obtain the country-level *Average Pyramid Score*. This measure can also be interpreted as the country-level average separation of cash-flow and control rights achieved through pyramiding.

We also construct *% Group* and *% Pyramid* variables, which are based on the percentage of total market capitalization represented by family business groups and pyramid-controlled firms

respectively. We label these variables *% Group MC* and *% Pyramid MC*.¹⁵ Finally, we calculate two additional statistics that measure the concentration (or power) of family business group in each of our sample countries. The first is the percentage market value controlled by groups divided by the number of groups (*Group Conc*). The second is the market capitalisation held by the largest group in the market (*% Largest Group*). Table II presents all our country-level business group measures, along with the identity of the largest family business group in each country based on both the percentage market capitalization under their control and the number of firms in the group.

[INSERT TABLE II HERE]

Not surprisingly, our country-level measures in Table II reveal that family business groups are more important in emerging markets. For instance, the proportion of listed firms belonging to family business groups (*% Group*) is at least 30 percent in Chile, Colombia, Israel, Philippines, Sri Lanka and Turkey, with Sri Lanka being the largest at about 63 percent. The trend is similar for group firms that are controlled through pyramids (*% Pyramid*). There are however, some important differences in these two statistics, indicating that pyramid structures are less popular in some markets than others. For example, about 28 percent of firms in India and 15 percent of firms in Pakistan belong to a family business group, but only about one third of these are controlled through a pyramid. Similar patterns exist in Turkey and the Philippines. In contrast, the proportion of business group firms structured as pyramids compared to all business groups is much larger in Colombia and Sri Lanka (29 percent out of 39 percent and 49 percent out of 63 percent respectively). While family business groups may only control a few firms in a market, they can often be very large firms that play a key role in the nation's economy. Our

¹⁵ We are unable to obtain market capitalisation information for approximately 1.8 percent of our group firms.

market capitalization measures (*% Group MC* and *% Pyramid MC*) attempt to capture these dimensions of the economic environment. Most notably, the East Asian Markets, such as Singapore, Malaysia, Indonesia and South Korea display a significant difference between the number of firms controlled and the value of firms controlled. For example, only about 10 percent of listed firms in Singapore belong to family business groups, but these groups represent 42 percent of equity market capitalization.

Augmenting the measures of the prevalence of family business groups, the *Average Pyramid Score* provides information on the extent (or depth) of pyramiding. The highest pyramid score is achieved by Colombia, indicating that on average, Colombian groups have the most pyramidal layers in their family groups. It is also noteworthy that group firms controlled through pyramids make up approximately 15 percent of market capitalization for Colombia, Indonesia, Malaysia, Sri Lanka and Turkey. However, *Average Pyramid Score* differs markedly across these four countries (about 61, 21, 11, 57 and 22, respectively).

Finally, our group concentration measures indicate that the degree to which a small number of business groups dominate a local stock market varies significantly across our sample countries. For example, Chile's Angelini family, Colombia's Grupo Empresarial Antioqueño (GEA), Denmark's A.P. Moeller-Maersk group, Italy's Tronchetti Provera group, Korea's Lee Gun-Hee, Mexico's Carlos Slim Helú, the Phillipine's de Ayala family, Thailand's Thaksin Shinawatra and Turkey's Sabanci family all control over 10 percent of their respective country's market capitalization. In contrast, in more developed markets such as the US, UK and Japan, the largest family-controlled business group owns less than 2 percent of stock market capitalization.¹⁶

¹⁶ As explained earlier, while Japan has a large number of business groups (Keiretsus) these are usually controlled by a widely held firm and thus we do not include them in our sample.

II. Firm-Level Empirical Analysis

To examine the motivation behind the prevalence of business groups, we conduct several analyses on the characteristics of each group firm. First, we compare firm attributes of group versus non-group firms. Second, we compare group firms at different layers within the same pyramidal business group. Third we examine whether group membership is related to firm performance, controlling for the endogeneity of group membership choice. Finally, we investigate whether within-group ownership linkages and positioning also influence performance.

A. Univariate Comparisons

In Table III we compare the median values of selected firm-level variables across group and non-group firms (*Group vs. Non Group Tests*) and between firms at different layers in same pyramidal business group (*Within-Group Tests*). The descriptions of these firm-level variables are summarized in Table I. For the *Group vs. Non-Group Tests*, we compare group firms with industry matched peers in the same market based on 2-digit SIC codes.¹⁷ The statistics reported in the table are the differences between group and non-group median values. We also compare group firms to their non-group peers matched by total assets. In an additional unreported test, we exclude peer firms that belong to other types of groups, (eg. government controlled groups or corporate groups such as Kieretsus) to ensure that peer firms are purely stand alone companies. The results are qualitatively similar to those reported in Table III.

¹⁷ In smaller markets, we find that finding a non-group match is not possible at the 2 digit SIC code level, in these cases we match at the 1-digit SIC code level. When this is not possible either we match to the country median.

[INSERT TABLE III HERE]

For the *Within-Group Tests*, we exclude groups that do not employ a pyramid structure (i.e. groups where member firms are directly connected to the controlling family). We then compare median values at the “Top” ,”Middle” and “Bottom” of each pyramidal group, with median values at the layer above. We define the top, middle and bottom position of the firms in the pyramid using two classification schemes. First, we separate the group firms into three groups that maximize the distance between the “Top” and “Bottom” firms. For example in Figure 1, the *Arab Malaysian Corporation*, at the direct control layer, is classified as the “Top” firm, and *Global Carriers* at pyramid layer 3 is classified as the “Bottom” firm. All the firms in between (at layers 1 and 2) are classified as “Middle” firms. Second, we examine firms at the bottom of a shareholding chain (*Bottom of Chain*) and compare them to top firms. A firm will be at the bottom of a shareholding chain if it is held in a pyramid, but does not hold any ownership stakes in other group firms. In our example in Figure 1, *Arab Malaysian Property*, *South Peninsular Industries* and *Global Carriers* will all be classified as “*Bottom of Chain*” firms. We use the Wilcoxon Rank-Sum test of medians to assess whether differences are significant.

We first examine differences in firm performance across group and non-group firms. We use two key firm performance measures, (1) Tobin’s Q (labeled Q henceforth) and (2) return on assets (labeled ROA henceforth) defined as earnings before interests, tax, depreciation and amortization (EBITDA) scaled by total assets. Due to the lack of information on replacement cost of assets, Q is simply calculated as the market value of equity plus book value of liabilities, divided by the book value of assets. The market value of equity is obtained from *Datastream*, and aggregates the market values of different classes of a firm’s tradable stocks as of the end of 2002.

We find that Q is lower for group firms. This is consistent with the findings of Claessens

et al. (2002), who find that separation of cash flow and control rights, (in this case achieved through pyramiding) reduces firm value.¹⁸ When matching by industry we find that group firms have a higher ROA, although this result reverses (although not significant) when matching by total assets. This suggests that since group firms are typically larger than their industry peers, accounting for size differences significantly influences our comparisons. Indeed, Table III confirms that group firms are larger based on both total assets and market capitalization and have higher asset growth, reflecting their superior ability to grow through leveraging their internal capital and reputation to expand their business (Khanna and Palepu, 1997). Group firms are also older than their industry peers reflecting their ability to survive periods of financial distress through the group's support.

Another reason that group firms are capable of greater growth is a superior ability to raise capital internally. For example, the comparison of the *Dividend Yield* shows that group firms, particularly those in the middle layers pay higher dividends than comparable non-group firms. This is in contrast with the implications from the country-level study of dividends by La Porta *et al.* (2000), who show that in the presence of weak investor protection, firms pay less dividends. While this may be true for a broad sample of firms, it does not apply to group-affiliated firms. Rather, our results appear more in line with those of Faccio, Lang and Young (2001), who show that “tight” group affiliation leads to higher dividends. Our explanation for the higher rate of dividends, however, invokes reputation and internal capital markets arguments. Groups pay out returns to shareholders to allay expropriation fears in order to protect their valuable reputation. Additionally, as suggested by Gopalan, Nanda and Seru (2008), dividends can be an important channel to re-distribute funds in an internal capital market. A group's internal capital advantages

¹⁸ Masulis, Wang and Xie (2008) find a similar result when cash flow and control rights are separated through the use of dual class shares.

also lead them to rely less on debt funding. Even though the industry-matched results indicate that group firms take on more debt (*Leverage*), the size-matched comparisons show the opposite.

Finally, while group firms are significantly less volatile than industry peers, they are significantly more volatile than their size-matched peers. This is potentially because the group structure diversifies the controlling family's investments, providing them with a competitive advantage in owning high-risk firms compared with entrepreneurs in control of a single firm.

Our within-group comparison in Table III reveals some surprising results. Tobin's Q rises significantly down the ownership chain. Panel A shows that the difference in Tobin's Q between bottom and the top layer (0.057) is larger than the difference between the middle and the top layer (0.006). Similarly, the level of capital expenditures scaled by total assets (labelled *CAPEX/TA*) also rise significantly down the pyramidal chain, consistent with the Almeida *et al.* (2008) results for Korea. The group vs. non-group results also show bottom tier firms have higher capital expenditures than stand-alone firms of comparable size. This is consistent with family business groups placing higher growth firms at lower layers of the pyramid. The differences in standard deviation of monthly returns measured over the 1997-2001 period (labelled *Stock Volatility*) and annual earnings volatility measured over the same period (labelled *Earnings Volatility*) also indicate the firms at the bottom of the pyramid are generally riskier. Bottom firms are also significantly smaller in terms of total assets (*Log Assets*) and market capitalization (*Log Market Cap*), younger as measured by *Log Age*, and have lower *Analyst Coverage*.¹⁹ These findings suggest that groups are structured in order to exploit risky, but potentially profitable investment

¹⁹ The size results hold by construction, since the parent's investment in the subsidiary will be recorded in the parent's balance sheet. While accounting consolidation will affect absolute firm characteristics (such as size) it should affect ratios such as *Q*. In fact, any biases created would understate our results. Since "top" firm *Qs* are partially made up of a weighted average of their subsidiaries' *Qs*, then high *Qs* at the bottom of these groups would artificially inflate the *Qs* of the parent.

opportunities (in a similar way that venture capitalists do in developed markets).

Young, risky, high growth firms with high information asymmetry have difficulty in raising capital, particularly in environments where capital is scarce and investor protection is weak. Family groups are in a position to fund such firms at the bottom of their pyramidal group, because it is precisely at this point where groups can leverage the most internal capital relative to their own invested capital (i.e. the point where the discrepancy between the family's cash and control rights is the largest). This means that such firms need to rely less on expensive external capital and are backed by the implicit protection provided by a group's reputation, reducing the cost of the residual funding required.²⁰ This is supported by the within-pyramid comparisons of *Direct Ownership* which show that the aggregate size of the group's direct shareholdings (through various ownership chains) of firms at the bottom of the pyramid is significantly greater than that at the top (where the median difference is 7.5 percent). Furthermore, from a risk sharing point of view, because such firms are riskier, the ultimate owner is able to limit their risk exposure in such firms by placing them at lower layers of the pyramid.

Among the other within-pyramid comparisons, both *Leverage* and *Dividend Yield* appear to decrease down the pyramidal chain, reflecting the fact that high growth firms do not have the required cash flows to support debt or to pay out dividends. Lower levels of leverage also indicate a higher proportion of assets are funded through equity, (higher book equity), providing further evidence these firms find it difficult to raise external capital. Borrowings seem to be conducted by the stable, established firms at (or close to) the top of the pyramid. These funds can then be used to finance their bottom-layer subsidiaries, consistent with the internal capital market argument.

²⁰ Evidence in Gopalan, Nanda and Seru (2007) on Indian family groups supports the proposition that member firms benefit from the financial strength of the group and can receive additional capital when they are in financial distress.

Contrary to expectations *Asset Growth* decreases down the pyramidal chain. We investigate this result further by comparing *Asset Growth* at the top of the pyramid with a subset of “young” bottom firms, defined as firms that have been listed for 5 years or less. These unreported results indicate that there is no statistically significant difference in *Asset Growth* between the two groups.²¹ Surprisingly, we also find no difference in *Sales Growth* between “bottom” and “top” firms. We again re-examine these results for “young” firms as defined above and find that *Sales Growth* of young bottom-tier firms is significantly higher than for apex firms. However, these accounting growth measures need not be consistent with market-based measures since the accounting variables measure historical growth rather than future growth potential.

Not surprisingly, the ultimate cash flow rights belonging to the controlling family (*Ultimate CF Rights*) diminish significantly down the pyramidal chain. The median difference between the cash flow rights at the bottom of the pyramid and at the top is 18.96 percent. Claessens, *et al.* (2002) provide evidence that lower cash-flow ownership by the controlling shareholder leads to poor performance due to tunneling. We do not find any evidence that this is the case for family-group affiliated firms. In fact, operating performance, as measured by *ROA*, appears to be higher at the bottom of the pyramid. This suggests that for some pyramidal groups in our sample, the high growth firms at the bottom of the pyramid begin to realize their growth potential by displaying superior operating performance.

B. Regression Analysis of Family-Group Affiliation and Firm Value

To investigate the univariate results reported in Table III more rigorously (with respect to

²¹ There are two possible reasons why we can not pick up differences in *Asset Growth* between “bottom” and “top” firms. First, if a “top” firm makes an investment in a new “bottom” firm, this is captured in the asset growth of the parent, but constitutes the base of total assets for the new firm and is thus no growth is recorded. Second, “top” firms which establish new subsidiaries may do so because they have experienced substantial historical growth rates.

differences between group and non-group firm performance), we turn to multivariate regressions of *Tobin's Q* and *ROA* against a family-group firm indicator and a set of control variables. Our main explanatory variable is an indicator variable which takes a value of one if a firm belongs to a family group, and is zero otherwise (labelled *Group Indicator*). As documented in the univariate results, family-group firms differ significantly from other firms in terms of size, historical asset growth rate, leverage, dividend yield, and investment intensity, all of which can influence *Q*. Therefore, in the *Q* regressions we control for such factors as well as country and industry fixed effects (the latter is constructed using 9 broad sectors based on the Standard Industry Classification system). In addition, both family group membership and firm value can be influenced by common factors reflecting a firm's level of information asymmetry with outside investors. Thus, we include several information asymmetry proxies, namely the extent of intangible assets to total assets (*Intangible*), the logarithm of firm age (*Log Age*), and the logarithm of the number of analysts covering the firm (*Log Analyst*). The control variables are described in Table I.

[INSERT TABLE IV HERE]

One issue that arises from a simple OLS estimation of the *Q* regression is the potential endogeneity of the family-group indicator variable (*Group Indicator*). If group-affiliation provides a mechanism to access otherwise expensive external capital and reduce the information asymmetries associated with high-growth projects, then the choice of whether a firm should be placed in a group may be dependent on its growth prospect, which is correlated with *Q*. To address this endogenous selection problem, we employ a treatment effect model in which we estimate the group affiliation-performance regression simultaneously with the treatment regression using maximum likelihood estimation. The treatment regression accounts for the self-

selection issue by explaining the differences between group and non-group firms using all of the explanatory variables in the group affiliation-performance regression and adding *Idiosyncratic Risk* as an identifying instrument.²² Idiosyncratic risk has been frequently employed as an instrument in previous studies on the impact of ownership on *Tobin's Q* (Himmelberg, *et al.* 1999; Villalonga and Amit, 2006) because on the one hand it influences whether a firm is part of a group (since groups possess a competitive advantage in owning high-risk firms), while on the other it should be unrelated to *Q* which is a function of market risk, rather than firm-specific risk.

Another important issue to consider is that the impact of family-group affiliation on firm value can be a result of the benefits (or costs) of concentrated ownership structure or access to a pool of the entrepreneurial skills (and/or commitment) in a family. To avoid the possibility that our results may be driven by systematic differences between family-controlled and other non-family firms or widely held firms, we conduct further robustness checks by applying the same regression models on two sub-samples of firms, namely, firms that have a controlling shareholder (family or non-family) and firms that are all controlled by a family or an individual (group and non-group firms).

Table IV first reports the baseline OLS estimation of the *Q* and ROA regressions. Similar to the univariate comparison, we find that both *Q* and ROA are significantly lower for family-group firms than for other firms, after controlling for other important determinants of performance. The same result is observed even when we restrict the sample to just controlled firms or family-controlled firms. Similar to the evidence in Claessens *et al.* (2002) and Lemmon and Lins (2003), it appears that control through a family business group has a negative effect on

²² This is measured as the standard error from estimating a one-factor market model on each firm's monthly stock returns from the beginning of 1997 to the end of 2001 using each country's MSCI index for the market returns. Similar results are obtained if we use idiosyncratic risk measured as the standard error obtained from the three-factor model or simply the standard deviation of raw stock returns as the alternative instrument.

performance. Without taking into account the potential endogeneity in group-affiliation choice, group firms appear to suffer a valuation discount and have lower operating returns which may reflect expropriation of minorities or consumption of private benefits by controlling families.

However, before dealing with endogeneity, there are two additional OLS results indicating that the internal capital market benefits of groups help moderate the extent to which their performance is weaker compared to non-group peers. First, we attempt to identify our model by exploiting exogenous differences in market-level environments related to the development of capital market. In particular, we create an indicator variable for whether a firm is listed in an emerging markets, using definition from the *Standard and Poors Emerging Market* database. The coefficient for the interaction between this indicator and *Group Indicator* in the Q regression suggests that the valuation discount of group firms is actually lower in emerging markets than in developed markets. We find similar (unreported) results when using alternative access-to-capital measure such as stock market capitalization to GDP, savings to GDP, or the amount of funds available from institutional investors scaled by the domestic stock market's capitalization, obtained from Li *et al.* (2006). Second, we also interact *Group Indicator* with a measure capturing the number of layers between a firm and its controlling shareholder. The positive coefficient of this interaction in the Q regression further suggests that the valuation discount exists mainly for the top-layer firms in a group, where the benefits of an internal capital market are likely to be the weakest.

In addition, after accounting for endogeneity using the treatment effect model in Table V, we find that the coefficient on *Group Indicator* in the *Tobin's Q* regression reverses sign and becomes significantly positive. This finding remains consistent in the sub-samples of controlled firms or family-controlled firms. We also find that there are strong statistical reasons not to

assume the group-affiliation choice is entirely exogenous. In particular, we report the Wald test, which rejects the null hypothesis that the correlation of the residuals from the two equations of the treatment effect model is zero. This test result indicates that the *Group Indicator* variable is indeed endogenous. The treatment effect model also indicates that idiosyncratic risk has a positive and significant impact on group-affiliation choice, confirming our earlier conjecture that the group structure helps reduce a family's exposure to idiosyncratic risk.

[INSERT TABLE V HERE]

The positive and significant coefficient of *Group Indicator* in models that account for endogeneity has an important implication that is more consistent with an internal capital markets explanation, rather than an expropriation interpretation for the existence of family-controlled business groups. It appears that while group firms on average have lower values than non-group firms, this may simply reflect the fact that firms with high-value projects can overcome information asymmetries by themselves to obtain external funding and do not need the support of a business group's internal funds or reputation. In contrast, projects with lower value (low security benefits or high information asymmetry) may find it nearly impossible to independently raise external funds in the capital market and may need to be supported through a group structure. However, having accounted for this endogenous selection (treatment effect), we find that the group structure helps to enhance firm value. This explanation is also supported by the *ROA* regression models in Table V. Unlike the *Q* regressions, group affiliation continues to be negatively related to *ROA* after accounting for endogenous selection. Since *ROA* does not incorporate the market's assessment of the value of family-group control, this measure simply reflects the contemporaneous operating characteristics of the firm. This re-enforces the conclusion that business groups fund firms with less attractive security attributes (proxied by

ROA), which find it difficult to overcome funding frictions in the external markets because of their lower pledgeable cash flows.²³

C. Within-Group Ownership Characteristics and Firm Value

We next examine whether variations in firm value can be explained by within-group differences in ownership and control structures. La Porta et al (2002) find that the ultimate cash flow rights of the controlling shareholder is positively related to firm value for a sample of large firms around the world. Claessens et al (2002) document similar results for a sample of East Asian firms, finding that the control rights of the controlling shareholder are negatively related to firm value. However, these results are based on samples of both group and non-group firms, and hence may reflect their systematic differences and endogeneity in group-affiliation choice.

To reduce the confounding effect of such systematic differences, the following analysis is limited to the sample of group firms. In particular, we estimate the regression of *Q* on various ownership and control measures, including direct ownership of the business group in a firm, the ultimate cash flow and control rights of the family, and the layer position of a firm in its group. These explanatory variables are described in section I.A. Other control variables in the *Q* regressions are the same as those used in the regression analysis reported in Tables IV and V. To control for time invariant group-level differences (e.g. the reputation and/or entrepreneurial skills of the controlling family/individual), we include group fixed effects in the regression model. Finally, to deal with the possibility that the observed variations in performance are due to intra-

²³ As an alternative estimation, we use a two-stage instrument-variable model, in which the instrument for *Group Indicator* is the fitted value obtained from the first-stage probit regression of this variable on all control variables, including *Idiosyncratic Risk*. The results (unreported) are quantitatively similar to those from the treatment-effect models. We also test for the exclusivity condition of the instrument using a generalized Anderson-Rubin test developed by Stock and Wright (2000). The test statistics are not significant at the 5 percent level, indicating that we cannot strongly reject the null hypothesis that the instrument can be excluded from the second-stage regression.

group corporate transfers (and tunnelling), which cause regression standard errors to differ systematically across groups, we use robust standard errors clustered by business group.

[INSERT TABLE VI HERE]

Using simple OLS estimations in our baseline model, Table VI documents that the ultimate cash-flow rights and the weakest-link control rights of the family individually have no significant influence on firm value. When combined together in one regression, Q is negatively related to the cash-flow rights measure and positively related the control rights measure. These results are in contrast to Claessens et al (2002), whose findings imply that weak cash flow rights and strong control rights create an incentive for expropriation.

Our results favor a different interpretation of group structure dynamics. The negative correlation between the ultimate cash flow rights and Q indicates that high-growth firms are often placed or established at the bottom layer of a business group. In fact, there is a positive and significant relation between firm value and the layer position of a firm in the business group. This finding holds regardless of whether we define a firm's business group position as the number of group firms above it (*Pyramid Layer*) or as an indicator for whether the firm is at the bottom of a pyramid chain (*Bottom of Chain*).²⁴

We also estimate the effects of group ownership and control characteristics on an alternative firm performance measure, namely ROA . Table VI indicates that within the pyramid ROA is in fact greater for pyramidal firms at the bottom of the chain of control. This result raises the question of why supposedly young, high growth group members (those at the bottom of a pyramid's ownership chains) deliver both high value (Q) and high operating returns (ROA) at the

²⁴ We also use the "Weighted Position" variable defined in Almeida *et al.* (2008). This produces virtually identical results to our other position variables.

same time. We investigate this issue in more detail by categorizing firms at the bottom of pyramid chains into newly established firms (defined as those having been listed for five years or less) and seasoned firms (having been listed for more than 5 years). We find that in the *ROA* regressions, most of the superiority in operating performance of bottom-of-chain firms compared with other group firms is driven by seasoned firms. This indicates that for firms at the bottom of a pyramid chain, group structure enhances firm value not only in the early years of listing, but over the long run these firms appear to realize greater benefits, which are manifested in superior operating returns.

We also find evidence that *Q* is significantly and positively related to the group's *Direct Ownership* measure. This relation is much stronger than that between *Q* and the ultimate cash flow rights measure. When a new firm is added to a group, the chain of ownership connecting the family to the immediate parent of the firm is often already well established, and thus, the ownership decision is focused on the last chain of ownership connecting the group to the new firm. This suggests that the ultimate cash flow rights held at the apex of a pyramid-controlled firm is not an active ownership decision variable from the perspective of the controlling family. Instead, it is the direct ownership link held by the parent firm that signals the group's capital commitment to a new firm, thereby reducing its information asymmetry with outside investors. The group's direct ownership also reflects the extent to which a new firm is funded by less expensive internal capital. Both of these effects are likely to explain the higher market valuation of firms with concentrated group ownership. This direct ownership link and the position of a firm in the pyramid appear to be the most important determinants of firm value.

The systematic differences between group versus non-group firms can create a selection bias that influences the coefficients of the ownership and control variables tested in Table VI. To

address this concern, we employ the Heckman two-stage procedure to correct for selection bias (reported in column 6). In the first stage, we run a probit selection model of group affiliation choice using the same specification as the treatment equation in Table V. The fitted values of this model are used to calculate the inverse Mill's ratio, which is then included in the regressions of the alternative performance measures on the ownership and control variables. Essentially, we find very similar results to the OLS regressions. As a robustness check, we repeat the first-stage of the Heckman correction on sub-samples of only controlled firms and only family-controlled firms. Again, we obtain very similar results.

The significant relation between the two performance measures and the group's direct ownership measure (and the layer position measure) may be confounded by potential endogeneity of these explanatory variables. In particular, a high growth (i.e. high Q) firm may be placed at the bottom of a group for ease-of-funding purposes. The group may also decide to retain a large direct ownership in high-value firms. We deal with this endogeneity by using two instruments, firm idiosyncratic risk and an indicator variable for whether a firm and its immediate parent belong to the same industry. The rationale for the first instrument has been discussed earlier. The second instrument is used because it determines the extent to which the group can capture potential synergy between two firms or leverage existing reputational capital by creating (or acquiring) a new group firm below an established group firm in the same industry.²⁵ This means that the same-industry indicator is likely to be correlated with the position of a group firm in the pyramid and the direct ownership level. However, there is no reason to expect that this indicator will be related to the (subsidiary) firm's value. This is because any potential synergy in a spin-off

²⁵ Alternatively, a firm that is in a different industry to its immediate parent is likely to be placed closer to the apex of the pyramid to maximize the diversification impact of its inclusion

or an acquisition is naturally absorbed by the parent rather than accruing to the target firm.²⁶

The instrumental-variable regression results are reported in Table VII. The signs of the coefficients for *Direct Ownership* and *Pyramid Layer* of the instrumental variable regression are consistent with the OLS regression results, but their coefficients are less significant, perhaps due to the weakness of our instruments. Nevertheless, we still find that positioning a group firm at the bottom of the pyramid tends to increase its firm value and *ROA*, and that direct ownership stakes in a group firm by its parent (and affiliates) also positively influences *Q* and *ROA*.²⁷

[INSERT TABLE VII HERE]

Overall, the findings from our within-group analysis are consistent with the internal capital market explanation of group formation. They suggest that the group benefits associated with its strong reputation and access to capital seem to outweigh the potential risk of expropriation in the eyes of minority shareholders.

III. Additional Country-level Analysis.

In this section we utilise our cross-country sample to analyse country-level factors that are related to the prevalence of business groups to provide supplementary evidence upon which we can evaluate the role of family groups.

A. Private Benefits of Control

²⁶ As this instrument can only be constructed based on group firms with a parent, the regression that uses this instrument is estimated on a sub-sample excluding firms directly connected to their controlling families

²⁷ In a final robustness check we also exclude countries from the analysis that allow the consolidation of financial statements to occur at an ownership threshold of less than 75 percent, as this may create biases (double counting) in the book-value based variables. We select the 75 percent threshold because our statistics show that only a small proportion (under 10 percent) of the direct ownership chains in our sample are over the 75 percent threshold. The results are very similar to those reported in Table VI.

Perhaps the most cited explanation for the prevalence of family-controlled firms is that they facilitate the extraction of private benefits of control. This is because structuring business groups as pyramids, creates a divergence between cash-flow and control rights, which increases the incentives of controlling families to tunnel profits out of lower tier firms at the expense of minority shareholders.²⁸ We measure private benefits of control by using the country-level average block premium estimated by Dyck and Zingales (2004). Since the block premium is only available for 33 of our 45 sample countries, we also test the individual country-level determinants of private benefits of control as identified by Dyck and Zingales (2004). These include measures of legal mechanisms such as the protection of shareholder rights,²⁹ and extra-legal mechanisms such as product market competition (*Competition*) and reputation penalties, as proxied by newspaper circulation (*Newspaper*). Table I provides the data sources as well as more detailed descriptions of these variables.

B. Access to Capital

We also examine whether family business groups are more popular in less developed markets, where access to external capital is restricted. These markets are characterized by lower GDP per capita, low savings rates and an underdeveloped investment management industry, which serve to reduce the domestic pool of funds available for corporate investment. We use several measures of access to capital at the country level. The first is the amount of savings scaled by GDP (*Savings to GDP*). The second is funds available from institutional investors,

²⁸Morck, Wolfenzon and Yeung, (2005) suggest that group control can also increase private benefits since controlling families can acquire significant political power which can be used to entrench or strengthen their control over corporate assets or to solicit political favors.

²⁹ This is proxied by the *Anti-director Rights* index (as constructed by La Porta et al (1997) and updated by Pagano and Volpin (2005)) or alternatively by a more generalized *Governance Index* incorporating other governance aspects such as the degree of enforcement of rights and disclosure standards. We also use both the *Anti-self Dealing* index from Djankov et al (2008), and a revised index constructed by Spamann (2008) as (unreported) alternative governance measures and find the results to be qualitatively similar.

using the total equity invested (both locally and internationally) by domestic banks, insurance companies, pension funds, and mutual funds scaled by the domestic stock market's capitalization (*Institutional Funds*), obtained from Li et. al (2006). Finally, a well-functioning external capital markets is dependant on stable political environment, as political instability causes high sovereign risk and restricts the amount of capital provided both by domestic and international investors. We obtain a measure of political stability from the World Bank's *Governance Matters* database and label it *Political Stability*.

C. Regulatory Factors

Tax consolidation rules that govern how a parent can treat its subsidiaries for taxation purposes can affect the prevalence of family business groups. In some countries, tax consolidation arrangements facilitate tax-free movements of income and assets within the group, offering additional tunnelling opportunities. We measure the effect of consolidation rules by categorizing countries into two tax regimes based on consolidation threshold levels. In the first regime, a parent firm is allowed to consolidate a subsidiary in which it has an ownership stake of less than 90 percent and in the second regime consolidation is only allowed at the ownership threshold of 90 percent or more. We construct an indicator variable equal to 1 if the sample country falls in the first regime and 0 otherwise and label this variable *Accounting Consolidation*.³⁰

We also consider the extent to which the government monitors the taxation of intra-group

³⁰ Morck (2005) points out that the double-taxation of inter-corporate dividends, introduced by the U.S. government in the 1930s was explicitly aimed at repressing business groups. We analyse this factor by collecting information on the tax treatment of inter-company dividends across our sample countries from *Deloitte International Taxation Guide*. We find, however, that only three countries have some form of double taxation of inter-corporate dividends and thus we exclude this factor from our empirical analysis due to insufficient cross-country variation.

transactions. An important way groups can generate private benefits of control is through shifting profits, assets, and liabilities within a group to minimize its overall tax liabilities. We construct a measure of inter-corporate tax rules and enforcement using a set of tax transparency indicators reported in the *Deloitte International Taxation Guide*. The variable is labelled *Tax Transparency* and its construction is outlined in Table I.

Finally, we examine the ability of a business group to create an internal capital market or leverage the reputational capital through partial acquisitions. Such transactions allow a group to avoid having to gather a large amount of capital, while still being able to control the same assets. In some markets, gaining a controlling ownership stake can be difficult due to takeover regulations. In particular, partial acquisitions can be restricted if a country's law specifies a very low ownership threshold that triggers a takeover offer to all shareholders. We measure the impact of merger and acquisition rules through an index (labelled *Takeover Index*) constructed by Nenova (2006) for 50 countries around the world that measures the level of protection of minority shareholders and transparency of the takeover process. We hypothesize that stringent takeover regulations can lead to fewer instances of business groups by precluding acquisitions of relatively smaller share blocks.

E. Baseline Country-Level Results

We examine the strength of the above factors in explaining the prevalence of family business groups by using the country-level measures of family business groups reported in Table II as our dependent variables. Table VIII reports the results of various model specifications. For both dependant variables, we find that in model (1), *Log GDP per Capita* clearly dominates *Block Premium* in explaining family business groups, suggesting that the prevalence of groups is

driven by a “poor-country” effect, rather than by a desire of large investors to extract private benefits of control. In unreported tests, we also substitute the *Governance Index* for the *Block Premium* and also remove the *Takeover Index* from our model, because it is correlated with the *Governance Index*. However, our main result remains qualitatively unchanged.

[INSERT TABLE VIII HERE]

In models (2) - (4), for both % *Group* and % *Pyramid* regressions, we replace our summary measures of private benefits of control (*Block Premium*) and economic development (*Log GDP per Capita*) with more specific factors that explain the importance of business groups. However, we can not include *Competition* and *Governance Index* in the same regression since they are highly correlated (correlation of -0.822).³¹ Of the factors related to the private benefits of control, *Tax Transparency* appears to be the strongest and also seems to subsume the *Accounting Consolidation* variable in all our regression models. This suggests that if taxation is not transparent, then the tax regime in place is not particularly relevant. From a private benefits perspective, the lack of government monitoring of inter-corporate transfers allows families to appropriate value through transfer pricing more easily and this increases the prevalence of family business groups. The *Governance Index* does not appear to have any effect on the prevalence of business groups.³² Consistent with our expectations, *Newspaper* circulation has a negative relationship with business groups, although it is insignificant in most models.

The most notable result from Table VIII is the ability of our access to capital variables to explain the prevalence of business groups. *Institutional Funds* is significant across all

³¹ Including *Competition* instead of the *Governance Index* is not significant in any of our regression models.

³² A potential concern is that this result can be confounded by reverse causality. For example, groups can wield significant political power (Morck, Wolfenzon and Yeung 2005) that can stymie development of corporate governance standards. To address this, we use an instrumental variable (IV) regression, and employ the legal origins of each of our sample countries as a historically predetermined instrument. The results remain quantitatively similar.

specifications and almost always at the 1 percent level. Moreover, *Savings to GDP* is also a statistically significant factor in both the *% Group* and *% Pyramid* regressions. Similarly, *Political Stability* is a significant explanatory variable. In an unreported regression, we also utilize a country-level average *Cost of Capital* measure from Hail and Leuz (2006), as an alternative measure of capital availability, which gives similar results. In interpreting these results, however, we recognize that *Institutional Funds* and *Cost of Capital* are themselves partially determined by aggregate corporate governance factors. For example, Khoranna, Servaes and Tufano (2005) find that higher quality national legal systems and greater corporate transparency promote equity investments by mutual funds. Thus, corporate governance factors can be seen to influence the prevalence of family business groups through two channels; directly by facilitating extraction of private benefits of control and indirectly by restricting the amount (or increasing the cost) of capital that outside investors are willing to provide. Our results suggest that this indirect link is a more influential determinant of the prevalence of these groups.

Among the remaining explanatory variables, the *Takeover Index* appears to be a significant determinant of the prevalence of business groups. When acquirers are not required to make an offer to buy all the outstanding shares in a takeover bid, then families are able to control a target firm with only a partial ownership stake.³³ Group formation through leveraging internal capital can thus be executed without fewer regulatory constraints.

F. Country-Level Analysis – Robustness Checks

Thus far, our results suggest that the prevalence of family business groups are more

³³ In unreported regressions, we also test whether firms remain under the control of founding families and their heirs due to a shortage of well-trained professional managers (Khanna and Palepu, 1997). We measure the quality and capacity of a country's business education using a survey variable from the World Economic Forum's Global Competitiveness Report. However, this variable does not seem to have an impact in any of our models.

strongly related to proxies of country-level access to external capital rather than those representing the scope for consumption of private benefits of control. However, these results may be driven by the possibility that access to capital is also related to the scope of private benefits. In addition, our country-level results cannot distinguish between two explanations for business groups, namely that they are more prevalent in certain markets since they facilitate extracting private benefits of control or that they are a substitute for other potentially more costly mechanisms for curbing the private benefits of control.

We attempt to provide some insights into these issues with two additional country-level regressions. First, we re-estimate the regression models in Table VIII using two alternative dependent variables that scale the prevalence of family group firms by the extent that firms in the same market have concentrated ownership. The two variables are (1) the number of firms that belong to a family business group as a proportion of all firms in a market that have a controlling shareholder, (*Group Firms / Controlled Firms*), and (2) the percentage of all family-controlled firms that belong to a family business group (*Group Firms/ Family-controlled Firms*). We argue that since concentrated ownership in general is a product of a business environment that promotes the value of corporate control, then these scaled variables allow us to measure the popularity of groups conditional upon the value of corporate control in a market. The second approach is to account for the private benefits of control directly in our regression models, together with other explanatory variables of interest. To do this, we re-estimate the % *Group* and % *Pyramid* regressions in Table VIII, adding *Block Premium* as an additional explanatory variable. Results from these two approaches are reported in Table IX.

[INSERT TABLE IX HERE]

All of the specifications for the modified dependent variables in Table IX indicate that the

Governance Index has a little explanatory power for the proportion of family-controlled firms that belong to groups. Thus, even after controlling for factors in the business environment that promote the value of corporate control, we do not find evidence that poor governance directly explains the prevalence of business groups. In contrast, the access to capital variables, *Institutional Funds*, *Savings to GDP* and *Political Stability* continue to have strong explanatory power for the prevalence of family groups across countries. The remaining variables in our models are qualitatively similar to the results in Table VIII.³⁴

IV. Conclusion

This paper examines the motivation behind the existence of family-controlled business groups based on two levels of analysis. First, at the firm level we find that after controlling for selection effects, group firms have higher Tobin's Q than non-group firms. It appears that the lower average value of group firms relative to non-group firms reflects the fact that firms with high-value projects can overcome information asymmetries themselves to obtain external funding and do not need the support of a group's internal funds or its reputation. In contrast, projects with lower value or lower pledgeable cash flows may find it impossible to be independently funded by the market and may need to be supported through a group structure. However, having accounted for this endogenous selection, we find that business group structures help to enhance firm value. Similarly, within-groups we find that firms placed at the bottom of the pyramidal chain have higher firm value. Family groups fund such firms at the bottom of their pyramidal group, because

³⁴ Holderness (2008) raises several issues regarding potential aggregation biases and missing variable problems when aggregating firm-level ownership measures to the country level. He suggests that regression analysis should be conducted at the firm level, using unstacked country level factors as additional explanatory variables. We follow this suggestion by estimating a logistic regression of *Group Indicator* on a set of firm-level characteristics used for the regression in Tables IV and V and the same country-level variables used for the regressions in Table VIII. This analysis produces similar results to the country-level aggregate analysis reported in Table VIII and Table IX.

it is precisely at this point where groups can leverage the most internal capital relative to their own invested capital. We also find that firms with greater proportions of equity funded by their parents (and other group firms) are likely to have better market value. The higher valuation of both of these group firm types perhaps reflect that they need to rely less on expensive external capital, while still being backed by the group's reputation. This result differs from the existing research that emphasizes the risk of minority shareholder expropriation when cash flow and control rights diverge, which is predicted to result in lower value due to increased incentives to expropriate private benefits.

Second, at the country level, we find that family-controlled business groups are more prevalent in countries where access to capital is restricted, tax regimes are non-transparent, and merger and acquisition rules do not constrain the ability of controlling families to build pyramids through acquisitions of large share blocks. While investor protection is an important factor that influences the availability of external capital, it does not appear to provide any explanatory power in our country level analysis in its own right. Our country-level results suggest that a group's ability to raise capital both internally and externally as a function of its reputation, renders the group structure beneficial in markets where external capital access is limited. This is analogous to Khanna and Palepu's (1997) argument relating to the power of brand names in product markets of underdeveloped economies. In such circumstance, brands with an established reputation for quality carry with them tremendous market power. Thus, in these circumstances trusted and established families can utilise their brand-like status to raise capital more cheaply. This makes co-investment by minority investors with controlling families more attractive.

Overall, our findings are consistent with the importance of the internal capital market benefits pyramids facilitate, in that the stakes taken in new pyramidal firms are determined by

their risk and value characteristics. Thus, our evidence indicates that expropriation of minority interests is not the primary motive for the existence and growth of pyramidal business groups.

An important implication of our analysis is that any country-level improvements in the ability to access capital should weaken the benefits of family business groups. In particular, in emerging markets, openness to foreign investment can reduce the importance of the role played by family business groups because experienced foreign investors can alternatively take on the role of funding new high growth firms. To the extent that foreign providers of capital can bring greater skills and experience in operating such firms, the competitive advantage of family business groups can be diminished, and the value associated with their access to internal capital and reputation may be significantly eroded.

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Table I – Description of Main Variables

Country-Level Measures of Prevalence of Family Business Groups	
<i>% Group</i>	The percentage of all listed firms in the market that belong to a family business group.
<i>% Pyramid</i>	The percentage of all listed firms in the market that belong to a family business group and are controlled through a pyramid structure.
<i>% Group MC</i>	The percentage of total market capitalization due to firms that belong to family business groups.
<i>% Pyramid MC</i>	The percentage of total market capitalization due to firms that belong to family business groups and are controlled through a pyramid structure.
<i>Group Firms / Controlled Firms</i>	The percentage of all firms in the market controlled by an ultimate owner that belong to a family business group.
<i>Group Firms /Family-controlled Firms</i>	The percentage of all family-controlled firms that belong to a family business group
Firm-Level Variables	
<i>Group Indicator</i>	An indicator variable which equals one if a firm belongs to a business group
<i>Direct Ownership</i>	The percentage of issued shares of a group firm held directly by its parent firm(s) in the same group.
<i>Weakest Control Link</i>	The sum of the weakest ownership links in various chains of ownership connecting the firm to its ultimate controlling shareholder.
<i>Ultimate CF Rights</i>	The sum of cash-flow rights of a group firm attributable to the ultimate controlling shareholder.
<i>Pyramid Layer</i>	An integer variable that counts the number of layers of listed firms that exist between a group firm and its ultimate controlling shareholder.
<i>Bottom of Chain</i>	An indicator variable which equals one if a firm is at the bottom of a pyramid chain.
<i>Q</i>	A proxy for Tobin's Q, calculated as the sum of market value of equity, book value of preference shares (where available) and book value of liabilities, divided by the book value of total assets as of 2002. Sources: <i>Osiris</i> , <i>Worldscope</i> , company annual reports, and <i>Datastream</i> .
<i>ROA</i>	Earnings before Interests, Tax, Depreciation and Amortisation (EBITDA) divided by total as of 2002. Sources: <i>Osiris</i> , <i>Worldscope</i>
<i>Asset Growth</i>	Average growth of total assets based on the five years previous to 2002. Sources: <i>Osiris</i> , <i>Worldscope</i> .
<i>Sales Growth</i>	Average growth of net sales based on the five years previous to 2002. Sources: <i>Osiris</i> , <i>Worldscope</i> .
<i>Market Capitalization</i>	Total number of shares outstanding multiplied by the share price as of 2002. Sources: <i>Datastream</i> , <i>Osiris</i> , and <i>Worldscope</i> .
<i>Log Size</i>	Log of market capitalization or log of total assets, depending on specifications.
<i>Cash</i>	Total cash or cash equivalents divided by total assets as of 2002. Sources: <i>Osiris</i> , <i>Worldscope</i> and company annual reports
<i>Leverage</i>	Total liabilities divided by total assets as of 2002. Sources: <i>Osiris</i> , <i>Worldscope</i> and company annual reports
<i>Dividend Yield</i>	Total dividends paid divided by price per share averaged over the five years previous to 2002. Sources: <i>Datastream</i>
<i>CAPEX/TA</i>	Total capital expenditures divided by total assets as of 2002. Sources: <i>Osiris</i> , <i>Worldscope</i> and company annual reports
<i>Intangible</i>	Total intangible assets divided by total assets as of 2002. Sources: <i>Osiris</i> , <i>Worldscope</i>
<i>Log Age</i>	Log of the age (in years) of a firm from its incorporation date to 2002. Source: <i>Osiris</i>
<i>Log Analyst</i>	The log of one plus the number of analysts providing coverage on a firm's stock. Source: I/B/E/S

<i>Stock Volatility</i>	The standard deviation of monthly stock returns calculated based on a 60-month window in the 5 years previous to 2002. Source: <i>Datastream</i>
<i>Earnings Volatility</i>	The standard deviation of the percentage change in earnings based on the 5 years previous to 2002. Sources: <i>Osiris</i> , <i>Worldscope</i> and company annual reports
<i>Beta</i>	The systematic risk of the company estimated through a market model based each firm's monthly stock returns in the 5 years prior to 2002. Source: <i>Datastream</i>
<i>Idiosyncratic Risk</i>	The standard error from estimating the market model on each firm's monthly stock returns in the 5 years prior to 2002. Source: <i>Datastream</i> .

Country-Level Variables explaining the Prevalence of Family Business Groups

<i>Block Premium</i>	Calculated based on the average difference between the negotiated price for a controlling block of shares and the prevailing market price across 33 countries. Source: Dyck and Zingales (2004)
<i>Governance Index</i>	A principal components aggregation of i) minority shareholder rights (Anti-director rights), from La Porta (1997) and update by Pagano and Volpin (2005), ii) the strength of the rule of law, regulatory quality and control of corruption from Kaufmann, Kraay, and Mastruzzi (2003), and iii) a survey variable measuring disclosure standards from the World Economic Forum's <i>Global Competitiveness Report 2003</i> .
<i>Competition</i>	A survey variable measuring the extent of product market competition. Source: World Economic Forum's <i>Global Competitiveness Report 2003</i> .
<i>Newspaper</i>	The total average circulation (or copies printed) of daily newspapers per 1000 inhabitants as measured in the year 2000 Source: <i>World Association of Newspapers</i>
<i>Tax Transparency</i>	A measure of the stringency of a country's tax law related to intra-corporate transactions, equal to the sum of four indicator variables. The first three indicates if the law addresses and controls three intra-group tax minimization practices, including (i) transfer-pricing, (ii) the use of thin-capitalization companies, and (iii) the registering of holding companies in tax havens. The last variable indicates if there is explicit reporting requirement for companies engaging in the above transactions. Source: <i>Deloitte International Taxation Guide</i> .
<i>Log GDP</i>	The natural logarithm of a country's gross domestic product as of 2001. Source: World Bank.
<i>Log GDP Capita</i>	The natural logarithm of a country's gross domestic product scaled by total population as of 2001. Source: World Bank.
<i>Institutional Funds</i>	Total equity investments of banks, insurance companies, pension and mutual funds in a country scaled by domestic stock market's capitalization, collected at various points during 2001-2002. Sources: OECD publications, websites of national regulators and international associations (EFRP, FEFSI and FIAP).
<i>Political Stability</i>	Perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means. Source: World Bank
<i>Savings to GDP</i>	Total domestic savings scaled by a country's gross domestic product as of 2001. Source: World Bank.
<i>Accounting Consolidation</i>	An indicator variable equal to 1 if a parent firm is allowed to consolidated a subsidiary in which it has an ownership stake of less than 90 percent, and equal to 0 if where consolidation is either not allowed or can only take place if the parent owns more than 90 percent of its subsidiaries. Price Waterhouse Coopers (1998). <i>Corporate Taxes: A Worldwide Summary</i>
<i>Manager</i>	A survey variable based on responses to the question: "Management or business schools in your country are 1 = limited or of poor quality, 7 = the best in the world" Source: World Economic Forum's <i>Global Competitiveness Report 2003</i> .
<i>Takeover Index</i>	An index measuring the level of protection of minority shareholders and the extent of fair and equitable treatment of all shareholders in the takeover process and the transparency of the process. Source: Nenova (2006)

Table II – Country Descriptive Statistics on Family Business Groups

The table reports various statistics on family business groups for 45 sample countries. *No. of Groups* is the number of families or individuals that control two or more firms listed in the same market. *% Group* is the percentage of listed firms in the market that belong to a family business group. *% Pyramid* is the percentage of listed firms that belong to a family business group and are controlled through a pyramid structure. *% Group MC* and *% Pyramid MC* are the percentage of market capitalization held by group-controlled firms and pyramid-controlled group firms respectively. *Average Pyramid Score* measures the average depth of pyramid-controlled by family business groups. The last five columns comprise of measures of country-level group concentration. *Group Conc.* is the percentage market value controlled by groups divided by the number of groups. *Largest Group by Market Cap* and *% Mkt. Cap* reveal the identity of the family business group with the largest share of market capitalization and the share of market capitalization under its control. *Largest Group by No. of Firms* and *No. of Firms* reveal the identity of the family business group with the largest number of firms in each country and the number of firms under its control.

Country	N	No. of Groups	% Group	% Pyramid	% Group MC	% Pyramid MC	Average Pyramid Score	Group Conc.	Largest Group by Mkt. Cap	% Mkt. Cap	Largest Group by No. of Firms	No. of Firms
Argentina	57	2	10.53	3.51	7.03	1.03	3.51	3.52	Pérez Companc, Gregorio	6.20	Pérez Companc, Gregorio	3
Australia	1405	33	6.76	3.49	8.08	1.58	3.84	0.24	Murdoch, Rupert	3.39	Millner, Robert	10
Austria	103	3	6.80	3.88	8.98	7.83	5.83	2.99	Mautner Markhof	5.93	Mautner Markhof	3
Belgium	164	14	23.17	11.59	26.58	19.80	16.46	1.90	Cera Holding (Allied families)	10.52	Baren, Dieryck & Bertrand Families	5
Brazil	341	16	16.72	10.26	13.17	6.37	14.08	0.82	Aguiar family	2.78	Egydio de Souza Aranha family (ITAU)	9
Canada	1220	17	4.51	2.54	12.90	6.82	2.87	0.76	Desmarais, Paul	3.80	Bronfman, Edward & Peter	9
Chile	170	17	40.59	22.35	42.10	22.19	32.35	2.48	Angelini family	13.48	Luksic family	13
Colombia	56	4	39.29	28.57	44.27	21.10	60.71	11.07	Grupo Empresarial Antioqueño (Allied families)	24.50	Grupo Empresarial Antioqueño (Allied families)	15
Czech	73	2	5.48	2.74	1.50	0.47	2.74	0.75	Bakala, Zdenek (RPJ)	1.03	Bakala, Zdenek (RPJ)	2
Denmark	184	6	7.07	1.63	19.44	0.88	1.63	3.24	Maersk, Mc-Kinney & Moeller families	16.69	Kjaer, Poul Christian Tage	3
Finland	169	7	11.24	5.33	3.10	0.92	6.51	0.44	Errko, Aatos	0.97	Erkko, Aatos	4
France	801	29	10.24	5.62	9.01	2.80	9.24	0.31	Arnault, Bernard	2.29	Bollere family	10
Germany	816	30	9.07	4.17	5.26	0.90	5.02	0.18	Plattner, Hasso	2.33	Ehlerding, Ingrid	7
Greece	263	16	19.01	11.79	18.81	3.72	12.17	1.18	Latsis, Spiro	4.20	Costopoulos Family	7
Hong Kong	519	25	15.41	8.29	24.94	11.44	12.33	1.00	Li Ka-Shing	9.31	Chan Kwok Keung	8
Hungary	41	2	9.76	4.88	1.50	0.03	4.88	0.75	Schreier, Bernard (CP Hold.)	1.47	Schreier, Bernard (CP Hold.)	2
India	659	55	28.22	10.02	20.85	4.10	10.32	0.38	Ambani, Mukesh	8.51	Tata Family	26
Indonesia	330	25	25.15	13.94	48.20	18.63	21.82	1.93	Salim, Soedono	10.34	Riady, Mochtar	11
Ireland	73	3	8.22	1.37	2.03	0.00	1.37	0.68	O'Reilly, Anthony	1.26	O'Reilly, Anthony	2
Israel	226	19	39.82	26.11	23.30	12.01	50.44	1.23	Dankner, Nochi	7.13	Dankner, Nochi	26
Italy	291	16	17.87	8.25	25.85	17.08	14.78	1.62	Tronchetti Provera family	13.81	Tronchetti Provera family	8

Japan	3233	36	2.54	1.05	2.89	1.23	1.08	0.08	Ito,Masatoshi (7 Eleven)	1.35	Ito,Masatoshi (7 Eleven)	4
Korea	1355	86	20.37	10.48	56.58	48.70	12.92	0.66	Lee Gun-Hee (Samsung)	24.77	Koo Bon-Moo (LG)	18
Malaysia	998	52	16.73	8.92	38.40	19.82	11.42	0.74	Lim Kok Thay (Genting) ^a	4.59	Quek Leng Chan	11
Mexico	123	9	21.14	10.57	34.97	22.15	13.01	3.89	Slim, Carlos	24.64	Slim, Carlos	8
Netherlands	183	5	5.46	2.19	4.69	3.36	2.73	0.94	de Carvalho-Heineken family	4.59	de Carvalho-Heineken family	2
New Zealand	96	3	7.29	6.25	10.99	10.09	13.54	3.66	Murdoch, Rupert ^b	7.45	Quek Leng Chan ^c	3
Norway	178	7	8.99	3.93	5.17	0.97	4.49	0.74	Rokke, Kjell Inge	1.34	Nagell-Erichsen, Tinius ^d	3
Pakistan	221	14	15.38	3.62	6.68	3.19	4.07	0.48	Dawood, Hussain	2.79	Dawood, Hussain	5
Peru	143	8	21.68	11.19	43.09	11.38	11.89	5.39	Alberto Benavides de la Quintana	15.31	Brescia Family	8
Philippines	221	31	44.80	16.74	30.11	8.96	19.91	0.97	de Ayala Family	11.73	Sy, Henry	7
Poland	137	5	7.30	2.92	3.44	0.50	3.65	0.69	Krauze, Ryszard (Softbank)	2.09	Krauze, Ryszard (Softbank)	2
Portugal	78	6	24.36	12.82	10.23	6.66	14.10	1.71	de Azevedo, Belmiro (Sonae)	7.76	de Azevedo, Belmiro (Sonae)	6
Singapore	627	18	10.69	7.02	42.11	16.82	9.09	2.34	Lee Seng Wee ^e (OCBC)	14.72	Lee Seng Wee ^e (OCBC)	13
South Africa	298	7	6.04	3.02	1.31	0.92	3.69	0.19	Kebble Family (Cons. African Mines)	0.44	Kebble Family (Cons. African Mines)	6
Spain	163	7	12.27	7.36	4.66	2.15	8.59	0.67	March Family	1.85	March Family	4
Sri Lanka	117	20	63.25	48.72	41.68	18.19	57.27	2.08	SE Captain	10.85	Selvanathan family (Carsons)	14
Sweden	294	13	17.69	8.50	25.50	16.58	8.50	1.96	Wallenberg family (Investor)	15.90	Wallenberg family (Investor)	10
Switzerland	298	5	3.69	1.01	0.78	0.06	1.01	0.16	Von Finck, August	0.50	Buehrle, Hortense	3
Taiwan	637	38	20.88	12.87	41.03	21.10	13.97	1.08	Y.C. Wang (Formosa Corp)	6.57	Shu Tong Hsu	8
Thailand	465	30	21.51	10.97	47.05	17.71	11.40	1.57	Shinawatra, Thaksin (Shin Corp)	11.20	Chokwatana Family (Saha Pathana)	14
Turkey	250	26	39.60	18.80	42.04	16.90	21.60	1.62	Sabancı Family	11.72	Koc Family	15
UK	2369	15	1.56	0.76	1.48	1.04	0.76	0.10	Murdoch, Rupert ^f	0.88	Cayzer Family	6
USA	7562	87	3.03	0.91	3.04	0.70	0.94	0.03	Buffet, Warren	1.23	Magness, Gary & Kim (Liberty Media)	10
Venezuela	32	1	6.25	3.13	0.38	0 ^g	3.13	0.38	Levy, Samuel	0.38	Levy, Samuel	2

^a Quek Leng Chan is in control of the largest group belonging to a Malaysian family, however his group comprises of listed firms in Singapore Malaysia, New Zealand, Thailand, Philippines and the UK. Thus it is not the biggest group made up of purely Malaysian firms.

^b Rupert Murdoch controls New Zealand's Sky Network and Independent Newspapers Ltd.

^c Quek Leng Chan controls CDL Hotels and other smaller listed firms in New Zealand.

^d This could have been superseded by the Hagen family with the acquisition of Steen & Strom in 2004.

^e Ng Teng Fong, another Singaporean businessman, is most likely in control of a larger group, however, this group comprises of firms listed mainly in Hong Kong.

^f Rupert Murdoch controls BSKyB and NDS Group PLC.

^g Market Capitalisation is missing for the single Venezuelan group firm that is controlled through a pyramid.

Table III Non-Parametric Tests of Differences between Group and Non-Group Firms and between Firms within the Same Group

The Table compares the median values of selected firm-level variables across group and non-groups firms as well as between firms at different positions in the same pyramidal business group. Group vs. Non-group comparisons are made between group firms and their matched industry peers as well as peers matched by total assets. Within-group tests compare median unadjusted firm variables across pyramidal layers in the same business groups. Pyramid groups are separated into three groups; directly controlled firms (Top), firms that separated from the ultimate owner by the maximum number of listed firms (Bottom) and firms that lie between top and bottom groups (Middle). Bottom of Chain firms are those held in a pyramid but do not control any other group firms. Statistical significance of differences is tested using a Wilcoxon Rank-Sum test of medians. *Q* is a proxy of Tobin's *Q*. *ROA* is earnings before interest, tax, depreciation and amortization divided by total assets. *Log Size* is the log of US-dollar market capitalization. *Log Total Assets* is the log of US-dollar total assets. *Asset Growth* is the average annual growth rate of total assets based on the five years previous to 2002. *Sales Growth* is the average growth rate of net sales based on the five years previous to 2002. *Cash* is the ratio of cash holdings to total assets. *Leverage* is the ratio of total liabilities to total assets. *Dividend Yield* is the ratio of dividend-per-share over share price. *CAPEX* is the ratio of capital expenditure over total assets. *Stock Volatility* is the standard deviation of monthly stock returns calculated based on a 60-month window in the 5 years previous to 2002. *Earnings Volatility* is the standard deviation of the percentage change in earnings based on the 5 years previous to 2002. *Log Analyst* is the logarithm of the number of analysts covering a firm plus one. *Log Age* is the logarithm of firm age. *Intangible* is the ratio of intangible assets to total assets. *Direct Ownership* is the percentage of issued shares of a group firm held directly by its parent firm(s) in the same group. *Ultimate CF Rights* is the sum of cash-flow rights of a group firm attributable to the ultimate controlling shareholder.

	<i>Group vs. Non-Group Tests</i>					<i>Within-Group Tests</i>						
	<i>Industry Matched</i>			<i>Size Matched</i>		<i>Industry Matched</i>		<i>Size Matched</i>		<i>Bottom of Chain</i>		
	Group minus Non-Group	Top minus Non-Group	Middle minus Non-Group	Bottom minus Non-Group	Bottom of Chain minus Non-Group	Group minus Non-Group	Top minus Non-Group	Bottom minus Non-Group	Middle minus Top	Bottom minus Top	Bottom minus Middle	Bottom of Chain minus Top
<i>Q</i>	-0.021	-0.029	-0.015	-0.015	-0.008	-0.019	-0.028	0.002 ^a	0.006	0.057 ^a	0.024 ^c	0.051 ^a
<i>ROA</i>	0.445 ^b	0.238	-0.202	1.162 ^b	0.812 ^b	-0.121	-0.213	0.513	0.041	0.910	2.319 ^b	0.008
<i>Log Total Assets</i>	0.850 ^a	0.958 ^a	1.398 ^a	0.547 ^a	0.532 ^a	--	--	--	-0.546 ^a	-1.311 ^a	-0.915 ^a	-1.325 ^a
<i>Log Market Cap</i>	0.827 ^a	0.847 ^a	1.253 ^a	0.632 ^a	0.654 ^a	--	--	--	-0.572 ^a	-0.906 ^a	-0.529 ^a	-0.961 ^a
<i>Asset Growth</i>	0.292 ^b	0.677 ^a	0.573	-0.707	-0.902	-0.838	-0.435	-1.540	-0.871	-2.169 ^a	-2.400	-2.140 ^a
<i>Sales Growth</i>	-0.028	0.243 ^b	-1.570	-0.199	-0.876	-0.653	-0.723	0.000	-5.426 ^a	-0.360	-0.113	-0.571
<i>Cash</i>	-0.185	-0.149	-0.260	-0.242	-0.190	-0.222 ^a	-0.013 ^a	-0.516	0.427 ^a	-0.106	-0.022	-0.006
<i>Leverage</i>	1.112 ^a	2.284 ^a	1.902 ^b	-0.995	-0.900	-2.360 ^a	-2.000 ^b	-2.798 ^a	-3.258	-4.404 ^a	-0.539	-0.036 ^a
<i>Dividend Yield</i>	0.000 ^{a+}	0.000 ^{a+}	0.003 ^a	0.000 ^{a+}	0.000 ^{a+}	0.000 ^{a+}	0.000 ^{a+}	0.000 ^{a+}	0.0004	0.000 ^{c-}	0.000	0.000 ^{c-}
<i>CAPEX</i>	0.025 ^a	0.017 ^a	-0.039	0.103 ^a	0.052 ^a	-0.037 ^a	-0.076 ^a	0.134 ^a	0.200	0.211 ^b	0.055	0.218 ^a
<i>Stock Volatility</i>	-0.823 ^a	-0.820 ^a	-0.968 ^c	-0.773	-0.743 ^c	0.012 ^a	0.170 ^b	0.043 ^b	0.426	0.616 ^a	0.416	0.621 ^a
<i>Earnings Volatility</i>	-0.379	-0.354	-0.706	-0.257	-0.337	0.215 ^a	0.178 ^a	0.283 ^a	-0.187	0.492 ^a	0.153	0.475 ^b
<i>Analyst Coverage</i>	0.000 ^{a+}	0.000 ^{a+}	1.000 ^a	0.000 ^{a+}	0.000 ^{a+}	0.000 ^{a+}	0.000 ^{a+}	0.000 ^{a+}	0.000	0.000 ^{a-}	0.000	0.000 ^{a-}
<i>Log Age</i>	0.137 ^a	0.192 ^a	0.150 ^a	0.032 ^c	0.045 ^a	0.060 ^a	0.111 ^a	0.000	-0.117	-0.278 ^a	-0.208 ^a	-0.276 ^a
<i>Intangible</i>	0.000 ^{a+}	0.000 ^{a+}	0.000 ^{a+}	0.000 ^{a+}	0.000 ^{a+}	0.000 ^{a+}	0.000 ^{a+}	0.000 ^{a+}	-0.050	0.000	0.000	0.000
<i>Direct Ownership</i>	--	--	--	--	--	--	--	--	0.042	0.078 ^a	0.072 ^c	0.078 ^a
<i>Ultimate CF Rights</i>	--	--	--	--	--	--	--	--	-0.253 ^a	-0.190 ^a	-0.043 ^a	-0.190 ^a

^a, ^b and ^c denote significance at the 1, 5 and 10 percent levels, respectively. ⁺ denotes that there are more positive than negative differences, despite the median difference of zero.

Table IV. Family Group Membership and Firm Performance – OLS regression

The dependent variable is the ratio of market value of assets over book value of assets, used as a proxy for Tobin's Q or EBITDA/Assets (*ROA*). *Group Indicator* is an indicator variable that equals one if a firm belongs to a family-controlled group and zero otherwise. *Group*Emerging* is the interaction between *Group Indicator* and the indicator for whether a firm is from an emerging market, as defined by the *S&P Emerging Market* database. *Group*Layer* is the interaction between *Group Indicator* and the number of layers of listed firms making up the chain of control between a firm and its controlling shareholder. *Log Size* is the log of US-dollar market capitalization or the log of US-dollar total assets in the *ROA* regression. *Beta* is the estimate of beta for each firm obtained from running a market model on the firm's monthly stock returns over 5-year period to 2002. *Asset Growth* is the five-year average annual growth rate in asset. *Leverage* is the ratio of total liabilities to total assets. *CAPEX* is the ratio of capital expenditure over total assets. *Dividend Yield* is the ratio of dividend-per-share over share price. *Intangible* is the ratio of intangible assets to total assets. *Log Age* is the logarithm of firm age. *Log Analyst* is the logarithm of the number of analysts covering a firm plus one. All regression models include indicator variables for industry sectors (based on their first SIC digit) and country fixed effects. Each of the specifications is estimated first on the full sample, then on the sample of firms with a controlling shareholder (controlled firms), and finally on the sample of family-controlled firms. The standard errors are reported in parentheses, and are corrected for cluster-specific heteroskedasticity, with a cluster being defined as a country in the sample.

	<i>Q</i>					<i>ROA</i>				
	Full sample		Controlled-firm sample		Family-firm sample	Full sample		Controlled-firm sample		Family-firm sample
<i>Group Indicator</i>	-0.167 ^a (0.033)	-0.231 ^a (0.059)	-0.184 ^a (0.034)	-0.219 ^a (0.041)	-0.274 ^a (0.044)	-0.024 ^a (0.007)	-0.017 ^c (0.009)	-0.022 ^a (0.008)	-0.031 ^a (0.008)	-0.045 ^a (0.009)
<i>Group*Emerging</i>		0.137 ^c (0.081)					-0.013 (0.013)			
<i>Group*Layer</i>			0.034 ^c (0.020)					-0.002 (0.004)		
<i>Log Size</i>	0.173 ^a (0.046)	0.171 ^a (0.044)	0.170 ^a (0.044)	0.191 ^a (0.035)	0.223 ^a (0.036)	0.047 ^a (0.011)	0.047 ^a (0.011)	0.047 ^a (0.011)	0.039 ^a (0.013)	0.047 ^a (0.012)
<i>Beta</i>	0.043 ^c (0.024)	0.043 ^c (0.023)	0.043 ^c (0.023)	0.019 (0.024)	0.022 (0.027)					
<i>Asset Growth</i>	0.165 ^a (0.057)	0.165 ^a (0.056)	0.166 ^a (0.056)	0.117 ^c (0.064)	0.133 (0.099)	0.011 (0.017)	0.009 (0.017)	0.009 (0.017)	0.002 (0.006)	0.007 (0.018)
<i>Leverage</i>	0.990 ^a (0.277)	0.998 ^a (0.283)	0.998 ^a (0.283)	1.001 ^a (0.301)	1.142 ^a (0.307)	-0.153 ^a (0.019)	-0.153 ^a (0.019)	-0.153 ^a (0.019)	-0.151 ^a (0.015)	-0.144 ^a (0.017)
<i>CAPEX/TA</i>	1.098 ^a (0.316)	0.952 ^a (0.272)	0.951 ^a (0.273)	1.129 ^a (0.333)	1.228 ^a (0.418)	0.046 ^c (0.027)	0.179 ^a (0.023)	0.179 ^a (0.023)	0.176 ^a (0.042)	0.171 ^a (0.047)
<i>Dividend Yield</i>	-2.308 ^a (0.783)	-2.301 ^a (0.788)	-2.306 ^a (0.787)	-1.190 ^c (0.631)	-1.283 ^c (0.663)	0.822 ^a (0.171)	0.812 ^a (0.173)	0.812 ^a (0.173)	0.720 ^a (0.147)	0.614 ^a (0.153)
<i>Intangible</i>	-0.238 ^b (0.098)	-0.238 ^b (0.097)	-0.238 ^b (0.097)	-0.210 (0.141)	-0.081 (0.124)	-0.029 (0.036)	-0.033 (0.035)	-0.033 (0.035)	0.002 (0.019)	-0.052 ^c (0.030)
<i>Log Age</i>	-0.268 ^a (0.065)	-0.268 ^a (0.066)	-0.268 ^a (0.065)	-0.248 ^a (0.068)	-0.274 ^a (0.065)	0.016 ^c (0.009)	0.017 ^c (0.009)	0.017 ^c (0.009)	0.021 ^b (0.008)	0.014 ^c (0.008)
<i>Log Analyst</i>	-0.270 ^c (0.144)	-0.267 ^c (0.143)	-0.266 ^c (0.143)	-0.224 ^c (0.114)	-0.264 ^b (0.121)	-0.022 ^c (0.013)	-0.023 ^c (0.013)	-0.023 ^c (0.013)	-0.012 (0.012)	-0.015 (0.011)
<i>Adjusted R²</i>	0.123	0.121	0.121	0.123	0.138	0.260	0.263	0.263	0.257	0.272
<i>No. of obs</i>	24070	24070	24070	12244	9274	23564	23564	23563	11774	9175

^a, ^b, and ^c denote significance at the 1, 5, and 10 percent levels.

Table V. Group Membership and Firm Performance – Treatment-Effect Regression

The dependent variable is the ratio of market value of assets over book value of assets, used as a proxy for Tobin's Q or EBITDA/Assets (ROA). *Group Indicator* is an indicator variable that equals one if a firm belongs to a family-controlled group and zero otherwise. *Log Size* is the log of US-dollar market capitalization or the log of US-dollar total assets in the ROA regression. *Beta* is the estimate of beta for each firm obtained from running a market model on the firm's monthly stock returns over 5-year period to 2002. *Asset Growth* is the five-year average annual growth rate in asset. *Leverage* is the ratio of total liabilities to total assets. *CAPEX* is the ratio of capital expenditure over total assets. *Dividend Yield* is the ratio of dividend-per-share over share price. *Intangible* is the ratio of intangible assets to total assets. *Log Age* is the logarithm of firm age. *Log Analyst* is the logarithm of the number of analysts covering a firm plus one. In the treatment effect models, the Q regression equation is estimated jointly with the treatment equation, in which *Group Indicator* is explained by *Idiosyncratic Risk* and the other explanatory variables in the Q regression, using the maximum likelihood procedure. To save space, the estimates of the first-stage regressions are not reported, except for the coefficients of *Idiosyncratic Risk*. The treatment-effect models report the Wald test for cross-equation correlation of the error terms, which indicates evidence of endogenous selection. All regression models include indicator variables for industry sectors (based on their first SIC digit) and country fixed effects. Each of the specifications is estimated first on the full sample, then on the sample of firms with a controlling shareholder (controlled firms), and finally on the sample of family-controlled firms. The standard errors are reported in parentheses, and are corrected for cluster-specific heteroskedasticity, with a cluster being defined as a country in the sample.

	<i>Q</i>			<i>ROA</i>		
	Full sample	Controlled-Firm Sample	Family-Firm Sample	Full sample	Controlled-Firm Sample	Family-Firm Sample
<i>Group Indicator</i>	2.056 ^a (0.381)	2.051 ^a (0.407)	2.092 ^a (0.421)	-0.337 ^a (0.047)	-0.322 ^a (0.056)	-0.337 ^a (0.056)
<i>Log Size</i>	0.150 ^a (0.050)	0.148 ^a (0.037)	0.130 ^a (0.045)	0.052 ^a (0.011)	0.050 ^a (0.013)	0.063 ^a (0.011)
<i>Beta</i>	0.036 (0.024)	-0.001 (0.024)	-0.004 (0.031)			
<i>Asset Growth</i>	0.173 ^a (0.058)	0.136 ^b (0.069)	0.203 ^b (0.098)	0.010 (0.017)	0.010 (0.018)	-0.001 (0.018)
<i>Leverage</i>	0.976 ^a (0.276)	0.980 ^a (0.301)	1.038 ^a (0.310)	-0.154 ^a (0.018)	-0.154 ^a (0.014)	-0.141 ^a (0.013)
<i>CAPEX/TA</i>	1.079 ^a (0.344)	1.202 ^a (0.333)	1.375 ^a (0.401)	0.052 ^b (0.026)	0.181 ^a (0.043)	0.169 ^a (0.043)
<i>Dividend Yield</i>	-2.333 ^a (0.799)	-0.955 (0.769)	-1.284 (0.798)	0.804 ^a (0.183)	0.580 ^a (0.161)	0.575 ^a (0.177)
<i>Intangible</i>	-0.259 ^a (0.099)	-0.261 ^c (0.139)	-0.029 (0.151)	-0.026 (0.036)	-0.039 (0.033)	-0.061 ^c (0.032)
<i>Log Age</i>	-0.310 ^a (0.062)	-0.342 ^a (0.073)	-0.384 ^a (0.070)	0.021 ^b (0.009)	0.026 ^a (0.008)	0.021 ^b (0.009)
<i>Log Analyst</i>	-0.288 ^b (0.140)	-0.273 ^b (0.126)	-0.353 ^b (0.147)	-0.022 (0.015)	-0.012 (0.012)	-0.009 (0.011)
<i>Idiosyncratic Risk</i>	0.346 ^a (0.082)	0.349 ^a (0.076)	0.400 ^a (0.086)	0.371 ^b (0.146)	0.390 ^a (0.147)	0.488 ^a (0.135)
<i>Wald test</i>	585.57 ^a	1081.64 ^a	1171.60 ^a	305.30 ^a	316.33 ^a	323.94 ^a
<i>No. of obs</i>	24070	12244	9274	23564	11890	9046

^a, ^b, and ^c denote significance at the 1, 5, and 10 percent levels.

Table VI. OLS regression of within-group differences and firm performance

The dependent variable is the ratio of market value of assets over book value of assets (used as a proxy for Tobin's Q) or EBITDA/Assets (ROA). The main explanatory variables of interest are different measures of within-group control and ownership measures. *Direct Ownership* is the percentage of issued shares of a group firm held directly by its parent firm(s) in the same group. *Weakest Control Link* is the sum of the weakest ownership links in various chains of ownership connecting the firm to its ultimate controlling shareholder. *Ultimate CF Rights* is the sum of cash-flow rights of a group firm attributable to the ultimate controlling shareholder. *Pyramid layer* is an integer variable that counts the number of layers of listed firms that exist between a group firm and its ultimate controlling shareholder. A logit transformation is applied to both *Direct Ownership* and *Ultimate CF Rights*. *Bottom of Chain* is the indicator variable for whether a firm is at the bottom of a pyramid chain (the suffix Old (or New) indicates whether a bottom-of-a-chain firm has been listed for at least 5 years (or less)). *Log Size* is the log of US-dollar market capitalization or the log of US-dollar total assets in the ROA regression. *Beta* is the estimate of beta for each firm obtained from running a market model on the firm's monthly stock returns over 5-year period to 2002. *Asset Growth* is the five-year average annual growth rate in asset. *Leverage* is the ratio of total liabilities to total assets. *CAPEX* is the ratio of capital expenditure over total assets. *Dividend Yield* is the the ratio of dividend-per-share over share price. *Intangible* is the ratio of intangible assets to total assets. *Log Age* is the logarithm of firm age. *Log Analyst* is the logarithm of the number of analysts covering a firm plus one. For robustness, the Heckman two-stage correction for potential selection bias is also used (column 6). The first stage is a probit regression that explains group-affiliation status using all of the standard control variables mentioned above, country and industry dummies, and *Idiosyncratic Risk*, which is the standard error from the same market model used to estimate of *Beta*, as the identifying instrument. The *Lambda* measure (inverse Mill's ratio) is calculated from this first stage and included in the Q regression as an additional control. All Q regressions include group-specific fixed effects. The standard errors are reported in parentheses, and are corrected for cluster-specific heteroskedasticity, with a cluster being defined as a group in the sample.

	<i>Q</i>						<i>ROA</i>					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
<i>Direct Ownership</i>	0.040 ^b (0.017)	0.032 ^c (0.018)	0.029 (0.017)	0.029 (0.018)		0.041 ^b (0.017)	0.007 (0.004)	0.006 (0.005)	0.005 (0.005)	0.005 (0.005)		0.006 (0.004)
<i>Pyramid Layer</i>		0.079 ^a (0.021)						0.014 (0.006) ^b				
<i>Bottom of Chain</i>			0.122 ^a (0.028)						0.015 ^b (0.007)			
<i>Bottom of Chain New</i>				0.200 ^b (0.082)						0.001 (0.018)		
<i>Bottom of Chain Old</i>				0.102 ^a (0.030)						0.019 ^b (0.008)		
<i>Ultimate CF Rights</i>					-0.064 ^a (0.020)						-0.008 (0.006)	
<i>Weakest Control Link</i>					0.067 ^b (0.030)						0.008 (0.007)	
<i>Log Size</i>	0.096 ^a (0.013)	0.105 ^a (0.013)	0.107 ^a (0.013)	0.107 ^a (0.013)	0.102 ^a (0.014)	0.093 ^a (0.016)	0.016 ^a (0.005)	0.018 ^a (0.005)	0.018 ^a (0.005)	0.018 ^a (0.005)	0.017 ^a (0.005)	0.012 ^b (0.006)
<i>Beta</i>	-0.005 (0.054)	-0.003 (0.054)	-0.001 (0.054)	-0.003 (0.054)	-0.009 (0.054)	-0.006 (0.054)						

(continued next page)

<i>Asset Growth</i>	-0.003 (0.052)	0.003 (0.052)	-0.003 (0.051)	-0.003 (0.051)	-0.000 (0.052)	-0.001 (0.053)	-0.016 (0.013)	-0.015 (0.013)	-0.016 (0.014)	-0.015 (0.013)	-0.015 (0.013)	-0.010 (0.013)
<i>Leverage</i>	0.705 ^a (0.088)	0.715 ^a (0.088)	0.715 ^a (0.088)	0.716 ^a (0.088)	0.714 ^a (0.088)	0.704 ^a (0.089)	-0.084 ^a (0.028)	-0.085 ^a (0.028)	-0.085 ^a (0.028)	-0.086 ^a (0.028)	-0.083 ^a (0.027)	-0.081 ^a (0.028)
<i>CAPEX/TA</i>	2.103 ^a (0.776)	2.087 ^a (0.778)	2.074 ^a (0.782)	2.066 ^a (0.787)	2.100 ^a (0.775)	2.103 ^a (0.777)	0.106 (0.066)	0.106 (0.065)	0.105 (0.065)	0.107 (0.066)	0.105 (0.066)	0.099 (0.065)
<i>Dividend Yield</i>	0.314 (0.458)	0.304 (0.452)	0.346 (0.460)	0.354 (0.467)	0.351 (0.457)	0.304 (0.460)	0.496 ^a (0.098)	0.498 ^a (0.098)	0.502 ^a (0.098)	0.497 ^a (0.097)	0.503 ^a (0.098)	0.499 ^a (0.100)
<i>Intangible</i>	-0.082 (0.228)	-0.100 (0.225)	-0.106 (0.227)	-0.113 (0.225)	-0.088 (0.226)	-0.084 (0.227)	-0.010 (0.052)	-0.014 (0.052)	-0.014 (0.052)	-0.012 (0.052)	-0.011 (0.052)	-0.018 (0.052)
<i>Log Age</i>	-0.079 ^a (0.026)	-0.069 ^a (0.025)	-0.066 ^b (0.026)	-0.057 ^b (0.028)	-0.076 ^a (0.025)	-0.082 ^a (0.027)	0.004 (0.006)	0.005 (0.006)	0.005 (0.006)	0.003 (0.006)	0.003 (0.006)	-0.004 (0.007)
<i>Log Analyst</i>	-0.032 (0.023)	-0.035 (0.023)	-0.033 (0.023)	-0.030 (0.023)	-0.043 ^c (0.022)	-0.032 (0.023)	-0.000 (0.006)	-0.001 (0.006)	-0.001 (0.006)	-0.001 (0.006)	-0.002 (0.006)	-0.003 (0.006)
<i>Lambda</i>							-0.046 (0.169)					-0.079 ^b (0.036)
R-squared	0.567	0.569	0.570	0.571	0.567	0.566	0.554	0.555	0.554	0.555	0.554	0.553
No. of observations	2453	2453	2453	2453	2453	2453	2406	2406	2406	2406	2406	2406

^a, ^b, and ^c denote significance at the 1, 5, and 10 percent levels.

Table VII. OLS regression of within-group differences and Tobin's Q – controlling for endogeneity of group position

The dependent variable is the ratio of market value of assets over book value of assets, used as a proxy for Tobin's Q or EBITDA/Assets (ROA). The main explanatory variables of interest are different measures of within-group control and ownership measures. *Direct Ownership* is the percentage of issued shares of a group firm held directly by its parent firm(s) in the same group. A logit transformation is applied to *Direct Ownership*. *Pyramid layer* is an integer variable that counts the number of layers of listed firms that exist between a group firm and its ultimate controlling shareholder. *Log Size* is the log of US-dollar market capitalization or the log of US-dollar total assets in the ROA regression. *Beta* is the estimate of beta for each firm obtained from running a market model on the firm's monthly stock returns over 5-year period to 2002. *Asset Growth* is the five-year average annual growth rate in asset. *Leverage* is the ratio of total liabilities to total assets. *CAPEX* is the ratio of capital expenditure over total assets. *Dividend Yield* is the five-year average of the ratio of dividend-per-share over share price. *Intangible* is the ratio of intangible assets to total assets. *Log Age* is the logarithm of firm age. *Log Analyst* is the logarithm of the number of analysts covering a firm plus one. To address potential endogeneity, the instrumental-variable estimation is used. All regressions are estimated with instrumental variables. *Direct Ownership* (or *Pyramid Layer*) is instrumented by *Idiosyncratic Risk* (measured as the standard error from the same market model used to estimate *Beta*) in the full-sample regression, and by both *Idiosyncratic Risk* and *Same Industry Indicator* (which equals one if a group firm's and its immediate parent's SIC-code share the same first digit) in a sub-sample regression excluding top-layer firms. The standard errors are reported in parentheses.

	Full sample regressions				Sub-sample regressions (excluding top-layer firms)			
	Q		ROA		Q		ROA	
<i>Direct Ownership</i>	0.647 ^c (0.369)		0.232 ^c (0.127)		0.159 ^b (0.079)		0.063 ^c (0.033)	
<i>Pyramid Layer</i>		1.127 (0.837)		0.834 (0.706)		0.507 ^c (0.302)		0.280 ^c (0.163)
<i>Log Size</i>	0.057 ^a (0.019)	0.215 ^c (0.119)	0.021 ^c (0.011)	0.154 ^c (0.101)	0.046 ^a (0.012)	0.084 ^a (0.025)	0.014 ^b (0.006)	0.040 (0.025)
<i>Beta</i>	0.057 (0.053)	0.048 (0.051)			0.034 (0.031)	0.010 (0.034)		
<i>Asset growth</i>	0.040 (0.053)	0.068 (0.079)	-0.003 (0.019)	0.033 (0.053)	0.033 (0.039)	0.068 (0.064)	-0.027 (0.024)	-0.005 (0.036)
<i>Leverage</i>	0.503 ^a (0.083)	0.714 ^a (0.196)	-0.068 ^b (0.034)	-0.148 ^c (0.081)	0.501 ^a (0.061)	0.563 ^a (0.075)	-0.093 ^a (0.035)	-0.093 ^b (0.041)
<i>CAPEX/TA</i>	0.218 (0.202)	0.337 (0.234)	0.086 (0.076)	0.240 (0.237)	0.438 ^a (0.156)	0.496 ^b (0.211)	-0.047 (0.090)	0.080 (0.147)
<i>Dividend Yield</i>	0.061 (0.443)	-0.201 (0.637)	0.404 ^b (0.177)	0.610 (0.436)	0.048 (0.318)	-0.428 (0.480)	0.639 ^a (0.155)	0.571 ^b (0.232)
<i>Intangible Dum</i>	0.332 (0.226)	0.018 (0.261)	0.051 (0.083)	-0.233 (0.214)	0.264 ^c (0.157)	0.289 ^c (0.166)	0.105 (0.067)	0.085 (0.078)
<i>Log Age</i>	0.043 (0.060)	0.153 (0.139)	0.034 (0.023)	0.090 (0.078)	-0.023 (0.022)	0.009 (0.037)	0.010 (0.009)	0.023 (0.020)
<i>Log Analyst</i>	0.097 (0.090)	-0.051 (0.035)	0.039 ^c (0.022)	-0.039 (0.043)	-0.010 (0.025)	-0.016 (0.029)	0.014 (0.009)	0.005 (0.011)
<i>No. of obs</i>	2453	2453	2406	2406	1162	1162	1129	1129

^a, ^b, and ^c denote significance at the 1, 5, and 10 percent levels.

Table VIII. Multivariate Regression Analysis of Cross-Country Variations in Family Business Groups

The table reports OLS regression results for a sample of 44 countries. *% Group* is the percentage of listed firms in the market that belong to a family business group. *% Pyramid* is the percentage of listed firms that belong to a family business group and are controlled through a pyramid structure. *% Group MC* and *% Pyramid MC* are the percentage of market capitalization held by group-controlled firms and pyramid-controlled group firms respectively. All dependants are measures as at 2002 *Block Premium* is calculated based on the average difference between the negotiated price for a controlling block of shares and the prevailing market price. *Governance Index*, is an index based on principle components weights of anti-director rights, an enforcement index and corporate disclosure. *Competition* is a survey variable measuring the degree of product market competition. *Newspaper* is the average newspaper circulation per 1000 inhabitants. *Tax Transparency* measures the stringency of tax laws related to intra-corporate transactions. *Log GDP per Capita* is the natural logarithm of GDP scaled by total population. *Log GDP* is the natural logarithm of GDP. *Institutional Funds* is total institutional equity investments scaled by stock market capitalization. *Savings to GDP* is total domestic savings scaled GDP. *Manager* is a survey variable measuring the quality of business schools. *Accounting Consolidation* indicates the ownership threshold at which subsidiaries can be consolidated into the parent for taxation purposes. *Takeover Index* measures the level of protection of minority shareholders and the extent of fair and equitable treatment of all shareholders in the takeover process and the transparency of the process. Heteroskedasticity-consistent standard errors are reported in parentheses.

<i>Dependent Variables</i>	<i>% Group</i>				<i>% Group MC</i>		<i>% Pyramid</i>				<i>% Pyramid MC</i>	
	(1)	(2)	(3)	(4)	(1)	(2)	(1)	(2)	(3)	(4)	(1)	(2)
<i>Intercept</i>	68.827 ^a (17.513)	69.423 ^a (14.816)	73.534 ^a (15.734)	41.596 ^a (14.308)	62.484 ^b (25.467)	54.200 ^c (27.521)	34.027 ^a (8.288)	35.595 ^a (11.772)	46.751 ^a (13.422)	24.276 ^b (9.633)	23.335 (18.778)	20.005 (20.949)
<i>Block Premium</i>	-0.012 (0.100)						0.018 (0.060)					
<i>Governance Index</i>		2.773 (2.159)	0.575 (2.205)	2.179 (2.102)	4.105 (4.047)	1.565 (4.376)			0.676 (1.407)	1.797 (1.301)	1.760 (2.828)	0.305 (2.909)
<i>Newspaper</i>		-3.391 (2.099)	-0.549 (2.469)	1.838 (2.193)	-0.682 (4.463)	0.326 (5.155)		-1.448 (1.470)	-0.397 (1.640)	1.360 (1.470)	1.281 (3.496)	2.106 (3.772)
<i>Tax Transparency</i>		-3.543 ^a (1.278)	-4.513 ^a (1.420)	-2.743 ^b (1.160)	-3.909 (2.504)	-2.598 (2.830)		-1.705 ^b (0.747)	-2.678 ^a (0.971)	-1.465 ^c (0.819)	-0.938 (1.944)	-0.451 (2.228)
<i>Log GDP Per Capita</i>	-4.327 ^b (2.065)						-2.105 ^c (1.048)					
<i>Log GDP</i>		-1.400 (1.391)	-2.441 ^c (1.340)	-1.951 ^c (1.124)	-0.207 (2.049)	-1.272 (2.407)		-1.406 (1.147)	-2.026 ^c (1.115)	-1.689 ^c (0.941)	-0.643 (1.439)	-1.268 (1.725)
<i>Institutional Funds</i>		-11.766 ^a (3.230)			-20.425 ^a (6.679)			-6.616 ^a (1.842)			-10.961 ^b (4.662)	
<i>Savings to GDP</i>			-0.794 ^a (0.262)			0.062 (0.522)			-0.543 ^b (0.202)			-0.071 (0.382)
<i>Political Stability</i>				-10.317 ^a (3.567)						-7.336 ^b (3.065)		
<i>Accounting Consolidation</i>	-0.182 (3.213)	0.748 (2.977)	-3.226 (2.769)	0.846 (2.703)	-6.390 (5.506)	-9.478 ^c (5.302)	-0.069 (2.076)	1.541 (2.011)	-1.730 (1.789)	1.108 (1.891)	-0.987 (4.453)	-2.920 (3.961)
<i>Takeover Index</i>	-21.825 ^a (7.607)	-26.338 ^a (7.830)	-16.608 ^c (9.256)	-20.426 ^b (8.622)	-30.182 ^b (14.505)	-34.232 ^c (17.375)	-11.148 ^c (6.039)	-9.380 ^b (3.877)	-8.477 (6.737)	-10.876 (6.560)	-15.432 ^c (9.069)	-16.090 (9.955)
<i>Adjusted R²</i>	0.423	0.476	0.529	0.559	0.289	0.168	0.318	0.354	0.420	0.465	0.045	-0.044
<i>No. of obs</i>	37	44	44	44	44	44	37	44	44	44	44	44

^a, ^b and ^c denote significance at the 1, 5 and 10 percent levels, respectively.

Table IX. Multivariate Regression Analysis of Family Business Groups Controlling for Private Benefits of Control

The table reports OLS regression results for a sample of 44 countries. *% Group* is the percentage of listed firms in the market that belong to a family business group. *% Pyramid* is the percentage of listed firms that belong to a family business group and are controlled through a pyramid structure. *Group Firms/Controlled Firms* is the percentage of all firms in the market controlled by an ultimate owner that belong to a family business group. *Group Firms/Family-controlled Firms* is the percentage of all family-controlled firms that belong to a family business group. All dependants are measured as at 2002. *Block Premium* is calculated based on the average difference between the negotiated price for a controlling block of shares and the prevailing market price. *Governance Index*, is an index based on principle components weights of anti-director rights, an enforcement index and corporate disclosure. *Competition* is a survey variable measuring the degree of product market competition. *Newspaper* is the average newspaper circulation per 1000 inhabitants. *Tax Transparency* measures the stringency of tax laws related to intra-corporate transactions. *Log GDP per Capita* is the natural logarithm of GDP scaled by total population. *Log GDP* is the natural logarithm of GDP. *Institutional Funds* is total institutional equity investments scaled by stock market capitalization. *Savings to GDP* is total domestic savings scaled GDP. *Manager* is a survey variable measuring the quality of business schools. *Accounting Consolidation* indicates the ownership threshold at which subsidiaries can be consolidated into the parent for taxation purposes. *Takeover Index* measures the level of protection of minority shareholders and the extent of fair and equitable treatment of all shareholders in the takeover process and the transparency of the process. Heteroskedasticity-consistent standard errors are reported in parentheses.

	<i>Group Firms/ Controlled Firms</i>			<i>Group Firms/Family-controlled Firms</i>			<i>% Group</i>		<i>% Pyramid</i>	
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(1)	(2)
<i>Intercept</i>	92.085 ^a (13.924)	96.171 ^a (16.371)	55.227 ^a (13.771)	104.512 ^a (13.563)	109.490 ^a (14.517)	68.413 ^a (14.113)	61.284 ^a (9.808)	71.749 ^a (13.215)	36.480 ^a (6.810)	42.392 ^a (8.186)
<i>Block Premium</i>							0.062 (0.116)	-0.091 (0.102)	0.078 (0.065)	-0.018 (0.052)
<i>Governance Index</i>	5.106 ^b (2.453)	2.825 (2.430)	4.783 ^b (1.931)	4.106 (2.608)	1.813 (2.109)	3.809 ^c (2.229)	4.149 (2.638)	0.418 (2.176)	3.575 ^b (1.480)	1.170 (1.242)
<i>Newspaper</i>	-3.735 (2.677)	-0.818 (3.544)	3.239 (3.173)	-3.774 (2.676)	-0.690 (3.361)	3.058 (3.050)	-1.825 (1.731)	0.767 (2.373)	-1.572 (1.145)	-0.035 (1.527)
<i>Tax Transparency</i>	-5.140 ^b (1.929)	-6.113 ^a (1.987)	-4.265 ^b (1.615)	-5.292 ^b (2.024)	-6.432 ^a (2.069)	-4.442 ^b (1.743)	-1.910 (1.570)	-3.958 ^b (1.616)	-1.138 (0.939)	-2.369 ^b (1.015)
<i>Log GDP</i>	-2.174 (1.895)	-3.253 ^c (1.866)	-2.725 ^c (1.355)	-3.359 ^c (1.860)	-4.453 ^b (1.724)	-3.891 ^a (1.347)	-1.129 (1.088)	-2.446 ^b (1.145)	-0.570 (0.742)	-1.409 ^c (0.821)
<i>Institutional Funds</i>	-12.301 ^c (6.185)			-11.914 ^c (6.838)			-16.126 ^a (5.084)		-10.739 ^a (3.595)	
<i>Savings to GDP</i>		-0.810 ^b (0.396)			-0.880 ^b (0.389)			-0.802 ^a (0.290)		-0.467 ^b (0.183)
<i>Political Stability</i>			-14.205 ^a (4.433)			-13.935 ^a (4.119)				
<i>Accounting Consolidation</i>	2.340 (4.615)	-1.762 (4.163)	3.095 (3.944)	2.105 (4.824)	-2.120 (4.654)	2.870 (4.251)	-1.036 (3.074)	-4.503 (3.533)	-0.549 (1.876)	-2.593 (2.100)
<i>Takeover Index</i>	-35.158 ^a (10.837)	-25.275 ^b (10.955)	-26.419 ^a (9.638)	-34.287 ^a (11.599)	-23.329 ^b (10.384)	-25.691 ^b (11.162)	-34.127 ^a (9.048)	-23.191 ^b (9.761)	-19.897 ^a (6.247)	-13.233 ^b (6.360)
<i>Adjusted R²</i>	0.411	0.446	0.560	0.468	0.513	0.588	0.524	0.539	0.514	0.487
<i>No. of obs</i>	44	44	44	44	44	44	37	37	37	37

^a, ^b and ^c denote significance at the 1, 5 and 10 percent levels, respectively.

Figure 1. The Arab Malaysian Group, controlled by Azman Hashim.

