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

Ronald W. Masulis
Owen Graduate School of Management
Vanderbilt University
Phone: +1 615-322-3687
ronald.masulis@owen.vanderbilt.edu

Peter Kien Pham
Australian School of Business
University of New South Wales
Phone: +61 2-9385-5952
p.pham@unsw.edu.au

Jason Zein
Australian School of Business
University of New South Wales
Phone:. +61 2-9385-5875
j.zein@unsw.edu.au

October 22nd, 2008

Preliminary version. Do not quote

* The authors would like to thank Joseph Fan, Jie Gan, Gloria Tian and participants at the HKUST Summer Symposium of Family Business Research for the valuable suggestions. We are also very grateful to Karl Lins and Yupana Wiwattanakantang for sharing their emerging market and Thai group data for verification purposes, and to Suk-won Kim, Gloria Tian, and Xiaowei Xu for the help in tracking down information on Korean and Canadian groups. All errors remain our own.

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

Abstract: We analyze whether family-controlled business groups, which are often structured as pyramids, are a means to facilitate better access to capital or to expropriate minority shareholders. At the country level, we find that, access to outside funding, taxation and regulatory factors are more important than the strength of the corporate governance environment in explaining the prevalence of business groups. At the individual firm level, group-affiliated firms tend to be larger, less risky, and more highly levered, and pay more dividends than non-group firms. Consistent with some previous findings, group-affiliated firms on average have lower Tobin's Q than unaffiliated firms. However, after controlling for endogeneity in group membership choice, we find that a group structure helps improve firm value. Within groups, we find that Q increases down the pyramidal chain and decreases with the ultimate owner's cash flow rights, and that the direct shareholding of the group in a firm is an important (positive) determinant of Q. These firm-level results are contrary to previous findings that emphasize agency problems and expropriation of minority shareholders in business groups. Our evidence indicates that such expropriation risk is outweighed by the funding and corporate control benefits provided by a group, similar to a venture capitalist in a developed market. Overall, both the country- and firm-level analyses point to a consistent implication that business groups exist and persist because of their critical roles in assisting projects that might not be otherwise funded by external investments, especially in underdeveloped capital markets.

The ownership structure of publicly listed firms differs markedly across the world. Concentrated ownership in the hands of wealthy families or individuals, while relatively infrequent in developed markets, is commonplace in smaller markets and emerging economies (La Porta et al, 1999 and Claessens, Djankov and Lang, 2000). A popular way in which wealthy families can control multiple independently listed firms is through a family business group, where member firms are connected through inter-corporate shareholdings and common ownership ties to a controlling family by means of pyramids and other cross-shareholding structures.

Existing research on business groups (family controlled and otherwise) points to both important costs and benefits (see Khanna and Yafeh (2007) for a review). On the one hand, Bertrand, Mehta and Mullainathan (2002), Bae, Kang and Kim (2002), Joh (2003) and Baek, Kang, and Lee (2006) suggest that pyramidal groups can facilitate expropriation of minority shareholders through various tunnelling activities.[1] Almeida and Wolfenzon (2006a) point to social welfare costs brought about by inefficient internal capital allocation of family groups. Fogel (2006), Morck, Strangeland and Yeung (2000), 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.

On the other hand, studies such as Khanna and Rivkin (2001) and Khanna and Palepu (2000) find that group affiliation in emerging markets is associated with better performance. The basic premise underlying these findings is that group reputation substitutes for underdeveloped legal and regulatory mechanisms that leave outside investors vulnerable to exportation risks and information asymmetries in the market, and thus reluctant to invest. In the absence of adequate protection mechanisms, access to capital markets is seriously restricted and as a consequence substantial barriers to entry are created. Fisman and Khanna (2004) suggest that business groups promote economic development in this risky environment, because they are able to overcome such problems and expand into underdeveloped regions, where these problems are most severe. Khanna and Palepu (1997) argue that business groups can also substitute for weak educational institutions, because they have a greater incentive to invest in management training programs compared with unaffiliated firms. Gopalan, Nanda and Seru (2007) find that business groups

[1] Johnson et al, (2000) also provides examples of how tunnelling can take place.

often lend financial support to financially distressed member firms. They also find that the group's reputation can benefit its member firms, making capital raising much easier. Finally, Khanna and Yafeh (2005) examine the idea that business groups facilitate risk sharing which provides mutual insurance to group firms that shield them from capital market shocks that can be particularly pronounced in emerging economies.

In this study we seek to understand the factors that contribute to the existence and prevalence of family-controlled business groups based on two levels of analysis. Our first analysis is conducted at the country level. Using a sample of 45 countries, we examine the factors that explain cross-country variations in the prevalence of family controlled-business groups. While groups may emerge for different reasons in different markets (Khanna and Yafeh, 2007), we focus on several measurable country-level characteristics common to all our sample countries that may explain the prevalence of family controlled business groups. These are broadly categorised as those characteristics that facilitate private benefits of control (e.g. corruption, weak investor protections etc), those 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 for explaining the existence of business groups. 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 financing in external capital markets is very limited (Almeida and Wolfenzon, 2006b).[2] This is not to say that corporate governance factors are unimportant. Rather we conjecture that these factors have an indirect rather than direct influence on the prevalence of family business groups by promoting a vibrant market for external capital which facilitates the growth of new firms that compete with business group firms that benefit from their own internal capital markets. Among our other country-level explanatory factors, we find that tax and merger and acquisition rules also play an important in explaining the cross-country variation in the prevalence of family business groups.

The second line of analysis focuses on firm-level variations in family group membership and ownership structure, and how these attributes can influence firm performance. From a total sample of 27,987 firms, for which ownership data are available from various sources, we are able to identify 845 family controlled groups, comprising of a total of 2526 firms. For each group we map out its exact structure in terms of the number of pyramidal layers in the group and the

[2] Almeida and Wolfenzon (2006b), refer to this advantage as a financing advantage.

position of each member firm in the chain of control. We also calculate the cash flow and control rights that belong to the ultimate owner (the controlling individual/family at the apex of the pyramid) for each firm. We first focus on the relationship between group firms and non-group firms. Our univariate analysis indicates that group-affiliated firms tend to have lower Tobin's Q than unaffiliated firms. Group firms also tend to be larger, less volatile, pay more dividends and have higher capital expenditures. Second, our within-group comparisons reveal that Tobin's Q actually rises down the pyramidal chain. This is contrary to some theories of pyramidal groups that emphasize agency problems and risk of minority shareholder expropriation, which is predicted to be a function of the cash flow and control rights of the ultimate controlling shareholder. In these models, greater free cash flows offer greater tunnelling opportunities, while high Tobin's Q firms tend to exhibit high growth, which requires large capital expenditures, lowering free cash flows.

Next, we re-examine our univariate findings in multivariate regression framework, which also facilitates the comparison of group versus non-group firms, controlling for potential endogenous selection biases (e.g. the possibility that firms with certain characteristics related to its value are more likely to be part of family business groups). We find that our initial univariate result that group-affiliated firms have lower Tobin's Q is reversed. This finding indicates that endogeneity has an important impact on our results that is more consistent with an internal capital market explanation, rather than an expropriation explanation for the existence of family groups. 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 themselves 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 may find it impossible to be independently funded in less developed capital markets and may need to be supported through a group structure. Having accounted for this endogenous selection (treatment effect), we find that the group structure helps to enhance firm value. This positive relation indicates that for those firms that choose to be in a group, the benefits of obtaining cheaper internal funding (relative to the cost of capital from external markets) and certification of firm quality by the group, help improve their market valuation.

We also re-examine our within-group univariate results in a multivariate analysis, controlling for group versus non-group selection biases, and potential endogeneity between

Tobin's Q and a group firm's ownership and group position characteristics. Consistent with our univariate results, and in contrast with a number of previous studies, we find that that Q increases down the pyramidal chain, where the ultimate owner's cash flow rights are low. This evidence is inconsistent with suggestions that firms at the bottom of a pyramid group (and those having low cash flow rights) are the most likely to be expropriated. More importantly, we find that the direct shareholding of the immediate parent in the pyramid firm is significantly positively related to Q. We interpret this finding as indicating that the upper echelons of the shareholding chain(s) connecting each firm in the pyramid to the ultimate owner are previously chosen in an optimal manner, so that any deviations can adversely affect the rest of the group. Therefore, it is a group's direct ownership stake in a newly formed or acquired firm at the bottom of the pyramid (the final link in the chain of control), rather than the ultimate cash-flow rights at the apex of the pyramid, that provides the most appropriate channel to examine the ultimate owner's motivations and strategies for expanding a business group while controlling the lowest rung of the pyramid. We argue that this is the most important link because it generally defines a group's level of control (i.e., voting power) as well as the amount invested in a junior firm in the pyramid. These links are important tools to leverage the group's reputation and its internal sources of capital. The positive relation between this direct ownership link and firm value indicates that to minority shareholders, the funding, certification of quality and corporate control/monitoring benefits provided by the group appear to outweigh the cost of potential expropriation.

Our analysis of firms at the bottom of the pyramid shows that they tend to have not only higher Tobin's Q, but also higher capital expenditures, indicating a high demand for external capital. They also tend to have high risk (stock return variance), which offers a further reason for limiting the ultimate owner's cash flow rights in these firms. At the same time, the substantial external funding requirements of these junior firms when operating in capital markets with limited investor protections presents serious challenges, because of the limited amount of external funding that is generally available in such environments having serious moral hazard risks. This makes the immediate parent firm an attractive source of direct funding to meet the junior firm's investment needs. Such funding also offers a strong reason for the immediate parent to hold significant control rights in these firms 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.[3]

While a number of related research papers examine the motivations behind business groups in general, we choose to focus specifically on family-controlled business groups. This choice is motivated by the fact that business groups controlled by widely held firms, or those made up of cross-held firms with no dominant shareholder, do not posses the same incentives to maintain their reputations as do family controlled groups. 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. Instead such groups allow member firms to mutually insure themselves against adverse market movements and protect themselves from hostile takeover bids.

Overall, our findings are consistent with the importance of internal capital market benefits that family-control business groups facilitate, in that the positioning and size of the stake taken in new group firms help strengthen their value. 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. Similarly, we find support for Almeida and Wolfsenzon's (2006b) theoretical proposition that beyond simply enhancing control, arranging firms in a pyramidal structure provides a financing advantage, because groups can tap into a larger pool of retained earnings. Our results also support the findings of Gomes (2000) and Gopalan, Nanda and Seru (2007) who show that reputation is key element in attracting funding in the presence of weak investor protection.

The rest of the paper is structured as follows. Section I describes our ownership data and business group construction procedures. Section II identifies potential country-level determinants of the prevalence of family business groups and presents the results of our country level empirical analysis. Section III presents our firm-level empirical analysis of the relationship between group membership and various firm-level characteristics. Finally, section IV summarizes our conclusions.

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

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. Despite the availability of a number of databases that provide international ownership information for listed firms, the coverage provided by any given single databases is not complete. Thus we use multiple data sources to ensure maximum coverage. Our primary sources of data are the *Osiris* database from *Bureau Van Dijk*, the *Worldscope* database from *Thomson Financial*, and various information providers in *LexisNexis*.[4] Despite the use of multiple databases we find that ownership information is missing for a significant number of firms. In these cases we resort to a manual search of individual firms to identify their owners. The manual search process begins by searching for firms individually in two online databases, the *Who Own's Whom* database by *Dunn and Bradsreet* and the *OneSource* database. For the remaining firms without ownership we refer to their annual reports, obtained from the *Mergent Online* or company websites. This constituted a significant portion of ownership information for firms in Mexico, Malaysia, Pakistan, Sri Lanka, Singapore, Thailand and Israel. In other markets such as Chile, Colombia, India, and Italy, ownership data on listed firms are available on their stock exchange or securities regulators websites. Our efforts to augment our two principal ownership databases (OSIRIS and Worldscope) with as many sources as possible are designed to maximize the coverage for firms for all countries in the sample. In total we obtain ownership data for 27,987 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 the minimum of 20 percent of voting rights of a firm and use this 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 the founder, CEO or chairman of the board. Ideally, firms that did not satisfy these criteria could be ruled out as being independent firms. However, this is not necessarily the case. In many emerging markets, where groups are most prevalent, controlling shareholders do not report their total beneficial holdings in a firm. The shareholdings of the controller are often spread out and

[4]We find that these data sources are somewhat complementary, in that a firm available in one database is often not available in another and vice-versa. Multiple data sources also allow us to cross-check outlying observations.

held in the name of a number of other entities such as private holding companies, by other family members, or in the case of firms belonging to business groups, in the name of other group entities (listed and unlisted). Further, even when information on beneficial shareholdings is available, it is often disclosed only in notes to company annual reports or through stock exchange websites, but not in the ownership databases listed above.

Thus, to determine whether such firms are ultimately controlled, we individually examine the shareholder data of firms with a large number of scattered shareholdings to identify if any of the above ownership patterns exist.[5] 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 shareholding vehicles in the shareholder lists, and search for them in the shareholder lists of other firms in the same countries. Through an examination of their annual reports, we can observe the holdings of these entities in other firms which often allow us to establish which controlling shareholder they are all connected to.[6]

The next stage of our group construction process establishes the type of entity that is in control of each of our sample firms. While the above procedure has established whether a firm is controlled by an ultimate owner, we want to distinguish family from non-family control. 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.[7] 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.[8] This is primarily done through company websites, annual reports and

[5] 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.
[6] Finding common shareholders also helps us identify whether two firms are in the same group, which is used in the next stage of the group identification process.
[7] This also allows us to establish if the firm is held in a pyramid structure.
[8] 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.)

through media articles accessed via the Google search engine or Factiva.[9] 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.

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).[11] 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 us 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. We find that a number of groups, although comprising of many listed firms, control only one firm in a particular national market. In this case, we classify the firm as not being group affiliated in the market in question.

Once our family-controlled firms have been identified and grouped together, 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.[12] This allows us to catch any additional group firms that were overlooked in our initial classification procedure. In total our group construction procedure

[9] 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 the controlling family. This narrows our list of suspected families which makes their control much easier to confirm.

[11] Both groups are controlled by a group of businessmen.

[12] Our crosscheck sources are as follows. For all countries, we search the Forbes World Billionaires list 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 verified against Rabelo and Vasconcelos (2002) for Brazil, *Inter-Corporate Ownership* 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, Classens, 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 group.

identifies 845 family controlled groups, comprising of 2526 firms from 45 countries. Our coverage of firms is far greater than other studies that examine business groups. For example Khanna and Yafeh (2005), look at only 15 countries, in which our coverage of sample firms is significantly higher for most countries.

To our knowledge this is the first paper to document the prevalence of family controlled business groups across a large number of countries. 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 attempt to understand the pervasiveness of family business groups, nor the dynamics of group structure and by construction they exclude less developed markets where groups are especially pervasive. Faccio, Lang and Young (2001) identify business groups in 14 Western European and East Asian countries, while Khanna and Yafeh (2005) do the same for 14 emerging countries mainly from Asia and South America. However they only identify whether a firm is group affiliated or not, without regard to the structuring of the group and to their sample firms' exact position in the group structure.

A. Constructing Cash Flow and Control Rights for Group Firms

The above process allows us to establish the identity of the immediate parent, the identity of the ultimate parent and shareholdings of the immediate parent and other group entities in each group affiliated firm. This information allows us to map out the structure of each group and calculate the ownership and control rights for every group firm as well as its position within the group. We construct several measures of the controlling family's ownership and control rights as well as measures for each firm's position in the group.

The first measure is the *direct* percentage ownership a group holds in the member firm. For example, A (the controlling family) can hold shares in Firm D, through two shareholding chains. A could own 40% of Firm B and 30% of Firm C. Firms B and C inturn hold 20% and 40% of Firm D, respectively. In this situation the direct percentage ownership of Firm D attributable to the group is 20% + 40% = 60%.

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 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 A in Firm D is: 0.4*0.2 + 0.3*0.4 = 0.20 or 20%.

The third measure is the control rights that the controlling shareholder can exert in each group firm. For each chain, the control rights are the smallest percentage voting interests (the weakest link) observed along the chain. Where multiple control chains exist we sum the control rights across all of the chains to arrive at the total control rights. In the above example, if all group firms issue shares with equal voting rights, the ultimate the control rights are equal to: 20% (weakest link along the first chain) + 30% (weakest link along the second chain) = 50%. If, for example, C issued a certain number of shares with superior voting rights to A, so that A actually controls 50% of its votes, then the ultimate control rights are equal to: 20% (weakest link along the first chain) + 40% (weakest link along the second chain) = 60%.[13] This weakest-link definition reflects the risk that the ultimate owner may lose control of a shareholding chain, where its voting rights is lowest.

The final measure is 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 minimum of this figure across all of the chains. In the above example, this position measure would be equal to one for D and zero for B and C. In other words, B and C are directly controlled while D is indirectly controlled through one layer of firms.

One issue that complicates the calculation of these measures arises when group firms own shares in each other (i.e., cross-shareholding). For example, A owns 40% of Firm B, B in turns owns 30% of Firm C and 20% of Firm D. In addition, C and D each own 20% 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

[13] 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.

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. In summary, the four ownership and control measures (as discussed above) for Firm C can be calculated as follows: (1) the direct ownership percentage of Firm C attributable to the group is (0.2+0.2)/(1-0.04)=0.41667 or 41.67%; (2) the ultimate cash flow rights of A in C is 0.2/(1-0.04)*0.3*0.4 + 0.2/(1-0.04)*0.2*0.4 = 0.0417 or 4.17%; (3) the weakest-link control right of A in C is 20+20 = 40%; and (4) the minimum number of firms between C and A is one.

B. Descriptive Statistics and Country-level Measures of Family Business Groups

Our construction of family business groups allows us to calculate several country-level measures of the prevalence of these groups. The first measure is calculated as the percentage of all listed firm in the market that belong to a family business group, 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 is defined as a group in which there is at least one firm not directly held by the ultimate controlling shareholder (i.e. there are at least two layers of firms). 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 assigning a number to each firm in a family business group corresponding to the number of listed firms that separate it from the ultimate owner.[14] We then sum the pyramid score of every firm in each market and divide by the total number of listed firms 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. All of the above measures are subsequently used as dependent variables in our country level regression analysis to follow.

[14] In cases where the apex of the group is made up of two cross-held firms, these firms are given a pyramid score of 1.

We also construct *% Group* and *% Pyramid* variables, which are based on the percentage of total market capitalization that is due to 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 number of groups divided by the number of total firms in the market, (*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.

Not surprisingly, our country-level measures in Table II reveal that the prevalence of family business groups is concentrated in emerging markets. For instance, the proportion of listed firms belonging to family business groups (*% Group*) is at least 30% in Chile, Colombia, Israel, Sri Lanka and Turkey, with Sri Lanka being the largest at 53%. 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. In India for example, 28.2% of listed firms belong to a family business group, while only 9.71% 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 (30.36% out of 41.07% and 40.17% out of 52.99% 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 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 10.53% of listed firms in Singapore belong to family business groups, but these groups represent 35.2% of equity market capitalization.

The country level measures examined thus far focus on the prevalence of family business groups. In contrast, the *Average Pyramid Score* provides insight into how these groups are

[15] We are unable to obtain market capitalisation information for approximately 7 percent of our group firms.

structured and specifically 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 also suggests that the average separation between cash-flow and control rights is greatest among Colombian family groups. It is also noteworthy that group firms controlled through pyramids make up approximately 15% of market capitalization for Colombia, Indonesia, Malaysia, Sri Lanka and Turkey. However, *Average Pyramid Score* differs markedly across these four countries (about 66, 20, 10, 48 and 19 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. Chile's Angelini family, Colombia's GEA Group, Israel's Shrem, Zimmerman & Fudim Group, Korea's Lee Gun-Hee, the Phillipine's de Ayala family, Singapore's Leng Seng Wee, and Turkey's Sabanci Family all control more than 10% 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% of stock market capitalization.[16] The *Largest Group by No. of Firms* produces two stand-out family business groups, namely the Tata group in India comprised of 24 listed firms and the Dankner Group in Israel comprised of 26 listed firms in our sample. Although both business groups control the largest number of listed firms in their respective markets, they are not the largest business groups by market capitalization.

II. Country-level Determinants of Family Business Groups.

The business group literature suggests that a number of country-level factors contribute to the prevalence of business groups around the world. However, Morck, Wolfenzon and Yeung (2005) states that "*much additional theoretical and empirical work is needed to solidify hypotheses in this area and to distinguish presumptions from facts*". Our paper is a first attempt to provide empirical evidence on the reasons for cross-country variations in the existence of family business groups. Using past theoretical and descriptive studies, we identify possible country-level determinants of these groups, and utilize several variables to proxy for them. We

[16] While Japan has a substantial amount of business groups (Keiretsus) these are almost always controlled by a widely held firm and thus we do not include them in our sample.

next describe these factors and explain how they are measured for the purposes of our empirical analysis.

A. Private Benefits of Control

Perhaps the most cited reason explaining the prevalence of family controlled firms is that they facilitate the extraction of private benefits of control. Private benefits available to families who control numerous firms through business groups may be magnified in comparison with families in control of a single firm. For example large family business groups can often wield significant political power (Morck, Wolfenzon and Yeung, 2005), which can be used to entrench or strengthen their control over corporate assets or to solicit political favors. Transfer pricing and other intra-group resource shifting mechanisms allow the distribution of profits to the group firms where they are most valuable to a controlling family. Moreover, 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. When such opportunities to capture the private benefits of control exist, then there is a greater incentive for controlling families to retain and magnify their control of corporate assets through a group structure.

We measure a controlling family's ability to capture private benefits of control by using the country-level average block premium estimated by Dyck and Zingales (2004). The block premium is derived based on the average difference between the negotiated price for a controlling block of shares and the prevailing market price. It allows us to analyse how country-level differences in the estimated value of private benefits of control influence the prevalence of family groups. However, the average block premium is only available for 33 of our 45 sample countries.[17] Therefore we also test the individual country-level factors, classified by Dyck and Zingales (2004) as either legal or extra-legal mechanisms, which curb the extraction of private benefits of control.

Legal mechanisms that discourage the consumption of private benefits of control involve the ability of minority shareholders to limit the appropriation of value by controlling shareholders. The enforcement of a greater number of protective rights and a greater ability to exert influence on corporate decision making should lead to smaller private benefits of control.

[17] In some countries such as Austria and Portugal the *Block Premium* is only calculated based on two transactions, which also leads us to rely more on our other private benefits measures.

We utilize a number of variables that measure the protection minority shareholders rights. First, the *Anti-director Rights* index constructed by LaPorta et al (1997) and updated in Pagano and Volpin (2005) quantifies the presence of six important provisions related to shareholder rights in a country's corporate laws and commercial code. Second, while minority rights may be well protected under the law, their effect can be weakened if they are not effectively enforced. To measure the degree of enforcement, we employ quantitative assessments of the rule of law (the extent to which agents have confidence in and abide by the rules of society), regulatory quality (the ability of government to formulate and implement effective policies for the regulation of businesses and markets), and the control of corruption that come from Kaufmann, Kraay, and Mastruzzi (2003). Third, country-level disclosure standards dictate the ability of non-controlling shareholders to monitor corporate decision making and limit any potential self-dealing by insiders. To measure disclosure standards we use survey data from the World Economic Forum's Global Competitiveness Report. We use responses to the question: "Access to reliable and timely information on company financial performance is: 1 = often insufficient, delayed and difficult to obtain, 7 = regular and easy," and label this variable *WEF Disclosure*. Finally, as a summary measure, we construct a *Governance Index* by aggregating all of the above factors together using weights based on a principle components analysis.[18]

Extra-legal mechanisms place constraints on the extraction of private benefits by imposing external discipline on controlling families. Dyck and Zingales (2004) suggest that product market competition disciplines a family wishing to use transfer pricing to tunnel resources out of a controlled firm because prices are more objective and verifiable when markets are competitive. Furthermore, the inefficient allocation of resources brought about by the consumption of private benefits will threaten the survival of a family-controlled firm in a competitive market. Similarly, increased competitiveness brought about by openness to the world economy may also threaten group controlled firms. We measure the country-level extent of product market competition using a survey variable from the World Economic Forum's Global Competitiveness Report. We use responses to the question. "Competition in the local market is (1 = limited in most industries and price-cutting is rare, 7 = intense in most industries as market leadership changes over time" and label it *Competition*.

[18] We also use both the Anti-self Dealing Index from Djankov et al (2008), and a revised Anti-director Index constructed by Spamann (2008) as alternative measures of the protection of minority investors from expropriation by controlling shareholders and find the results to be qualitatively similar.

Another relevant extra-legal factor that can play a particularly important role in understanding family-business groups is the role of reputation. The consumption of private benefits by a controlling family comes at the expense of a damaged group reputation. For families that intend on controlling only a single firm, the value extracted from consuming private benefits may outweigh the reputation cost. Families that intend on creating or expanding their business groups, however, will bear significant reputation cost, which may outweigh the value of the private benefits consumed. The reputation cost of consuming private benefits of control depends on whether information relating to improper behaviour by controlling shareholder can be widely disseminated. We measure this by the average circulation (or copies printed) of daily newspapers per 1000 inhabitants as measured in 2000, for each of our sample countries.[19] We obtain this variable from the *World Association of Newspapers* and label it *Newspaper*.

At this point it is important to note that there are two possibilities regarding the role of reputation in explaining the prevalence of family business groups. First, the desire to protect reputation curbs private benefits, and renders control less valuable, leading to less incentive to establish business groups. Second, while reputation may curb private benefits, it also creates a competitive advantage for family business groups who can use their reputation as a substitute for strong legal protections of minority shareholders, thus giving business groups a competitive advantage in weak legal protection environments. Indeed, all of our measures of private benefits of control (investor protection, newspaper circulation, competition etc.) can be interpreted in a similar manner. In our empirical results, we attempt to distinguish between these two effects by using as our dependant variable, the proportion of all listed firms controlled by an ultimate owner, (both group and non-group firms) that belong to family groups. Since this dependent variable is based on a sample of controlled firms only, we can assume that the scope and value of private benefits of control are more homogeneous across this sub-sample than for the broad sample. This allows us to consider the effect of the above variables on the prevalence of business groups, without needing to control for their ability to increase or decrease private benefits of control.

The final extra-legal mechanism we examine is government monitoring of firms through the tax system. An important way groups can generate private benefits of control is through

[19] For 9 of our sample countries this figure was only available at some point before 2000, with the earliest being 1995 for Greece.

shifting profits, assets, and liabilities within a group to minimize its overall tax liabilities. The government has an incentive to monitor within-group transfers in order to limit profit-shifting and maximize its tax revenue. Thus, the degree to which the government prescribes and enforces a strict inter-corporate tax rules will influence the ability of controlling families to tunnel resources out of firms less important to the family to those that are more important. We measure the effect of inter-corporate tax rules and enforcement using a tax transparency measure from the *Deloitte International Taxation Guide*. For each country, this measure is a sum of four indicators for: (1) whether there is a specific regulation that limits transfer pricing so that intra-group transactions must be conducted on an arm's length basis, (2) whether there is a specific rule against setting up a thinly capitalized firms (low equity) so that income is redistributed as interest rather than dividend to minimize taxes, (3) whether there is a specific rule against setting up a controlling or holding company in a low-tax jurisdiction, (4) whether there is a specific requirement to disclose corporate transactions and structures that are related to the three requirements above for the purpose of strengthening the monitoring ability of the tax authority. We label this variable *Tax Transparency*.

B. Access to Capital

Another reason why family business groups are more popular in emerging markets is the difficulty in accessing capital. Khanna and Palepu (1997) argue that in most emerging markets, investors are generally wary of putting capital into unfamiliar ventures because mechanisms that curb private benefits are either absent or very weak. For example, in many such countries enforcement of insider trading laws is often nonexistent and securities law disclosure requirements are frequently lax. Thus, business groups can benefit if they are able to substitute for these deficient mechanisms using their greater visibility and reputation. Aside from expropriation risks, emerging markets are also characterized by lower GDP per capita, low savings rates and an underdeveloped investment management industry. These factors also serve to reduce the domestic pool of funds available for corporate investment.

Almeida and Wolfenzon (2006b) develop a theoretical model that illustrates how family pyramidal business groups can alleviate such capital constraints. They propose that a pyramidal business structure allows the controlling investor of the apex firm to access the retained earnings

of all the group firms to help finance a new firm. Furthermore the family can then access the retained earnings of both the new firm and existing firms to finance a third new firm and so on.

We argue that when external capital is scarce, there are greater incentives for controlling families to organise firms into groups. Under such circumstances, the use of the group's internal capital becomes very valuable because of the high cost of external financing.[20] The use of a higher percentage of internal capital allows families to finance new risky ventures that otherwise could not be funded due to high information asymmetry and a prohibitive cost of capital. Moreover, expropriation risk faced by minority investors can be alleviated through the implicit protection provided by the family's reputation. In this sense, the group's role is much like that of a venture capitalist. These unique advantages in accessing capital and funding new firms make it attractive for both families and minority investors to invest through the group structures. This argument suggests that new high risk firms are likely to be financed in this manner. Group reputation can be especially valuable in economic downturns or periods of high market volatility and when firms face financial distress, which are all circumstances when outside equity investors and unaffiliated lenders are especially risk averse due to the severe moral hazard and adverse selection problems that investors face in these markets.

In contrast, an independent entrepreneur will not have access to an internal capital market, creating a heavy reliance on expensive external capital. Even if these entrepreneurs can finance a large proportion of the new firm with their own personal wealth, they remain unable to sell equity to outside investors since they cannot offset their country's poor investor protection by relying on their own reputation in the capital market. The increased risk these outside investors face will force them to discount the value of the securities they receive to provide financing. As a result, an entrepreneur able to obtain external financing will be forced to hand over a larger proportion of ownership to outside investors. This further increases the cost of capital, as insiders are unable to signal their commitment to the firm by retaining a sufficiently large ownership stake.

We use a number of variables to measure the access to capital at the country level. First, we use the amount of savings scaled by GDP (*Savings to GDP*). Second, we attempt to capture the funds available from institutional investors, 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

[20] Almeida and Wolfenzon (2006b) point out that this is an extension of the pecking order theory.

(2006). Finally, a well-functioning external capital markets is dependant on stable political environment which underpins the rule of law and the enforceability of contracts and regulations. The lack of political stability causes high sovereign risk and restricts the amount of capital provided both by domestic and international investors. In such circumstances a group's internal capital and its ability to survive political turmoil through its economic power and influence becomes important. We obtain a measure of political stability from the World Bank's *Governance Matters* database and label it *Political Stability*. *Political stability* can also be used as a measure of the credibility of the macro-level governance environment, provided by the *Governance Index*. While the *Governance Index* may be strong, this may be undermined by a lack of political stability.

C. Taxation Factors

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 addressing corporate governance problems created by business groups. Since inter-corporate dividends are a means to tunnel resources out of group firms, a tax on such dividends is argued to have repressed the dominance of family business groups in the U.S. relative to other countries. We collect information on the tax treatment of inter-company dividends across our sample countries from *Deloitte International Taxation Guide,* in order to test its effect on the frequency of family groups. However, we find that only three countries, Colombia, the U.S. and Pakistan, have some form of double taxation of inter-corporate dividends. Since there is insufficient cross country variation in this variable, we decide to exclude it from our empirical analysis.

Another element of a country's tax system, which can affect the extent of family business groups, is its tax consolidation rules. These rules govern how a parent can treat its subsidiaries for taxation purposes. In some countries, tax consolidation allows a family business group to be treated as one entity for tax purposes. This arrangement permits the parent to disregard intra-group transfers for income tax purposes and also allows tax-free movements of assets within the group. Tax regimes in different countries will have differing ownership thresholds at which they allow the parent firm to consolidate their subsidiaries. We distinguish between two tax consolidation regimes based on consolidation threshold levels. First, regimes where a parent firm

is allowed to consolidated a subsidiary in which it has an ownership stake of less than 90% and second, regimes where consolidation is either not allowed or can only take place if the parent owns more than 90% of its subsidiaries. We construct a dummy variable equal to 1 if the sample country has the first regime and 0 otherwise. We label this variable *Accounting Consolidation*.

D. Merger and Acquisition Rules

If a business group can create an internal capital market or leverage the reputation capital of a family or entrepreneur, then one important way to capitalize on such competitive advantages is to expand the business group through acquisitions of large blocks of shares. Such transactions allow a group to avoid having to gather a large amount of capital, as required by a complete merger or takeover, while still being able to control the same assets. However, in some markets, gaining a controlling ownership stake can be difficult due to takeover regulations that favor minority shareholders. In particular, if a country's takeover law specifies a very low ownership threshold that triggers a takeover offer (any shareholder crossing this threshold is required to formally bid for all shares on issue), then any acquirer would find it difficult to seek only a proportion of the ownership interest for the purpose of creating a controlling stake. In such countries, groups may be created for reasons completely unrelated to those discussed above, simply because it is difficult and costly for a firm to completely takeover another firm.

To account for the extent to which block holdings can be easily created through mergers and acquisitions, we employ the index of takeover regulations (labelled *Takeover Index*) constructed by Nenova (2006) for 50 countries around the world. This index measures the level of protection of minority shareholders, the extent of fair and equitable treatment of all shareholders in the takeover process and the transparency of the process. The higher the value of the index, the harder it is for an acquirer to create a controlling, but less than full ownership position, that we describe earlier to be the critical link between group firms. Thus, we hypothesize that stringent takeover regulations can lead to fewer instances of business groups.

E. Baseline Country-Level Results

In this section we examine the determinants of family business groups in a multivariate OLS regression framework. Using country-level measures of family business groups as our dependant variables, we analyse the strength of our proposed determinants in explaining cross country variations in family business groups. We use four measures of business group dominance

in an economy, namely *% Group* and *% Pyramid*, to account for the proportion of listed firms in business groups and pyramids respectively and *% Group MC* and *% Pyramid MC* to account for the dominance in terms of market capitalization of business groups and pyramids respectively. Our explanatory variables can be broadly categorized into four areas; factors that facilitate the private benefits of control, factors characteristic of poorer or emerging countries (poor access to capital and underdeveloped human capital) and tax and regulatory factors.

Table IV reports the results of various model specifications for the four dependant variables described above. Model (1) represents our first test of the importance of the four determinants of business group importance in an economy for both *% Group* and *% Pyramid*. We use *Block Premium* to proxy for private benefits of control, *Log GDP per Capita* to proxy for economic development (good or poor access to capital and human capital), *Accounting Consolidation* to capture tax features affecting groups and a *Takeover Index* to account for the effects of regulation on the difficulty of making acquisitions. For both dependant variables, we find that *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.[21]

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). Therefore, we exclude *Competition* from our regressions.[22] 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

[21] While it is conceivable that either private benefits of control are determined by factors that are also related economic underdevelopment, or that private benefits of control can lead to economic underdevelopment, we do not believe that this drives our results since Table III indicates a correlation of only -0.354 between *Block Premium* and *Log GDP per Capita*.

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

of inter-corporate transfers allows families to appropriate value through transfer pricing more easily and this appears to increase the prevalence of family business groups. The *Governance Index* does not appear to have any effect on the prevalence of business groups. 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 IV is the ability of our access to capital variables to explain the prevalence of business groups. *Institutional Funds* is significant across all 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 also 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 a second alternative measure for the availability of capital, which gives similar results. In interpreting these results 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, outside investors are willing to provide. To this end, our interpretation of the access to capital variables in our models is twofold i) the impact of corporate governance standards on the prevalence of family business groups is more important in terms of its access to capital implications, rather than its private benefits effects ii) the availability of capital is an important determinant of the extent of family business groups because when capital is scarce, the groups ability utilize its internal capital becomes a more valuable competitive advantage.

Among the remaining explanatory variables, the *Takeover Index* appears to be the most important factor in explaining business groups. When acquirers are not required to make an offer to buy all the outstanding shares in a takeover, then families are able to control a target firm's assets with only a partial ownership stake.

Finally, in unreported regressions, we also consider the hypothesis that in many emerging economies, firms remain under the control of founding families and their heirs due to a shortage

of well-trained professional managers. Groups also may serve as a substitute for weak business educational institutions by investing in their own internal management development programs, which focus on identifying and developing talent within the business group (Khanna and Palepu, 1997). Thus, the prevalence of family business groups should be negatively related to the capacity of a country's business education system to train professional managers. We measure the quality and capacity of a country's business education system by employing a survey variable from the World Economic Forum's Global Competitiveness Report. We use responses to the question: "Management or business schools in your country are 1 = limited or of poor quality, 7 = the best in the world" and label it *Manager* and include this in our country-level regression analysis. However, this variable does not seem to have an impact in any of our models, suggesting that while a lack of management talent is not a strong motivation behind the popularity of business groups in some markets.

F. Country-Level Analysis – Robustness Checks

A concern with the interpretation of our baseline country-level results is that the direction of causality between corporate governance related factors and family business groups is opposite to what our models suggest. For example large family business groups can often wield significant political power (Morck et al 2005), which can be used to lobby against any governance reforms that would diminish their power or threaten their existence. Alternatively, regulations could respond to the threats that business groups present for minority shareholders to ensure that existing business group structures can not be not used to expropriate minorities.

To address this reverse causality concern, we use an instrumental variable (IV) regression, and employ the legal origins of each of our sample countries as an instrument. Several studies suggest that the legal origin of a country is a suitable instrument because it is historically predetermined and highly correlated with current governance environments (La Porta et al., 1999, 2006, Dyck and Zingales, 2004). Following these studies, we use a dummy variable for common law origin as the instrument because it is associated with greater shareholder rights and transparency (La Porta et al. 1998). Given that the explanatory variables, *Institutional Funds* and *Cost of Capital*, can also be influenced by the overall corporate governance environment, they could also be subject to a reverse causality explanation. Thus, we use *Savings to GDP* to instrument for *Institutional Funds*, as it is strongly correlated with *Institutional Funds*, but

theoretically unrelated to the prevalence of family business groups. The IV regressions show that the *Governance Index* changes sign from positive to negative, although it remains statistically insignificant. These untabulated results suggest that endogeneity biases are responsible for the positive coefficient observed in Table IV. The remaining results are consistent with the results in Table IV, suggesting that endogeneity biases are unlikely to be responsible for our main findings.

Thus far, our results suggest that the prevalence of family business groups are more strongly related to proxies of country-level access to external capital rather than those representing the scope for the 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, a possibility that our list of explanatory variables cannot capture entirely. In addition, our current results cannot distinguish whether groups are more prevalent in certain markets as a means to capture private benefits or that groups are a substitute for mechanisms that could curb private benefits.

We attempt to provide some insights into these issues with two additional country-level regression analyses. The first approach is to re-estimate the regression models in Table IV using two alternative dependent variables that scale the prevalence of family group firms by the extent of firms in the same market having concentrated ownership. We argue that concentrated ownership in general is a product of business environments that promote the value of corporate control; therefore, this alternative scaling method allows us to measure the popularity of groups conditional upon the value of corporate control in a market. In particular, the two alternative dependent 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, using the 20% ownership level as the definition of control (*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*). This approach allows us to consider the effect of governance, access to capital, and other regulatory variables on the prevalence of family groups that is not driven by private benefits of control considerations. 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 IV, adding *Block Premium* as an additional independent variable. Results from these two approaches are reported in Table V.

All of the specifications for the modified dependent variables in Table V indicate that the *Governance Index* has a little explanatory power for the proportion of family controlled firms that belong to groups. The *Governance Index* is positive and significant in one of the *Block Premium* regressions possibly due to the reverse causality explanation discussed earlier. Thus, even after controlling for factors in a business environment that promote the value corporate control, we do not find evidence that poor governance directly exaplains the prevalence of business groups. In contract, 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. This implies that, after controlling for the general attractiveness of 'retaining control', the indirect role of investor protection through its influence on access to capital is the primary mechanism that renders family business groups more attractive. The *Tax Transparency* variable remains significant at the 1 percent level across all models, confirming the role that tax benefits play in the incentive to form business groups. The remaining variables in our models are qualitatively similar to the results in Table IV.

Our final robustness check addresses issues raised by Holderness (2007) regarding country-level analysis. He argues that there are potential aggregation biases and missing variable problems when aggregating firm-level variables (e.g. ownership measures) to the country level for the purpose of investigating the role of macro level factors (e.g. corporate governance environments and regulations). He also suggests that regression analysis should be conducted at the firm level, using unstacked country level factors of interest as additional explanatory variables together with firm-level controls. We follow this approach by estimating a logistic regression of the group membership dummy (the dependent variable) on a set of firm-level characteristics (to be explained in detail in section IIIB) and the same country-level variables as used in regressions reported in Table IV. For the sake of brevity, we do not tabulate these results. We find that country-level corporate governance variables are again not significant in explaining the probability of a firm being a member of a family group. Among the access to capital variables, *Log GDP per Capita, Savings to GDP* and *Political Stability* are consistently significant in the expected direction. The regulatory variables *Tax Transparency* and *Takeover Index* are also significant in the same direction as reported previously. In summary, the firm-level analysis incorporating country-level variables produce quite similar results to the country-level aggregate analysis reported in Table IV and Table V.

Overall, country-level results suggest that corporate governance factors either have weak explanatory power for cross-country variations in the prevalence family business groups across countries, or that their effects are through access to capital, rather than through their impact on private benefits of control. Family business groups appear to be a powerful channel for raising external capital because their reputation substitutes for the absence of effective legal protections for minority investors. This is analogous to Khanna and Paleupu'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 to expand their business, even into areas that can be completely unrelated to their existing operations. This makes co-investment by minority investors with controlling families more attractive.

III. Firm-Level Analysis

To further examine the motivation behind the prevalence of business groups, we next conduct several firm-level analyses that delve into the characteristics of each group firm and their relation to firm performance. First, we compare firm attributes of group versus non-group firms and among different layers of firms in a group. Second, we examine whether group membership is related to firm value, controlling for the endogeneity of group membership choice. Finally, we investigate whether within-group ownership and control linkages also influence firm performance. These tests aim to provide empirical evidence on whether group structures exist more as a means for the controlling shareholder (or family) to leverage monetary (and human) capital or as a mechanism to expropriate minority shareholders and/or to capture private benefits of control.

A. Univariate Comparisons

In Table VI we compares 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 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.[23] The statistics reported in the table are the differences between group and non-group median values. 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. If there is only one firm at any particular layer, then the median is equal to the firm observation. We control for country and group-effects by only comparing firms that belong to the same family business group. We use the Wilcoxon Rank-Sum test of medians to assess whether differences are significant.

Panel A of Table VI presents the results for all 45 sample countries. For the *Group vs. Non-Group Tests*, Q is significantly lower for group firms. This is consistent with the findings of Claessens, Djankov, Fan and Lang (2002), who find that separation of cash flow and control rights, (in this case achieved through pyramiding) reduces firm value.[24] Group firms also tend to be larger based on both total assets and market capitalization, reflecting their superior ability to grow through leveraging their reputation to expand into multiple business lines (Khanna and Palepu, 1997).

Another reason that group firms are capable of greater growth is a superior ability to raise capital internally and externally. 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 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, centers on a reputation argument. Groups pay out returns to shareholders to allay expropriation fears in order to protect their valuable reputation. Finally as expected group firms are also significantly less volatile, since they tend to control diversified subsidiaries, and group firms also tend to be in multiple lines of business.

[23] 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 resort to matching based on the 1-digit SIC code level.

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

Our within-group comparison in Table VI 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 (0.08) is larger that the difference between the middle and the top layer (0.073). Similarly, the level of capital expenditures scaled by total assets (labeled *CAPEX/TA*) also rise significantly down the pyramidal chain with the difference between expenditure at the top and bottom being 0.008. 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 (labeled *Stock Volatility*) also indicate the firms at the bottom of the pyramid are generally riskier. These findings provide evidence that groups are structured in order exploit risky, but potentially profitable investment opportunities (in a similar way that venture capitalists do in developed markets). Risky high growth firms have difficulty in raising capital, particularly in environments when 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 in the largest). This means that such firm need to rely less on expensive external capital and are backed by the implicit protection provided by the group's reputation, reducing the cost of the residual funding required.[25] This is supported by the within-pyramid comparisons of *Immediate Ownership %* which show that the size of the controlling family's direct ownership link at the bottom of the pyramid is significantly greater than at the top. Furthermore, from a risk sharing point of view, because such firms are riskier, the ultimate owner is able to limit their risk exposure to such firms by placing them at lower layers of the pyramid.

Among the other within-pyramid comparisons, *Leverage* appears to decrease down the pyramidal chain, reflecting the fact that high growth firms do not have the capacity to support debt. 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. Both the *Log Assets* and *Log Market Cap* measures show that group firms lower down in the pyramid tend to be significantly smaller than those

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

above them. This again reflects the growth potential of firms lower down in the pyramid compared with their parents.

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

It has been well documented that most listed firms around the world are controlled by an individual or a family. Even in the US, about 37% of Fortune 500 firms are family-controlled (Villalonga and Amit, 2006). However, empirical findings regarding the effect of a controlling shareholder on firm value have been mixed (Holderness and Sheehan, 1988; Anderson and Reeb, 2003, Villalonga and Amit, 2006; Classens et al. 2002, La Porta et al 2002, Lemmon and Lins, 2003). Within this line of enquiry, there is further uncertainty as to whether family firms, controlled in conjunction with a number of other firms in a group structure, possess a value premium compared with similar independent family-controlled firms.

We investigate this issue for a large sample of firms around the world by estimating a multivariate regression of Tobin's Q on family-group membership. 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.[26]

Our main explanatory variable is an indicator variable which equals one if a firm belongs to a family group, and zero otherwise (labelled *Group Dummy*). As documented by the univariate results, family-group firms differ significantly from other firms in size, historical asset growth rate, leverage, dividend yield, and investment intensity (as measured by the ratio of capital expenditure to total assets), all of which can influence Q. Therefore, we control for these and other firm characteristics (*Log Size*, *Beta*, *Asset Growth*, *Leverage*, *CAPEX/TA*, and *Dividend Yield*) in the Q regressions, which also include 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 related to the extent of a firm's information asymmetry. Therefore, we also control for several proxies for information asymmetry, including the dummy variable for whether a firm reports

[26] At this current stage of the paper, we are still devising ways to take into account non-tradable shares and to compute market value of equity at the closing balance date rather at the end of 2002.

positive intangible assets (*Intangible Dummy*), the logarithm of firm age (*Log Age*), and the logarithm of the number of analysts covering a particular firm (*Log Analyst Cov*). The control variables are described in Table I.

One issue that arises from a simple OLS estimation of the Q regression is the potential endogeneity of the family-group indicator variable (*Group Dummy*). 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. Alternatively, a maturing (low-Q) group firm may be spun off from the group if its role in generating capital or its need to be supported by the group's reputation is no longer necessary.

We employ two alternative methods to address this endogenous selection problem in comparing the performance between family-group versus non-family-group firms. The first approach is two-stage IV estimation, in which we assume endogeneity for *Group Dummy* and instrument for it using firm idiosyncratic risk. The latter 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. 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) since Q (as a reflection of cost of capital) should be related to market risk, rather than firm-specific risk. In the context of our study, idiosyncratic risk is likely to explain whether a firm is created as part of a business group, because the group structure diversifies the controlling family's investments, therefore providing them with a competitive advantage in owning and control high-risk firms. In addition, as *Group Dummy* is an indicator variable, we do not use idiosyncratic risk as the instrument directly, but instead the fitted values of the probit regression of *Group Dummy* on idiosyncratic risk along with all of the other explanatory variables in the Q regression.

Alternatively, we employ a treatment effect model in which we estimate the Q 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 Q regression and adding idiosyncratic risk as an identifying instrument.

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 the concentrated ownership structure or the entrepreneurial skills (and/or commitment) of the 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. First, we use a sample of all firms that that have a controlling shareholder (family or non-family) and second we use a sample of firms that are all controlled by a family or an individual (group and non-group firms).

Table VII first reports the baseline OLS estimation of the Q regression. Similar to the univariate comparison, we find that Q is significantly lower for family-group firms than for other firms, after controlling for other important determinants of Q. 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 firm value. Without taking into account the potential endogeneity in group-affiliation choice, group firms appear to suffer a valuation discount that may reflect expropriation of minorities or consumption of private benefits by controlling families.

However, after accounting for endogeneity, using idiosyncratic risk as an instrumental variable, we find that the coefficient of *Group Dummy* reverses sign and becomes significantly positive when using either the two-stage procedure or the treatment effect model. This finding remains consistent in the sub-samples of only controlled firms or only family-controlled firms. We also find that there are strong statistical reasons not to assume the group-affiliation choice is entirely exogenous. With the two stage procedure, the choice of instrument appears to be validated by the Stock and Yogo (2005) test statistic that is much higher than the highest suggested critical value of the test. In addition, we report the Wald test, which rejects the null hypothesis that the correlation between the errors of the two equations in the treatment effect model is zero. This test result indicates that the *Group Dummy* 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 reduces a family exposure to idiosyncratic risk.

The positive and significant coefficient of *Group Dummy* 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 all group firms on average have lower firm value than non-group firms, this may simply reflect the fact that 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 reputation. In contrast, projects with lower value 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 (treatment effect), we find that the group structure helps to enhance firm value.

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. These results imply that the deviation of cash flow rights from control rights can create an incentive for the controlling owner to expropriate minority interests. 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, our next analysis focuses only on the sample of group firms. In particular, we estimate the regression of Q on various ownership and control measures, including the direct ownership of the 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 standard control variables for Q again include *Log Size*, *Beta, Asset Growth, Leverage, CAPEX/TA, Dividend Yield*, *Intangible Dummy*, *Log Age*, and *Log Analyst Cov*. To control for 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 variations in Q may be due to intra-group corporate transfers (and tunnelling), hence causing regression standard

errors to differ systematically across groups, we test our regression estimates using clustered-robust standard errors, calculated by treating each business group as a cluster.

Using simple OLS estimations in our baseline model, Table VIII documents that the ultimate cash-flow rights and the weakest-link control rights of the family individually have no significant influence on Q. 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 group. In fact, there is a positive and significant relation between firm value and the layer position of a firm in the business group. We also find evidence that Q is significantly and positively related to the direct ownership measure. This relation is much stronger than that between Q and the ultimate cash flow rights measure. This indicates 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. 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 optimized, and thus, the ownership decision is focused on the last chain of ownership connecting the group to the new firm. Our results indicate that Q increases with the size of the direct ownership link. 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 still create a selection bias that influences the coefficients of the ownership and control variables tested in Table VIII. To address this, we also employ the Heckman two-stage procedure to correct for selection bias. In the first stage, we run a probit selection model of group affiliation choice using the same specification as the treatment equation in Table VII. The fitted values of this model are used to calculate the inverse Mill's ratio, which is then included in the regressions of Q on the ownership and control variables. Essentially, we find very similar results to the OLS regression. As a robustness check, we repeat the first-stage of the Heckman correction on the sub-samples of only controlled firms and that of only family-controlled firms. Again, we obtain very similar results.

The significant relation between Q and the direct ownership measure of the group (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 the 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 first instrument is used because the ownership and firm placement decisions can be influenced by the ultimate controlling shareholder's concern about under-diversification. In particular, exposure to firms with high idiosyncratic risk can be reduced by establishing these firms at the bottom of the pyramid and by selling more of their shares to outside investors who do not face diversification constraints. As mentioned earlier, idiosyncratic risk is likely to be exogenous with respect to Q because the latter is a function of systematic risk (Villalonga and Amit, 2006). The second instrument is used because it determines the extent to which the group can capture potential synergy between two firms or leverage existing reputation capital by creating (or acquiring) a new group firm below an established group firm of the same industry and connecting them through a large ownership stake 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. 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, for each group firm, there is no reason to expect that this indicator, which describes the relationship between the firm and its parent, to be related to the (subsidiary) firm's value. This is because any potential synergy is likely to be captured by the parent, rather than the subsidiary firm. As the second 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 (i.e. apex firms).

The instrumental-variable regression results are reported in Table IX. One econometric issue that arises is that our instruments are not strong enough to identify regressions that include multiple within-group ownership variables, especially since these variables are often correlated with each other. Therefore, we only test each variable one by one. In addition, we again incorporate the Heckman two-step correction for selection bias as a robustness check (with the

first-stage selection equation estimated on the full sample or alternatively, on the sample of controlled firms or family firms).

The results of the instrumental variable regression are generally consistent with the OLS regression results. We find that the ultimate cash flow rights of the controlling family are again negatively related to firm value. Therefore, even after controlling for potential endogeneity, we do not find evidence consistent with the expropriation argument that group firms with high cash flow rights attributable to the controlling shareholder have a higher market value as they are less susceptible to potential expropriation. Instead, the negative relation between the cash flow rights measure and Q is likely to arise simply due to the correlation between the former and the layer positioning of a group firm. We find that establishing a group firm at the bottom of the pyramid tends to increase firm value (i.e. the coefficients of *Pyramid Dummy* are always positive and significant regardless of instruments used), indicating that this is the best position for a new firm to receive relatively low-cost financing so as to capitalize on its growth opportunities. The variable *Direct Ownership* also positively influences Q, although the significance of its coefficient is reduced in the sub-sample regression using a set of two instruments. The positive coefficient of *Direct Ownership* indicates that for a newly established group firm, the group's ownership interests do provide signal a strong commitment in the firm, thereby reducing its information asymmetry. The group's direct ownership also reflects the extent to which the firm is funded by possibly less expensive internal capital. Both of these effects are likely to explain the higher market valuation of firms with concentrated group ownership. 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.

IV. Conclusion

This paper examines the motivation behind the existence of family controlled business groups based on two levels of analysis. First, at the country level, we find that family controlled business groups are more prevalent in countries where access to capital restricted, tax regimes are not transparent, and merger and acquisition rules constrain the ability of controlling families to build pyramids through acquisitions of share block holdings. 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 as a function of its reputation, externally, renders the group structure beneficial in markets where external capital access is limited.

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 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 reputation. In contrast, projects with lower value 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 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 proportion of its equity funded by its parent (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 is differs from 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 expropriation incentives.

Overall, our findings are consistent with the importance of the internal capital market benefits that pyramids facilitate, in that the size of the stake taken in new pyramidal firms is determined by risk and return characteristics. Thus, our evidence indicates that expropriation of minority interests is not the primary motive for the establishment and growth of pyramidal business groups.

An important implication of our analysis is that any country-level improvements in the ability to access to 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 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 owning such firms, the competitive advantage of family business groups in this area can be diminished, and the value associated with the their internal capital and reputation may be significantly reduced.

References

Almeida, Heitor and Daniel Wolfenzon, 2006a. Should Business Groups Be Dismantled? The Equilibrium Costs of Efficient Internal Capital Markets, *Journal of Financial Economics* 79, 99–144.

Almeida, Heitor, and Daniel Wolfenzon, 2006b. A Theory of Pyramidal Ownership and Family Business Groups, *Journal of Finance* 61, 2637–2680.

Anderson, Ronald C. and David M. Reeb, 2003. Founding-Family Ownership and Firm Performance: Evidence from the S&P 500, *Journal of Finance* 58, 1301–1327.

Bae, Kee-Hong, Jun-Koo Kang, and Jin-Mo Kim, 2002.Tunneling or Value Added? Evidence from Mergers by Korean Business Groups. *Journal of Finance* 57 2695–2740.

Baek, Jae-Seung, Jun-Koo Kang, and Inmoo Lee, 2006.Business Groups and Tunneling: Evidence from Private Securities Offerings by Korean Chaebols. *Journal of Finance* 61, 2415–49.

Bertrand, Marianne, Paras Mehta, and Sendhil Mullainathan, 2002. Ferreting Out Tunneling: An Application to Indian Business Groups, *Quarterly Journal of Economics* 117, 121–48.

Claessens, Stijn, Simeon Djankov, and Larry H.P. Lang, 2000. The separation of ownership and control in East Asian corporations, *Journal of Financial Economics* 58, 81-112.

Claessens, Stijn, Simeon Djankov, Joseph P. H. Fan, and Larry H. P. Lang, 2002. Disentangling the Incentive and Entrenchment Effects of Large Shareholdings, *Journal of Finance* 57, 2741–71.

Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer, 2008. The law and economics of self-dealing, *Journal of Financial Economics*, forthcoming.

Dyck, Alexander, and Luigi Zingales, 2004, Private Benefits of Control: An International Comparison, *Journal of Finance* 59, 537-600.

Faccio, Mara, and Larry H. P. Lang, 2002. The Ultimate Ownership of Western European Corporations, *Journal of Financial Economics* 65, 365–95.

Faccio, Mara, Larry H. P. Lang, and Leslie Young, 2001. Dividends and Expropriation, *American Economic Review* 91, 54–78.

Fisman, Raymond, and Tarun Khanna. 2004. Facilitating Development: The Role of Business Groups, *World Development* 32, 609–28.

Fogel, Kathy, 2006. Oligarchic Family Control, Social Economic Outcomes, and the Quality of Government, *Journal of International Business Studies*, 37, 603–22.

Gomes, Armando, 2000. Going Public without Governance: Managerial Reputation Effects, *Journal of Finance* 55, 615–46.

Gompers, Paul and Josh Lerner, 1996, The Use of Covenants: An Empirical Analysis of Venture Partnership Agreements, *Journal of Law and Economics* 39, 463-498.

Gopalan, Radhakrishnan, Vikram K. Nanda, and Amit Seru, 2007. Affiliated Firms and Financial Support: Evidence from Indian Business Groups, *Journal of Financial Economics* 86, 759–795

Gopalan, Radhakrishnan, Vikram K. Nanda, and Amit Seru, 2008. Do Business Groups Use Dividends to Fund Investments? SSRN Working Paper: http://ssrn.com/abstract=639184

Hail, Luzi and Christian Leuz, 2006. International Differences in the Cost of Equity Capital: Do Legal Institutions and Securities Regulation Matter? *Journal of Accounting Research* 44, 485–531.

Himmelberg Charles P., R.Glen Hubbard, and Darius Palia, 1999. Understanding the Determinants of Managerial Ownership and the Link between Ownership and Performance, *Journal of Financial Economics* 53, 353-384.

Holderness, Clifford, and Dennis Sheehan, 1988. The role of majority shareholders in publicly held corporations: An exploratory analysis, *Journal of Financial Economics* 20, 317–346.

Holderness, Clifford, 2007. Do Differences in Legal Protections for Investors Explain Differences in Ownership Concentration, *working paper.*

Joh, Sung Wook, 2003. "Corporate Governance and Firm Profitability: Evidence from Korea before the Economic Crisis." *Journal of Financial Economics*, 68, 287–322.

Johnson, Simon, Rafael LaPorta, Florencio Lopez de Silanes and Andrei Shleifer, 2000, Tunneling, *American Economic Review* 90, 22-27.

Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi, 2003. Governance Matters III: Governance Indicators for 1996–2002. Working paper, The World Bank.

Kaplan, S., and P. Stromberg, 2003, Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital contracts, *Review of Economic Studies* 70, 281-315.

Khanna, Tarun, and Krishna Palepu. 1997. Why Focused Strategies May Be Wrong for Emerging Markets, *Harvard Business Review* 75, 41–51.

Khanna, Tarun, and Krishna Palepu, 2000. Is Group Affiliation Profitable in Emerging Markets? An Analysis of Diversified Indian Business Groups, *Journal of Finance* 55, 867–91.

Khanna, Tarun, and Jan W. Rivkin, 2001. Estimating the Performance Effects of Business Groups in Emerging Markets, *Strategic Management Journal* 22, 45–74.

Khanna, Tarun, and Yishay Yafeh. 2005. Business Groups and Risk Sharing around the World, *Journal of Business* 78, 301–40.

Khanna, Tarun, and Yishay Yafeh, 2007. Business Groups in Emerging Markets: Paragons or Parasites? *Journal of Economic Literature* 45, 331–372.

Khorana, Ajay, Henri Servaes, and Peter Tufano, 2005. Explaining the Size of the Mutual Fund Industry around the World, *Journal of Financial Economics* 78, 145-185.

Kosenko, Konstantin, 2007. Evolution of Business Groups in Israel: Their Impact at the Level of the Firm and the Economy, *Israel Economic Review* 5, 55-93.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 1997. Legal Determinants of External Finance, *Journal of Finance* 52, 1131-1150

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 1998. Law and Finance, *Journal of Political Economy* 106, 1115-1155.

La Porta, Rafael, Florencio Lopez-de-Silanes and Andrei Shleifer, 1999. Corporate Ownership around the World, *Journal of Finance* 54, 471-517.

La Porta, Rafael, Florencio Lopez-de-Silanes and Andrei Shleifer, 2000. Agency Problems and Dividend Policies around the World, *Journal of Finance* 55, 1-33.

La Porta, Rafael, Florencio Lopez-de-Silanes and Andrei Shleifer, 2002. Investor Protection and Corporate Valuation, *Journal of Finance* 57, 1147–1170

Lemmon, Michael L, and Karl V. Lins, 2003. Ownership Structure, Corporate Governance, and Firm Value: Evidence from the East Asian Financial Crisis, *Journal of Finance* 58, 1445–1468

Li, Donghui, Fariborz Moshirian, Peter Kien Pham, and Jason Zein, 2006. When Financial Institutions Are Large Shareholders: The Role of Macro Corporate Governance Environments, *Journal of Finance* 61, 2975–3007.

Lins, Karl V., 2003. Equity Ownership and Firm Value in Emerging Markets, *Journal of Financial and Quantitative Analysis* 38, 159-184.

Masulis, Ronald W., Cong Wang and Fei Xie, 2008, Agency Costs and Dual Class Companies, *Journal of Finance*, forthcoming.

Majluf, Nicolas, Nureya Abarca, Dario Rodriguez and Luis A. Fuentes, 1998, Governance and Ownership Structure in Chilean Economic Groups, *Revista ABANTE* 1, 111-139.

Morck, Randall K., David A. Stangeland, and Bernard Yeung. 2000. Inherited Wealth, Corporate Control, and Economic Growth: The Canadian Disease? In Concentrated Corporate Ownership,

ed. R. Morck. NBER Conference Report series. Chicago and London: University of Chicago Press, 319–69.

Morck, Randall. 2005. How to Eliminate Pyramidal Business Groups: The Double Taxation of Intercorporate Dividends and Other Incisive Uses of Tax Policy. In Tax Policy and the Economy, Vol. 19, ed. J. Poterba. Cambridge and London: MIT Press, 135–79.

Morck, Randall, Daniel Wolfenzon, and Bernard Yeung, 2005. Corporate Governance, Economic Entrenchment, and Growth, *Journal of Economic Literature* 43, 655–720.

Nenova, Tatiana, 2006, Takeover Laws and Financial Development. Working Paper http://papers.ssrn.com/sol3/papers.cfm?abstract_id=935491

Pagano, Marco, and Paolo Volpin, 2005. Political Economy of Corporate Governance, *American Economic Review* 95, 1005-1030.

Rabelo, Flavio, and Flavio C. Vasconcelos, 2002. Corporate Governance in Brazil, *Journal of Business Ethics* 37, 321-335.

Sato, Yuri, 2004. Corporate Governance in Indonesia: a Study on Governance of Business Groups, *Asian Development Experience Vol. 2: The Role of Governance in Asia*, edited by Yasutami Shimomura, Institute of Asian Studies, Singapore.

Shimizu, Tatsuya, 2004. Family Business in Peru: Survival and Expansion under the Liberalization, *Institute of Developing Economies Working Paper*.

Spamann, Holger, 2008. 'Law and Finance' Revisited. Harvard Law School John M. Olin Center Discussion Paper No. 12. Available at SSRN: http://ssrn.com/abstract=109552

Stock, James. H., and Motohiro Yogo, 2005. Testing for Weak Instruments in Linear IV Regression, in D.W.K. Andrews and J.H. Stock, eds. Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg. Cambridge: Cambridge U Press, 2005, 80–108.

Stulz, Rene M., 2005. The Limits of Financial Globalization, *Journal of Finance* 60, 1595-1638.

Villalonga, Belen and Raphael Amit, 2006. How Do Family Ownership, Control and Management Affect Firm Value, Journal *of Financial Economics* 80, 385-417.

Table I – Description of Main Variables

Country-Level Measures of Prevalence of Family Business Groups	
% Group	The percentage of all listed firms in the market that belong to a family business group.
% Pyramid	The percentage of all listed firms in the market that belong to a family business group and are controlled through a pyramid structure.
% Group MC	The percentage of total market capitalization due to firms that belong to family business groups.
% Pyramid MC	The percentage of total market capitalization due to firms that belong to family business groups and are controlled through a pyramid structure.
Group Firms / Controlled Firms	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	The percentage of all family controlled firms that belong to a family business group
Country-Level Variables explaining the Prevalence of Family Business Groups	
Block Premium	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)
Governance Index	A principal components aggregation of i) minority shareholder rights (Anti-director rights), from La Porta (1997) and update by Volpin and Rossi (2004), 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 *Global Competitiveness Report 2003*.
Competition	A survey variable measuring the extent of product market competition. Source: World Economic Forum's *Global Competitiveness Report 2003*.
Newspaper	The total average circulation (or copies printed) of daily newspapers per 1000 inhabitants as measured in the year 2000 Source: *World Association of Newspapers*
Tax Transparency	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: *Deloitte International Taxation Guide*.
Log GDP	The natural logarithm of a country's gross domestic product as of 2001. Source: World Bank.
Log GDP Capita	The natural logarithm of a country's gross domestic product scaled by total population as of 2001. Source: World Bank.
Institutional Funds	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).
Political Stability	Perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means. Source: World Bank
Savings to GDP	Total domestic savings scaled by a country's gross domestic product as of 2001. Source: World Bank.
Accounting Consolidation	A dummy 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%, and equal to 0 if where consolidation is either not allowed or can only take place if the parent owns more than 90% of its subsidiaries. Price Waterhouse Coopers (1998). *Corporate Taxes: A Worldwide Summary*
Manager	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 *Global Competitiveness Report 2003*.
Takeover Index	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)
	Firm-Level Variables
Direct Ownership	The percentage of issued shares of a group firm held directly by its parent firm(s) in the same group.
Weakest Control Link	The sum of the weakest ownership links in various chains of ownership connecting the firm to its ultimate controlling shareholder.
Ultimate CF Rights	The sum of cash-flow rights of a group firm attributable to the ultimate controlling shareholder.
Pyramid Layer	An integer variable that counts the number of layers of listed firms that exist between a group firm and its ultimate controlling shareholder.
Q	A proxy for Tobin's Q, calculated as the market value of equity plus book value of liabilities, divided by the book value of assets as of 2002. Sources: *Osiris*, *Worldscope*, company annual reports, and *Datastream*.
Asset Growth	Average growth of total assets based on the five years previous to 2002. Sources: *Osiris*, *Worldscope*.
Market Capitalization	Total no. shares outstanding multiplied by the share price as at the end of 2001. Sources: *Datastream*, *Osiris*, and *Worldscope*.
Log Size	The log of US dollar market capitalization measured at the end of 2001. Sources: *Datastream*, *Osiris*, and *Worldscope*.
Cash	Total cash or cash equivalents divided by total assets as at the end of 2001. Sources: *Osiris*, *Worldscope* and company annual reports
Leverage	Total liabilities divided by total assets as at the end 2001. Sources: *Osiris*, *Worldscope* and company annual reports
Dividend Yield	Total dividends paid divided by price per share averaged over the five years previous to 2002. Sources: *Datastream*
CAPEX/TA	Total capital expenditures divided by total assets averaged over the five years previous to 2002. Sources: *Osiris*, *Worldscope* and company annual reports
Intangible Dummy	Dummy variable for whether a firm reports non-zero intangible assets.
Log Firm Age	Log of the age (in years) of a firm from its incorporation date until the end of 2001. Source: Osiris
Log Analyst Coverage	The log of one plus the number of analysts providing coverage on a firm's stock. Source: I/B/E/S
Stock Volatility	The standard deviation of monthly stock returns calculated based on a 60-month window in the 5 years previous to 2002. Source: *Datastream*
Earnings Volatility	The standard deviation of the percentage change in earnings based on the 5 years previous to 2002. Sources: *Osiris*, *Worldscope* and company annual reports
Beta	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: *Datastream*
Idiosyncratic Risk	The standard error from estimating the market model on each firm's monthly stock returns in the 5 years prior to 2002. Source: *Datastream*.

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 calculated as the number of groups divided by the number of firms multiplied by 100. *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	6.43	0.85	3.51	3.51	Perez	6.12	Perez	3
Australia	1405	30	5.48	2.7	5.35	0.3	3.06	3.42	Murdoch	3.62	Millner	9
Austria	103	2	4.85	3.88	6.62	6.59	5.83	2.11	Mautner Markhof	4.88	Mautner Markhof	3
Belgium	164	17	25.61	12.8	21.13	13.83	17.68	11.64	Cera Holding	6.79	Boel, Solvay & Janssen	5
Brazil	341	15	15.54	9.97	10.82	8.26	13.49	5.14	Jaeger (SSJ)	4.22	Egydio de Souza Aranha (ITAU)	9
Canada	1220	14	3.77	2.21	8.73	5.58	2.54	1.73	Weston	2.76	Bronfman	9
Chile	169	16	36.69	20.71	38.21	19.26	29.59	9.76	Angelini	12.46	Luksic	12
Colombia	56	4	41.07	30.36	29.36	13.57	66.07	7.14	Bojanini, Piedrahita, Velez & Londoño (Grupo Empresarial Antioqueño, GEA)	11.70	Bojanini, Piedrahita, Velez & Londoño (Grupo Empresarial Antioqueño, GEA)	14
Czech	73	4	10.96	6.85	1.15	0.48	6.85	5.48	Bakala (RPJ)	0.66	Kozeny	2
Denmark	184	6	7.61	1.63	6.03	0.72	1.63	4.23	Stroeyberg	3.38	Stroeyberg	3
Finland	169	5	7.69	5.33	1.38	0.78	6.51	3.65	Ehrnrooth	0.54	Erkko	4
France	801	31	10.49	5.87	9.23	3.06	9.48	4.04	Arnault	2.24	Bollore	9
Germany	816	29	7.84	3.55	4.61	0.75	4.41	4.01	Plattner	2.34	Quandt	4
Greece	256	13	13.67	7.81	10.37	2.61	8.20	5.63	Leventis	3.91	Stassinopoulos	7
Hong Kong	475	25	15.16	7.79	22.19	9.13	11.58	5.66	Li Ka-Shing	9.92	Chan Kwok Keung	9
Hungary	41	2	9.76	4.88	1.42	0.05	4.88	4.88	Schreier (CP Holdings)	1.37	Schreier (CP Holdings)	2
India	659	57	28.22	9.71	19.29	3.81	9.86	9.45	Ambani	8.78	Tata	24

Indonesia	330	25	23.94	13.33	45.35	16.11	20.00	9.65	Soedono	9.82	Mochtar Riady	11
Ireland	73	3	8.22	1.37	2.12	0.01	1.37	4.84	O'Reilly	1.33	O'Reilly	2
Israel	226	18	38.5	25.66	41.17	32.29	50.00	7.96	Shrem, Zimmerman & Fudim	17.42	Dankner	26
Italy	291	15	15.46	7.22	18.87	13.13	13.40	6.76	Tronchetti Provera	10.75	Tronchetti Provera	8
Japan	3233	33	2.29	0.96	1.27	0.32	0.99	1.17	Uehera Shoji	0.22	Masayoshi Son	3
Korea	1355	85	19.78	10.11	46.75	39.87	12.55	6.37	Lee Gun-Hee (Samsung)	23.8	Koo Bon-Moo & Huh Chang-Soo (LG)	18
Malaysia	998	47	14.73	7.92	33.57	17.43	9.92	6.7	Lim Kok Thay (Genting) [a]	4.54	Vincent Tan (Berjaya) [a]	11
Mexico	123	8	19.51	9.76	13.46	3.91	12.20	6.56	Slim	8.39	Slim	8
Netherlands	183	5	5.46	2.19	4.62	3.36	2.73	2.73	de Carvalho-Heineken	4.52	De Carvalho-Heineken	2
New Zealand	96	3	7.29	6.25	10.18	9.28	13.54	3.53	Murdoch [b]	7.03	Quek Leng Chan [c]	3
Norway	178	8	8.99	4.49	4.84	0.9	5.29	6.02	Nagell-Erichsen [d]	1.18	Nagell-Erichsen [d]	3
Pakistan	221	14	15.38	3.62	6.6	3.12	4.07	6.33	Dawood	2.65	Dawood	5
Peru	143	11	25.17	11.19	12.72	7.76	11.89	7.69	Romero	7.5	Brescia	8
Philippines	221	31	43.44	16.74	27.71	8.55	18.55	17.32	de Ayala	10.85	Sy	7
Poland	137	6	8.76	3.65	3.19	0.35	5.11	5.77	Krauze (Softbank)	1.96	Kulikowski (Rolmex)	3
Portugal	78	6	24.36	12.82	10.19	6.48	14.10	7.69	de Azevedo (Sonae)	7.89	De Azevedo (Sonae)	6
Singapore	627	19	10.53	6.38	35.2	12.31	8.29	5.59	Lee Seng Wee [e] (Overseas Chinese Banking Corp)	14.06	Lee Seng Wee [e] (Overseas Chinese Banking Corp)	13
South Africa	298	7	6.04	3.02	1.3	1.03	3.69	2.79	Kebble (Consolidated African Mines)	0.53	Kebble (Consolidated African Mines)	6
Spain	163	8	15.34	9.2	5.75	1.44	10.43	5	Valls	2.48	Valls	6
Sri Lanka	117	19	52.99	40.17	26.35	15.06	47.86	16.24	Jayasundera (Hayleys)	6.70	Selvanathan (Carsons)	10
Sweden	294	12	14.63	7.82	14.63	9.26	7.82	5.58	Wallenberg (Investor AB)	8.93	Wallenberg (Investor AB)	10
Switzerland	298	8	5.03	2.01	5.67	3.69	2.01	3.45	Combes	3.05	Buhrle	3
Taiwan	637	37	19.15	11.93	36.19	18.74	13.03	10.39	Y.C. Wang (Formosa Corp)	6.25	Shu Tong Hsu	8
Thailand	465	27	18.06	9.03	38.64	14.81	9.46	7.76	Shinawatra (Shin Corp)	9.46	Chokwatana (Saha Pathana)	14

Turkey	250	21	32	16	38.39	18.12	18.80	10.24	Sabanci	14.07	Koc	13
UK	2369	15	1.52	0.72	1.42	1.04	0.72	1.06	Murdoch [f]	0.88	Cayzer	6
USA	7562	81	2.9	0.86	2.87	0.61	0.89	1.29	Buffet	1.22	Magness (Liberty Media)	10
Venezuela	32	1	6.25	3.13	0.11	0	3.13	3.13	Levy	0.11	Levy	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.

Table III Correlation Matrix for Country Level Variables

The table displays the correlations amongst the country-level variables used to explain the prevalence of family-controlled business groups, with p-values reported beneath. *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. *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 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. *Political Stability* is a measure of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means

	Log GDP Per Capita	*Accounting Conso-lidation*	*Savings to GDP*	*Institu-tional Funds*	*Block Premium*	*Compet-ition*	*Manager*	*Newspaper*	*Takeover Index*	*Cost of Capital*	*Tax Trans-parency*	*Log GDP*	*Govern-ance Index*
Accounting Consolidation	**0.492** 0.001												
Savings to GDP	**0.307** 0.042	**-0.122** 0.428											
Institutional Funds	**0.543** 0.000	**0.395** 0.008	**0.176** 0.252										
Block Premium	**-0.352** 0.032	**-0.054** 0.749	**-0.235** 0.161	**-0.115** 0.496									
Competition	**0.541** 0.000	**0.231** 0.130	**0.059** 0.699	**0.342** 0.023	**-0.359** 0.028								
Manager	**0.707** 0.000	**0.371** 0.013	**0.217** 0.156	**0.625** 0.000	**-0.3844** 0.019	**0.688** 0.000							
Newspaper	**0.794** 0.000	**0.347** 0.021	**0.338** 0.024	**0.288** 0.057	**-0.244** 0.136	**0.477** 0.001	**0.566** 0.000						
Takeover Index	**0.583** 0.000	**0.205** 0.187	**0.411** 0.006	**0.402** 0.007	**-0.42** 0.011	**0.656** 0.000	**0.665** 0.000	**0.515** 0.000					
Cost of Capital	**-0.703** 0.000	**-0.300** 0.066	**-0.152** 0.359	**-0.260** 0.114	**0.496** 0.004	**-0.552** 0.000	**-0.553** 0.000	**-0.684** 0.000	**-0.480** 0.002				
Tax Transparency	**0.351** 0.0193	**0.245** 0.107	**-0.329** 0.029	**0.094** 0.541	**-0.3169** 0.056	**0.300** 0.047	**0.275** 0.070	**0.198** 0.196	**0.186** 0.231	**-0.364** 0.0247			
Log GDP	**0.491** 0.0007	**0.343** 0.023	**-0.130** 0.397	**0.298** 0.049	**-0.1825** 0.279	**0.435** 0.003	**0.316** 0.036	**0.358** 0.017	**0.251** 0.103	**-0.455** 0.0041	**0.530** 0.0002		
Governance Index	**0.755** 0.000	**0.408** 0.006	**0.206** 0.178	**0.522** 0.000	**-0.5082** 0.001	**0.822** 0.000	**0.839** 0.000	**0.562** 0.000	**0.739** 0.000	**-0.571** 0.000	**0.322** 0.0327	**0.343** 0.0223	
Political Stability	**0.797** 0.000	**0.428** 0.004	**0.422** 0.004	**0.474** 0.001	**-0.3522** 0.033	**0.528** 0.000	**0.691** 0.000	**0.744** 0.000	**0.614** 0.000	**-0.731** 0.000	**0.223** 0.1447	**0.359** 0.0167	**0.711** 0.000

Table IV 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.

Dependent Variables	***% Group***				***% Group MC***		***% Pyramid***				***% Pyramid MC***	
	(1)	(2)	(3)	(4)	(1)	(2)	(1)	(2)	(3)	(4)	(1)	(2)
Intercept	65.901[a]	64.143[a]	67.654[a]	40.923[a]	32.913	27.534	32.979[a]	33.085[a]	42.869[a]	23.983[b]	13.075	11.540
	(16.534)	(12.213)	(13.041)	(13.329)	(20.241)	(22.623)	(8.129)	(9.446)	(11.514)	(9.658)	(15.217)	(16.878)
Block Premium	-0.001						0.029					
	(0.083)						(0.048)					
Governance Index		2.280	0.273	1.635	1.652	-0.763			0.571	1.523	1.000	-0.170
		(1.934)	(1.767)	(1.907)	(3.460)	(3.687)			(1.225)	(1.328)	(2.300)	(2.314)
Newspaper		-3.302[c]	-0.749	1.045	0.949	2.344		-1.282	-0.342	1.027	1.886	2.749
		(1.820)	(2.209)	(2.194)	(3.719)	(4.267)		(1.254)	(1.496)	(1.487)	(2.836)	(3.019)
Tax Transparency		-3.034[b]	-3.874[a]	-2.308[b]	-4.431[b]	-3.650		-1.475[b]	-2.310[b]	-1.246	-0.976	-0.797
		(1.229)	(1.386)	(1.122)	(1.946)	(2.257)		(0.719)	(0.936)	(0.804)	(1.529)	(1.747)
Log GDP Per Capita	-4.218[b]						-2.055[b]					
	(1.930)						(1.007)					
Log GDP		-1.321	-2.270[c]	-1.840[c]	0.708	-0.331		-1.345	-1.914[b]	-1.620[b]	-0.614	-1.128
		(1.220)	(1.160)	(1.021)	(1.752)	(2.050)		(0.952)	(0.913)	(0.792)	(1.135)	(1.329)
Institutional Funds		-10.874[a]			-18.111[a]			-6.259[a]			-8.214[b]	
		(3.234)			(5.374)			(1.799)			(3.574)	
Savings to GDP			-0.707[a]			-0.128			-0.478[b]			-0.143
			(0.247)			(0.421)			(0.181)			(0.290)
Political Stability				-8.436[b]						-6.060[b]		
				(3.243)						(2.621)		
Accounting Consolidation	-0.111	0.844	-2.758	0.724	-5.236	-8.460[c]	0.244	1.847	-1.115	1.308	-2.091	-3.777
	(2.936)	(2.847)	(2.723)	(2.661)	(4.175)	(4.272)	(1.998)	(1.895)	(1.793)	(1.831)	(3.351)	(2.947)
Takeover Index	-19.860[a]	-22.762[a]	-14.162[c]	-18.121[b]	-9.445	-10.367	-10.645[c]	-8.955[b]	-8.312	-10.728	-8.066	-7.256
	(6.867)	(6.725)	(7.122)	(7.518)	(10.502)	(13.030)	(6.164)	(4.011)	(6.181)	(6.560)	(6.862)	(7.640)
Adjusted R^2	0.434	0.488	0.533	0.539	0.270	0.116	0.315	0.377	0.432	0.455	0.046	-0.030
N	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 V. 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.

	Group Firms/ Controlled Firms			***Group Firms/Family Controlled Firms***			***% Group***		***% Pyramid***	
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(1)	(2)
Intercept	65.786[a]	67.202[a]	41.112[a]	87.376[a]	89.096[a]	63.365[a]	58.342[a]	68.169[a]	35.575[a]	41.294[a]
	(12.525)	(14.196)	(14.379)	(13.736)	(14.656)	(15.009)	(8.725)	(11.907)	(7.624)	(8.718)
Block Premium							0.064	-0.081	0.083	-0.008
							(0.108)	(0.088)	(0.064)	(0.044)
Governance Index	3.031	0.733	2.027	2.677	0.248	1.552	3.475	-0.061	3.251[b]	0.960
	(2.365)	(2.468)	(2.288)	(2.378)	(2.290)	(2.372)	(2.482)	(1.928)	(1.525)	(1.234)
Newspaper	-1.950	0.517	2.636	-2.628	0.020	1.820	-1.886	0.556	-1.482	-0.004
	(2.416)	(3.321)	(2.892)	(2.352)	(3.245)	(2.623)	(1.529)	(2.179)	(1.141)	(1.461)
Tax Transparency	-5.796[a]	-6.272[a]	-4.898[a]	-6.594[a]	-7.139[a]	-5.662[a]	-1.451	-3.383[b]	-0.951	-2.133[b]
	(1.745)	(1.855)	(1.441)	(1.879)	(2.032)	(1.565)	(1.522)	(1.549)	(0.949)	(1.034)
Log GDP	-0.579	-1.637	-1.254	-1.958	-3.079[b]	-2.672[b]	-1.381	-2.628[b]	-0.803	-1.604[b]
	(1.516)	(1.484)	(1.256)	(1.490)	(1.368)	(1.186)	(1.068)	(1.063)	(0.736)	(0.753)
Institutional Funds	-13.808[b]			-14.484[b]			-15.323[a]		-10.195[a]	
	(5.702)			(6.887)			(4.536)		(3.249)	
Savings to GDP		-0.613[c]			-0.665[c]			-0.755[b]		-0.450[b]
		(0.331)			(0.361)			(0.278)		(0.179)
Political Stability			-8.594[b]			-8.192[b]				
			(3.759)			(3.785)				
Accounting	0.628	-3.193	0.071	1.624	-2.443	0.883	-0.579	-3.844	-0.039	-2.006
Consolidation	(3.745)	(4.061)	(3.879)	(4.170)	(4.856)	(4.440)	(2.766)	(3.254)	(1.814)	(2.096)
Takeover Index	-16.898[c]	-10.108	-12.590	-17.334	-9.892	-13.431	-29.884[a]	-19.560[b]	-18.485[a]	-12.097[c]
	(9.598)	(10.599)	(8.917)	(11.198)	(11.425)	(11.066)	(7.752)	(7.951)	(6.617)	(6.307)
Adjusted R^2	0.330	0.306	0.337	0.404	0.389	0.395	0.538	0.550	0.508	0.487
N	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.

Table VI 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. Within-group tests compare median unadjusted firm variables across pyramidal layers in the same business groups. Statistical significance of differences is tested using a Wilcoxon Rank-Sum test of medians. Panel A examines all firms in our sample. Panel B examines only countries whose Governance Index is below the sample median and Panel C examines countries whose GDP Per Capita is below the sample median. All variables are calculated as at the end of 2001 and are described in Table I.

	Q	*Asset Growth*	*Log Assets*	*Log Market Cap*	*Cash*	*Lever-age*	*Div-idend Yield*	*Capex*	*Stock Vola-tility*	*Earnings Vola-tility*	*Direct Owner-ship %*
Panel A: All Sample Countries											
Group vs. Non-Group Tests											
Groups minus Non-Group Firms	-0.061[a]	0.001	0.954[a]	0.777[a]	-0.120	1.003	0.032[a]	0.002[a]	-0.011[a]	-0.003	-
Middle Firms minus Non-Group Firms	-0.04[a]	-0.01[c]	1.60[a]	1.31[a]	-0.16	1.12	0.47[a]	0.00	-0.01[a]	-0.01	-
Bottom Firms minus Non-Group Firms	-0.036[c]	-0.007	0.562[a]	0.598[a]	-0.262	-0.997	0.000[a]	0.005[a]	-0.011[a]	-0.002	-
Within-Group Tests											
Middle Firms minus Direct Control Firms	0.073[a]	-0.016[c]	-0.454[a]	-0.466[c]	0.410[a]	-2.718	0.284	0.006	0.003	0.005[c]	3.423
Bottom Firms minus Direct Control Firms	0.080[a]	-0.017[a]	-1.242[a]	-0.806[a]	-0.012	-2.933[a]	0.000	0.008[a]	0.007[a]	0.006[a]	7.060[a]
Bottom Firms minus Middle Firms	0.036	-0.029[c]	-1.164[a]	-0.769[a]	-0.147	-2.955	-0.029	0.013	0.008	0.000	0.332
Panel B: Weak Governance Countries											
Group vs. Non-Group Tests											
Groups minus Non-Group Firms	-0.084[a]	-0.006	0.910[a]	0.777[a]	-0.124	0.959	0.000[a]	0.000[a]	-0.011[a]	-0.002	-
Middle Firms minus Non-Group Firms	-0.11[a]	-0.04[a]	1.63[a]	1.29[a]	-0.21	-0.12	0.68[a]	0.00	-0.01[a]	-0.01	-
Bottom Firms minus Non-Group Firms	-0.055	-0.007	0.496[a]	0.451[a]	-0.733	-0.095	0.000[a]	0.008[a]	-0.015[b]	-0.004	-
Within-Group Tests											
Middle Firms minus Direct Control Firms	0.065[a]	-0.022	-0.421	-0.421	0.084	-2.683	0.157	-0.001	0.011	0.003	-2.755
Bottom Firms minus Direct Control Firms	0.047[a]	-0.016[a]	-1.175[a]	-0.722[a]	-0.047	-3.413[a]	0.000	0.010[c]	0.006[a]	0.006[a]	4.305[a]
Bottom Firms minus Middle Firms	0.025	-0.048[a]	-1.350[a]	-0.765[a]	0.233	-6.455[c]	0.101	0.026[a]	0.005	0.007	1.104
Panel C: Low GDP Per Capita Countries											
Group vs. Non-Group Tests											
Groups minus Non-Group Firms	-0.054[a]	0.004	0.882[a]	0.658[a]	-0.095	1.009	0.151[a]	0.003[a]	-0.012[a]	-0.005[c]	-
Middle Firms minus Non-Group Firms	-0.02	-0.02	1.42[a]	1.21[a]	-0.15	2.08	0.24[a]	0.00	-0.01	-0.01	-
Bottom Firms minus Non-Group Firms	-0.031	-0.007	0.561[a]	0.542[a]	-0.001	-0.331	0.112[a]	0.004	-0.011[b]	-0.003	-
Within-Group Tests											
Middle Firms minus Direct Control Firms	0.062[a]	-0.051	-0.389	-0.161	0.140	-2.718	0.038	0.000	0.011	0.002	-0.273
Bottom Firms minus Direct Control Firms	0.055[a]	-0.017[a]	-1.188[a]	-0.652[a]	0.057	-3.413[a]	0.000	0.006	0.007[a]	0.006[c]	5.490[a]
Bottom Firms minus Middle Firms	0.036	-0.049[a]	-1.393[a]	-0.908[a]	-0.008	-6.455[a]	0.000	0.024[c]	0.008	0.003	-1.506

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

Table VII. Family Group Membership and Firm Performance

This analysis is based on the sample of 13,910 firms from 45 selected countries. The dependent variable is the ratio of market value of assets over book value of assets, used as a proxy for Tobin's Q. In the Q regression, *Group Dummy* 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 measured at the end of 2001. *Beta* is the estimate of beta for each firm obtained from running a market model on the firm's monthly stock returns over the 1997-2001 period. *Asset Growth* is the average annual growth rate in asset size over the 1997-2001 period. *Leverage* is the ratio of total liabilities to total assets. *CAPEX* is the ratio of capital expenditure over total assets. *Dividend Yield* is the average of the ratio of dividend-per-share over share price over the 1997-2001 period. *Intangible Dummy* is an indicator variable that equals one if a firm reports non-zero intangible assets, and zero otherwise. *Log Age* is the logarithm of firm age. *Log Analyst Cov* is the logarithm of the number of analysts covering a firm plus one. To address potential endogeneity of *Group Dummy*, two alternative models are used, both employing *Idiosyncratic Risk*, which is the standard error from the same market model used to estimate of *Beta*, as the identifying instrument. In the two-stage instrument-variable (IV) models, *Group Dummy* is first regressed on *Idiosyncratic Risk* and other explanatory variables in the Q regression using a probit estimation. The fitted values from this first stage are used as the instrument for *Group Dummy* in the second stage (the Q regression). In the treatment effect models, the Q regression equation is estimated jointly with the treatment equation, in which *Group Dummy* 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. The two-stage IV models report the Stock and Yogo (2005) test for weak instruments. All regression models include dummy 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 robust standard errors are reported in parentheses below the coefficients.

	Full sample	**Controlled-Firm Sample**	**Family-Firm Sample**	**Endogenous Selection Regression Models**					
				Full sample		**Controlled-Firm Sample**		**Family-Firm Sample**	
	OLS regression	**OLS regression**	**OLS regression**	**Two-stage IV reg.**	**Treatment-Effect reg.**	**Two-stage IV reg.**	**Treatment-Effect reg.**	**Two-stage IV reg.**	**Treatment-Effect reg.**
Group Dummy	-0.141[b]	-0.188[a]	-0.241[a]	3.308[a]	2.121[a]	1.474[b]	1.786[a]	0.352	1.814[a]
	(0.056)	(0.053)	(0.063)	(1.041)	(0.522)	(0.720)	(0.394)	(0.340)	(0.435)
Log Size	0.150[b]	0.165[a]	0.188[a]	0.118	0.126[c]	0.121[a]	0.111[a]	0.159[a]	0.081
	(0.064)	(0.027)	(0.036)	(0.073)	(0.070)	(0.031)	(0.036)	(0.036)	(0.050)
Beta	0.069[a]	0.054[c]	0.058	0.060[a]	0.017	0.030	-0.008	0.052	-0.011
	(0.014)	(0.028)	(0.041)	(0.018)	(0.012)	(0.028)	(0.019)	(0.040)	(0.026)
Asset growth	0.063[a]	0.094[b]	0.099[b]	0.065[a]	0.065[a]	0.101[b]	0.104[a]	0.104[b]	0.118[a]
	(0.013)	(0.042)	(0.047)	(0.011)	(0.012)	(0.040)	(0.040)	(0.045)	(0.043)
Leverage	0.019[a]	0.015[a]	0.016[a]	0.019[a]	0.019[a]	0.014[a]	0.014[a]	0.016[a]	0.015[a]
	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
CAPEX/TA	1.156[a]	0.897[a]	0.687[a]	1.322[a]	1.265[a]	1.116[a]	1.154[a]	0.786[a]	1.027[a]
	(0.163)	(0.257)	(0.217)	(0.183)	(0.186)	(0.316)	(0.301)	(0.248)	(0.273)

(continued next page)

Dividend Yield	-0.024[c]	-0.008	-0.009	-0.022[c]	-0.024[c]	-0.003	-0.003	-0.009	-0.010
	(0.013)	(0.010)	(0.011)	(0.013)	(0.013)	(0.010)	(0.010)	(0.011)	(0.011)
Intangible Dummy	-0.590[b]	-0.400[b]	-0.420[b]	-0.715[a]	-0.670[a]	-0.497[a]	-0.513[a]	-0.445[b]	-0.502[b]
	(0.229)	(0.167)	(0.194)	(0.230)	(0.236)	(0.178)	(0.174)	(0.194)	(0.203)
Log Age	-0.168[a]	-0.102[a]	-0.105[a]	-0.188[a]	-0.184[a]	-0.123[a]	-0.129[a]	-0.111[a]	-0.130[a]
	(0.052)	(0.026)	(0.026)	(0.046)	(0.048)	(0.025)	(0.028)	(0.026)	(0.033)
Log Analyst Cov	-0.238	-0.132	-0.153	-0.237	-0.226	-0.122	-0.112	-0.157	-0.152
	(0.185)	(0.093)	(0.102)	(0.190)	(0.190)	(0.098)	(0.100)	(0.108)	(0.119)
Idiosyncratic Risk (from first stage)				0.026	0.296[a]	0.090	0.437[a]	0.133	0.478[a]
				(0.322)	(0.080)	(0.300)	(0.092)	(0.290)	(0.115)
Wald test (H0: Rho=0)					918.272		340.993		316.148
Stock-Yogo test				45.580		47.804		95.869	
R-squared	0.223	0.194	0.205						
No of obs	14309	6302	4667	14317	14317	6291	6291	4667	4667

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

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

This analysis focuses on the sample of 1267 family-group firms from 45 selected countries. The dependent variable is the ratio of market value of assets over book value of assets, used as a proxy for Tobin's Q. 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. Other control variables for Q are also included. *Log Size* is the log of US-dollar market capitalization measured at the end of 2001. *Beta* is the estimate of beta for each firm obtained from running a market model on the firm's monthly stock returns over the 1997-2001 period. *Asset Growth* is the average annual growth rate in asset size over the 1997-2001 period. *Leverage* is the ratio of total liabilities to total assets. *CAPEX* is the ratio of capital expenditure over total assets. *Dividend Yield* is the average of the ratio of dividend-per-share over share price over the 1991-2001 period. *Intangible Dummy* is an indicator variable that equals one if a firm reports non-zero intangible assets, and zero otherwise. *Log Age* is the logarithm of firm age. *Log Analyst Cov* is the logarithm of the number of analysts covering a firm plus one. All Q regressions include group-specific fixed effects. To address potential selection bias as a result of investigating only group firms, the Heckman two-stage procedure is used. 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. For robustness, the first-stage of Heckman selection bias correction is estimated first on the full sample, then on the sample of 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 group in the sample.

								Heckman Selection Bias Correction		
	OLS Regression Models							1st stage: full sample	1st stage: ctrl. firms	1st stage: family firms
Weakest Control Link	0.145	0.391[c]								
	(0.222)	(0.234)								
Ultimate CF Rights		-0.304	-0.053		-0.235					
		(0.206)	(0.200)		(0.186)					
Direct Ownership				0.292[b]	0.378[a]		0.249[c]	0.253[c]	0.253[c]	0.249[c]
				(0.132)	(0.109)		(0.141)	(0.141)	(0.142)	(0.140)
Pyramid Layer						0.078[a]	0.069[b]	0.068[b]	0.069[b]	0.068[b]
						(0.027)	(0.028)	(0.028)	(0.028)	(0.028)
Log Size	0.102[a]	0.106[a]	0.104[a]	0.104[a]	0.108[a]	0.111[a]	0.111[a]	0.103[a]	0.098[a]	0.099[a]
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.027)	(0.030)
Beta	-0.067	-0.073	-0.068	-0.062	-0.066	-0.071	-0.066	-0.069	-0.074	-0.070
	(0.067)	(0.068)	(0.067)	(0.067)	(0.067)	(0.066)	(0.067)	(0.067)	(0.070)	(0.069)
Asset growth	-0.001	0.001	-0.002	0.006	0.008	0.004	0.010	0.017	0.020	0.020
	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)	(0.058)	(0.055)	(0.052)

(continued next page)

Leverage	0.006[a]	0.006[a]	0.006[a]	0.006[a]	0.006[a]	0.006[a]	0.006[a]	0.006[a]	0.006[a]	0.006[a]
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CAPEX/TA	0.173	0.169	0.169	0.154	0.142	0.145	0.134	0.164	0.187	0.165
	(0.174)	(0.175)	(0.175)	(0.179)	(0.180)	(0.179)	(0.182)	(0.185)	(0.198)	(0.188)
Dividend Yield	-0.002	-0.002	-0.002	-0.001	-0.001	-0.002	-0.001	-0.001	-0.000	-0.001
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Intangible Dummy	-0.110[c]	-0.101[c]	-0.113[b]	-0.105[c]	-0.100[c]	-0.104[c]	-0.098[c]	-0.122[c]	-0.123[c]	-0.108[c]
	(0.057)	(0.058)	(0.056)	(0.058)	(0.059)	(0.057)	(0.059)	(0.069)	(0.071)	(0.065)
Log Age	-0.020	-0.021	-0.021	-0.016	-0.016	-0.022	-0.017	-0.022	-0.022	-0.019
	(0.020)	(0.019)	(0.020)	(0.020)	(0.020)	(0.019)	(0.019)	(0.019)	(0.020)	(0.020)
Log Analyst Cov	-0.028	-0.030	-0.030	-0.023	-0.025	-0.032	-0.026	-0.023	-0.021	-0.024
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.034)	(0.032)
Lambda								-0.143	-0.161	-0.096
								(0.164)	(0.232)	(0.214)
R-squared	0.650	0.651	0.650	0.652	0.653	0.653	0.654	0.654	0.654	0.654

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

Table IX. Regression of within-group differences and firm performance under endogeneity assumption

This analysis focuses on the sample of 1267 family-group firms from 45 selected countries. The dependent variable is the ratio of market value of assets over book value of assets, used as a proxy for Tobin's Q. 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. *Ultimate CF Rights* is the sum of cash-flow rights of a group firm attributable to the ultimate controlling shareholder. A logit transformation is applied to both *Direct Ownership* and *Ultimate CF Rights*. *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. Other control variables for Q are also included. *Log Size* is the log of US-dollar market capitalization measured at the end of 2001. *Beta* is the estimate of beta for each firm obtained from running a market model on the firm's monthly stock returns over the 1997-2001 period. *Asset Growth* is the average annual growth rate in asset size over the 1997-2001 period. *Leverage* is the ratio of total liabilities to total assets. *CAPEX/TA* is the ratio of capital expenditure over total assets. *Dividend Yield* is the average of the ratio of dividend-per-share over share price over the 1997-2001 period. All Q regressions include group-specific fixed effects. *Intangible Dummy* is an indicator variable that equals one if a firm reports non-zero intangible assets, and zero otherwise. *Log Age* is the logarithm of firm age. *Log Analyst Cov* is the logarithm of the number of analysts covering a firm plus one. To address potential endogeneity, the two-stage instrumental-variable procedure is used. The first stage regression regresses one of the within-group ownership variable of interests (*Ultimate CF Rights*, *Direct Ownership*, *Pyramid Layer*) on the standard control variables mentioned above and two additional instruments, *Idiosyncratic Risk*, which is the standard error from the same market model used to estimate *Beta*, and *Same Industry Dummy*, which equals one if a group firm's and its immediate parent's SIC-code share the same first digit. In addition, to address potential selection bias as a result of investigating only group firms, the Heckman two-stage procedure is used. 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* 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. For robustness, the first-stage of Heckman selection bias correction is estimated first on the full sample, then on the sample of controlled firms and finally on the sample of family-controlled firms. The standard errors are reported in parentheses.

	Full sample						**Full sample excluding top-layer firms**					
	1st Stage	**2nd Stage**	**1st Stage**	**2nd Stage**	**1st Stage**	**2nd Stage**	**1st Stage**	**2nd Stage**	**1st Stage**	**2nd Stage**	**1st Stage**	**2nd Stage**
Ultimate CF Rights		-2.118						-0.254[c]				
		(1.776)						(0.151)				
Direct Ownership				0.879[b]						0.079		
				(0.442)						(0.088)		
Pyramid Layer						0.926[a]						0.300[b]
						(0.358)						(0.151)
Idiosyncratic Risk	-0.273		0.683[b]		0.647[a]		-0.866[b]		0.008		0.743[a]	
	(0.322)		(0.289)		(0.214)		(0.388)		(0.465)		(0.269)	
Same Industry Dummy							-0.217[a]		0.413[a]		0.202[a]	
							(0.076)		(0.085)		(0.050)	
Log Size	0.097[a]	0.295	-0.010	0.084[a]	-0.086[a]	0.156[a]	0.051[c]	0.086[a]	0.743[a]	0.092[a]	0.008	0.071[a]
	(0.022)	(0.255)	(0.020)	(0.021)	(0.015)	(0.041)	(0.030)	(0.018)	(0.269)	(0.019)	(0.465)	(0.014)

(continued next page)

Beta	-0.101[c]	-0.255	-0.107[c]	0.044	0.008	-0.056	-0.032	0.007	0.202[a]	-0.006	0.413[a]	0.019
	(0.061)	(0.195)	(0.055)	(0.064)	(0.040)	(0.045)	(0.076)	(0.040)	(0.050)	(0.039)	(0.085)	(0.035)
Asset growth	-0.002	0.010	-0.122[c]	0.135	-0.066	0.087	0.011	-0.025	-0.066[a]	-0.001	-0.021	-0.030
	(0.071)	(0.146)	(0.064)	(0.089)	(0.047)	(0.057)	(0.087)	(0.046)	(0.020)	(0.045)	(0.033)	(0.041)
Leverage	0.001	0.005[a]	-0.000	0.004[a]	-0.002[a]	0.006[a]	0.001	0.003[a]	0.075	0.004[a]	0.048	0.003[a]
	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.050)	(0.001)	(0.084)	(0.001)
CAPEX/TA	-0.478[b]	-0.678	0.362[c]	0.065	0.425[a]	-0.015	-0.296	0.220	-0.087	0.198	-0.011	0.280[b]
	(0.227)	(1.164)	(0.204)	(0.246)	(0.151)	(0.234)	(0.298)	(0.163)	(0.056)	(0.153)	(0.095)	(0.142)
Dividend Yield	0.004	0.006	-0.009	0.008	-0.005	0.003	-0.005	-0.005	-0.001	-0.008	0.001	-0.004
	(0.008)	(0.014)	(0.007)	(0.009)	(0.005)	(0.006)	(0.015)	(0.008)	(0.001)	(0.007)	(0.002)	(0.007)
Intangible Dummy	0.120[c]	0.167	-0.129[b]	-0.017	-0.113[b]	-0.021	0.068	0.010	0.324[c]	-0.008	0.219	-0.003
	(0.072)	(0.435)	(0.065)	(0.074)	(0.048)	(0.073)	(0.091)	(0.048)	(0.194)	(0.044)	(0.326)	(0.042)
Log Age	-0.003	-0.024	-0.107[a]	0.066	-0.010	-0.018	-0.001	-0.023	0.016	-0.030	-0.014	-0.020
	(0.033)	(0.074)	(0.029)	(0.053)	(0.022)	(0.025)	(0.039)	(0.020)	(0.010)	(0.019)	(0.017)	(0.019)
Log Analyst Cov	-0.080[b]	-0.170	-0.130[a]	0.120[c]	0.015	-0.009	-0.056	0.008	0.004	0.013	-0.022	0.029
	(0.038)	(0.183)	(0.034)	(0.071)	(0.025)	(0.029)	(0.048)	(0.026)	(0.059)	(0.024)	(0.099)	(0.024)
Lambda		0.046		-0.216		-0.187		-0.227		-0.257[c]		-0.259[c]
		(1.281)		(0.189)		(0.141)		(0.153)		(0.152)		(0.155)
Stock-Yogo statistics	1.387		5.324		9.436		4.019		7.724		8.853	
No. of observations	1267		1267		1267		551		551		551	

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