

Family Business Groups around the World: Costs and Benefits of Pyramids

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Family Business Groups around the World: Financing Advantages, Control Motivations and Organizational Choices

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Family Business Groups around the World: Financing Advantages, Control Motivations and Organizational Choices

Abstract: Using a dataset of 28,635 firms in 45 countries, this study investigates the motivations for family-controlled business groups. We provide new evidence consistent with the argument that particular group structures emerge not only to perpetuate control, but also to alleviate financing constraints at the country and firm levels. At the country level, family groups, especially those structured as pyramids, are more prevalent in markets with limited availability of capital. At the firm level, investment intensity is greater for firms held in pyramidal rather than in horizontal structures, reflecting the financing advantages of the former. Within a pyramid, internal equity funding, investment intensity and firm value all increase down the ownership chain. However, group firm performance declines when dual-class shares and cross shareholdings are employed as additional control-enhancing mechanisms.

Across a broad sample of national economies around the world, we find that on average, 19 percent of listed firms belong to family-controlled business groups, rising to over 40 percent in some emerging markets.¹ The manner in which member firms are organized into groups takes two major forms. Approximately one third of all groups employ a purely horizontal structure, in which the controlling family directly (or through a private holding vehicle) owns equity stakes in all the group firms. The remaining two thirds are set up as pyramids, with varying numbers of listed firms separating group members from the ultimate owner. Family groups also differ substantially in their use of control-enhancing mechanisms such as cross-holdings of shares (10 percent of groups) and dual-class shares with unequal voting rights (15 percent of groups). Although family business groups are a significant and long standing phenomenon in most parts of the world,² variations in their use of different organizational structures and control-enhancing mechanisms have received little attention. Our study documents these organizational choices and explores their motivations across a wide range of external market environments.

The conventional explanation for the existence of business groups emphasizes the control motivations of founding families. As a consequence, the extant literature on family groups predominantly studies the pyramidal structure because it facilitates control without necessitating a commensurate capital contribution, leading to a clear and often dramatic wedge between cash-

¹ We define family-controlled business groups as a collection of listed firms controlled by the same family or individual. For brevity, we refer to them also as ‘family business groups’ or ‘family groups’.

² In the US, pyramidal groups were popular until the introduction of double-taxation of inter-corporate dividends ended their expansion in the 1930s (Morck (2005)). Around the world, some of the largest firms in many countries are controlled by family business groups, such as Fiat (Italy), Ford (US), Hutchison Whampoa (Hong Kong), News Corp (Australia), Overseas Chinese Banking Corp (Singapore) and Samsung (South Korea). Further, many family groups have a long history. The Jardine Matheson group (Hong Kong/Singapore) and the Bolloré family group (France), for example, were established more than 150 years ago.

flow and control rights (La Porta, Lopez-de-Silanes, and Shleifer (1999)).³ Pursuing this line of investigation, Johnson, La Porta, Lopez-de-Silanes, and Shleifer (2000), Bae, Kang, and Kim (2002), Bertrand, Mehta, and Mullainathan (2002), Joh (2003), and Baek, Kang, and Lee (2006) conclude that this wedge can encourage expropriation of minority shareholders by a controlling family through various tunneling activities.

Thus, the corporate control explanation for family groups highlights the potential risk of investing in their member firms, but it also raises a fundamental question. Why do minority shareholders continue to co-invest alongside controlling families? One possible explanation is that unaffiliated investors rationally anticipate the costs associated with the divergence of cash-flow and control rights, and discount the prices of group firm securities accordingly. However, if such private benefits of control are priced, what then are a family's incentives to create or to maintain these business groups? To address these questions, some recent studies have started exploring whether certain group structures also exist for other reasons, specifically, because they create significant financing advantages by leveraging a group's internal capital market (Almeida and Wolfenzon (2006a)) and reputation (Gomes (2000), Khanna and Palepu (2000)). These studies argue that in the presence of moral hazard risks, such advantages help improve access to and lower the cost of raising equity capital, especially in less developed capital markets.

In this study we focus on how both group affiliation and group organizational structures emerge to address financing difficulties at both the individual firm level and at the economy-wide level. Utilizing an extensive new dataset of 3,007 family group firms drawn from 28,635 listed firms across 45 countries, we begin by characterizing the country-level environments conducive to group formation. We then shift to a firm-level analysis to explore how the choices of structures (horizontal or pyramidal) of individual groups and the placement decisions of member firms

³ See Morck, Wolfenzon, and Yeung (2005) and Khanna and Yafeh (2007) for a review.

within a group are related to particular firm characteristics. Finally, we examine performance differences between group and non-group firms, between pyramidal and horizontal structures, and within each group. Across various lines of analysis, our evidence consistently indicates that the continuing prevalence of family groups and their choice of organizational structures reflect not only control motivations, but also their ability to support high-risk, capital intensive firms that could otherwise find it difficult to attract external funding, especially in weak capital markets.

Our analysis takes into consideration several important elements of Almeida and Wolfenzon's (2006a) theory on group formation. In their theory, a family can either fund a new firm directly with its own wealth or indirectly with the retained earnings of another firm in a pyramid. Compared to direct funding, the pyramidal structure creates a financing advantage by leveraging the internal capital under the family's control, which helps raise external funding for projects with relatively large capital requirements and low anticipated cash flows.⁴ Under other ownership arrangements, such projects may be unfunded given the often large valuation discount demanded by minority investors, who anticipate expropriation of a portion of their investments. According to this theory, rather than being the reason for the creation of pyramids, the separation of cash-flow and control rights emerges as a consequence of the family's optimal funding choice.

Financing advantages also arise if group structures facilitate reputation building. Khanna and Palepu (2000) observe that a group's track record in establishing, managing, and/or monitoring multiple firms substitutes for underdeveloped investor protection regulations. In a multi-period model, Gomes (2000) argues that a family can build a reputation for treating minorities well by retaining large shareholdings and voluntarily bearing the cost of under-

⁴According to Hoshi, Kashyap, and Scharfstein (1991), Khanna and Yafeh (2005), and Gopalan, Nanda, and Seru (2007), such internal capital markets also facilitate risk-sharing and intra-group financial support as a way to overcome external capital constraints and financial distress.

diversification. This is a credible commitment because the family will repeatedly need to raise capital, and any expropriation will be penalized by discounts of its future stock offerings. The Gomes model predicts that the reputation effect is actually more intense when cash-flow and control rights can be separated: a non-expropriating controlling family derives payoff mainly from future sales of shares. Hence the ability to subsequently divest shares without losing control actually improves the credibility of the family's initial ownership retention signal.

The above arguments imply that even when expropriation is anticipated and priced by the capital market, certain group structures can still be an optimal choice for a controlling family due to their offsetting financing benefits, which are especially advantageous in markets with restricted capital availability and for firm types with extensive funding needs. Our empirical analysis begins by investigating this prediction at the country level. While groups can emerge in different countries as a result of unique historical circumstances (Morck and Steier (2005)), the financing explanation implies that their long-term survival reflects weaknesses in the capital market that create barriers to entry for independent firms needing to raise funds externally. Consistent with this prediction we find that after controlling for legal mechanisms aimed at curbing private benefits of control and other regulatory constraints to group formation, external capital availability is negatively associated with the prevalence of family groups across economies, especially those organized under a pyramidal structure.

Our main line of analysis is conducted at the firm level, where we compare firm characteristics between group and non-group firms, across group structures and within each group. In a comparison of group members and their non-group peers, we find that despite having higher idiosyncratic risk, group firms are larger, more established and use more leverage, reflecting their financing advantages. Consistent with the reputation building argument, group firms also tend to have higher dividend yields. Comparisons of firms across pyramidal and

horizontal group structures and within the same pyramid also produce a number of important findings. First, investment intensity is greater for firms at the bottom of a pyramid compared to both firms at the apex of the same pyramid and those held in a purely horizontal structure. These firms also tend to be younger and have higher idiosyncratic risk, making it more difficult for them to raise external capital. Thus, in addition to control motivations, the pyramidal structure appears to serve an important function of leveraging a group's available internal funds to support its more capital-intensive member firms.

We then examine how group affiliation and structuring choices are related to firm performance. Based on a more comprehensive cross-country ownership dataset, we document findings consistent with those reported in La Porta, Lopez-de-Silanes, and Shleifer (2002), Claessens, Djankov, Fan, and Lang (2002), and Lemmon and Lins (2003), that is, group firms on average have lower firm value (measured by Tobin's Q) than non-group firms. Although the extant literature often attributes such valuation differences to the deviation of cash-flow rights from control rights frequently observed in business groups, this inference is problematic given that group and non-group firms can have substantially different firm and owner characteristics. Further, summarizing ownership differences across all firms using only cash-flow (and control) rights ignores the fact that the same rights can be achieved through many alternative group organizational structure choices and with the use of additional control enhancing mechanisms.

Thus, our next analysis is limited to a sample of only family group firms and examines firm performance variations within a group and across alternative group structures. We document a number of striking results. First, within each pyramid, firm value is greater for firms at the bottom than those at the top, despite the bottom firms having lower cash-flow rights held by the controlling family. Such differences are more pronounced for bottom firms with particularly high capital requirements. This finding is again consistent with the internal capital explanation of

Almeida and Wolfenzon (2006a). Since each bottom firm is partially funded with the retained earnings of its parent, the difference in their valuation suggests that such support is both costly to the parent's minority shareholders, who effectively subsidize the cost of expected expropriation by the family, and beneficial to the bottom firm as it limits the extent to which its funding needs are satisfied by more expensive external capital.

Second, we examine the direct ownership stake retained in each group firm by its immediate parent(s) as a measure of a group's internal capital contribution and find that it is higher for bottom firms than for other group members. In addition, it is this direct ownership measure, rather than the ultimate cash-flow rights of the controlling family, which is positively related to firm value. Thus, we conclude that the ability of a group to leverage internal capital plays an important role in reducing the costs of raising external capital for its younger, capital-intensive members. Another interpretation is that such concentrated ownership and control also generates a certification effect that can offset the moral hazard risk faced by minority investors. This is analogous to the rationale for giving superior control rights to venture capitalists.⁵

Third, consistent with control motivations for the existence of groups, we find that when cash-flow and control rights of group firms are separated by devices other than pyramids, such as dual-class shares and cross shareholdings, they suffer a valuation discount relative to other member firms. This can be explained by the fact that dual-class shares do not generate internal financing advantages, but clearly intensify moral hazard concerns by increasing the wedge between a family's control and cash-flow rights. A similar argument can be made for cross shareholdings because they can effectively be created by a simple exchange of shares between two members, which may not involve significant reallocation of a group's internal capital.

We also examine non-family groups (those controlled by widely-held corporations,

⁵ See Gompers and Lerner (1996) and Kaplan and Stromberg (2003) for discussions on control by venture capitalists.

governments, or financial institutions). However, we do not find that the differences in firm characteristics and performance levels within family groups are also observed within non-family groups. This finding highlights that the presence of a controlling family (or an entrepreneur) at the helm of a business group is an important precondition for creating the financing advantages associated with certain group structures. Without a dominant shareholder who controls (or closely monitors) group capital allocations, bears the costs of raising external capital, and internalizes the benefits from choosing a particular group structure, capturing financing advantages does not appear to be a relevant consideration to a non-family group's organizational decisions.

Our within-group analysis suggests that the financing advantages of family groups play a significant role in supporting the financing needs of specific types of firms. Reconciling this finding with prior evidence of lower valuation in firms with a wider separation of cash-flow and control rights (La Porta *et al.* (2002), Claessens *et al.* (2002), and Lemmon and Lins (2003)), suggests that group membership may be subject to an endogenous selection effect. That is, the observed non-group firms in a market may have superior valuations than group firms because they possess inherent attributes that aid their ability to raise funds independently. Although we cannot offer a conclusive endogeneity correction due to difficulties associated with identification in a cross-sectional setting, we estimate a treatment effects model that provides preliminary evidence that the valuation discount of group firms has an endogenous component and that certain group firms would experience even greater valuation discounts if independently funded.

Overall, our findings contribute to a growing body of evidence on the financing roles of family groups. Gopalan, Nanda, and Seru (2008) find that dividends are a means of redistributing internal funds within business groups in Asia and Europe. Khanna and Palepu (2000) find that in India, group affiliation is positively related to profitability, although Khanna and Yafeh (2005) report that this relationship is not consistent across 12 emerging markets. These studies, however,

do not examine differences within a group. Almeida, Park, Subrahmanyam, and Wolfenzon (2011) document that the pyramidal structure is optimal for certain firm types and that valuation differences between firms within a pyramid are consistent with the Almeida and Wolfenzon (2006a) financing explanation. However, their analysis focuses only on family groups within South Korea, and their evolution over time. Our study differs from the above studies in number of important dimensions. First, with a dataset encompassing a wide range of market environments, we can examine how the prevalence and organizational structure of groups are related to country-level factors. Second, with a broad coverage of firms in each country, we can compare firms in pyramidal or horizontal family groups to not only independent firms, but also to those in non-family business groups. Finally, in addition to examining within-group differences in detail, our analysis highlights the possibility of a selection bias in group affiliation.

The rest of the paper is structured as follows. Section 1 describes our ownership data and group construction procedures. Section 2 discusses the association between various country-level factors and group prevalence. Section 3 analyzes differences in characteristics and performance across group structures and firm ownership types. Section 4 summarizes our conclusions.

1. Ownership Data and Group Construction

1.1 Data Sources

To identify business groups, we first obtain ownership data for all listed firms in 45 countries available through two primary sources, namely the *Osiris* database from *Bureau Van Dijk* and the *Worldscope* database from *Thomson Reuters*. However, ownership information is missing for a large number of firms even in this merged sample. To maximize sample coverage, we manually collect shareholding data for these firms from various information providers in *LexisNexis* (for example, *The Major Companies Database*) and *Factiva* (for example, the *Taiwan*

Economic Journal database of Asian companies) and other online sources such as *Dun and Bradstreet's Who Owns Whom* and *Thomson Reuters' OneSource*. Further ownership information is obtained from stock exchange and securities regulator websites (in Argentina, Belgium, Chile, Colombia, India, Indonesia, Italy, and Sri Lanka) and directly from company annual reports available in the *Standard and Poors' Mergent Online* database or other online sources (this constitutes a substantial portion of the ownership data collected for firms in Israel, Malaysia, Mexico, Pakistan, Sri Lanka, Singapore, and Thailand). Due to the large sample size and the complexity of ownership identification, we focus on ownership data for 2002. However, for a small number of firms without 2002 data, we use the earliest ownership information available in the 2003-2006 period. In total, ownership information is available for 28,635 sample firms.

1.2 Group Construction Procedures

Based on the above ownership data, the first stage of the group construction process is to distinguish between widely held firms and controlled firms. As a starting point, we identify the controlling shareholder of a firm as the largest shareholder who effectively controls (directly or through holdings of affiliates) at least 20 percent of a firm's voting rights. We lower this threshold to 10 percent if the largest shareholder also has other forms of control such as being a firm's founder, CEO, or chairman of the board.⁶ In many firms, the controlling shareholders are not immediately visible as their shareholdings are spread out across a number of corporate entities. For these cases, we carefully examine the shareholder list to identify whether the fragmented blocks actually belong to the same owner. This manual search (utilizing company annual reports, stock exchange/securities regulator websites, *LexisNexis*, *Factiva*, and the *Google*

⁶ There are a few cases where a sample firm is reported to be effectively controlled by the founding family through executive and board positions, but the family has divested its interests to below 10 percent of voting rights (for example, the Banco Santander group in Spain). For consistency, these firms are categorized as widely held.

search engine) is conducted on all ownership stakes in excess of five percent of issued shares, but is limited to markets where beneficial ownership disclosure is not mandatory.

Once control is established, the second stage determines whether the ultimate owner is a family (including biologically linked families, individual entrepreneurs, and known alliances of families/entrepreneurs) or a non-family entity (including governments, widely-held firms, collective investment funds, and widely-held financial institutions). For each sample firm, if the controlling shareholder is a listed firm, we investigate this company's ownership to determine its controlling shareholder until we reach the ultimate owner at the top of the chain of control. If at any stage, the controlling shareholder is a private company, we also investigate the identity of the owner of this entity, primarily through the *Who Owns Whom* database, the list of subsidiaries of other public companies (available in *Osiris*), the annual report (or website) of the firm being investigated, and related articles accessed via the *Google* search engine, *Factiva*, or *LexisNexis*.⁷

This process only stops when we reach the ultimate owner whose real identity can be ascertained. When the ultimate shareholder is a widely held corporation, we also make sure that there is no hidden controlling family behind the firm by checking through all reported ownership stakes in the firm (including those below 5%), its corporate history, and its annual report. Based on the ultimate owner information uncovered through this process, we define a family business group as two or more firms in the same market that share the same ultimate controlling family.⁸ Following Hoshi, Kashyap, and Scharfstein (1991), non-family groups is defined as at least two

⁷ Where detailed shareholdings of a private company are unavailable, we assume that it is 100 percent owned.

⁸ If two firms with the same controlling family are listed in different national markets, we do not consider them to be part of a business group. In our sample, 87 firms are not counted as group firms because of this restriction. Our results remain qualitatively unchanged when these firms are included in the sample.

firms controlled by the same non-family ultimate controlling shareholder.⁹

Once the sample of business groups is assembled, the third stage involves re-examining the non-identified equity blocks in each group firm to check if they also belong to the ultimate owner or other firms in the same group. Cross shareholdings are also identified in this process. Information on the usage of shares with differential voting rights for all sample firms is also collected from *Worldscope*, *Datastream*, *Mergent Online*, and company annual reports.

The final stage of the group construction procedure is to ensure that the identified group structures are as complete and accurate as possible by verifying our sample of groups with independent sources. Specifically, our list of group controlling families is cross-checked against “rich lists” from *Forbes Magazine*, *Family Business Magazine*, and other country-specific sources to ensure that wealthy individuals and families, who often own a business group, are accounted for. Our group information is also verified against (published and proprietary) data from various country-specific studies/sources: Fracchia and Mesquita (2006) for Argentina, Leal and Carvalhal da Silva (2007) for Brazil, Morck, Percy, Tian, and Yeung (2005) and the *Inter-Corporate Ownership* publication for Canada, Gutierrez, Pombo, and Taborda (2008) for Colombia, Majluf, Abarca, Rodriguez, and Fuenes (1998) for Chile, Fisman (2001), Sato (2004), and UBS Investment Research (2006b) for Indonesia, Kosenko (2007) for Israel, the *Korean Fair Trading Commission* website for Korea, Siegel (2005) for Mexico, Rahman (1998) for Pakistan, Shimizu (2004) for Peru, the *Taiwan Economic Journal* database for Taiwan, Polsiri and Wiwattanakantang (2006) for Thailand, the *Who Owns Whom in South Africa* publication for South Africa, Zellweger (2004) for Switzerland, Colpan (2010) for Turkey, Lins (2003) for a

⁹ Listed firms directly owned by governments are not grouped together under the same non-family group as we argue that these firms are often the outcome of a privatization program and share very few connections with each other. Thus, government-controlled firms are part of a group only if they have ownership linkages with one another.

sample of emerging markets, Claessens, Djankov and Lang (2000) for East Asian countries, and Faccio and Lang (2002) and UBS Investment Research (2006a) for Western European countries. Finally, the structures of many groups are disclosed on their websites or through media articles, and where available, we verify our information with these sources as well.

The above procedure succeeds in reaching the ultimate owner for an average of 97 percent of sample firms in each country. Although tracing the real identities behind all controlling entities in our sample is virtually impossible, the number of these cases in our sample is much lower than comparable cross-country studies (Claessens *et al.* (2000) and Faccio and Lang (2002)). Following Faccio and Lang (2002) we classify firms with an unidentified controlling shareholder as simply controlled by an individual/family.¹⁰ Given their small representation, potential misclassification involving these cases is unlikely to affect our results. In total, across our 45 sample countries we identify 951 family-controlled groups, comprising 3,007 listed firms and 418 non-family groups consisting of 1,575 firms. Of the 418 non-family business groups, 267 (64%) are controlled by a widely held listed corporation, 72 (17%) are controlled by an unlisted financial institution/collective investment scheme and 79 (19%) are government-controlled.¹¹

Our study utilizes a more comprehensive dataset than most previous research into cross-country ownership structures. To our knowledge, this is the first study of the prevalence and structures of family groups across five continents, and including both developed and emerging markets. For example, Claessens, Djankov, and Lang (2000) and Faccio and Lang (2002) focus on nine East Asian and 13 Western European countries, respectively. La Porta *et al.* (1999) examine the 27 richest economies, but cover only the 20 largest firms in each country. In addition to examining more countries, our sample covers more firms in most of these countries.

¹⁰ When we exclude firms with unidentified ultimate ownership from the sample, our findings remain the same.

¹¹ The last category includes a small number of cooperative societies, political parties, and charitable organizations.

1.3 Group Placement and Ownership Structure Measures

For each group in the final sample, we map out its structure and construct several measures of the ownership ties between the controlling family and member firms. The first measure, *Pyramid Layer*, captures the layer position of each firm in a group. In particular, we count how many listed firms in the chain of control separate an individual group firm from its controlling family. When a firm is controlled through multiple ownership chains, *Pyramid Layer* is determined based on the chain associated with the largest shareholding.¹²

The second measure is a group's total direct ownership in a member firm (*Direct Own*), calculated by aggregating the percentage ownership associated with all equity stakes held directly by the ultimate controlling owner and/or by other group members (parents). Under a one-share-one-vote regime, this measure reflects both the degree of control of a group over a member firm and the equity contribution from its internal capital market. However, as group firms may employ shares with differential voting rights, we also calculate an alternative direct ownership measure based on percentage of voting rights (*Direct Control Rights*).¹³

¹² For robustness purposes, we adopt an alternative weighted average positioning measure from Almeida *et al.* (2011). This measure adjusts for cases when a firm is controlled by two or more affiliates at different positions in the pyramid by weighting the *Pyramid Layer* value of each chain by the ultimate cash-flow rights that the chain provides to the ultimate owner. These values are then summed to obtain the final weighted position. However, we do not report the results related to this formulation as they are similar to those obtained from the *Pyramid Layer* variable.

¹³ Alternatively, we follow La Porta *et al.* (1999) and Claessens *et al.* (2002) and construct the strength of voting control of the family along and across various ownership chains. Along each chain, we take the smallest percentage voting interests (the weakest link) as the control rights of the chain, and then we sum this weakest link measure across all shareholding chains. This definition reflects the risk that the ultimate owner may lose control of a shareholding chain at the point where their voting rights are the lowest. However, we do not report the results related to this formulation as they are similar to those obtained from the *Direct Control Rights* variable.

The third measure is the ultimate cash-flow rights of the controlling family (*Ult CF Rights*) in a group firm, defined as the former's total claim on each dollar of earnings generated by the latter. This is calculated by aggregating the cash-flow rights across all ownership chains through which the family holds an ownership stake. The cash-flow rights of each chain are the product of all percentage shareholdings connecting the firms along the chain.

Cross shareholdings present a complication in the calculation of these measures. Consider the following example. Ultimate owner A owns 40 percent of Firm B, B in turns owns 30 percent of Firm C and 20 percent of Firm D. In addition, C and D own 20 percent in each other, creating a cross-holding layer. In such a case, the cross shareholding between two group firms means that each effectively owns some shares in itself. To exclude the effect of such circular ownership, we rescale our ownership and ultimate cash-flow rights measures by the percentage of shares not self-owned by cross-holding firms.¹⁴ Note that cross shareholdings are also relevant to the control rights calculation as they give the ultimate owner increased voting rights in both firms through the exchange of reciprocal voting blocks. Table I summarizes the definitions for our main ownership and control measures, as well as other variables used in our analysis.

[INSERT TABLE I HERE]

1.4 Country-Level Descriptive Statistics

We construct two classes of country-level statistics that measure business group prevalence and structure respectively. Our primary measure of group prevalence is the percentage of all listed firms in a market that belong to a family group (*% Family Group*). To account for size biases, we also calculate *% Family Group MC*, which is the proportion of aggregate market

¹⁴ For example, Firm C itself has an interest in $0.2 \times 0.2 = 0.04$ or 4 cents of every one dollar of earnings that it generates. This effectively means that each shareholder of Firm C has a share of cash-flow rights that is $1/(1-0.04)$ times more than the level implied by his or her nominal percentage shareholding.

capitalization (subject to data availability) attributable to family group firms. While the above measures describe the overall economic importance of groups, they do not indicate how families choose to structure these groups. Thus, we also report the average number of pyramid layers (*Average Pyramid Layer*) across all family-controlled (group and non-group) firms in a country and the proportion of family group firms controlled through a pyramid to all listed firms (*% Family Pyramid*). Other group statistics include the number of family groups organized horizontally and in a pyramid, and the number of non-family groups. We define a horizontal group structure as a group where the controlling shareholder only holds direct stakes in member firms. If even one member firm is indirectly controlled through another listed group affiliate (forming a pyramidal chain), the group is then classified as having a pyramidal structure. These distinct group types and firm types are used as points of comparison in the analysis to follow.

Table II presents these country-level statistics. Not surprisingly, family business groups are relatively more important in emerging markets. For example, the proportion of listed firms belonging to family business groups (*% Family Group*) is at least 40 percent in Chile, Colombia, Israel, Philippines, and Turkey, and is as high as 67 percent in Sri Lanka. The trend is similar for pyramid-controlled family group firms (*% Family Pyramid*). However, there are some important disparities between these two statistics, indicating that pyramids are a less popular means of structuring groups in some markets than others. For example, India and Pakistan have the largest proportion of horizontally structured family groups (approximately 60 percent), while in Colombia and Sri Lanka there are no horizontally structured family groups at all. This indicates that family business groups are not necessarily synonymous with pyramids.

In certain markets, especially in East Asia, family groups often control very large firms in the economy, as captured by the *% Family Group MC* measure. For example, only 11 percent of listed firms in Singapore belong to family groups, but they represent 41 percent of total market

capitalization. Finally, the depth of pyramids can vary substantially across countries where the importance of groups is very similar. For example, family groups make up over 40 percent of market capitalization in Colombia, Mexico, Sri Lanka and Thailand, but their *Average Pyramid Layer*, which measures the country-level average number of listed firms separating a firm from its ultimate controlling family, differs substantially (1.256, 0.154, 0.747, and 0.196, respectively).

[INSERT TABLE II HERE]

2. Country-level Analysis

If family groups possess financing advantages, then their prevalence should be related to funding constraints in a particular market. Indeed, the existing literature often points to business groups as an underdeveloped market phenomenon. However, Morck, Wolfenzon, and Yeung (2005) state that “...*empirical work is needed to solidify hypotheses in this area and to distinguish presumptions from facts*”. La Porta *et al.* (1999) document substantial variations in ownership concentration across 27 countries, based on a sample of each country’s 20 largest firms. They do not explicitly examine the prevalence of business groups. Nevertheless, they find more instances of pyramids in markets with poor investor protection, though this difference is not statistically significant. Claessens *et al.* (2000) and Faccio and Lang (2002) provide more detailed statistics on pyramidal structures in East Asia and Western Europe respectively, but do not systematically analyze cross-country variations due to their limited geographic focus.

Our broad cross-country sample and large coverage of firms in each country provides a unique setting to examine how the prevalence and complexities of family groups can vary with multiple country-level factors. It should be noted that because of the longevity and potential influence of groups over time, our analysis does not aim to prove causation. We are however able to document new evidence on the strength of association between certain economic and

institutional constraints to external fundraising and the importance of groups. Our country-level analysis pays particular attention to two country-level factors that are hypothesized to influence the prevalence of groups, the scope for consuming private benefits of control and the availability of investment capital in an economy. The motivations for this focus are outlined below.

2.1 Selection of Country-Level Variables

2.1.1 Legal and Extra Legal Mechanisms Restricting Private Benefits of Control

A widely held view in the literature on business groups is that they emerge in market environments where corporate control is highly valuable. Further, it has been suggested that certain group structures, such as pyramids, emerge to facilitate the extraction of private benefits of control by separating control rights from cash-flow rights.¹⁵ Under the alternative financing explanation, groups and especially pyramids serve as a mechanism that helps a controlling shareholder alleviate external fundraising constraints caused by minority investor expropriation concerns. We examine these arguments by analyzing how group prevalence differs across investor protection environments. Following Dyck and Zingales (2004), we consider both legal and extra-legal mechanisms which can curb private benefits of control. Legal mechanisms include the extent of shareholder rights, the effectiveness of the enforcement of these rights, and the quality of corporate disclosure. These three characteristics are aggregated into a single variable, *Investor Protection*, using weights from a principal component analysis.¹⁶ The extra-legal mechanisms we consider are product market competition (*Competition*) and firm reputation

¹⁵ Morck, Wolfenzon, and Yeung (2005) provide a review of this literature and further suggest that group control can also increase private benefits because controlling families can acquire significant political connections, which can be used to entrench or strengthen their control over corporate assets or to solicit political favors.

¹⁶ This approach uses the first principal component to determine the weights on each variable.

penalties, proxied by newspaper circulation (*Newspaper*).^{17,18} Table I provides the data sources as well as more detailed descriptions of these variables.

2.1.2 Capital Availability

In addition to strong investor protection, funding constraints can be alleviated by an abundance of investment capital available in the economy. In the context of business groups, the economic significance of their financing advantages can be observed by examining the correlation between their prevalence and external capital availability. It should be noted that we avoid using direct measures of equity market development as proxies for access to external capital (for example, the relative size of the stock market or the rate of initial public offerings), as these variables are found in prior studies to be related to investor protection (La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997)). Instead, we use measures that can capture the aggregate pool of available investment capital in an economy since these measures are less likely to be influenced by the scope for private benefits of control consumption in a local stock market.

The first capital availability measure is national savings intensity defined as gross domestic savings scaled by GDP (*Savings to GDP*), which is viewed as an important factor that

¹⁷ The Anti-director rights index (as constructed by La Porta *et al.* (1997) and updated by Pagano and Volpin (2005)) acts as a proxy for the shareholder rights protection level in the country. We also use both the Anti-self-dealing index from Djankov, La Porta, Lopez-de-Silanes and Shliefer (2008), and a revised Anti-director Rights index constructed by Spamann (2009) as alternative shareholder rights measures. Similarly, we also use alternative measures for legal enforcement, such as the Property Rights Protection index (from the *Heritage Foundation*) and the Judicial Efficiency index (from the *International Country Risk Guide*), and for financial disclosure, the Accounting Disclosure index from Bushman, Piotroski, and Smith (2004). As an alternative construction of *Newspaper*, we use the Press Freedom index from *Reporters without Borders*. All alternatives provide qualitatively similar results.

¹⁸ We obtain the same results using the average premium paid for controlling equity block acquisitions (from Dyck and Zingales (2004)) as an aggregated measure of the extent of private benefits of control.

promotes the efficient supply of capital (see Pagano (1993)). The second measure is related to the pool of potential equity capital available from the financial system (*Institutional Funds*), calculated as total equity invested both locally and internationally by domestic banks, insurance companies, pension funds, and mutual funds, scaled by domestic stock market capitalization. This measure is obtained from Li, Moshirian, Pham, and Zein (2006). Finally, we consider exogenous shocks to the aggregate supply of external capital that can arise due to major upheavals in a nation's political environment. Political instability can increase investment risk at the country level, which in turn can restrict the amount of capital provided by both domestic and international investors. We obtain a political stability measure from the *World Bank's Governance Matters* database (*Political Stability*).¹⁹

2.1.3 Other Regulatory Factors

We also control for other forms of regulation that may discourage group formation. The first measure is the presence of accounting consolidation rules that require partially owned group firms to be treated as separate taxable entities, restricting tax-minimization benefits achieved through the consolidation of profits and losses within a group. Following La Porta *et al.* (1999), this tax effect is measured by an indicator variable (*Consolidation*), which equals one if a country allows a parent firm to consolidate a subsidiary in which it has an ownership stake of less than 90

¹⁹ We also include the natural logarithm of GDP (*Log GDP*) in the regression to control for size differences across markets that may create biases when aggregating firm-level data. Holderness (2008) argues that to account for such biases and other missing variable concerns when aggregating firm-level measures to the country level, regression analysis should also be conducted at the firm level, adding unstacked country-level factors as explanatory variables. We implement this approach using firm-level data and find (unreported) results consistent with Tables III and IV.

percent, and zero if consolidation is only allowed for ownership levels of 90 percent or above.²⁰

The second constraint on group formation arises when a tax system limits the ability of groups to minimize tax liabilities through intra-group transactions. We measure the extent to which a tax system controls and monitors such transactions through the use of an index (*Intra-Group Tax*) that aggregates four key aspects of inter-company tax regulations in each country as reported in the *Deloitte International Taxation Guide* (see more detailed descriptions in Table I).

Finally, we examine regulatory restrictions on partial acquisitions. Such transactions allow a group to form or expand by gaining control of another firm without having to conduct a full takeover offer to buy all shares on the same terms. When a country's takeover law dictates that all shareholders of a target must be treated fairly and equally, the ability and incentives of a group to execute a partial acquisition are effectively curtailed. Such laws may also introduce complications in negotiating a block purchase from another controlling shareholder, making the deal less likely. For example, it may be difficult to gain a partial, but controlling ownership stake if a country's takeover law specifies a low ownership threshold beyond which a tender offer to all shareholders is required. We use an index of takeover regulations (*Takeover Index*) constructed by Nenova (2006) as a proxy for restrictions on conducting partial acquisitions.²¹

2.2 Country-Level Results

Table III reports the regression results from using % *Family Group*, % *Family MC*, as alternative dependent variables. Note that among the proxies for mechanisms restricting private

²⁰ Morck (2005) also argue that the double-taxation of inter-corporate dividends (introduced in the US in the 1930s) can repress business groups. According to the *Deloitte International Taxation Guide*, only three countries in our sample have such double taxation rules. Thus, we do not analyze this factor explicitly due to insufficient variation.

²¹ Due to the index being unavailable for Venezuela, the sample size for our country-level regression drops to 44 countries, but this omission does not influence the results with respect to other country-level variables.

benefits (*Investor Protection*, *Competition*, and *Newspaper*), we cannot include the first two jointly in the same regression since they are highly correlated (correlation of -0.822).²² The measures of capital availability (*Savings to GDP*, *Institutional Funds*, and *Political Stability*) are also strongly correlated and they are tested in separate models.

The most notable result in Table III is the strong association between capital availability and the prevalence of family groups. The coefficients of *Savings to GDP*, *Institutional Funds*, and *Political Stability* are negative and statistically significant across all the dependent variables. In contrast, *Investor Protection* and *Newspaper*, which are hypothesized to restrict business group expansion by curbing private benefits of control, do not have any significant explanatory power.²³

[INSERT TABLE III HERE]

If pyramids allow a group to leverage its internal capital, then they should be particularly beneficial in markets with restricted access to capital. We next test this prediction by examining whether our access to capital measures can explain the decision to structure groups as pyramids. In Table IV, we use our two country-level group structure measures, % *Family Pyramid* and *Average Pyramid Layer*, as dependent variables to measure the prevalence and depth of pyramiding respectively. We also construct a separate dependent variable to measure the popularity of horizontal groups, % *Family Horizontal*, defined as the proportion of all listed firms in the market that are controlled through a purely horizontal group. The results in Table IV indicate that the choice of structuring a group as a pyramid also appears to be strongly influenced

²² In an unreported regression, our results remain unchanged when *Governance Index* is replaced with *Competition*.

²³ A potential concern is that this result can be confounded by reverse causality. For example, groups can wield significant political power (Morck, Wolfenzon, and Yeung (2005)) that can stymie development of corporate governance standards. To address this, we use an instrumental variable (IV) regression, and employ the legal origins of our sample countries as a historically predetermined instrument. The results remain quantitatively similar.

by access to capital factors. The popularity of horizontal group structures, however, displays a much weaker relationship with the capital availability proxies. Overall, these findings suggest that the reasons behind both the prevalence of groups and the choice of the pyramid structure appear to have more to do with the lack of available investment capital in the economy, rather than weaknesses in the country-level corporate governance environment.

[INSERT TABLE IV HERE]

Nevertheless, it is difficult to completely rule out the possibility that our capital availability measures are related to some aspects of a country's governance environment. For example, in relation to *Institutional Funds*, Khorana, Servaes, and Tufano (2005) suggest that stronger legal enforcement and corporate disclosure are related to greater equity investments by mutual funds.²⁴ Thus, a weak governance environment can affect group prevalence through two channels: directly by facilitating extraction of private benefits and indirectly by restricting the amount of external capital provided to independent firms by national capital markets. Based on our country-level evidence, if the governance environment plays a role in promoting group formation, then it appears the second channel of restricting access to capital is the most relevant.

Among the remaining explanatory variables, the coefficients of *Intra-Group Tax* and *Takeover Index* are significant across all models.²⁵ Thus, the ability to minimize tax liabilities

²⁴ Although *Institutional Funds* reflects the pool of equity investments (international and domestic) of all institutional investors, it is possible that business groups crowd out institutional investors' investment in domestic equity. We use an alternative construction of *Institutional Funds* based on total assets under management of a country's investment funds industry (obtained from Khorana *et al.* (2005)), which reflects fund inflows rather than asset allocations. This alternative measure is also related to group prevalence, although at a weaker significance level of 10 percent.

²⁵ We also test one important component of the *Takeover Index* by itself, that is, the ownership threshold that triggers a formal bid to buy all outstanding shares. We find that similar to *Takeover Index*, the indicator variable based on the median of these thresholds is also significantly related to our country-level business group variables.

through related-firm transactions and the ability to assemble controlling stakes through partial acquisitions both play an important role in facilitating group formation and expansion.

The above results are unlikely to be driven by shortcomings in our group construction procedures. Table II shows that we are able to consistently identify the ultimate controlling owners in at least 95% of sample firms in nearly all the countries we study. Therefore, the proportion of potential misclassifications is likely to be very small and evenly distributed across countries in the sample. In unreported regressions, we find that the above results are also robust to alternative measures of group prevalence. These measures include (1) number of family group firms as a proportion of all firms having any type of controlling shareholder, and (2) number of family group firms as a proportion of all family-controlled firms. In other unreported tests, we consider several alternative explanatory variables, such as the extent of creditor rights protection (constructed by La Porta *et al.* (1997)) and the amount of private credit scaled by GDP (taken from the *World Bank*). We also test whether group firms remain under the control of founding families and their heirs due to a shortage of well-trained professional managers (Khanna and Palepu (1997)), using a survey variable for the quality of a country's business education system obtained from the *World Economic Forum's Global Competitiveness Report*. We also employ a cross-country index of legal rules on inheritances constructed by Ellul, Pagano, and Pannunzi (2010) to examine the possibility that restrictive inheritance laws which limit bequest amounts by a founder to a single heir can lead to break-ups of groups. However, none of these variables is significantly related to the proportion of listed firms belonging to a family group.

Overall, our country-level evidence supports the view that family groups, especially those structured as pyramids, arise to alleviate external financing difficulties. However, it remains unclear whether the same explanation can be applied to non-family groups. In such groups, managers do not hold significant ownership stakes in any group member firms. Thus, these

managers neither bear the moral hazard costs of group members raising new equity, nor can they internalize most of the benefits associated with leveraging a group's reputation or supplying group members with internal capital through the selection of a particular group structure.

To examine this issue we conduct an additional (unreported) analysis of the variations in the country-level measures of the importance of non-family groups, and find that their prevalence is not significantly related to capital availability measures. In contrast, the coefficient of *Investor Protection* is negative and significant. This is consistent with the interpretation that non-family groups are subject to similar agency problems as those experienced by widely held corporations. For instance, their expansion is likely to be symptomatic of empire-building activities by managers whose incentives to consume private benefits are likely to go unchecked under weak investor protection. The voluminous literature on Keiretsus in Japan (the country with the most numerous non-family groups in our sample) also points to risk-sharing, bank and product-market relationships, and takeover defenses, rather than the type of financing advantages described earlier, as the main explanations for their existence (see Yafeh (2003) for a review).

3. Firm-Level Empirical Analysis

With the country-level results suggesting that group prevalence is related to capital availability, we proceed to a firm-level analysis of family business groups to provide a more rigorous examination of the motivations behind their formation and architecture. Our extensive dataset and detailed group information facilitates several lines of inquiry. First, we identify the main differences between group and non-group firms, focusing on firm characteristics related to their financing needs. Second, we analyze how member firm traits change across alternative group structures (horizontal versus pyramidal) and with their layer placement in a pyramid. Third, we investigate the relationship between firm performance and group affiliation as well as

within-group pyramid placement and ownership linkages.

3.1 Selection of Firm-Level Variables

To highlight key differences between group and non-group firms, and among firms controlled through alternative group structures, we focus on observable firm characteristics related to transparency, capital requirements, and riskiness.²⁶ We are interested in transparency because the business group literature often emphasizes that control motivations behind group formation arise because groups facilitate the extraction of private benefits. However, it is difficult to directly quantify such benefits in a cross-sectional setting such as ours. By analyzing firm attributes that reflect the level of transparency, we can at least provide some insights into how visible the actions of controlling families are to the market. In particular, we compare firms by how well established they are, based on their age (in years) since incorporation (*Age*). As analyst coverage has also been shown to reduce information asymmetry in the market (Chang, Dasgupta, and Hillary (2006)), our next variable of interest is the number of analysts providing coverage for each sample firm (*Analyst*). Further, when firms commit to a high dividend payout policy, there is greater transparency with respect to their free cash flows (La Porta, Lopez-de-Silanes, and Shleifer (2000)). We capture this effect using the ex-ante five-year average dividend yield (*Dividend Yield*). In contrast, when asset values are less verifiable, it is more difficult for outsiders to evaluate the behavior of firm controllers (Dyck and Zingales (2004)). We measure this weak verification property by the ratio of intangible assets to total assets (*Intangibles*).

To analyze the financing advantages of groups, we examine firm characteristics related to a firm's growth and capital requirements. These include investment intensity measured by capital

²⁶ A key consideration in our selection is whether there is sufficient data coverage across countries for a particular variable. To minimize missing observations, firm-level data from *Worldscope* and *Datastream* are supplemented with data from *Osiris* and *Bloomberg*. We also perform many cross-checks across databases to ensure data accuracy.

expenditures scaled by total assets (*CAPEX*), and historical asset growth measured by five-year average growth rates of total assets (*Asset Growth*). As funding needs can be partially satisfied by borrowings of member firms, we also analyze where total interest-bearing debt scaled by total assets (*Debt*) is highest within the group, relative to where investment intensity is the greatest.

Firm risk is implicitly excluded from many risk-neutral moral hazard models of ownership structure. However, there is a large body of evidence showing that risk sharing is an important consideration in ownership retention decisions (Villalonga and Amit (2006)) and group formation decisions (Khanna and Yafeh (2005)). Gomes (2000) further argues that the cost of under-diversification strengthens the reputation building effect of groups with high ownership concentration. Following Villalonga and Amit (2006), we account for the roles of firm risk in group structuring decisions using both systematic risk, measured as the beta from a single-factor market model estimated over five years of monthly stock returns prior to 2002 (*Beta*), and idiosyncratic risk, measured as the standard error from the same model (*Idio Risk*).

Finally, we assess the aggregate impact of group affiliation and group position through two standard performance variables. The first measure is Tobin's Q, approximated by the market value of assets divided by the book value of assets (*Q*). The second is return on assets, calculated as earnings before interest, tax, depreciation and amortization scaled by total assets (*ROA*). Panel C of Table I summarizes the sources and construction of our firm-level variables.²⁷

3.2 Comparison of Group and Non-Group Firm Characteristics

Table V reports median differences (and their significance levels based on the Wilcoxon

²⁷ To limit the number of outliers, our firm-level analysis excludes firms that are not traded for more than six months in 2002 and those that are six months away from being delisted. A few firms also have extremely high leverage (and hence, high *Q*), indicating likely cases of financial distress or reporting/data errors. We therefore also exclude firms in the top 2.3 percentile (two standard deviations from the mean of a normal distribution) of sample leverage ratios.

signed-rank test) for the selected firm characteristics between group firms and their matched non-group peers (Group vs. Non-Group tests). For each group firm, matched firms have their primary listing in the same market and are either in the same two-digit Standard Industry Classification (SIC) code or similar in size (ranging from 90 to 110 percent of the group firm's market capitalization).^{28,29} The Group vs. Non-Group results in Table V show that group firms are typically larger than their industry-matched peers (by about \$19 million in U.S. dollar market capitalization) and also experience stronger historical asset growth, which can reflect their ability to leverage their internal capital and reputation to grow more rapidly and take on larger projects (Khanna and Palepu (1997)). Another noteworthy feature of these firms is that compared to non-group firms of similar size, they appear riskier and have more intangible assets.³⁰ This further highlights the financing advantages of group structures in helping to channel funds into firms for which project values are difficult to verify. Group firms are also able to borrow more than their non-group peers. This evidence is consistent with several explanations. First, greater borrowing capacity can be the result of intra-group mutual support, which reduces bankruptcy risk. Second, groups can also prefer debt funding because issuing equity risks a loss of control (Faccio and Masulis (2005)). Finally, debt financing of one group member can also be used to support other rapidly growing members.

²⁸ In smaller markets, finding a non-group match at the two-digit SIC level is not possible, so we match at the one-digit SIC level. In rare cases when this is not possible, we use the country median.

²⁹ For robustness purposes, we restrict the matching sample to cover only (i) stand-alone companies that do not belong to other types of groups, such as government-controlled and other non-family groups, and (ii) firms that are family-controlled, but unaffiliated to any group. We also match firms based on total assets instead of market capitalization. These alternative procedures generate very similar results.

³⁰ Belenzon, Berkovitz, and Bolton (2009) also report that a substantial share of innovation (measured by the number of patents) across 15 European countries is concentrated among business groups.

Comparisons of group and non-group firms along several transparency-related dimensions show that group firms are highly visible to the market, suggesting that they have incentives to protect their reputations, rather than exploiting a lack of transparency. For instance, group firms are significantly older and attract greater analyst coverage, which indicates that any loss of reputation from minority investor expropriation is likely to be broadcast more widely across investors relative to actions by their non-group peers. The lack of dividend payments is often interpreted as an indication that minority shareholders find it difficult to enforce their rights or protect against being expropriated (La Porta *et al.* (2000)). However, we find that group firms pay relatively more dividends than non-group firms. Similar to Faccio, Lang, and Young (2001), our evidence suggests that groups pay out returns to shareholders to allay fears of expropriation and to strengthen their reputation. Further, we note that dividends can also be an important channel for redistributing funds within a family group (Gopalan *et al.* (2008)).³¹

It must be emphasized that the above comparisons do not provide evidence as to whether financing advantages dominate expropriation as alternative motivations for group formation. Rather, the reason that group firms (especially pyramidal firms) are more capable of funding large capital-intensive projects is precisely because external investors are concerned about potential expropriation in funding such projects (Almeida and Wolfenzon (2006a)). Although we cannot directly observe the consumption of private benefits or therefore its size, our evidence indicates that family groups do not typically control small opaque types of firms often associated with high expropriation risk. Further, we show that expropriation concerns may indeed be higher for group firms than for non-group firms due to the significantly lower *Q* and *ROA* of the former. This is consistent with the finding of Claessens *et al.* (2002) that the separation of cash-flow and

³¹ In unreported tests we also analyze differences between group and non-group firms using various discreet choice regression models and find similar results to those found in the univariate comparisons.

control rights, a frequently observed feature of group firms, is associated with lower value.³²

[INSERT TABLE V HERE]

3.3 Comparison of Group Firm Characteristics across Pyramid Layer Positions

We next document how firm characteristics differ across group structures and within a pyramid. For this analysis, all family groups are separated into Pyramidal and Horizontal groups. Among Pyramidal groups, we distinguish between three categories of member firms, namely Apex (firms at the very top of a pyramid), Bottom (firms at the bottom of a pyramidal chain), and Middle (firms within a pyramidal chain that are neither Apex nor Bottom).

The Group vs. Non-Group tests in Table V compare characteristics of these three categories of pyramidal group firms as well as firms in Horizontal groups to their non-group peers. Table V also reports Within-Group tests, which exclude Horizontal groups and focus on differences in firm traits at different layers of the same pyramid. One notable result in Table V is that within a group firm value (Q) typically rises down a pyramid chain and that Bottom firms no longer underperform their non-group peers in the manner that other group firms do. Investment intensity ($CAPEX$) also rises significantly down a pyramidal chain. Bottom firms also have higher $CAPEX$ than their non-group peers. In contrast, firms held in a purely horizontal structure have lower $CAPEX$ than their non-group peers. This is consistent with the unique financing advantages of the pyramidal structure that can be used to support capital hungry group firms.

Asset Growth, however, decreases down the pyramidal chain. When interpreting this result, it is important to recognize that historical growth measures need not be consistent with expected future growth measures. This evidence suggests that firms with higher growth prospects tend to be found at lower layers of a pyramidal group and that these firms are established by

³² Masulis, Wang and Xie (2009) find similar results in dual-class firms that raise control relative to cash-flow rights.

parent firms that have experienced strong prior growth and accumulated substantial retained earnings. We also find that Bottom firms are significantly smaller and younger, exhibit higher idiosyncratic risk and have less analyst coverage than Apex firms in the same group.³³ Thus, groups appear to be carefully structured to limit risk exposure of controlling families, while facilitating the pursuit of capital-intensive investment opportunities (similar to a venture capitalist limiting their risk taking, while exercising substantial control).³⁴

The above univariate analysis provides a consistent picture of the motive for structuring family groups as pyramids. Young, risky, and capital-intensive firms have difficulty raising capital, particularly in a weak capital market. Family groups are in a position to fund such firms at the bottom of a pyramid, because it is at this point where a group can most effectively leverage its internal capital. This means that such young firms can rely less on expensive external capital as well as reduce the cost of any external capital they do require, as they are backed both implicitly by a group's reputation, and explicitly through its internal capital investments.³⁵ This conjecture is supported by delving further into measures of a group's internal capital support. A within-pyramid comparison of a group's direct ownership stake in its members (*Direct Own*) shows that this measure is significantly greater (by 8.75 percentage points) in Bottom firms than in Apex firms (a similar but unreported result is found for *Direct Control Rights*). If control and

³³ The size results hold by construction, since a parent's investment in a subsidiary will be recorded in the parent's balance sheet. While accounting consolidation can affect absolute firm characteristics (such as size), it should not affect other relative measures. In fact, any biases created would understate our results since each relative measure for an Apex firm is partially made up of the weighted average of corresponding measures of their subsidiaries.

³⁴ An alternative explanation is that groups expropriate bottom-tier firms by forcing them to take unnecessary risk. However, this is inconsistent with our evidence that bottom-tier firms have higher firm value than other group firms.

³⁵ Evidence in Gopalan, Nanda, and Seru (2007) on Indian family groups supports the proposition that member firms benefit from the financial strength of the group and can receive additional capital when they are in financial distress.

expropriation were the sole motives for establishing a pyramidal group, then the family should actually maximize its direct shareholdings/voting rights in the Apex firms because holding a majority of voting rights at this level facilitates control of the entire pyramid, and hence, is more critical than voting rights of lower-tier firms. Overall, our univariate findings regarding the nature of group firms and their ownership strategies yield interesting similarities between the functions of such groups and those of private equity investors in developed markets.³⁶

To provide a more comprehensive analysis of within-group heterogeneity, we examine the relation between group firm characteristics and layer positions using an ordered logit regression model. The dependent variable is *Pyramid Layer*. The explanatory variables are the firm characteristics presented in Table V and sector indicators based on the first digit of a firm's primary SIC code.³⁷ In some specifications, we use group-specific fixed effects to control for the potential influence of differences in group-level characteristics (for example, reputation, entrepreneurial skills of controlling families and their abilities to extract private benefits).

The *Pyramid Layer* regression results in Table VI confirm most of our univariate findings. Firms with larger *CAPEX* tend to be controlled in a pyramid and are located at lower layers. In contrast, firms with greater *Debt* and *Asset Growth* are found near the apex, reflecting that they play an important role in establishing new subsidiaries. In the regression incorporating group fixed effects, which excludes Horizontal group firms due to their invariant *Pyramid Layer* values, *Idio Risk* and *Intangibles* also increase down a pyramidal chain. In an unreported analysis, we divide the sample into firms from emerging markets and those from developed markets

³⁶ A case-by-case analysis by UBS Investment Research (2006) of 26 European holding companies, most of which are part of family groups in our sample, shows that many of these companies adopt strategies akin to those of a private equity fund. Private equity and unlisted assets on average make up 47 percent of their portfolios.

³⁷ We apply the natural logarithmic transformation on *Size*, *Age*, and *Analyst* in this and subsequent regressions.

(following the classification in *Standard and Poors' Emerging Market Database*). It appears that the previous results regarding *CAPEX* and *Asset Growth* are mainly driven by family groups in emerging markets, where access to external capital is more critical.

The *Pyramid Layer* regressions do not distinguish between Horizontal group firms and Apex firms in a pyramid, both of which have a *Pyramid Layer* value of zero. Thus, to facilitate a comparison of group firms in pyramidal structures with those in horizontal structures, we employ a multinomial logit regression where the categorical variable, *Family-Group Structure*, takes a value of one if a family group firm is positioned at the bottom of a pyramidal chain (Bottom), two if a group firm is part of a pyramid chain, but is not at the bottom (Non-Bottom), and three if a group firm is part of a purely horizontal group (Horizontal). Table VI shows that Bottom firms have higher *CAPEX* than Horizontal firms, which in turn have higher *CAPEX* than Non-Bottom firms. While Bottom firms are larger, the negative coefficient of *Debt* suggests that they possess inherent characteristics that do not allow them to borrow as much as Horizontal firms.

Finally, we investigate whether the same financing considerations are evident in the structuring of other types of conglomerate structures, where there is no dominant family/individual at the helm of a group. Based on the *Pyramid Layer* variable constructed for non-family group firms, Table VI shows that the differences in risk, leverage, or investment intensity observed across family group pyramid layers do not exist within non-family groups. This result highlights the role that corporate control plays in generating within-group differences. Unlike a controlling family, the CEO of a non-family group firm usually owns a small ownership stake, and hence does not bear the costs of external financing and cannot internalize the benefits of group structuring or reputation. Further, there can be a lack of centralized control over member firm decisions to provide equity capital to other firms. Therefore, realizing financing advantages from group member placement appears less important to non-family group firms.

[INSERT TABLE VI HERE]

3.4 The Impact of Group Affiliation and Group Structuring on Firm Performance

3.4.1 Group Affiliation and Firm Performance

The preceding analysis highlights important differences between group and non-group firms and among firms within a group that are consistent with groups possessing financing advantages. In this section we investigate whether these advantages are reflected in firm performance. A number of prior studies have suggested that group firms suffer from a valuation discount due to concerns over expropriation by controlling families. For example, La Porta *et al.* (2002) find that cash-flow rights of ultimate controlling shareholders are positively related to firm value for a sample of large firms in 27 countries. Claessens *et al.* (2002) not only document a similar result for cash-flow rights for East Asian firms, but also find that ultimate owners' control rights are negatively related to firm value.

We re-examine this evidence utilizing a broader cross-country sample and more extensive firm coverage within each country. Extending the univariate results in Table V, the analysis presented in Table VII estimates the relation between *Q* (and *ROA*) and group affiliation using multivariate OLS regressions, with *Family Group Firm* (which is equal to one if a firm belongs to a family group, and zero otherwise) as the main independent variable. For comparison purposes, we include an equivalent indicator variable for non-family group firms, and two other indicator variables for dual-class shares and cross-shareholdings as they can exacerbate the separation of cash-flow rights and control rights. The other control variables include firm size, age, investment intensity, historical asset growth, debt, dividend yield, asset tangibility, and analyst coverage, as Table V shows that these factors can differ systematically between group and non-group firms. Following Villalonga and Amit (2006), we control for a firm's beta in the *Q* regression.

[INSERT TABLE VII HERE]

The results show that both *Q* and *ROA* are significantly lower for family group firms (and similarly for non-family group firms) than for non-group firms in most specifications.³⁸ This result is comparable to those reported by Claessens *et al.* (2002) and Lemmon and Lins (2003). As group affiliation is associated with a separation of cash-flow rights and control rights, our evidence appears to be consistent with their conclusions that such separation leads to poor performance because it encourages expropriation by controlling families.³⁹

However, an important caveat in making this inference is that the analysis is based on samples of both group and non-group firms, and thus could reflect systematic differences in the properties of the two samples. Based on our earlier univariate comparisons, it would be heroic to assume that group and non-group firms are similar in major characteristics. Further, although group firms on average have a greater separation of cash-flow rights and control rights than non-group firms, within a group the same rights can be achieved through many alternative structuring choices and control mechanisms (pyramids, dual-class shares, and cross shareholdings). Therefore, an analysis involving all firms in a market cannot pinpoint whether the worst performing firms within a particular group are indeed those at the bottom of the pyramid and/or those with the lowest cash-flow rights. To answer these questions, we restrict our next analysis to only group firms and focus specifically on within-group variations in firm performance.

³⁸ To minimize the possibility that the impact of family-group affiliation on firm performance is a result of the generic benefits and/or costs of a concentrated ownership structure or commitment of a controlling family (or individual), the performance regression models are alternatively estimated on a sub-sample of all firms controlled by families (or individuals). The results remain qualitatively similar.

³⁹ However, in an unreported test, we find that the valuation discount of group firms is actually lower in emerging markets than in developed markets. This indicates that expropriation risk, which is expected to be higher in emerging markets, is unlikely to be the only explanation for the performance differences between group and non-group firms.

3.4.2 Group Member Placement and Firm Performance

To examine how firm performance varies within a group, we estimate alternative OLS regressions of Q (or ROA) on various position and ownership measures. In addition to observable differences, we use group fixed effects to control for unobservable group-level differences in certain regression specifications. To deal with the possibility that intra-group transfers can cause variations in performance such that regression standard errors differ systematically across groups, we use cluster-adjusted standard errors, with a cluster defined as a business group.

Table VIII documents a positive and significant relation between Q and the layer position of member firms within the same pyramid. We obtain the same finding regardless of whether a firm's position is measured with *Pyramid Layer* or with the bottom of a pyramidal chain indicator (*Bottom Firm*). This is important evidence, which reaffirms our earlier findings that the financing advantages created by pyramids provide valuable support for Bottom firms.

[INSERT TABLE VIII HERE]

If pyramidal groups are associated with certain financing advantages, then the value of their support should be more pronounced for firms with particularly high capital requirements. To test this prediction we further segregate Bottom firms into two sub-categories, based on whether their $CAPEX$ values are above or below their sample country's median. We then incorporate two indicator variables into the Q regression, *Hi-CAPEX Bottom* and *Lo-CAPEX Bottom*, which equal to one when a Bottom firm falls into either of these categories respectively, or zero otherwise. Consistent with the financing benefits of pyramids, we find that Bottom firms with above median $CAPEX$ values generate more significant valuation differences along their pyramidal chain than do Bottom firms with below median $CAPEX$.

We also find that Q has a significant positive relation to the *Direct Own* (and *Direct Control Rights*) measure. When a new firm is added to a group, the ultimate cash-flow rights of

the controlling family are not likely to be an active decision variable since the existing ownership chain(s) connecting the family to the immediate parent(s) of the new firm is well established and already optimally configured. Therefore, the main ownership decision is the direct shareholding level of the immediate parent(s) of the new firm. This direct ownership link held one layer up in the pyramid not only signals a group's commitment to a new firm, but also reflects the extent to which the firm is funded by less expensive internal capital. Both effects can explain higher market valuations of firms with greater *Direct Own* relative to other group members.

We next revisit the question of whether a controlling family's ultimate cash-flow rights in a group firm explain performance differences within the same group. When included as an alternative explanatory variable in Table VIII, *Ult CF Rights* is actually associated with lower *Q*. *Q* is also positively related to a family's control rights. Thus, when analyzing within-group differences, we do not find that the aggregate separation of cash-flow rights from control rights, which is hypothesized to reflect expropriation incentives, results in inferior firm value. Rather, the negative correlation between *Ult CF Rights* and *Q* reflects the ability of the pyramidal structure to provide valuable funding support to certain firm types, and that the separation between cash-flow and control rights arises as a *consequence* of this organizational choice.

The results above however do not distinguish between the separation of cash-flow and control rights created by pyramids and that created by other means. Almeida and Wolfenzon (2006a) suggest that alternative control enhancing devices may have different motivations to that of pyramids.⁴⁰ Thus, we exploit the fact that cross shareholdings and dual-class shares enhance a

⁴⁰ In an unreported test, we include both *Pyramid Layer* and *Ult CF Rights* as explanatory variables in the same model to determine whether the ultimate owner's cash flow rights do in fact have a negative impact on firm value, after controlling for firm placement. However, *Ult CF Rights* is not statistically significant because it is highly correlated with *Pyramid Layer*, which remains significant.

family's control, but do not provide substantial financing advantages, to examine whether they have divergent effects on firm value. In the regression specifications in Table VIII, we incorporate the *Dual-class* and *Cross-holdings* indicator variables, and find that they have significantly negative coefficients in the *Q* regression, after controlling for a firm's position in the pyramid.⁴¹ Similar to Villalonga and Amit's (2009) findings for U.S. firms, our evidence indicates that control enhancing devices can have heterogeneous effects, depending on whether they yield offsetting economic benefits, such as better access to capital.

In Table IX, we proceed to analyze the variations in *ROA* across group firms. The results show that *ROA* is also greater for firms close to the bottom of a pyramid. This finding raises an interesting question. Why do junior group members deliver both high *Q* and high *ROA* at the same time? We investigate this issue in more detail by categorizing Bottom firms into those listed within the last five years (*Bottom New*) and seasoned firms that have been listed for more than five years (*Bottom Old*). We find that most of the superior operating performance of Bottom firms relative to other group firms is driven by the seasoned-firm sub-sample, while the *Q* result remains consistent across both sub-samples. This suggests that for firms at the bottom of a pyramid, group affiliation enhances their value not only when they first become affiliated, but that continued access to a group's funding support helps them realize the cash-flow benefits from their investment opportunities.

[INSERT TABLE IX HERE]

To examine the effect of a purely horizontal structure on firm performance, we drop the

⁴¹ We also consider potential endogeneity in the *Pyramid Layer* relation to *Q* (and *ROA*) that reflects unobserved growth-related factors which influence both pyramid placement and firm performance. In particular, we re-estimate regressions of *Pyramid Layer* on *Q* (or *ROA*) using a 2SLS model, where the first-stage determines *Pyramid Layer*, as reported in Table V. These unreported results are consistent with the earlier OLS regression estimates.

group fixed effects and estimate a regression model that includes all group types. This regression incorporates two indicator variables, *Bottom Firm* and *Horizontal Structure*, for firms at the bottom of a pyramidal chain and firms in a strictly horizontal group, respectively. The omitted group-firm categories are thus Apex and Middle firms (i.e. firms in a pyramidal group that play a role in funding other members because they are positioned higher up the ownership chain). We find that similar to Bottom firms, firms directly controlled through a strictly horizontal structure are associated with higher *Q* than those in the omitted categories. Since these firms have yet to be used to establish new members, they are likely to have not experienced the large valuation discounts of firms higher up in a pyramidal chain. The fact that these groups have historically not employed pyramids also helps maintain their member firm valuations because they can more credibly commit not to use pyramids in the future. Consistent with the predictions in Almeida and Wolfenzon (2006a), firms in a horizontal structure also have higher *ROA*. This suggests that they are funded using a horizontal structure because they have greater pledgeable cash flows, which reduces the need to use pyramids to leverage their group's internal capital to support them.⁴²

Finally, we examine how member-firm performance varies within a non-family group by estimating equivalent performance regressions on the non-family group sample, also reported in Tables VIII and IX. In contrast to family groups, performance of non-family group firms does not display the same systematic relationship with their pyramid layer position. However, consistent with family groups, cross-held firms in non-family groups experience poorer performance.

⁴² In a further unreported robustness analysis, we exclude countries that allow consolidation of parent and subsidiary financial statements at ownership levels below 75 percent, as this could bias (by double counting) the book-value based variables. A 75 percent threshold is used because only a small proportion (under 10 percent) of the within-group shareholdings in our sample exceeds 75 percent. The results are similar to those reported in Tables VI and VII.

3.4.3 Reconciling Financing Advantages with Evidence of Expropriation

It is important to point out that our finding of stronger performance at the bottom of a pyramidal chain should not be viewed as evidence inconsistent with expropriation in group firms. Rather, such valuation differences reflect the outcomes of a group's funding support to newly affiliated member firms in the presence of expropriation concerns, as hypothesized by Almeida and Wolfenzon (2006a). Moreover, the utilization of internal capital from an existing group member to fund a new firm, while helping to alleviate the latter's funding constraints, is effectively a cost-of-capital subsidy provided by the parent firm, which imposes a cost on its minority shareholders. This implies that firm value may not necessarily decline along a pyramidal chain as the ownership-control wedge becomes larger, because of the benefits a new group firm realizes in obtaining a large amount of internal group capital.

It is also important to clarify that our findings are not directly opposite to evidence on expropriation within business groups documented by some prior studies. For example, Bertrand *et al.* (2002), Bae *et al.* (2002), Baek *et al.* (2006), and Cheung, Rau and Stouraitis (2006) examine tunneling activities of business groups in India, Korea and Hong Kong by using various types of corporate events. These papers however do not examine where expropriation tends to occur within a pyramid, nor do they analyze how the ownership-control separation within a group affects firm performance. Notably, one of our findings, that firm value is positively related to the size of a group's direct ownership stake in a member firm (*Direct Own*), is in fact consistent with Bertrand *et al.* (2002). Using a sample of Indian business groups they document that the extent of expropriation is lower in firms with larger ownership held by the controlling family and other group affiliates (which is defined in the same way as our *Direct Own* variable). However, we also show that firms with higher levels of direct (as opposed to ultimate) ownership are typically located at the bottom of a pyramidal chain. This underscores the need to look beyond a

controlling family's ultimate cash-flow rights and to examine group architecture and within-group firm placement decisions. Of the few existing studies that make this distinction, Almeida *et al.* (2011) document evidence consistent with ours for a sample of Korean business groups. Finally, several other prior studies focus on particular markets or regions that indirectly examine expropriation incentives of controlling shareholders by linking firm performance to the separation of cash-flow and control rights or to the extent of pyramiding (Claessens *et al.* (2002), Volpin (2002), Lins (2003), and Lemmon and Lins (2006)). Although they tend to document a negative relationship, their evidence is based on a comparison of both group and non-group firms, and is therefore not directly contradictory to our finding that within a group this relationship is actually positive.⁴³

Reconciling the evidence that family groups provide valuable support to bottom-of-pyramid firms with the valuation discount of group firms relative to non-group firms strongly suggests that group affiliation is subject to an endogenous selection effect. Khanna and Yafeh (2007) raise this possibility in pointing out that “*comparisons of group versus non-group firms are plagued with selection issues, the most obvious one being the assumption that group affiliation is exogenous*”. Indeed, our previous results show that groups use pyramids to fund particular types of firms that otherwise would find it difficult to obtain external financing. Thus, a simple comparison of group and non-group firms is likely to suffer from the absence of any credible counterfactual firms in the economy. For example, projects that are capital intensive and lack immediate pledgeable cash flows may be unable by themselves to raise funds in external capital markets due to their high moral hazard discounts, and as a result may naturally gravitate to

⁴³ To ensure that our results are not simply driven by variations in sample construction, we replicate our analysis on the country sample of each of the above studies. In an unreported robustness analysis, we find that the evidence of increasing valuations down a pyramidal chain is consistently found in nearly all of the sub-sample regressions.

family group affiliation. Conversely, observed non-group firms are likely to be those with project attributes that enable them to overcome such funding difficulties by themselves. Both scenarios can result in group firms possessing lower current market valuations than their non-group peers.

While addressing endogenous selection in a cross-sectional setting is difficult, we provide preliminary evidence in support of this possibility. In an unreported test, we employ a treatment-effects model in which we estimate the performance regression (the outcome equation) simultaneously with the group-selection regression (the treatment equation) using maximum likelihood estimation.⁴⁴ The latter equation explains group membership using firm characteristics discussed previously plus an additional identifying instrument. We follow previous studies on ownership concentration and firm performance (Himmelberg, Hubbard, and Palia (1999), Villalonga and Amit (2006)) and employ a firm's idiosyncratic risk as the instrument. This variable is likely to be related to group membership (as group structures help to diversify a controlling family's exposure to firms with high firm-specific risk), but should be unrelated to Q (which theory says is a function of market risk, rather than firm-specific risk).^{45,46} Our estimation results show that in the selection equation, idiosyncratic risk has a significant positive relation to the likelihood of group membership. In the outcome equation, we find that the *Family Group*

⁴⁴ This estimation requires a strong distributional assumption of bivariate normality, but provides cluster-adjusted standard errors. We also estimate the model using both a two-stage instrumental variable estimation (with the first stage involving a probit regression) and the Heckman two-step consistent estimator, which do not impose the same assumption. Both generate similar results to the maximum likelihood estimation.

⁴⁵ Our idiosyncratic risk measure is obtained from the single-factor market model. However, we find similar results when using the standard error obtained from the three-factor model as the alternative measure for idiosyncratic risk.

⁴⁶ Idiosyncratic risk may be empirically correlated with Q due to the possibility that both are associated with a firm's growth and information asymmetry. However, as we already control for growth and information asymmetry, we argue that idiosyncratic risk is unlikely to be related to the unexplained component of Q in the outcome equation.

Firm indicator variable now has a positive and significant relationship with *Q*, which is actually consistent with the hypothesized financing advantage of family groups. Thus, while the average valuation discount of group firms may in part be due to expropriation concerns of investors, it may also reflect potential endogenous selection effects. In other words, the results of the treatment-effects estimation imply that family groups can enhance the market values of member firms relative to the counterfactual situation where these firms seek funding independently.⁴⁷ Of course, this evidence must be interpreted as conditional on the validity of the instrument. Nevertheless, it highlights a strong possibility of endogenous selection in group affiliation that could be more rigorously explored in time-series and event-study settings.

4. Conclusion

This study examines the motivation behind the existence and organizational diversity of family business groups. At the country level, we find that such groups are less prevalent where the economy provides a large pool of investment capital, where stringent taxation regulations related to intra-group transactions exist, and where takeover rules restrict group expansion through partial acquisitions. Although it is difficult to establish causality and to account for unique historical circumstances leading to the emergence of groups, the significant negative coefficients on the capital availability variables suggest that a family group's financing support of its member firms makes such groups more attractive (or perhaps more entrenched) in markets where external capital is limited or very costly to obtain.

⁴⁷ We also employ propensity score matching (PSM) to minimize the roles of selection biases (due to observable factors) in creating performance differences between group and non-group firms. By simply matching based on observables, the treatment effect on the treated (the effect of group membership on group firms) is already substantially smaller than the unmatched performance difference between group and non-group firms, and is even insignificant in some PSM specifications.

Our firm-level analysis provides the clearest evidence of the financing advantages associated with certain group organizational structures. Within each group, we find that firms funded at the bottom of a pyramidal chain are more capital intensive than those at the apex or those held in a purely horizontal structure. These bottom layer firms are also younger, riskier and more opaque. By financing such firms at the bottom of a pyramidal chain, groups can obtain the greatest leverage from their own invested capital, while minimizing the risk borne by controlling families. Relative to other firms within the same group, this placement is in turn associated with higher firm value. Group members with greater proportions of equity funding supplied through the group's internal capital market also have higher firm values. Thus, family groups appear to provide important benefits to certain member firms by reducing their need to rely on expensive external capital. However, consistent with an expropriation risk viewpoint, we find that groups that employ additional control enhancing mechanisms that lack funding benefits, such as dual-class shares and cross shareholdings, suffer a valuation discount. When comparing all firms in a market, we find that group firms appear to underperform their non-group counterparts. Although this may reflect higher expropriation risk in group firms, we also provide preliminary evidence that such underperformance reflects significant differences in firm characteristics that would motivate weaker firms to seek family group financing support.

Overall, our findings suggest that preserving private benefits of control is not the sole motive behind the creation and expansion of family business groups. Rather, such structures also serve a critical function of leveraging a group's internal capital and helping to build its reputation. However, Almeida and Wolfenzon (2006b) argue that financing advantages, while beneficial for member firms, do not always translate into economy-wide allocative efficiency because in certain instances, a group may choose to internally fund enterprises that are inefficient relative to the investment opportunities offered by other independent firms competing for funds.

Thus, an important implication of our analysis is that improvements in capital availability can weaken the financing advantages of family groups. For emerging markets in particular, openness to foreign investment and the development of a venture capital industry can provide new avenues of competition to established business groups by offering alternative funding sources for capital-intensive and high-growth ventures, thereby seriously eroding the value of their support to member firms and weakening their overall economic dominance.

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Table I. Description of Main Variables**Panel A: Country-Level Measures of Prevalence of Family Business Groups**

% Family Group (% Family Pyramid)	The percentage of all listed firms in a market that belong to a family business group (that belong to a family group and are controlled by another listed group member).
% Family Group MC	The percentage of total market capitalization held by firms that belong to a family business group.
Average Pyramid Layer	The country average of the number of listed firms (pyramid layers) that separate a firm from its ultimate controlling owner, calculated using the sub-sample of all listed family-controlled firms in an economy.
% Family Horizontal	The percentage of listed firms in a market controlled through a purely horizontal family group.

Panel B: Country-Level Variables explaining the Prevalence of Family Business Groups

Investor Protection	A principal components aggregation of i) a measure of the minority shareholder rights (the Anti-director Rights index) from La Porta <i>et al.</i> (1997) and updated by Pagano and Volpin (2005), ii) a legal enforcement index incorporating 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 <i>World Economic Forum's Global Competitiveness Report 2003</i> .
Newspaper	The total average circulation (or copies printed) of daily newspapers per 1000 inhabitants as measured in the year 2000. Source: <i>World Association of Newspapers</i> .
Intra-Group Tax	The stringency of a country's tax law related to intra-group transactions, equal to the sum of four indicator variables. The first three respectively indicate whether the law regulates the following three intra-group tax minimization practices: (i) transfer pricing, (ii) the use of thin-capitalization companies, and (iii) registration of holding companies in tax havens. The last variable indicates if there is explicit reporting requirement for companies engaging in the above transactions. Source: <i>Deloitte International Taxation Guide</i> .
Log GDP	The natural logarithm of a country's gross domestic products as of 2001. Source: <i>World Bank</i> .
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 (<i>European Federation for Retirement Provision</i> , <i>International Federation of Pension Funds Administrators</i> , and <i>Fédération Européenne des Fonds et Sociétés d'Investissement</i>).
Political Stability	Perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means. Source: <i>World Bank</i> .
Savings to GDP	Total domestic savings scaled by a country's gross domestic products as of 2001. Source: <i>World Bank</i> .
Consolidation	An indicator variable equal to one if a parent firm can consolidate a subsidiary in which it has an ownership stake of less than 90 percent, and zero otherwise. Source: <i>Price Waterhouse Coopers' Corporate Taxes: A Worldwide Summary</i> .
Takeover Index	An index measuring the extent of fair and equitable treatment of all shareholders in the takeover process and the transparency of the process. Source: Nenova (2006).

Panel C: Firm-Level Variables

Family Group Firm	An indicator variable which equals one if a firm belongs to a family business group.
Non-Family Group Firm	An indicator variable which equals one if a firm belongs to a non-family business group.
Direct Own (Direct Control Rights)	The percentage of issued shares (voting rights) of a group firm held directly by its parent firm(s) in the same group.
Ult CF Rights	The ultimate cash-flow rights of a group firm attributable to the controlling shareholder.

<i>Pyramid Layer</i>	An integer variable that counts the number of layers of listed firms that exist between a group firm and its ultimate controlling shareholder.
<i>Bottom Firm</i>	An indicator variable which equals one if a firm is at the bottom of a pyramidal chain, and zero otherwise.
<i>Dual-class</i>	An indicator variable which equals one if a firm utilizes dual-class shares with differential voting rights, and zero otherwise.
<i>Cross-holding</i>	An indicator variable which equals one if a group firm participates in a reciprocal shareholding arrangement with one or more firms in the same group, and zero otherwise.
<i>Q</i>	A proxy for Tobin's Q, calculated as the sum of balance-date market value of equity, book value of preference shares, minority interests, and liabilities, divided by the book value of total assets as of 2002. Sources: <i>Worldscope</i> , <i>Datastream</i> , and <i>Osiris</i> .
<i>ROA</i>	Earnings before interests, tax, depreciation, and amortization in 2002 scaled by the average of year-beginning and year-end total assets. Sources: <i>Worldscope</i> , <i>Osiris</i> .
<i>Log Size</i>	The log of balance-date market capitalization. Sources: <i>Datastream</i> , <i>Worldscope</i> , and <i>Osiris</i> .
<i>Asset Growth</i>	The pre-2002 five-year average of total assets growth rate. Sources: <i>Worldscope</i> and <i>Osiris</i> .
<i>Debt</i>	Total interest-paying debt divided by total assets. Sources <i>Worldscope</i> and <i>Osiris</i> .
<i>Dividend Yield</i>	The pre-2002 five-year average of dividend per share divided by share price. Source: <i>Datastream</i> and <i>Osiris</i> .
<i>CAPEX</i>	Total capital expenditures divided by total assets. Sources: <i>Worldscope</i> and <i>Osiris</i> .
<i>Log Analyst</i>	The natural logarithm of one plus the number of analysts covering a firm. Source: <i>I/B/E/S</i> .
<i>Log Age</i>	The natural logarithm of the age (in years) of a firm from its incorporation date to 2002. Source: <i>Worldscope</i> and <i>Osiris</i> .
<i>Intangibles</i>	Total intangible assets divided by total assets. Sources: <i>Worldscope</i> and <i>Osiris</i> .
<i>Beta</i>	The systematic risk of a firm obtained from estimating the one-factor market model on the firm's monthly stock returns in the five years prior to 2002. Sources: <i>Datastream</i> and <i>Bloomberg</i> .
<i>Idio Risk</i>	The standard error from estimating the one-factor market model on each firm's monthly stock returns in the five years prior to 2002. Sources: <i>Datastream</i> and <i>Bloomberg</i> .
<i>Index Return at Listing</i>	The annual market index return in the year of a firm's listing. Source: <i>Datastream</i> .

Table II. Country-level Descriptive Statistics on Family Business Groups

The table reports family business group statistics for each of the 45 sample countries. *No. of obs.* is the number of firms in each country for which raw shareholding data are available. *% UO Identified* is the percentage of firms with shareholding data for which we can ascertain the identity of the ultimate controlling owner at the top of the ownership chain. *No. of Family Groups* is the total number of family-controlled business groups. *No. of Horizontal Family Groups* is the number of family groups organized in a purely horizontal structure. *No. of Pyramidal Family Groups* is the number of family groups where at least one firm is held in a pyramid structure. *No. of Family Group Firms* is the total number of firms controlled by family groups. *No. of Family Firms* is the total number of firms where a family is the ultimate controlling shareholder. *No. of Non-Family groups* is the total number of groups controlled by a non-family entity. *No. of Non-Family Group Firms* is the number of firms controlled by a non-family group. *% Family Group* is the percentage of listed firms that belong to a group. *% Family Pyramid* is the percentage of firms that belong to a family group and are controlled by another listed group member. *% Family Group MC* is the percentage of market capitalization held by family group firms. *Average Pyramid Layer* is the country average of the number of listed firms that separate a firm from its ultimate owner, calculated using the sub-sample of all listed family-controlled firms in an economy.

Country	Country-Level Ownership Characteristics								Family Business Groups			
	<i>No. of obs.</i>	<i>% UO Identified</i>	<i>No. of Family Groups</i>	<i>No. of Horizontal Family Groups</i>	<i>No. of Pyramidal Family Groups</i>	<i>No. of Family Group Firms</i>	<i>No. of Non-Family Groups</i>	<i>No. of Non-Family Group Firms</i>	<i>% Family Group</i>	<i>% Family Pyramid</i>	<i>% Family Group MC</i>	<i>Average Pyramid Layer</i>
Argentina	77	100.00	6	2	4	15	3	6	19.48	7.79	11.03	0.230
Australia	1406	96.16	34	8	26	98	14	37	6.97	3.63	8.59	0.119
Austria	103	99.03	2	1	1	5	6	23	4.85	1.94	7.04	0.052
Belgium	164	98.17	14	3	11	40	2	7	24.39	12.80	28.50	0.371
Brazil	373	96.51	22	2	20	78	13	38	20.91	13.67	15.31	0.282
Canada	1221	98.61	21	3	18	63	5	14	5.16	2.95	13.15	0.119
Chile	197	96.95	21	7	14	91	10	25	46.19	22.34	44.52	0.422
Colombia	56	96.43	4	0	4	27	0	0	48.21	41.07	52.13	1.205
Czech Rep.	73	97.26	2	1	1	4	3	12	5.48	2.74	1.50	0.125
Denmark	185	99.46	7	2	5	18	3	7	9.73	3.78	20.06	0.088
Finland	169	98.22	7	1	6	19	3	7	11.24	5.92	3.10	0.231
France	804	95.40	32	6	26	90	21	77	11.19	6.09	9.20	0.151
Germany	825	96.97	32	9	23	77	16	68	9.33	4.24	5.80	0.093
Greece	265	98.11	16	1	15	53	4	11	20.00	12.45	19.06	0.171
Hong Kong	678	98.38	33	4	29	106	2	6	15.63	9.00	26.29	0.192
Hungary	41	97.56	3	1	2	6	3	7	14.63	7.32	1.92	0.130
India	662	98.79	59	37	22	194	13	31	29.31	6.34	22.63	0.107
Indonesia	330	91.21	31	13	18	98	1	2	29.70	13.94	53.07	0.308
Ireland	73	98.63	3	1	2	8	0	0	10.96	1.37	2.87	0.063
Israel	227	96.92	20	5	15	91	2	4	40.09	26.43	23.22	0.856
Italy	291	96.91	17	4	13	56	4	10	19.24	9.62	26.34	0.286

Japan	3234	96.04	42	10	32	102	124	668	3.15	1.52	3.76	0.053
Korea	1356	96.46	85	24	61	278	10	29	20.50	10.25	56.64	0.198
Malaysia	998	97.80	53	13	40	170	13	54	17.03	9.42	38.52	0.236
Mexico	141	98.58	12	2	10	37	1	2	26.24	12.06	49.47	0.154
Netherlands	183	94.54	5	2	3	10	3	7	5.46	2.19	4.69	0.099
New Zealand	96	97.92	3	0	3	7	0	0	7.29	6.25	10.99	0.295
Norway	178	97.19	7	1	6	16	5	11	8.99	5.06	4.04	0.169
Pakistan	223	96.41	19	11	8	51	6	14	22.87	5.83	9.89	0.193
Peru	144	93.06	8	1	7	31	3	6	21.53	10.42	43.09	0.185
Philippines	222	95.95	31	10	21	102	4	9	45.95	18.47	30.23	0.337
Poland	137	95.62	8	4	4	18	3	7	13.14	5.84	7.36	0.183
Portugal	78	96.15	6	2	4	18	1	3	23.08	11.54	9.94	0.185
Singapore	627	97.29	19	2	17	67	8	23	10.69	7.18	41.11	0.165
South Africa	339	95.87	9	3	6	33	13	55	9.73	5.31	8.65	0.182
Spain	164	97.56	7	0	7	19	7	24	11.59	6.71	4.38	0.241
Sri Lanka	117	98.29	15	0	15	78	2	4	66.67	52.14	43.88	0.747
Sweden	294	96.94	14	4	10	60	3	7	20.41	11.22	25.66	0.250
Switzerland	298	99.33	5	3	2	11	6	16	3.69	1.01	0.78	0.021
Taiwan	888	99.10	41	1	40	147	3	8	16.55	10.59	41.33	0.237
Thailand	465	95.70	30	4	26	101	4	15	21.72	10.75	47.06	0.196
Turkey	250	96.00	34	13	21	125	3	20	50.00	24.00	46.43	0.317
UK	2370	98.48	19	4	15	44	10	36	1.86	0.97	1.50	0.065
USA	7577	97.90	89	48	41	237	56	160	3.13	1.03	3.46	0.041
Venezuela	36	97.22	4	1	3	8	2	5	22.22	8.33	25.69	0.100

Table III. Multivariate Regression Analysis of the Prevalence of Family Business Groups

The table reports OLS regression results for a sample of 44 countries. *% Family Group* is the percentage of listed firms in the market that belong to a family group. *% Family Group MC* is the percentage of market capitalization held by family group-controlled firms. *Investor Protection* is an index based on principle components weights of anti-director rights, an enforcement index and corporate disclosure. *Newspaper* is the average newspaper circulation per 1000 inhabitants. *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 by GDP. *Political Stability* is the perceived likelihood that the government will be destabilized or overthrown by unconstitutional or violent means. *Consolidation* is an indicator variable constructed based on the ownership threshold at which subsidiaries can be consolidated into the parent for taxation purposes. *Intra-Group Tax* measures the stringency of tax laws related to intra-group transactions. *Takeover Index* measures the extent to which target shareholders are treated fairly and equally in the takeover process. Heteroskedasticity-consistent standard errors are reported in parentheses.

	% Family Group			% Family Group MC		
	(1)	(2)	(3)	(1)	(2)	(3)
<i>Intercept</i>	0.787 ^a (0.163)	0.833 ^a (0.160)	0.491 ^a (0.172)	0.595 ^b (0.241)	0.498 ^c (0.266)	0.314 (0.291)
<i>Investor Protection</i>	0.027 (0.023)	0.004 (0.023)	0.021 (0.023)	0.026 (0.041)	0.003 (0.045)	0.009 (0.041)
<i>Newspaper</i>	-0.044 ^c (0.022)	-0.014 (0.026)	0.012 (0.024)	-0.021 (0.043)	-0.016 (0.044)	0.031 (0.050)
<i>Log GDP</i>	-0.014 (0.014)	-0.025 ^c (0.013)	-0.020 ^c (0.011)	0.013 (0.020)	0.003 (0.021)	0.003 (0.020)
<i>Institutional Funds</i>	-0.120 ^a (0.036)			-0.196 ^a (0.061)		
<i>Savings to GDP</i>		-0.008 ^a (0.003)			0.002 (0.004)	
<i>Political Stability</i>			-0.111 ^a (0.034)			-0.092 ^c (0.048)
<i>Consolidation</i>	0.005 (0.029)	-0.036 (0.029)	0.007 (0.026)	-0.079 (0.053)	-0.104 ^c (0.058)	-0.093 ^c (0.052)
<i>Intra-Group Tax</i>	-0.037 ^a (0.013)	-0.048 ^a (0.014)	-0.029 ^b (0.011)	-0.046 ^c (0.025)	-0.030 (0.028)	-0.034 (0.024)
<i>Takeover Index</i>	-0.295 ^a (0.091)	-0.191 ^c (0.100)	-0.231 ^b (0.097)	-0.221 ^c (0.126)	-0.284 ^c (0.158)	-0.183 (0.144)
Adjusted R ²	0.537	0.594	0.624	0.343	0.231	0.296
No. of observations	44	44	44	44	44	44

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

Table IV. Multivariate Regression Analysis of the Structuring of Family Business Groups

The table reports OLS regression results for a sample of 44 countries. *Average Pyramid Layer* is the country average of the number of listed firms that separate a firm from its ultimate owner calculated using the sub-sample of only listed family-controlled firms in an economy. *% Family Pyramid* is the percentage of listed firms that belong to a group and are controlled by another listed group member. *% Family Horizontal* is the percentage of firms in a market controlled through a purely horizontal group. *Investor Protection* is an index based on principle components weights of anti-director rights, an enforcement index and corporate disclosure. *Newspaper* is the average newspaper circulation per 1000 inhabitants. *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 by GDP. *Political Stability* is the perceived likelihood that the government will be destabilized or overthrown by unconstitutional or violent means. *Consolidation* is an indicator variable constructed based on the ownership threshold at which subsidiaries can be consolidated into the parent for taxation purposes. *Intra-Group Tax* measures the stringency of tax laws related to intra-group transactions. *Takeover Index* measures the extent to which target shareholders are treated fairly and equally in the takeover process. Heteroskedasticity-consistent standard errors are reported in parentheses.

	<i>Average Pyramid Layer</i>			<i>% Family Pyramid</i>			<i>% Family Horizontal</i>		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
<i>Intercept</i>	1.230 ^a (0.390)	1.265 ^a (0.387)	0.823 ^b (0.372)	0.525 ^a (0.151)	0.551 ^a (0.153)	0.315 ^b (0.117)	0.070 (0.062)	0.087 (0.063)	0.044 (0.063)
<i>Investor Protection</i>	0.099 ^b (0.048)	0.065 (0.045)	0.087 ^c (0.048)	0.028 ^c (0.015)	0.013 (0.016)	0.024 (0.015)	-0.007 (0.009)	-0.010 (0.008)	-0.007 (0.008)
<i>Newspaper</i>	-0.076 ^c (0.044)	-0.037 (0.050)	0.000 (0.053)	-0.030 ^c (0.017)	-0.010 (0.018)	0.010 (0.015)	-0.002 (0.008)	0.004 (0.008)	0.003 (0.009)
<i>Log GDP</i>	-0.034 (0.026)	-0.050 ^c (0.027)	-0.043 ^c (0.024)	-0.014 (0.012)	-0.021 ^c (0.012)	-0.018 ^c (0.010)	0.001 (0.005)	-0.001 (0.005)	0.000 (0.005)
<i>Institutional Funds</i>	-0.196 ^a (0.056)			-0.084 ^a (0.020)			-0.008 (0.011)		
<i>Savings to GDP</i>		-0.010 ^c (0.005)			-0.005 ^b (0.002)			-0.002 ^c (0.001)	
<i>Political Stability</i>			-0.147 ^b (0.069)			-0.079 ^b (0.030)			-0.010 (0.013)
<i>Consolidation</i>	0.044 (0.058)	-0.014 (0.052)	0.041 (0.054)	0.007 (0.020)	-0.020 (0.020)	0.009 (0.018)	-0.001 (0.008)	-0.008 (0.009)	-0.001 (0.008)
<i>Intra-Group Tax</i>	-0.039 (0.028)	-0.049 (0.031)	-0.026 (0.029)	-0.023 ^b (0.009)	-0.029 ^b (0.011)	-0.017 ^c (0.009)	-0.003 (0.005)	-0.007 (0.006)	-0.003 (0.005)
<i>Takeover Index</i>	-0.512 ^c (0.292)	-0.395 (0.289)	-0.432 (0.287)	-0.206 ^b (0.080)	-0.141 (0.088)	-0.161 ^c (0.084)	-0.029 (0.041)	-0.003 (0.042)	-0.023 (0.040)
Adjusted R ²	0.338	0.338	0.380	0.419	0.455	0.512	0.070	0.157	0.084
No. of observations	44	44	44	44	44	44	44	44	44

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

Table V. Differences in Firm Characteristics between Group and Non-Group Firms and between Firms within the Same Group

In the Group vs. Non-Group Tests, group firms are compared to their peers matched by either industry or market capitalization. Pyramidal groups are those where at least one firm is controlled by another listed group member. Horizontal groups are those where the family directly controls all members. Pyramidal firms are further classified into those at the top of an ownership chain (Apex) and those at the bottom of the chain (Bottom), and those that are in between (Middle). *Market Cap* is the \$US value (in millions) of market capitalization. *Asset Growth* is the average annual growth rate of total assets based on the five years previous to 2002. *Beta* is the estimate of beta obtained from estimating the market model on a firm's monthly stock returns over the five-year period before 2002. *Idio Risk* is the regression standard error from the same market model. *Age* is firm age from incorporation. *Analyst* is the number of analysts covering a firm. *Intangibles* is the ratio of intangible assets to total assets. *CAPEX* is the ratio of capital expenditures to total assets. *Dividend Yield* is the ratio of dividend-per-share to share price. *Q* is the ratio of market value of total assets to book value of total assets. *ROA* is EBITDA divided by the average of year-beginning and year-end total assets. For these variables, Panel A reports their median differences and whether they are significantly different from zero. For ease of interpretation, Panel B also reports the mean differences for the variables where the median differences are predominantly zero. Panel C reports the mean differences for the following variables. *Direct Own* is the percentage of issued shares of a group firm held directly by its parent firm(s) in the same group. *Ult CF Rights* is the ultimate cash-flow rights attributable to the ultimate owner.

	Group vs. Non-Group Tests								Within-Group Tests	
	Industry Matched				Size Matched					
	Group vs. Non-Group	Pyramidal groups Apex vs. Non-Group	Bottom vs. Non-Group	Horizontal vs. Non- Group	Group vs. Non-Group	Pyramidal groups Apex vs. Non-Group	Bottom vs. Non-Group	Horizontal vs. Non-Group	Bottom vs. Apex	Bottom vs. Middle
Panel A: Median Differences for All Firm Characteristics										
<i>Market Cap</i>	19.163 ^a	90.281 ^a	11.152 ^a	0.352 ^a					-45.604 ^a	-66.184 ^a
<i>Asset Growth</i>	0.025 ^c	1.588 ^a	-1.172	-0.026	-1.729	-1.217	-2.151 ^a	-0.492	-2.390 ^a	-2.744 ^a
<i>Age</i>	3.000 ^a	6.750 ^a	0.500 ^a	2.000 ^a	2.000 ^a	5.750 ^a	0.000 ^b	2.000 ^a	-7.000 ^a	-5.000 ^a
<i>Debt</i>	1.984 ^a	5.271 ^a	0.000 ^b	0.865 ^a	1.723 ^a	5.221 ^a	-0.658 ^c	3.231 ^a	-3.169 ^a	-4.466 ^a
<i>Beta</i>	0.038 ^a	0.091 ^a	0.026	-0.033	0.005 ^a	0.022 ^a	-0.003	-0.029	-0.082 ^a	-0.113 ^a
<i>Idio Risk</i>	-0.767 ^a	-1.274 ^a	-0.447	-0.361	0.034 ^a	0.146 ^a	-0.096 ^c	0.042	1.067 ^a	0.749 ^b
<i>CAPEX</i>	0.042 ^a	0.005 ^c	0.166 ^a	-0.068 ^b	-0.121 ^a	-0.382	0.012 ^a	0.205 ^a	0.247 ^b	0.263
<i>Dividend Yield</i>	0.000 ^a	0.172 ^a	0.000 ^a	0.000 ^a	0.000 ^a	0.000 ^a	0.000 ^a	0.000 ^a	0.000 ^b	0.000
<i>Analyst</i>	0.000 ^a	1.250 ^a	0.000 ^a	0.000 ^a	0.000 ^a	0.000	0.000 ^a	0.000 ^a	-0.500 ^a	-1.000 ^a
<i>Intangibles</i>	0.000 ^a	0.001 ^a	0.000 ^a	0.000 ^a	0.000 ^a	0.000 ^a	0.000 ^a	0.000 ^a	0.000 ^b	-0.040 ^b
<i>Q</i>	-0.021	-0.019	-0.014	-0.057	-0.063 ^a	-0.120 ^a	-0.027	-0.020	0.044 ^a	0.053
<i>ROA</i>	0.132	0.000	0.348	0.001	-1.165 ^a	-2.197 ^a	-0.404	0.560 ^c	0.484	0.087
Panel B: Mean Differences for Firm Characteristics with Predominantly Zero Median Differences										
<i>Dividend Yield</i>	0.779 ^a	0.784 ^a	0.833 ^a	0.748 ^a	0.740 ^a	0.549 ^a	0.867 ^a	0.793 ^a	-0.210	-0.286
<i>Analyst</i>	2.554 ^a	4.279 ^a	2.002 ^a	2.583 ^a	0.310 ^a	0.047	0.485 ^a	0.352 ^a	-2.496 ^a	-2.252 ^a
<i>Intangibles</i>	2.403 ^a	2.441 ^a	2.064 ^a	2.615 ^a	3.230 ^a	2.568 ^a	3.069 ^a	4.459 ^a	-0.314	-2.214 ^b
Panel C: Mean Differences for Selected Within-Group Ownership Characteristics										
<i>Direct Own</i>									8.747 ^a	3.100 ^b
<i>Ult CF Rights</i>									-16.517 ^a	-4.256 ^a

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

Table VI. The relationship between firm characteristics and group organization choices

The dependent variable is either *Pyramid Layer*, which is the number of layers of listed firms that exist between a group firm and its ultimate controlling shareholder, or *Family-Group Structure*, which is a categorical variable describing both group membership and group organizational choices (1 = firms at the bottom of a pyramidal chain, 2 = firms that make up a pyramidal chain but are not at the bottom, 3 = firms in a purely horizontal group). *Log Size* is the log of US-dollar market capitalization. *Beta* is the estimate of beta obtained from running the market model on a firm's monthly stock returns over 5-year period to 2002. *Asset Growth* is the five-year average annual growth rate in asset. *Debt* is total interest-paying debt divided by total assets. *CAPEX* is the ratio of capital expenditures to total assets. *Dividend Yield* is the ex-ante five-year average of the ratio of dividend-per-share to share price. *Intangibles* is the ratio of intangible assets to total assets. *Log Age* is the logarithm of firm age. *Log Analyst* is the logarithm of one plus the number of analysts covering a firm. All regression models include indicator variables for industry sectors (based on their first SIC digit). The *Pyramid Layer* regressions are estimated using ordered logit estimation. The *Family-Group Structure* regression is estimated using multinomial logit estimation. In the models that include group fixed effects, only Pyramidal groups are considered as *Pyramid Layer* does not vary within each Horizontal group. The standard errors (in parentheses) are corrected for cluster-specific heteroskedasticity, with a cluster being defined as a group in the sample.

	<i>Pyramid Layer</i> (Family-group sample)		<i>Family-Group Structure</i> (Family-group sample)		<i>Pyramid Layer</i> (Non-Family group sample)	
			Bottom v Horizontal	Non-Bottom v Horizontal		
<i>Log Size</i>	0.023 (0.029)	-0.147 ^a (0.031)	0.115 ^a (0.043)	0.319 ^a (0.049)	-0.129 ^c (0.067)	-0.305 ^a (0.060)
<i>Beta</i>	-0.062 (0.071)	-0.113 ^c (0.063)	-0.035 (0.094)	0.188 ^c (0.101)	-0.174 (0.165)	-0.037 (0.165)
<i>Idio Risk</i>	0.712 (0.540)	1.009 ^b (0.409)	0.129 (0.708)	0.156 (0.788)	-0.409 (1.504)	0.065 (1.825)
<i>Debt</i>	-0.489 ^a (0.157)	-0.527 ^a (0.136)	-0.503 ^b (0.243)	0.326 (0.232)	0.027 (0.352)	-0.508 (0.366)
<i>Asset Growth</i>	-0.279 ^a (0.106)	-0.170 ^c (0.093)	-0.094 (0.133)	0.067 (0.130)	0.081 (0.223)	-0.023 (0.227)
<i>CAPEX</i>	0.601 ^b (0.247)	0.329 ^c (0.191)	0.911 ^b (0.455)	-1.598 ^c (0.864)	1.200 (1.011)	0.272 (1.248)
<i>Dividend Yield</i>	-0.353 ^c (0.187)	-0.166 (0.172)	-0.318 (0.244)	-0.029 (0.165)	1.557 (2.209)	0.588 ^a (0.199)
<i>Intangibles</i>	-0.277 (0.358)	0.501 ^c (0.273)	-0.939 ^c (0.517)	-1.426 ^a (0.534)	0.045 (1.090)	0.020 (0.779)
<i>Log Age</i>	-0.232 ^a (0.068)	-0.260 ^a (0.051)	-0.214 ^b (0.097)	0.133 (0.094)	-0.228 ^b (0.115)	-0.167 ^b (0.083)
<i>Log Analyst</i>	-0.056 (0.062)	-0.061 (0.049)	-0.003 (0.091)	0.031 (0.091)	-0.181 (0.127)	-0.151 (0.099)
Group fixed effects	NO	YES		NO	NO	YES
Adjusted R ²	0.028	0.067		0.084	0.117	0.137
No. of observations	2781	2203		2781	1483	792

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

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

The sample is composed of both group and non-group firms. The dependent variable is the ratio of market value of total assets to book value of total assets (*Q*) or EBITDA scaled by the average of year-beginning and year-end total assets (*ROA*). *Family Group Firm* is an indicator variable that equals one if a firm belongs to a family-controlled group and zero otherwise. *Non-Family Group Firm* is an indicator variable equals one if a firm belongs to a business group not controlled by a family, and zero otherwise. *Dual-class* (and *Cross-holding*) is an indicator variable for firms that have dual-class shares (cross shareholding with other member firms). *Log Size* is the log of US-dollar market capitalization. *Beta* is the estimate of beta obtained from running the market model on a firm's monthly stock returns over 5-year period to 2002. *Asset Growth* is the five-year average annual growth rate in asset. *Debt* is total interest-paying debt divided by total assets. *CAPEX* is the ratio of capital expenditures to total assets. *Dividend Yield* is the ex-ante five-year average of the ratio of dividend-per-share to share price. *Intangibles* is the ratio of intangible assets to total assets. *Log Age* is the logarithm of firm age. *Log Analyst* is the logarithm of one plus the number of analysts covering a firm. These firm-level controls are lagged by one period in the *ROA* regression. All regression models include indicator variables for industry sectors (based on their first SIC digit). Country-level controls include the set of country-level variables discussed in Sections 2.1.1 and 2.1.2. Their coefficients are not reported. The family firm sub-sample comprises only (group and non-group) family-controlled firms. The standard errors (in parentheses) are corrected for cluster-specific heteroskedasticity, with a cluster being defined as a country in the sample.

	Q			ROA		
	Full Sample		Family Firm Sub-sample	Full Sample		Family Firm Sub-sample
<i>Family Group Firm</i>	-0.145 ^a (0.041)	-0.148 ^a (0.039)	-0.223 ^a (0.048)	-0.007 (0.006)	-0.008 (0.006)	-0.022 ^a (0.006)
<i>Non-Family Group Firm</i>	-0.112 ^a (0.026)	-0.084 ^a (0.026)		-0.020 ^a (0.007)	-0.023 ^a (0.007)	
<i>Dual-class</i>	-0.242 ^a (0.052)	-0.182 ^a (0.061)	-0.335 ^a (0.077)	0.036 ^a (0.011)	0.014 (0.014)	0.035 ^a (0.012)
<i>Cross-holding</i>	-0.078 (0.081)	-0.049 (0.084)	-0.063 (0.089)	-0.055 ^a (0.014)	-0.060 ^a (0.014)	-0.043 ^a (0.015)
<i>Log Size</i>	0.122 ^a (0.016)	0.133 ^a (0.017)	0.148 ^a (0.015)	0.026 ^a (0.004)	0.026 ^a (0.004)	0.024 ^a (0.004)
<i>Beta</i>	0.067 ^b (0.025)	0.061 ^b (0.027)	0.047 (0.040)			
<i>Debt</i>	0.569 ^b (0.245)	0.551 ^b (0.245)	0.689 ^b (0.265)	0.012 (0.013)	0.014 (0.013)	0.009 (0.009)
<i>Asset Growth</i>	0.100 ^c (0.050)	0.114 ^b (0.049)	0.077 (0.090)	0.013 (0.020)	0.008 (0.020)	0.029 (0.021)
<i>CAPEX</i>	0.913 ^a (0.234)	0.901 ^a (0.252)	0.984 ^a (0.279)	0.104 ^c (0.054)	0.091 ^c (0.051)	0.153 ^b (0.058)
<i>Dividend Yield</i>	-0.198 (0.166)	-0.191 (0.147)	-0.017 (0.115)	0.066 ^b (0.031)	0.057 ^c (0.028)	0.040 (0.025)
<i>Intangibles</i>	-0.023 (0.077)	-0.084 (0.065)	0.059 (0.116)	-0.139 ^a (0.033)	-0.137 ^a (0.032)	-0.155 ^a (0.025)
<i>Log Age</i>	-0.216 ^a (0.048)	-0.208 ^a (0.051)	-0.237 ^a (0.049)	0.035 ^b (0.013)	0.035 ^b (0.014)	0.031 ^b (0.013)
<i>Log Analyst</i>	-0.186 ^c (0.096)	-0.202 ^c (0.104)	-0.162 ^b (0.077)	0.011 ^c (0.006)	0.010 (0.006)	0.014 ^c (0.008)
Country-level controls	YES	NO	YES	YES	NO	YES
Country fixed effects	NO	YES	NO	NO	YES	NO
Adjusted R ²	0.098	0.110	0.111	0.162	0.177	0.166
No. of observations	22380	22380	9823	22103	22103	9723

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

Table VIII. Family/Non-Family Group Structure and Q – Within group regression

The sample is composed of either family or non-family group firms. The dependent variable is the ratio of market value of total assets to book value of total assets (Q). For each group firm, *Direct Own* (*Direct Control Rights*) is the ownership (voting rights) held directly by its immediate parent(s). *Pyramid Layer* is the number of layers between a group firm and the ultimate owner. *Bottom Firm* is an indicator variable for firms at the bottom of a pyramidal chain. *Ult CF Rights* is the ultimate cash-flow rights attributable to the ultimate owner. *Dual-class* (*Cross-holding*) is an indicator variable for group firms that have dual-class shares (cross shareholdings with other group firms). *Horizontal Structure* is an indicator variable for firms in a purely horizontal group. *Log Size* is the log of US-dollar market capitalization. *Beta* is the estimate of beta obtained from running the market model on a firm's monthly stock returns over the 5-year period to 2002. *Asset Growth* is the five-year average annual asset growth rate. *Debt* is total interest-paying debt divided by total assets. *CAPEX* is the ratio of capital expenditures to total assets. *Hi(Lo)-CAPEX Bottom* is an indicator variable for Bottom firms with CAPEX values above (below) the country median. *Dividend Yield* is the ex-ante five-year average of the ratio of dividend-per-share to share price. *Intangibles* is the ratio of intangible assets to total assets. *Log Age* is the logarithm of firm age. *Log Analyst* is the logarithm of one plus the number of analysts covering a firm. All regression models include SIC industry sector indicators. Group-clustered standard errors are reported in parentheses.

	Family Groups				Non-Family Groups		
<i>Direct Own</i>	0.035 ^c (0.019)	0.032 ^c (0.019)	0.032 ^c (0.019)		0.031 ^b (0.016)	0.074 ^a (0.027)	0.077 ^a (0.026)
<i>Pyramid Layer</i>	0.053 ^b (0.022)					0.064 (0.070)	
<i>Bottom Firm</i>		0.085 ^a (0.030)			0.075 ^a (0.028)		0.061 (0.065)
<i>Dual-class</i>	-0.116 ^a (0.042)	-0.115 ^a (0.042)	-0.110 ^a (0.042)	-0.149 ^a (0.042)	-0.138 ^a (0.036)	0.156 (0.122)	0.151 (0.112)
<i>Cross-holding</i>	-0.122 ^b (0.057)	-0.104 ^c (0.061)	-0.108 ^c (0.061)	-0.125 ^b (0.057)	-0.108 ^a (0.041)	-0.166 ^b (0.071)	-0.164 ^b (0.075)
<i>Hi-CAPEX Bottom</i>			0.127 ^a (0.039)				
<i>Lo-CAPEX Bottom</i>			0.044 (0.035)				
<i>Ult CF Rights</i>				-0.031 ^c (0.018)			
<i>Direct Control Rights</i>				0.048 ^a (0.015)			
<i>Horizontal Structure</i>					0.070 ^c (0.038)		0.089 ^c (0.047)
<i>Log Size</i>	0.101 ^a (0.014)	0.103 ^a (0.015)	0.102 ^a (0.015)	0.100 ^a (0.014)	0.105 ^a (0.011)	0.072 ^b (0.034)	0.086 ^a (0.028)
<i>Beta</i>	-0.012 (0.034)	-0.010 (0.034)	-0.008 (0.033)	-0.013 (0.034)	0.026 (0.031)	0.053 (0.073)	0.050 (0.066)
<i>Debt</i>	0.362 ^a (0.094)	0.365 ^a (0.094)	0.369 ^a (0.095)	0.361 ^a (0.094)	0.449 ^a (0.172)	-0.001 (0.170)	-0.043 (0.142)
<i>Asset Growth</i>	0.061 (0.047)	0.058 (0.047)	0.055 (0.047)	0.058 (0.047)	0.071 (0.043)	0.179 (0.124)	0.079 (0.106)
<i>CAPEX</i>	0.597 ^b (0.279)	0.586 ^b (0.276)	0.517 ^c (0.267)	0.604 ^b (0.276)	0.532 ^b (0.248)	1.037 ^c (0.632)	0.645 (0.474)
<i>Dividend Yield</i>	0.167 (0.148)	0.166 (0.150)	0.162 (0.151)	0.161 (0.151)	0.102 ^c (0.055)	-0.034 (0.280)	-0.223 (0.297)
<i>Intangibles</i>	0.045 (0.217)	0.037 (0.217)	0.037 (0.216)	0.045 (0.216)	-0.047 (0.155)	-0.704 (0.500)	-0.723 ^b (0.363)
<i>Log Age</i>	-0.040 (0.024)	-0.040 (0.025)	-0.038 (0.025)	-0.043 ^c (0.025)	-0.078 ^a (0.023)	-0.038 (0.058)	-0.053 (0.051)
<i>Log Analyst</i>	-0.030 (0.024)	-0.029 (0.024)	-0.030 (0.024)	-0.031 (0.024)	-0.036 ^c (0.019)	-0.024 (0.039)	-0.037 (0.038)
Group fixed effects	YES	YES	YES	YES	NO	YES	NO
Adjusted R ²	0.497	0.497	0.498	0.496	0.170	0.439	0.157
No. of observations	2784	2784	2784	2784	2784	1300	1300

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

Table IX. Family/Non-Family Group Structure and Operating Returns – Within group regression

The sample is composed of either family or non-family group firms. The dependent variable is EBITDA scaled by the average of year-beginning and year-end total assets (ROA). For each group firm, *Direct Own* (*Direct Control Rights*) is the ownership (voting rights) held directly by its immediate parent(s). *Pyramid Layer* is the number of layers between a group firm and the ultimate owner. *Bottom Firm* is an indicator variable for firms at the bottom of a pyramidal chain. *Bottom New (Old)* is an indicator variable for Bottom firms that are newly listed firms (seasoned firms). *Ult CF Rights* is the ultimate cash-flow rights attributable to the ultimate owner. *Dual-class* (*Cross-holding*) is an indicator variable for those group firms that have dual-class shares (cross shareholdings with other group firms). *Horizontal Structure* is the indicator variable for firms in a purely horizontal group. The following firm-level controls are lagged by one period. *Log Size* is the log of US-dollar market capitalization. *Asset Growth* is the five-year average annual growth rate in asset. *Debt* is total interest-paying debt divided by total assets. *CAPEX* is the ratio of capital expenditures to total assets. *Dividend Yield* is the ex-ante five-year average of the ratio of dividend-per-share to share price. *Intangibles* is the ratio of intangible assets to total assets. *Log Age* is the logarithm of firm age. *Log Analyst* is the logarithm of one plus the number of analysts covering a firm. All regression models include industry sector indicators (based on their first SIC digit). Each of the specifications is estimated first on the full sample, and then on the sample of family-controlled firms. Group-clustered standard errors are reported in parentheses.

	Family Groups				Non-Family Groups		
<i>Direct Own</i>	-0.001 (0.004)	-0.001 (0.005)	-0.001 (0.005)		0.007 (0.004)	-0.001 (0.006)	-0.001 (0.006)
<i>Pyramid Layer</i>	0.013 ^b (0.005)					0.031 ^b (0.015)	
<i>Bottom Firm</i>		0.016 ^b (0.008)			0.026 ^a (0.008)		0.028 ^b (0.012)
<i>Dual-class</i>	-0.021 ^c (0.012)	-0.021 ^c (0.012)	-0.021 ^c (0.012)	-0.025 ^b (0.012)	-0.019 ^c (0.010)	-0.001 (0.022)	0.011 (0.020)
<i>Cross- holding</i>	-0.026 ^b (0.013)	-0.023 ^c (0.013)	-0.022 ^c (0.013)	-0.025 ^c (0.013)	-0.020 ^c (0.011)	-0.048 ^a (0.015)	-0.043 ^a (0.011)
<i>Bottom New</i>			-0.003 (0.016)				
<i>Bottom Old</i>			0.022 ^a (0.008)				
<i>Ult CF Rights</i>				-0.012 ^a (0.004)			
<i>Direct Control Rights</i>				0.008 ^c (0.004)			
<i>Horizontal Structure</i>					0.048 ^a (0.011)		0.031 ^a (0.011)
<i>Log Size</i>	0.010 ^b (0.004)	0.010 ^b (0.004)	0.010 ^b (0.004)	0.011 ^b (0.004)	0.019 ^a (0.003)	0.016 ^b (0.007)	0.011 ^b (0.005)
<i>Debt</i>	0.015 (0.012)	0.015 (0.012)	0.015 (0.012)	0.015 (0.012)	0.021 ^c (0.011)	0.011 (0.023)	0.019 (0.023)
<i>Asset Growth</i>	0.000 (0.011)	-0.001 (0.011)	-0.000 (0.011)	0.000 (0.011)	0.010 (0.012)	-0.008 (0.020)	-0.001 (0.023)
<i>CAPEX</i>	0.228 ^a (0.080)	0.226 ^a (0.080)	0.232 ^a (0.079)	0.228 ^a (0.080)	0.223 ^a (0.065)	0.231 ^a (0.081)	0.194 ^a (0.064)
<i>Dividend Yield</i>	0.004 (0.016)	0.003 (0.016)	0.004 (0.016)	0.003 (0.016)	0.002 (0.006)	-0.053 (0.066)	0.001 (0.096)
<i>Intangibles</i>	-0.031 (0.045)	-0.032 (0.046)	-0.028 (0.046)	-0.033 (0.045)	-0.109 ^b (0.043)	-0.077 (0.133)	-0.007 (0.101)
<i>Log Age</i>	0.005 (0.007)	0.004 (0.007)	0.002 (0.007)	0.005 (0.007)	0.013 ^b (0.006)	0.013 (0.011)	0.022 ^a (0.008)
<i>Log Analyst</i>	0.009 (0.006)	0.009 (0.006)	0.009 (0.006)	0.009 (0.006)	0.012 ^b (0.006)	-0.002 (0.010)	0.010 (0.008)
Group fixed effects	YES	YES	YES	YES	NO	YES	NO
Adjusted R ²	0.551	0.550	0.551	0.552	0.207	0.500	0.148
No. of observations	2666	2666	2666	2666	2666	1257	1257

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

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