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Why Do Family Business Groups Expand by Creating New Public Firms? The Role of Internal Capital Markets

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Keywords: Business Groups, Internal Capital Markets, Financing Constraints, IPOs

JEL Classifications: G32

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1. Introduction

In public equity markets around the world, corporations can take distinctly different approaches to funding investment opportunities with external equity capital. In developed capital markets, publicly listed firms generally rely on sales of additional shares in seasoned equity offerings (SEOs), a process extensively studied in the literature. In contrast, investment opportunities in emerging markets are frequently financed through initial public offerings (IPOs) of divisions or private affiliates of closely held public firms. Such IPOs result in the creation or expansion of a business group, defined as two or more public firms controlled by a common shareholder. Despite the well-documented importance of business groups in many parts of the world,[1] surprisingly little is known about the underlying funding choices that give rise to these corporate ownership structures. We address this gap by analyzing the conditions under which business groups sponsor affiliates going public.

We analyze a newly constructed international dataset that identifies the pre-IPO controlling owners of 12,793 newly listed firms in 44 countries. Our data reveals significant cross-country variation in the extent to which observed IPOs are affiliates of existing listed firms. On average, such "affiliated" IPOs account for more than a quarter of the equity capital raised in emerging markets, compared to only 9% of the equity capital raised in developed markets. One key factor that explains this difference is the extent to which business groups, controlled by wealthy families and individuals, participate in IPO markets. In developed markets, where such groups are sparse, public firms typically use IPOs as means to carve-out corporate divisions, for the purpose of either restructuring their operations or selling off non-core assets. In emerging markets, family business groups frequently utilize IPOs of affiliates, not as divestiture strategy, but as a funding channel to raise outside equity for corporate affiliates under their control. Such affiliates can range from corporate divisions of existing public firms to stand-alone private firms directly owned by the family. Our data shows that in emerging markets, funds raised by IPOs of family group affiliates make up an

[1] See La Porta, Lopez-De-Silanes, and Shleifer (1999), Claessens, Djankov, and Lang (2000), Faccio and Lang (2002), Masulis, Pham, and Zein (2011), among others.

average of 26% of total IPO issuance proceeds, which highlights the economic importance of this funding channel.

The extensive participation of family business groups in global IPO markets raises questions regarding why, in many circumstances, IPOs rather than SEOs are used to satisfy these equity capital needs. The extant business group literature suggests that one important motive for this funding choice is that it reconciles the conflict between raising external capital and maintaining control.[2] Funding a new investment project as a division of an existing public firm can require a large share offering that can seriously dilute the family's control rights in the issuing firm, whereas creating a separate publicly listed firm to raise new equity leaves their control rights in existing public affiliates untouched. This alternative is particularly valuable when a family's control rights are relatively weak and they face restrictions on the use of other control retention mechanisms.[3]

External financing through a new public firm can also benefit a group through reducing the costs associated with its conglomerate activities. Khanna and Palepu (2000) argue that in response to poorly functioning capital, labor and product markets, firms in developing economies tend to leverage their resources and reputation to pursue diverse business activities. However, this creates organizational complexity and opacity, which can be alleviated by funding a group's expansion through a separate firm.[4] This makes the operations of both the new and existing group affiliated firms more transparent, leading to more precise analyst valuations, improved external monitoring, and more disaggregated performance-based

[2] See Morck, Wolfenzon, and Yeung (2005) for a discussion. They offer a pre-war Japanese example in which Nissan's founder explains that creating a group is a solution to the "capitalist's quandary" (the tension between raising external capital for expansion and control retention).

[3] For example, dual-class shares can be restricted by regulations (La Porta, Lopez-de Silanes, Shleifer, and Vishny (1997)). Corporate debt can reduce the need to conduct dilutive equity raisings, but family firms can also be averse to excessive borrowing because it allocates contingent control rights to creditors and raises bankruptcy risk, both of which adversely affect private benefits of control (Roberts and Sufi (2009), Strebulaev and Yang (2013)).

[4] Khanna and Palepu (2000) suggest that a business group's entry into a new industry is mostly carried out by creating a new public firm. Using Indian business groups, they show that while a typical group is diversified (operating in 3 industries), individual group firms are focused, with 80 percent having only one line of business.

management incentives.[5]

However, conducting an IPO to realize the two above-mentioned benefits may not always be possible. To invest in new untested firms, public equity investors often require large price discounts, which can excessively dilute a family's ownership in the new IPO firm and thereby deter it from raising the capital needed to undertake its new investment projects. Such price discounting is especially acute in countries with weak legal and regulatory institutions, so that IPO markets tend to strongly favor fund-raisings by large established firms (La Porta et al. (1997), Braun and Larrain (2009)) where insiders retain large ownership stakes.[6]

Recent theories suggest that family business groups possess a unique advantage in overcoming such new firm financing barriers. The theoretical model of Almeida and Wolfenzon (2006) highlights how available internal capital within a group is utilized as seed money to fund difficult-to-finance investment projects, thereby making it possible for them to eventually access the external equity market. Almeida and Wolfenzon emphasize that a pyramid structure maximizes this financing advantage since it allows a business group to utilize all of the retained earnings of an existing internal-capital-rich public affiliate to alleviate this new firm financing barrier. In a related theory, Gopalan, Nanda, and Seru (2014) suggest that a group's internal capital market facilitates external financing for a second reason: namely that internal capital can be reinvested to help a controlling family retain sufficiently large cash flow rights in its capital-raising affiliates, so as to credibly commit not to divert substantial firm resources for their private benefit.

Applying these theoretical insights to a business group IPO setting generates our central empirical prediction: groups with abundant internal capital are those more capable of supporting external capital raising through the creation of a new public firm.[7] Our predic-

[5] These are also typical benefits of corporate restructuring transactions that lead to split-ups of multi-division firms (see Eckbo and Thorburn (2013) for a review of this literature).

[6] For example, Braun and Larrain (2009) report that the ratio of the average IPO's size to total stock market capitalization in emerging markets is equivalent to 25 times the ratio of the size of Google's IPO to U.S. stock market capitalization.

[7] Our study treats the concept of creating a new public group firm as being equivalent to conducting an IPO for a group entity, but we are agnostic as to its pre-IPO legal form.

tion reflects the theoretical advantage of groups in alleviating external financing constraints of new affiliates, which allows them to broaden their feasible investment opportunity set to include projects that would otherwise find it difficult to attract external equity capital. This is also consistent with the general observation that internal-capital-rich groups actively participate in incubating high growth, capital intensive investment projects.[8] In particular, groups can reallocate internal equity capital to meet the financing needs of major investment opportunities and develop them into large and established private firms or corporate divisions, while continuing to keep them private.[9] When some of these projects outgrow a group's internal capital market and require substantial external capital from public markets, this prior group internal capital support assists them to meet both the minimum scale and minimum insider equity ownership levels required to clear the external financing barriers commonly faced by new firms in the IPO market.

Our comprehensive international dataset combines IPO and business group ownership data to test the above prediction. We document that group-level internal capital accumulation is positively related to the likelihood that a group conducts an IPO. This relationship is driven by not only a group's overall profitability, but also by it limiting dividend payouts by existing affiliates so as to accumulate sufficient internal capital to further support IPOs of their young affiliates. After introducing group-level fixed effects to control for unobservable time-invariant differences across groups, our baseline results remain unchanged.

[8] For example, Khanna and Palepu (2000) observe that, similar to private equity organizations, business groups in emerging markets play a critical role in launching new ventures. Their incubation activity has also been recognized in the strategy literature (see Ramachandran, Manikandan, and Pant (2013)). Several examples drawn from our sample follow. In 1996, the Taiwan-listed Acer group invested $70 million to create Acer Display Technology, an LCD display manufacturer. The venture went public in 2000, raising a further $40 million, and is now a global industry leader. New World China Land (NWCL), a private firm in the Hong Kong-listed New World Development (NWD) conglomerate relied on capital backing from NWD to acquire "hundreds of millions square feet of land in China", a fact prominently featured in the marketing of its 1999 IPO. Pre-IPO financial support can flow from various (in some cases, quite distant) group members. For example, Gigamedia, an Internet provider directly owned by Taiwanese billionaire Jeffrey Koo, also received pre-IPO investments from other public group affiliates, including TCC International, a cement distributor.

[9] Bena and Ortiz-Molina (2013) show that even in the context of private firms, pyramidal structures are frequently used to set up new projects as distinct entities from their parent firm so that they can benefit from a pyramid's financing advantage. They find that private firms set up in this structure display characteristics associated with greater entrepreneurial activity.

A relationship between internal capital and IPOs could arise if they are both correlated with common unobservable time-varying factors. For example, group reputation, investment opportunities and market power may change over time, affecting both their profitability (i.e. internal capital) and ability to conduct IPOs. To address this possibility, we utilize an identification strategy that exploits country-level dividend tax rate changes to generate exogenous variations in internal capital availability. Such tax changes affect the attractiveness of redeploying internal capital among individual group affiliates, rather than distributing it as cash dividends. This tax change also widens the resource gap between internal-capital-rich and internal-capital-poor groups, but at the same time, is not driven by the reputation or investment needs of *individual groups*. Using dividend tax changes across 25 countries, we show that greater internal capital availability triggered by a dividend tax rate rise causes more IPO activity by internal-capital-rich groups, but not by internal-capital poor groups.

The observed aggregate positive relationship between internal capital and group IPOs may appear counter-intuitive given the pecking order perspective that internal capital should be used before raising external capital. One might expect that large amounts of internal capital may free up groups from undertaking any external equity raisings, including IPOs. Given that the scale of a group's investment opportunities is inherently unobservable, our analysis cannot completely discount this possibility. However, employing a battery of additional tests, we go beyond simply providing evidence on the aggregate relationship between group internal capital and IPO activity to analyze the precise conditions that strengthen this positive relationship. We show that these conditions generally match those predicted by extant business group theories.

The first condition we test relates to the existence of *strategic non-financing motives* for raising external capital through a new public firm. Without these motives, a group may simply choose an SEO to meet its external capital needs. We document the existence of two such motives in our sample: groups use IPOs to preserve their voting control of existing group firms and/or to reduce the costs of conglomeration. In relation to control retention, we

show that if all external funds raised in a group IPO were alternatively raised in an SEO of an existing public affiliate, then the family's voting rights in this affiliate would fall on average below the level assumed to confer effective control under country-specific mandatory takeover rules, indicating a significant increase in the risk of losing control. Given this empirical observation, when we condition our baseline analysis on situations where family voting rights are close to this important control threshold, we find a stronger relationship between internal capital availability and the likelihood of an IPO. With respect to conglomeration costs, our data reveals that the typical group IPO firm operates in a different industry from its group parent and has attributes associated with difficult-to-finance investment projects. Under such circumstances, our results indicate that internal capital also plays a more significant role in facilitating an IPO.

The second condition that we test relates to *new firm financing barriers*. When these barriers are high, internal-capital-rich groups are in a comparatively stronger position to help their private divisions go public, whereas groups with limited internal capital are typically forced to raise external equity through SEOs in their established firms or forego the investment opportunity completely. We find evidence that financial support provided by a group's internal capital market is uniquely suited to alleviating the financing barriers of new firms, rather than those of established firms: groups conduct IPOs when they have abundant internal capital, and SEOs when internal capital levels are low. This result also reinforces the conclusion that the relationship between internal capital and group IPO activity does not simply arise because of common factors driving the demand for all types of external equity funding.

To further demonstrate the role of new firm financing barriers, we exploit another type of regulatory shock, namely the introduction of second-tier stock exchanges or separate boards which cater to listing small, high-growth firms. By loosening the minimum size and track record requirements for IPOs, the entry of a new stock exchange triggers exogenous reductions in new firm financing barriers. We find that, following the establishment of a

second-tier exchange, the competitive advantage of internal-capital-rich groups in facilitating IPOs is reduced.

We next analyze the channels through which a group's internal capital market can facilitate IPOs. One way that internal capital can be channeled to new group investment projects is to structure these projects as subsidiaries of existing internal-capital-rich public affiliates. We find that group IPO firms tend to emerge from existing affiliates (parent firms) with high internal capital availability. We also find that when groups use a pyramidal structure, IPO firms tend to be located below a public affiliate where the controlling family holds high ultimate cash-flow rights. This structuring decision then allows controlling families to maintain sufficiently high ultimate ownership interests in IPO firms themselves. According to the Gopalan et al. (2014) model, this is a necessary condition for these firms to successfully raise external equity capital. Another channel through which group investment projects receive internal capital support is through intra-group equity investments by other group affiliates besides their direct parent. We find that such equity investments come from other affiliated firms with high internal capital availability. Since this intra-group support comes from affiliates that are more distant from the IPO firm in the group structure, this result provides an even clearer indication that groups reallocate resources through their internal capital markets to support the creation of new public firms.

Finally, we investigate whether the transaction characteristics of group IPOs reflect the financing advantages they derive from having group support. If such support is valuable, we should observe that group IPO firms are able to limit the extent of costly external capital they initially have to raise, as implied by Almeida and Wolfenzon (2006). Equivalently, sponsoring groups should be able to retain higher ownership levels in IPO firms, as implied by Gopalan et al. (2014). We find that as predicted, family-group IPOs, especially those sponsored by internal-capital-rich groups, raise proportionally less new equity than independent IPO firms. We further document several other beneficial IPO outcomes that support the conclusion that new group firms possess a clear financing advantage in the IPO market. Specifically, groups

IPOs suffer from less underpricing and are less sensitive to market-wide financing constraints than their non-group counterparts, both at the time of listing and in the aftermarket.

Overall, our findings provide new empirical evidence supporting the Almeida and Wolfenzon (2006) theory of pyramidal ownership and its predicted group financing advantages. Their model analyzes a controlling family's decision to raise capital from the equity market for a new firm (Almeida and Wolfenzon, 2006, pp.2643-2645). Group IPO transactions are consistent with this setting.[10] By conducting a transaction-based analysis of several predictions inferred from their model, our study is the first to provide empirical evidence documenting why groups expand by listing new *public* firms. In contrast, Masulis et al. (2011), Almeida, Park, Subrahmanyam, and Wolfenzon (2011), and Bena and Ortiz-Molina (2013) provide evidence in support of the Almeida and Wolfenzon (2006) model by analyzing characteristics of existing public firms and of private firms across different (pyramidal versus horizontal) group control structures.

More broadly, our findings contribute to the long-standing debate on the prevalence of business groups around the world. Some studies suggest that group structures are used by wealthy families to expand their influence and facilitate minority shareholder expropriation, while others contend that groups generate valuable reputation and internal capital benefits.[11] Yet, no study has directly explored why new public firms are spawned by groups. Our study provides new insights into the role that group internal capital plays in facilitating this process, thereby expanding an emerging strand of literature that investigates the channels through which groups support their affiliates (Gopalan, Nanda, and Seru (2007); Gopalan et al. (2014), Buchuk, Larrain, Munoz, and Urzua (2014), Almeida et al. (2015)). The fact that groups rely so heavily on IPOs to raise external capital and expand their organizational

[10] New group firms can occasionally receive co-funding from external investors before going public (e.g. private equity funds and other corporations). However, these investors are likely to possess significant ownership stakes, contracts, and monitoring and control mechanisms that allow them to deal more effectively with the capital raising frictions raised in Almeida and Wolfenzon (2006) relative to public investors.

[11] For example, see Bae, Kang, and Kim (2002), Bertrand, Mehto, and Mullainathan (2002), Baek, Kang, and Lee (2006), Cheung, Rau, and Stouraitis (2006) for evidence on the dark side and Khanna and Palepu (2000), Almeida et al. (2011) and Almeida, Kim, and Kim (2015) for evidence on the bright side.

boundaries underscores the economic significance of the support channel documented in our study and provides a new explanation for why groups are a dominant feature in many equity markets around the world.

2. Existing Theories and Hypothesis Development

2.1. Role of Group Internal Capital in Facilitating IPOs

The Almeida and Wolfenzon (2006) model provides a useful theoretical framework on which to develop our main predictions. Their model focuses on the choice between using a horizontal or pyramidal structure to create a new group firm, but also provides important implications concerning the role that internal capital plays in alleviating new firm financing barriers, regardless of the organizational structure employed. This aspect of the model can be illustrated in the following summary.

The model considers a stylized business group in which a controlling family initially owns fraction α of an existing firm A, and for *exogenous reasons*, wants to create a *new firm* B to fund a new investment project with cost i and revenue r. Firm B can obtain capital both from the group itself and from the *external market*, but it faces financing constraints under the latter option, since outside investors anticipate that some of the revenue r can be diverted to private benefits.[12] Firm A has a cash flow c, and the family can either (1) pay this out as a dividend, where αc is distributed to the family and can be re-invested in firm B (horizontal structure), or (2) have firm A directly invest c in firm B (pyramidal structure). In the model's simplest form, the family can only divert firm B's revenue r up to a maximum level $\bar{d}$ due to the existing investor protection environment, which corresponds to the following payoffs to the family under a horizontal (U^H) versus a pyramid (U^P) structure:

$$U^H = \alpha c + r - i \tag{1}$$

[12] This setting of a competitive external capital market (Almeida and Wolfenzon, 2006, p. 2644) therefore closely resembles the situation of a firm raising capital from public investors in a going public process.

$$U^P = \alpha c + r - i - (1-\alpha)[(1-\bar{d})r - i] \tag{2}$$

Since this extraction of private benefits is expected, outside investors only provide a maximum amount of financing to firm B of $[(1-\bar{d})r - i]$. As a result, the model shows that given the level of funds available to the family, creating firm B is only feasible under a horizontal structure if:

$$\bar{R}^H = \alpha c + (1-\bar{d})r \geq i, \tag{3}$$

and is only feasible under a pyramidal structure, if:

$$\bar{R}^P = c + (1-\bar{d})r \geq i, \tag{4}$$

where $\bar{R}^P$ ($\bar{R}^H$) represents the combined amount of internal and external funds available to firm B under a horizontal (pyramid) structure. The role of group internal capital in facilitating access to the external capital market is described by the conditions embedded in Equations (3) and (4). They imply that as firm A's cash flow c rises, a wider range of states exist where it is *feasible* to create and fund a new firm B by meeting the investment requirement i. It is clear that a pyramid structure has an advantage since the family can direct the full amount of cash flow c (rather αc in a horizontal structure) to support firm B. This is especially true when $(1-\bar{d})r - i < 0$, that is, when firm B's pledgeable NPV is negative (and cannot raise external capital by itself as an independent firm). Under this scenario, the family may still be able to fund firm B within a pyramid structure if c is sufficiently large, and it should actually prefer this option due to its higher payoff ($U^P > U^H$ when $(1-\bar{d})r - i < 0$).

The Gopalan et al. (2014) model offers further insights. Their focus is on explaining intra-group dividend payouts and investments, but they also show that group internal capital markets can facilitate external equity financing by allowing a controlling family to maintain high cash flow rights in their affiliates to moderate expropriation concerns of outside investors. If a cash-poor firm in a group needs to raise external equity, the group can sup-

ply it with internal capital from another cash-rich firm. This support helps the cash-poor firm lower its external financing costs by allowing the family to maintain a sufficiently large ownership stake, where raising additional equity capital might otherwise excessively dilutes its ownership position.

The theories discussed above motivate our main prediction, which is that family business groups with greater internal capital accumulation have, *on the margin*, a greater capacity to take new firms public. It is important to emphasize that this hypothesized positive relationship is not inconsistent with a firm's preferences to use internal capital before seeking external financing. By using internal capital first, before tapping the external capital market, internal-capital-rich groups can expand their feasible investment opportunity set to include investment projects which, by their nature, must be funded internally before eventually requiring an IPO to raise substantially more funds after the investment project is further developed.

One example of such an investment opportunity is a highly capital-intensive project, such as a semiconductor fabrication plant. A group with abundant internal capital has an advantage over other groups and independent entrepreneurs when it comes to undertaking such projects because its internal capital can be used to fulfill the project's initial capital requirements until it becomes possible to seek supplementary funding from public investors. The tendency of business groups to act like incubators provides a further illustration. Here, a group can rely on its internal funds to incubate a large number of highly risky early stage or exploratory projects, akin to purchasing a portfolio of real options. When some of these options move into-the-money and require large-scale financing, having prior internal capital support makes it feasible for them to access the IPO market. In these examples, it is the utilization of internal capital as the first funding avenue that enables subsequent external capital raisings to take place.

There are of course other scenarios where internal capital (or access to debt) can completely meet a group's investment requirements, resulting in the group not requiring any

external capital, including IPOs. It is thus possible for a negative relationship to exist between group internal capital and its IPO activity. Outside of business groups, Leary and Roberts (2005) and Almeida and Campello (2010) document that a firm's dependence on external equity financing is negatively related to its ability to tap internal funds. Thus, an important first step in our empirical analysis is to determine which relationship dominates across our sample; that is, whether internal capital availability facilitates group IPOs or whether it makes such financing superfluous.

The contrasting scenarios outlined above require an understanding of *when* a positive relationship is dominant in our empirical setting. Drawing on the Almeida and Wolfenzon model, we argue that this arises when there are strategic non-financing benefits of creating a new public firm and when there are significant barriers to accessing the IPO market. Our prediction can thus be tested by analyzing variations in these conditions, as elaborated below.

2.2. Strategic Non-financing Motives for Establishing a New Public Firm

The central assumption in the Almeida and Wolfenzon model is that there are exogenous reasons to fund a new firm as a *separate entity*,[13] otherwise, a group can simply obtain financing from SEOs. We consider two non-financing benefits of creating a new public firm that have been frequently raised in the literature.

The first is a founding family's desire to maintain control. When a firm needs to issue new shares, control dilution represents an important cost to insiders who value their private benefits (Zingales (1995), Brennan and Franks (1997)). Prior evidence shows that control considerations affect the choice of equity raising methods (Cronqvist and Nilsson (2005), Wu, Wang, and Yao (2016)). For example, Schipper and Smith (1986) observe that maintaining control is an important motivation for equity carve-out transactions.

This conflict between capital raising and control retention may not be fully resolved by other control retention mechanisms. Non-voting shares can help insiders maintain control,

[13] The Gopalan et al. (2014) model also assumes that new investment opportunities can only be taken by a specific firm within a group, which can be a new firm.

but their issue is often restricted by regulations (La Porta et al. (1997)) and can significantly dilute insider cash flow rights (given the substantial price discounts they generally require). Voting control can be maintained by issuing debt, but this may result in a costly deviation from a firm's optimal capital structure. For family firms, the use of debt is particularly limited because it raises bankruptcy risk, which in turn can threaten a family's future (inter-generational) stream of private benefits of control (Strebulaev and Yang (2013)). Anderson, Mansi, and Reeb (2003) document that family firms tend to have lower agency costs of debt, which is consistent with controlling families giving priority to maintaining their firms' long-term solvency and reputation. This concern is particularly acute for investment projects with limited tangible assets and pledgeable cash flows, where debt funding carries highly restrictive covenants and allocates significant contingent control rights over corporate decisions to creditors (Roberts and Sufi (2009)).

The tradeoff between control and external equity financing features most prominently in the literature that studies financing constraints in international capital markets. For example, Dyck and Zingales (2004) documents a negative correlation between the scope for private benefits of control and external equity financing activity, especially in markets characterized by weak investor protection. In reviewing the reasons for ownership structure differences across markets, Morck et al. (2005) observe that control retention is an important consideration for why new firms are created under a group structure. This observation is consistent with cross-country evidence that groups appear to dominate in less developed financial markets and in capital intensive industries (Masulis et al. (2011), Belenzon, Berkovitz, and Rios (2013)).

The second key strategic benefit that business groups realize by setting up new public firms is to reduce the costs associated with their conglomerate activities. In many international markets, firms tend to take on multiple activities to provide diversification for their large shareholders (Faccio, Marchica, and Mura (2011)) and to leverage the group's reputation (Khanna and Palepu (2000)). However, operating in multiple activities exposes firms

to a conglomerate discount (see Eckbo and Thorburn (2013)). Schipper and Smith (1986) suggest that creating a new public firm from an existing division/subsidiary is a corporate restructuring remedy for the conglomerate discount problem since it allows the investors to better monitor both entities independently. Nanda (1991) further suggests that the same strategy can also help mitigate the underinvestment problem when a subsidiary's investments are more favorably viewed by the market relative to the rest of the firm's assets-in-place. Almeida and Wolfenzon (2006) reach a similar conclusion under an agency theory framework: if a firm operates in different industries with different investor protection parameters, it is optimal to finance these industries separately.

Our analysis explores the importance of the above motives, henceforth referred to as the *control retention motive* and the *efficient conglomeration motive*, in the context of our business group sample. We predict that the relationship between internal capital and group IPO activity should be more significant when these motives are strong, that is, when family control over existing public affiliates is particularly weak and when substantial differences exist in the nature of the IPO firm's assets relative to other group members.

2.3. New-firm Financing Barriers

Another critical condition underpinning a positive relationship between internal capital and group IPO activity is the existence of external financing barriers for new firms. For example, in the Almeida and Wolfenzon model, the effects of these barriers can be illustrated by changes in $\bar{d}$, the parameter for poor investor protection. As $\bar{d}$ increases, the maximum funding from the external market, $(1-\bar{d})r$, declines, and hence, it becomes less feasible to raise sufficient capital for firm B (that is, for the conditions embedded in Equations (3) and (4) to be satisfied). When this occurs, group internal capital, c, plays a more critical role in assisting firm B in successfully raising external funding.

Based on this observation, we form additional predictions about how variations in external financing barriers affect the value of group internal capital support for IPOs. In our empirical context, external financing barriers can differ between new and established group firms. In

the law and finance literature, concerns about the adequacy of outside investor protections are especially pronounced for new firms seeking to go public (see La Porta, Lopez-de Silanes, and Shleifer (2006) for a review and evidence). We thus predict that the benefits of group internal capital on its ability to access external capital become more critical when private group affiliates undertake IPOs, compared to existing public affiliates undertaking SEOs. In our empirical context, external financing barriers can also vary with regulations, especially those that restrict the ability of equity markets to allocate capital to certain types of new firms. We predict that when these restrictions become less binding, the role of internal capital in supporting group IPO activity should also weaken.

3. Data and Sample Characteristics

3.1. IPO Sample and Identification of IPO Ultimate Owners

Our initial sample consists of international IPOs completed between January 1997 and December 2007 taken from *Thomson Reuter's SDC Platinum* and the *Bureau Van Dijk's Zephyr* databases and *Bloomberg* for IPOs not covered by *SDC Platinum*. A number of our empirical tests examine these IPOs for up to 5 years after their listing, so our sample effectively ends in December 2012. From this combined sample, we exclude IPOs involving investment funds, partnerships, trusts, non-common stock offers and offers that raise less than US$0.5 million.[14] The last criterion effectively excludes back-door listings, spin-offs, split-offs and demergers, which do not raise new capital.

We then apply a systematic procedure to identify whether an IPO firm is group affiliated by determining whether it is controlled by an existing business group or if its listing results in the formation of a new business group. We define a business group as two or more publicly listed firms linked by a common controlling shareholder, defined as the largest shareholder who holds a minimum of 20 percent of voting rights, or 10 percent if the shareholder is also

[14] Our initial base sample comprised of 13,506 IPOs which is equivalent to other cross-country studies. Boulton, Smart, and Zutter (2010) cover 4,462 IPOs from 2000 to 2004. Caglio, Hanley, and Marietta-Westberg (2016) cover 17,808 IPOs over a longer sample period (1995-2007).

a founder, CEO or board chair. As a starting point, our procedure relies on the dataset used in Masulis et al. (2011), which provides a group affiliation snapshot of 28,635 listed firms from 45 countries in 2002. We match each IPO firm going public prior to or during 2002 to firms of known business groups in 2002, and then cross-check this list with other data sources (*SDC Platinum*, *Factiva*, company websites and *Google* searches) to ensure that a firm does not become a group affiliate through a post-IPO acquisition. Merging the two datasets restricts our final sample to firms in 44 countries.

Firms delisted before 2002 and those listed after 2002 do not appear in the Masulis et al. (2011) dataset, so we determine their group affiliation status through their pre-IPO controlling entities. Pre-IPO controlling shareholder information is available for some IPOs in *SDC Platinum* (or *Zephyr*). For the remainder, we identify the controlling shareholder using a comprehensive set of ownership databases (*Bureau van Dijk Orbis*, *Thomson Reuters Worldscope*, *Thomson Reuters Global Ownership*, *Factset Lionshares* and *Taiwan Economic Journal*), and manually from stock exchange / securities regulator websites, *Factiva* news articles around the time of listing, and company prospectuses and annual reports. In cases where the controlling shareholder can only be identified immediately after listing, we assume that the same shareholder also has control just prior to listing. Identified controlling shareholders are then traced to a business group using the same ultimate owner identification procedure as in Masulis et al. (2011).

Our final sample consists of 12,793 IPOs from 44 countries, for which the ultimate controlling owner at listing can be clearly identified. Table 1 provides a breakdown of this sample by country and by type of controlling shareholder. An IPO firm is categorized as (1) affiliated with a family group (controlled by a family/entrepreneur), (2) affiliated with a non-family group (controlled by a widely-held company, financial institution or government body), (3) unaffiliated with a group, but having a controlling shareholder, or (4) widely held. We then investigate all disclosed blockholdings in each IPO in the first category to ensure that the controlling family and existing group affiliates together hold dominant control of

the IPO firm before it goes public. Any IPO firm that is a joint venture between a group and other unrelated entities is classified as category 3.

[Insert Table 1 Here]

Our sample is the first comprehensive dataset of IPO ownership around the world, on average representing 96% of the initial sample of IPOs (that satisfy our sample criteria) in each country. This allows us to provide several important new statistics about the global IPO market. A sizeable component of this market (15% of the global number of IPOs and 31% of the total global IPO proceeds in our sample) are listings that are not IPOs in the traditional sense (that is, new firms owned by independent entrepreneurs), but rather new firms affiliated with existing listed firms, including IPOs controlled by (family and non-family) business groups and IPOs carved out of divisions of widely held corporations. Examining the proceeds of these "affiliated" IPOs relative to SEO proceeds of existing listed firms reveals marked differences across markets.[15] Between these two options, affiliated IPOs in a developed market make up on average only 9 percent of the combined offer proceeds, whereas in an emerging market, this average rises to 26 percent. Importantly, the majority of affiliated IPOs (57 percent) are sponsored by family business groups. As a result, these groups are an important player in the global IPO market, accounting for about 19% of the aggregate proceeds raised by IPOs in each country. However, this concentration is much higher in many emerging markets (for example, rising to more than one third in Argentina, Indonesia, Israel, Peru, Philippines, Thailand, and Turkey).

3.2. Business Group Data and Measures of Group Ownership Structure

In addition to IPO ownership data, we collect annual snapshots of the membership, organizational structure, and shareholdings for each business group over our sample period. Again using the Masulis et al. (2011) data as the starting point, we track how a group

[15] Global SEO data are obtained from *SDC Platinum* and *Bloomberg* using the same selection criteria applied to our IPO sample and excluding share issues due to dividend reinvestments, option exercises, and debt conversions. Emerging markets are defined as those covered by the *S&P Emerging Markets* database as of 2002.

evolves over time through the following events: (1) IPOs of group affiliates as discussed above, (2) spin-off and M&A transactions (from *SDC Platinum*) that result in additions of new affiliates and sales of control in existing affiliates, and (3) delistings of group firms (from *Datastream*), which should also capture bankruptcies. Next, we use information on controlling shareholder identities and ownership linkages between listed firms available on a yearly basis in the *Orbis*, *Worldscope*, *Global Ownership*, and *Lionshares* databases to identify additional group firms and group membership changes not identified in the previous step. Overall, the above procedure yields a total of 1,397 family groups (4,567 firms) and 510 non-family groups (2,449 firms) over our sample period. To the best of our knowledge, this is the most comprehensive global business group data that has been used in the literature. Prior studies tend to focus on groups in a single country, and only a few studies employ a panel dataset to examine groups over time (Gopalan et al. (2007), Almeida et al. (2011), and Buchuk et al. (2014)).

For each family group firm, we also collect detailed ownership information over our sample period, including total percentage shareholdings and associated voting rights held by the controlling family and other firms in the group. The ownership databases mentioned above are our primary data sources. These are supplemented with hand-collected ownership information from annual reports and regulatory filings of group firms and their parents.[16]

We construct several standard group ownership measures. The first is family control rights, calculated by aggregating the percentage voting rights held in a group firm by the family and all other group members. The second measure is family ultimate cash-flow rights, calculated for a group firm by first obtaining the product of all the percentage shareholdings connecting the listed firms along a control chain and then aggregating these products across all the chains. The third measure is the pyramid layer position of a group firm, computed as the minimum number of listed firms that separate the firm from its controlling family.

[16] For cases where we obtain data manually, we only collect shareholdings for (1) 1997 or the year when the firm first joins the group if this is earlier, (2) 2007 or the year when the firm leaves the group if this is later, and (3) each 3-year interval in between. We then linearly interpolate the ownership variables for the years within these intervals.

Combining the business group and IPO data shows that IPOs are an economically important form of equity capital raisings for family groups, on average accounting for 40 percent of the total equity capital they raise annually (through both SEOs and IPOs). IPOs are also the most important mode of group membership expansion, on average accounting for 72 percent of all new public firms added to a group (the other modes are acquisitions, demergers, and spin-outs).

3.3. Characteristics of Group-affiliated IPO Firms

We document key characteristics of family group IPO firms and other existing firms within their group. This helps us demonstrate the strategic non-financing motives for creating a new public firm in a business group context. On the control retention motive, Panel A of Table 2 shows that group IPO firms are tightly held, with the median family control rights measure (54%) exceeding an absolute majority and significantly higher than the same statistic for other existing public firms (by 11%). We also examine post-listing corporate control turnover of an IPO firm in the first 5 years after listing.[17] Only 4.5% of family group IPO firms experience a change of control, which is significantly less than non-family group IPO firms and non-group IPO firms. These results indicate that for family business groups, IPOs are not generally a means to divest control, but instead allow groups to retain control over new investment projects.

[Insert Table 2 Here]

We next explore how creating a new public firm helps controlling families preserve control over other existing group firms. To do this, we assign each group IPO firm a "parent" firm. For an IPO carved out of a division of an existing listed firm (in a pyramidal structure), this firm is easily identified as the immediate parent. If an IPO is directly held (or held through a private holding company) by the controlling family, we define the parent as the largest

[17] This information is collected from SDC Platinum, and includes (1) spin-offs and negotiated control sales, (2) full mergers and acquisitions, and (3) partial acquisitions that result in the emergence of a new controlling shareholder. This follows the Dyck and Zingales (2004) approach and our group identification procedure. In defining a control change for a group IPO, the acquirer must not be from the same group.

existing listed firm in the group. This allows us to show what would happen if the observed IPO firms were instead funded as divisions of their assigned parent firms.

Panel B of Table 2 reports that in median terms, the family control rights measure for the assigned parent firm of a group IPO firm is quite low, at only 35%. In fact, controlling families hold absolute majority voting rights over these parent firms in only 25% of cases. To demonstrate control retention concerns more clearly, for each actual group IPO transaction, we calculate the number of new shares the parent would need to issue if the IPO did not occur and the parent raised the same amount of new equity capital through an SEO instead.[18] As going public can be viewed as an extended process, we further include in this calculation all additional equity capital raisings that the IPO firm conducts during the first 5 years of its listing.[19] Under this hypothetical scenario, we find that the family would on average suffer a 48% percent dilution of its ownership stake. The median family control rights in the parent would fall to 26.6%.

To put this hypothetical control dilution issue into perspective, we compare our counterfactual post-SEO family control rights to a country-specific control threshold. Following Dyck and Zingales (2004), we use the mandatory takeover threshold of each country as the point of comparison. This is defined as the ownership threshold after which a block shareholder is required to make a tender offer for all minority shares at a common price. A controlling family would want to keep their voting rights above this threshold otherwise a rival shareholder can amass a competing stake of similar size without having to make a mandatory offer. Equivalently if the family's stake fell below this threshold, it can be costly for them to raise their ownership above the threshold to defend against a potential hostile takeover, as a mandatory minimum size tender offer is then required.[20] Panel B shows that

[18] We do this by assuming that the offer price of the hypothetical SEO is set at the average price of the parent firm's shares over the 20-day period before the issue date of the actual IPO. SEOs are generally priced at a discount, so we actually understate the potential dilution.

[19] Iliev and Lowry (2017) show that 68% of US IPO firms raise additional capital within the first five years.

[20] We provide details regarding these country-specific thresholds and our data sources in a separate Internet Appendix (Table A1)

the current median family control rights in the parent firm of an IPO is about 7% higher than the corresponding domestic control threshold. However, under the hypothetical scenario that the parent firm conducts SEOs to fund the would-be IPO firm, the median family control rights in the parent would fall below the threshold.

Panel C of Table 2 presents evidence pointing to the efficient conglomeration motive discussed in Section 2. Our general observation is that a group IPO firm is very different from the remaining firms in the group. Firm characteristics that we examine are firm size, measured by total assets and market capitalization at listing, firm riskiness measured by the standard deviation of first-year weekly stock returns, firm age since incorporation, as well as capital expenditures, cash net income, and intangible assets scaled by total assets. We find that group IPO firms have greater risk and CAPEX intensity, and less profitability and tangible asset intensity than other existing group members. In addition, group IPO firms tend to operate in a different industry from those of their sponsoring group members. We compare the primary two-digit SIC code of each IPO firm to that of its assigned parent (using the same definition as above) and they differ in about 70% of cases. Even if we use a one-digit SIC industry sector classification, this difference remains strikingly high at 52%. In summary, the typical characteristics of group IPO firms appear to justify their status as a separate public firm, given that they tend to be in different industries, they are more capital intensive and harder to monitor than the other firms in the same group.

We also compare group IPO firms to non-group IPO firms in the same country. The results reported in Panel C of Table 2 show that the median family-group IPO firm is almost twice the size of a typical non-group IPO firm. After matching on size and listing conditions, [21] we find that family group IPO firms tend to be younger, have lower profitability, greater investment intensity and more intangible assets than their matched non-group peers. Thus, group IPO firms appear to take on investment projects with much greater funding

[21] This is based on firms with similar size (from 90% to 110% of US-dollar market capitalization) and listed in the same IPO market conditions (defined for each IPO as either 'hot' or 'cold' depending on whether the number of IPOs in the country from 6 months before to 6 months after its listing date exceeds the average annual IPO number)

requirements and with characteristics that would make it difficult for them to independently raise external finance. Consistent with our prediction, it is these types of firms that should benefit the most from a group's internal capital support in facilitating an eventual IPO.

4. Internal Capital and IPO Decisions at the Group Level

4.1. Aggregate Relationship between Group Internal Capital and IPOs

To test our main hypothesis, we estimate several panel regressions where the unit of observation is a group-year. Group-year data points are created by aggregating data each year across all listed member firms for each group in the sample. For each group-year, the dependent variable is equal to one if the group conducts an IPO for which the listing date is within six months of the fiscal year-end date, and zero otherwise. The main explanatory variables are related to group-level internal capital accumulation through two components of retained cash earnings: net income before dividends paid and received, excluding depreciation, amortization, and impairment charges (*GRPINCOME*), and cash dividend distributions (*GRPDIVIDEND*).[22] Both variables are scaled by the corresponding year-opening total asset values.

As discussed in Section 2, IPOs can be precipitated by the control retention or efficient conglomeration motives. To control for the first motive, we use the market-capitalization weighted average of the family's voting rights in its existing member firms (*GRPCONTROL*). We also include a measure for the extent of pyramiding in a group, computed as the market-capitalization weighted average pyramid layer of its member firms (*GRPPYRLAYER*). To capture the second motive, we use a measure of the industry diversity of the *existing listed* member firms in a group. We identify the one-digit SIC industry sector of each listed firm in a group and compute a Herfindahl index (*GRPHERFINDAHL*) to determine the industry

[22] Some groups can rely on incomes from private firms, but to the extent that they are subsidiaries of other public firms, their internal capital contributions are already be reflected in our measures. It is possible that controlling families directly own private operating firms where we do not have data. However, they are not directly relevant to our hypotheses, which focus on how families can mobilize resources attributable to shareholders of public firms under their control to support a new firm's financing needs.

concentration for the whole group. This measure captures the possibility that groups create a new listed firm to take on a new business activity (Khanna and Palepu (2000)). Therefore, a group that already operates a structure in which each firm takes on a different industry (a low *GRPHERFINDAHL* value) may no longer have a clear need to create new firms. In contrast, a group with a high industry concentration of listed firms may have a greater need to fund new investments under a new public firm, possibly to help the family diversify and to leverage group capabilities across industries.

Any relationship between internal capital and IPO activity may simply reflect their underlying correlations with general equity financing needs. While we address this issue more rigorously later, at this stage, we use several observable financial characteristics of a group to control for its demand for external equity. Our regression analysis includes the following variables, again measured at the group level: Tobin's Q (*GRPQ*), capital expenditure intensity (*GRPCAPEX*) and debt-to-asset ratio (*GRPDEBT*).[23]

Finally, we consider other conditions that may make IPOs more feasible. We control for any potential size effects using the number of listed group firms (*GRPNOFIRMS*) and the average of the natural logarithm of each affiliate's total assets (*GRPFIRMSIZE*). Established groups may use their reputation to ease external financing constraints so we include group age, computed as the natural logarithm of the listing age of the oldest group firm (*GRPAGE*). For the same reason, we include an indicator (*GRPFINMEMBER*) for groups that have an affiliate operating in the finance industry.[24] To account for variations in IPO market conditions, we compute for each country its MSCI stock index return (*MKTRET*) and the number of IPOs in a given year scaled by the total number of IPOs (*IPOVOL*).

Table 3 present the results. In Column 1, we estimate a random effects logit model, where unobserved group effects are assumed to be uncorrelated with model errors. In Column 2,

[23] Pagano, Panetta, and Zingales (1998) also show that IPOs can be motivated by debt repayment motives.

[24] As an alternative proxy we use an indicator variable for whether a group has hired a top-tier IPO underwriter for one or more equity offerings (SEO or IPO) in the prior 3 years. Top-tier IPO underwriters are defined as those in the top quintile of lead underwriter market share of aggregate domestic IPO proceeds in the same country over the sample period, or among the top ten in the world in aggregate global IPO proceeds. Our results are qualitatively unchanged if this alternative control is used.

we impose country-year fixed effects so that our estimates are only due to variations across groups in a country and year.[25] The results from both models strongly support the proposition that internal capital availability facilitates the going public process of group entities, as both *GRPINCOME* and *GRPDIVIDEND* are significant in explaining the likelihood of a group IPO.

[Insert Table 3 Here]

Confirming the results in Table 2, the estimates in Table 3 are consistent with the presence of both control retention and efficient conglomeration motives. Both *GRPCONTROL* and *GRPHERFINDAHL* are consistently significant in their expected directions. Groups are more likely to conduct IPOs when family control rights over existing affiliates are low and are less likely to do so when their structure is already highly diversified.

With respect to the control variables, we find that groups with higher growth opportunities (*GRPQ*) and low debt levels (*GRPDEBT*) are also more likely to expand through IPOs. This may simply reflect that these groups have higher equity financing needs. The negative coefficient of *GRPDEBT* may also indicate a possible limit to using debt to maintain corporate control. Certain groups may have a preference for low debt levels (possibly due to concerns over covenant violations and bankruptcy that threaten their private benefits), and as a result they tend to raise external equity through an IPO to preserve their private benefits of control.

We next impose group fixed effects and estimate a conditional logit model predicting which year a group conducts an IPO (Column 3).[26] This analysis accounts for any time-invariant unobservable differences across groups (such as family talent and reputation) that could explain why some groups tap the IPO market while others do not. We find that the

[25] Due to the incidental parameters problem associated with a large number of fixed effects, we use conditional logit estimation (Chamberlain (1980)) for all logit regression models that incorporate fixed effects. See Dyck, Morse, and Zingales (2010), Fracassi and Tate (2012), and Bena and Li (2014), who also apply this method.

[26] In this setting, we drop *GRPDUALCLASS* due to its lack of time variation and *GRPNOFIRMS* and *GRPAGE* due to their correlation with the time dimension.

positive relationship between internal capital availability and IPO likelihood is still observed when considering only time variations. In Column 4, we incorporate both group fixed effects and country-year fixed effects and find that the results remain unchanged.[27]

4.2. Identification Strategy

To identify the impact of internal capital accumulation on group IPO activity, we utilize a quasi-natural experiment that generates an external shock to a firm's internal capital. Specifically, we focus on changes to a country's dividend tax rate. Such tax changes are shown to directly affect corporate payouts (Chetty and Saez (2005)) and thus, the availability of a firm's internal capital. However, they are unlikely to generate systematic differences in incremental underlying investment opportunities across firms through other channels.[28] In the business group context, we argue that the incentive to retain earnings as internal capital increases following a dividend tax hike. Similar to the empirical design in Becker et al. (2013), we exploit the fact that this increase in internal capital differs across groups depending on their cash flow generating abilities. That is, according to our hypothesis, an exogenous shift in payout incentives should have a greater impact on more profitable groups in terms of their ability to support their IPO candidates.[29]

Our test utilizes an effective dividend tax rate measure constructed each year for 25 of our sample countries by Jacob and Jacob (2013) and Becker et al. (2013).[30] This measure takes into account country-specific imputation credits and tax exemptions. In our analysis, it is defined for each country-year as either (1) an indicator for whether the dividend tax rate in a given year is above the country's sample period median tax rate ($DIVTAXHIGH$) or (2) the actual tax rate ($DIVTAXRATE$). We then estimate a model akin to a difference-in-

[27] To incorporate high-dimensional fixed effects, the model is estimated as a linear probability model.

[28] This rationale follows Becker, Jacob, and Jacob (2013), who discuss the advantages of using dividend tax changes as an external shock. They provide detailed justifications from a political economy perspective for why changes in dividend tax rates are unlikely to be motivated by differences in investment decisions across individual firms.

[29] The same identification strategy is also used in other contexts, such as executive compensation (Brown, Liang, and Weisbenner (2007)) and corporate philanthropy (Masulis and Reza (2015)).

[30] We also construct DIVTAX using another dividend tax rate measure used in these studies that reflects the relative importance of dividends vis-à-vis share repurchases, but our results are unchanged.

difference specification in which the dividend tax variable is interacted with the group's cash income measure (*GRPINCOME*), controlling for group and country-year fixed effects.[31,32]

Table 4 report these findings. Regardless of whether the dividend tax variable is an indicator variable or the actual tax rate, the coefficient of its interaction term with *GRPINCOME* is significantly positive. In other words, when a group's cash net income position is high, a rise in the dividend tax rate, which makes retained earnings more attractive, leads to a higher likelihood of an IPO (and vice versa). Thus, consistent with our prediction, a macro policy shock to the value of retained earnings amplifies the positive impact of a group's internal capital accumulation on its member firm's ability to access to the IPO market. We also conduct a placebo test by re-estimating the models (see Columns 5 and 6) using tax changes from a neighboring country (defined as another country in the Jacob and Jacob (2013) sample with the nearest capital city). We find that the interaction of *DIVTAX* and *GRPINCOME* is no longer significant. Overall, the results using this identification strategy are in line with those reported in our baseline analysis.

[Insert Table 4 Here]

4.3. The Role of Strategic Non-financing Benefits of Creating a New Public Firm

In this section, we test whether the relationship between internal capital availability and IPO likelihood is accentuated when groups have strategic non-financing reasons to raise equity capital by means of a new firm, as discussed in Section 2. First, we examine how this relationship varies when the control retention motive is present by interacting the *GRPCONTROL* variable with our key measure of group internal capital, *GRPINCOME*. The results reported in columns (1) and (2) of Table 5 show that the coefficient for this interaction is

[31] *GRPDIVIDEND* is not included in this test because dividend policies are directly affected by dividend tax changes (Chetty and Saez (2005))

[32] This and other discrete choice regressions in our study that incorporate interaction terms are estimated as linear probability models. Ai and Norton (2003) show that in non-linear models such as a logit model, both the economic magnitude and statistical significance of an interaction term may not equal its coefficient and t-statistic respectively. Thus, linear probability models are a commonly used alternative (see for example, Puri, Rocholl, and Steffen (2011) and Cornelli, Kominek, and Ljungqvist (2013) for applications in other contexts.

consistently negative and statistically significant across all models. This indicates that the ability of internal capital to explain the propensity to conduct an IPO is stronger among groups where the controlling family has relatively weaker control over existing member firms.

The above approach assumes that the degree of control is proportional to voting rights. However, corporate control can be quite discrete and tends to be more critical around certain thresholds. Calibrating a family's voting rights to such a threshold can offer a more precise way of measuring the precariousness of the family's control. Similar to the analysis in Table 2 , we again employ the national mandatory takeover offer threshold applicable to each group to generate an objective, country-specific control benchmark, and rerun the above regression analysis for two scenarios: whether *GRPCONTROL* is above or below the threshold. The results reported in Columns (3) and (4) show that when *GRPCONTROL* is above (below) the threshold, the interaction *GRPINCOME*×*GRPCONTROL* is significantly negative (positive). This indicates that far above the threshold, the relationship between internal capital and IPO activity is less positive, as families are not strongly concerned about a potential control loss. The relationship is also less positive when *GRPCONTROL* is well below the threshold, perhaps because families in these situations have already adapted to operating with low control rights. An equivalent interpretation of the result is that families are most concerned about the voting rights dilution effect of an SEO when their current control of existing group firms is just around the relevant threshold. In this case, the role of group internal capital in facilitating IPO activity becomes more important.

[Insert Table 5 Here]

We next turn our attention to the efficient conglomeration motive. To examine how our main results vary with this motive, we interact *GRPINCOME* with *GRPHERFINDAHL*. Columns (5) and (6) show that the interaction terms are positive and significant. This indicates that the role of group internal capital is more positive when a group has a more pressing need to establish new public firms to cater for its diverse operations. We also extend

our baseline regression analysis to incorporate two alternative scenarios: whether a group IPO firm is in the same (2-digit SIC) industry or in a different industry to its parent. This analysis is conducted using a multinomial logit regression. The results in Column (7) show that for out-of-industry IPOs, the GRPINCOME variable is significant in explaining IPO likelihood, whereas for the same-industry IPO alternative, this variable is less significant. This indicates that when a group's expansion into new industries is an important motive for setting up a new public firm, as first documented in Khanna and Palepu (2000), internal capital plays a more significant role in aiding the IPO process.

4.4. The Role of New Firm Financing Barriers

We next examine whether group internal capital markets play a particularly important role in facilitating an IPO when new firm financing barriers are high. To test this prediction, we compare our previous findings on IPOs with cases where groups conduct SEOs for existing affiliates. Specifically, we estimate a multinomial logit model incorporating the options of conducting an SEO, an IPO, or foregoing any capital raising. The results are reported in column 1 of Table 6. The coefficients of the internal capital variables show that the likelihood of a group choosing an IPO rises with its capacity to accumulate internal capital, and the likelihood of an SEO falls with this accumulation capacity. The results indicate that internal capital accumulation provides benefits that are unique to raising capital through an IPO.

[Insert Table 6 Here]

To directly compare IPOs to SEOs, we exclude observations where the group does not conduct any equity offers. This model of the choice of equity capital raising methods helps us rule out a number of alternative explanations. For instance, groups may opportunistically raise capital to take advantage of positive earnings shocks that coincide with some underlying investment needs. If this is a dominant explanation, then it should apply to all means of raising equity capital and not the choice of SEOs versus IPOs. By examining this choice alone, we are also able to impose the condition that a group requires external equity capital

and eliminate circumstances when a group's demand for capital can be fully met by internal financing or through additional borrowing. Given these considerations, the results reported in columns (2) and (3) of Table 6 again show that internal capital support has a more important role in explaining IPO activity relative to SEO activity. The regressions also incorporate the interaction between *GRPCONTROL* and *GRPINCOME*. This interaction term is negative and significant, reinforcing the earlier results in Table 5 related to the control retention motive, but more specifically in the context of IPO versus SEO choice.

As another way of evaluating how the IPO support role of group internal capital varies with new firm financing barriers, we analyze changes in these barriers that are explicitly imposed by regulators. Specifically, we examine the introduction of a second-tier board or exchange (commonly known as an "SME market"). In many countries, the main exchanges impose serious hurdles on emerging new firms seeking to go public through their demanding listing standards. To list, new firms are often required to satisfy strict asset size, profit record, and number of shareholders criteria. These prescriptive, historically designed requirements often become entrenched in the operations of main exchanges, serving to protect their reputation with market participants, intermediaries, and firms (Macey and O'Hara (2002), Chemmanur and Fulghieri (2006)). New firms with characteristics that do not fit these requirements may find access to public equity funding severely restricted and may need to remain private for longer periods. A second-tier exchange caters for such small, high-growth firms by easing the main exchange's listing requirements, and in some cases, replacing them with more efficient bonding mechanisms, such as stronger financial disclosure standards and longer lockup periods of insider shares.

We use the introduction of a second-tier exchange to define a regulator-imposed shock to new firm financing barriers.[33] One benefit of using this type of shocks is that they tend to be externally driven, as exchanges try to emulate successful experiences from other countries (such as the Alternative Investment Market in the UK), and that their timings in differ-

[33] Details on when secondary stock exchanges were established are provided in Table A1 in the Internet Appendix.

ent countries are reasonably staggered across our sample period. We argue that prior to such an event, external funds that equity markets can allocate to new firms are restricted, and hence, private group affiliates need to be incubated for a longer period before they can develop characteristics that comply with strict main-exchange listing requirements. This results in barriers that favor groups with greater internal availability. In columns (4) and (5), we re-estimate our baseline regression model incorporating the interaction between *GRPINCOME* and the indicator variable for the period after a second-tier exchange introduction. The coefficient for this interaction is negative, indicating that the positive effect of internal capital on group IPO likelihood is weakened in the post-event years. Our results are robust to controlling for all underlying economic factors that may lead to the creation of new exchanges through year or country-year fixed effects. Thus, after new firm financing barriers are reduced, group internal capital markets appear to play a lesser role in facilitating access to the IPO market.

4.5. Other Unreported Group-level Results

Non-family Groups: Thus far we have focused on family groups, but it is important to emphasize that our main results are much weaker for non-family groups. This difference is expected since the internal capital support channel should only work in organizational structures with clear hierarchical control. However, in non-family groups, control retention considerations are not as important and the power necessary to make capital allocation decisions across group affiliates is perhaps weaker than in family groups.

Alternative Internal Capital Measures: In our baseline analysis, we capture the availability of group internal capital using the rate of yearly additions to retained earnings. Since these variables could be sensitive to temporary spikes in retained earnings, we also calculate our internal capital variables using prior 3-year averages and find that our results (not reported) are qualitatively similar. In another unreported test, we investigate whether the negative coefficient of *GRPDIVIDEND* is due to an abnormal dip in dividends in the IPO year. Examining changes in group dividend payouts around each IPO, we find that on av-

erage dividend rates during the three years prior to the IPO are lower than the rates in the subsequent three years. Another possible concern is that the relationship between an IPO's likelihood and internal capital accumulation is driven solely by strong pre-IPO profitability of group affiliates going public. To address this concern, we collect pre-IPO earnings of group IPO firms (available for about 80% of our sample) from *SDC Platinum* and *Worldscope*, and then remove this component from *GRPINCOME*. We then re-estimate the regressions of Table 3 (excluding groups where we cannot obtain pre-IPO earnings). The results (not reported) are qualitatively unchanged.

5. Channels of Internal Capital Support for IPOs

In this section, we explore how family business groups operate their internal capital market to support the external financing needs of their emerging private entities by analyzing which existing group firms are intimately involved in a group IPO. One main channel described the Almeida and Wolfenzon model is to set up capital intensive projects as subsidiaries of existing cash rich members to fully utilize the financing advantage of a pyramidal structure. It follows that in a pyramid, firms with greater internal capital are more likely to be the immediate parent of an IPO firm. In addition, a group's controlling family can also direct other group firms to employ their internal capital to co-invest in the private subsidiaries being incubated by another affiliate. Thus, we expect that a potential IPO candidate can also obtain support from multiple internal-capital-rich group members before going public.

The Gopalan et al. (2014) model provides another insight regarding which firms within a group are likely to be the parent of an IPO firm. They argue that internal capital markets can facilitate external capital raisings by allowing the controlling family to maintain a large ownership position in a capital raising firm to allay the expropriation fears of outside investors. This means that when choosing an existing public firm to incubate a potential future IPO firm or to have one of its divisions carved out to go public, the family should take into account the ultimate cash flow rights it holds in the existing firms. By choosing a

parent firm in which it has the largest cash flow rights, the family is also able to maximize its ultimate cash flow rights in the new IPO firm, thus alleviating expropriation concerns of potential IPO investors and reduce its external financing costs.

5.1. Characteristics of an IPO Parent

We test the above predictions at the group-firm level, using a panel data set of group firms and years. The dependent variable is an indicator variable that equals one in years where a group firm is an immediate parent to a group IPO firm going public. The explanatory variables are similar to those in Table 3, except that they are calculated for each existing group firm in a given year. In addition to using firm-level measures of internal capital, namely net cash income (*PARENTINCOME*) and dividends (*PARENTDIVIDEND*), we also examine variations in control rights (*PARENTCONTROL*) and ultimate cash flow rights (*PARENTULTCF*) held by the controlling family in each group firm.

Column 1 of Table 7 reports estimates of a conditional logit regression model with group fixed effects. Consistent with the implication that we draw from the Almeida and Wolfenzon model, the regression estimates indicate that within a group, the level of a firm's internal capital availability plays an important role in predicting whether it becomes an IPO parent. We also find that consistent with the implication drawn from the Gopalan *et al.* model, existing group members with high family ultimate cash flow rights tend to become IPO parents. Further, existing members with relatively low family control rights are also more likely to be IPO parents, since raising equity capital through a parent SEO can threaten family control. Taken together, these two results imply that apex firms at the top of a pyramid are likely to become IPO parents since: (1) the family's voting rights over these firms tends to be low, but they are critical for maintaining control of the whole group, and (2) they are also where the family possesses higher ultimate cash flow rights compared to other affiliates in lower pyramidal layers.

[Insert Table 7 Here]

In Column 2 of Table 7, we replace group fixed effects with group-year fixed effects. This stricter test only considers variations in firm characteristics across existing group members in the year in which a group has an IPO event. Effectively, it shows which types of group firms tend to be IPO parents, controlling for all factors affecting the whole group in a given year. Our results remain robust in this specification. In Column 3, we employ firm fixed effects and again find that the likelihood of a group firm bringing a subsidiary public rises in years with relatively high additions to retained earnings. Due to low within-firm (over time) variability, *PARENTCONTROL* and *PARENTULTCF* are insignificant in this specification.

We examine the choice that a group firm faces between undertaking a subsidiary IPO or an SEO of its own shares in in Column 4 (with group fixed effects) and Column 5 (with group-year fixed effects) of Table 7. The second specification considers only within-group variations in cases where a group has at least one firm conducting a subsidiary IPO and another firm conducting an SEO in a given year. Again, consistent with our interpretations of both the Almeida and Wolfenzon and Gopalan *et al.* models, high retained earnings and family ultimate cash flow rights result in a firm choosing to sponsor an IPO over undertaking an SEO.

5.2. Internal Capital and Intra-group Investment in IPO Firms

We next examine the types of existing group firms selected to provide pre-IPO funding to a group IPO firm in addition to its parent. We hand-collect these data to identify cases where an IPO firm has equity stakes held by multiple group affiliates.[34] A novel feature of this analysis is that unlike examining which firm takes its subsidiary public (as in the preceding analysis), here we can provide more direct evidence of internal capital market operations by showing more clearly the directionality of intra-group internal capital flows between two group firms that are clearly separate in the group structure.

Columns 6 and 7 of Table 7 provide estimates of the likelihood that a listed group affiliate

[34] It is unlikely that these stakes are formed by existing affiliates subscribing to the new firm's IPO shares. This is an inefficient funding mechanism given the transaction costs involved in the process (such as underwriter spreads).

holds a minority stake in a new IPO firm in the same group, incorporating group fixed effects and group-year fixed effects respectively. Similar to our earlier results, we observe that group firms chosen to provide additional pre-IPO equity investments to a group's IPO firm tend to have higher cash earnings. However, unlike parent firms of group IPOs, family control is not an important factor that explains which firms provide these intra-group pre-IPO investments.

6. Financing Advantages of Groups in the IPO Market

Our analysis thus far has focused on the role that internal capital markets play in facilitating a group's expansion through an IPO. In this section, we investigate whether such support translates into significant financing advantages for group firms over other firms in the going public process.

6.1. Internal Capital Support and Offer Size

As discussed in Section 2, when a group IPO takes place, pre-IPO internal capital support can help limit the proportion of costly external equity capital raised in an IPO, which also means that a group can retain higher post-IPO ownership. We test this prediction by first comparing relative offer size of group and non-group IPOs. Our main dependent variable is the fraction of primary shares issued (representing the new capital raised) as a proportion of post-listing shares. As this test involves all sample (group and non-group) IPOs, we introduce several new control variables related to their characteristics. IPO firms sponsored by family groups are captured by two indicator variables: *FAMGRPPYR* for pyramidal IPOs and *FAMGRPHOR* for horizontal IPOs. We also include indicator variables for non-family group IPOs, non-group IPOs controlled by widely held corporations or government entities, all IPOs with dual-class shares, and those with venture capital backing, among other standard control variables.

The results are reported in Table 8. Column 1 shows that IPO firms owned by family groups raise proportionally fewer new primary shares than IPOs of non-group firms. We next examine only family group IPOs to assess whether variations in group internal capital within

this cohort (measured at the aggregate group level and the IPO parent level) can explain the proportion of primary shares offered. The results reported in Columns 3 and 4 further show that additions to retained earnings at both the group and parent levels significantly reduce the proportion of primary shares sold in a family group IPO. Complementing our earlier group level findings, this represents more direct evidence supporting the significant role played by a group's internal capital market in facilitating a group IPO by reducing the external equity capital needed.

[Insert Table 8 Here]

We also consider the fraction of secondary shares sold by IPO insiders for comparison purposes (Column 2). We find that family groups do not sell proportionally more secondary shares than other issuers, further confirming that they do not use an IPO as an ownership divestiture strategy. We also repeat the analysis in Columns 3 and 4 using secondary shares as a placebo test, but do not find the same results. Similarly, we do not find the same results for non-family groups. These results are not reported for brevity.

6.2. Variations in Emergence of Group IPOs across Countries and IPO Market Conditions

If group internal capital plays an important role in alleviating external financing barriers, we should observe more group IPOs in market environments where such barriers are high. We investigate this prediction using both variations across countries and across IPO market cycles within each country. In Column 1 of Table 9, we estimate a probit model to test whether the probability of observing a family-group IPO can be explained by proxies of aggregate economy-wide financing constraints. We consider the following measures that may lower such constraints: a corporate governance index (*GOVERNINDEX*), and a measure of equity capital supply of domestic institutional investors (*INSTOFUNDS*), the general availability of venture capital (*VENTUREFUNDS*), and the extent to which foreign equity investment restrictions have been liberalized (*FOREIGNLIB*). Our model explicitly controls for the prevalence of existing family group firms (*FAMGRP%*), so that we can focus specif-

ically on variations in the extent of group involvement in the IPO market.We also include additional control variables that may explain group IPO prevalence, including indicators for whether a country has a second-tier exchange catering for less established firms, whether there are restrictions on dual-class shares, and whether tax regulators impose stringent rules against consolidation of partially owned subsidiaries and on intra-group transactions. These are not reported for brevity. [35]

The results are reported in Table 9. We find that several measures of external financing barriers, including *GOVERNINDEX*, *INSTOFUNDS*, and *FOREIGNLIB*, are indeed significantly and negatively related to the prevalence of family group IPOs. This result is consistent with the country-level findings in Masulis et al. (2011) and Belenzon et al. (2013), who show that the prevalence of groups is higher in capital intensive industries and in countries with lower financial development.

[Insert Table 9 Here]

Group financing advantages can also manifest themselves in the timing of IPOs. We argue that in 'cold' IPO markets, independent entrepreneurs may have to delay or forego IPOs, whereas group IPO firms can rely on group internal capital support to further develop the firm before going public, so as to minimize the cost of raising external capital. As a consequence, group firms may be able to go public under less favorable capital market conditions. To examine such variations in market conditions across time, we include in the above probit model two measures of stock market and IPO market conditions around the time of each IPO, which we discussed earlier, namely *MKTRETLIST* and *IPOVOLLIST*. In an alternative model (Column 2), we estimate a model with country fixed effects in which all time-invariant country-level variables are suppressed. Across both models, we show that *IPOVOLLIST* has a significant negative relationship with the probability that an IPO is

[35] For most of our country-level explanatory variables, we do not have sufficient data to construct time-varying measures for the length of our sample period. We therefore opt to construct these variables as at the year 2002, the mid-point of our sample period. All country-level variables are described in detail in Table A2 of the Internet Appendix.

group affiliated. Thus, unlike their non-group counterparts, group IPO firms are less affected by unfavorable capital market conditions when they go publlic.

6.3. Group Affiliation and IPO Flotation Costs

Our next test examines variations in IPO underpricing. It is quite possible that group support may generate spillover benefits beyond those discussed in Almeida and Wolfenzon (2006) and Gopalan et al. (2014). Specifically, because groups' internal capital markets can be used to incubate IPO candidates, this can reduce their adverse selection costs when they go public. The results, reported in Column 3 ofTable 9, show that the coefficients of the family group IPO indicators (*FAMGRPPYR* and *FAMGRPHOR*) in the underpricing regression are negative and significant. This relationship is weaker for non-family group IPO firms and insignificant for IPO firms carved out of non-group widely held corporations. We also test whether group affiliation helps reduce underpricing due to their strong bargaining power in dealing with underwriters. In Columns 4, 5, and 6, we split family group IPO firms according to whether their sponsoring groups have a strong (weak) connection to an underwriter based on three alternative metrics: the group has used a top-tier underwriter in the prior three years (Column 2), the underwriter is part of the same group (Column 3), and the group includes a financial firm (Column 4). The results show that across all three metrics, there is no solid evidence to suggest that underwriter ties play a significant role. We also consider the impact of group affiliation on IPO underwriter fees, but find no clear relationship.

6.4. Group Affiliation and Post-listing Access to External Equity Capital

Similar to our previous analysis on IPO timing, we predict that if group IPO firms are supported by group internal capital then they should continue to be able to raise new equity capital under a wider range of market conditions after listing than other IPOs. To test this prediction, we compute the proportion of new equity capital raised in SEOs (excluding secondary share sales) relative to the original IPO gross proceeds for each IPO firm for five

years after its listing date, and assess how this responds to changing market conditions.

The first three columns of Table 10 report estimates of firm-fixed effects regressions of relative SEO offer size firm characteristics such as size, CAPEX, cash income and growth opportunities (Tobin's Q). To capture variations in market conditions, we include two measures of home country stock market returns in the current and preceding year, $MKTRET_t$ and $MKTRET_{t-1}$. We first estimate this model separately for family group and non-group IPO firms. We find that the market return variables are significant in explaining post-listing SEO activity only for non-group firms. In final column of Table 10, we estimate the model using all IPOs. The interaction terms between the variable *FAMGRPPYR* with current and lagged stock market returns are negative and significant, indicating that for family group IPO firms in a pyramidal structure, post-listing SEOs exhibit less sensitivity to capital market conditions as predicted.

[Insert Table 10 Here]

7. Conclusion

Using a large and comprehensive panel dataset of business group structures and ownership of IPO firms from 44 countries around the world, our study shows that groups use their internal capital markets to facilitate access to the IPO market for their emerging group entities. Our analysis of variations in group internal capital, both across groups and within groups over time, shows that group IPO activity increases with the rate of group internal capital accumulation. This is confirmed with an identification strategy utilizing dividend tax rate changes to generate exogenous variations in internal capital availability. The relationship between internal capital and IPOs is particularly strong when groups have strategic non-financing motives to raise external capital under a new firm and when new firm financing barriers are especially high.

Within a group, firm-level internal capital availability and family ultimate cash flow rights are found to be significant factors in explaining which existing group firm is likely to serve as

an IPO parent. We also show that other existing group firms which provide additional pre-IPO equity investment to a going public affiliate also tend to be internal-capital-rich affiliates. This suggests that an active internal capital market operates to support the going public process of group affiliates. We also find evidence consistent with the interpretation that business groups possess significant financing advantages over other issuers in the IPO market. This is shown through the characteristics of group IPO firms, their offer size decisions, and the market conditions under which they go public. Group financing advantages appear to persist after listing, as reflected in the SEO activities of their newly listed firms.

Overall, our study provides a broad set of results that provide a rationale for why groups expand through IPOs. Our results also highlight a critical channel through which groups support new firm development: namely by using a group's existing internal capital to partially meet a new project's funding needs. This mitigates an IPO firm's need to raise large amounts of costly external equity capital and allows the firm's investments to be more developed before it goes public. By funding new, capital intensive projects before they go public, groups appear to play an important economic function akin to that of venture capitalists and private equity investors. However, unlike these investors who rely on enforceability of complex financial contracts to fund risky growth opportunities, family groups often operate in underdeveloped capital markets with weak institutions and investor rights. In such environments, our evidence indicates that a group's internal capital market provides a very attractive means for groups to both extend their control and overcome the external financing challenges faced by new firms seeking public listing.

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Table 1. Distribution of sample IPOs across world markets

For each market, Column 1 reports the number of IPO firms for which the ultimate controlling shareholder at listing can be identified (also shown in parentheses as a percentage of the initial number of IPOs in the country that meet our sample criteria). Column 2 reports the number and percentage (in parentheses) of sample IPO firms that are part of business groups controlled by families and individuals (family groups). Column 3 reports the same statistics for IPO firms that are part of business groups controlled by non-family entities (non-family groups). Columns 4, 5, and 6 report the number of IPOs that are not part of a business group but have a controlling shareholder. Column 7 reports the number of IPOs that have no post-listing controlling shareholder. Columns 8 and 9 report the aggregate gross proceeds of IPO firms that are part of family and non-family groups, respectively, both in dollar amount and as a percentage (in parentheses) of the aggregate gross proceeds of all IPO firms in the same country. Column 10 reports the aggregate gross proceeds of IPOs affiliated with existing listed firms (IPOs in columns 2, 3, and 4), both in dollar amount and as a percentage (in parentheses) of the sum of the aggregate gross proceeds of affiliated IPOs and SEOs of existing listed firms in the same market. Emerging markets are defined as those covered by the *S&P Emerging Markets* database as of 2002, including Argentina, Brazil, Chile, Colombia, Czech Republic, Hungary, India, Indonesia, Israel, Malaysia, Mexico, Pakistan, Peru, Philippines Poland, Singapore, South Africa, South Korea, Sri Lanka, Taiwan, Thailand, Turkey; and developed markets are the remainder.

Country	Final sample: IPOs with identified owners	Group IPOs		Non-group IPOs controlled by			Widely held IPOs	Total offer size (US$ billion)		
		Family	Non-family	Widely held firm	Family	Others		Family group IPOs	Non-family group IPOs	All affiliated IPOs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Argentina	16 (94%)	7 (44%)	5 (31%)	0	3	1	0	0.97 (33%)	0.93 (31%)	1.90 (26%)
Australia	1195 (99%)	42 (4%)	31 (3%)	58	721	84	259	3.40 (7%)	3.64 (8%)	11.98 (7%)
Austria	51 (100%)	4 (8%)	1 (2%)	2	26	17	1	2.77 (25%)	0.56 (5%)	3.72 (12%)
Belgium	78 (98%)	7 (9%)	6 (8%)	0	48	17	0	2.25 (15%)	3.36 (23%)	5.61 (12%)
Brazil	106 (98%)	17 (16%)	6 (6%)	1	58	19	5	7.68 (21%)	2.14 (6%)	10.15 (20%)
Canada	559 (91%)	19 (3%)	8 (1%)	18	236	68	210	1.75 (7%)	1.65 (7%)	5.93 (1%)
Chile	20 (100%)	5 (25%)	0 (0%)	0	6	1	8	0.54 (8%)	0.00 (0%)	0.54 (5%)
Colombia	5 (100%)	3 (60%)	0 (0%)	0	0	1	1	0.14 (5%)	0.00 (0%)	0.14 (8%)
Czech Rep.	6 (100%)	0 (0%)	1 (17%)	0	4	1	0	0.00 (0%)	0.18 (33%)	0.18 (8%)
Denmark	44 (92%)	1 (2%)	5 (11%)	2	17	9	10	0.03 (1%)	0.24 (7%)	0.46 (3%)
Finland	60 (98%)	6 (10%)	5 (8%)	0	29	16	4	0.76 (10%)	0.72 (10%)	1.47 (5%)
France	522 (94%)	29 (6%)	19 (4%)	1	377	67	29	6.01 (7%)	24.52 (29%)	30.65 (12%)
Germany	496 (96%)	29 (6%)	30 (6%)	8	340	65	24	2.79 (4%)	16.12 (25%)	21.04 (11%)
Greece	164 (94%)	28 (17%)	6 (4%)	1	106	18	5	2.36 (22%)	1.49 (14%)	3.89 (7%)
Hong Kong	587 (97%)	71 (12%)	10 (2%)	2	454	42	8	7.60 (17%)	2.03 (4%)	9.75 (9%)
Hungary	7 (100%)	0 (0%)	2 (29%)	1	2	2	0	0.00 (0%)	0.10 (7%)	1.42 (28%)
India	322 (79%)	32 (10%)	3 (1%)	1	247	35	4	4.69 (24%)	0.24 (1%)	6.11 (11%)
Indonesia	140 (93%)	41 (29%)	2 (1%)	2	77	17	1	2.16 (36%)	0.04 (1%)	2.95 (10%)
Ireland	50 (98%)	2 (4%)	2 (4%)	1	30	11	4	0.00 (0%)	0.56 (8%)	0.61 (10%)
Israel	108 (98%)	31 (29%)	2 (2%)	2	66	6	1	3.47 (56%)	0.07 (1%)	3.65 (29%)

Italy	207 (100%)	22 (11%)	9 (4%)	3	132	37	4	4.08 (8%)	8.49 (16%)	12.95 (8%)
Japan	1407 (92%)	87 (6%)	184 (13%)	47	894	114	81	4.26 (5%)	25.74 (33%)	33.25 (10%)
Malaysia	458 (95%)	62 (14%)	8 (2%)	0	372	16	0	2.62 (30%)	1.06 (12%)	3.68 (21%)
Mexico	23 (100%)	6 (26%)	2 (9%)	0	11	4	0	3.13 (31%)	0.52 (5%)	3.65 (15%)
Netherlands	91 (95%)	12 (13%)	2 (2%)	3	50	20	4	3.90 (18%)	0.98 (4%)	7.37 (7%)
New Zealand	52 (100%)	1 (2%)	1 (2%)	1	20	15	14	0.81 (22%)	0.13 (4%)	0.99 (16%)
Norway	107 (91%)	21 (20%)	6 (6%)	4	42	29	5	2.49 (15%)	1.50 (9%)	4.19 (11%)
Pakistan	16 (100%)	5 (31%)	1 (6%)	0	5	5	0	0.09 (18%)	0.13 (27%)	0.22 (83%)
Peru	6 (86%)	1 (17%)	2 (33%)	1	2	0	0	0.27 (54%)	0.09 (18%)	0.42 (45%)
Philippines	47 (100%)	13 (28%)	0 (0%)	1	24	4	5	1.52 (53%)	0.00 (0%)	1.53 (21%)
Poland	138 (98%)	21 (15%)	4 (3%)	1	77	30	5	1.30 (12%)	1.55 (14%)	2.86 (30%)
Portugal	19 (100%)	4 (21%)	2 (11%)	0	8	4	1	0.45 (5%)	1.74 (20%)	2.19 (7%)
Singapore	386 (100%)	41 (11%)	15 (4%)	5	283	23	19	2.30 (18%)	5.25 (40%)	7.88 (23%)
South Africa	95 (92%)	8 (8%)	2 (2%)	3	62	8	12	0.72 (10%)	1.44 (20%)	2.40 (9%)
South Korea	591 (97%)	88 (15%)	13 (2%)	3	421	16	50	7.70 (31%)	1.56 (6%)	9.34 (9%)
Spain	55 (100%)	7 (13%)	9 (16%)	1	25	10	3	5.49 (17%)	10.72 (33%)	16.47 (16%)
Sri Lanka	13 (100%)	7 (54%)	1 (8%)	0	2	3	0	0.03 (15%)	0.09 (48%)	0.11 (59%)
Sweden	98 (91%)	18 (18%)	1 (1%)	3	44	26	6	1.91 (12%)	0.64 (4%)	2.73 (7%)
Switzerland	86 (96%)	6 (7%)	5 (6%)	3	44	25	3	6.14 (23%)	2.38 (9%)	9.30 (11%)
Taiwan	603 (100%)	80 (13%)	12 (2%)	15	446	29	21	3.45 (28%)	0.24 (2%)	3.96 (7%)
Thailand	184 (100%)	47 (26%)	11 (6%)	2	112	11	1	2.83 (39%)	1.66 (23%)	4.59 (21%)
Turkey	40 (95%)	17 (43%)	2 (5%)	0	13	4	4	3.48 (41%)	0.14 (2%)	3.63 (82%)
UK	1161 (94%)	53 (5%)	30 (3%)	18	738	229	93	9.48 (9%)	4.35 (4%)	19.83 (7%)
US	2374 (96%)	89 (4%)	45 (2%)	108	978	825	329	18.53 (5%)	36.41 (11%)	103.86 (11%)
All markets	12 793 (96%)†	1090 (16%)†	511 (7%)†	332	7652	1984	1234	136.37 (19%)†	165.43 (13%)†	379.55 (18%)†
- Emerging	3911 (96%)†	603 (24%)†	103 (7%)†	40	2743	277	145	56.69 (26%)†	19.28 (12%)†	80.88 (26%)†
- Developed	8882 (96%)†	487 (9%)†	408 (6%)†	282	4909	1707	1089	79.66 (11%)†	146.12 (14%)†	298.67 (9%)†

† denotes cross-country average.

Table 2. Ownership, Control and Firm Characteristics of Family-Group IPO Firms

Panel A focuses on family group IPO firms. Family control rights are voting rights held by the controlling family and other same-group firms in an IPO firm immediately after it goes public. Pyramid layer is the number of listed firm separating an IPO firm from the family. Post-listing control turnover (in percentage) is the rate at which IPO firms experience a control turnover transaction during the first 5 years after its listing for the following categories of IPO firms: family-group IPO firms, non-family IPO firms, and non-group IPO firms. These rates are compared to one another using the test on equality of proportions. Panel B focuses on the parent of an IPO firm, defined as the existing listed firm that has a controlling stake in the IPO firm (if it is in a pyramidal structure), or the largest directly held listed firm in the group (if the IPO firm is directly held by the family in a horizontal structure). The domestic control threshold is the percentage ownership that triggers a mandatory takeover offer in each country. For each IPO firm, hypothetical dilution factor is the proportion of new shares that the parent firm would have to issue if the IPO proceeds (along with all SEO proceeds raised by the IPO firm in the first 5 years) were to be raised by SEOs on the parent firm instead. Hypothetical control rights are the voting rights that the family would retain in the parent under this hypothetical SEO alternative. Panel C report the medians and their differences in the following characteristics of family-group IPO firm to existing firms in the same group and to non-group IPO firms matched by size and IPO market conditions. *ASSETS* and *MARKETCAP* are the book value of assets at the first financial year end after listing and market capitalization at the listing date (both in $US million). *AGE* is firm age (in years) since incorporation at listing. *CAPEX*, *CASHINCOME*, and *INTANGIBLE* are capital expenditure, cash net income, total debt, and intangible assets scaled by total assets, computed at the first financial year end after listing.

	Mean	Median	25^{th} percentile	75^{th} percentile
Panel A: Family control of group IPOs				
Pyramid layer of family group IPO	0.70	1.00	0.00	1.00
Family control rights of family group IPO	53.22	54.00	38.00	69.00
- Diff. relative to other same-group firms	9.62***	11.18***		
Post-IPO ctrl turnover of family group IPOs	4.50			
Post-IPO ctrl turnover of non-fam. group IPOs	10.37***			
Post-IPO ctrl turnover of non-group IPOs	13.60***			
Panel B: Family Control of IPO Parents				
Current family control rights of IPO parent	37.48	35.00	22.00	51.00
- Diff. relative to domestic ctrl threshold	8.31***	7.10***		
Hypothetical dilution of parent in an SEO	48.26	12.89	3.57	44.21
Hypothetical ctrl rights of parent in an SEO	29.26	26.60	16.62	40.14
- Diff. relative to domestic ctrl threshold	0.09	−0.68		

Panel C: Firm and Industry Characteristics of Family Group IPO Firms

	Family-group IPOs (A)	Same-group firms (B)	Diff. (A) vs (B)	Non-group IPOs (C)	Diff. (A) vs (C)
ASSETS	120.24	480.61	−19.73***		56.86***
MARKETCAP	150.36	427.97	−16.51***		60.72***
RISK	7.61	6.83	0.39***	7.71	−0.09
AGE	8.00	26.00	−15.00***	9.00	−0.75
CAPEX	4.35	4.03	−0.04	3.71	0.29***
CASHINCOME	7.56	7.85	−0.68**	8.57	−0.71*
INTANGIBLE	1.02	0.00	0.96***	0.85	3.69***†
% of IPOs in new industries 2 digit SIC	70.33%				
% of IPOs in new industries 1 digit SIC	52.25%				

*, ** and *** indicate significance at the 10, 5 and 1 percent levels respectively.

† median difference is zero but *Wilcoxon* statistic is positive; mean difference is reported.

Table 3. Group Internal Capital Availability and IPO Likelihood Baseline Model

The sample consists of family business groups from 45 countries. All variables are computed for each group in a given year. The dependent variable is a indicator for an IPO event. Model (1) is a random-effects logit model. Models (2) and (3) are estimated as conditional logit models. Model (4) is estimated as a linear probability model. *GRPINCOME* and *GRPDIVIDEND* are total cash net income and common dividends scaled by total assets. *GRPCONTROL* and *GRPPYRLAYER* are the (market capitalization) weighted average family control rights and pyramid layer of existing member firms. *GRPDUALCLASS* is an indicator for the use of dual-class shares. *GRPNOFIRMS* and *GRPFIRMSIZE* are the number of existing member firms and the (averaged) natural logarithm of their asset value. *GRPAGE* is the natural logarithm of listing age. *GRPQ*, *GRPCAPEX*, and *GRPDEBT* are total market value of assets scaled by, total capital expenditures, and total debt, scaled by the book value of total assets. *GRPHERFINDAHL* is a Herfindahl industry-concentration index. *GRPFINMEMBER* is an indicator for the presence of a financial member firm. *MKTRET* are *IPOVOL* are the country's MSCI index return and the relative frequency of IPOs during the financial year. Clustered standard errors are reported in parentheses.

	(1)	(2)	(3)	(4)
GRPINCOME	1.907***	1.733***	1.170**	0.073**
	(0.390)	(0.422)	(0.523)	(0.032)
GRPDIVIDEND	−6.551***	−7.515***	−6.616**	−0.533***
	(2.267)	(2.260)	(3.370)	(0.188)
GRPCONTROL	−1.455***	−0.714**	−3.507***	−0.173***
	(0.253)	(0.290)	(0.702)	(0.033)
GRPPYRLAYER	−0.095	−0.164	0.156	−0.024*
	(0.094)	(0.104)	(0.240)	(0.015)
GRPHERFINDAHL	0.747***	0.684***	2.903***	0.262***
	(0.190)	(0.195)	(0.401)	(0.028)
GRPFIRMSIZE	0.187***	0.181***	0.397***	0.035***
	(0.026)	(0.030)	(0.080)	(0.005)
GRPNOFIRMS	0.132***	0.131***		
	(0.019)	(0.019)		
GRPAGE	−0.655***	−0.635***		
	(0.088)	(0.106)		
GRPQ	0.128***	0.142***	0.155**	0.015***
	(0.038)	(0.046)	(0.070)	(0.005)
GRPCAPEX	0.607	1.011*	0.699	0.034
	(0.498)	(0.560)	(0.696)	(0.051)
GRPDEBT	−0.611***	−0.826***	−0.879*	−0.045*
	(0.232)	(0.245)	(0.475)	(0.025)
GRPFINMEMBER	0.416***	0.437***	2.329***	0.182***
	(0.109)	(0.114)	(0.351)	(0.027)
MKTRET	0.125		0.367**	
	(0.168)		(0.183)	
IPOVOL	4.492***		5.484***	
	(0.511)		(0.700)	
Country×year FEs		YES		YES
Group FEs			YES	YES
No. of observations	11363	11363	11363	11363

*, ** and *** indicate significance at the 10, 5 and 1 percent levels respectively.

Table 4. Identification Strategy Exploiting Country-level Dividend Tax Changes

The sample consists of family business groups from 45 countries. All variables are computed for each group in a given year. The dependent variable is a indicator for an IPO event. All models are estimated as linear probability models. *GRPINCOME* and *GRPDIVIDEND* are total cash net income and common dividends scaled by total assets. *GRPCONTROL* and *GRPPYRLAYER* are the (market capitalization) weighted average family control rights and pyramid layer of existing member firms. *GRPDUALCLASS* is an indicator for the use of dual-class shares. *GRPNOFIRMS* and *GRPFIRMSIZE* are the number of existing member firms and the (averaged) natural logarithm of their asset value. *GRPAGE* is the natural logarithm of listing age. *GRPQ*, *GRPCAPEX*, and *GRPDEBT* are total market value of assets scaled by, total capital expenditures, and total debt, scaled by the book value of total assets. *GRPHERFINDAHL* is a Herfindahl industry-concentration index. *GRPFINMEMBER* is an indicator for the presence of a financial member firm. *MKTRET* are *IPOVOL* are the country's MSCI index return and the relative frequency of IPOs during the financial year. *DIVTAXHIGH* is an indicator for when the dividend tax rate in a given year is above a country's sample-period median. *DIVTAXRATE* is the actual dividend tax rate. Clustered standard errors are reported in parentheses.

	Dividend tax changes				Placebo changes	
	(1)	(2)	(3)	(4)	(5)	(6)
GRPINCOME (A)	0.046	0.007	0.003		0.162***	0.223***
	(0.057)	(0.059)	(0.085)		(0.058)	(0.075)
GRPINCOMEHIGH (B)				0.001		
				0.009		
DIVTAXHIGH	−0.004					
	(0.008)					
(A)×DIVTAXHIGH	0.136**	0.166***			−0.062	
	(0.063)	(0.066)			(0.063)	
(A)×DIVTAXRATE			0.435*			−0.004*
			(0.251)			(0.002)
(B)×DIVTAXHIGH				0.025**		
				(0.013)		
GRPCONTROL	−0.163***	−0.141***	−0.140***		−0.142***	−0.140***
	(0.048)	(0.046)	(0.047)		(0.048)	(0.048)
GRPPYRLAYER	0.009	0.009	0.008		0.008	0.008
	(0.022)	(0.021)	(0.021)		(0.021)	(0.021)
GRPHERFINDAHL	0.200***	0.233***	0.233***		0.238***	0.237***
	(0.039)	(0.036)	(0.036)		(0.037)	(0.037)
GRPFIRMSIZE	0.033***	0.039***	0.039***		0.038***	0.038***
	(0.006)	(0.007)	(0.006)		(0.006)	(0.006)
GRPQ	0.018***	0.017***	0.017***		0.018***	0.018***
	(0.007)	(0.007)	(0.006)		(0.007)	(0.007)
GRPCAPEX	0.071	0.041	0.039		0.037	0.041
	(0.07)	(0.072)	(0.072)		(0.074)	(0.074)
GRPDEBT	−0.010	−0.037	−0.035		−0.032	−0.036
	(0.035)	(0.036)	(0.036)		(0.037)	(0.037)
GRPFINMEMBER	0.227***	0.197***	0.197***		0.198***	0.197***
	(0.036)	(0.036)	(0.038)		(0.039)	(0.039)
MKTRET	0.011					
	(0.016)					
IPOVOL	0.257***					
	(0.063)					
Country×year FEs		YES	YES	YES	YES	YES
Group FEs	YES	YES	YES	YES	YES	YES
No. of observations	6135	6135	6135	6135	6135	6135

*, ** and *** indicate significance at the 10, 5 and 1 percent levels respectively.

Table 5. The Role of Strategic Non-financing Benefits of Conducting Group IPOs

The sample consists of family business groups from 45 countries. For each group year, the dependent variable is an indicator for an IPO event, except in Model (7), where it takes the value of 1 if a group IPO firm is in a different 2-digit SIC industry relative to its parent, 2 if a group IPO firm is in the same industry, and zero otherwise. Models (1) to (6) are linear probability models. Model (7) is a random-effects multinomial logit model, with the first (second) column reporting estimates on the likelihood of observing a new-industry (same-industry) IPO. *GRPINCOME* and *GRPDIVIDEND* are the group's total cash net income and common dividends scaled by its total assets. *GRPCONTROL* and *GRPPYRLAYER* are the (market capitalization) weighted average control rights and pyramid layer of existing firms in the group. *GRPDUALCLASS* is an indicator for the use of dual-class shares. *GRPNOFIRMS* and *GRPFIRMSIZE* are the number of member firms and the average of the natural logarithm of their book asset value. *GRPAGE* is the natural logarithm of the listing age of the oldest member. *GRPQ*, *GRPCAPEX*, and *GRPDEBT* are the group's total market value of assets scaled by, total capital expenditures, and total debt, scaled by the book value of total assets. *GRPHERFINDAHL* is a Herfindahl industry-concentration index for existing members. *GRPFINMEMBER* is an indicator for whether a group has a financial firm. *MKTRET* are *IPOVOL* are the country's MSCI index return and the relative frequency of IPOs during the financial year. Models 3 and 4 only include samples of business groups where the controlling family's average ownership stake is either below (Low) or above (High) a country specific control threshold defined under the takeover law. Clustered standard errors are reported in parentheses.

			Subsamples split by family control rights				Multi. logit model of IPO industry choice	
			Low	High			New ind.	Same ind.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
GRPINCOME (A)	0.269***	0.239***	−0.106	0.358***	−0.052	−0.122	1.833***	0.662
	(0.052)	(0.071)	(0.146)	(0.073)	(0.059)	(0.081)	(0.687)	(0.788)
GRPDIVIDEND	−0.418***	−0.351*	−0.909***	−0.273*	−0.499***	−0.539***	−9.019**	1.649
	(0.132)	(0.198)	(0.242)	(0.156)	(0.14)	(0.188)	(3.966)	(6.768)
GRPCONTROL	−0.065***	−0.163***	−0.050	−0.005	−0.045***	−0.175***	−2.941***	−3.872***
	(0.016)	(0.037)	(0.065)	(0.022)	(0.016)	(0.033)	(0.782)	(1.332)
GRPPYRLAYER	−0.012*	0.014	0.001	−0.014*	−0.012*	−0.025*	0.191	−0.612
	(0.007)	(0.016)	(0.014)	(0.007)	(0.007)	(0.014)	(0.275)	(0.470)
GRPHERFINDAHL					0.029***	0.244***		
					(0.011)	(0.028)		
(A)×GRPCONTROL	−0.359***	−0.360**	1.062*	−0.567***				
	(0.109)	(0.146)	(0.56)	(0.142)				
(A)×GRPHERFINDAHL					0.200***	0.253***		
					(0.081)	(0.106)		
Other control variables	YES	YES	YES	YES	YES	YES	YES	
Country×year FEs	YES	YES	YES	YES	YES	YES		
Group FEs		YES				YES		
No. of observations	11363	11363	11363	11363	11363	11363	11363	

*, ** and *** indicate significance at the 10, 5 and 1% levels respectively.

Table 6. The Role of New Firm Financing Barriers

The sample consists of family business groups from 45 countries. For each group year, the dependent variable is an indicator variable for an IPO event, except in Model 1, where it takes the value of 1 for an IPO, 2 for an SEO, and zero otherwise. Model 1 is a random-effects multinomial logit model, with the first (second) column reporting estimates on the IPO (SEO) likelihood. Models 2 to 5 are linear probability models, with Models 2 and 3 estimated on a subsample of group-years with no equity offers. *GRPINCOME* and *GRPDIVIDEND* are the group's total cash net income and common dividends scaled by its total assets. *GRPCONTROL* and *GRPPYRLAYER* are the (market capitalization) weighted average control rights and pyramid layer of existing firms in the group. *GRPDUALCLASS* is an indicator for the use of dual-class shares. *GRPNOFIRMS* and *GRPFIRMSIZE* are the number of member firms and the average of the natural logarithm of their book asset value. *GRPAGE* is the natural logarithm of the listing age of the oldest member. *GRPQ*, *GRPCAPEX*, and *GRPDEBT* are the group's total market value of assets, total capital expenditures, and total debt, scaled by total assets. *GRPHERFINDAHL* is a Herfindahl industry-concentration index for existing members. *GRPFINMEMBER* is an indicator for whether the group has a financial firm. *MKTRET* are *IPOVOL* are the country's MSCI index return and the relative frequency of IPOs during the financial year. *SECONDBOARD* is an indicator for the period after the second-tier market introduction. Clustered standard errors are reported in parentheses.

	Comparison of group IPOs to SEOs					
	Multi. logit model of raising choice		Excluding group-years with no equity raisings		Introduction of second board	
	IPO	SEO				
	(1)		(2)	(3)	(4)	(5)
GRPINCOME (A)	1.554***	−1.207***	0.529***	0.490*	0.149***	0.192**
	(0.399)	(0.318)	(0.134)	(0.252)	(0.036)	(0.037)
GRPDIVIDEND	−8.284***	−5.839***	−0.768*	−0.456	−0.537**	−0.367*
	(2.352)	(2.018)	(0.428)	(0.725)	(0.270)	(0.412)
GRPCONTROL	−1.71 ***	−0.848***	−0.017	−0.466***	−0.174***	−0.177***
	(0.265)	(0.207)	(0.056)	(0.142)	(0.035)	(0.037)
GRPPYRLAYER	0.013	0.242***	−0.044***	0.041	−0.024*	−0.019
	(0.11)	(0.089)	(0.017)	(0.058)	(0.012)	(0.013)
SECONDBOARD						0.037***
						(0.009)
(A)×GRPCONTROL			−0.641**	−0.949*		
			(0.311)	(0.544)		
(A)×SECONDBOARD					−0.095**	−0.122**
					(0.042)	(0.045)
Other control variables	YES	YES	YES		YES	YES
Country×year FEs			YES		YES	
Group FEs				YES		YES
No. of observations	11363		3295	3295	11363	11363

*, ** and *** indicate significance at the 10, 5 and 1 percent levels respectively.

Table 7. Characteristics of IPO Parent Firms and Other Group Firms Holding a pre-IPO Stake

The sample consists of family business groups member firms from 45 countries. For each firm year, the dependent variable is either an indicator for whether the firm conducts an IPO for its subsidiary (Models (1) to (5)) or an indicator for whether the firm holds a minority stake in an IPO from the same group (Models (6) and (7)). All models are estimated as conditional logit regressions. *PARENTINCOME* and *PARENTDIVIDEND* are cash net income and cash distributions scaled by year-beginning total assets. *PARENTCONTROL* and *PARENTULTCF* are the control rights and ultimate cash flow rights of the family over the firm. *PARENTSIZE* and *PARENTAGE* are the natural logarithm of total assets and of firm age since listing. *PARENTQ*, *PARENTCAPEX*, and *PARENTDEBT* are market value of assets, capital expenditures and debt, scaled by book value of total assets. *MKTRET* are *IPOVOL* are the country's MSCI index return and the relative frequency of IPOs during the financial year. Models (4) and (5) are estimated on a subsample of only firms that experience an equity raising event, either a subsidiary IPO or an SEO of their own shares. Clustered standard errors are reported in parentheses.

	Likelihood of becoming IPO parent					Likelihood of holding pre-IPO stake	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PARENTINCOME	1.863***	2.152***	1.863***	1.569***	2.182**	2.931***	4.728**
	(0.392)	(0.756)	(0.392)	(0.456)	(1.053)	(1.083)	(2.018)
PARENTDIVIDEND	−6.943***	−6.056**	−6.943***	−6.745***	−17.615***	−0.720	0.669
	(2.296)	(2.716)	(2.296)	(2.392)	(6.057)	(4.689)	(7.236)
PARENTCONTROL	−3.430***	−2.180***	−3.430***	−2.836***	−0.944	0.197	0.586
	(0.521)	(0.537)	(0.521)	(0.731)	(0.785)	(2.430)	(0.511)
PARENTULTCF	3.855***	3.757***	3.855***	5.132***	5.677***	0.327	1.986*
	(0.475)	(0.597)	(0.475)	(0.643)	(1.262)	(2.156)	(1.156)
PARENTSIZE	0.441***	0.461***	0.441***	0.124	0.011	0.233**	0.280***
	(0.054)	(0.064)	(0.054)	(0.078)	(0.104)	(0.094)	(0.077)
PARENTAGE	0.415***	0.832***	0.415***	0.390***	1.466***	0.480**	0.802***
	(0.097)	(0.125)	(0.097)	(0.135)	(0.369)	(0.241)	(0.287)
PARENTQ	1.153	0.864	1.153	0.320	−1.566	−0.444	0.998
	(0.952)	(1.533)	(0.952)	(1.279)	(2.966)	(2.190)	(2.981)
PARENTCAPEX	0.316	0.646	0.316	0.329	1.559*	0.068	−0.135
	(0.374)	(0.530)	(0.374)	(0.443)	(0.841)	(0.724)	(1.097)
PARENTDEBT	0.065	−0.049	0.065	−0.133**	−0.101	0.078	−0.202
	(0.045)	(0.076)	(0.045)	(0.058)	(0.124)	(0.084)	(0.142)
MKTRET	0.086		0.086	−0.361		0.276	
	(0.225)		(0.225)	(0.263)		(0.592)	
IPOVOL	3.271***		3.271***	2.223**		1.406	
	(0.638)		(0.638)	(0.995)		(1.563)	
Country×year FEs		YES			YES		YES
Group FEs	YES			YES		YES	
Firm FEs			YES				
No. of observations	12481	12481	12481	2091	2091	4084	4084

*, ** and *** indicate significance at the 10, 5 and 1% levels respectively.

Table 8. Proportion of new shares issued for group and non-group IPOs

The dependent variable is the number of primary shares (Models 1, 3, and 4) or secondary shares (Model 2) offered as a proportion of post-IPO shares. Models 1 and 2 are estimated on all (group and non-group) IPO firms, incorporating the following variables. All models are OLS regressions. *FAMGRPPYR* (*FAMGRPHOR*) is an indicator for family-group IPOs owned through a pyramid (directly). *NONFAMGRP* is an indicator for non-family-group IPOs. *NONGRPCORP* (*NONGRPGOV*) is an indicator for non-group IPOs controlled by a widely held corporation (a government entity). *VENTUREBACK* and *DUALCLASS* are indicators for IPOs with venture backing and dual-class shares. The following IPO firm control variables are not reported. *LogOFFERSIZE* is the natural logarithm of offer proceeds. *RISK* is the first-year weekly return standard deviation. *TOPUW* and *TECH* are indicators for IPOs with a top-tier underwriter and for high-tech IPOs. *MKTRETLIST* is the country MSCI index return in the quarter before listing. *IPOVOLLIST* is the relative frequency of other IPOs in the same country during the one year window around listing. Model 3 is estimated on the family group IPO subsample, incorporating the variables computed for each sponsoring group. The reported variable is *GRPRETAINADD*, or a group's total cash net income minus dividends scaled by total assets. Other unreported group-level variables include the following. *GRPCONTROL* and *GRPPYRLAYER* are the weighted average family control rights and pyramid layer position of existing group firms . *GRPDUALCLASS* is an indicator for the use of dual-class shares. *GRPNOFIRMS* and *GRPFIRMSIZE* are the number of member firms and the average of the natural logarithm of their book asset value. *GRPAGE* is the natural logarithm of the listing age of the oldest member. *GRPQ*, *GRPCAPEX*, and *GRPDEBT* are a group's total market value of assets, total capital expenditures, and total debt, scaled by total assets. *GRPHERFINDAHL* and *GRPFINMEMBER* are a group's Herfindahl industry-concentration index and an indicator the presence of a financial member. Model 4 is estimated on a subsample of family-group IPOs owned through a pyramid, incorporating variables computed for each IPO parent firm . The reported variable is *PARENTRETAINADD*, or a parent's as cash net income minus dividends scaled by total assets. *PARENTCONTROL* and *PARENTULTCF* are family control rights and ultimate cash flow rights. *PARENTSIZE* and *PARENTAGE* are the natural logarithm of total assets and of firm age since listing. *PARENTQ*, *PARENTCAPEX*, and *PARENTDEBT* are a parent's market value of assets, capital expenditures and debt, scaled by total assets. *PARENTFINFIRM* and *PARENTDUALCLASS* are indicator variables for whether a parent is a financial firm or has dual-class shares. Country, year, and industry fixed effects are included in all models. Clustered standard errors are reported in parentheses.

	All IPOs		Family group IPOs	
	(1)	(2)	(3)	(4)
FAMGRPPYR	-0.061^{***}	-0.001	0.013	
	(0.019)	(0.005)	(0.010)	
FAMGRPHOR	-0.060^{***}	-0.007		
	(0.015)	(0.006)		
GRPRETAINADD			-0.099^{**}	
			(0.045)	
PARENTRETAINADD				-0.162^{***}
				(0.049)
IPO firm control variables	YES	YES	YES	YES
Group control variables			YES	
Parent control variables				YES
No. of observations	12315	12315	881	600

*, ** and *** indicate significance at the 10, 5 and 1 percent levels respectively.

Table 9. Market conditions and underpricing of family group IPOs compared to other IPOs

The dependent variable is an indicator a family group IPO (Models 1 and 2), or the logarithmic transformation of underpricing (Models 3 to 6). Models 1 and 2 are probit regressions and Model 3 to 6 are OLS regressions. The following variables are computed for the country of each IPO. *FAMGRP%* is the percentage of existing (non-IPO) firms controlled by family groups. *GOVERNINDEX* is a measure of the strength of governance environment. *INSTOFUNDS* is a measure of total stock market investments by institutions. *VENTUREFUNDS* is a measure of venture capital availability. *FOREIGNLIB* is a measure of (lack of) foreign equity investment restrictions. Other unreported country-level control variables are: an indicator the threshold at which subsidiaries can be consolidated for tax purposes *TAXCONSOLIDATION*, a measure of stringency of tax rules on intra-group transactions (*TAXAVOIDANCE*), and indicators for the existence of dual-class shares restrictions (*DUALCLASSRES*) and of alternative market for less-established firms (*SECONDBOARD*). The following variables are computed for each IPO. *FAMGRPPYR* (*FAMGRPHOR*) is an indicator for pyramidal (horizontal) family group IPOs. *FAMGRPUWST* (*FAMGRPUWWK*) classifies whether a family group IPO has a strong (weak) underwriter connection based on: the group having past dealings with a top-tier underwriter (Model 4), the underwriter being part of the same group (Model 5), and the group having a financial firm (Model 6). *MKTRETLIST* is the country MSCI index return in the quarter before listing. *IPOVOLLIST* is the relative frequency of other IPOs in the same country during the one year window around listing. Other unreported firm-level control variables are: indicators for IPOs sponsored by non-family groups (*NONFAMGRP*), by governments (*NONGRPGOV*), and by widely held firms (*NONGRPCORP*), indicators for IPOs having venture backing (*VENTUREBACK*) and dual-class shares (*DUALCLASS*), the natural logarithm of offer proceeds (*LogOFFERSIZE*), first-year weekly return standard deviation (*RISK*), indicators for high-tech IPOs (*TECH*) and IPOs managed by top-tier underwriters (*TOPUW*). Clustered standard errors are reported in parentheses.

	Prob(Group IPO)		Underpricing			
	(1)	(2)	(3)	(4)	(5)	(6)
FAMGRP%	1.634***					
	(0.424)					
GOVERNINDEX	−0.173***					
	(0.062)					
INSTOFUNDS	−0.342***					
	(0.131)					
VENTUREFUNDS	0.025					
	(0.049)					
FOREIGNLIB	−0.256***					
	(0.074)					
FAMGRPPYR			−0.031**			
			(0.012)			
FAMGRPHOR			−0.055***			
			(0.019)			
FAMGRPUWST				−0.013	−0.058**	−0.041***
				(0.018)	(0.026)	(0.013)
FAMGRPUWWK				−0.042***	−0.038***	−0.028**
				(0.010)	(0.011)	(0.011)
MKTRETLIST	−0.063	−0.011	0.460***	0.460***	0.459***	0.459***
	(0.165)	(0.034)	(0.115)	(0.115)	(0.115)	(0.115)
IPOVOLLIST	−0.410*	−0.127**	−0.040	−0.039	−0.039	−0.038
	(0.239)	(0.058)	(0.191)	(0.192)	(0.192)	(0.191)
Other control variables	YES		YES	YES	YES	YES
Country FEs		YES	YES	YES	YES	YES
Year FEs		YES	YES	YES	YES	YES
No. of observations	12483	12483	12266	12266	12266	12266

*, ** and *** indicate significance at the 10, 5 and 1 percent levels respectively.

Table 10. Sensitivity of SEOs and capital expenditures to market conditions in the first five years after listing

For each IPO firm, the dependent variable is the total gross proceeds from SEOs scaled by its IPO gross proceeds (SEO_t), with t indicating the first to the fifth full financial years after the listing. All models are OLS regressions. $CAPEX_{t-1}$ is the one-year lag of capital expenditures scaled by beginning-of-year total assets. $CASHINCOME_t$ is the contemporaneous net income adding back depreciation and amortization scaled by year-beginning total assets. Q_{t-1} is the one-year lag of the Tobin's Q ratio. $LogSIZE_{t-1}$ is the one-year lag natural logarithm of the total assets in the previous year. $MKTRET_t$ ($MKTRET_{t-1}$) is the contemporaneous (lagged) MSCI country index return. $FAMGRPPYR$ ($FAMGRPHOR$) is an indicator for pyramidal (horizontal) family group IPOs. Clustered standard errors are reported in parentheses.

	Family group IPOs	Other IPOs	All IPOs
$CAPEX_{t-1}$	0.052^{**}	0.014^{*}	0.016^{**}
	(0.024)	(0.008)	(0.007)
$CASHINCOME_t$	-0.017	0.004	0.002
	(0.014)	(0.004)	(0.004)
Q_{t-1}	0.005^{**}	0.004^{***}	0.004^{***}
	(0.002)	(0.001)	(0.001)
$LogSIZE_{t-1}$	-0.005	-0.027^{***}	-0.025^{***}
	(0.006)	(0.002)	(0.002)
$MKTRET_t$	0.001	0.018^{***}	0.018^{***}
	(0.005)	(0.002)	(0.002)
$MKTRET_{t-1}$	0.000	0.006^{***}	0.006^{***}
	(0.004)	(0.002)	(0.002)
$FAMGRPPYR \times MKTRET_t$			-0.031^{***}
			(0.006)
$FAMGRPPYR \times MKTRET_{t-1}$			-0.010^{*}
			(0.005)
$FAMGRPHOR \times MKTRET_t$			0.001
			(0.010)
$FAMGRPHOR \times MKTRET_{t-1}$			-0.007
			(0.009)
Firm FEs	YES	YES	YES
No. of observations	3652	40147	45405

*, ** and *** indicate significance at the 10, 5 and 1% levels respectively.

Internet Appendix

for "Why do Family Business Groups Expand by Creating New Public Firms: The Role of Internal Capital Markets"

Table A1. Country-level Control Thresholds and Second-tier Stock Exchanges

The mandatory offer threshold, presented in the second column below, is the maximum percentage of voting rights that can be acquired without triggering a mandatory tender offer to all shareholders. We obtain this information from country takeover guides provided by the International Bar Association (IBA), with the exception of Indonesia, Mexico, Pakistan, Philippines, South Korea, Thailand, and Taiwan, for which we research the rules through *Factiva* and internet searches. We also verified that these thresholds applied as of 2007 (the end of our sample period). Information on second-tier markets or market segments is obtained from national stock exchanges, the *World Federation of Exchanges*, and *Factiva* and internet searches. The third column of the table below provides the name of the second-tier market (or market segment) for each country (or NA if no such market exists), and the year of its establishment and the effective year of closure if relevant (if the market is closed or merged before 2007) in parentheses. Some countries may have more than one second-tier market.

Country	Mandatory offer threshold	Second-tier markets (segments)
Argentina	0.5	Buenos Aires Stock Exchange PyME Board (2005)
Austria	0.3	Austrian Growth Market (1999-2001), Vienna Stock Exchange Specialist Segment (2001)
Australia	0.2	NA
Belgium	0.3	Euro.NM Belgium (1997-2005), Euronext Alternext (2005)
Brazil	0.5	BM&F BOVESPA Bovespa Mais (2006)
Canada	0.2	Toronto Stock Exchange Venture Exchange (2000)
Chile	0.67	NA
Colombia	0.25	NA
Czech Republic	0.3	NA
Denmark	0.33	Dansk AMP (2000)
Finland	0.3	Helsinki Exchanges NM List (2000-2006)
France	0.33	Euronext Paris Nouveau March (1996-2005), Euronext Alternext (2005)
Germany	0.3	Neuer Markt (1997-2003) Entry standard (2005)
Greece	0.33	Athens Stock Exchange Parallel Market and New Market (1989)
Hong Kong	0.3	Hong Kong Stock Exchange Growth Enterprise Market (2000)
Hungary	0.33	NA
India	0.25	Bombay Stock Exchange SME Platform (2011) National Stock Exchange Emerge (2012)
Indonesia	0.25	Jakarta Stock Exchange Development Board (2000)
Ireland	0.3	ITEQ and Developing Companies Market (2000), Irish Enterprise Exchange (2005)
Israel	0.45	NA
Italy	0.3	Nuovo Mercato (1999-2004)
Japan	0.33	JASDAQ Securities Exchange (1991), Tokyo Stock Exchange Mothers (1999), Osaka Securities Exchange Hercules (2000)
Malaysia	0.33	MESDAQ, renamed ACE Market (1998)
Mexico	0.3	NA
Netherlands	0.3	Euro.NM Amsterdam (1997-2005),

		Euronext Alternext (2005)
New Zealand	0.2	NZX Alternative Market (2003)
Norway	0.33	Oslo Stock Exchange SMB List (1992-2007), Oslo Stock Exchange Axcess (2007)
Peru	0.25	Lima Stock Exchange Venture Exchange (2003)
Pakistan	0.5	Karachi Stock Exchange OTC Market (2011)
Philippines	0.35	Philippines Stock Exchange SME Board (2001)
Poland	0.25	Warsaw Stock Exchange New Connect (2007)
Portugal	0.33	Euronext Lisbon Novo Mercado (2000-2005), Euronext Alternext (2005)
Singapore	0.3	Singapore Stock Exchange SESDAQ (1987)
Spain	0.3	Neuvo Mercado (2000-2007)
South Korea	0.15	KOSDAQ Securities Exchange (1996)
Sri Lanka	0.3	Colombo Stock Exchange Second Board (1997)
Sweden	0.3	Stockholm Stock Exchange O-List (1988-2006)
Switzerland	0.33	SWX New Market (1999-2004)
Thailand	0.25	Stock Exchange of Thailand Market for Alternative Investments (1999)
Turkey	0.25	Borsa Istanbul Second National Market (1995)
Taiwan	0.2	GreTai Securities Market, renamed Taipei Exchange (1995)
United Kingdom	0.3	London Stock Exchange Alternative Investment Market (1994)
United States	NA	NASDAQ (1971)
South Africa	0.35	Johannesburg Stock Exchange Alternative Exchange (2004)

Table A2. Definitions and Sources for Country-level Variables

FAMGRP%	The percentage of existing listed firms in a country, excluding IPOs in the same year, that belong to a family controlled business group.
GOVERNINDEX	This index aggregates three dimensions of a countrys corporate governance environment using a principal component analysis. These components are (i) the extent of shareholder rights (based on the anti-director index from La Porta et al. (1997) and updated by Pagano and Volpin (2005)), (ii) the effectiveness of the legal enforcement of these rights (based on the average strength of rule of law, regulatory quality and control of corruption taken from Kaufmann, Kraay, and Mastruzzi (2003), and (iii) the quality of corporate disclosure (based on a survey variable measuring disclosure standards from the *World Economic Forum's Global Competitiveness Report 2003*).
INSTOFUNDS	The total institutional equity investments scaled by stock market capitalization. To capture this, we use a measure of the extent of external capital available from institutional investment, compiled by Li, Moshirian, Pham, and Zein (2006) and computed as the total equity invested locally and internationally by domestic banks, insurance companies, pension funds and mutual funds, scaled by domestic stock market capitalization.
VENTURE	A survey variable from the *World Economic Forum's Global Competitiveness Report* 2003, which ranks the availability of venture capital funding in a country from 1 = "unavailable" to 7 = "widely available".
FOREIGNLIB	A measure of the extent to which foreign ownership restrictions are liberalized in a local market, constructed by averaging (i) the extent of restrictions on foreign investor purchases of domestic equity and (ii) the extent of restrictions on shares issues by foreign companies. The first component (i) is itself the average of: (a) industry-specific restrictions and (b) market-wide restrictions, each of which takes the value of 0 if a country does not impose any restriction, 0.5 if a country requires regulatory approval for foreign ownership of a domestic firm in excess of a threshold, and one if a country imposes a strict foreign ownership cap. The second component (ii) takes a value of 0 if there is no restriction on shares issues by foreign companies, 0.5 if such transactions require regulatory approval and one if they are prohibited. Information on these restrictions is obtained from the *2002 International Monetary Fund Annual Report on Exchange Arrangements and Exchange Restrictions* (*AREAER*).
DUALCLASSRES	An indicator variable for whether a country restricts the use of dual-class shares. This variable is coded using information collected by the project on Law, Finance and Development at the *Centre for Business Research* of the *University of Cambridge*, the report into Proportionality between Capital and Control commissioned by the European Commission, and other sources for individual countries, which are available upon request.
SECONDBOARD	An indicator variable for whether a second-tier stock market (market segment) exists in a country, as discussed in Table A1.
CONSOLIDATION	An indicator variable that is equal to 1 if firms are able to consolidate a subsidiary in which they have ownership stakes of less than 90%, and zero if consolidation is either not allowed or can only occur if the parent owns more than 90%. Source: *Deloitte International Taxation Guide*
TAXAVOIDANCE	Measures the stringency of tax laws related to intra-corporate transactions, which is based on information from the *Deloitte International Taxation Guide*. It is calculated as a sum of four anti-tax-avoidance indicators. The indicators relate to whether regulations exist to limit (i) transfer-pricing, (ii) thinly capitalized firms, (iii) holding companies in low tax jurisdictions, and whether (iv) full disclosures of inter-corporate transactions are required.

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