

Family Business Group Expansion through IPOs: The Role of Internal Capital Markets in Financing Growth while Preserving Control

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Abstract

Using data from 44 countries, we document a new channel through which a family business group's internal capital market supports its members. We find that groups use internal capital to incubate difficult-to-finance projects, making it feasible for them to rapidly scale up, thus facilitating their IPO market access. This IPO support role is particularly valuable when groups find capital raising through SEOs less attractive due to control-retention concerns, and in capital markets with high new-firm financing barriers. Unlike carve-outs employed as a corporate restructuring strategy, group-affiliated IPOs primarily appear to serve a group's expansion goals, rather than its liquidation needs.

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1. Introduction

Around the world, corporations can take distinctly different approaches to financing investment opportunities with external equity. In developed capital markets, publicly listed firms generally rely on sales of new shares in seasoned equity offerings (SEOs), a process extensively studied in the existing literature. In emerging markets, investment opportunities are frequently financed through initial public offerings (IPOs) of divisions or private affiliates of closely held public firms. Such IPOs can result in the creation or expansion of a business group. 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 this widespread corporate ownership structure. We address this gap by analyzing conditions under which business groups raise capital by sponsoring IPOs of their affiliates, and thereby extend their breadth of control over a greater number of publicly listed firms.

Our analysis relies on a unique international dataset that identifies the pre-IPO controlling owners of 12,793 IPOs from 44 countries. Our data reveal the economic importance of IPOs affiliated with existing listed firms, especially in emerging markets, where they account for on average more than a quarter of the total external equity capital raised. A majority of these IPOs are sponsored by family business groups, which dominate the IPO market in some countries. For example, in Israel, Peru, Philippines and Turkey, family-group IPO firms account for more than 40% of total IPO issue proceeds.

The widespread participation of family business groups in global IPO markets raises a fundamental question regarding why, in many circumstances, a controlling family uses an IPO, rather than an SEO, to satisfy its external equity needs. The extant family business group literature suggests that one important motive for this funding choice is that it reconciles the family's conflict between the need for external equity capital and the desire to retain control of its publicly listed firms.² Funding a new project as a division of an *existing public*

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.

² See Morck, Wolfenzon, and Yeung (2005) for a discussion. They offer a pre-war Japanese example

firm can require an SEO that critically dilutes family control rights in the issuing firm (this threat rises with the size of the SEO), whereas creating a *new separate public firm* allows a large amount of equity capital to be raised (i.e. up to 50% of outstanding shares), while leaving family control rights in the existing firm untouched. In a rapidly growing group, the control-retention feature of the IPO option can also be favorable for minority investors because they can continue to benefit from valuable family-specific assets, such as reputation, networks and contracting abilities (see [Bennedsen, Fan, Jian, and Yeh \(2015\)](#)). These benefits of an IPO are especially important when a family's control over its existing group firms is fragile and when they face restrictions on the use of other control retention mechanisms such as issues of dual-class shares or corporate debt.

While an IPO can be an attractive financing method for groups wanting to expand without losing control, it is important to recognize that undertaking an IPO is not always possible. This is because IPO shares are only *directly* backed by the cash flows of a group's new investment projects. This is quite unlike a situation where the same expansion is financed by an SEO of an existing firm under a conglomerate structure, where the cash flows of a portfolio of projects of an SEO firm can be cross-pledged to help fund the new projects.³ For this reason, minority investors in a group IPO often require a large price discount to invest, which can substantially dilute the family's ownership in the new IPO firm and thereby prevent it from raising the required level of capital. The external financing disadvantages of IPOs relative to SEOs are especially severe in countries with weak legal and regulatory institutions, where groups are prevalent. In these countries, IPO markets tend to strongly favor large established firms ([La Porta, Lopez-de Silanes, Shleifer, and Vishny \(1997\)](#), [Braun](#)

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). [Bonbright and Means \(1932\)](#) and [Kandel, Kosenko, Morck, and Yafeh \(2015\)](#) explore the same motive in the context of US business groups in the 1930s and [Bennedsen and Fan \(2014, pp. 117-118\)](#) discuss contemporary international cases.

³ Cross-pledging (co-insurance) refers to the ability of a conglomerate to raise more capital in aggregate than an equivalent set of independent firms, since the former can use cash flows in one division to support the financing of investment in another division. [Diamond \(1984\)](#) argues that uncorrelated cash flows can be used to reduce financial distress risk and alleviate credit constraints. Section 4.2 of [Tirole \(2010\)](#) further shows that cross-pledging can create external financing benefits by reducing an entrepreneur's incentive to consume private benefits. See [Larrain, Sertsios, and Urzua \(2018\)](#) for recent empirical evidence.

and Larrain (2009)) and those with high insider ownership retention.

High new firm financing barriers imply that, for an IPO to be a viable funding choice, a group investment project must be sufficiently developed or “incubated” before it can be taken public. Our focus is on the role that group internal capital plays in providing such support. We argue that groups have the ability to tap the available internal capital of their existing affiliates as “seed money” to fund *difficult-to-finance* investment projects and grow them into established private firms or well-developed corporate divisions. When the investment needs of these projects outgrow the funding capacity of their internal capital markets, the prior growth achieved with group support can still facilitate their IPO market access by alleviating the external financing barriers commonly faced by small new firms. Another related possibility is that groups can utilize internal capital to broaden their feasible set of investment opportunities to include projects with *large capital requirements*. Under a group structure, these projects become feasible because internal capital infusions can partially meet their substantial financing needs, allowing them to rapidly scale up and eventually access the IPO market.

The above incubation role is implicit in theories suggesting that a business group’s internal capital can be used to alleviate member firms’ external financing constraints (Almeida and Wolfenzon (2006), Gopalan, Nanda, and Seru (2014)).^{4,5} It is also consistent with observations in both the finance and strategy literatures (Khanna and Palepu (2000), Ramachandran, Manikandan, and Pant (2013)) that groups play an active role in launching new high-growth firms, similar to that of venture capitalists. Bena and Ortiz-Molina (2013) further add that pyramidal structures can fund entrepreneurial activity by channeling internal capital to private firms that may otherwise be unable to raise enough external finance.⁶

⁴ Almeida and Wolfenzon (2006) compare pyramidal to horizontal structures and show that the former maximizes a group’s external financing advantage by allowing it to utilize the retained earnings of an existing internal-capital-rich affiliate to set up a new firm. Gopalan et al. (2014) also show that within-group equity investments facilitate external financing of a group firm by allowing the controlling shareholder to maintain sufficient cash-flow rights to credibly commit not to divert firm resources for private gain.

⁵ The same idea was raised as far back as Bonbright and Means (1932), who describe how US business groups in the 1930s operate internal capital markets to support their member firms.

⁶ This incubation role is illustrated by the following anecdotes. In 1996, the Taiwan-listed Acer group

Our hand-collected international dataset, which combines IPO and SEO transactions data with annual business group membership data, allows us to develop broad-based evidence in support of our arguments. As a starting point, we show that control retention is a key motivation for raising equity under a new public firm. Specifically, if the amount of equity raised through a group IPO was alternatively raised through an SEO of an existing public affiliate, then the family's voting rights in this affiliate would, on average, fall below the level assumed to confer effective control under country-specific mandatory takeover rules. We also find that family-group IPO firms are more capital intensive and grow more rapidly before going public, compared to standalone IPO firms as well as other existing (public and private) firms in the same group. This suggests that groups appear to use IPOs primarily to finance expansion opportunities. In fact, we do *not* find evidence that IPOs help groups achieve objectives typically observed for divisional carve-outs of widely held corporations (such as to liquidate shareholdings, reduce debt, or improve transparency).

The central empirical prediction of our incubation hypothesis is that internal capital rich groups can more effectively incubate emerging investment projects, leading to a higher likelihood that they will be able to raise equity capital independently under a new public firm (through an IPO), rather than under a conglomerate structure (through an SEO). The evidence from our empirical analysis support this prediction: group internal capital accumulation positively predicts the likelihood of an IPO, but not the likelihood of an SEO.

We also test the incubation hypothesis by focusing on certain identifiable conditions under which the relationship between group internal capital and IPOs should be especially observable. First, groups should have a compelling strategic reason to conduct an IPO. We show that the relationship between internal capital and IPOs is indeed stronger in situations where an IPO offers a solution to the conflict between financing growth and preserving

invested \$70 million to create Acer Display Technology, an LCD display manufacturer. The venture went public in 2000 and is now a global industry leader. In another case, New World China Land relied on capital from its Hong Kong-listed parent, New World Development, to acquire "hundreds of millions square feet of land in China", and actively marketed this fact to support its IPO. Pre-IPO financial support can also flow from quite distant group members. Gigamedia, an Internet provider owned by Taiwanese billionaire Jeffrey Koo, received pre-IPO funding from many affiliates, including TCC International, a cement distributor.

control, that is, when families only hold tenuous control over their existing group firms.

Second, a group should have a clear need to raise external funds in the first place (that is, internal capital is not sufficient to meet its capital needs), and that the preferred way to satisfy this need should be external equity. We identify such situations within two subsamples: group-year observations (1) involving some form of equity issue (either an IPO or an SEO), and (2) involving groups whose marginal source of external finance is likely to be equity given the existing state of their capital structure (i.e. when they have relatively high leverage). Our analysis shows that the positive relationship between internal capital and IPO likelihood is particularly robust under these conditions.

Third, group internal capital support should also be highly valuable when new firm financing barriers are high. In these cases, internal-capital-rich groups are in a comparatively stronger position to help their private divisions go public, whereas groups with limited internal capital may be forced to raise external equity through SEOs in their established firms or forego the investment opportunity entirely. To test this condition, we exploit a regulatory shock caused by the introduction of second-tier stock exchanges that cater to small, high-growth firms. Following a reduction in new firm financing barriers due to the establishment of such exchanges, we find that the competitive advantage of internal-capital-rich groups in facilitating IPOs is indeed reduced.

A positive correlation between group internal capital and IPO likelihood could arise because talented controlling families may be able to both generate more income and conduct successful IPOs. We address this concern with several additional tests. We show that the above relationship is not only driven by a group's profitability, but also by its decision to restrict dividends. The relationship also survives the inclusion of group fixed effects, which capture unobservable time-invariant differences across groups. We also follow [Becker, Jacob, and Jacob \(2013\)](#) and examine episodes of dividend tax rate changes around the world. These changes affect the relative internal financing advantage that internal-capital-rich groups have over internal-capital-poor groups, but are unlikely to be related to either a family's skills and

reputation. We show that the reduction in a group's internal financing advantage triggered by a dividend tax cut results in a significant narrowing of the gap in IPO frequencies between these internal-capital rich and poor business groups.

In addition to examining variations in IPO activity across groups, we show how internal capital is utilized *within each group* to facilitate IPOs. Specifically, we examine the types of existing group firms that serve as IPO parents and that provide additional pre-IPO investments. We find that they both tend to be internal-capital-rich group members. They also tend to be firms where controlling families hold high ultimate cash-flow rights. This structuring decision allows families to subsequently maintain high ultimate ownership interests in IPO firms themselves, which according to the [Gopalan et al. \(2014\)](#) model, is an important condition for these firms to successfully raise external equity capital. The incubation role of group internal capital is also reflected in a newly listed group firm's pre-IPO investment activity. We find that the pre-IPO phase is the period in which a group firm's capital expenditures are most dependent on the income generated by the rest of the group.

Finally, we investigate whether the transaction characteristics of group IPO firms reflect their financing advantages. If internal capital support is valuable, these firms should be able to limit the number of new shares they initially issue. This is exactly what we find, especially for IPOs sponsored by internal-capital-rich groups. Group IPO firms also have lower 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.

Our study is the first to provide empirical evidence on how internal capital helps resolve the tension between control retention and the need to raise equity capital for investment purposes, and it helps explain why groups choose to expand through IPOs of new firms, rather than through SEOs of existing public affiliates. In doing so, we expand the IPO literature by shedding new light on a previously undocumented aspect of global IPO markets, namely that group sponsorship of IPOs is a very common phenomenon, especially in emerging economies.

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.⁷ Yet, to our knowledge, no existing study has directly explored why new public firms are spawned by business groups. By providing new insights into the role that group internal capital plays in facilitating this process, our study expands the set of recent studies that investigate the channels through which groups support their affiliates, such as [Gopalan, Nanda, and Seru \(2007\)](#); [Gopalan et al. \(2014\)](#), [Buchuk, Larrain, Munoz, and Urzua \(2014\)](#), and [Almeida et al. \(2015\)](#). Compared to these studies, the incubation channel that we focus on has significant economic implications as it can explain why groups rely heavily on IPOs as a way to expand their organizational boundaries. It also suggests that an important reason behind groups' dominance in many public equity markets around the world is their ability to utilize internal capital markets to incubate valuable, high-growth investment opportunities.

2. Empirical Predictions

2.1. *Control retention motive for group IPOs*

Control is important for fast-growing business groups because it allows families to effectively deploy their family-specific assets (reputation, skills, connections, etc.) over a long horizon. However, a tension arises when groups have large financing needs, as new share issues generally dilute families' control rights. Issuing non-voting shares does not necessarily resolve this tension as they are often restricted by regulations ([La Porta et al. \(1997\)](#)) and attract substantial price discounts, which further dilute families' cash flow rights. Issuing debt is an alternative means of maintaining control, but at the expense of a costly deviation from optimal capital structure. A more serious concern for family groups is that additional debt

⁷ For example, see [Bae, Kang, and Kim \(2002\)](#), [Bertrand, Mehto, and Mullainathan \(2002\)](#), [Claessens, Djankov, Fan, and Lang \(2002\)](#), [Baek, Kang, and Lee \(2006\)](#), [Cheung, Rau, and Stouraitis \(2006\)](#) for evidence on the dark side and [Khanna and Palepu \(2000\)](#), [Almeida, Park, Subrahmanyam, and Wolfenzon \(2011\)](#) and [Almeida, Kim, and Kim \(2015\)](#) for the bright side. Groups may also exist as an equilibrium outcome that balances both their costs and benefits ([Fan, Jin, and Zheng \(2016\)](#)).

generally comes with stricter covenants and raises the risk of bankruptcy, which can directly threaten family control and future (inter-generational) stream of private benefits ([Anderson, Mansi, and Reeb \(2003\)](#), [Faccio and Masulis \(2005\)](#), [Strebulaev and Yang \(2013\)](#)).

As a result, there are situations where groups must issue equity to fund expansions and must also consider the control implications of doing so. In a general setting, control retention concerns can result in firms having to scale back external equity financing activity, as indicated by cross-country evidence from [Dyck and Zingales \(2004\)](#). Alternatively, they may have to change equity issuing methods. [Cronqvist and Nilsson \(2005\)](#), [Wu, Wang, and Yao \(2016\)](#) show that firms often conduct rights issues instead of underwritten share offers if they seek to limit control dilution. [Schipper and Smith \(1986\)](#) also note that control retention is a reason why US firms conduct carve-out transactions. In a review of ownership structure differences across countries, [Morck et al. \(2005\)](#) suggests that the same reason explains why new firms are created under a group structure. This is consistent with evidence that groups are prevalent in less developed financial markets and in capital intensive industries, where the value of corporate control is high along with the need for external capital ([Masulis et al. \(2011\)](#), [Belenzon, Berkovitz, and Rios \(2013\)](#)). Putting the above related evidence together suggests that the importance of maintaining control over existing firms influences the need for business groups to create new public firms. This hypothesis, to the best of our knowledge, is yet to be tested and forms our first empirical prediction.

Empirical Prediction 1: Groups are more likely to conduct IPOs (rather than SEOs) when they seek to expand without losing control.

2.2. The role of a group's internal capital market

When a group needs to create a new firm to resolve the conflict between raising equity and preserving control, we argue that internal capital market support can minimize the cost of an IPO and thus, make it both feasible and more attractive. This implies that groups with higher rates of internal capital accumulation are more capable of taking firms public. We note that this predicted positive relationship between internal capital accumulation and IPOs

is *not* inconsistent with a firm's presumed (pecking order) preference to use internal capital before turning to external capital. By using internal capital first before tapping the external capital market, internal-capital-rich groups 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.

For example, with projects that are highly capital-intensive and have low immediate cash flows in their early stages, a group with abundant internal capital has a competitive advantage in undertaking them. The group can deploy resources to meet the projects' large initial capital requirements until their future cash flow prospects reach a stage where it is possible to seek supplementary funding from public investors. Another scenario involves groups relying on internal funds to incubate many highly risky exploratory projects, akin to purchasing a portfolio of real options. When some of these options move into-the-money and require large-scale investments, having such prior internal capital support makes it feasible for them to more quickly access the IPO market for external financing. In these examples, using internal capital in the first funding round enables subsequent external equity raising to successfully take place.

Empirical Prediction 2: Family groups with a greater rate of internal capital accumulation are more active in taking their private affiliates public.

3. Data and Sample Characteristics

3.1. IPO sample and identification of IPO firm's ultimate owners

Our initial sample consists of IPOs in the *Thomson Reuter SDC Platinum* database that are completed between 1997 and 2007, and is supplemented by IPOs from *Bureau Van Dijk Zephyr* database and *Bloomberg*.⁸ We exclude IPOs of investment funds, partnerships, trusts, non-common stock offers and offers that raise less than US\$0.5 million (also effectively

⁸ Our initial sample of 13,506 IPOs 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).

excluding back-door listings, spin-offs, split-offs, and demergers).

We then apply a systematic procedure to identify whether an IPO firm is controlled by an existing business group or if its exchange listing results in the formation of a new group. A business group is defined as two or more publicly listed firms linked by a common controlling shareholder (the largest shareholder holding at least 20 percent of voting rights, or 10 percent if the shareholder is also 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 group firms in the [Masulis et al. \(2011\)](#) dataset and then cross-check with other data sources (*SDC Platinum*, *Factiva*, company websites and *Google* searches) to ensure that the firm does not become a group affiliate through a post-IPO acquisition.

Firms delisted before 2002 and firms listed after 2002 are not in the [Masulis et al. \(2011\)](#) dataset. To determine their group affiliation status, we collect information about their pre-IPO controlling entities from a comprehensive set of ownership data sources (*SDC Platinum*, *Zephyr*, *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. Where the controlling shareholder can only be identified after listing, we assume that the same shareholder 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, where the ultimate controlling owner of each firm can be clearly identified. With this first comprehensive dataset of IPO ownership around the world (on average representing 96% of IPOs in each country), we document several important new statistics about the global IPO market (see [Table 1](#)). A sizeable portion of this market (15% of the number of IPOs and 31% of the total IPO proceeds) are not IPOs in the traditional sense (that is, new independent firms owned by

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. These “affiliated” IPOs represent a significant alternative means of equity financing in place of conducting SEOs, especially in emerging markets, where they on average account for 26% of all the equity issues associated with existing listed firms. Importantly, the majority of affiliated IPOs (57 percent) are sponsored by family business groups, making these groups an important player in the global IPO market.

[INSERT TABLE 1 HERE]

3.2. *Business group ownership panel data*

To construct the yearly ownership snapshots of each group in the sample, we again use the [Masulis et al. \(2011\)](#) data as a starting point and track the following events: (1) IPOs as discussed above, (2) spin-off and M&A transactions that result in additions or sales of control of public affiliates, and (3) delistings of public affiliates. 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 other group membership changes. 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 using the ownership databases mentioned above as well as hand-collected data from annual reports and filings of group firms and their parents.⁹ This allows us to construct the

⁹ With the hand-collected data, we only obtain shareholdings for (1) 1997 or when a firm first joins the group, (2) 2007 or when the firm leaves the group, and (3) each 3-year interval in between these two dates. We then linearly interpolate the ownership variables for the years within these intervals.

following group ownership measures: (1) family control rights (the total voting rights held in a group firm by the family and all other group members), (2) 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 to the family and then aggregating these products across all the individual chains), and (3) the pyramid layer position (the minimum number of listed firms that separate a group firm from its controlling family).

Combining the business group and IPO data shows that IPOs are an economically important source of external capital for family groups, on average accounting for 40 percent of the total equity capital raised (through IPOs and SEOs) and 72 percent of new public firms added to a group (the other modes are acquisitions, de-mergers, and spin-outs).

4. Motives for group IPOs

In this section, we provide evidence in support of Empirical Prediction 1 by documenting the characteristics of both family-group IPO firms and other listed group firms around their IPO events. Our focus is on establishing whether the primary motivation behind a group IPO is to help the group expand without losing control, or whether it is used to liquidate/restructure existing operations.

4.1. *Incubating investment projects to access IPO markets*

If group IPO firms can rely on group internal capital support to facilitate their access to the IPO market, then we should observe them aggressively expanding even before they go public. To test for this growth pattern, we collect capital expenditures data of group IPO firms for up to 5 years before their listing year.¹⁰ In Panel A of Table 2, we show that during the pre-IPO period (including the IPO year), group IPO firms have a significantly higher capital expenditure rate (CAPEX/assets) than a matched sample of other IPO firms in the

¹⁰ CAPEX is defined using cash flows from investment activities. Data availability is limited by firm age and country-specific pre-IPO reporting requirements. We obtain this data from *Worldscope*, *Osiris* and directly from prospectuses (from the *Mergent* database) for all family-group IPO firms. For the remaining IPOs, which represent a vast majority of the sample, we rely on the first two data sources.

same country (matched on pre-IPO firm size and IPO market conditions in the IPO event year). We also find that group IPO firms on average have a higher CAPEX rate than other listed firms in the same group and the same year.

We next compare group IPO firms to an even more relevant control sample: private subsidiaries of listed firms in the same group and private firms directly controlled by the family. These are collected from the *Orbis* database, a premier data source providing data for private firms around the world. We argue that these private entities could in theory also go public, but do not, so their expansion rates provide an appropriate alternative benchmark. An issue with this analysis is that private firms do not generally disclose CAPEX information, so we have to rely on fixed asset growth rates to capture expansionary activities. In Panel B of Table 2, we document that group IPO firms on average have a greater fixed asset growth rate than their matched private entities from the same group.¹¹

Other characteristics of group IPO firms are presented in Online Appendix Table A3, which shows that they are almost twice as large as a typical non-group IPO firm. Matched on size and listing conditions, group IPO firms are also significantly younger. This is consistent with the evidence presented above that group IPO firms grow faster than their non-group peers before going public. In addition, group IPO firms have lower profitability and more intangible assets. All of these characteristics make it more difficult to raise external equity independently and this makes group internal capital support particularly valuable.

[INSERT TABLE 2 HERE]

4.2. *Control retention motive for group IPOs: Univariate results*

We next analyze whether family groups that expand through IPOs possess characteristics consistent with a strong control retention motive. Panel A of Table 3 shows that group IPO firms are tightly held, with the median family control rights exceeding an absolute voting majority (54%) and significantly higher than those of other member firms (by 11%). We

¹¹ We use three alternative matching criteria: firm age, size and year. Our ability to combine these criteria or to employ a comprehensive matching method is limited by private firm data availability.

also examine the rate of corporate control turnovers in IPO firms over the first 5 years after listing.¹² Only 4.5% of group IPO firms experience a change of control, which is substantially less than the 13.6% recorded for stand-alone IPO firms.

The control retention motive is most clearly reflected in how IPOs help families preserve control over existing group firms. To show this, we assign each group IPO firm a “parent” firm. For an IPO involving a division of an existing listed firm (pyramidal structure), the parent is this listed firm. If an IPO is directly held by the family (horizontal structure), the parent is defined as the largest existing listed firm in the group.

Panel B of Table 3 reports that the average family control rights in an IPO parent firm are quite low, at 37%. To demonstrate the risk of losing control, we calculate the number of new shares the parent would need to issue if, instead of an IPO, the parent raised the same amount of capital through an SEO.¹³ We add to this calculation all SEOs that the IPO firm conducts during the first 5 years after its listing. Under this hypothetical scenario, we find that the family would on average suffer a 48% percent ownership dilution and their control rights in the parent firm would on average fall to 29%.

To put the extent of the dilution into perspective, we compare the above counter-factual post-SEO family control rights to a country-specific control threshold – the mandatory tender offer threshold. This follows Dyck and Zingales (2004), and is defined as the ownership threshold which when crossed requires the block shareholder to make a tender offer for all the minority shares at a common price. A controlling family would want to keep their voting rights above this threshold, otherwise a rival shareholder could amass a competing stake of similar size without being forced to make such costly tender offers.¹⁴ Panel B shows that the median family control rights in the parent of an IPO firm are 7% higher than the corresponding domestic control threshold, but would fall below this threshold under the

¹² We use *SDC Platinum* to identify (1) spin-offs (2) full mergers and acquisitions, and (3) partial divestitures that result in the emergence of a new controlling shareholder.

¹³ We set the offer price of the hypothetical SEO at the average price of the parent firm’s shares over the 20-day period before the issue date of the actual IPO. As SEOs are generally priced at a discount, this is a conservative estimate that understates the potential control dilution.

¹⁴ The country-specific thresholds are reported in Online Appendix Table A1.

scenario where the parent firm conducted an SEO in place of the IPO.

4.3. Other motives for group IPOs

Group IPO firms are often divisions/subsidiaries carved out of existing listed group firms. The corporate restructuring literature suggests that corporate carve-outs may serve both partial liquidation and restructuring purposes ([Schipper and Smith \(1986\)](#), [Eckbo and Thorburn \(2013\)](#)). If liquidation is a dominant reason for groups to conduct IPOs, we should observe a large proportion of existing shares (secondary shares) being sold. As reported in Panel A of Table 3, we find that the extent of secondary shares sold is smaller for family-group IPO firms than for standalone IPO firms. When compared to other affiliated IPO firms (carve-outs from widely held corporations or non-family business groups), family-group IPO firms sell significantly fewer secondary shares.

To evaluate other restructuring motives, we examine several characteristics of the parent firm of each group IPO firm (as defined above) and how they vary around the IPO event. First, an IPO can be conducted to raise funds to repay its parent firm's debt or to shift debt into the new firm ([Pagano, Panetta, and Zingales \(1998\)](#), [Dittmar \(2004\)](#)). We do not find that the parent firm's debt changes significantly after an IPO event. Second, by creating a new public firm, a group IPO can generate risk-sharing benefits for controlling families, allowing individual group firms to take on more risk ([Faccio, Marchica, and Mura \(2011\)](#)). To evaluate this possibility, we examine the stock return volatility of the parent firm around each IPO event, but do not find strong evidence of a change in their risk taking. Third, we explore whether an IPO delivers benefits to the parent firm in terms of greater corporate transparency, as measured by the parent firm's Tobin's Q and analyst forecast dispersion. Again, we do not find any improvements in these metrics.

[INSERT TABLE 3 HERE]

It is possible that, before going public, group IPO firms undertake relatively small projects that do not significantly reduce the transparency of their parent firms. However, had these

projects been allowed to grow inside their parent firms (through a conglomerate structure), they might have a significant transparency impact. We compare the characteristics of group IPO firms after they are listed to those of existing group members. We find some important differences that are consistent with the argument in Almeida and Wolfenzon (2006) that they should be financed as separate entities. Specifically, group IPO firms have greater risk, less profitability, and lower asset tangibility. They also tend to operate in different industries. When comparing the primary two-digit SIC code of each IPO firm to that of its parent firm (using the same definition as above), we find that 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%. These results are presented in Online Appendix Table A3.

5. Internal Capital and IPO Activity of Groups

To test Empirical Prediction 2, we first focus on the binary outcome of a group either expanding through an IPO or not. In an alternative specification, we explicitly examine whether a group funds an expansion through an IPO or an SEO. Our analysis involves the estimation of several panel regression models where the unit of observation is a group-year. To capture group IPO (SEO) decisions, we construct an indicator variable that equals one if the focal group conducts an IPO (SEO) within six months of the fiscal year-end of the focal year, and zero otherwise. We construct two group-level measures that capture the main channels through which a group can accumulate its internal capital: namely its net income before dividends paid and received, excluding depreciation, amortization, and impairment charges (*GRPINCOME*), and its cash dividend distributions (*GRPDIVIDEND*).¹⁵ Both variables are scaled by the corresponding year-opening total asset values.

Our regression models include a large set of control variables, several of which warrant

¹⁵ 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 reflected in our measures. It is possible that controlling families directly own other privately operated 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.

further explanations. To provide more evidence on Empirical Prediction 1, we include a proxy for the control motive of each group: the market-capitalization weighted average of family control rights in its existing member firms (*GRPCONTROL*). Industry diversification is also a potential IPO motive,¹⁶ which we measure with a Herfindahl-Hirschman index (*GRPHHI*), constructed for each group using the one-digit primary SIC codes of its listed member firms. Following [Khanna and Palepu \(2000\)](#), a low value for this measure indicates that the group already has a diversified structure (its listed affiliates already operate across many industries), and hence, has less need to create new firms for diversification purposes. Finally, both group internal capital and IPO activity may be jointly correlated with underlying equity financing needs. While we address this issue more rigorously later, at this stage, the controls include several observable firm characteristics indicating equity financing needs: Tobin's Q (*GRPQ*), capital expenditure intensity (*GRPCAPEX*) and debt-to-asset ratio (*GRPDEBT*).¹⁷

5.1. Baseline results

Table 4 presents our baseline estimates. In Column 1, we estimate a logit model where the IPO indicator is the dependent variable. The model incorporates random effects, so unobserved group effects are assumed (for now) to be uncorrelated with model errors. The results strongly support Empirical Prediction 2 as both *GRPINCOME* and *GRPDIVIDEND* have significant positive relations to the likelihood of observing a group IPO. In Columns 2a and 2b, we estimate a multinomial logit model with random effects, where the dependent variable captures a group's choices of conducting an IPO, an SEO, or no public equity capital raising. The estimates indicate that the likelihood of a group choosing an IPO rises with its capacity to accumulate internal capital through its realized income (*GRPINCOME*), while the likelihood of an SEO actually falls with that same capacity.

In Column 3, we include both group fixed effects to capture time-invariant unobservable differences across groups and country-by-year fixed effects to hold constant country-specific

¹⁶ [Khanna and Palepu \(2000\)](#) show that a business group's entry into a new industry is most typically carried out by creating a new public firm and that individual group firms are often focused firms.

¹⁷ [Pagano et al. \(1998\)](#) also show that IPOs can be motivated by debt repayment motives.

conditions.¹⁸ In Column 4, we estimate a model where the dependent variable is a binary choice of IPO versus SEO. This model partially addresses the possibility that our results are driven by a group's propensity to raise capital to exploit positive earnings shocks. If this is a dominant motivation, then it should explain the timing of equity issues, but not the choice between SEOs and IPOs. Our results are unchanged across both specifications.

5.2. Other determinants of group IPOs and SEOs

It is worth noting that, from the estimates in Columns 2 and 4, IPOs and SEOs are associated with different group characteristics. This indicates that unlike SEOs, group IPOs are motivated by certain *non-financing benefits*. In particular, the coefficient of *GRPCONTROL* is twice as large in the IPO equation than in the SEO equation. Thus, consistent with Empirical Prediction 1, groups are more likely to conduct IPOs when family control rights over existing affiliates are lower, so that control dilution through SEOs is more of a concern. Interestingly, groups with low debt levels (*GRPDEBT*) are significantly more likely to expand through an IPO rather than through an SEO. This preference reflects the possibility that low-debt groups have a high propensity to use debt as their marginal external funding source, unless raising new equity leads to other strategic benefits as in the case of IPOs. For example, in highly competitive environments and when there are rapid technological changes, debt issues can create unnecessary risks to maintaining corporate control. Some groups may therefore prefer to operate under low debt levels and externally finance through IPOs to preserve their private benefits of control.

We also find that group age and Tobin's Q have a stronger positive relationship with the likelihood of an SEO over an IPO. This is consistent with groups taking advantage of established member firms and those with high valuation to achieve cross-pledging benefits and reduce SEO discounts. In contrast, IPOs are more likely to occur when groups have a financial-firm affiliate, suggesting that such affiliates provide particularly relevant assistance

¹⁸ Due to the incidental parameters problem associated with a large number of fixed effects, our estimates are based on a linear probability model. In Online Appendix Table A4, we report the estimates obtained from conditional logit regressions (Chamberlain (1980)) as another way of incorporating fixed effects.

(such as underwriting and marketing) to the going public process. Finally, the significant positive coefficient of *GRPHHI* in the IPO equation, but not in the SEO equation, suggests that groups have a stronger need to create new firms (for diversification reasons) when their current businesses are concentrated within a few industries.

[INSERT TABLE 4 HERE]

5.3. *Conditions underpinning the incubation hypothesis*

5.3.1. *Control retention benefits of creating new public firm*

We next delve into the specific conditions that underpin the applicability of Empirical Prediction 2. The positive relationship between internal capital and group IPO activity should strengthen when a family's control retention concerns become more pressing, such as when their voting rights in existing public affiliates are sufficiently weak that further share issues may trigger a loss of control. To test this, we interact *GRPCONTROL* with *GRPINCOME*.¹⁹ This interaction term (reported in Columns 1 and 2 in Panel A of Table 5) is indeed negative and significant. Expanding the analysis in Table 3, we further examine the country's mandatory tender offer threshold as an objective benchmark for the *GRPCONTROL* value of each group. We find that *GRPINCOME* × *GRPCONTROL* is significantly negative only when *GRPCONTROL* is above the threshold, and actually turns positive below the threshold. Thus, the voting rights dilution effect of group SEOs is a primary concern for controlling families when their level of voting control in existing member firms is near the mandatory tender offer threshold. Under these circumstances, the role of group internal capital in facilitating IPOs becomes considerably more important.

5.3.2. *The need to raise new external equity finance*

Another condition underpinning Empirical Prediction 2 is whether a group needs to raise new equity capital in the first place. When internal capital (or access to debt) can completely

¹⁹ All discrete choice regressions that incorporate interaction terms are estimated as a linear probability model. See [Ai and Norton \(2003\)](#) for issues related to the use of interaction terms in non-linear models such as a logit model.

meet its investment requirements, groups would not need to bear the costs of raising any external capital, including through IPOs.²⁰

A test involving situations where groups have a clear equity financing need is presented in Column 4 of Table 4. This test excludes group-year observations where the group does not raise any external equity capital. The estimates indicate that, conditional on observing groups raising new equity, internal capital support is more important to IPOs than SEOs. In another analysis, we condition on a group's current debt level, which is an important predictor of the likelihood of raising new equity capital (see [Jung, Kim, and Stulz \(1996\)](#) for early evidence). We argue that, when a group has a very low debt level, equity is unlikely to be the primary funding source given the high borrowing capacity. In addition, at very high debt levels, groups are again unlikely to rely on equity as their primary funding source due to the debt overhang problem ([Myers \(1977\)](#), [Hart and Moore \(1995\)](#)), where high leverage leads to a greater fraction of the value created by new equity financing accruing to debtholders. It is also possible that firms nearing financial distress may face severe information problems, making equity offerings prohibitively costly.

Motivated by this line of reasoning, we repeat our baseline analysis across four subsamples of group-years, split by quartiles of group excess debt levels, calculated by aggregating the excess debt (relative to the industry median debt levels) of individual group members. The relationship between internal capital and IPO activity is strongest for groups in the two middle quartiles (see Panel B of Table 5), and becomes insignificant in the two extreme quartiles. Under the assumption that business groups with particularly low or high debt levels are less likely to seek external equity, our results support the view that having marginal equity financing needs is an important condition that helps produce a positive relationship between group internal capital and group IPO activity.

[INSERT TABLE 5 HERE]

²⁰ [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 generate internal funds.

5.3.3. *The Role of New Firm Financing Barriers*

Another condition underpinning Empirical Prediction 2 is the existence of external financing barriers in establishing newly listed firms. When these barriers become less binding, the role of internal capital in supporting group IPO activity should weaken. To test this proposition, we focus on a type of changes in new-firm financing barriers created by the introduction of a second-tier board or stock exchange (commonly known as an “SME market”). In many countries, the main exchanges impose serious hurdles on new firms seeking to go public, requiring them to meet minimum requirements on asset size, profit records, and number of shareholders. These historically designed requirements often become entrenched in the operations of the main exchanges, serving to protect their reputation with market participants and listed firms (Chemmanur and Fulghieri (2006)). New firms with characteristics that do not fit these requirements may find access to public equity funding severely limited and may need to remain private for longer periods. Second-tier exchanges cater to such small, high-growth firms by offering lower listing requirements and replacing them with more efficient bonding and disclosure mechanisms.²¹

A benefit of using these events is that they are staggered over time and tend to be externally driven, as exchanges try to emulate successful experiences in other countries (such as the Alternative Investment Market in the UK). We argue that prior to such an event, private group affiliates require more incubation support before they are able to comply with the strict main-exchange listing rules. This results in barriers to entry that favor groups with greater internal capital availability. In Panel C of Table 5, we re-estimate our baseline regression models incorporating the interaction between *GRPINCOME* and the indicator variable for the period when a second-tier exchange is active. The coefficient of this interaction term is significantly negative, indicating that the positive effect of internal capital on IPO likelihood is weakened in the post-event years.

²¹ Information on second-board exchanges is provided in Online Appendix Table A1.

5.4. Other group-level results

5.4.1. Alternative internal capital measures

Our main measure of group internal capital is the rate of yearly additions to retained earnings. As this can be sensitive to temporary spikes in profitability, we replace it with the prior 3-year average additions to retained earnings as a robustness check (see Online Appendix Table A5). This does not change our baseline results. As further robustness, Table A5 reports the results of using up to four lags of *GRPINCOME*. Their coefficients are significant using the 1, 3, and 4 year lags.

Another concern is that *GRPINCOME* is related to time-varying investment opportunities, and this could drive the relationship between group internal capital and IPO activity. To address this possibility, we use the stock of retained earnings scaled by total assets as an alternative measure of accumulated group resources. This is also significantly related to a firm's choice of pursuing IPOs rather than SEOs (see Table A5).

5.4.2. Alternative explanations: A family's managerial skills and reputation

It is possible that the correlations we have documented thus far are mainly caused by family-specific skills and reputation, which can influence both a group's operating performance and its ability to conduct IPOs. Establishing causality is a serious challenge in our cross-country context. Nevertheless, we can point to several results below which suggest that family skills and reputation are not major drivers of our results.

Dividend decisions: Unlike the income-based measure of internal capital accumulation, dividend decisions are not directly related to family talent. We previously show in Table 4 that group IPOs can be linked to groups deliberately reducing dividend distributions. We now further evaluate whether the negative coefficient of *GRPDIVIDEND* reported in Table 4 is simply due to an abnormal dip in dividends for the IPO year. This is not the case. For each group IPO, we compute the average of *GRPDIVIDEND* over 3 years leading to (and including) the IPO year, and over 3 years after the IPO year. Combining all group IPOs,

the median of the pre-IPO average dividend rate measure is 0.72%, while for the post-IPO period, it is 0.87% (the difference is significant at the 1% level).

Group fixed effects: If a family's managerial skills are time invariant, then group fixed effects can account for family-specific human capital factors that could drive the relationship between group internal capital and IPO listings. As reported in Tables 4, 5, and Online Appendix Table A4, we continue to find that, even after controlling for group fixed effects, periods of high internal capital accumulation are associated with a high IPO likelihood.

Dividend tax changes: Empirical Prediction 2 is motivated by the argument that group internal capital can be deployed to minimize the amount of costly external capital required to finance a new firm, making its IPO more feasible. Internal-capital-rich and internal-capital-poor groups thus have different propensities to incubate new firms. We examine a shock to the former group's internal financing advantage that is unlikely to be related to family skills and reputation – namely a change to a country's dividend tax rate.

Prior studies suggest two channels through which dividend taxes can create *differences across firms* in the financing of marginal investments. First, the presence of a dividend tax introduces a *tax wedge* effect on the cost of capital of internal versus external funds. This is because retaining internal capital avoids an expected immediate dividend tax payment. Without this tax benefit, the required rate of return on the same investment is higher if it is funded by new external capital (see Auerbach (2002), Chetty and Saez (2005, pp. 797-798), and Becker et al. (2013, pp. 4-5) for a detailed discussion). Thus, a high dividend tax rate generates a large gap between firms with high cash flows (internal capital rich) and those with low cash flows (dependent on external financing) in terms of their investment capacity. It follows that a reduction in the dividend tax rate narrows the cost of capital difference and moderates the competitive advantage of internal-capital-rich firms in undertaking marginal investments.

Second, Chetty and Saez (2005), Brown, Liang, and Weisbenner (2007) and Masulis and Reza (2015) empirically show that, by increasing the after-tax benefits of a dollar of

cash dividends, a dividend tax cut puts pressure on corporate managers to immediately pay out rather than retaining profits to satisfy the tax-driven increase in shareholder demand for dividends. This can lead to a reduction in internal capital availability, and given that dividends are generally restricted to corporate earnings (for example, due to standard debt covenants), the magnitude of the effect is likely to be greater for internal-capital-rich firms than internal-capital-poor firms. In a theoretical model, [Chetty and Saez \(2010\)](#) further suggest that the payout pressure is disproportionately greater for internal-capital-rich firms because of the agency problem of free cash flows.

In our business group context, we similarly argue that a dividend tax cut reduces the relative financing advantage of group internal capital. Before the dividend tax cut, internal-capital-rich groups have a clear advantage in incubating new firms as internal-capital-poor groups with similar investment opportunities face a high cost of external capital to (eventually) fund these opportunities. After the tax cut, the competitive advantage of internal-capital-rich groups declines, as internal-capital-poor groups face a smaller cost of capital disadvantage and are therefore more willing to compete for investments that require external finance. Internal-capital-rich groups now also face more pressure to increase dividends, leaving less available internal capital for incubation. In other words, a dividend tax cut reduces *the gap between the two group types* in their incubation propensities.

Thus, the tax change setting allows us to estimate a difference-in-differences model. We argue that the estimated effect (the difference in differences) is unlikely to be explained by superior family skills and reputation. Although skills and reputation can influence a group's ability to generate cash flows, the assignment of business groups into internal-capital-rich and internal-capital-poor groups is unlikely to be related to a dividend tax change. In support of this argument, [Becker et al. \(2013\)](#) discuss the fact that dividend tax changes are mainly caused by political considerations rather than profitability differences across firms, and present evidence indicating that the parallel trends assumption holds before each tax change. In addition, our model includes country-by-year (and group) fixed effects to sweep

out the effect of any tax-cut driven changes in aggregate investment opportunities facing all groups in a specific country. The model also includes Tobin's Q and CAPEX to control for (as much as our data permits) other potential variations in firm-specific investment opportunities.

To capture dividend tax changes in each country, we utilize the effective dividend tax rate measure constructed by [Becker et al. \(2013\)](#) to form an indicator for low (below country median) dividend tax periods (*DIVTAXLOW*).²² Similar to their study, we also focus on major tax cut events (cuts of at least 3 percentage points) that occur within our sample period to construct an alternative tax change measure – an indicator for the post-tax-cut period (*POSTTAXCUT*).

The results reported in Table 6 show that the coefficients of $DIVTAXLOW \times GRPINCOME$ and $POSTTAXCUT \times GRPINCOME$ are significantly negative. This means that a dividend tax cut reduces the relative retained earnings advantage of internal-capital-rich groups vis-à-vis internal-capital-poor groups, leading to a convergence in their likelihood of conducting an IPO. We then conduct a falsification test by re-estimating the models using tax changes from a neighboring country (see Columns 5 and 6), and as expected, the interaction terms are no longer significant. Overall, these results suggest that family skills and reputation are not the main drivers of the relationship between group internal capital and IPOs.

[INSERT TABLE 6 HERE]

5.4.3. Different control structures of group IPO firms

A group IPO firm may not always originate from a division of an existing member firm, but is instead controlled directly by the family or through a private holding company. The [Almeida and Wolfenzon \(2006\)](#) model shows that the first type (pyramidal structure) has an advantage over the second type (horizontal structure) in terms of better utilizing group internal capital to support new firms. Consistent with their model, we find that pyramidal

²² This measure is available for 25 of our sample countries and takes into account country-specific imputation credits and tax exemptions. Our results are unchanged when we use an alternative dividend tax rate measure constructed in [Becker et al. \(2013\)](#) that also accounts for share repurchases.

IPO firms are more dependent on internal capital support (see Online Appendix Table A6).

5.4.4. *Non-family groups*

Thus far, we have focused on family groups. It is important to emphasize that we do not find a consistent significant relationship between group internal capital and the likelihood of an IPO for non-family groups (see Online Appendix Table A6). 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 allocate capital across group affiliates is generally more diffusely held than in family groups.

6. Operations of Internal Capital Markets to Support IPOs

In this section, we provide evidence on *how* a group's internal capital market operates to support IPO activity. Specifically, we examine (1) which exist affiliates serve as IPO parents, (2) which affiliates make pre-IPO equity investments in new IPO firms, and (3) how group internal capital helps these new firms meet their capital expenditure requirements.

6.1. *Characteristics of an IPO parent*

[Almeida and Wolfenzon \(2006\)](#) suggest that it is efficient to establish a new firm as a subsidiary of an existing internal-capital-rich member firm to fully utilize the financing advantage of a pyramidal structure. As pointed out by [Gopalan et al. \(2014\)](#), this also helps avoid transfers of capital between two separate group firms that can be costly and subject to rigorous audits. Thus, we expect that firms with greater internal capital are more likely to be the direct parent of an IPO firm.

An existing firm's current ownership structure should also matter. [Gopalan et al. \(2014\)](#) argue that group controlling families need to maintain large ownership positions in capital raising firms to allay expropriation fears of outside investors. In the specific case of raising funds through an IPO, a key concern will be the wedge between control rights and cash-flow

rights created in the new firm: while the family retains control, their ultimate cash-flow rights will be the product of their ownership in the parent firm and the parent firm's direct ownership in the new firm. Maintaining high family cash-flow rights in the new firm to alleviate external financing constraints can therefore be difficult if the family only has a small ownership percentage in the parent firm. In such a situation, an excessive level of internal capital investment by the group will be required to support the immediate financing requirements of the new firm. This argument suggests that, in addition to choosing an internal-capital-rich affiliate to incubate a future IPO firm, the family should take account of their cash-flow rights in each potential parent.

We test the above predictions at the group-firm level using several panel regression specifications. The dependent variable is an indicator variable that equals one if a group firm conducts an IPO for one of its divisions/subsidiaries in a given year. Column 1 of Table 7 reports the estimates of a linear probability model with group and country-year fixed effects. Consistent with our expectations, we find that the internal capital generating capacity of a firm plays an important positive role in predicting whether it becomes an IPO parent or not. IPO parent firms also tend to be group members where controlling families hold relatively high ultimate cash-flow rights and relatively low control rights. These opposite relationships are possible since ownership and control can be separated in a pyramidal group structure. For example, apex firms at the top of a pyramid tend to be more established firms where the family might have run down their control rights, but at the same time they are directly connected to the family, who should hold greater ultimate cash-flow rights in these apex firms than other firms in lower pyramid 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 across existing group members in the year in which a group has an IPO event. In Column 3, we employ firm fixed effects, which allow us to show whether the likelihood of a group firm bringing a subsidiary public rises in periods

with relatively high additions to its retained earnings. We then examine the choice that a group firm faces between conducting an IPO of a subsidiary or an SEO of its own shares in Column 4. Across these specifications, the estimates show that high retained earnings play an important role in explaining whether a firm conducts an IPO of a subsidiary.

6.2. *Internal capital and intra-group investment in IPO firms*

It may also be possible that an IPO candidate firm requires pre-IPO internal capital support beyond that which can be provided by its immediate parent. In such cases, a group can also direct other internal-capital-rich member firms to co-invest in private subsidiaries being incubated by another affiliate.

To examine this possibility, we hand-collect cases where an IPO firm has equity stakes held by multiple group affiliates.²³ This analysis allows us to provide even more direct evidence of internal capital market operations by showing the directionality of the internal capital flows between two group firms that are separate in the group structure. Columns 5 to 7 of Table 7 report the results from regression models that incorporate various layers of group fixed effects, group-year fixed effects, and firm fixed effects. Similar to the IPO parent results, we observe that existing group firms chosen to provide additional pre-IPO equity investments to an IPO affiliate tend to have higher cash earnings themselves.

6.3. *Internal capital and pre-IPO corporate investment*

To further show how a group's internal capital market operates to incubate new firms, our next analysis focuses on cash flow variations *within a group*. Specifically, we examine whether the high growth rate of group IPO firms before going public, as shown in Table 2, can be linked to the ability of other existing group affiliates to accumulate resources. This analysis covers all eventually listed group firms and utilizes the same CAPEX data described

²³ In some cases, we infer the existence of pre-IPO stakes through the ownership structure disclosed immediately after listing. It is unlikely that these stakes are formed by existing affiliates subscribing to the new firm's IPO. This would be an inefficient funding mechanism given the transaction costs involved in the process (such as underwriter spreads). Nevertheless, we are agnostic about whether these stakes are formed before or during the IPO process. In either scenario, these equity investments help a group IPO firm limit the amount of new equity sold to outside public investors.

in Subsection 4.1 to measure the investment intensity of each firm during both its pre-listing and post-listing years. The regression model in Column 1 of Table 8 confirms the univariate results in Panel A of Table 2: on average, the CAPEX/assets ratios of group firms are about 2% higher in their pre-IPO years than post-IPO years. In Columns 2 and 3, we impose group (or group-year) fixed effects to create a comparison of firms within a group, and interact the pre-listing indicator variable with a firm's own cash income and with other group affiliates' cash income.²⁴ The estimates indicate that, relative to other listed group firms, a group IPO firm's pre-listing investment intensity is less sensitive to its own cash flows and more sensitive to the level of internal capital available from the group. In Columns 4 and 5, we impose firm fixed effects and find similar results.

[INSERT TABLE 8 HERE]

We note that the three sets of results presented in this section are unlikely to be driven by family skills and reputation – an alternative explanation discussed in Subsection 5.4.2 above. This is because we compare firms within a group and the use of group-year fixed effects helps us control for unobservable family effects.

7. Financing Advantages of Groups in the IPO Market

Our analysis thus far has focused on the role of internal capital markets in facilitating group IPO activity. In this section, we investigate whether such support translates into significant financing advantages for group firms over other firms in the going public process.

7.1. *Internal capital support and offer size*

Before a group IPO takes place, group internal capital support can help limit the fraction of costly external equity capital that needs to be sold in an IPO. This implies that a group can retain higher post-IPO ownership. We explore this implication by first comparing the relative offer size of group and non-group IPOs. Our main dependent variable is the fraction

²⁴ The pre-IPO CAPEX and income measures of a group firm are constructed from the reported financial data of its pre-listing private firm predecessor, and not those of its parent firm.

of primary shares issued (representing the new capital raised) as a proportion of post-listing shares. Our main variables of interest are two indicator variables for IPO firms sponsored by family groups are captured by two indicator variables: *FAMGRPPYR* for pyramidal IPOs and *FAMGRPHOR* for horizontal IPOs. The results are reported in Table 9. Column 1 shows that IPO firms owned by family groups raise proportionally fewer new primary shares than IPOs of non-group firms. We next drill deeper into the variations in group internal capital within the family-group IPO sample. The results reported in Columns 3 and 4 show that additions to retained earnings at both the group and parent levels significantly reduce the proportion of primary shares issued by a group IPO firm.

[INSERT TABLE 9 HERE]

We also consider the fraction of secondary shares sold by IPO firm insiders for comparison purposes (Column 2). We do not find that family groups sell proportionally more secondary shares than other issuers, confirming that their IPOs are not used as an ownership divestiture strategy. The analysis in Columns 3 and 4 is repeated on secondary shares (not reported), but this does not lead to the same results as obtained for primary shares.

7.2. *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, then 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 10, we estimate whether the probability of observing a family-group IPO can be explained by several measures of aggregate economy-wide financing constraints, including the strength of corporate governance (*GOVERNINDEX*), the extent of equity capital supplied by domestic institutional investors (*INSTOFUNDS*), the general availability of venture capital (*VENTUREFUNDS*), and foreign equity investment restrictions (*FOREIGNLIB*). Our model explicitly controls for the prevalence of *existing* family group firms in the domestic economy (*FAMGRP%*), along with

other country-level control variables that are not reported for brevity.²⁵

We find that several measures of external financing barriers, including *GOVERNINDEX*, *INSTOFUNDS*, and *FOREIGNLIB*, are indeed significantly negatively related to the prevalence of family-group IPO firms. 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. Another possible interpretation of these results is that our measures of external financing constraints are also related to the strength of the country-level contracting environment. Group IPOs may be more prevalent in countries with weak contracting because controlling families' business and political connections substitute for explicit contracting mechanisms. IPOs help families maintain these advantages by preserving control, while still allowing groups to expand their operations by raising new capital.²⁶

[INSERT TABLE 10 HERE]

Group financing advantages can also manifest themselves in the timing of IPOs. In subdued ("cold") IPO market conditions, independent entrepreneurs may have to delay or abandon taking their firms public, whereas group firms may still be able to go public given that they are already more developed and face lower barriers in meeting their external equity capital requirements. To account for such time variations in market conditions, we include in the above model (Column 1) two measures of stock market and IPO market conditions around the time of each IPO: the country's MSCI stock index return during the three months prior to listing (*MKTRETLIST*) and the relative frequency of IPOs from the same country during the 12 months bracketing an IPO's listing date (*IPOVOLLIST*). In an alternative model (Column 2), we estimate a regression specification with country fixed effects in which all time-invariant country-level variables are suppressed. Across both models,

²⁵ As we do not have data to cover the entire sample period, these country-level measures are constructed as of 2002 – the sample period mid-point. See Online Appendix Table A2 for more descriptions.

²⁶ Although some country-level measures explain the prevalence of group IPO firms, they do explain the strength of the incubation effect. Online Appendix Table A7 shows that the relationship between group internal capital and IPOs is broadly consistent across country sub-samples.

we show that *IPOVOLLIST*, which reflects the strength of IPO market conditions, has a significant negative relationship with the probability of group affiliated IPOs.

7.3. *Group affiliation and IPO flotation costs*

Next, we examine IPO underpricing and test whether group support also reduces the well documented adverse selection costs of going public. The results reported in Column 3 of Table 10 show that the two family-group IPO indicators (*FAMGRPPYR* and *FAMGR-PHOR*) are negative and significant in our underpricing regression model. We assess whether this relationship is mainly driven by groups with strong bargaining power in negotiations with underwriters. In Columns 4, 5, and 6, we split family-group IPO firms by whether a sponsoring group has a strong (weak) connection to an underwriter based on three alternative metrics: the group uses a top-tier underwriter in the prior three years (Column 4), the underwriter is part of the same group (Column 5), and the group includes a financial firm (Column 6). The results show that across all three metrics, there is no consistent evidence to suggest that such underwriter ties play a significant role.

7.4. *Group affiliation and post-listing support*

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 IPO firms. This should manifest itself in group IPO firms being able to maintain greater stability in their investment activities. To test these predictions, we assess how both the amount of new equity capital raised in SEOs (as a proportion of the original IPO gross proceeds) and the CAPEX/assets ratio of each IPO firm varies with changing market conditions over the five-year post-listing period.

The first three columns of Table 11 report the SEO results. We measure market conditions using domestic stock market returns in the current and preceding year ($MKTRET_t$ and $MKTRET_{t-1}$). These two measures of stock market conditions are only significant in

explaining the SEO activity of IPO firms that are *not* affiliated with family groups. In the model estimated on all IPO firms, the interaction terms between *FAMGRPPYR* with current and lagged stock market returns are negative and significant, indicating that family-group IPO firms under a pyramidal structure exhibit less SEO sensitivity to capital market conditions than do other IPO firms. The final three columns of Table 11 report the CAPEX results. Since CAPEX is a backward-looking measure and it takes time for an investment plan to be implemented, our focus is on the lagged market condition measure $MKTRET_{t-1}$. The estimates show that for group IPO firms, the sensitivity of CAPEX to $MKTRET_{t-1}$ is significantly lower than that of other IPO firms.

The above results indicate that group affiliation alleviates the capital constraints of new member firms after their listing. This evidence is consistent with the explanation that pre-IPO incubation by groups leads to better developed IPO firms that can weather adverse external capital market conditions. It is also consistent with another possibility considered in prior studies, that business groups provide explicit support (investments) and implicit guarantees to financially support their listed member firms, especially under adverse market conditions (Gopalan et al. (2007, 2014), Buchuk et al. (2014), Almeida et al. (2015), and Ang, Masulis, Pham, and Zein (2018)).

[INSERT TABLE 11 HERE]

8. Conclusion

Using a large and comprehensive panel dataset tracking the ownership structures of IPO firms and family business groups across 44 countries around the world, we show that family business groups create new listed firms to resolve a conflict between financing growth and preserving control. We also show that groups' internal capital markets facilitate IPO market access for their emerging group affiliates: when groups accumulate internal capital at a relatively high rate, they are more likely to expand through an IPO, rather than through an SEO of an existing group firm. The relationship between internal capital and IPO activity

is particularly strong when groups have a clear need to raise new equity but face pressing control retention concerns, and when new firm financing barriers are especially high.

Within a group, firm-level internal capital availability is found to be a significant factor in explaining which existing public affiliates are likely to serve as an IPO parent and which are likely to provide additional pre-IPO equity investment to a going public firm. Family group IPO firms invest aggressively before going public and their investment rates are linked to the availability of internal capital within their group. This suggests that an active internal capital market operates to support the going public process of group affiliates.

Overall, our study provides a broad set of evidence that explains why family business 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 the need to raise large amounts of costly external equity capital and allows new projects to rapidly scale up and thereby facilitate access to public equity markets as independent firms. 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 legal institutions and investor rights. In such environments, our evidence indicates that using internal capital markets to support incubation activities is a very attractive and effective means for families both to extend their control over more resources and to overcome the external financing challenges faced by new firms.

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Table 1. Distribution of sample IPOs across countries

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). Columns 3 and 4 report the same statistics for IPO firms that are part of business groups controlled by non-family entities (non-family groups) and those controlled by a (non-group) widely held firm. These 3 categories together make up “affiliated” IPO firms (those affiliated with existing listed firms). Columns 5, 6 and 7 report the number and percentage (in parentheses) of “standalone” IPO firms controlled by families/individuals, by other shareholder types, or widely held. Column 8 reports the gross proceeds of family-group IPO firms (expressed in parentheses as a percentage of the aggregate gross proceeds of all sample IPO firms in the same country). Column 9 reports the gross proceeds of affiliated IPOs in Columns 2, 3, and 4 (expressed in parentheses as a percentage of the aggregate gross proceeds of both affiliated IPOs and SEOs of existing listed firms in the same country). 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.

	Number of IPOs with identified owners	Number of IPO firms controlled by					No con- trolling owner	Offer size of family-group IPO firms	Offer size of affiliated IPOs
	(1)	Family groups	Non- family groups	Widely held firms	Families/ Indi- viduals	Others	(7)	(8)	(9)
Argentina	16 (94%)	7 (44%)	5 (31%)	0 (0%)	3 (19%)	1 (6%)	0 (0%)	0.97 (33%)	1.90 (26%)
Australia	1195 (99%)	42 (4%)	31 (3%)	58 (5%)	721 (60%)	84 (7%)	259 (22%)	3.40 (7%)	11.98 (7%)
Austria	51 (100%)	4 (8%)	1 (2%)	2 (4%)	26 (51%)	17 (33%)	1 (2%)	2.77 (25%)	3.72 (12%)
Belgium	78 (98%)	7 (9%)	6 (8%)	0 (0%)	48 (62%)	17 (22%)	0 (0%)	2.25 (15%)	5.61 (12%)
Brazil	106 (98%)	17 (16%)	6 (6%)	1 (1%)	58 (55%)	19 (18%)	5 (5%)	7.68 (21%)	10.15 (20%)
Canada	559 (91%)	19 (3%)	8 (1%)	18 (3%)	236 (42%)	68 (12%)	210 (38%)	1.75 (7%)	5.93 (1%)
Chile	20 (100%)	5 (25%)	0 (0%)	0 (0%)	6 (30%)	1 (5%)	8 (40%)	0.54 (8%)	0.54 (5%)
Colombia	5 (100%)	3 (60%)	0 (0%)	0 (0%)	0 (0%)	1 (20%)	1 (20%)	0.14 (5%)	0.14 (8%)
Czech Rep.	6 (100%)	0 (0%)	1 (17%)	0 (0%)	4 (67%)	1 (17%)	0 (0%)	0.00 (0%)	0.18 (8%)
Denmark	44 (92%)	1 (2%)	5 (11%)	2 (5%)	17 (39%)	9 (20%)	10 (23%)	0.03 (1%)	0.46 (3%)
Finland	60 (98%)	6 (10%)	5 (8%)	0 (0%)	29 (48%)	16 (27%)	4 (7%)	0.76 (10%)	1.47 (5%)
France	522 (94%)	29 (6%)	19 (4%)	1 (0%)	377 (72%)	67 (13%)	29 (6%)	6.01 (7%)	30.65 (12%)
Germany	496 (96%)	29 (6%)	30 (6%)	8 (2%)	340 (69%)	65 (13%)	24 (5%)	2.79 (4%)	21.04 (11%)
Greece	164 (94%)	28 (17%)	6 (4%)	1 (1%)	106 (65%)	18 (11%)	5 (3%)	2.36 (22%)	3.89 (7%)
Hong Kong	587 (97%)	71 (12%)	10 (2%)	2 (0%)	454 (77%)	42 (7%)	8 (1%)	7.60 (17%)	9.75 (9%)
Hungary	7 (100%)	0 (0%)	2 (29%)	1 (14%)	2 (29%)	2 (29%)	0 (0%)	0.00 (0%)	1.42 (28%)
India	322 (79%)	32 (10%)	3 (1%)	1 (0%)	247 (77%)	35 (11%)	4 (1%)	4.69 (24%)	6.11 (11%)
Indonesia	140 (93%)	41 (29%)	2 (1%)	2 (1%)	77 (55%)	17 (12%)	1 (1%)	2.16 (36%)	2.95 (10%)
Ireland	50 (98%)	2 (4%)	2 (4%)	1 (2%)	30 (60%)	11 (22%)	4 (8%)	0.00 (0%)	0.61 (10%)

Israel	108 (98%)	31 (29%)	2 (2%)	2 (2%)	66 (61%)	6 (6%)	1 (1%)	3.47 (56%)	3.65 (29%)
Italy	207 (100%)	22 (11%)	9 (4%)	3 (1%)	132 (64%)	37 (18%)	4 (2%)	4.08 (8%)	12.95 (8%)
Japan	1407 (92%)	87 (6%)	184 (13%)	47 (3%)	894 (64%)	114 (8%)	81 (6%)	4.26 (5%)	33.25 (10%)
Malaysia	458 (95%)	62 (14%)	8 (2%)	0 (0%)	372 (81%)	16 (3%)	0 (0%)	2.62 (30%)	3.68 (21%)
Mexico	23 (100%)	6 (26%)	2 (9%)	0 (0%)	11 (48%)	4 (17%)	0 (0%)	3.13 (31%)	3.65 (15%)
Netherlands	91 (95%)	12 (13%)	2 (2%)	3 (3%)	50 (55%)	20 (22%)	4 (4%)	3.90 (18%)	7.37 (7%)
New Zealand	52 (100%)	1 (2%)	1 (2%)	1 (2%)	20 (38%)	15 (29%)	14 (27%)	0.81 (22%)	0.99 (16%)
Norway	107 (91%)	21 (20%)	6 (6%)	4 (4%)	42 (39%)	29 (27%)	5 (5%)	2.49 (15%)	4.19 (11%)
Pakistan	16 (100%)	5 (31%)	1 (6%)	0 (0%)	5 (31%)	5 (31%)	0 (0%)	0.09 (18%)	0.22 (83%)
Peru	6 (86%)	1 (17%)	2 (33%)	1 (17%)	2 (33%)	0 (0%)	0 (0%)	0.27 (54%)	0.42 (45%)
Philippines	47 (100%)	13 (28%)	0 (0%)	1 (2%)	24 (51%)	4 (9%)	5 (11%)	1.52 (53%)	1.53 (21%)
Poland	138 (98%)	21 (15%)	4 (3%)	1 (1%)	77 (56%)	30 (22%)	5 (4%)	1.30 (12%)	2.86 (30%)
Portugal	19 (100%)	4 (21%)	2 (11%)	0 (0%)	8 (42%)	4 (21%)	1 (5%)	0.45 (5%)	2.19 (7%)
Singapore	386 (100%)	41 (11%)	15 (4%)	5 (1%)	283 (73%)	23 (6%)	19 (5%)	2.30 (18%)	7.88 (23%)
South Africa	95 (92%)	8 (8%)	2 (2%)	3 (3%)	62 (65%)	8 (8%)	12 (13%)	0.72 (10%)	2.40 (9%)
South Korea	591 (97%)	88 (15%)	13 (2%)	3 (1%)	421 (71%)	16 (3%)	50 (8%)	7.70 (31%)	9.34 (9%)
Spain	55 (100%)	7 (13%)	9 (16%)	1 (2%)	25 (45%)	10 (18%)	3 (5%)	5.49 (17%)	16.47 (16%)
Sri Lanka	13 (100%)	7 (54%)	1 (8%)	0 (0%)	2 (15%)	3 (23%)	0 (0%)	0.03 (15%)	0.11 (59%)
Sweden	98 (91%)	18 (18%)	1 (1%)	3 (3%)	44 (45%)	26 (27%)	6 (6%)	1.91 (12%)	2.73 (7%)
Switzerland	86 (96%)	6 (7%)	5 (6%)	3 (3%)	44 (51%)	25 (29%)	3 (3%)	6.14 (23%)	9.30 (11%)
Taiwan	603 (100%)	80 (13%)	12 (2%)	15 (2%)	446 (74%)	29 (5%)	21 (3%)	3.45 (28%)	3.96 (7%)
Thailand	184 (100%)	47 (26%)	11 (6%)	2 (1%)	112 (61%)	11 (6%)	1 (1%)	2.83 (39%)	4.59 (21%)
Turkey	40 (95%)	17 (43%)	2 (5%)	0 (0%)	13 (33%)	4 (10%)	4 (10%)	3.48 (41%)	3.63 (82%)
UK	1161 (94%)	53 (5%)	30 (3%)	18 (2%)	738 (64%)	229 (20%)	93 (8%)	9.48 (9%)	19.83 (7%)
US	2374 (96%)	89 (4%)	45 (2%)	108 (5%)	978 (41%)	825 (35%)	329 (14%)	18.53 (5%)	103.86 (11%)
All markets	12 793 (96%) [†]	1090 (16%) [†]	511 (7%) [†]	332 (3%)	7652 (60%)	1984 (16%)	1234 (10%)	136.37 (19%) [†]	379.55 (18%) [†]
- Emerging	3911 (96%) [†]	603 (24%) [†]	103 (7%) [†]	50 (1%)	2743 (70%)	277 (7%)	145 (4%)	56.69 (26%) [†]	80.88 (26%) [†]
- Developed	8882 (96%) [†]	487 (9%) [†]	408 (6%) [†]	282 (3%)	4909 (55%)	1707 (19%)	1089 (12%)	79.66 (11%) [†]	298.67 (9%) [†]

[†] denotes cross-country average.

Table 2. Investments by family-group IPO firms before and after going public

Panel A reports the median of capital expenditures scaled by assets (*CAPEX*) of family-group IPO firms for 5 years surrounding their IPO events. Panel A also reports the median difference between this *CAPEX* measure and the median *CAPEX* of a matched cohort drawn from all other IPO firms (those in Columns 3 to 7 in Table 1). The matched IPO firms are those that have their pre-listing asset size in the range of 90% to 110% of the focal family-group IPO firm, and are listed in the same country under the same IPO market condition (defined as either “hot” or “cold” depending on whether the number of IPOs in the country during the one year window around the focal family-group IPO firm’s listing date is above the average number). Another reported median difference is between the *CAPEX* measure of a family-group IPO firm and the median *CAPEX* measure of all other firms in the same group that are already listed in the same year. Panel B reports the median annual *change* in fixed assets scaled by total assets ($\Delta FixedAsset$) of family-group IPO firms for their pre-IPO years. This median is compared to that of a cohort of private firms/subsidiaries in the same group (including subsidiaries of other listed affiliates and private firms owned by the controlling family). $\Delta FixedAsset$ is used in this analysis because capital expenditures cannot be consistently obtained for private firms/subsidiaries. The matched cohorts are drawn from a pool of firm-year observations of private firms/subsidiaries in the same group, using one of the following criteria: similar age (firm age since incorporation in the same age quartile as the focal group IPO firm), observations in the same year, or similar size (asset size in the range of 70% to 130% of the focal family-group IPO firm). The figures in parentheses are the number of observations.

	Year -5	Year -4	Year -3	Year -2	Year -1	IPO Year	Year +1	Year +2	Year +3	Year +4	Year +5
<i>Panel A: Comparing CAPEX of group IPO firms to other listed firms</i>											
<i>CAPEX</i> – family-group IPOs	5.212 (34)	5.175 (105)	5.166 (247)	5.187 (473)	5.691 (710)	4.646 (841)	4.345 (877)	3.347 (857)	3.121 (825)	3.087 (776)	2.963 (713)
Diff to other IPO firms	-3.397 (19)	0.706 (62)	-0.253 (180)	0.124*** (359)	0.756*** (584)	0.547*** (647)	-0.326 (643)	-0.015 (613)	0.144*** (580)	0.174*** (553)	1.240*** (429)
Diff to same group (listed) firms	0.335 (27)	0.570** (83)	1.080*** (207)	1.051*** (411)	1.621*** (638)	0.780*** (761)	0.902*** (787)	0.572*** (773)	0.059*** (768)	0.071** (690)	0.108** (629)
<i>Panel B: Comparing $\Delta FixedAsset$ of family-group IPO firms to other private firms/subsidiaries in the same group</i>											
$\Delta FixedAsset$ – family-group IPOs		3.260 (42)	3.646 (116)	4.605 (272)	6.800 (503)						
Diff to firms with similar age		0.754 (20)	1.192 (60)	2.246*** (116)	6.667*** (190)						
Diff to firms in the same year		-0.452 (9)	1.759* (49)	5.877*** (105)	4.436*** (179)						
Diff to firms with similar size		-3.499 (16)	1.076 (53)	1.670* (95)	3.653** (162)						

*, ** and *** indicate significance at the 10, 5 and 1 percent levels, respectively, based on the *Wilcoxon* signed-rank test.

Table 3. Characteristics of family-group IPO firms and their parent firms

Panel A examines family control of family-group IPO firms. Pyramid layer is the number of listed firms separating an IPO firm from the family. 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. Secondary sales capture the number of existing shares sold in a family-group IPO firm as a proportion of post-IPO shares, and are compared against the corresponding statistics for other affiliated IPO firms (IPOs affiliated with non-family groups and widely held corporations) and standalone IPO firms (all other IPOs). Post-listing control turnover is the rate (in percentage) at which a family-group IPO firm experiences a control turnover transaction during the first 5 years after its listing. This rate is also compared to the corresponding rate for other affiliated IPO firms and standalone IPO firms using the test on equality of proportions. Panel B and C focus on the parent firm 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). In Panel B, the domestic control threshold is the percentage ownership that triggers a mandatory tender offer in each country. For each IPO firm, the 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; and the hypothetical control rights are the voting rights that the family would retain in the parent under this hypothetical SEO alternative. Panel C reports the median levels of debt/assets ratio (*DEBT*), Tobin's Q (*Q*), analyst forecast dispersion as measured by the standard deviation of forecast scaled by absolute mean forecast (*DISPERSION*), and the standard deviation of weekly stock returns (*RISK*) of IPO parent firms. These statistics computed for the IPO year and each of the post-IPO years. They are compared against the corresponding average for the pre-IPO period (Year -5 to Year -1) using the Wilcoxon signed rank test.

	Mean	Median	25 th percentile	75 th percentile			
<i>Panel A: Family control of group IPO firms</i>							
Pyramid layer of family-group IPO firms	0.70	1.00	0.00	1.00			
Family control rights of family-group IPO firms	53.22	54.00	38.00	69.00			
Difference relative to other same-group firms	9.62***	11.18***					
Secondary sales – family-group IPO firms	4.85	0.00	0.00	2.75			
Secondary sales – other affiliated IPO firms	9.82***	0.00***	0.00	3.99			
Secondary sales – standalone IPO firms	4.42	0.00	0.00	3.99			
Post-IPO ctrl turnover of family-group IPO firms	4.50						
Post-IPO ctrl turnover of other affiliated IPO firms	10.37***						
Post-IPO ctrl turnover of standalone IPO firms	13.60***						
<i>Panel B: Family control of IPO parent firms</i>							
Current family control rights of IPO parent firms	37.48	35.00	22.00	51.00			
Difference relative to domestic control threshold	8.31***	7.10***					
Hypothetical (SEO) dilution factor of IPO parent firms	48.26	12.89	3.57	44.21			
Hypothetical (SEO) family ctrl rights of IPO parents	29.26	26.60	16.62	40.14			
Difference relative to domestic control threshold	0.10	−0.68					
<i>Panel C: Characteristics of IPO parent firms before and after each IPO event</i>							
	Pre-IPO years	IPO year	Year +1	Year +2	Year +3	Year +4	Year +5
<i>DEBT</i>	26.33	25.15	26.24	26.92	26.46	26.64	25.21
<i>Q</i>	1.24	1.18***	1.07***	1.02***	1.01***	1.01***	1.01***
<i>DISPERSION</i>	0.23	0.18	0.20	0.21	0.23	0.17	0.17
<i>RISK</i>	7.00	6.35	6.46	6.41	6.43	5.96*	5.60**

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

Table 4. 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. Column 1 reports the estimates of a random-effects logit model with the dependent variable being an indicator variable for a group conducting an IPO. Columns 2a and 2b report a multinomial logit model with the dependent variable being a discrete choice variable for a group conducting an IPO (2a), an SEO (2b), or no capital raising (as the omitted category). Columns 3 and 4 report the estimates of two linear probability models, used to incorporate fixed effects, with the same dependent variable as that in Column 1. The sub-sample used in Column 4 excludes group-year observations with no equity raising events. *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. *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 of the oldest member firm (excluded in the model that includes group fixed effects due to correlation with the time dimension). *GRPQ*, *GRPCAPEX*, and *GRPDEBT* are the total market value of assets scaled by, total capital expenditures, and total debt, scaled by the book value of total assets. *GRPHHI* is a Herfindahl industry-concentration index. *GRPFINMEMBER* is an indicator of 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.

	Logit model Full sample	Multi. logit model IPO eq. SEO eq.		Linear prob. model Full sample IPO v SEO	
	(1)	(2a)	(2b)	(3)	(4)
<i>GRPINCOME</i>	1.907*** (0.390)	1.842*** (0.401)	-0.730** (0.334)	0.074** (0.033)	0.286*** (0.064)
<i>GRPDIVIDEND</i>	-6.551*** (2.267)	-7.984*** (2.443)	-5.071*** (1.920)	-0.522*** (0.149)	-0.842* (0.441)
<i>GRPCONTROL</i>	-1.455*** (0.253)	-1.859*** (0.287)	-0.883*** (0.230)	-0.148*** (0.034)	-0.058 (0.054)
<i>GRPPYRLAYER</i>	-0.095 (0.094)	-0.065 (0.142)	0.147* (0.140)	0.009 (0.016)	-0.043*** (0.016)
<i>GRPHHI</i>	0.747*** (0.149)	0.795*** (0.211)	-0.146 (0.147)	0.207*** (0.031)	0.148*** (0.036)
<i>GRPFIRMSIZE</i>	0.187*** (0.026)	0.233*** (0.029)	0.150*** (0.025)	0.030*** (0.005)	0.002 (0.005)
<i>GRPNOFIRMS</i>	0.132*** (0.019)	0.220*** (0.026)	0.163*** (0.023)	-0.030*** (0.006)	0.007** (0.003)
<i>GRPAGE</i>	-0.655*** (0.088)	-0.377*** (0.093)	0.385*** (0.093)		-0.078*** (0.022)
<i>GRPQ</i>	0.128*** (0.038)	0.323*** (0.052)	0.469*** (0.042)	0.012** (0.005)	-0.014* (0.008)
<i>GRPCAPEX</i>	0.607 (0.498)	1.295*** (0.552)	2.279*** (0.418)	0.038 (0.052)	-0.140 (0.141)
<i>GRPDEBT</i>	-0.611*** (0.232)	-0.741*** (0.266)	-0.318 (0.208)	-0.041 (0.026)	-0.144*** (0.042)
<i>GRPFINMEMBER</i>	0.416*** (0.141)	0.608*** (0.142)	0.408*** (0.140)	0.150*** (0.028)	0.044** (0.019)
<i>MKTRET</i>	0.143 (0.147)	0.355** (0.147)	0.212** (0.093)		
<i>IPOVOL</i>	4.492*** (0.511)	5.032*** (0.475)	2.087*** (0.392)		
Country×year FEs				YES	YES
Group FEs				YES	
No. of observations	11363	11363		11363	3295

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

Table 5. Conditions underpinning the role of group internal capital in facilitating IPOs

For each group year observation, the dependent variable is an indicator for an IPO event. All models are estimated as linear probability models. The “IPO v SEO” models exclude observations with no equity raising events. *GRPINCOME* is a group’s total cash net income scaled by total assets. In Panel A, *GRPCONTROL* is the weighted average family control rights of existing member firms in a group. The analysis is split into two sub-samples where *GRPCONTROL* is either below (Low control) or above (High control) the control threshold for the relevant country (defined in Online Appendix Table A1). In Panel B, observations are split into 4 quartiles of group excess debt. This is computed as the weighted average excess debt level of all member firms in a group (a firm’s excess debt is the difference between its debt/assets ratio and the corresponding average for firms in the same country and 2-digit-SIC industry). *MIDDEBT* is the indicator for the middle two quartiles. In Panel C, *SECONDBOARD* is an indicator for the years in which there is a second-tier market in existence. The other control variables are not reported, and are the same as those used in Column 3 of Table 4 for the “full sample” models, or those used in Column 4 of Table 4 for the “IPO v SEO” models. Clustered standard errors are reported in parentheses.

<i>Panel A: Results split by family control rights</i>						
	All groups		Low control groups		High control groups	
	Full sample	IPO v SEO	Full sample	IPO v SEO	Full sample	IPO v SEO
<i>GRPINCOME</i> (A)	0.212*** (0.067)	0.359*** (0.129)	0.016 (0.176)	0.036 (0.313)	0.288*** (0.105)	0.735*** (0.201)
<i>GRPCONTROL</i>	-0.162*** (0.036)	-0.004 (0.055)	-0.031 (0.149)	0.091 (0.193)	-0.200*** (0.047)	0.085 (0.081)
(A)× <i>GRPCONTROL</i>	-0.330*** (0.140)	-0.645*** (0.279)	0.485 (0.687)	1.331 (1.130)	-0.470*** (0.192)	-1.096*** (0.402)
Country×year FEs	YES	YES	YES	YES	YES	YES
Group FEs	YES		YES		YES	
No. of observations	11363	3295	3091	928	8272	2367
<i>Panel B: Results split by groups’ excess debt levels</i>						
	1 st quartile	2 nd quartile	3 rd quartile	4 th quartile	Full sample	
<i>GRPINCOME</i> (A)	0.058 (0.051)	0.184*** (0.050)	0.164*** (0.067)	0.051 (0.043)	0.031 (0.039)	
<i>MIDDEBT</i>					-0.004 (0.006)	
(A)× <i>MIDDEBT</i>					0.100** (0.047)	
Country×year FEs		YES	YES	YES	YES	YES
Group FEs		YES	YES	YES	YES	YES
No. of observations		2747	2750	2979	2883	11359
<i>Panel C: Results split by new-firm financing barriers – presence of second board</i>						
	All sample countries		Countries adding 2 nd board			
	Full sample		Full sample		IPO v SEO	
<i>GRPINCOME</i> (A)	0.100*** (0.031)	0.147*** (0.059)	0.524*** (0.141)	0.112*** (0.044)	0.234*** (0.072)	1.043*** (0.278)
<i>SECONDBOARD</i>	0.030*** (0.010)			0.021*** (0.010)		
(A)× <i>SECONDBOARD</i>		-0.093 (0.065)	-0.310*** (0.147)		-0.188*** (0.082)	-0.850*** (0.238)
Country×year FEs		YES	YES		YES	YES
Group FEs	YES	YES		YES	YES	
No. of observations	11363	11363	3295	5837	5837	1681

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

Table 6. Variations in group internal capital due to country-level dividend tax changes

The sample consists of family business groups from 25 countries (out of 45 countries in the sample), where annual dividend tax rates can be obtained from Becker et al. (2013). All variables are computed for each group in a given year. The dependent variable is an indicator for an IPO event. The “IPO v SEO” models exclude observations with no equity raising events. All models are estimated as linear probability models. *GRPINCOME* is the total cash net income of scaled by total assets a group. *DIVTAXLOW* is an indicator for when the dividend tax rate in a given year is below a country’s sample-period median. *POSTTAXCUT* is an indicator for the period after a significant dividend tax cut (by at least 3 percentage points, as defined by Becker et al. (2013)) in a given country. This is only computed for countries where such tax cuts come into effect during the sample period. *FALSEDIVTAXLOW* is calculated in the same way as *DIVTAXLOW*, but using the dividend tax rate of the nearest neighboring country (another country in the Becker et al. (2013) sample with the nearest capital city) instead of the subject country’s tax rate. The following control variables are not reported. *GRPCONTROL* and *GRPPYRLAYER* are the (market capitalization) weighted average family control rights and pyramid layer of existing member firms. *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 the listing age of the oldest member firm (excluded in the models that include group fixed effects due to correlation with the time dimension). *GRPQ*, *GRPCAPEX*, and *GRPDEBT* are the total market value of assets scaled by, total capital expenditures, and total debt, scaled by the book value of total assets. *GRPHHI* is a Herfindahl industry-concentration index. *GRPFINMEMBER* is an indicator for the presence of a financial member firm. Clustered standard errors are reported in parentheses.

	All countries with dividend tax information		Countries with tax cut events		Placebo tax changes	
	Full sample	IPO v SEO	Full sample	IPO v SEO	Full sample	IPO v SEO
	(1)	(2)	(3)	(4)	(5)	(6)
<i>GRPINCOME</i> (<i>A</i>)	0.162*** (0.040)	0.345*** (0.078)	0.156** (0.075)	0.315** (0.137)	0.093** (0.038)	0.255*** (0.074)
<i>(A) × DIVTAXLOW</i>	-0.153*** (0.054)	-0.202** (0.104)				
<i>(A) × POSTTAXCUT</i>			-0.267* (0.155)	-0.134* (0.077)		
<i>(A) × FALSEDIVTAXLOW</i>					0.069 (0.058)	0.077 (0.143)
Country × year FEs	YES	YES	YES	YES	YES	YES
Group FEs	YES		YES		YES	
No. of observations	6447	1965	3286	1042	6447	1956

*, ** 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 firms affiliated with family business groups from 45 countries. For each firm-year, the dependent variable is either an indicator for whether the firm conducts an IPO for its subsidiary (Columns 1 to 4) or an indicator for whether the firm holds a minority stake in an IPO from the same group (Column 5 to 7). The model in Column 4 is estimated using only firms that experience an equity raising event, either a subsidiary IPO or an SEO. All models are estimated as linear probability models. *PARENTINCOME* and *PARENTDIVIDEND* are cash net income and cash dividends scaled by total assets. *PARENTCONTROL* and *PARENTULTCF* are the control rights and ultimate cash-flow rights held by the family in a group firm. *PARENTSIZE* and *PARENTAGE* are the natural logarithm of total assets and of firm age since listing. *PARENTQ*, *PARENTCAPEX*, and *PARENTDEBT* are the market value of assets, capital expenditures and debt, respectively, scaled by the book value of total assets. 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)
<i>PARENTINCOME</i>	0.027*** (0.007)	0.016* (0.009)	0.025** (0.012)	0.073* (0.039)	0.007** (0.003)	0.011** (0.005)	0.006 (0.004)
<i>PARENTDIVIDEND</i>	-0.075*** (0.029)	-0.053 (0.033)	-0.091** (0.045)	-0.342 (0.249)	0.002 (0.017)	0.047* (0.028)	0.012 (0.021)
<i>PARENTCONTROL</i>	-0.050*** (0.006)	-0.048*** (0.006)	-0.054** (0.025)	-0.187*** (0.054)	-0.003 (0.002)	-0.019* (0.010)	-0.003 (0.002)
<i>PARENTULTCF</i>	0.058*** (0.007)	0.064*** (0.007)	0.047* (0.025)	0.382*** (0.064)	0.005* (0.003)	0.020 (0.016)	0.005 (0.003)
<i>PARENTSIZE</i>	0.006*** (0.001)	0.004*** (0.001)	0.002 (0.003)	0.012* (0.007)	0.001*** (0.000)	-0.001 (0.001)	0.001* (0.000)
<i>PARENTAGE</i>	0.018*** (0.002)	0.026*** (0.002)		0.095*** (0.012)	0.002*** (0.001)		0.002*** (0.001)
<i>PARENTQ</i>	0.001 (0.001)	-0.002* (0.001)	-0.004*** (0.002)	-0.005 (0.005)	0.001* (0.000)	-0.001 (0.001)	0.001 (0.000)
<i>PARENTCAPEX</i>	-0.001 (0.017)	0.001 (0.020)	0.005 (0.024)	-0.071 (0.159)	-0.005 (0.006)	0.004 (0.012)	0.001 (0.010)
<i>PARENTDEBT</i>	0.003 (0.005)	0.008 (0.005)	-0.011 (0.011)	0.026 (0.039)	-0.001 (0.002)	0.001 (0.004)	-0.001 (0.002)
Country×year FEs	YES			YES	YES		
Group FEs	YES			YES	YES		
Group×year FEs		YES	YES			YES	YES
Firm FEs			YES				YES
No. of observations	29422	29422	29422	3925	29422	29422	29422

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

Table 8. Group internal capital and pre-IPO CAPEX of family-group IPO Firms

The sample consists of firms that are eventually listed and affiliated with family business groups from 45 countries. The analysis is conducted using firm-year observations and captures both the pre-listing (if available) and post-listing periods of each firm. The dependent variable is capital expenditures scaled by total assets. *PRELISTING* is an indicator variable for the period before the listing of a group firm. *OWNFIRM INCOME* is the cash net income scaled by total assets of the focal group firm (excluding that of its parent firm in the pre-IPO period). *OTHERFIRM INCOME* is the total cash net income scaled by total assets of all other listed firms in the same group. *OWNFIRM SIZE* is the natural logarithm of the focal firm's assets. Clustered standard errors are reported in parentheses.

	(1)	(2)	(3)	(4)	(5)
<i>PRELISTING</i> (A)	0.019*** (0.003)	0.019*** (0.005)	0.020*** (0.005)	0.010*** (0.004)	0.012*** (0.005)
<i>OWNFIRM INCOME</i>	0.036*** (0.009)	0.037*** (0.009)	0.035*** (0.012)	0.018*** (0.005)	0.008 (0.006)
(A)× <i>OWNFIRM INCOME</i>		−0.046*** (0.017)	−0.043*** (0.015)	−0.035** (0.015)	−0.043*** (0.015)
<i>OTHERFIRM INCOME</i>	−0.014*** (0.005)	−0.018*** (0.005)	−0.031 (0.019)	−0.003 (0.006)	−0.027*** (0.012)
(A)× <i>OTHERFIRM INCOME</i>		0.060** (0.025)	0.072** (0.033)	0.056* (0.030)	0.081* (0.044)
<i>OWNFIRM SIZE</i>	−0.001 (0.001)	−0.001 (0.001)	−0.001** (0.001)	−0.001 (0.001)	−0.002* (0.001)
Country×year FEs	YES	YES			YES
Group FEs	YES	YES			
Group×year FEs			YES	YES	
Firm FEs				YES	YES
No. of observations	27919	27919	27919	27919	27919

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

Table 9. Proportion of new shares issued by family group IPOs

The sample consists of all IPO firms (Columns 1 and 2) or family-group IPO firms (Columns 3 and 4) from 45 countries. The dependent variable is the number of primary shares (Columns 1, 3, and 4) or secondary shares (Column 2) offered as a proportion of post-IPO shares. All models are OLS regression models. *FAMGRPPYR* (*FAMGRPHOR*) is an indicator for family-group IPOs owned through a pyramid (directly). In Columns 1 and 2, the following IPO firm control variables are not reported. *NONFAMGRP* is an indicator for non-family-group IPOs. *NONGRPCORP* (*NONGRP GOV*) 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. *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 a listing. The model in Column 3 examines group-level variables. The reported variable is *GRPRETAINADD*, or a group's total cash net income minus dividends scaled by total assets. The following group-level variables are not reported. *GRPCONTROL* and *GRPPYRLAYER* are the weighted average family control rights and pyramid layer positions of existing group firms. *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. *GRPHHI* and *GRPFINMEMBER* are a group's Herfindahl industry-concentration index and an indicator for the presence of a financial member. The model in Column 4 focuses on family-group IPOs owned through pyramids and examines parent-level variables. The reported variable is *PARENTRETAINADD*, or a parent's as cash net income minus dividends scaled by total assets. The following variables are not reported. *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* is the indicator variable for whether a parent is a financial firm. Clustered standard errors are reported in parentheses.

	All IPOs		Family-group IPOs	Pyramid family-group IPOs
	(1)	(2)	(3)	(4)
<i>FAMGRPPYR</i>	-0.060*** (0.019)	-0.001 (0.006)	0.012 (0.011)	
<i>FAMGRPHOR</i>	-0.060*** (0.013)	-0.008 (0.006)		
<i>GRPRETAINADD</i>			-0.126** (0.044)	
<i>PARENTRETAINADD</i>				-0.176*** (0.058)
IPO firm control variables	YES	YES	YES	YES
Group control variables			YES	
Parent control variables				YES
Country FEs	YES	YES	YES	YES
Industry×Year FEs	YES	YES	YES	YES
No. of observations	12315	12315	881	600

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

Table 10. Family-group IPOs vs other IPOs: Market conditions and underpricing

The dependent variable is an indicator of a family-group IPO (Columns 1 and 2), or the logarithmic transformation of underpricing (Columns 3 to 6). The models in Columns 1 and 2 are linear probability models and those in Columns 3 to 6 are OLS regression models. 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 the 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 variable for 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 two indicator variables for the existence of dual-class shares restrictions (*DUALCLASSRES*) and for the existence of a second-tier market for less-established firms (*SECONDBOARD*). In Columns 3 to 6, 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 (Column 4), the underwriter being part of the same group (Column 5), and the group having a financial firm (Column 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 the 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)
<i>FAMGRP%</i>	0.412*** (0.065)					
<i>GOVERNINDEX</i>	-0.038*** (0.008)					
<i>INSTOFUNDS</i>	-0.062*** (0.022)					
<i>VENTUREFUNDS</i>	0.013 (0.007)					
<i>FOREIGNLIB</i>	-0.062*** (0.013)					
<i>FAMGRPPYR</i>			-0.032*** (0.012)			
<i>FAMGRPHOR</i>			-0.053*** (0.020)			
<i>FAMGRPUWST</i>				-0.010 (0.017)	-0.053 (0.036)	-0.039*** (0.013)
<i>FAMGRPUWWK</i>				-0.045*** (0.010)	-0.038*** (0.011)	-0.030** (0.012)
<i>MKTRETLIST</i>	0.013 (0.035)	0.012 (0.032)	0.453*** (0.118)	0.453*** (0.118)	0.452*** (0.118)	0.452*** (0.118)
<i>IPOVOLLIST</i>	-0.118** (0.051)	-0.149** (0.067)	0.171 (0.130)	0.171 (0.131)	0.172 (0.130)	0.172 (0.130)
Other control variables			YES	YES	YES	YES
Country FEs		YES	YES	YES	YES	YES
Industry×Year FEs	YES	YES	YES	YES	YES	YES
No. of observations	12792	12792	12266	12266	12266	12266

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

Table 11. Sensitivity of SEOs and capital expenditures to market conditions in the first five years after listing

For each IPO firm, the dependent variable is either (1) the total gross proceeds from SEOs scaled by its IPO gross proceeds (SEO_t) or (2) capital expenditures scaled by total assets ($CAPEX_t$). The subscript t indicates the first to the fifth full financial years after the listing. $CASHINCOME_t$ 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.

	SEO regressions			CAPEX regressions		
	Family-group IPOs	Other IPOs	All IPOs	Family-group IPOs	Other IPOs	All IPOs
	(1)	(2)	(3)	(4)	(5)	(6)
$CAPEX_{t-1}$	0.052** (0.024)	0.014* (0.008)	0.016** (0.007)			
$CASHINCOME_t$	-0.017 (0.014)	0.004 (0.004)	0.002 (0.004)	0.057*** (0.012)	0.039*** (0.003)	0.040*** (0.003)
Q_{t-1}	0.005** (0.002)	0.004*** (0.001)	0.004*** (0.001)	0.007*** (0.002)	0.009*** (0.000)	0.009*** (0.000)
$LogSIZE_{t-1}$	-0.005 (0.006)	-0.027*** (0.002)	-0.025*** (0.002)	-0.045*** (0.008)	-0.036*** (0.002)	-0.037*** (0.002)
$MKTRET_t$	0.001 (0.005)	0.018*** (0.002)	0.018*** (0.002)			
$MKTRET_{t-1}$	0.000 (0.004)	0.006*** (0.002)	0.006*** (0.002)	0.009*** (0.004)	0.016*** (0.002)	0.016*** (0.002)
$FAMGRPPYR \times MKTRET_t$			-0.031*** (0.006)			
$FAMGRPPYR \times MKTRET_{t-1}$			-0.010* (0.005)			-0.008** (0.004)
$FAMGRPHOR \times MKTRET_t$			0.001 (0.010)			
$FAMGRPHOR \times MKTRET_{t-1}$			-0.007 (0.009)			0.008 (0.008)
Firm FEs	YES	YES	YES	YES	YES	YES
No. of observations	3652	41753	45405	3598	42664	46262

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

About ECGI

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