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From Public to Internal Capital Markets: The Effects of Affiliated IPOs on Group Firms

by Luana Zaccaria,* Simone Narizzano, Francesco Savino** and Antonio Scalia****

Abstract

Using detailed data on corporate ownership for private and public firms, we document the effects of group-affiliated initial public offerings (IPOs) on other unlisted firms in the same group. We find evidence of a significant and persistent decrease in leverage (-6 per cent) and of an increase in employment (+18 per cent), with the latter effect being more pronounced for more financially constrained, younger, and smaller firms within the group. By comparing the determinants and the ex-post effects of IPOs on affiliated and stand-alone issuers, we show that affiliated IPOs are less likely to be driven by the investment needs of the issuer. Overall, this evidence is consistent with the hypothesis that relaxing financial constraints and expanding the workforce in group firms are the intended objectives of affiliated IPOs rather than side effects.

JEL Classification: G32.

Keywords: IPOs, Business Groups, Financial constraints.

Sintesi

Sfruttando dati dettagliati sulla struttura proprietaria delle imprese italiane, si valutano gli effetti della quotazione di un'impresa appartenente a un gruppo sulle altre imprese (non quotate) dello stesso gruppo. I risultati mostrano una riduzione significativa e persistente della leva finanziaria (-6%) e un aumento dell'occupazione (+18%); quest'ultimo effetto è più pronunciato per le imprese maggiormente vincolate dal punto di vista finanziario, più giovani e più piccole all'interno del gruppo. Confrontando le determinanti e gli effetti ex post della quotazione sulle imprese affiliate e su quelle autonome, si osserva che è meno probabile che la quotazione di un'affiliata sia guidata dalle proprie esigenze di investimento. Nel complesso, questa evidenza è coerente con l'ipotesi secondo cui l'allentamento dei vincoli finanziari e l'espansione della forza lavoro nelle imprese del gruppo sono obiettivi specifici della quotazione delle affiliate piuttosto che "effetti collaterali".

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CONTENTS

1 Introduction[1]

Over the last few decades, financial regulators in various countries have enacted reforms that aim at expanding and facilitating access to public equity markets (Bernstein et al. [2020]). These policies are based on the premise that well-developed public capital markets can foster growth and innovation to the benefit of the whole economy (see Levine [2005]). Yet, the real effects of new public equity issuances, and in particular IPOs, on firm-level and aggregate outcomes are contentious. Some studies find that IPOs play a limited role in financing growth. For example, IPOs can serve the purpose of rebalancing the firm's capital structure and lowering the cost of financing (Pagano et al. [1998]), exploiting temporary fluctuations in market valuations (Baker and Wurgler [2002]), or providing liquidity and diversification to early investors and founders (Bodnaruk et al. [2008]). Other researchers suggest instead that the funds raised in IPOs are actually used to finance investments in fixed assets and R&D (Kim and Weisbach [2008]). More recently, Borisov et al. [2021] show that access to public equity markets also contributes to employment growth.

In assessing the motivations and the effects of IPOs, most previous research implicitely treats newly listed companies as stand-alone entrepreneurial firms and, consequently, examines issuer-level outcomes.[2] This approach is arguably too narrow when the issuing firm belongs to a business group, which is a common occurrence, especially in Europe and in emerging markets.[3] An affiliated-IPO, i.e., the IPO of a firm that

[1]We are grateful to Tommaso Perez, Francesco Columba, Francisco Urzua, Merih Sevilir, Giovanna Nicodano, Sergey Tsyplakov and participants to the 2023 UBC Finance Summer Conference, Venice Finance Workshop, 12th ICEF-CInSt International Moscow Finance Conference, Bank of Italy MISP Seminar, USI Lugano, ASU Finance, and LUISS University for very useful comments and suggestions. We also thank Patrizia Celia and Caterina Crociata for sharing Borsa Italiana's data on IPOs.

[2]Few papers in the spin-offs literature are notable exceptions, see Michaely and Shaw [1995] and Dittmar [2004] for empirical contributions and Dai et al. [2020] for a theoretical one.

[3]Larrain et al. [2021] estimate that 23% of European initial public offerings (IPOs) and and 45% of the market capitalization of new issues since the year 2000 correspond to firms affiliated with business groups.

belongs to a business group, is presumably part of a wider business strategy and its effects may stretch beyond the issuer to all the firms comprising the group. In light of the importance of this form of industrial organization around the world (see Khanna and Yafeh [2007]), in this paper we ask whether and to what extent affiliated-IPOs affect investments in both fixed and human capital for other firms in the group.

The answer to this question is not immediately obvious. On the one hand, an IPO is a costly and time-consuming process that may drain resources from the entire organization, including firms that are not directly involved in the listing. On the other hand, IPOs may allow the more mature firms in the group to raise new funds that can be employed to relax other firms' financial constraints. However, differently from other forms of intra-group transfers (such as loans or dividens, see Buchuk et al. [2014] and Gopalan et al. [2014]), cross-subsidizing firms with publicly issued equity involves additional costs (e.g., in the form of legal and administrative fees, loss of control, mandatory disclosures), making it unclear whether in practice affiliated-IPOs can play a significant role in internal capital allocation within groups.

Our empirical investigation hinges on detailed ownership data for the universe of Italian private and public firms, which allows us to map business groups, i.e., sets of firms that share the same ultimate corporate owner. This dataset has two main advantages. First and foremost, it allows us to identify private firms linked to IPO firms through business group ties even when such connections could not be uncovered using commonly available information. For example, suppose that company A, which is partly owned by private company B, goes public, and that company B also owns (or is a large shareholder of) company C. Companies A and C are connected through the ultimate owner (company B), but most commercial datasets may not reveal this link, for instance if company B is not subject to mandatory disclosures. Our data – based on local administrative records – enables us to unearth the common ownership

of A and C, and therefore to correctly classify IPOs as stand-alone or affiliated even when ultimate owners do not publicly disclose their holdings. In our sample, over 50% of the IPOs are classified as affiliated. More importantly, we can track changes in C's outcomes following A's IPO to examine the role of initial equity offerings in internal capital markets. Second, the information on group affiliation for the universe of Italian firms (not only those that eventually go public) can be used to construct accurate control samples and reduce estimation biases. Firm-level financing and investment policies may be drastically different between stand-alone and affiliated firms, implying that affiliation status is a crucial (yet often omitted) factor to take into account when comparing outcomes across firms. We compare outcomes of IPO-group firms (firm C from the example above) around the IPO year to those of other *affiliated* firms (of similar size and operating in the same sectors) belonging to groups that did not list any of the member firms.

Our results show that, following an affiliated IPO, group firms increase their assets base (+11%) and expand the labor force (+18%). These changes occur as one-off permanent increases in levels. Importantly, we document a significant drop in financial leverage (-6%), which is not explained by changes in assets' profitability or tangibility, and does not bring savings in terms of the cost of debt. This suggests that affiliated IPOs unlock fresh equity capital which is employed by group firms to finance labor. Thus, our evidence is consistent with previous literature on the relationship between firms' employment decisions and financial leverage (see for example Agrawal and Matsa [2013], Benmelech et al. [2021], Baghai et al. [2021]). In particular, Simintzi et al. [2015] show that rigid labor claims generate operating leverage, especially in jurisdictions that are more protective of workers' rights, implying that large investments in human capital may require a reduction in financial leverage. Moreover, unlike fixed capital, human capital cannot be owned nor pleadged, making it less suitable for debt financing. In sup-

port of this interpretation, we show that the effect on employment is more pronounced for more levered, younger, and smaller firms within the group, which is consistent with the idea that the proceeds of affiliated IPOs contribute to relaxing financial constraints of group firms. Assets of group firms increase more when existing (rather than new) shares are sold in the IPO, and ownership becomes more concentrated post-listing, suggesting that the effects that we document are directly related to the affiliated IPO through the improved liquidity of the ultimate owners' portfolio.

Having documented the effects of affiliated-IPOs on group firms, we address the question of whether these effects are a simple by-product or can be interpreted as one of the motivations for the affiliated IPO. Three pieces of evidence lend support to the second view. First, affiliated firms are more likely to sell secondary shares (i.e., existing shares) as compared to stand-alone firms (34% vs 14%). This suggests that by listing one of the group companies, ultimate owners cash in (part of) their initial investment in the IPO firm and collect liquidity which can be potentially invested in different projects. Second, as documented by previous research, the going-public decision of *stand-alone* firms correlates with firm leverage and with industry-specific market-to-book ratios. This is consistent with view that firms list their shares when they face large investment opportunities which cannot be fully funded through other standard sources (e.g. bank loans or trade credit) due to high levels of indebtness. Instead, we show that affiliated IPOs do not present these empirical regularities, i.e., the probability of going public is unrelated to leverage and industry market-to-book ratios, suggesting a weaker correlation with the firm's investment needs. Third, for each dollar of proceeds generated by the sale of primary shares, the issuer's assets increase by 3 dollars after stand-alone IPOs, but only 1.5 dollars after affiliated IPOs. This is mainly due to the fact that stand-alone firms complement new equity from the IPO with a significantly larger amount of debt capital as compared to affiliated firms. Moreover, affiliated firms

are more likely to hold the IPO proceeds in cash or cash equivalent accounts rather than investing them in working capital or fixed assets. Taken all together this evidence is consistent with the view that affiliated firms are less likely to go public to raise investment capital for their own projects.

Overall, our study shows that business groups can use public capital markets to feed their internal capital markets. This implies the possibility of capital misallocation and significant conflicts of interest between controlling and minority shareholders, especially when corporate governance rules are lenient (Johnson et al. [2000]), an implication often referred to as the "dark side" of internal capital markets. The "bright side" of internal capital markets, however, is that diversification and intra-group transfers may lead to a systematic overperformance of affiliated firms over stand-alone firms, due to lower cash flow volatility (see Gopalan et al. [2007] and Boutin et al. [2013]). We examine monthly stock returns of affiliated and stand-alone IPO firms in our sample, and, consistently with both a dark and a bright side of internal capital markets, we find that affiliated stocks generate an extra monthly return of approximately 90 basis point if listed on the main exchange, but underperform by 70 basis points if listed on the "start-up" segment, where regulatory requirements in terms of governance are significantly less stringent.[4] Said differently, affiliated firms' valuations account for the implicit cash-flow insurance provided by the group and, consequently, are larger than stand-alone firms', but only provided that governance practices are in place to avoid expropriation of minority shareholders.

The rest of the paper proceeds as follows. Section 2 reviews the literature and Section 3 describes the data construction process and the sample descriptive statistics. We examine the effects of affiliated IPOs on group firms in Section 4, and investigate the differences in the going public decision between affiliated and stand-alone firms in

[4]In a recent study, Faccio et al. [2021] show that investors expectations of resource and risk reallocation within groups reduce group firms' idiosyncratic stock return volatility from commodity shocks.

Section 5. In Section 6 we present the results of a series of robustness tests. Section 7 concludes.

2 Literature Review

This study relates to two main strands of literature. The first is the large body of empirical and theoretical finance research on the decision to go public and its effects on firm financing and investment policies. Within this strand, previous studies have investigated the role of IPOs in firms' capital structure and expenditure decisions (Pagano et al. [1998], Lowry [2003], Kim and Weisbach [2008]), innovation (Bernstein [2015]) and, more recently, organization and employment (Borisov et al. [2021], Babina et al. [2022], Bias et al. [2022]). Focusing on direct firm-level outcomes, this research offers mixed evidence broadly consistent with two views. The first is that IPOs relax financial constraints for the issuing firm allowing for investment both in fixed and human capital (albeit bringing changes in governance that can affect employee incentives and the allocation of the workforce). The second is that IPOs do not have an effect on investments (at least not directly) as firms go public to exploit market sentiment (possibly at the expense of new shareholders) and rebalance their capital structure, thus lowering the firm's cost of funding and increasing the liquidity of the existing shareholders' wealth.

As in previous studies, we examine these two hypothesis but we expand the analysis to firms that belong to the same "strategic nexus" (i.e., business group) as the issuer. In this sense, this paper also relates to a smaller strand of literature that examines the indirect (or spillover) effects of IPOs on trade partners (Kutsuna et al. [2016]), competitors (Spiegel and Tookes [2020], Aghamolla and Thakor [2022]), and the local economy (Butler et al. [2019]). Differently from this literature, we do not treat IPOs as exogenous events, rather we find evidence that places the going-public decision of

affiliated firms within a broader group strategy.

Secondly, our study directly relates to the literature on business groups and internal capital markets. Business groups, consisting of legally independent firms linked by ownership ties, are very common forms of industrial organizations, especially in the emerging markets, but also in developed countries (e.g., Italy and Sweden).[5] One of the benefits of business groups is the presence of internal markets through which capital can be allocated among member firms, especially when local financial markets are less developed (see for example Masulis et al. [2011]).[6] Indeed, previous research documents that internal capital markets can mitigate the effect of economic and financial crises (see Almeida et al. [2015], Santioni et al. [2020]) and support investments in new projects or products (Boutin et al. [2013]), particularly when they are capital intensive and require high-skill labor (Bena and Ortiz-Molina [2013]).[7] The transfer of resources within the internal capital market has been shown to occur through intra-group loans (Buchuk et al. [2014]) or dividend policies (Gopalan et al. [2014]), but extant literature is thus far silent on the role of affiliated IPOs in shifting resources across group firms. On the one hand, issuing new public equity may not be optimal for such transfers since, differently from loans and dividends, it involves additional costs, including those related to loss of control (Brau and Fawcett [2006]), disclosure requirements (Farre-Mensa [2017]; Aghamolla and Thakor [2022]), takeover risk (Zingales [1995]), and short-termist pressures (Asker et al. [2015]). On the other hand, public equity markets allow for large cash inflows which are hard to generate internally over a short period of time. Whether or not affiliated firms use the funds raised in an IPO to feed internal capital markets remains an open question, which we seek to answer in this paper.

[5]See Claessens et al. [2002], Faccio and Lang [2002]

[6]Previous research suggests that an additional rationale for business groups is enhanced control (e.g., Almeida and Wolfenzon [2006]).

[7]In the similar setting of multi-division firms, the efficiency of internal capital markets meets both supporting (Giroud and Mueller [2015]) and conflicting (Shin and Stulz [1998]) evidence.

Recent literature has focused on the relationship between internal capital markets, control rights, and group IPOs. Consistently with the view that group firms have more availability of internal capital for growth and higher costs associated with loss of control, Larrain et al. [2021] show that group firms are more selective (i.e., larger and older) and engage less in market timing when going public than standalone firms. Our detailed data on ownership structures for the universe of firms (not only for those that eventually go public) allows us to revisit these results. Specifically, we show that despite the fact that group IPOs are larger in terms of money raised, a lower share of IPO capital is invested in productive assets of the newly listed firm, and that assets and employment of other non-listed affiliated firms grow after the IPO. This suggests that, rather than pursuing similar goals as stand-alone firms while being more "selective" in their listing decisions, group firms go public to support other affiliated firms in the group. The importance of control is emphasized by Masulis et al. [2020] who show that controlling families of listed groups prefer to fund novel projects by creating new separate public firms rather than issuing seasoned equity that critically dilutes family control rights in the issuing firm. Specifically, they show that group internal capital accumulation positively predicts the likelihood of an IPO but not the likelihood of an SEO. This suggests that internal capital markets can be employed to incubate new projects, and that, when investment needs outgrow internal funding capacity, groups restort to IPOs in order not to dilute ownership in the parent company. Thus, while Masulis et al. [2020] emphasize the role of internal capital markets in the lead-up to affiliated IPOs, we examine what happens *after* the listing event, and in particular we ask whether newly listed firms "give back" to the group by (partly) sharing the resources raised from public markets.

3 Data Collection and Descriptive Statistics

This study relies on four datasets. First, we use the income statement and balance sheet information of the universe of the Italian limited-liability firms provided by the National Official Business Register and collected by Cerved Group (a private consulting firm). Our sample includes all private non-financial companies from 2005 to 2019 with total assets worth at least 1 million euro, strictly positive revenues and non-negative equity. Second, we use data from the Infocamere database, which is based on information collected by the Italian Chambers of Commerce. It contains yearly data on firms' ownership structure, including the type of shareholders (corporate vs individuals) and the equity share owned by majority shareholders. The third data source consists of social security payments made by legal entities to the Italian National Social Security Institute (INPS) for all employees with permanent, fixed-term or apprenticeship contracts. INPS collects information for all private sector firms operating in Italy, with at least one employee during each calendar year. We use this dataset to retrieve data at firm level on the average number of employees over the year, share of work force by occupational categories (blue collars, white collars, managers, apprentices, others), the monthly average gross wage bill by worker category, and the total number of employees in each month and year. Finally, we use data provided by the Italian Stock Exchange (Borsa Italiana) to identify companies that became publicly listed between 2006 and 2020. From our analysis of IPOs we exclude listings of investment vehicles and financial, real estate, blank-cheque and foreign companies. We also exclude companies that go public again after having previously delisted. As a result, our IPO sample includes 224 newly-listed firms, for which we collect data on the IPO date, the number of primary and secondary shares issued, the IPO price and proceeds, and the sponsor or nominated advisor (Nomad). We also gather information on the listing exchange of choice, distinguishing between the Mercato Telematico delle Azioni (MTA), which is

the main trading platform for listed shares, and the second-tier segment reserved for small and medium enterprises (SMEs), which we refer to as the Alternative Investment Market (AIM).[8] The requirements to obtain admission on the AIM are less stringent than those for the MTA, for example there is no lower limit on market capitalization (40 mil. euros on the MTA) and the minimum free float is 10% (25% on the MTA). Importantly, on the AIM there are no mandatory corporate governance rules over and above those established by law for private firms, while MTA listed firms must either comply with the standard governance code recommended by the regulator or provide an alternative governance code, explaining the reasons for deviating from the regulator's recommendation.

We define a firm as corporate owned if its largest shareholder is another company - the "immediate owner"- rather than an individual, provided that the immediate owner's share is at least 20%. By recursively identifying immediate owners for all firms in the dataset, we link each corporate owned company to its ultimate owner, that is the company in the chain of control that has no known immediate corporate owner. The relationship between corporate owned firms and ultimate owners can be direct, if immediate and ultimate owner coincide, or indirect, i.e. featuring one or more intermediate owners. For example, in Figure 1a all affiliated firms (firms A, B, and C) are directly connected to the ultimate owner, while in Figure 1b firms B and C are directly connected to firm A which is directly owned by the ultimate owner. In the first case the ownership structure has one layer, while in the second case the structure has two layers. More in general we refer to the number of layers in an ownership structure as the maximum number of intermediate steps between the bottom and the top of the

[8]This second-tier segment was named Mercato Expandi between 2004 and 2008, AIM Italia in 2008-2018, and finally Euronext Growth. Despite the changes in name, however, the listing requirements stayed substantially constant. Finaldi Russo et al. [2020] note that, in Italy, the increase in the number of listed firms of the recent two decades has been driven by SMEs' listings, and the smaller size of Italian public firms largely explains the differences with Germany and Spain in terms of equity market capitalization.

ownership pyramid. We define business groups (or simply groups) as the set of firms with the same ultimate owner at a given point in time. We exclude from this definition structures where the ultimate owner is a financial institution (e.g. bank trusts) and single-layer groups where the ultimate owner is a holding company, as these type of ownership structures are generally set up purely for tax optimization purposes. Notice that our definition of group is not static, as our data allow us to identify ownership relationships each year. Thus, groups can change in size and composition over time and the only time-invariant characteristic is the identity of the ultimate owner. We refer to all firms in a group, except for the ultimate owner, as affiliated firms, while firms that do not belong to a group are referred to as stand-alone. One major limitation of our data is that foreign companies, though identified through a specific flag in the Infocamere shareholders records, are not included in the CERVED dataset, which implies that no additional information is available to us for these companies. As a consequence, we are able to reconstruct the chain of control for each company up the the first foreign owner (if any), implying that firms that we classify as ultimate foreign owners may in turn be owned by other domestic or foreign firms. All firm and group level variables are described in Table 1 .

Table 2 shows descriptive statistics at group level for the approximately 190,000 group-year observations in our dataset. On average, groups are fairly small, comprising 1.9 affiliated firms, and have a flat structure, with 1.2 layers. Groups are also quite concentrated as 87% of total group sales on average originate from one single company. We distinguish between foreign and domestic ultimate owners and, within the latter group, we classify ultimate owners in two types, holding vs industrial. Specifically, holding parent companies differ from the industrial ones in that their main line of business is to manage and control ownership in operating firms within the group and not to produce goods or services. Ultimate owners in our sample are predominantly domestic

industrial companies (55%), followed by foreign companies (26%), and domestic holding companies (19%). The average (median) size of domestic ultimate owners' assets is 120.9 million (11.1 million).

Table 3 compares balance sheet data for affiliated firms (13% of the total firm-year observations) with those of stand-alone firms. Affiliated firms are larger in terms of assets (42 versus 9 million on average), marginally younger (18 versus 19 years of age), and have a larger share of intangible assets over total fixed assets (6% versus 3% on average), but there are no clear differences in terms of profitability or leverage, nor do they appear to operate in systematically different sectors (see Figure 2a). Differences in financial statements and sectors are more pronounced, as one would expect, when we compare IPO and non IPO firms. IPO firms are significantly more likely to operate in manufacturing and IT&Telecom, and less likely to operate in commerce and real estate (see Figure 2b). Table 4 shows balance sheet data of non listed firms split in non-IPO firms and IPO firms in the year before going public. IPO firms are on average much larger in terms of total assets (over 10 times on average), moderatly younger (2 years), significantly more profitable (14% vs 7% on average), have larger share of intangibles (17% vs 4% on average) and, surprisingly, lower leverage (70% vs 74% on average).

Interestingly, affiliated firms are over-represented in the IPO sample. In particular, while affiliated firms only represent 11% of the total sample, this share increases to over 50% in the IPO sample, although this ratio varies over time (Figure 3). Table 5 suggests that this difference is not simply explained by listing requirements (e.g. in terms of capitalization) since 66% of affiliated-IPOs, i.e., IPOs where the issuing firms is part of a business group, are listed on the AIM, i.e. the exchange originally designed for emerging businesses. Moreover, while affiliated-IPOs are larger, the median ratio of proceeds over total assets is smaller than for stand-alone firms (36% vs 41%). Additionally, newly issued ("primary") shares represent 86% of shares sold in stand-

alone firms IPOs and 66% of those sold in affiliated IPOs on average, implying that the actual capital increase is 36% of assets for affiliated firms and 47% for stand-alone firms.

We identify 304 firms belonging to the same group as affiliated-IPO firms in the sample. These firms (henceforth "group firms") are exposed to potential IPO spillover effects and are the main object of this study. Figure 4 shows the industry breakdown. Similarly to the IPO firms (see Figure 2b), group firms are less likely to operate in commerce and real estate and more likely to operate in IT&Telecom as compared to non-listed firms. However, group firms are twice as likely to operate in services as compared to both IPO and private firms in the sample, suggesting that some of these firms may perform a support role in the group (e.g., engineering or management consulting). Table 6 shows balance sheet and employment data of group firms in the 5 years before and after the IPO. Notably, the mean (median) asset size increases from 266 to 317 millions (from 9 to 11 millions), while both average leverage and turnover ratios drop from 73% to 70% and from 1.03 to 0.98 respectively. The mean (median) total employment increases from 341 to 363 employees (from 32 to 49 employees), with no significant change in the relative shares of worker's categories (managers, white collars and blue collars). Most group firms are located in the same region (56%) and operate in the same sector (53%) as the IPO firm in the group (untabulated).

4 The Effects of Affiliated IPOs on Group Firms

We examine the effects of affiliated IPOs on group firms by estimating the following model

$$Y_{i,g,T,y} = \beta Post\,IPO_{i,y} + \lambda Post\,IPO_{i,y} \times Size_g + \sum_{T=-4,T\neq-1}^{4} \theta_T D_T + \alpha_i + \gamma_y + \varepsilon_{i,g,T,y} \qquad (1)$$

where the subscripts i, g, and y indicate the firm, the group, and the calendar year respectively, and T represents years relative to IPO, i.e., it is the difference between y and the group IPO year. We examine outcomes measured in terms of (log of) assets, leverage ($\frac{Financial\ Debt}{Financial\ Debt+Equity}$), cost of debt ($\frac{Interests}{Financial\ Debt}$), tangibility ($\frac{Tangible\ Fixed\ Assets}{Total\ Assets}$), profitability ($\frac{Net\ Income}{Total\ Assets}$), and (log of) total employment.

The sample consists of both treated and control firms. Treated firms are those belonging to a group where one of the affiliated firms goes public during the observation period. We restrict the treated sample to firm-year observations starting 4 years before and up to 4 years after the group IPO (i.e., $-4 \leq T \leq 4$). The control sample is built by matching each treated firm with the 5 closest firms by asset size which at $T = -1$ operated in the same sector and belonged to a non-listed group. Thus, for control firms, T represents years relative to group IPO of the firm they are matched to. We include firm-year observations in the control sample starting 3 years and up to 5 years after the matching year (i.e., $-4 \leq T \leq 4$).

For treated firms the variable $Post\,IPO$ equals 1 if $T \geq 0$ and zero otherwise, while for control firms it is always equal to zero. The variable $Size_g$ is equal to the number of firms belonging to the same group as firm i in the year prior to the IPO. We use the interaction term $Post \times Size$ to account for the fact that any possible effect of affiliated IPOs on a specific group firm may depend on the size of the group, and in particular it may be weaker when the group is large, as resources may be spread out across a larger number of entities. The terms α_i and γ_y indicate firm and year fixed effects. To account for trends in the data we include a set of dummy variables D_T for each value of T between -4 and 4. Therefore, the coefficient β quantifies incremental effects on outcome dynamics following a group IPO.

Table 7 shows the estimation results of equation 1. The coefficient estimates in columns 1 and 2 imply that, following the IPO, group firms experience an increase in

assets (+11%) and a decrease in leverage (-6%), suggesting that the expansion in the asset base is mostly supported by an increase in equity capital. These effects are not due to pre-exsisting trends, as the estimated coefficients for the dynamic effects show in Figures 5a and 5b . The coefficient estimates for the interaction term $Post_{g,y} \times Size_g$ (λ) imply that, as expected, these effects are smaller for larger groups.

Columns 3 to 5 show that, despite the drop in leverage, affiliated IPOs do not seem to affect the firm's cost of debt, asset tangibility, and profitability all indicators that are generally cross-sectionally correlated with leverage. This suggests that the recapitalization that follows affiliated IPOs in group firms may not be motivated by savings in interest costs, nor by the need to invest in intangible assets, which are possibly more efficiently financed with equity due to the non-pleadgeable nature of collateral. Similarly, the drop in leverage is not explained by a sudden improvement in the firm's ability to generate cash internally (e.g., via larger sales turnover or operating margins). Rather, column 5 suggests that a reduction in financial leverage is coupled with an increase in operating leverage, through an expansion of the labor force (+18%). This is consistent with the view that operating leverage, created by labor claims, and financial leverage act as substitutes (see Simintzi et al. [2015]). The dynamic effects of affiliated IPOs on group firms employment are illustrated in Figure 5c.

We explore the effects on employment further in Table 8, which shows coefficient estimates of the following model

$$\begin{aligned} Y_{i,g,T,y} =& \beta_1 Post\,IPO_{i,T} \times HighLev_i + \beta_2 Post\,IPO_{i,T} \times Old_i \\ &+ \beta_3 Post\,IPO_{i,T} \times Large_i + \beta_{4 Post\,IPO_{i,T}} Post_{g,y} \times SameIndustry_i \\ &+ \pi Post\,IPO_{i,T} + \lambda Post\,IPO_{i,T} \times Size_g \\ &+ \sum_{T=-4}^{4} \theta_T D_T + \alpha_i + \gamma_y + \varepsilon_{i,g,T,y} \end{aligned} \tag{2}$$

where $HighLev_i = 1$ if firm i has leverage above the median of its group at $t = -1$ (and zero otherwise), $Old_i = 1$ if firm i is older than the median of its group at $t = -1$ (and

zero otherwise), $Large_i = 1$ if firm i has assets size above the median of its group at $t = -1$ (and zero otherwise), $SameIndustry_i = 1$ if firm i operates in the same industry as the affiliated firm in its group that goes public at $t = 0$. The sample includes both treated and control firms as in equation (1)

The results show that the effects on total employment (column 1) are stronger for more levered, younger, and smaller firms, the most financially constrained units in the group. In terms of workforce composition (columns 2 to 4), the share of managers tends to increase more in large, younger, less constrained firms, and in particular in firms operating in the same sector as the affiliated IPO firm in the group. In this last case only, the share of blue collar workers decreases and, consequently, the firm-level average wage increases significantly.

To summarize, affiliated IPOs seem to unlock fresh capital contributions for group firms, which are employed for new investments in human capital. What is the exact origin of these new resources and how do they get transferred to group firms? There are at least two channels through which new capital can be funneled from public into internal capital markets following an affiliated IPO. The first is a direct wealth channel: ultimate owners receive cash inflows from the sale of secondary shares in the IPO firm (or from the sale of exisitng shares in the markets after the IPO), that can be redeployed in investments in other group firms. The second is an indirect liquidity channel: as the ultimate owner's portfolio becomes more liquid following the listing event, group firms can reduce their payout ratios and retain a larger share of profit. In our dataset we observe level of equity capital, but we cannot distinguish between contributed capital and retained earnings. As such, we cannot precisely attribute changes in assets to the direct or the indirect channels mentioned above. However, we show that the increase in assets documented in Table 7 is more pronounced when the affiliated IPO features the sale of secondary shares. Specifically, we augment the regression in equation (1) with

the interaction term $Post\,IPO_{i,T} \times Secondary_g$, where secondary is a dummy variable that takes value 1 if secondary shares were sold in the affiliated IPO. The results in Table 9 column 1 suggest that affiliated IPOs with secondary shares sales are associated with larger increase in group firms assets. We obtain similar results when we examine the effects on (log of) equity capital (Table 9 column 2). Moreover, in column 3 we show that the ownership share of the largest shareholder increases significantly after the IPO, which is consistent with additional capital contributions of existing shareholders (while earning retention does not affect ownership concentration). Nevertheless, the estimated coefficients in Table 9 columns 1 and 2 show that part of effects on assets and equity capital post IPO are not explained by the sale of secondary shares, suggesting also a possible role for the liquidity channel.

5 Group Affiliation and the Going-public Decision

The results presented so far suggest that affiliated IPOs relax financial constraints of group firms. Is this a simple side effect or an intended objective of affiliated IPOs? To answer this question we revisit existing evidence on the determinants of IPOs, accounting for group affiliation.

Perhaps the most intuitive reason – though certainly not the only one – for going public is to raise capital for new investments. Since debt capital is the most common form of external finance for small and private firms (Berger and Udell 1995; Berger and Udell 2002; Robb and Robinson 2014), companies are more likely to raise equity capital on public markets once they exhaust their borrowing capacity, i.e., when debt-to-equity ratio is relatively high. Indeed, prior literature on IPOs has documented the positive correlation between firm leverage and the decision to issue new shares (e.g., Kim and Weisbach [2008]). Another related robust empirical pattern is the relationship between

industry-specific stock market valuations (as measured by market-to-book ratios) and IPOs (see Pagano et al. [1998]), which suggests that firms go public when there are good investment opportunities in their sector. Taken altogether, these findings are consistent with the view that firms list their shares when they face large investment needs which cannot be fully sourced through other channels (e.g. using internal/private equity or bank loans).[9]

This explanation, however, seems to apply better to stand-alone rather than affiliated IPOs. Affiliated firms can access internal capital markets, which alleviates the financing constraints that stand-alone firms face when sourcing funds on external capital markets. Ultimate owners can reshuffle resources within the group to finance profitable investment opportunities, allowing affiliated firms with the best projects to pursue growth more aggressively than similar stand-alone firms (see Bena and Ortiz-Molina [2013]). This implies that leverage should be a less important determinant of IPOs since, differently from stand-alone firms, affiliated firms can tap into the group's resources. This also implies, however, that, once the target scale is achieved and external capital markets become accessible on more favorable terms, mature affiliated firms may be required to "give back" to the group by redirecting externally sourced capital towards other firms in the group.[10] Thus, the IPO of an affiliated firm may be motivated by the investment needs of the group firms (thus generating the outcomes we document in the previous section) rather than those of the issuer itself. To the extent that group firms operate in different sectors, affiliated firms IPOs may correlate with valuations at the broader market level rather than industry-specific market-to-book ratios.

In Table 10 we test these predictions by examining the listing decisions of affiliated

[9]The empirical findings mentioned here have potential alternative explanations. Firms may go public to restructure their balance sheet (see Pagano et al. [1998]) or to exploit a "window of opportunity" offered by temporary overvaluations in the stock market, rather than to raise capital for investments. By examining the use of IPO funds (as in Kim and Weisbach [2008]), we show that these motivations find less empirical support in our sample.

[10]See Dai et al. [2020] for a theoretical role of spin-offs in internal capital markets.

and stand-alone companies both combined (columns 1 and 2) and separately (columns 2 to 6). In Table 10a we use the following logit model

$$Pr\left(IPO_{i,j,t+1}\right) = f\left(\beta Leverage_{i,j,t} + \gamma\left(MtB\right)_{j,t} + \theta X_{i,j,t} + \alpha_j + \epsilon_{i,j,t}\right) \tag{3}$$

where $IPO_{i,j,t+1} = 1$ if firm i goes public in year $t+1$, and j indicates broad industry categories (IT&Telecom, Manufacturing, Other). In Table 10b we show results for the estimation of the analogous linear probability model where $IPO_{i,j,t+1} = 100$ if firm i goes public in year $t+1$, and zero otherwise. We focus on two explanatory variables, $Leverage_{i,j,t}$, i.e., the ratio of debt to total assets of firm i in year t, and $MtB_{j,t}$, i.e., industry j's average Market-to-Book Enterprise Value in year t. We also estimate an alternative specification where we replace $MtB_{j,t}$ with MtB_t, i.e., the all-industries average Market-to-Book Enterprise Value in year t. Controls in $X_{i,j,t}$ include age, sales growth, ROA quintile, share of intangible assets, and ownership concentration as defined in Table 1.

Using the full sample of firm-year observations, we show that, as in previous literature, leverage correlates positively and significantly with subsequent IPO events (Table 10, columnn 1 and 2). However, when we split the sample in stand-alone (Table 10, columns 3 and 4) and affiliated (Table 10, columns 5 and 6) firms, leverage appears to be significantly correlated with IPO only for the first sub-sample, suggesting that affiliated firms that go public are not significantly more financially constrained than those that stay private.

Second, the decision to list shares on a stock exchange positively depends on public equity valuations, and in particular on market-to-book ratios, as established by prior studies. This is consistent with the interpretation that firms listing decisions respond either to future investment opportunities, as measured by market-to-book ratios, or to market timing considerations, as firms can sell shares at higher prices when market

sentiment is high. However, while the listing of stand-alone firms correlates only with industry-specific ratios (see column 3 vs column 4), that of affiliated firms correlates with market-wide ratios (see column 5 vs column 6). Said differently, the going-public decision of affiliated firms is affected by factors that are not firm-specific. Both the investment opportunities and the market-timing explanations may apply here. By going public, affiliated firms raise fresh capital to support investments in other group firms that operate in different sectors, as our analysis in the previous section suggests. Alternatively, as shown by Faccio et al. [2021], stock prices of affiliated firms incorporate the expectation that any firm-specific shock can be absorbed by intra-group cash flows transfers and therefore tend to have less idiosyncratic returns and track the broad market more closely. Importantly, both explanations build on the assumption of listed firms' active participation in the group's internal capital market.

It is worth noticing that factors such as sales growth, profitability, firm age, asset size, and share of intangible assets are significantly correlated (and with the expected sign) with the probability of IPO in the following period. Moreover, the coefficients for all controls (except *Ownership Concentration*) are fairly similar in magnitude and statistical significance across the affiliated and stand-alone samples, suggesting that stand-alone and affiliated firms do not differ substantially in how those factors affect their listing decisions.

The results illustrated above are consistent with the view that affiliated firms IPOs are less likely to respond to the issuer's investment needs and financing constraints, which is also in line with the larger portion of secondary shares sold on average in the IPO by affiliated firms (34% vs 14%). If affiliated firms raise public equity at least in part to support other firms in the group, as the internal markets argument suggests, we should observe that the capital raised with the IPO is less likely to be invested in the issuer's own productive assets. In other words, we should observe

significant differences in the use of proceeds between affiliated and stand-alone firms, and in particular, we should expect a larger effect on liquid assets and a smaller increase in working capital and fixed assets. Additionally, firms with large investment needs may couple the issuance of new equity with new debt financing. We expect this effect to be less significant for affiliated firms.

We examine the effects of IPOs on firm's assets composition and capital structure by estimating the following model

$$\begin{aligned} Y_{i,t} =& \beta Proceeds_{i,t} + \gamma Proceeds_{i,t} \times Affiliated_i \\ &+ \delta D_t + \theta \left(D_t \times Affiliated_i \right) + NetIncome_{i,t} + \alpha_i + \epsilon_{i,t} \end{aligned} \tag{4}$$

where the outcome variable is the amount of firm i's total assets, liquid assets (i.e., cash and cash equivalents), working capital (i.e., accounts receivable and inventory), fixed assets, equity capital or debt capital. For this analysis we use all IPO firms plus a control sample of matched firms.[11] The variable $Proceeds$ takes the value 0 in the years leading to the IPO (and every year for matched firms) and the value of total proceeds from the sale of primary shares in the IPO year and afterwards. Therefore, the coefficient β measures the effects of the IPO proceeds on the issuer's balance sheet figures (assets, equity, and debt). The variable $Affiliated_i$ equals 1 if firm i belongs to a business group in the year prior to the IPO. The coefficient of the interaction term $Proceeds_i \times Affiliated_i$ captures differences in these effects between affiliated and stand-alone firms. The variable D_t is meant to capture possible linear trends in the data and it is computed as the number of years before or after the IPO, with $D_t = 0$ being the IPO year. For each matched firm, the value of D_t is the same as for the IPO firm they are matched to. We restrict observations in this analysis to be in

[11] These control firms are selected by means of an algorithm that matches each firm i that went public in year $t+1$ with up to ten private firms in the whole dataset that in year t were closest in assets size to firm i (within a tolerance band of +/- 20% of firm i's assets), operated in the same sector and had the same affiliation status as firm i.

the range $-5 \leq t \leq 5$, in order to focus on the years surrounding the financing event. We also control for the interaction term $D_t \times Affiliated_i$ to allow for the possibility of differences in trends between affiliated and stand-alone firms. Finally, $NetIncome_{i,t}$ accounts for internally generated funds. All specifications include firm fixed effects.

The results in Table 11 show that, for stand-alone firms, assets increase with IPO proceeds by a factor of approximately 3 (column 1), implying that each dollar raised in an IPO translates into a 3 dollars increase in assets, which in turns reflects an increase of approximately 1 dollar in equity capital and 2 dollars in debt capital (columns 2 and 3). This suggests that IPO proceeds are not used to pay back debt. Rather, new debt is raised along with fresh equity capital to meet the issuer's investment needs (as in Kim and Weisbach [2008]). This is consistent with the results in columns 4 to 6. Liquid assets do not significantly change after the IPO, while new investments in working capital and fixed capital absorb the entire increase in assets. Taken all together, this evidence suggests that the primary objective of an IPO for stand-alone firms is to undertake new investments.[12]

Importantly, the estimated coefficients for the interaction term $Proceeds_{i,t} \times Affiliated_i$ suggest that, as compared to stand-alone firms, affiliated firms are less in need for investment capital and are more likely to keep the IPO proceeds in cash. In particular, assets expand less (column 1), owing to a lower increase in the level of debt (column 3) following the IPO. Moreover, in contrast with the evidence for stand-alone firms, the increase in liquid assets is positive and significant, and accounts for approximately 26% of the overall asset increase (column 4).

To summarize, our evidence is consistent with the view that stand-alone and affiliated firms have different motivations for going public. While stand-alone firms issue new equity to finance expansion, affiliated IPOs are partly meant to generate cash flows

[12]Notice that this consistent with issuers also rebalancing their capital structure. Indeed, even if the level of debt increases, the average leverage ratio drops from 71% to 59% on average after the IPO.

for the ultimate owners (e.g., through the sale of secondary shares) and to retain liquid assets in the issuer's balance sheet. These results point to the idea that affiliated firms issue equity in IPOs to the benefit of other firms in the group.

5.1 Stock Market Returns

The functioning of internal capital markets bears important implications in terms of the returns on equity required by outside investors (i.e., minority shareholders). On the one hand, the presence of an internal capital market partly insures shareholders against temporary cash-flow shortfalls, implying higher valuations for affiliated firms stocks. On the other hand, investors may require a larger premium for affiliated stocks to account for the possibility of being expropriated through intra-group dealings. Importantly, this premium should be larger when corporate governance rules are more permissive (e.g., less protective of minority shareholders interests). In our context, this may occur when firms are listed on the Alternative Investment Market (AIM). Differently from the MTA – the main trading platform on the Milan Stock Exchange – the AIM does not require listed firms to abide by the corporate governance protocol set by the regulator. This rule is intended to facilitate the access to public markets for small and medium firms by reducing the organizational costs associated with public listings, but it may also increase the risk of misappropriation of corporate funds. To validate this conjecture, we examine monthly stock returns of affiliated and stand-alone IPO firms in our sample. Specifically, we regress adjusted returns (i.e., stock returns minus the return on the domestic equity index) on the variable $Affiliated_i$ as follows

$$r_{i,t} = \beta Affiliated_i + \gamma Affiliated_i \times AIM_i + \lambda AIM_i + \theta_t + \varepsilon_{i,t} \tag{5}$$

where AIM_i is a dummy variable that takes value 1 if the stock is listed on the Alternative Investment Market, and θ_t indicates month-year fixed effects. The estimation results are presented in Table 12 , where we also show the results for two alternative specifications. In column 2 we augment controls by adding industry and IPO year fixed effects, while in column 3 we additionally include a dummy variable ($Large$) that takes value 1 if the firm is classified as large by the stock exchange, the return on the first trading day, and the percentage of free floating shares over total shares. Our estimation results are consistent across all three specifications. Affiliated firms perform approximately 90 basis points better than stand-alone firms on a monthly basis if listed on the main exchange (MTA), but 70 basis points worse if listed on the AIM. Differences in firm size, initial underpricing, and timing of the IPO do not drive these results. We interpret this evidence by suggesting that investors benefit from firm's group affiliation provided that corporate governance rules are sufficiently rigorous and transparent so to protect them from expropriation.

6 Robustness

To verify that our results do not depend on the specific control sample used in Section 4 we perform our many analysis using an alternative matching algorithm. Specifically, we use the model in equation 3 to estimate the probability of an IPO for all affiliated firms. For each never-listed affiliated firm, we identify its maximum propensity score as the highest estimated IPO probability in the firm-specific time series. We then select firm-year observations where the maximum propensity score is larger than the median of the propensity score distribution of Affiliated-IPO firms in the year prior to the IPO. These observations identify *potential* affiliated IPO firms, i.e., affiliated firms that at time t display similar characteristics as *actual* affiliated IPO firms. Finally, firms that,

at time t, belonged to the same group as the "potential" IPO firm are included in the control group. We further impose a common support restriction on group size at the time of the "potential" IPO to match the group size of treated firms. We estimate equation 1 using this alternative control group. The results in Table 13a show that assets and employment increase and leverage decreases after the group IPO for treated firms, with magnitudes similar or larger than in our base case.

One of the main drawbacks of our dataset is that we cannot build the entire chain of ownership for firms with a non-resident corporate owner. This can affect our estimates by introducing measurement errors. For example, two affiliated firms may be incorrectly classified as belonging to two different groups when in fact they have the same (unobservable) ultimate owner. To verify that our main results do not depend on miss-classifications, we exclude both treated and control firms with foreign ultimate owners from the estimation sample. The coefficient estimates reported in Table 13b show qualitatively similar results as in our main analysis.

Finally, Table 13c shows that our estimates are significant even when we cluster standard errors at the group level, that is when we take into account possible (and plausible) correlation among firms belonging to the same group.

7 Conclusions

In this paper we show that affiliated IPOs, i.e., IPOs of firms that belong to a business group, have significant effects on other group members. In particular, immediately following the IPO, group firms decrease their leverage by 6% and increase their labor force by 18% on average. These effects are persistent over the following 3-4 years. We additionally show that the effects on employment are more pronounced for the younger, more levered, smaller firms in the group, and that, as compared to stand-

alone, affiliated IPOs seem to be less motivated by the issuer's investment needs. This evidence suggests that relaxing financial constraints for group firms is an important driver for the going-public decision of affiliated companies.

Let us conclude with two remarks. First, our findings should be placed in the wider context of the changing regulation worldwide that aims at facilitating access to public capital markets, especially for small and young firms. Our study suggests that, while affiliated IPOs are not necessarily in contrast with the objective of these policies, corporate governance requirements associated with public listings, which are normally less strict on new "entrepreneurial" markets, should account for group affiliation, and in particular for the possibility that the funds raised in an IPO may be diverted into the internal capital markets, as our results suggest.

Second, our insight may extend beyond business groups, as strategic alliances among firms – similar to those generated by common ownership – may be established through different links. For example many industries are characterized by strong and sometime exclusive supplier-customer or creditor-borrower relationships, and it is possible that seemingly independent financing decisions (such as an IPO) originate within these informal networks of firms. We leave this question to future research.

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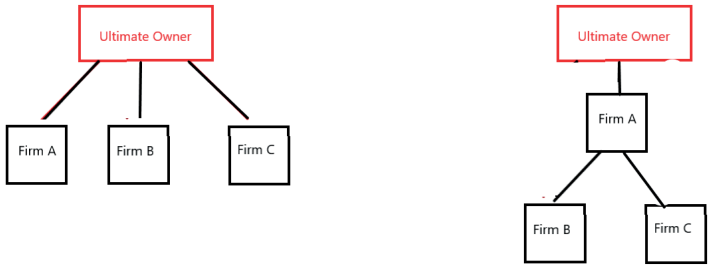
Table 1: Variables Description

	Definition	Data Source
Firm Level Variables		
Assets	Firm's total assets, measured in millions of euros	CERVED
Age	Years since firm's registration	CERVED, INPS
EBITDA	Earnings before net interest payments, taxes, depreciation and amortization	CERVED
EBIT	Earnings before net interest payments and taxes	CERVED
ROA	Net Income /Assets	CERVED
ROA Class	Quintiles of ROA (unlisted firms)	CERVED
Share Intangibles	Intangible Fixed Assets/Assets	CERVED
Profitability	EBITDA/Assets	CERVED
Leverage	Total Debt/Assets	CERVED
Sales Growth	$\text{Sales}_t/Sales_{t-1} - 1$	CERVED
Ownership Concentration	Largest Ownership Share	Infocamere
Employment	Average Number of Employees	INPS
Share Managers	Managers/Employment	INPS
Share White Collar	White Collar Workers/Employment	INPS
Share Blue Collar	Blue Collar Workers/Employment	INPS
Group Level Variables		
Group Size	Number of affiliated firms in a group	CERVED, Infocamere
Group Layers	Maximum number of intermediate owners between any affiliated firm and the ultimate owner	CERVED, Infocamere
Group Leverage	Weighted average of affiliated leverage. The weights are given by the relative share of total group sales	CERVED, Infocamere
Concentration	The maximum share of total group sales	CERVED, Infocamere
Foreign UO	Non-domestic ultimate owner (dummy)	CERVED, Infocamere
UO Type: Holding	Ultimate owner is holding company (dummy)	CERVED, Infocamere
UO Type: Industrial	Ultimate owner is an industrial company (dummy)	CERVED, Infocamere

Figure 1: Business Groups: Stylized Examples

These charts represent stylized examples of a single-layer (panel a) and multi-layer (panel b) group organization.



(a) **(b)**

Table 2: Business Groups

This table shows descriptive statistics for all group-year observations in the sample. All variables are defined in Table 1.

	mean	p50	sd	count
Group Size	1.90	1.00	2.14	192,120
Group Layers	1.19	1.00	0.45	192,120
Concentration	0.87	1.00	0.20	192,120
Foreign UO	0.26	0.00	0.44	192,120
UO Type: Industrial	0.55	1.00	0.50	192,120
UO Type: Holding	0.19	0.00	0.39	192,120
UO: Assets (Eur Mil.)	120.91	11.13	2,004.78	142,135

Table 3: Financial Statements: Affiliated vs Stand-Alone

This table shows descriptive statistics for all firm-year observations in the sample, split between stand-alone and affiliated firms. All variables are defined in Table 1.

	Stand-alone			Affiliated		
	mean	p50	sd	mean	p50	sd
Assets (Eur Mil.)	8.74	2.44	348.47	41.67	5.56	502.53
Age	18.86	16.00	17.25	17.86	14.00	27.06
Profitability	0.07	0.06	0.10	0.08	0.06	0.12
Turnover	1.04	0.90	1.00	1.10	0.94	1.22
Share Intangibles	0.03	0.00	0.09	0.06	0.01	0.12
Leverage	0.74	0.81	0.23	0.72	0.79	0.24
Observations	2337677			351639		

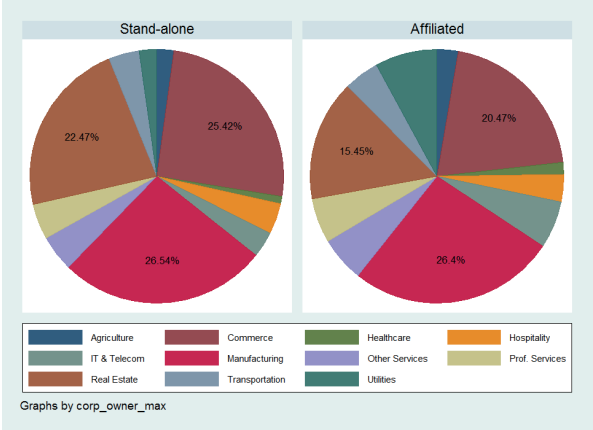
Table 4: Financial Statements: Public vs Private

This table shows descriptive statistics for private firms and for IPO firms. The statistics for IPO firms refer to the year prior to the IPO. All variables are defined in Table 1.

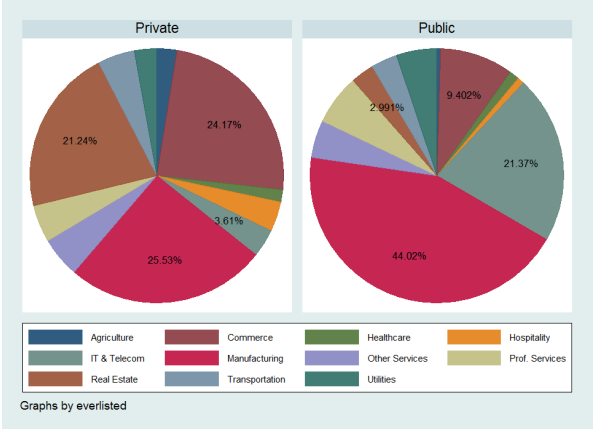
	(1) No IPO				(2) IPO			
	mean	p50	sd	count	mean	p50	sd	count
Assets (Eur Mil.)	19.656	2.638	666.662	2953496	256.684	26.475	1131.723	224
Age	19.007	16.000	19.162	2951098	16.688	12.000	17.617	224
Profitability	0.074	0.059	0.099	2945751	0.140	0.128	0.129	224
Share Intangibles	0.037	0.004	0.094	2953496	0.170	0.088	0.200	224
Leverage	0.737	0.807	0.233	2953496	0.698	0.738	0.181	224
Observations	2953496				224			

Figure 2: Industries

These graphs show the industry break-down for stand-alone vs affiliated firms (panel a) and non-IPO and IPO firms (panel b).



(a)



(b)

Table 5: IPOs: Stand-alone vs Affiliated

This table shows descriptive statistics for the IPOs of stand-alone and affiliated IPOs. AIM is a dummy variable that takes value 1 if the IPO is on the AIM market segment. Proceeds are the total IPO proceeds in million euros. Assets refers to firm's assets the year prior the IPO. Primary shares in the share of primary shares over total shares sold. Capital increase is equal to Proceeds*Primary Shares.

	Stand-alone			Affiliated		
	mean	p50	sd	mean	p50	sd
AIM	0.83	1.00	0.37	0.66	1.00	0.48
Proceeds	63.66	6.30	232.28	123.21	14.13	348.12
Proceeds/Assets	0.57	0.41	0.67	0.67	0.36	0.75
Primary Shares	0.86	1.00	0.26	0.66	0.85	0.39
Capital Increase /Assets	0.47	0.35	0.59	0.36	0.24	0.48
Observations	103			121		

Figure 3: IPOs

This figure plots the total number of IPOs (right axis) and the share of affiliated IPOs (left axis) per year.

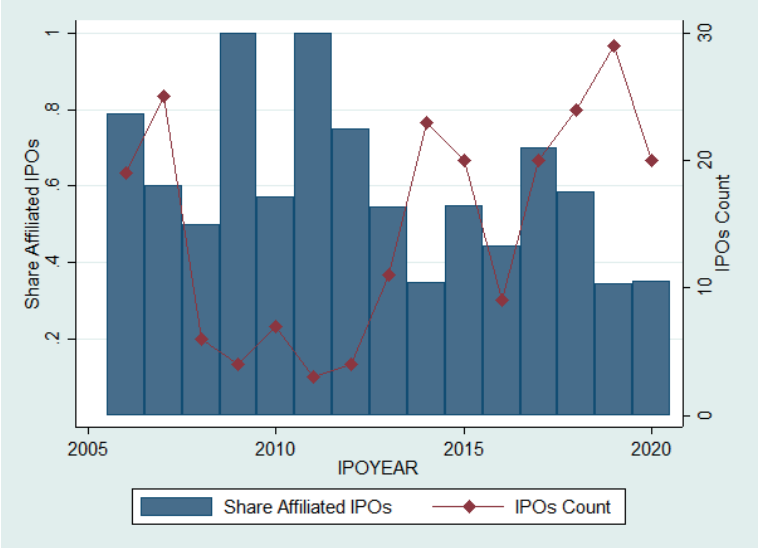


Table 6: Group Firms

This table shows balance sheet and employment data of group firms in the 5 years before and after the IPO of a group member.

(a) Balance Sheet

	Pre IPO			Post IPO		
	mean	p50	sd	mean	p50	sd
Assets (Eur Mil.)	265.53	9.02	1,932.92	316.91	11.36	1,929.57
Age	14.51	12.00	12.29	17.22	14.00	12.53
Profitability	0.08	0.08	0.18	0.10	0.09	0.12
Turnover	1.03	0.87	0.89	0.98	0.86	0.77
% Fixed Assets	0.46	0.35	0.38	0.45	0.37	0.37
% Intangibles	0.10	0.02	0.16	0.09	0.03	0.14
Leverage	0.73	0.79	0.22	0.70	0.74	0.22
Group Size	7.45	6.00	6.12	7.85	7.00	6.58
Observations	1056			861		

(b) Employment

	Pre IPO			Post IPO		
	mean	p50	sd	mean	p50	sd
Employment	341.08	32.08	2,009.89	362.52	49.00	1,674.74
% Managers	0.02	0.00	0.05	0.03	0.00	0.06
% White Collars	0.68	0.80	0.31	0.69	0.81	0.31
% Blue Collars	0.26	0.07	0.32	0.26	0.07	0.31
Observations	943			737		

Figure 4: Group Firms: Industry

These chart shows the industry break-down for group firms, i.e., firms that belong to the same group as affiliated-IPO firms.

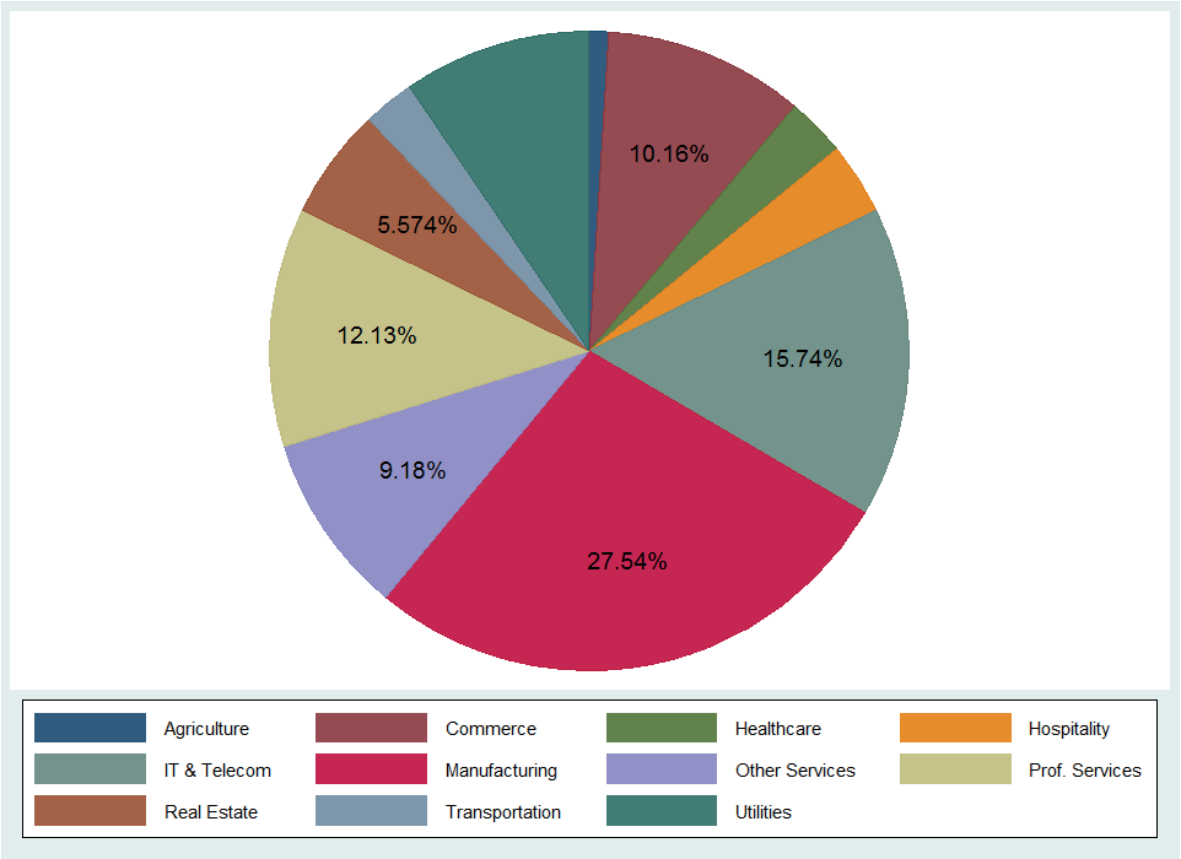


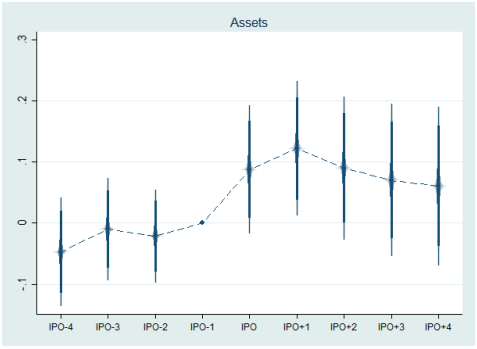
Table 7: Effects of Affiliated IPOs on Group Firms

This table shows coefficient estimates for six linear regressions of (log of) assets, leverage, cost of debt, ROA, tangibility, and (log of) total employment of firm i. *Post IPO* is a dummy variable that takes value 1 in the years after the group-IPO year and zero otherwise. *Size* is the number of firms belonging to the same group as firm i the year before the group-IPO. D_T is a dummy variable for each value of T between -4 and 4, where T represents years relative to group-IPO. All specifications include firm and year fixed effects. The sample consists of both treated and control firms. Treated firms are those belonging to a group where one of the affiliated firms goes public during the observation period. The control sample is built by matching each treated firm with the 5 closest firms by asset size which at T=-1 operated in the same sector and belonged to a non-listed group. Standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

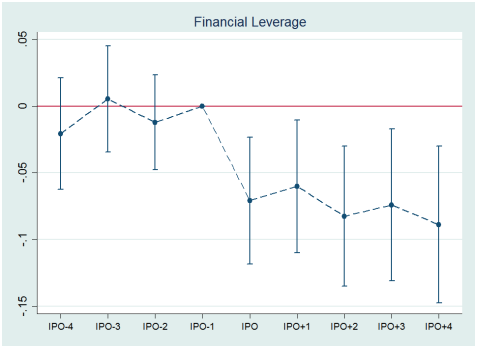
	(1) Assets	(2) Leverage	(3) Debt Cost	(4) Tangibility	(5) ROA	(6) Employment
Post IPO	0.1063***	-0.0665***	0.0486	0.0101	-0.0108	0.1831***
	(0.0343)	(0.0207)	(0.1345)	(0.0086)	(0.0120)	(0.0494)
Post IPO X Group Size	-0.0100***	0.0064***	-0.0056	-0.0005	0.0027**	-0.0170***
	(0.0037)	(0.0022)	(0.0141)	(0.0009)	(0.0013)	(0.0053)
D_T	yes	yes	yes	yes	yes	yes
Firm and Year FE	yes	yes	yes	yes	yes	yes
Observations	8150	6332	5210	8150	8040	7169
Firms	1461	1284	1186	1461	1444	1298
R-Squared	0.069	0.025	0.005	0.015	0.009	0.016
Mean Dep.	9.45	0.42	0.24	0.21	0.02	3.66

Figure 5: Dynamic Effects of Affiliated IPOs on Group Firms

These graphs show coefficient estimates for θ_T in the following regression $Y_{i,T,y} = \sum_{T=-4}^{4} \theta_T D_T X GroupIPO + PostIPOXSize + \alpha_i + \gamma_y + \varepsilon_{i,y,T}$. *Post IPO* is a dummy variable that takes value 1 in the years after the group-IPO year and zero otherwise. *Size* is the number of firms belonging to the same group as firm i the year before the group-IPO. D_T is a dummy variable for each value of T between -4 and 4, where T represents years relative to group-IPO. All specifications include firm and year fixed effects. $Y_{i,T,y}$ is equal to (log of) assets, leverage, and (log of) total employment in panel (a), (b) and (c) respectively. The sample consists of both treated and control firms. Treated firms are those belonging to a group where one of the affiliated firms goes public during the observation period. The control sample is built by matching each treated firm with the 5 closest firms by asset size which at T=-1 operated in the same sector and belonged to a non-listed group.



(a)



(b)

(c)

Table 8: Effects on Employment

This table shows coefficient estimates for five linear regressions of (log of) total employment, share of managers, share of white collars, share of blue collars, and (log of) average salary of firm i. The sample includes all group firms plus up to 5 affiliated control firms, matched on the basis of industry and asset size in the year prior to the IPO. $Post = 1$ if one of the members in firm i's group is public (and zero otherwise). $HighLev_i = 1$ if firm i has leverage above the median of its group at t=-1 (and zero otherwise), $Old_i = 1$ if firm i is older than the median of its group at t=-1 (and zero otherwise), $Large_i = 1$ if firm i has assets size above the median of its group at t=-1 (and zero otherwise), $SameIndustry_i = 1$ if firm i operates in the same industry as the affiliated firm in its group that goes public at t=0. Standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	(1) Employment	(2) % Managers	(3) % White Collar	(4) % Blue Collar	(5) Avg. Wage
Post	0.2778***	0.0055	0.0053	0.0050	-0.0213
	(0.0735)	(0.0050)	(0.0141)	(0.0130)	(0.0301)
Post X High Lev.	0.1146**	-0.0088***	0.0146	-0.0067	-0.0256
	(0.0473)	(0.0032)	(0.0090)	(0.0083)	(0.0193)
Post X Old	-0.1293**	-0.0138***	0.0021	0.0083	-0.0155
	(0.0506)	(0.0034)	(0.0096)	(0.0089)	(0.0206)
Post X Large	-0.0924*	0.0098***	-0.0133	0.0021	0.0377*
	(0.0512)	(0.0034)	(0.0098)	(0.0090)	(0.0208)
Post X Same Industry	-0.0265	0.0158***	-0.0004	-0.0153*	0.0667***
	(0.0468)	(0.0031)	(0.0089)	(0.0082)	(0.0190)
Post X Size	-0.0179***	-0.0013***	-0.0006	0.0010	-0.0012
	(0.0054)	(0.0004)	(0.0010)	(0.0010)	(0.0022)
T	yes	yes	yes	yes	yes
Firm and Year FE	yes	yes	yes	yes	yes
Observations	7169	7169	7169	7169	7169
Firms	1298	1298	1298	1298	1298
R-Squared	0.019	0.015	0.020	0.021	0.051
Mean Dep.	3.66	0.03	0.62	0.32	7.88

Table 9: Liquidity Effects on Group Firms Capital Structure

This table shows coefficient estimates for three linear regressions of (log of) assets, (log of) equity, and ownership concentration of firm i. *Post IPO* is a dummy variable that takes value 1 in the years after the group-IPO year and zero otherwise. *Secondary* is a dummy variable that takes value of one if existing shares were sold in the affiliated IPO. *Size* is the number of firms belonging to the same group as firm i the year before the group-IPO. D_T is a dummy variable for each value of T between -4 and 4, where T represents years relative to group-IPO. All specifications include firm and year fixed effects. The sample consists of both treated and control firms. Treated firms are those belonging to a group where one of the affiliated firms goes public during the observation period. The control sample is built by matching each treated firm with the 5 closest firms by asset size which at T=-1 operated in the same sector and belonged to a non-listed group. Standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)
	Assets	Equity	Ownership Concentration
Post IPO X Secondary	0.1317***	0.1330**	
	(0.0343)	(0.0655)	
Post IPO	0.0672*	0.1205*	0.0478***
	(0.0372)	(0.0711)	(0.0084)
Post IPO X Group Size	-0.0161***	-0.0193***	-0.0034***
	(0.0038)	(0.0073)	(0.0009)
T	yes	yes	yes
Firm and Year FE	yes	yes	yes
Observations	8150	8150	7583
Firms	1461	1461	1459
R-Squared	0.055	0.069	0.027
Mean Dep.	9.45	7.79	0.86

Table 10: IPO Determinants: Affiliated vs Stand-Alone

This table shows estimates of odds ratios (panel a) or linear coefficients (panel b) for the probability of an IPO at time $t+1$ for firm i on explanatory variables measured at t. The sample includes all private firms (columns 1 and 2), all private stand-alone firms (column 3 and 4), or all affiliated private firms (columns 5 and 6). *Leverage* is firm i's ratio of total debt over total assets. *Mkt-to-Book (Industry Specific)* is the average ratio of the U.S. stock market value over book value for firm i's sector (IT&Telecom, Manufacturing, or Other). *Mkt-to-Book (Industry Specific)* is the average ratio of the U.S. stock market value over book value averaged across industries. All other variables are described in Table 1. Standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

(a) Logit

	All Firms	All Firms	Stand-Alone	Stand-Alone	Affiliated	Affiliated
Leverage	1.0460***	0.9922***	1.6571***	1.6330***	0.5925	0.5254
	(0.3533)	(0.3521)	(0.5374)	(0.5355)	(0.4670)	(0.4654)
Mkt-to-Book (Industry Specific)	0.1475**		0.1868**		0.1088	
	(0.0701)		(0.0822)		(0.1166)	
Mkt-to-Book (All Industries)		0.7582***		0.5088		0.9416***
		(0.2322)		(0.3286)		(0.3164)
Sales Growth (1 lag)	0.4663***	0.4561***	0.4997***	0.4973***	0.3991***	0.3825***
	(0.0657)	(0.0660)	(0.0949)	(0.0954)	(0.0899)	(0.0901)
ROA Class	0.5534***	0.5543***	0.6914***	0.6902***	0.4428***	0.4418***
	(0.0677)	(0.0678)	(0.1073)	(0.1073)	(0.0815)	(0.0816)
Age (yrs)	-0.0025***	-0.0025***	-0.0038***	-0.0038***	-0.0015***	-0.0015***
	(0.0004)	(0.0004)	(0.0005)	(0.0005)	(0.0004)	(0.0004)
Share Intangibles	3.1401***	3.1763***	3.2619***	3.2788***	2.9346***	2.9927***
	(0.3005)	(0.3005)	(0.4460)	(0.4452)	(0.3717)	(0.3734)
Ln(Assets)	0.7295***	0.7297***	0.7746***	0.7750***	0.5737***	0.5727***
	(0.0278)	(0.0277)	(0.0406)	(0.0405)	(0.0418)	(0.0416)
Ownership Concentration	-0.4825**	-0.4780**	-0.5813	-0.5724	-2.0711***	-2.0429***
	(0.2392)	(0.2400)	(0.3539)	(0.3545)	(0.4002)	(0.3990)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,595,880	2,595,880	2,259,421	2,259,421	336,459	336,459
Firms	352,615	352,615	326,648	326,648	63,909	63,909
Mean Dep. Var.	8.59e-05	8.59e-05	4.56e-05	4.56e-05	3.57e-04	3.57e-04
Pseudo-R^2	0.1986	0.1999	0.2151	0.2149	0.1484	0.1516

(b) LPM

	All Firms	All Firms	Stand-Alone	Stand-Alone	Affiliated	Affiliated
Leverage	0.0055**	0.0051**	0.0045**	0.0044**	0.0134	0.0118
	(0.0025)	(0.0025)	(0.0018)	(0.0018)	(0.0134)	(0.0134)
Mkt-to-Book (Industry Specific)	0.0024**		0.0020**		0.0052	
	(0.0011)		(0.0008)		(0.0060)	
Mkt-to-Book (All Industries)		0.0069***		0.0024		0.0379***
		(0.0022)		(0.0016)		(0.0137)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,595,880	2,595,880	2,259,421	2,259,421	336,459	336,459
Firms	352,615	352,615	326,648	326,648	63,909	63,909
Mean Dep. Var.	8.59e-03	8.59e-03	4.56e-03	4.56e-03	3.57e-02	3.57e-02
Adj.-R^2	0.0007	0.0007	0.0005	0.0005	0.0012	0.0013

Table 11: Use of IPO Proceeds: Affiliated vs Stand-Alone

This table shows coefficient estimates for six linear regressions of assets, equity, total debt, working capital and fixed assets of firm i. The sample includes IPO firms plus a matched sample of private firms operating in the same sector, with the same affiliation status, and of similar size as the IPO firms. *Proceeds* equals zero before the IPO (or at any time for the matched sample) and the amount of total primary shares IPO proceeds after the IPO. $Affiliated$ is a dummy variable that takes value 1 if firm i belongs to a business group. t is the number of years before or after the IPO (with t=0 being the IPO year). Matched firms are associated with the same t as the IPO firms they are matched to. All specifications include firm fixed effects. Standard errors in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	(1) Assets	(2) Equity	(3) Debt	(4) Liquid Assets	(5) Working Capital	(6) Fixed Assets
Proceeds	3.0339***	1.1920***	1.8419***	-0.0324	1.2494***	1.8169***
	(0.2018)	(0.1100)	(0.1550)	(0.0294)	(0.0924)	(0.1528)
Proceeds X Affiliated	-1.4001**	-0.4179	-0.9822**	0.4219***	-0.4904*	-1.3316***
	(0.5494)	(0.2995)	(0.4219)	(0.0801)	(0.2515)	(0.4160)
t	1.1331	0.8475	0.2857	0.5829***	-0.5840	1.1342
	(1.0475)	(0.5710)	(0.8044)	(0.1527)	(0.4795)	(0.7931)
t X Affiliated	8.5677***	5.1537***	3.4140***	0.5167**	2.7758***	5.2752***
	(1.4199)	(0.7740)	(1.0904)	(0.2069)	(0.6500)	(1.0751)
Net Income	0.0743***	0.3712***	-0.2969***	0.0385***	0.0789***	-0.0431**
	(0.0277)	(0.0151)	(0.0213)	(0.0040)	(0.0127)	(0.0210)
Firm FE	yes	yes	yes	yes	yes	yes
Observations	14764	14764	14764	14764	14764	14764
Firms	2347	2347	2347	2347	2347	2347
R-Squared	0.029	0.067	0.029	0.017	0.021	0.019
Mean Dep.	213.00	74.04	138.96	11.82	85.95	115.23

Table 12: Post IPO stock market returns: Affiliated vs Stand-Alone

This table shows coefficient estimates for a linear regression of monthly excess stock returns of firm i. $Affiliated$ is a dummy variable that takes value 1 if firm i belongs to a business group. *AIM Mkt* is a dummy variable that takes value 1 if firm i's share are listed on the Alternative Investment Market. *Large* is a dummy variable that takes value 1 if firm i is classified as a large cap by the stock exchange. *% Free Float* is the share of equity floated on the exchange at the IPO. Standard errors in parentheses are clustered at the firm level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Affiliated	0.0089***	0.0090***	0.0084***
	(0.0030)	(0.0032)	(0.0032)
Affiliated X AIM Mkt	-0.0154***	-0.0158***	-0.0182***
	(0.0038)	(0.0040)	(0.0041)
AIM Mkt	0.0051	0.0044	0.0090**
	(0.0031)	(0.0033)	(0.0042)
Large			0.0061*
			(0.0035)
1st Day Return			-0.0028
			(0.0075)
% Free Float			-0.0044
			(0.0087)
Month-Year FE	Yes	Yes	Yes
Industry FE	No	Yes	Yes
IPO Year FE	No	Yes	Yes
Observations	16,485	16,485	15,265
Firms	214	214	205
Mean Dep. Var.	-0.00106	-0.00106	-0.00069
Adj. R^2	0.3066	0.3063	0.3078

Table 13: Robustness

This table shows coefficient estimates for three linear regressions of (log of) assets, leverage, and (log of) total employment of firm i. *Post IPO* is a dummy variable that takes value 1 in the years after the group-IPO year and zero otherwise. *Size* is the number of firms belonging to the same group as firm i the year before the group-IPO. D_T is a dummy variable for each value of T between -4 and 4, where T represents years relative to group-IPO. All specifications include firm and year fixed effects. The sample consists of both treated and control firms. Treated firms are those belonging to a group where one of the affiliated firms goes public during the observation period. The control sample is built with propensity score matching in Panel (a). In Panel (b) and (c) the control sample is built by matching each treated firm with the 5 closest firms by asset size which at T=-1 operated in the same sector and belonged to a non-listed group. In Panel (b) we exclude all firms belonging to groups with non-resident (foreign) ultimate owners. Standard errors in parentheses in Panel (a) and (b). Errors are clustered at the group level in Panel (c). *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

(a) Propensity Score Matching

	(1) Assets	(2) Leverage	(3) Employment
Post IPO	0.1740***	-0.0561*	0.2042***
	(0.0487)	(0.0292)	(0.0672)
Post IPO X Group Size	-0.0216***	0.0052	-0.0178**
	(0.0057)	(0.0034)	(0.0083)
D_T	yes	yes	yes
Firm and Year FE	yes	yes	yes
Observations	40303	32744	36033
Firms	7225	6524	6529
R-Squared	0.056	0.015	0.015
Mean Dep.	2.58	0.43	3.63

(b) Excluding Foreign Ultimate Owners

	(1) Assets	(2) Leverage	(3) Employment
Post IPO	0.1820***	-0.0416*	0.2682***
	(0.0355)	(0.0216)	(0.0536)
Post IPO X Group Size	-0.0156***	0.0042*	-0.0242***
	(0.0037)	(0.0022)	(0.0056)
D_T	yes	yes	yes
Firm and Year FE	yes	yes	yes
Observations	6812	5295	5989
Firms	1209	1072	1072
R-Squared	0.066	0.024	0.016
Mean Dep.	9.42	0.43	3.64

(c) Clustered Standard Errors

	(1) Assets	(2) Leverage	(3) Employment
Post IPO	0.1063*	-0.0665**	0.1831*
	(0.0644)	(0.0304)	(0.0988)
Post IPO X Group Size	-0.0100	0.0064**	-0.0170*
	(0.0064)	(0.0028)	(0.0097)
D_T	yes	yes	yes
Firm and Year FE	yes	yes	yes
Observations	8150	6332	7169
Firms	1461	1284	1298
R-Squared	0.069	0.025	0.016
Mean Dep.	9.45	0.42	3.66

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