

IPO Valuation of European Pyramidal Groups

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This paper investigates the valuation of firms belonging to European pyramidal groups at the time of their IPO. In two independent samples of firms that went public in Europe over the last decade, we find that the market-to-book ratio at IPO is positively affected by affiliation with a pyramidal group. The two samples are modeled using ordinary least squares regressions controlling for firm- and offer-specific variables such as age, size, and underpricing. Pyramidal companies thus appear to be more highly valued by investors, who may believe that this ownership structure substitutes for weak market institutions.

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1. Introduction

Pyramidal business structures, consisting of one holding company and several layers of subsidiaries, are a very common mechanism of separating ownership and control around the world. Pyramids are involved in the ownership of 67% of companies in Indonesia, 49% in Taiwan, 37% in Japan (Claessens et al., 2000), 35% in Canada (Attig et al., 2006), 20% of in Western Europe, and 9% in the US (Faccio and Lang, 2002). The controlling shareholder typically retains a majority vote in every company, either directly or indirectly.

Most of the literature on pyramidal groups emphasizes the conflict between the controlling and the minority shareholders. This agency problem is associated with the low share of cash flow that the controlling shareholder is entitled to in operating subsidiaries, and hence with opportunities for expropriation (Bebchuk, 1999; Bebchuk et al., 2000). This poses particular challenges to valuation of the subsidiaries.

There are a variety of situations in which the value of a firm must be established without referring to its current market price, for example when calculating gift or estate taxes on a closely held business. Corporate control transactions such as mergers, acquisitions, and management buyouts also require an independent valuation of equity. However, the most crucial time for valuation is a firm's IPO. Indeed, the principal challenge facing a company going public is convincing a wide variety of potential external investors that it has potential.

The valuation of IPOs is an important topic in finance. Nevertheless, the empirical literature on this subject focuses on U.S. offerings. The European context has drawn less interest, probably due to the greater difficulty of constructing large and homogeneous datasets. Consequently, the ownership structures of European companies have not received much attention. It is well known that while ownership tends to be dispersed in Anglo-Saxon countries, in continental Europe and many Asian countries privately owned companies are often organized into pyramids. This peculiarity doubtless has an effect on the valuation of firms, with several implications for studies in corporate finance (La Porta et al., 1999). This paper attempts to shed light on the valuation of pyramidal companies, in

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particular investigating whether cross-shareholding affects the attractiveness of individual companies in the equity market.

This is an issue of considerable practical and theoretical importance to both investors and academics. An analysis of the offer price determinants should indicate which drivers are perceived to be important by players in the capital market. Our interest is based on the evidence that complex pyramidal structures are often correlated with high managerial agency costs (Claessens et al., 2002; La Porta et al., 2002; Bekaert et al., 2003; Lins, 2003), larger private control benefits (Burkart et al., 1998; Nenova, 2003; Doidge, 2004; Dyck and Zingales, 2004), weaker protection of minority shareholders (Bebchuck et al., 2000; La Porta et al., 2000) and an underdeveloped corporate control market (Nenova, 2003; Doidge, 2004; Meoli et al., 2008). We therefore ask whether investors, anticipating higher expropriation opportunities, discount the firm in their IPO valuation. If so, we expect to observe *ceteris paribus* lower prices among pyramidal firms. On the contrary, Morck (2009) acknowledge that pyramids play an important role in developing countries, where they may substitute for weak market institutions. However, no such role is evident in developed or in slowly growing developing economies.

Empirically, we investigate the effect of ownership structure on IPO valuation using an extensive European dataset (EurIPO). This source is supplemented by published and hand-collected information on corporate governance and ownership to create two independent samples: one of European firms, and a complete set of Italian firms. We expect our analysis to demonstrate that European IPOs, although valued following determinants similar to those observed in US IPOs, are also affected by the existence of a differentiated ownership structure. In particular, we aim to test whether investors anticipate the possibility of expropriation when pricing shares of companies owned by a pyramidal group.

The remainder of this paper is structured as follows. Section 2 reviews the literature, Section 3 presents the research design, and Section 4 discusses our econometric results. Section 5 concludes the paper.

2. Literature Review

2.1. The valuation of IPOs

The valuation of IPOs is an important area of investigation in both financial and accounting literature. Over the last decade, research on this topic has evolved in several directions. For example, a broad stream of research beginning with Kim and Ritter (1999) studies the methodologies used to price IPO companies (e.g. Purnanandam and Swaminathan, 2004; Cassia, Paleari and Vismara, 2004; Jagannathan and Gao, 2005). The consensus is that on average, IPO firms are priced higher than equivalent listed firms. Other studies specifically address this over-optimism, questioning the role of financial analysts and other intermediaries. On one hand, analysts reduce the agency costs associated with the separation of ownership and control (Jensen and Meckling, 1976). On the other hand, analysts may provide biased information. Prior research has indicated that their earnings forecasts systematically exceed actual figures (e.g. Rajan and Servaes, 1997; Brav and Lehavy, 2003).

A closely related branch of literature investigates the relevance of accounting data to the values of IPO firms. These studies typically examine three classes of potential value drivers (Guo, Lev and Zhou, 2005): firm and issue attributes (such as the stake retained by pre-IPO owners or the age of the firm at its IPO), financial fundamentals (such as sales, earnings, and research and development expenditures), and non-financial information (such as web traffic, patents or alliance agreements). As our goal is to relate IPO valuation to firm-level variables of ownership, this paper falls squarely into the first group. Its unique contribution, investigating the effects of involvement in a pyramidal structure, is of particular interest in the European context.

Prior studies of the relationship between ownership and IPO variables are characterized by an empirical approach and a focus on post-issue performance. Berle and Means (1932) suggested that the diffuseness of shareholdings should be inversely correlated with firm performance. Much later, Jensen and Meckling (1976) analyzed the conflict of interest between managers and owners when the

latter must pay to monitor the performance of the former. Their model implies that managerial ownership is inversely related to the strength of the board's monitoring role. For example, in firms with little managerial ownership, a strong board will be selected to monitor the activities of management (Fama and Jensen, 1983). Accordingly, an IPO can increase agency problems by reducing the level of management ownership. Leland and Pyle (1977) developed an IPO model in which the original shareholders seek financing for projects whose true value is not made public. The entrepreneurs can convincingly signal their project's quality by retaining a significant ownership stake, since false representation would be costly. Even though they originate from very different perspectives, all three of the results just mentioned are in agreement: a high level of managerial ownership tends to increase outside confidence in the firm. Our paper contributes to this stream by analyzing the relationship between valuation and a more qualitative aspect of ownership.

2.2. Ownership Structure and Valuation

The idea that a firm's ownership structure affects its value is central to modern finance (Demsetz and Lehn, 1985, Morck et al., 1988, Cho, 1998, Hovakimian et al., 2001, Claessens et al., 2002, La Porta et al., 2002, Lins, 2003). Two seminal papers shape our understanding of this relationship. Leland and Pyle (1977) developed a model wherein the entrepreneur knows more about the firm's expected future cash flow than potential investors. Accordingly, equity retention by existing shareholders at the time of listing is interpreted by the market as a sign of the entrepreneurs' level of commitment (the *signaling hypothesis*). The current value of the firm is therefore positively related to equity retention at the IPO. According to Jensen and Meckling (1976), managers retaining a high level of ownership have fewer incentives to undertake projects that do not maximize the firm's value. (This perspective is known as the *agency hypothesis or alignment of interest hypothesis*.) Due to a reduction of agency costs, this hypothesis predicts that firm value increases with the level of management ownership.

Other theoretical work suggests that the relationship between management equity and a firm's value may not be significantly positive across the full range of possibility. In contrast with the alignment-of-interest and signaling hypotheses, Fama and Jensen (1983) point out the problem of entrenchment, suggesting that managerial ownership has both positive and negative effects (the *entrenchment hypothesis*). In environments with high levels of information asymmetry, entrenched managers may indulge their preferences for non-value-maximizing behavior. The research of Bebchuk (1999) shows that when managers hold enough equity to gain effective control of the firm, they may pursue private benefits. That is, high levels of management ownership may prevent outside shareholders from effectively monitoring and controlling managerial actions.

In a similar vein, Stulz (1988) shows that a large fraction of voting rights controlled by managers reduces the probability of a successful takeover bid. In his model, a high concentration of voting rights in the hands of incumbent management has an ambiguous influence on the value of the firm. On the negative side, an increase in managerial control reduces the current value of the target by limiting the probability of a future value-increasing takeover. On the positive side, the premiums offered with a takeover attempts increase with the fraction of voting rights controlled by managers.

Empirical research accounts for the entrenchment hypothesis by considering a non-linear relationship between managerial ownership and firm performance. Morck, Shliefer and Vishny (1988) argue that the incentive alignment argument outweighs the entrenchment argument for low levels of managerial ownership. Specifically, the benefits of incentive alignment appear to be dominant for managerial ownership fractions in the range of 0 percent to 5 percent. The entrenchment effect is dominant for management ownership levels of 5 percent to 25 percent, while at still higher levels the focus shifts back to interest alignment. Empirical studies of European firms generally find that the turning point occurs at higher levels of ownership (McConnell and Servaes, 1990; Short and Keasey, 1999; Roosenboom and Van der Goot, 2005; and Bonardo, Paleari and Vismara, 2007). This difference is attributed to the size of the sample firms; Morck et al. (1988) only analyzed large U.S. companies in the Fortune 500, while European samples typically contain smaller

firms. Based on this research, we hypothesize a nonlinear relationship between management ownership and firm value.

2.3. Pyramidal groups

Most papers on the relationship between ownership structure and valuation or performance are based on an Anglo-Saxon perspective: the firm's ownership is widely dispersed. However, in continental Europe (Franks and Mayer, 2001), Japan, and many other Asian countries (Hiraki et al., 2003), we often observe more concentrated ownership structures. In regulated industries such as energy and telecommunication, the government may effectively control large companies (Boubakri et al., 2004). In other industries, most firms are privately controlled through pyramidal structures (La Porta et al., 1999).

A similar pattern is evident when we consider how ownership and control are separated in the two regions. In the UK and USA, public companies and family-owned companies coexist. Sometimes firms adopting a two-class ownership structure, where one group of shareholders has limited voting rights. In continental Europe, the situation is quite different (Becht and Röell, 1999, La Porta et al., 1999, Buysschaertet al., 2004). A two-class structure is often observed in conjunction with pyramids, so that the controlling shareholder need only formally control the company with the highest position in the group (Bebchuck et al., 2000, Faccio and Lang, 2002). This allows the group as a whole to conduct its financial activities with minimal investment from the majority shareholders (Slovin and Sushka, 1997) and no chance for minority shareholders to affect or dismiss an operation. Claessens et al. (2002) conduct a similar analysis of East Asian Countries, with the same result.

The recent literature expresses various concerns over the effects of pyramidal ownership in continental Europe. First, when control over a firm is exerted through the group structure rather than direct ownership, managerial agency costs may be high (Claessens et al., 2002; La Porta et al., 2002; Bekaert et al., 2003; Lins, 2003). Likewise, the benefits of private control in this environment are larger (Burkart et al., 1998; Nenova, 2003; Doidge, 2004; Dyck and Zingales, 2004). Secondly, recent studies in corporate finance emphasize the point that pyramids adversely affect the protection of minority shareholders (Bebchuck et al., 2000; La Porta et al., 2000). Third, pyramidal structures undermine the market for corporate control. This last point has often been investigated in works analyzing how markets award voting rights (Nenova, 2003; Doidge, 2004).

As pyramids allow a single shareholder to control large conglomerates (Becht and Roell, 1999; Faccio and Lang, 2002), an important research question is how the existence of a controlling shareholder affects a firm's value. The prior literature considers two hypotheses. According to the *interest alignment hypothesis*, large shareholders with a higher level of cash flow rights are more committed to actively monitoring managerial activities and maximizing the firm's value. La Porta et al. (2002) and Claessens et al. (2002) report evidence supporting a positive correlation between the cash flow rights of large shareholders and Tobin's q -statistic in samples of large seasoned firms. However, Yeh et al. (2008) find that this positive correlation is weakened in aftermarket trading.

On the other hand, according to the *entrenchment hypothesis*, the separation of ownership and control generates a conflict of interest between controlling and minority shareholders. Grossman and Hart (1988) and Harris and Raviv (1988) show that separating ownership and control lowers a firm's value to shareholders and may not be socially optimal. Shleifer and Vishny (1997) demonstrate that when majority owners gain almost full control, the benefits of private control do not extend to minority shareholders. Claessens et al. (2002) report a value discount that increases with the size of the difference between voting and cash flow rights. Furthermore, Yeh et al. (2008) find that this kind of voting/cash flow rights structure is negatively correlated with IPO underpricing.

3. Research Design

3.1. IPOs in Europe

European IPOs are not overseen by a single regulator as in the United States, but by a patchwork of distinct national regulators. Regulators belonging to the European Union have only

one duty in common: to follow legal guidelines set out by the European Investment Services Directive, the Prospectus Directive, and the Transparency Directive. Any firm wishing to undertake an IPO on a regulated market must first obtain permission from the appropriate regulator. Depending on the firm's country, this entity may be the Ministry of Finance, an independent authority over security markets, or the stock exchange itself. In addition, most European stock exchanges are segmented into a main market and one or more second-tier markets dedicated to particular classes of firms. Historically, the second-tier markets tend to succeed during hot periods and collapse during cold periods. On the other hand, Europe has witnessed considerable evolution in the segmentation of its stock markets.

The structures of European markets are linked to the strikingly cyclic character of the IPO landscape. For a long time, Europe's IPO market was dwarfed by the U.S. IPO market (Ritter, 2003). In the year 2000, however, continental European IPOs exceeded U.S. IPOs in volume for the first time in at least several decades. More recently, the London Stock Exchange launched a successful second-tier market for small and medium-sized companies: the Alternative Investment Market (AIM). The AIM has attracted a large number of companies from many different industries and countries (Paleari, Pellizzoni and Vismara, 2008). Academics have fiercely debated the causes of the US IPO market's decreasing appeal, which are thought to involve the 2002 Sarbanes-Oxley Act (Leuz et al., 2007; Zhang, 2007). Yet the AIM is still weak in continental Europe, where new listings most often take place in the issuer's home market. Furthermore, even when a security is listed simultaneously in more than one market, trading tends to be concentrated in the home market (Paleari, Ritter and Vismara, 2009).

3.2. Dataset and sample

In recent years, several important developments have affected the market for IPOs in Europe. Given the vast number of IPOs, this paper focuses on the stock exchanges of the four largest economies, namely Germany, France, the UK, and Italy. Our sample of IPOs is selected from the EURIPO database, which provides prospectuses as well as very detailed information on the companies. EURIPO includes all companies that have recently gone public in Europe¹. Our sample comprises only firms that executed 'real' initial public offerings; it excludes introductions (admissions with no initial offer), re-admissions, and companies already listed on other stock markets. The IPOs of investment entities (such as trusts) and financial companies are also excluded, because these firms have unusual characteristics compared to other IPO firms.

Table 1 provides a breakdown of our sample by market and year of listing. A total of 3,052 non-financial firms held IPOs on the stock markets of Germany (Deutsche Börse), France (Euronext), the United Kingdom (London Stock Exchange), and Italy (Borsa Italiana) during the decade 1996-2005. Most of these took place on the London Stock Exchange, reflecting the well-known difference in propensity for firms to go public in Anglo-Saxon countries compared to Continental Europe. The AIM (Alternative Investment Market), with 1,195 IPOs during the period 2004-2006, is arguably the strongest market in Europe despite its "second-tier" status. It hosted approximately ten times more IPOs than the LSE Main Market. If we exclude the three "New Markets" of continental Europe, the fraction of IPOs appearing in continental European markets is fairly constant at about one-third of the sample. The three New Markets produced a total of 513 IPOs, most of them in the bubble period 1998-2000.²

¹ The EURIPO database is maintained by Universoft, a spin-off of the University of Bergamo (www.euripo.eu). It contains data on all the companies that went public through IPOs on European stock markets since 1985, totalling more than 5,000. Specific data on these firms are derived from IPO prospectuses and annual reports.

² The IPO firms reported in this paragraph and in Table 1 exclude financial companies. The three European New Markets were combined into a pan-European network named Euro.NM through the Markets Harmonization Agreement, which established many common regulations. Euro.NM is dedicated to growth companies, and each market is ultimately governed by the requirements of its native country. Its members were the French *Nouveau Marché* (first listing March 20 1996, closed on February 21 2004), the German *Neuer Markt* (first listing March 10 1997, closed on June 5 2003), the Dutch *Nieuwe Markt NMAX* (first listing March 25 1997, later absorbed into Euronext), EuroNM Belgium (first listing April 11 1997, later absorbed

Table 1
Description of the IPO sample by year and by market

	1995-1997	1998-2000	2001-2003	2004-2006	1995-2006	%
LSE - AIM	172	249	192	582	1,195	(39.2)
LSE - Main Market	165	141	28	55	389	(12.7)
Euronext - NM	36	131	7	0	174	(5.7)
Euronext (others)	122	264	90	152	628	(20.6)
Deutsche Börse - Neuer Markt	11	277	11	0	299	(9.8)
Deutsche Börse (others)	28	85	10	74	197	(6.5)
Borsa Italiana - Nuovo Mercato	0	35	4	1	40	(1.3)
Borsa Italiana (others)	30	42	22	35	129	(4.2)
Continental Europe (excl. NM)	180	391	122	261	954	
%	(31.9)	(31.9)	(33.5)	(29.0)	(31.3)	
New Markets (Euro.NM)	47	443	22	1	513	
%	(8.3)	(36.2)	(6.0)	(0.1)	(16.8)	
LSE	337	390	220	637	1,584	
%	(59.8)	(31.9)	(60.4)	(70.9)	(51.9)	
Total	564	1,224	364	899	3,052	
%	(18.5)	(40.1)	(11.9)	(29.5)	(100.0)	

Notes: Continental Europe excludes the three "New Markets" belonging the Euro.NM association, but includes all other markets managed by *Deutsche Börse*, Euronext and *Borsa Italiana*. LSE includes both the Main Market and the AIM. The numbers in parentheses are percentages relative to the total number of IPOs in that three-year period. In the last row and column, percentages are relative to the entire sample of 3,052 IPOs.

Table 2 reports descriptive statistics of IPOs from the various markets for the entire sample period. The market-to-book ratio (M/B) at the IPO varies significantly across markets. New Market firms had the highest median M/B (4.68 overall, 4.75 on Germany's Neuer Markt), while the Italian Stock Exchange (excluding the Nuovo Mercato) had the lowest median M/B. The median age of IPO companies is highest in Continental Europe (12 years), and particularly low on the AIM (3 years). The median firm size varies from 30 €m in Continental Europe to 2.87 €m on the AIM. Long-term debt plays a very important role in financing continental European firms (median leverage 22.44%), but has little relevance to firms listing on the New Markets (5.6%). The least profitable firms went public on the New Markets (median ROE 7.1%) and on the AIM. In the latter case, most of the companies actually had negative earnings (-1.73%), especially in recent years. The sizes of the offers (i.e., proceeds) are largest on the traditional Italian (74 €m) and UK (50.3 €m) markets. The smallest offers occurred on the Euronext market, probably due to the large number of IPOs on the Second Marché and Marché Libre. Most IPOs in the UK did not have a secondary offer (median participation ratio equal to 0), whereas in the typical continental European IPO 10% of shares held by existing shareholders are sold at the offer. Underpricing is highest on the New Markets (19.37%, with 29.03% on the Neuer Markt) and lowest in continental Europe (3.90%).

3.3. Pyramids and Ultimate Controlling Shareholder

In order to determine how a pyramidal ownership structure and the nature of the ultimate shareholder affect a firm's value, we introduce a set of dedicated variables³. A dummy variable is

in Euronext), and the Italian *Nuovo Mercato* (first listing June 17 1999, renamed MTax on September 19 2005). In the UK, no independent new market was launched during the sample period. However, the UK created a new market segment (techMARK) of companies listed on the LSE operating in high-tech industries. The AIM replaced the USM (Unlisted Securities Market) in June 1995.

³ In fact, Morck, Shliefer and Vishny (1988) analyze the hypothesis of a non-linear relationship between ownership and valuation. As pyramid affiliation and ultimate ownership are measured in our paper with dummy variables, we do not investigate non-linearity in our analysis.

used to identify firms that are part of a pyramidal structure. Following the definition given in Faccio and Lang (2002), pyramiding occurs whenever a single shareholder owns one corporation through another which he controls but does not totally own. We set a 10% threshold for the controlling stake.

Table 2
Descriptive statistics of the main control variables

<i>Panel A: Firms at IPO</i>	M/B	Firm Age	Firm Size (Sales €m)	Leverage	Profitability (ROE)	Operating Risk
LSE - AIM	2.51	3.0	2.87	10.31	-1.73	79.9
LSE - Main Market	2.68	9.0	30.70	8.22	14.89	83.7
Euronext - NM	4.42	6.0	10.62	7.52	7.94	85.7
Euronext (others)	3.76	10.0	21.98	26.40	18.15	80.1
Deutsche B. - Neuer Markt	4.75	8.0	14.85	3.94	5.35	84.9
Deutsche B. (others)	3.36	9.0	33.13	14.47	10.20	85.0
B. Italiana - Nuovo Mercato	4.33	9.0	26.35	2.16	8.53	89.9
B. Italiana (others)	2.14	29.0	133.92	18.97	12.68	71.6
Contin. Europe (excl. NM)	3.36	12.0	30.31	22.44	15.70	80.5
New Markets (Euro.NM)	4.68	8.0	13.56	5.60	7.10	84.9
LSE	2.55	4.5	5.50	9.47	1.46	81.0
Total	3.22	7.0	12.91	13.26	9.76	81.6

<i>Panel B: Offer characteristics</i>	Proceeds (€m)	Participation	Underpricing	Market Sentiment	Hi-tech	Consumer services
LSE - AIM	6.12	0.00	11.48	289	23.8	23.1
LSE - Main Market	50.32	13.14	9.04	242	26.5	31.4
Euronext - NM	11.00	3.73	5.26	300	56.9	56.3
Euronext (others)	4.23	10.00	4.41	300	28.5	37.9
Deutsche B. - Neuer Markt	37.73	6.67	29.03	348	44.5	46.8
Deutsche B. (others)	36.25	11.48	3.45	322	21.8	29.4
B. Italiana - Nuovo Mercato	43.16	2.95	5.62	498	65.0	65.0
B. Italiana (others)	73.98	16.61	2.96	301	6.2	16.3
Contin. Europe (excl. NM)	9.92	10.10	3.90	309	24.1	33.2
New Markets (Euro.NM)	28.37	5.89	19.37	327	50.3	51.5
LSE	8.91	0.00	10.47	279	24.5	25.1
Total	11.81	3.92	9.04	305	28.7	32.1

Notes: Defined in the text and in Table 4. This table reports median values for the entire sample of 3,052 IPOs. Monetary data (source: Datastream) are reported in millions of euros, where UK figures are converted using the daily exchange rate reported for the IPO date (for IPO proceeds) or the average exchange rate over one year prior to the IPO (for sales). The operating risk is measured as the variance of EBIT over the five years prior to the IPO. This variable is calculated on a more limited period for young companies, such as those going public on the AIM, leading to an underestimation of their operating risk. Profitability and M/B are calculated only for those firms with positive pre-IPO book equity. This criterion excludes 246 companies, mainly those going public on the new markets and on the AIM.

In Figure 1 we depict a typical example: the ownership structure of an Italian pyramidal company.

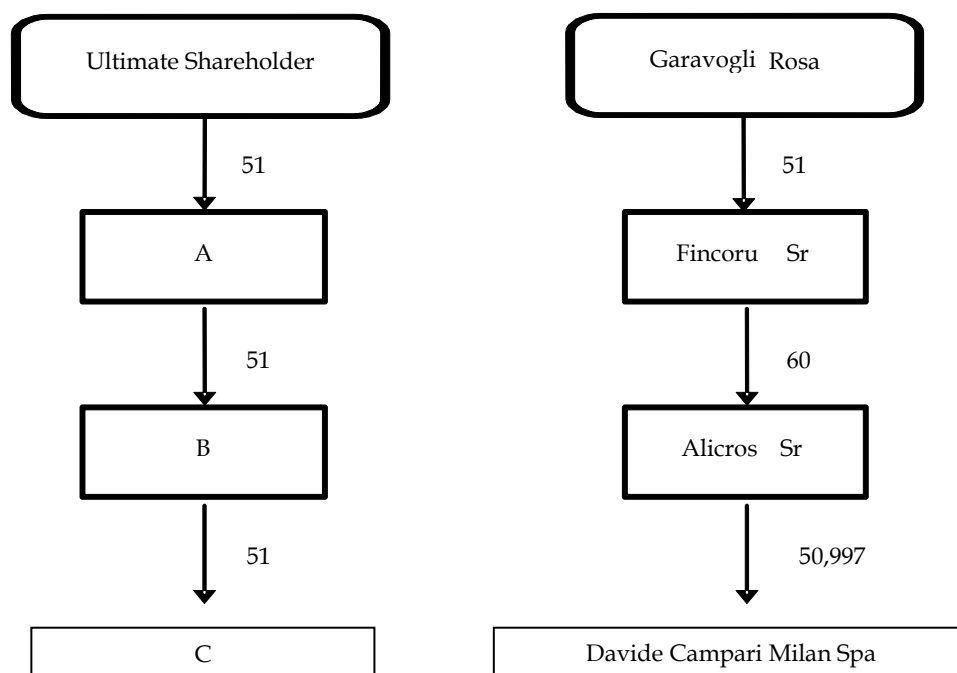
While pyramiding is not the only way to separate ownership and control, we neglect less common mechanisms such as firm-specific voting caps, golden shares and informal alliances (i.e., voting blocs), and transfer restrictions on shares. While a dual share structure is widely used in Europe, in most countries companies do not issue non-voting shares before being listed. For instance, in Italy only listed companies are allowed to issue shares with limited voting rights (law 216/1974

and articles 145-147 of the law 58/1998). Furthermore, such shares must grant higher dividends. Thus, the two-class share structure is not relevant to IPO valuation in Italy.

To represent the ultimate shareholder's identity, we introduce the following set of dummy variables⁴:

1. Family: the ultimate shareholder is an individual, a family, or a firm that is unlisted on any stock exchange.
2. Widely-held financial institution: the ultimate shareholder is a financial firm (SIC 6000-6999) that is widely held at the control threshold.
3. Widely-held corporation: the ultimate controlling shareholder is a non-financial firm that is widely held at the control threshold.
4. State: the control chain is headed by a national government (domestic or foreign), local authority (county, municipality, etc.), or government agency.

Figure I



Notes: On the left side, a theoretical pyramidal structure. On the right side, As a typical example of real pyramidal structure, we report the ownership chain, at the time of the IPO, of Davide Campari Milan Spa. The ultimate shareholder (the Geravoglia Family), holds control through a 51% ownership share in Fincorus Srl, controlling Alicross Srl with a 60% share, controlling Davide Campari Milano SpA with a 51% share.

Table 3 provides descriptive statistics on the frequency of pyramidal ownership and the nature of the ultimate shareholder in two samples of pyramidal firms. In this section, the analysis is limited to cases where detailed information on the ownership structure is available. To create the first sample, we matched our EURIPO dataset with the Faccio and Lang (2002) ownership dataset, identifying a sample of 213 IPOs. Only 144 of these companies are included in the following empirical analysis, however, due to missing information. We also hand-collected data on all Italian IPOs between 1995 and 2006, obtaining a complete and independent sample of 169 companies. In all four countries, it is rare for pyramids to be controlled by widely held non-financial companies (0.82%). The differences between countries are not to be generalized, as the samples are small.

⁴ A few very uncommon cases are dropped, so this set of dummies does not constitute a complete partition of the sample.

Nevertheless, it is evident that financial institutions play a greater ownership role in the UK than in Continental Europe.

Italy is a good example of a market rich in pyramidal structures. Panel B provides statistics on the set of Italian IPOs. More than half of the firms are involved in a pyramidal structure, and families or privately owned firms are most often the ultimate shareholders.

Table 3
Descriptive Statistics of the “Pyramidal structure” and “Ultimate shareholder identity”

<i>Panel A: European sample</i>	n.	Pyramids	Ultimate ownership				
			Family	Widely Held Fin. Inst.	Widely Held Co.	State	Other
LSE - AIM	30	26.67	23.89	23.81	0.00	1.73	50.58
LSE - Main Market	102	21.57	23.10	22.18	1.72	0.57	52.43
Euronext - NM	1	100.00	0.00	0.00	0.00	0.00	100.00
Euronext (others)	39	10.26	29.57	13.33	0.00	4.57	52.52
Deutsche B. - Neuer Markt	11	27.27	24.24	36.36	0.00	0.00	39.39
Deutsche B. (others)	11	0.00	24.24	13.18	0.00	10.91	51.67
B. Italiana - Nuovo Mercato	0						
B. Italiana (others)	19	5.26	13.16	21.05	0.00	5.26	60.53
Contin. Europe (excl. NM)	69	7.25	24.20	15.43	0.00	5.77	54.59
New Markets (Euro.NM)	12	33.33	22.22	33.33	0.00	0.00	44.44
LSE	132	22.73	23.28	22.55	1.33	0.83	52.01
Total	213	18.31	23.52	20.85	0.82	2.39	52.42

<i>Panel B: Italian population</i>	n.	Pyramids	Ultimate ownership				
			Family	Widely Held Fin. Inst.	Widely Held Co.	State	Other
B. Italiana - Nuovo Mercato	40	55.00	84.50	3.83	2.50	0.00	9.17
B. Italiana (others)	129	56.59	59.69	4.52	1.04	12.40	22.35
Total	169	56.21	65.56	4.36	1.38	9.47	19.23

Notes: all data are percentages. Dummies employed in the regression analysis. Ultimate ownership is classified according to the criterion of Faccio and Lang (2002). “Other” refers to firms controlled by unlisted companies and miscellaneous cases. Panel A reports on the sample of EURIPO companies also appearing in the Faccio and Lang (2002) ownership dataset (213 observations, 144 of which were used in analysis). Panel B reports on the complete sample of Italian IPOs between 1995 and 2006 (169 observations).

3.4 Methodology and variable definition

Theoretically, the market values of companies differ from their book values by the present value of their future abnormal earnings. The market-to-book ratio (henceforth M/B) therefore reflects the investors’ assessment of future abnormal profits. In other words, M/B is the difference between the expected return on equity and the cost of equity. This ratio is of particular interest, as the spread between “value” stocks (with low M/B) and “growth” stocks (with high M/B) is statistically and economically significant. Several explanations for this market premium have been proposed, but the most likely causes are risk proxy (Fama and French, 1993) and investor overreaction (Lakonishok, Shleifer, Vishny, 1994).

The first idea states that growth stocks require a higher return because they are riskier. The second posits that investor expectations are based on an extrapolation of recent performance.

A high M/B ratio may also indicate valuable intangible assets that are not entirely reflected in the company’s financial statements. Financial accounting does not attempt to value a firm in its entirety; it records only the amounts of severable assets in accordance with current legislation. On

the other hand, the market value of a company is also affected by a number of external variables such as the degree of competition in the industry (monopoly power, deregulation) and investor sentiment (for instance, consider public opinion on the New Markets in the aftermath of the dot-com bubble). In this paper we take the M/B ratio as a proxy for valuation, and hereafter the terms are used interchangeably. We wish to know whether the dummy variables defined above influence M/B, the value accruing to IPO companies directly from the market⁵. All estimations are OLS regressions. The first step of our empirical analysis is a regression on the determinants of IPO M/B values, drawing on the existing literature. Note that any correlations observed between valuation and ownership structure dummies might not reflect causal relationships, but instead emerge from correlations between the latter and other measures of firm quality. While the possibility of unknown factors is always an issue, we control for a large number of characteristics related to firm quality. A detailed list of control variables and their definitions is provided in Table 4.

Table 4
Variable definitions

Variables	Definition
Market-to-book	Ratio between the market value of the company at the IPO (first-day price times number of shares after the issue) and the post-listing equity book value (pre-IPO book value plus capital inflow at the IPO)
Firm Age	Years between the firm's initial incorporation and the time of the IPO
Firm Size	Sales (€m) (natural logarithm in the regressions)
Offer Size	Offer price times number of shares offered (€m) (natural logarithm in the regressions)
Underpricing	Difference between the first-day closing price and the final offer price, scaled by the final offer price (%)
Participation Ratio	Percentage of the IPO offering composed of existing shares
Leverage	Ratio between long-term debt and equity
Profitability	Net earnings over book value of equity
Operating Risk	The variance of EBIT over five years prior to the IPO, estimated as $\left\{ \frac{1}{n} \cdot \sum_{i=-n}^{-1} \left[\frac{EBIT_i - \overline{EBIT}}{\overline{EBIT}} \right]^2 \right\}^{1/2}$, where n is $\min(\text{age}, 5)$;
New Markets (Euro.NM)	Dummy variable equal to 1 if the firm goes public on a "new" stock market belonging to the Euro.NM association
Internet Bubble	Dummy variable equal to 1 if the firm goes public in the period 1998-2000
Hi-tech	Dummy variable equal to 1 if the company operates in a high-tech sector
Consumer Services	Dummy variable equal to 1 if the company operates in a consumer services sector
Pyramids	Dummy variable equal to 1 when the controlling shareholder owns one corporation through another which he does not totally own. We set a 10% threshold to define a controlling stake.
Family	Dummy variable equal to 1 when the ultimate shareholder is an individual, a family, or a firm that is not listed on any stock exchange
Widely held financial inst.	Dummy variable equal to 1 when the ultimate controlling shareholder is a financial firm (SIC 6000-6999) that is widely held at the control threshold
Widely held corporations	Dummy variable equal to 1 when the ultimate controlling shareholder is a non-financial firm that is widely held at the control threshold
State	Dummy variable equal to 1 when a national government (domestic or foreign), local authority (county, municipality, etc.) or government agency is the controlling shareholder

Notes: All variables were measured at the time of the IPO. Accounting data are hand-collected from IPO prospectuses.

⁵ To calculate the market-to-book ratio of equity, market capitalization on the first day of trade is divided by the sum of the primary offering proceeds and the book values of equity from the last pre-IPO financial statement. As in previous studies (e.g. Kim and Ritter, 1999), market-to-book values (the dependent variable in this study) are constrained to be non-negative and no greater than 10.

To establish a baseline, this first regression employs the broader dataset of European IPOs between 1995 to 2006. The baseline regression represents all 1,406 EURIPO observations for which full information is available.

Second, we focus on the two samples containing ownership information (see Table 3): a set of 144 firms that are also included in the Faccio and Lang (2002) dataset, and the complete set of 169 Italian IPOs between 1995 and 2006. For both samples, we begin by regressing M/B on the control variables as in the baseline model. Then we estimate a model including the “Pyramid structure” dummy. Finally, we estimate a model including the “Pyramid structure” dummy and all four dummies for the ultimate shareholder identity.

4. Econometric Results

Table 5 describes a set of four baseline regressions with different determinants. All estimations employ the same sample of 1,406 observations (except for Model 3, which only uses 505 companies), IPOs occurring between 1995 and 2006 inclusive in the UK, Italy, Germany or the Euronext Countries. Model (1) includes only the essential set of regressors: firm age, firm size, offer size, underpricing, and participation. All baseline regressions also include the “New market” and “Internet bubble” dummies to control for the effects of market segmentation and the extraordinary evaluation of IPOs between 1999 and 2000. The results generally align with our expectations: the coefficients on firm age, firm size, and offer size are all negative and significant, while the underpricing and participation coefficients are both positive and significant. The marginal effects of listing in a high-tech market or during the internet bubble are also positive and significant.

Table 5
Baseline Regressions

Model	(1)	(2)	(3)	(4)
Variables	Coefficient	Coefficient	Coefficient	Coefficient
Constant	8.568***	7.446***	12.148***	8.141***
Firm Age	-0.012***	-0.010***	-0.010*	-0.011***
Firm Size	-0.140	-0.027	-0.170***	-0.008
Offer Size	-0.270***	-0.261***	-0.343***	-0.267***
Underpricing	0.011***	0.011***	0.011***	0.011***
Participation Ratio	0.023***	0.024***	0.024***	0.023***
New Markets (Euro.NM)	0.555**	0.322	-0.309	0.330
Internet Bubble	0.768***		1.503***	0.732***
Year dummies		Yes		
Leverage			0.002***	
Profitability			0.008***	
Operating Risk			-0.003***	
High-tech				0.425**
Consumer Services				0.510***
R ²	0.188	0.210	0.330	0.210
n. obs.	1,406	1,406	550	1,406

Notes: All estimations are obtained through OLS regressions of the market-to-book value in the 1,406 companies (550 in model 3) that held IPO operations between 1995 and 2006 in the UK, Italy, Germany or Euronext countries. Model (1) describes M/B as a function of firm determinants, offer determinants, and two dummies taking into account the effects of the internet bubble and listing on the New Markets. Model (2) replaces the internet bubble dummy with yearly dummies. Model (3) adds leverage, operating performance and risk to the first model (856 observations lacking these data were dropped). Model (4) adds dummies for specific industries where the market to book values are commonly elevated. The symbols ***, ** and * indicate statistical significance at the 1, 5 and 10% levels respectively.

Model (2) replaces the “Internet bubble” dummy with dummies for each year in the sample. Most of the results are unaffected, but the coefficients on firm size and the high-tech market dummy lose some significance. Model (3) controls for the effects of profitability, financial risk (leverage), and

operating risk. The coefficients on profitability and operating risk are positive and negative respectively, as expected. Interestingly, the leverage coefficient is *positive* and significant⁶. Model (4) adds two dummies to control for the relevance of specific industries characterized by high M/B ratios: high-tech firms and consumer services. Both dummies are significant. All variables introduced in Model (1) retain their sign and significance throughout all four specifications, with the exception of the “New market” dummy. While the prior literature generally finds that listing in a New Market has a positive effect on IPO valuation, we argue that this effect is lost when we control for firm profitability and risk or specific industry effects.

Table 6 reports OLS estimations for the sample of 144 European companies whose complete ownership information appears in the Faccio and Lang (2002) database. This sample contains IPO operations occurring between 1995 and 1998 in the UK, Italy, Germany and the Euronext Countries.

Model (1) includes firm age and size, offer size and structure, underpricing, the “New market” dummy and four year dummies (the “Internet bubble” dummy cannot be used because the sample duration is too short). This estimation is inefficient compared to the results of Table 5 due to the small size of the sample, but most coefficients are consistent with the baseline model. The most remarkable difference is the effect of firm size, here positive but insignificant. Model (2) adds a dummy variable for firms involved in a pyramid. Its coefficient is positive and significant, *opposing* the hypothesis that this ownership framework leads investors to expect a higher level of expropriation.

Table 6
Regressions with Ownership Variables

Model	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Constant	1.708	0.409	0.670	0.246	0.203	-1.189
Firm Age	-0.012*	-0.013*	-0.013*	-0.018***	-0.017***	-0.016***
Firm Size	0.194	0.247**	0.290**	-0.318***	-0.310***	-0.330***
Offer Size	-0.107	-0.096	-0.154	0.445***	0.432***	0.536***
Underpricing	0.007**	0.006*	0.006*	0.035***	0.036***	0.039***
Participation Ratio	0.004	0.003	0.002	0.035***	0.037**	0.043***
New Markets (Euro.NM)	1.835	1.703	1.707	-0.311	-0.254	-0.379
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Pyramids		1.349**	1.547**		0.333	0.167
Family			0.003			0.003
Widely held financial inst.			-0.004			-0.012
Widely held corporations			0.002			-0.012
State			-0.019			-0.011*
R ²	0.185	0.214	0.222	0.534	0.538	0.579
n. obs.	144	144	144	169	169	169

Notes: Models (1) to (3) are obtained for a sample of 144 companies holding IPO operations between 1995 and 1998 in the UK, Italy, Germany or Euronext countries and included in the Faccio and Lang (2002) database. (Some observations with missing information were dropped from the original sample of 213 firms.) Models 4 to 6 describe the population of all 169 companies that went public through an IPO during the period 1995 to 2006 in Italy. Models (1) and (4) are baseline regression similar to the models of Table 5, expect that year dummies are used instead of the “Internet bubble” dummy. Models (2) and (4) add dummies for the presence of a dual-class capital structure and pyramidal ownership. Models (3) and (6) test the effect of specific types of controlling shareholders: families, widely held financial institutions, widely held corporations, and the State. The symbols ***, ** and * represent statistical significance at the 1, 5 and 10% levels respectively.

⁶ This result definitively deserves further investigation. Nevertheless, we drop accounting variables from our investigation of the ownership effect due to the limited availability of observations with full ownership information. Also, including accounting variables would raise difficulties in homogenizing data from firms belonging to different countries.

Model (3) includes a set of dummies to test whether the identity of the ultimate shareholder has an impact on the M/B ratio of IPOs. Although none of the dummies are significant, it is interesting that the family and widely-held corporation dummies have positive coefficients, while the widely-held financial institution and state dummies have negative coefficients. Models (4), (5), and (6) are identical in structure to Models (1), (2) and (3), but describe the complete sample of 169 Italian IPOs between 1995 and 2006. Model (4) is quite similar to Model (1) for the European sample except that offer size is now significant⁷. In Model (5) the “Pyramiding” dummy has a positive coefficient, but this effect is not statistically significant as it was in the European sample. In Model (6) only the “Family” coefficient is positive, unlike Model (3), but the “State” coefficient is negative and statistically significant.

Some differences between the two regression models linking ownership structure to firm valuation deserve further discussion.

First, the dummy variable identifying pyramidal ownership has a positive effect on valuation in both samples, but this effect is not significant among Italian firms. Some country-specific effect is definitely at work. A possible and intriguing explanation is that pyramidal affiliation has a positive effect on minority shareholder protection. In fact, a number of contributions in the recent literature assert that minority protection has been a problem in Italy over the last decade, notwithstanding recent improvements (Dyck and Zingales, 2004; Melis, 2005; Meoli et al., 2008). Therefore, the positive relationship between pyramidal affiliation and firm valuation may hold only when minority protection is good.

Second, while state ownership has a negative effect in both samples, this effect is statistically significant only in the Italian sample. It would be interesting to test whether the political turbulence experienced in Italy over the last decade is a determinant of the stronger negative effect. Further empirical evidence is needed to confirm both of these intuitions.

5. Conclusions

This paper investigates the determinants of IPO valuation among European firms, with a particular focus on the role of ownership structure. Complex pyramidal structures, quite common in continental Europe, are often correlated with high managerial agency costs, larger private control benefits, lower protection of minority shareholders, and an underdeveloped market for corporate control.

Our analysis draws on a complete sample of 3,052 non-financial firms that conducted IPOs between 1995 and 2006 on the stock markets of the four largest European economies. From this dataset, we create two reduced samples with ownership information: the 144 firms included in the Faccio and Lang (2002) dataset, and the entire population of 169 Italian IPOs between 1995 and 2006. We find that the market-to-book ratio at the IPO varies across markets, with firms listing on the New Markets dedicated to high-tech companies having the highest median value. The initial market valuation is positively influenced by underpricing and participation by existing shareholders, while firm age, firm size and offer size all have a negative impact. Market values at the time of valuation are also higher among firms that listed during the internet bubble. The well-known positive effect of companies listing on technological market is also significant, but not robust in specifications including accounting determinants or checking for industry effects.

OLS regressions of the ownership samples show that firms included in pyramidal groups are valued more highly by the market than other firms. This result is significant in the cross-section of European IPOs included in the Faccio and Lang dataset, but not statistically confirmed in the Italian IPOs. While Morck (2009) asserts that pyramids play a positive role in rapidly developing countries by substituting for efficient market institutions, this paper presents the first evidence that pyramids maintain this positive function in continental European countries. After analyzing the effect of the

⁷ The offer sizes of Italian IPOs are quite different from those of European IPOs, as reported in Table 2, Panel B. This might be one reason why the estimated coefficient differs. This result deserves further investigation when a larger dataset is available.

ultimate shareholder identity, we find only one significant result: state ownership is detrimental to firm value in the Italian sample.

Hence, we conclude that European IPOs are affected by the existence of a differentiated ownership structure. Our results have low significance levels, so should not be generalized. Future research will investigate wider and more homogeneous samples.

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