The Impact of Ownership Retention on Ipo Firm Value
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Abstract

This paper studies whether retained ownership affects the value of the initial public offerings (IPOs) in Turkey, an emerging market. The findings show that the coefficient corresponding to the ownership retention signal is positive for a sample 67 IPOs that listed on Istanbul Stock Exchange (ISE) between 2000 and 2010 (inclusive) implying that initial valuation increases with ownership retention signal at IPO stage. The study further suggests that primary share issuing is a stronger signal on firm value and again it affects IPO firm value positively.

Introduction

As Mello and Parsons (1998) state, going public is a strategic decision and it is crucial to allocate the shares to be sold keeping the final ownership structure in mind. At IPOs, most of the investors buy small stocks and stay passive in firm management while some others buy large block of shares considering control issues (Mikkelson and Ruback, 1985; Shleifer and Vishny, 1986; Barclay and Holderness, 1989). After evaluating various methods of sale, Mello and Parson's suggestion is to design the sale of the new shares such that dispersed holdings are sold to small and passive investors while controlling blocks are kept for the sale to the active investors. This strategy of positive discrimination for the active investors is said to maximize the market value of the firm for all the shareholders. However, these active investors can use their controlling power for their own interests, so the seller can raise the price of these controlling blocks. That's why the writers conclude that the value of the IPO firm which depends on the controlling blocks offered at a discount or premium price is related to the relative significance of the public and private benefits of the controlling blocks. These same benefits make the managers prefer stay private rather than allow investors to limit their power. Here, emerges the agency conflict between managers and investors in IPOs which was also stated by Pagano & Roell (1998). However, since the firms may not be wholly owned by the founders in the pre-IPO period, agency problems may exist before the IPO process, too (Ang, Cole and Wuh Lin, 2000). This pre-IPO structure may influence the IPO firm value. Pagano and Roell (1998) suggest a less dispersed share ownership structure as a remedy for the agency problem. The shareholders with larger stakes in the company should have greater role in decision making since they partially internalize the benefits from their monitoring effort.

There are three main theoretical papers evaluating the relationship between ownership retention and firm value. With their alignment-of-interest hypothesis, Jensen and Meckling (1976) proposed that the ownership structure of IPO companies is the key to manage the agency costs. Leland and Pyle (1977) came up with an explanation of the signalling hypothesis for the positive impact of ownership retention on value. Contradicting these two papers, Fama and Jensen's (1983) entrenchment hypothesis put evidence supporting the negative relation between high ownership levels and firm value.

This paper is a study on the retained ownership in the post-IPO stage and its effects on reducing the agency costs in Turkish IPOs, a civil law country where the main source of financing is banks, and where the capital markets are still developing. Even though the number of traded companies has increased from 80 at the end of 1986 to 370 in 2010, the market capitalization is around 38% of the GDP in 2010, still below developed countries average of 82%; but far above its level of 24% in 2001. However, Turkish

capital market is still developing and the average market cap/ GDP is 28% between 2001 and 2009. Yet, the number of firms traded is more or less at the same level since the end of 2000. Within these market conditions, this study will investigate the effect of ownership retention on IPO firm value decomposing the retention variable into primary and secondary share sale. The sample consists of 67 IPOs on ISE during the years 2000 – 2010. The main contribution of the paper to the literature is that it provides a recent test of the principal- agent theory of Jensen and Meckling (1976) involving data on Turkish stock market. Using basic Leland and Pyle (1977) regression model, the relationship between retained ownership and the firm value at the time of the IPO is especially examined. Another concern of this study is the impact of the source of issue on firm value.

Related studies

1- *Ownership retention in IPO firms*

Previous literature has majorly investigated three potential value drivers for IPOs: firm and issue attributes (i.e. stake retained by pre-IPO owners, the age at the IPO), financial fundamentals (i.e. sales, earnings, and research and development expenditures) and non-financial information (i.e. patents or alliance agreements) (Guo, Lev and Zhou, 2005). Among those, there are studies dating back to Berle and Means (1932) which analyze the corporate ownership structure and firm value relation. The main focus of these studies is the conflict of interest between managers and shareholders (Baumol ,1959; Jensen & Meckling ,1976). They are based on the assumption of dispersed ownership structure. The ownership structure is important in the sense that the attitude of pre-IPO owners towards internal control and the change in ownership structure may affect IPO firm value. According to the agency hypothesis (alignment-of interest hypothesis), higher ownership retention by managers reduces their incentives to undertake non-value maximizing projects (Jensen and Meckling, 1976). Due to a reduction of agency costs, this hypothesis predicts that firm value increases as management ownership rises. Following Jensen and Meckling (1976), Beatty and Zajac, (1994) and Mikkelson et al., (1997) suggested that the executives and outside shareholders have more conflict of interest when executives' stakes decrease, which is associated with inferior performance. On the contrary, by retaining equity, executive directors signal higher value for the firm to outside investors.

Leland and Pyle (1977) state that a manager owning shares of a company is unintentionally signalling that the firm has a high value (signalling hypothesis). Since the founders of the company know more about the future cash flows of the firm than the outside investors, retention of shares acts like a signal of firm's good quality. Also, the existing shareholders forgo the benefits of diversifying their portfolios. The pre-IPO owners are believed to retain share only if they are optimistic about the firm's future cash flows. This assumption on the existence of private information for the advantage of the shareholders suggests a positive relation between equity retention and IPO firm value. Downes and Heinkel (1982) testing Leland and Pyle's (1977) univariate signalling model, worked on a sample of 297 U.S. IPO firms. They found that initial market valuation is increasing with an increase in the percentage of ownership retained by the entrepreneur. Ritter (1984) also suggested a positive relationship between retained ownership and firm value but he pointed out that this could also be the result of wealth or agency effect rather than signalling. Hughes (1986) studied a sample of 464 U.S. firms and tested Leland and Pyle's work. Hughes, just as Datar et al. (1991) did, suggested that managers send various signals to investors about firm value. These signals can be used independently or jointly. When there are multiple signals, one reinforces the other. So, the impact of the combined effect of the signals on firm value is expected to be positive (Li and McConomy,2004). Koh *et al.* (1991), studying Singaporean IPOs, Keasey and McGuinness (1992),

studying British IPOs and Keasey and Short (1997) provide evidence supporting the signalling hypothesis. Similarly, in a recent study by Clarkson et al. (1991), it is suggested that initial valuation increases with ownership retention signal. According to Michaely and Shaw(1994), to reduce the agency costs, IPO firms seek signalling mechanisms to convey the message that they are costly to imitate for low quality firms. These signals may also be associated with corporate governance characteristics of IPO firms. Especially, retained share ownership is considered as a sign of a good quality firm (Certo et al., 2001; McBain and Krause, 1989). According to the studies on the signalling effect of ownership retention, the pre-IPO owners of the high quality firms try to retain shares in the IPO process since they want to make up for their loss from underpricing by a wealth gain coming from the retained shares. So, retained ownership acts as a signal to communicate private favorable information to investors, and, this signalling may allow less underpricing (Espenlaub and Tonks, 1998). Although there are papers pointing out a negative relation between firm value and founder existence in management (Charan ,1984; Daily and Dalton ,1992; Mintzberg and Quinn ,1991); Vesper (1996), Finkelstein and Hambrick (1996) and Kunze (1990) mentioned that at the IPO stage where uncertainty is high, when the founders have active role in management or ownership, this may act as a stability signal to the investors increasing firm value. Keasey and MCGuiness (2008) had an interesting contribution to the signalling hypothesis literature in the sense that they decomposed the retained equity variable into two parts reflecting the effects the primary and secondary share sales. They investigated the source of issue and firm value relation. The issue source can be capital increase, sale of existing shares or both. It defines how the proceeds will be used; either for the company use or for the shareholders' own use. When it is used by the shareholders, it may not be reverted back to the company so it may be a negative signal for firm value. However, if the source of shares is capital increase, the proceeds is assumed to be used to finance positive NPV projects for the firm growth. That's why investors prefer capital increase firms.

An alternative explanation for the positive relationship between ownership retention and firm value may be from an economical perspective. According to Ofek and Richardson (2008), under the assumption of downward sloping demand curves for shares and high retention rates implying fewer shares available for trading, shares act like a scarce commodity and their price increases.

Other findings from different studies do not suggest a positive relationship between IPO firm value and retained equity. Fama & Jensen (1983) provide evidence for both positive and negative influence of management ownership on IPO firm value. In their entrenchment hypothesis**,** the main reasoning for the negative effect is that in the existence of high information asymmetry, managers may pursue private benefits. Similarly, Bebchuk (1999) studies the choice between the concentrated and dispersed ownership of corporate shares and votes at the IPO stage. When private benefits of control are large, the initial owners are reluctant to leave the control. So, high levels of management ownership may result in entrenchment since it is now difficult to control managerial actions. In this case, maintaining a lock on control can enable the founders of the company to increase the fraction of surplus that they would be able to capture in a surplus creating transfer of control. Likewise, Krinsky and Rotenberg (1989 a, b) using a sample of 115 Canadian initial public offerings (IPOs) between 1971 and 1983, suggested that the relationship between entrepreneurial ownership retention and initial valuation of unseasoned common shares may not hold in the Canadian environment.

2- *Ownership retention in IPO firms- emerging markets*

However, most of these studies include U.S. or other developed countries' data. Some recent studies provide evidence for the concentrated ownership both in developed and developing countries (Demsetz ,1983; Shlefier and Vishny, 1986; La Porta et al., 1998, 1999). In developing markets, the number of listed companies on stock exchanges is quite low.Emerging markets are important in IPO valuation and ownership structure analyses in the sense that they have distinct structures like pyramidal ownership structures, poor investor protection and developing markets for corporate control. That's why the agency problems are more severe in these countries. Moreover, these structural issues have effects on valuation (Lins, 2003). Many studies show that other than in U.S. and few other developed countries, the ownership structure of firms is dominated by large shareholders (Shleifer and Vishny, 1997; La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998; La Porta, Lopez-de-Silanes, and Shleifer, 1999; Claessens, Djankov, and Lang, 2000; Denis and McConnell, 2003). These previous studies also provide evidence that concentrated ownership is due to the lack of investor protection. Since they are not protected, owners protect themselves by becoming controllers. Control in excess of proportional ownership is achieved through pyramid structures in which one firm is controlled by another (Lins, (2003), Burkart and Gromb (1997), La Porta et al. (1999), Claessens et al. (2000)). The voting rights exceed cash-flow rights via the pyramid structure (Claessens et al., 2000). This enables the shareholders to effectively monitor the managers to decrease agency conflicts.

Within these pyramidal or network structures, the management group usually consists of the family members and is the largest blockholder of a firm at the top of the pyramid. The overlaps between the top firm's management group and the other firms down the pyramid enable effective control of all the firms in the pyramid. These firms are controlled by controlling shareholders (La Porta, 1999). Burkart et al. (1997) defines pyramidal group as a structure minimizing the dilution of outside shareholdings by a reduction in the ratio of voting rights to cash flow rights. Bebchuck et al. (1999) argue that pyramidal structures aim control of the company through separation of ownership and control rights; nevertheless, they can end up being inefficient.

In his model on ownership and IPO value, Gomes (2000) provides explanation for the benefits using pyramidal and dual-class share structures – mechanisms that increase separation of ownership and control. However, large shareholders may as well act for their own private benefits which cause a conflict of interest between large shareholders and minority shareholders (Dyck & Zingales, 2004). The level of their pursuing those private benefits determines an increase or a decrease in firm value (Holderness, 2003). Only if the large shareholders use their control power for shared benefits, the value of the firm is positively related with the firm value and the level of concentrated ownership (Lemmon & Lins, 2003).

When the company in emerging markets goes public, usually a group of shareholders retain the controlling share of the company (Pegano, 1998). The controlling shareholder generally manages the company. In this case, the conflict of interest is between the controlling shareholder and the minority shareholders, not between managers and the generality of shareholders. On the other hand, La Porta, Lopez-de-Silanes, Shleifer, & Vishny (2002) studied the effect of bonding of management on agency costs by retaining an ownership stake of the IPO firm. They found that retained ownership increases the IPO firm value in the sense that they provide a guarantee that the manager will make decisions considering the goals of the company rather than his own benefits because he can internalize the value effects of his decision about the company through retained ownership. Due to the decreased agency cost, the price the investors are willing to pay for the IPO shares will rise.

3- *Takeover defenses*

The literature on pyramidal ownership structure to keep control over the firm is already mentioned. However, irrespective of pyramiding, managers of a firm can issue and own shares with superior voting rights to keep control of the firm (Zingales, 1994). Companies may choose to adopt takeover defenses that limit minority shareholders' rights. Takeover defenses are mainly used to keep the managers' controlling positions and to maintain their decision-making autonomy. Bebchuk (1999) works also on the decision of the founder of the company to maintain a lock on control at the time of the IPO. This decision depends on the private benefits of control. When these benefits are large, a lock on control by adopting takeover defences at the IPO helps the initial shareholders to get larger surplus from value producing transfers of control. So, he suggests that in countries where private benefits of control are high, IPO firms prefer having controlling shareholders to keep control uncontestable. These takeover defences decrease monitoring and allow managers to pursue private benefits. The results of Bebchuk's study were confirmed by those of Daines and Klausner (2001) and Field and Karpoff (2002). They both show that the reason behind takeover defenses by U.S. IPO firms is managerial entrenchment. However, takeover defenses create agency costs for public firms reducing firm value (Karpoff & Malatesta, , 1989; Jarrel & Poulsen, 1987). Field and Karpoff further state that at public offerings, owners need takeover defenses especially when the compensation is high, shareholdings are small and nonmanagerial shareholder oversight is weak.
Opposing evidence on the effect of takeover defenses came from the work of Cornelli & Goldreich (2001) and Arugaslan et al. (2004). They acknowledged that control issues are not considered by pre-IPO owners in the IPO process and that institutional ownership after the IPOs are driven by only firm size.

4- *Turkey*

Analyzing especially the Turkish case, we observe that most of the listed companies on the Istanbul Stock Exchange (ISE) exhibit concentrated ownership structure and families are dominant shareholders. Also, changes in large shareholdings do not suggest the existence of an active market for share stakes (Yurtoglu, 2000). As Yurtoglu (2000) states, Turkey has strong similarities with an "insider system" of corporate governance which is characterized by few listed companies, large number of substantial share stakes (direct or indirect ownership) and large inter-corporate shareholdings. However, cash flow and voting rights are relatively more aligned compared to other family ownership dominated insider system countries (Demirag & Serter, 2003). In insider system countries, internal controls such as board of directors are more important (Mak & Li, 2001). Turkey has another distinction which is the existence of business groups. Many large corporations are affiliated with each other within a business group and these business groups are organized around a holding company. Leff (1978) defines business groups as a substitute for imperfect markets where they can act as a tool to resist managerialism and help keeping control of the business and the growth. The legal power of control belongs to the board of directors and it can monitor, advice and replace the management team when necessary. Companies have two-tier board system (consisting of management board and supervisory board) where managing executives are represented on the board. The law specifies at least 3 members on the board. At least 1 board member is a member of the controlling family and at least one third of all board members are large shareholders in Turkey (Yurtoglu, 2000). In Turkish companies, other than direct ownership, indirect ownership plays an important role in corporate control (Demirag & Serter, 2003). Informal relations set up among shareholders both through voting agreements and indirect ownership shape the ownership structure of Turkish listed firms. Mainly, the owners of Turkish listed firms are holding companies, families, non-

financial companies, financial companies and foreign companies (Demirag & Serter, 2003). Families, both directly and indirectly, own more than 70% of all traded companies and they have majority control. However, a major advantage of the ownership structure in Turkey is direct monitoring of managers by a small number of large owners (Demirag & Serter, 2003).

In terms of the tools used for takeover defense, the case for Turkey is different. The Turkish Company Law (TCL) does not enforce one-share one-vote principle. Shares assigning a high number of votes to one class of shares (priority shares with A, B, C type of shares) and non-voting shares (preference shares) can be issued. Preferred stocks carry no voting rights and they are associated with preference in assets in the event of liquidation and in dividends. However, this relatively new application of preference shares is not considered for this study.

After all these literature, the first hypothesis of the paper is that within this pyramidal and network ownership structure, retained ownership still reduces the agency costs. In a financial environment where the investors are not strongly protected, retained ownership is high. As a result, we expect the relationship between the price the investors are willing to pay for IPO shares and retained ownership to be high. The second hypothesis is that ownership retention arising from capital increase acts as a signal for firm value and its effect is positive.

Hypothesis 1. Retained ownership acts as a positive signal for IPO firm value
Hypothesis 2. Fraction of ownership retained arising from capital increase is positively related to IPO firm value

Data and Methodology

The original sample of the study consists of 98 IPOs on Istanbul Stock Exchange (ISE) during the period 2000- 2010. Financial companies and real estate investment trusts are excluded because they have quite different characteristics. Introductions (admissions to the stock exchange without offering) and re-admissions are not considered as real IPOs, so they are not included in the study. Five firms which have missing data were also excluded from the sample. After this exclusion, the final sample size is 67 firms. The market prices are collected from ISE and Capital Markets Boards of Turkey (CMB) official web page. Ownership, takeover defense, IPO, firm age data are hand collected from IPO prospectuses and the Yearbook of Companies published by the Documentation Department of the Istanbul Stock Exchange available at ISE database.

In the literature, there are several methods in choosing a proxy for the dependent variable. Firstly, Kim and Ritter (1999) and Purnanandam and Swaminathan (2004), have associated the offer price or first-day closing price per share deflated by earnings per share with firm value. However, using earnings as a deflator eliminates some firms with negative earnings which in return reduces the generalization of the results. This problem is valid for both book value of equity and sales for the same reason. Using any of these variables as deflators cause small denominators and, therefore, nonnormality in the price-to-sales ratio (Aggarwal, 2009). Secondly, offer price per share can be associated with firm value. The offer price is easy to use and interpret since its distribution is close to normal. Also, heteroscedasticity can be reduced by using the shares outstanding as a deflator. But, Aggarwal (2009) finds offer per share as a deficient proxy for value. Finally, following Aggarwal (2009), total offer value was used as a proxy for the dependent variable in this study. Because it is the total IPO value that the investment bankers estimate, it was associated with firm value more strongly than the other variable candidates. Total IPO

offer value is defined as offer price multiplied by the post-IPO shares outstanding. Since, total IPO value data has nonnormality (skewness = 5.3, kurtosis = 32.6) and heteroskedasticity problems, the natural logarithm of the total offer value is taken as the dependent variable. For our dataset, the natural log of total offer value has a skewness of -0.59 and a kurtosis of 3.64.

Following Schultz and Zaman (2001), retained ownership ($\propto$) as the percentage of the total number of shares retained (primary and secondary shares) by the original owners is the independent variable in this study. A larger decrease in percentage of ownership acts as a signal lowering the confidence in the future performance of the firm (Leland and Pyle, 1977). Therefore, a positive relation between ownership retention and IPO value is expected. To study the impact of the source of issue on firm value, the retention variable is decomposed into the capital increase and sale of existing shares parts. IPOs which use both methods are included in both groups. To analyze the separate effects of the sales of primary and secondary shares, $\propto$ is decomposed into $\propto_{CAP}$ and $\propto_{EXIS}$ (Keasey & McGuiness, 2008).

$$\propto = \frac{\text{Total number of outstanding shares after the IPO} - \text{number of primary shares sold} - \text{number of secondary shares sold}}{\text{Total number of outstanding shares after the IPO}} \quad (1)$$

$$\propto = \frac{\text{Number of shares prior to the listing}}{\text{Total number of outstanding shares after the IPO}} - \frac{\text{Number of secondary shares sold}}{\text{Total number of outstanding shares after the IPO}} = \propto_{CAP} - \propto_{EXIS} \quad (2)$$

$\propto_{CAP}$ and $\propto_{EXIS}$ reflect two separate but additive effects enclosed within $\propto$. With this decomposition, the different signalling effects of the primary and secondary share sales were expected to be observed. To illustrate $\propto_{CAP}$ and $\propto_{EXIS}$ distinction, imagine a case where a firm with 800.000 pre-IPO shares will place an IPO with a capital increase of 200.000 and a sale of 200.000 shares of the existing shareholders. In this case, $\propto$ would take a value of 0.60. This number can be separated into the retained equity by the capital increase (0.80) and the sales of shares by the existing shareholders (0.20). In our sample, 36% of the IPOs had their source of issues as both capital increase and sales of existing shareholders. So, we had positive values for $\propto_{CAP}$ and $\propto_{EXIS}$ in these offerings.

The definitions of the variables in the model are presented in Table 1.

Table	1	Description	of	variables

Variables	Description
Dependent Variable	
TV	IPO value – natural logarithm of total offer value. Offer price times the total number of post issue shares
Ownership Variables	
$\propto$	Ownership retention- Fractional retained ownership by all existing shareholders
$\propto_{CAP}$	Fraction of equity retained arising from the capital increase. Equal to the number of pre-IPO shares divided by the total number of shares in issue
$\propto_{EXIS}$	Fraction of equity sold by all of the pre-IPO existing shareholders. Equal to the number of secondary shares sold divided by the total number of shares in issue
Control Variables	
AGE	Age of the firm at the time of the IPO. Equal to the natural logarithm of one plus age
UNDERPRICING	Return on offer to close of the first day price (percentage)
TD	Equal to one if a company has a takeover defense strategy ; zero otherwise
COLD	Market condition. Equal to one if the IPO occurred in 2001, 2002, 2003, 2007, 2008, 2009
HOT	Market condition. Equal to one if the IPO occurred in 2000, 2006, 2010

Table2 reports the correlations of the variables. None of the variables are significantly correlated so multicollinearity is not a serious concern for OLS estimation of the regression. The highest correlation is between the two market condition variables, HOT and COLD. Both in Panel A and Panel B, the correlation between value and underpricing is positive. This result contradicts with the arguments of Rock (1986) and Koh and Walter (1989). Their winner's curse hypothesis states that underpricing arises to compensate for the uninformed investors for the adverse selection problem they face. Since adverse selection problems will be higher in the case of an information asymmetry, *ceteris paribus*, IPOs that are more subject to depressed valuation due to information asymmetry will show higher underpricing. Also, the correlation between underpricing and ownership retention is not negative in this study contradicting Baron' study (1982). He suggested that relation between underpricing and the retained ownership is negative because an investment banker could use underpricing as a way to reduce marketing effort (Baron, 1982). In PaneB, we observe that the correlation between $\propto_{CAP}$ and $\propto_{EXIS}$ is relatively high.

Table 2 Correlations

	PANEL A: Single ownership retention variable model (Equation 3)						
∝	TV		AGE	UNDERPRICING	COLD	HOT	TD
TV	1						
	0.158	1					
AGE	0.074	0.064	1				
UNDERPRICING	0.038	0.191	0.041	1			
COLD	0.218	0.086	-0.020	-0.130	1		
HOT	-0.130	0.213	0.161	0.197	-0.564	1	
TD	-0.087	0.018	0.234	0.169	-0.417	0.193	1

	PANEL B: Two seperate ownership retention variables (Equation 4)							
	TV	CAP	EXIS	AGE	COLD	HOT	UNDERPRICING	TD
TV	1							
CAP	0.484	1						
EXIS	0.393	0.670	1					
AGE	0.074	0.034	-0.018	1				
COLD	0.218	0.039	-0.026	-0.020	1			
HOT	-0.130	-0.112	-0.304	0.161	-0.564	1		
UNDERPRICING	0.038	0.221	0.075	0.041	-0.130	0.197	1	
TD	-0.087	0.063	0.053	0.234	-0.417	0.193	0.169	1

Table 3 Descriptive statistics

	Mean	Median	Maximum	Minimum	Std. Dev.
TOTAL OFFER VALUE (TL)	724,000,000	110,000,000	16,100,000,000	10,637,742	2,360,000,000
MARKET CAPITALIZATION (TL)	746,000,000	102,000,000	16,200,000,000	9,660,220	2,400,000,000
PROCEEDS (TL)	124,000,000	22,759,000	2,420,000,000	1,900,000	338,000,000
RETENTION ( )	76.6%	75.0%	95.0%	57.0%	9.1%
_CAP	85.6%	85.0%	100.0%	59.0%	11.5%
_EXIS	9.0%	5.0%	43.0%	0.0%	10.8%
AGE	17	13	50	1	11
UNDERPRICING	3.6%	2.0%	24.0%	-18.0%	10.3%

As indicated in Table 3, the sample has a broad base in terms of total offer value, total post-issue market value, IPO proceeds, retention, age (as measured by operating history), and underpricing. As stated before total offer value is calculated as the offer price times the number of post-IPO outstanding shares. The average offer value is 724 million TL for the sample. The average ownership retention is 76.6 %. Concerning IPO data, the market capitalization is calculated as the number of post-IPO outstanding shares times the closing price of the first trading day. The median market capitalization of the first trade day is 746 million TL, with a minimum of 9.7 million TL and a maximum of 16.2 billion TL. IPO proceeds is computed as the number of shared sold in the IPO times the offer price. In our sample, the median IPO proceeds is 124 million TL. The ages of the firms ranges from 1 to 50, with 17 years being the median. Underpricing is measured as the ratio of the first day closing price to the offer price. In this case, underpricing is 3.6% on average.

To examine the value relevance of ownership retention signal, a simplified version of the Lyland and Pyle model is used. Heteroscedasticity was corrected by using White's (1980) heteroscedasticity-consistent estimation of the variance- covariance matrix for the standard errors of the residuals in the equation. The model is set as:

$$Firm\ Value = \beta_0 + \beta_1 \propto + \gamma\ control\ variables \tag{3}$$

$$Firm\ Value = \beta_0 + \beta_{1a} \propto_{CAP} + \beta_{1b} \propto_{EXIS} + \gamma\ control\ variables \qquad (4)$$

Control variables (age, underpricing, existence of takeover defence and market conditions) were used to check for the effects on the firm value not captured by the ownership variables. Their coefficients are associated with their incremental effect on firm value. Following the work of Ibbotson (1975) and Meoli et al. (2008), *UNDERPRICING* is positively associated with firm value. Similarly, experience (*AGE*) is expected to be positively related to the firm value. We know from previous researches that older firms financially outperform younger firms in the pre and post-IPO period (Ritter, 1998). Firm age was operationalized as the natural log of one plus the difference between the firm's founding date and its IPO date. Market conditions is another control variable for the study. IPOs that have occurred in periods where the number of IPOs and the proceeds are higher relative to the average values are considered to have occurred in *HOT* market conditions. For this study the years 2000,2006 and 2010 carry *HOT* market characteristics while the years 2001, 2002, 2003, 2007, 2008, 2009 carry *COLD* market characteristics. The rest of the time periods are considered as neutral. Just like the market conditions, the *TAKEOVER DEFENSE* (TD) strategy will be included in the regression as a dummy. The measure of the takeover defense is taken as the existence of more than one type of stocks (A, B, C type).

Empirical results and discussions

Linearity for both equations is confirmed and the results of the OLS regression and the coefficients on the variables are summarized in Table 4. Though not significant, the results of the regression provide support for the signalling argument in Leland and Pyle (1977) controlling for age, underpricing, market conditions and takeover defense. This result suggests that the agency problems are reduced when pre-IPO owners are willing to retain a larger share in the IPO stage. As a result, the study suggests that higher retained earnings cause higher firm value. However, only the retention variable for the capital increase which is positively related to firm value is significant at 5% level in equation 4. We can infer that, together with the positive effect of the primary and secondary share sales on firm value, there is increased significance for the retention once it is separated from the effects of secondary share sales.

Table 4
OLS regressions of Firm value proxied by Total offer value against explanatory variables (Equations 3 and 4)

$$TV = \beta_0 + \beta_1 \propto + \beta_2 UNDERPRICING + \beta_3 AGE + \beta_4 TD + \beta_5 HOT + \beta_6 COLD \qquad \text{Eq. 3}$$

$$TV = \beta_0 + \beta_{1a} \propto_{CAP} + \beta_{1b} \propto_{EXIS} + \beta_2 UNDERPRICING + \beta_3 AGE + \beta_4 TD + \beta_5 HOT + \qquad \text{Eq. 4}$$
$$\beta_6 COLD$$

	Eq. (3)	Eq. (4)
	Coefficient	**Coefficient**
	t statistic	*t statistic*
Intercept	**16.370**	**13.419**
	9.056 *	*6.669* *
$\propto$	**2.680**	**-**
	1.109	
$\propto_{CAP}$	**-**	**5.061**
		2.027 *
$\propto_{EXIS}$	**-**	**2.937**
		1.228
Control variables		
UNDERPRICING	**0.762**	**-0.680**
	0.441	*-0.445*
AGE	**0.210**	**0.145**
	0.949	*0.640*
TD	**-0.142**	**-0.154**
	-0.235	*-0.276*
HOT	**-0.355**	**0.439**
	-0.848	*1.071*
COLD	**0.724**	**1.320**
	0.622	*1.297*
R^2	0.079	0.301

Numbers in bold indicate the estimated coefficients on variables for a particular regression
Numbers in italics indicate the calculated t-statistic for the estimated coefficients
* indicates that the t-statistic is significant at the 5% level for a one-tailed test.

The control variables do not receive significant support but are mostly signed as expected. AGE has positive coefficients in both models, as expected. In equation 3, UNDERPRICING has a positive sign suggesting higher firm value for the firms that have higher underpricing. The relation is negative in equation 4. HOT variable proxying for market conditions have ambiguous results with a negative coefficient in equation 3 and a positive coefficient in equation 4. Although it turned out to be an insignificant explanatory variable, COLD market conditions have positive coefficients in both equations. Analyzing further the outcome from the control variables, we see that there is a negative but insignificant relation between a dummy indicating the use of a takeover defense strategy and IPO firm value. This result is aligned with the previous literature suggesting increasing agency costs with a takeover defense, indicating a lower IPO firm value.

Robustness checks

As McConnell & Servaes (1999) studied, the non-linear effects of α were further investigated. In this model, the square of ownership retention was related to the IPO firm value. A negative coefficient would indicate entrenchment at higher levels of ownership (McConnell & Servaes, 1999). However, in this sample, this kind of a negative relation is not observed. Despite being insignificant, the relation between the squared retention variable and total offer value is still positive. This result may be due to the high retention levels in Turkish IPO market.

Conclusion

Sales of shares in an IPO may cause agency problems. Ownership retention may help controlling these agency costs. The results based on our sample of Turkish IPOs support the Leland and Pyle (1977) prediction that firm value is increasing in the percentage of retained ownership. This result is consistent with that of Downes and Heinkel (1982) study based on U.S. data sets, but it is in contrary to the conclusions reached by Krinsky and Rotenberg (1989) which was a study on the Canadian IPOs. Furthermore, in the study two equations were modelled to show the effect of primary and secondary share sales on IPO firm value. The retention variable is decomposed into two parts representing retention arising from capital increase and sale of existing shareholders. The results suggest that the greater the number of pre-listing shares in issue to the total shares outstanding upon listing, the greater initial firm value. The significance of the coefficient of the retention variable increases with primary share selling. Yet, the sale of existing shares in the secondary offer is not negatively related to firm value as it was also suggested by Keasey and McGuiness (2008). But, the coefficient of this variable was not significant so we cannot make a strong inference from the result. Similarly, although insignificant, it can be inferred that initial IPO firm valuation is supported by underpricing and firm age, while market condition impacts are ambiguous. Takeover defence strategies are found out to be negatively related to initial firm value at IPO stage.

In summary, it can be concluded that agency problems, ownership retention and the source of issue are important to valuing IPOs. However, the results are obtained at low significance levels so they cannot be generalized at the moment. Also, additional control variables proxying size may be used. Further research with a greater sample size is needed.

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