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The choice of equity-selling mechanisms ☆

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Abstract

This paper examines the impact of information asymmetry and monitoring of managers on the choice between public offerings and private placements. Three key findings emerge. First, private placement firms have higher information asymmetry than public offering firms. Second, private placement investors do not engage in more monitoring than public offering investors. Finally, discounts for private placements sold to managers are higher than discounts for private placements in which managers do not participate. The final two findings cast doubts on the widely held view that private placements are motivated by a demand for enhanced monitoring.
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1. Introduction

Equity is a primary source of funding for firms that have recently issued initial public offerings (IPOs) but have not yet become very large (hereafter referred to as post-IPO firms) (Ravid and Spiegel, 1997; Bolton and Freixas, 2000; Rajan and Zingales, 1998). Although post-IPO firms raise equity through both public offerings and private placements, extant research has focused predominantly on public offerings. To the best of my knowledge, remarkably little empirical analysis has been conducted of the choice between public offerings and private placements. The lack of analysis is surprising in light of the increasing importance of private placements (Fenn et al., 1997).[1]

The emerging literature on private placements suggests two potentially important determinants of the choice between public offerings and private placements. Information asymmetry is the first potential determinant of equity-selling mechanism choice. Firms with high information asymmetry are expected to be more likely to choose private placements than public offerings (Chemmanur and Fulghieri, 1999). Private placements involve much fewer investors than do public offerings, so, at a given level of information asymmetry, private placements incur lower information production costs. Firms with high information asymmetry, therefore, have stronger incentives to reduce information production costs by issuing equity privately.

Akerlof's (1970, 2002) lemons principle suggests that high information asymmetry in the private equity market is more likely to attract bad-quality firms. Moreover, high-quality firms have incentives to reveal their qualities to increase their market values, whereas poor quality firms have few reasons to reveal their qualities (Chemmanur, 1993). These arguments suggest a close association between information asymmetry and firm quality. This paper contributes to the extant literature by assessing how information asymmetry (proxied in part by firm quality) affects the choice between public offerings and private placements.

The level of monitoring demanded by firms is another potential determinant of the choice of equity-selling mechanisms. A widely held view is that private placements result in enhanced monitoring of managers, because extant research shows that private placements are associated with more concentrated ownership and with restrictions on post-placement trading (Wruck, 1989; Kahn and Winton, 1998). However, the association between private placements and enhanced monitoring has not been fully resolved. Hertzel and Smith (1993) find that institutional ownership decreases in private placement firms. Because institutional investors possess incentives to monitor managers (McConnell and Servaes, 1990; Stoughton and Zechner, 1998), the finding of Hertzel and Smith (1993) does not support the monitoring view.

Extant research has not extensively studied the nature of investors in private placements, though the nature of these investors has a substantial influence on the

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[1] The private equity market was the fastest growing financing market for firms from 1980 to 1996. The amount of private equity under management—by partnerships investing in venture capital, leveraged buyouts, etc.—increased markedly from under $5 billion in 1980 to over $125 billion in 1996.

subsequent level of monitoring that will be performed. As public offerings are sold to a diverse group of small investors, managers have relatively little influence over the resulting ownership structure (Rock, 1986). In contrast, managers are able to influence ownership structure following private placements. Specifically, private placements usually target a few sophisticated investors, and managers' preferences play a significant role in the search for investors.[2] For example, managers may select investors who vote in managers' favor, who protect managers' positions, or who commit to monitoring managers. This paper contributes to the literature by documenting the identities of private placement investors and by breaking down changes in ownership concentration after private placements.

This paper samples 360 private placements and 728 public offerings by high-technology post-IPO firms during 1986–1997. Three findings suggest that private placement firms are characterized by high information asymmetry. (1) They are more likely to have gone public at an earlier life cycle stage. (2) They are less likely to have been backed by venture capitalists in IPOs. (3) They have fewer institutional investors, wider bid-ask spreads, and smaller trading volumes and are covered by fewer equity analysts.

Two findings suggest that private placements perhaps are not motivated by monitoring. First, evidence on investors' identities and ownership changes does not indicate that private placements result in greater monitoring. Consistent with other studies (e.g., Admati and Pfleiderer, 1994; Sahlman, 1990; Karpoff, 1999), this paper assumes that pension and venture capital funds are the strongest monitors among institutional blockholders (i.e., unaffiliated institutional owners holding at least 5% of shares). Compared with public offerings, pension and venture capital funds insignificantly decrease their ownership in private offerings whereas other blockholders significantly increase their ownership. Second, evidence indicates that trading restrictions do not affect monitoring incentives. Trading restrictions could improve monitoring incentives by preventing investors from selling equity of companies that have performed poorly. The monitoring benefits investors with large initial shareholdings more than investors with small initial shareholdings. Investors who hold small initial shareholdings have fewer incentives to monitor, but they could be compensated for the resale restrictions by receiving large price discounts. Therefore, according to the monitoring argument, the price discounts for shareholders with large initial shareholdings are expected to be smaller than the price discounts for shareholders with small initial shareholdings. However, this paper shows that the difference in price discounts between small and large initial shareholders are insignificant, which is inconsistent with the monitoring argument.

As a further test of the monitoring hypothesis, I examine private placement discounts for managerial investors. Price discounts vary according to the equity-selling mechanism. Public offerings are usually sold to a large number of investors at fixed prices. In contrast, there are relatively few investors in private placements, and this allows for direct negotiations between firms and investors. Direct negotiations permit price discounts to vary according to the identities of investors. Therefore,

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[2] Thanks to several private equity fund managers for indicating this to me.

managers could use private placements to expropriate wealth from existing shareholders in the form of large discounts. In particular, managers have strong incentives to purchase private placements at large discounts when their initial ownership stakes are small. This is because price discounts dilute the value of existing share capital by transferring wealth from existing shareholders to new shareholders. These arguments suggest that private placements could be motivated by managerial self-dealing instead of monitoring.

Evidence indicates that discounts for private placements sold to managers are higher than discounts for private placements in cases in which managers do not participate and managers receive higher discounts when they have small initial ownership stakes. This is consistent with the view that managers have stronger incentives to expropriate wealth from existing shareholders when the managers' initial ownership stakes are small. This paper's conclusion about the monitoring role of private placements is consistent with the view of Barclay et al. (2003). According to their findings, placement investors are generally passive, and price discounts reflect implicit compensation for entrenching managers.

This paper is organized as follows. Section 2 provides a brief introduction to Securities and Exchange Commission (SEC) regulations on private placements. Section 3 develops the empirical predictions and explains the research methodologies. Section 4 describes the data, Section 5 presents the results, and Section 6 concludes.

2. Securities and Exchange Commission (SEC) regulations on private placements

Fig. 1 illustrates three types of private placements: (1) registered (unrestricted), (2) unregistered (restricted) Regulation D, and (3) unregistered (restricted) Regulation S. Registered private placements take place only if effective registration statements cover the resale of securities. Restricted private placements cannot be sold in the public market until two years after the initial purchase by investors. In addition, restrictions are placed on the way in which the securities can be sold as well as on the number of securities that can be sold (see Securities Act Rule 144 for details). To compensate for these resale restrictions, price discounts are expected to be higher for restricted private placements than for registered private placements.

Regulation D private placements are sold inside the United States, whereas Regulation S private placements are sold outside of the United States. Another difference between Regulation D and Regulation S private placements is that issuers cannot solicit the general public under Rules 505 and 506 of Regulation D. This has three important consequences for Regulation D private placements. (1) They are exempt from SEC-mandated disclosure requirements such as having to issue prospectuses and, thus, lack mandatory information disclosure. (2) They target mostly accredited (sophisticated) investors. The SEC imposes no limitations on the number of accredited investors, but the number of non accredited investors is limited to 35. (3) They must have an aggregate offering amount below $5 million within a 12-month period under Rule 505.
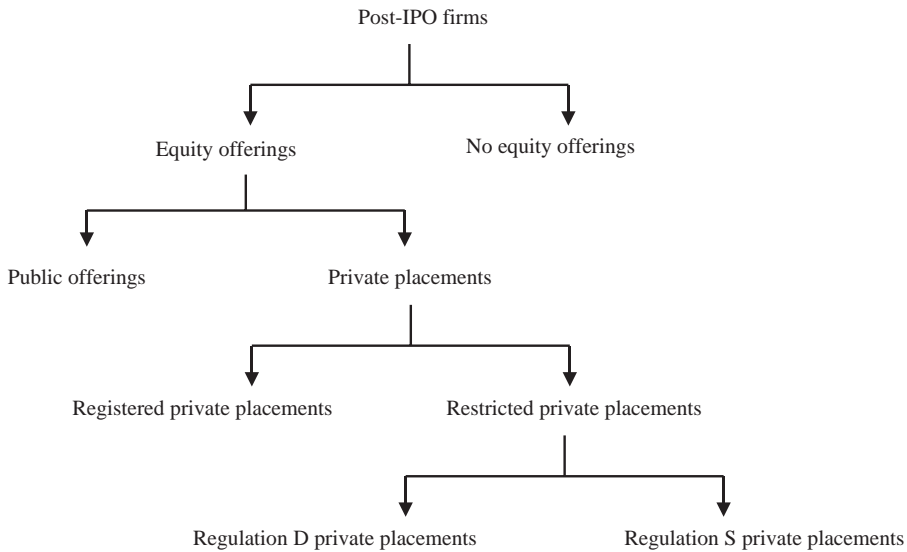
Post-IPO firms

Equity offerings   No equity offerings

Public offerings   Private placements

Registered private placements   Restricted private placements

Regulation D private placements   Regulation S private placements

Fig. 1. Equity-selling mechanism choices of post-initial public offering (IPO) firms.

3. Empirical predictions and research methodologies

This section derives testable hypotheses regarding the choice between private placements and public offerings (Section 3.1), and the determinants of private placement discounts for managerial investors (Section 3.2). This section also describes the methods used to test the hypotheses.

3.1. The determinants of equity-selling mechanism choice

Theoretical models suggest that firms choose private placements instead of public offerings when information asymmetry is high or when there is a high demand for monitoring (Chemmanur and Fulghieri, 1999; Shleifer and Vishny, 1986; Kahn and Winton, 1998), or both.

3.1.1. The information asymmetry hypothesis

The theoretical model of Chemmanur and Fulghieri (1999) predicts that well-known firms choose public offerings while firms characterized by high information asymmetry choose private placements. To secure the success of offerings, firms must be able to attract a much larger number of investors in public offerings than in private placements, so, at a given level of information asymmetry, firms incur higher information production costs if they issue equity publicly instead of privately. In equilibrium, firms with high information asymmetry tend to reduce information production costs by issuing equity privately.

This paper measures information asymmetry using variables at IPO dates and thereafter. This paper uses three variables to measure information asymmetry at IPO dates: (1) the firm's age at IPO (Age_1), (2) IPO underpricing (*Underpricing*), and (3) a dummy variable that equals one for IPOs backed by venture capitalists (*Venture*). Age_1 is expected to correlate negatively with the likelihood of private placements because young firms are usually not well known. *Underpricing* is expected to correlate positively with the likelihood of private placements because greater IPO underpricing is associated with higher information asymmetry (Chemmanur, 1993). *Venture* is expected to correlate negatively with the likelihood of private placements because IPOs backed by venture capitalists are associated with lower information asymmetry (Megginson and Weiss, 1991).

This paper uses six variables to measure information asymmetry after IPO dates: (1) the number of equity analysts/ln (*asset*) (*Analyst*), (2) the number of institutional investors/ln (*asset*) (*INST*), (3) the number of institutional investors/the number of shareholders (*INST/Share*), (4) the length of time between IPO dates and offering announcements (Age_2), (5) trading volume/the average of shares outstanding over the previous two years (*VOL*), and (6) $100(1 - bid/ask)$ (*Spread*). *Analyst* is expected to correlate negatively with the likelihood of private placements because analyst following is associated with lower information asymmetry (Brennan and Subrahmanyam, 1995); a similar reasoning holds for *INST* and *INST/Share*. Age_2 is expected to correlate negatively with the likelihood of private placements because information asymmetry is higher for companies with shorter listing histories; a similar argument can be made for *VOL* (Diamond and Verrecchia, 1991). *Spread* is expected to correlate positively with the likelihood of private placements because a wider spread is consistent with higher information asymmetry (Stoll, 1989; Glosten and Harris, 1988).

3.1.2. The monitoring hypothesis

Theoretical models explain private placements as motivated by monitoring of managers either because of increased ownership concentration or because of trading restrictions (Shleifer and Vishny, 1986; Kahn and Winton, 1998).

Shleifer and Vishny (1986) show that concentrated ownership improves monitoring incentives. Concentrated ownership is attained when a large percentage of shares is sold to a small number of investors, as is typical in a private placement. It might therefore be expected that private placements improve monitoring (Wruck, 1989). However, monitoring may not necessarily become more effective after private placements if ownership is concentrated in the hands of passive investors. As there are fewer investors in private placements, management is able to select investors based on their own objectives. Because private placement investors are chosen by management, the lack of information on investors' identities is a drawback of previous studies.

Investors are identified in two steps. (1) Blockholders are categorized as non institutional or institutional. (2) Institutional blockholders are then sub categorized as monitoring (pension and venture capital funds) or non monitoring. This paper assumes that pension and venture capital funds are the strongest monitors among

institutional blockholders. This is because pension funds are active in monitoring their portfolio companies through participation in proxy proposals, private negotiation, or both (Karpoff, 1999), and venture capital funds work closely with management and hence monitor them intensively (Admati and Pfleiderer, 1994; Sahlman, 1990).

Kahn and Winton (1998) show that trading restrictions provide monitoring incentives, even in the absence of large initial stakes, because they prevent investors from selling equity of poorly performing companies. Investors who hold small initial stakes have little incentive to participate in private placements but can be compensated for resale restrictions if they receive large price discounts.

Investors are categorized based on their initial holdings: Large investors hold at least 5% initial stakes, and small investors hold initial stakes of below 5%. According to the monitoring view, price discounts are expected to be bigger for small investors than for large investors.

3.2. The managerial self-dealing hypothesis

The managerial self-dealing hypothesis states that private placements allow managers to expropriate shareholders by entrenching themselves or by purchasing shares at low prices. Barclay et al. (2003) suggest that private placements are best explained by entrenchment. They show that private placement discounts reflect implicit compensation for entrenching managers. Hertzel and Smith (1993) find that price discounts are higher for private placements sold to managers than for private placements sold to other investors (44% and 19%, respectively).

Managers with small initial stakes are expected to have strong incentives to purchase private placements at large discounts. Price discounts dilute the value of existing share capital by transferring wealth from existing shareholders to new shareholders. Therefore managers have strong incentives to purchase private placements at large discounts when they hold small initial stakes.

4. The data and summary statistics

4.1. Sample construction

This paper samples high-technology post-IPO firms instead of the entire equity-offering population for two reasons. (1) Equity is the primary source of funding for post-IPO firms, so sample-selection bias is less likely to be a problem when ignoring alternative funding sources (e.g., debt issues, etc.). (2) Information asymmetry is particularly evident in the high-technology sector (Himmelberg and Petersen, 1994), which increases the power of tests for the presence of information asymmetry.

Data on IPOs during 1986–1996 are collected from the *Investment Dealer's Digest* and high-technology industries are identified from the *CorpTech Directory of Technology Companies*. The initial sample contains 1,640 high-technology IPOs. This study requires IPOs to have evident information asymmetry. Because

reverse-leveraged buyout (LBO) IPOs and spin-off IPOs are characterized by low information asymmetry (Degeorge and Zeckhauser, 1993), three reverse-LBOs and 41 spin-offs are dropped from the sample. This leaves a sample of 1,596 high-technology IPOs, with 123 listed on NYSE, 80 listed on Amex, and 1,393 listed on Nasdaq.

Data on post-IPO public offerings and private placements during 1986–1997 are collected as follows: (1) The company news file of the Lexis-Nexis database is searched using the keywords *private stock offering, private placement, privately negotiated transaction, restricted security, Regulation D placement, Regulation S placement, overseas placement, common sold privately*, and *direct placement (sale)*. (2) Data are supplemented using the Dow Jones Interactive database, FISonline, the Standard & Poor's corporate descriptions file of the Lexis-Nexis database, the Security Data Corporation database, and SEC filings (Forms 8-K, 10-Q, and 10-K). (3) Each company in the sample is screened to make sure it satisfies two criteria: The stocks it offers must be of the same class as the stocks listed on the Center For Research in Security Prices (CRSP) (to allow for price discount computations), and the stocks it offers must be listed on CRSP at the offering announcement date.

This collection method gives a final sample of 360 (14%) private placements and 728 (32%) public offerings out of the 1,596 firms.[3] The remaining firms are not documented to have equity offerings during 1986–1997 and are therefore excluded from the final sample.

The above data sources do not provide complete information on the identities of private placement investors. For example, some press reports only state that "certain" directors and officers participate in private placements without disclosing their identities. Therefore, additional information is gathered on the identities of investors from the *Summary of Insider Transactions* and from the Compact Disclosure database.

4.2. Summary statistics on equity-selling mechanisms

Table 1 presents the mean and the median descriptive statistics for private placements and public offerings. On average, the number of shares issued (*Block size*) in private placements and public offerings are 13% and 17% of outstanding shares, respectively. The mean and the median of price discounts (*Issue discounts*) are substantially higher for private placements than for public offerings. Private placement discounts are further broken down by placement types. The median of *Issue discounts* is slightly smaller for registered private placements than for restricted private placements (15% and 20%, respectively). The mean private placement proceeds are 18% as large as those in public offerings and the mean book value of

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[3] Out of the 229 firms that make 360 private placements (11 listed on NYSE, 45 listed on Amex, and 304 listed on Nasdaq), precisely 149 firms make one, 45 firms make two, and 35 firms make three or more. Out of the 513 firms that make 728 public offerings (76 listed on NYSE, 19 listed on Amex, and 633 listed on Nasdaq), 360 firms make one, 108 firms make two, and 45 firms make three or more. In addition, 94 firms report both private and public offerings, 66 of which are biotechnology firms.

Table 1

Panels A and B present the summary statistics for private placements and public offerings during 1986–1997, respectively. *Block size* is defined as shares offered/(shares offered + outstanding shares), where outstanding shares are measured on the offering announcement date or, if unreported, at the end of the quarter prior to the offering announcement date. *Issue discounts* is defined as (share price ten days after the offering announcement date—offering price)/share price ten days after the offering announcement date. Registered private placements take place only if there are effective registration statements covering the resale of securities. Restricted private placements cannot be sold in the public market until two years after the initial purchase by investors. In addition, restrictions are placed on the way in which the securities can be sold as well as on the number of securities that can be sold. *Book value of assets* is measured one fiscal year before the offering announcement date. *Market value of equity* is measured 30 days before the offering announcement date.

	Mean	Median	Number of observations
Panel A. Private placements			
Block size (%)	12.9*	9.6*	341
Offering price	6.80*	4.50*	338
Issue discounts (%)	8.7***	19.4*	338
Registered private placement	9.3	15.3***	37
Restricted private placement	8.7	19.8	301
Issue discounts (millions)	1.3	0.8	338
Gross proceeds (millions)	7.7*	4.2*	338
Book value of assets (millions)	31.9*	13.7*	357
Market value of equity (millions)	92.8*	50.7*	335
Purchaser stakes before the transaction (%)	4.9	0.3	169
Purchaser stakes after the transaction (%)	11.3	7.4	169
Panel B. Public offerings			
Block size (%)	16.9	16.3	718
Offering price	19.50	16.25	720
Issue discounts (%)	3.1	3.3	720
Issue discounts (millions)	2.3	0.7	720
Gross proceeds (millions)	43.6	28.2	720
Book value of assets (millions)	110.2	36.9	724
Market value of equity (millions)	298.7	166.4	714

The superscripts *, **, and *** indicate that the mean and the median between private placements and public offerings for two-tailed tests differ significantly at the 1%, 5%, and 10% levels, respectively.

assets is 29% as large. These differences between private placements and public offerings make it necessary to control for issue size and firm size.[4] The median of investor ownership before and after private placements is 0% and 7% of outstanding shares, respectively. Overall, significant differences exist between private placements and public offerings.

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[4] The choice of equity-selling mechanism could affect the differences in gross proceeds between private placements and public offerings. For example, Rule 505 restricts the offering amount in a specific period. However, this study does not attempt to explain the relation between proceeds and equity-selling mechanism choices.

The SEC's definition of accredited (informed) investors cannot be adopted because companies do not publicly disclose whether private placement investors are accredited. Instead, I identify informed private placement investors based on their ownership or corporation affiliation. Panel A of Table 2 lists six non mutually exclusive categories of informed private placement investors: (1) *Managers* (officers and directors), (2) *Strategic alliance partners* (suppliers, customers, and strategic alliance partners), (3) *Existing large shareholders* (existing shareholders with at least

Table 2

Private placement investors and private placement contracts. Informed private placement investors include Managers (officers and directors), Strategic alliance partners (suppliers, customers, and strategic alliance partners), Existing large shareholders (existing shareholders with at least 5% ownership), Venture_IPOs (venture capitalists who back initial public offerings, or IPOs), Venture_boards (venture capitalists on boards), and Institutional investors (pension funds, insurance companies, mutual funds, banks, foundations, units and investment trusts, venture capital funds, and endowments). To gather information on the identities of investors, I search the company news file of the Lexis-Nexis database, the Dow Jones Interactive database, FISonline, the Standard & Poor's corporate descriptions file of the Lexis-Nexis database, the Security Data Corporation database, Securities and Exchange Commission filings (Forms 8-K, 10-Q, and 10-K), the Summary of Insider Transactions, and the Compact Disclosure database. Registered private placements take place only if there are effective registration statements covering the resale of securities. Restricted private placements cannot be sold in the public market until two years after the initial purchase by investors. In addition, restrictions are placed on the way in which the securities can be sold as well as on the number of securities that can be sold. The restricted private placements include Regulation D and Regulation S private placements, which are sold inside and outside the United States, respectively. The classifications are not mutually exclusive.

	Number of placements	Frequency (%)
Panel A. Private placement investors		
Informed investors	226	63
Managers	51	14
Strategic alliance partners	53	15
Existing large shareholders	51	14
Venture_IPOs	15	4
Venture_boards	25	7
Institutional investors	160	44
Private investors	51	14
Characteristics of investors unidentified	83	23
Multiple investors	168	47
Single investor	110	31
Number of investors unidentified	82	22
Foreign investors	55	15
Panel B. Private placement contracts		
Investors with board seat rights	25	7
Registered private placements	38	11
Restricted private placements	322	89
Regulation S placements	22	6
Regulation D placements	300	83

5% ownership), (4) *Venture_IPOs* (venture capitalists who back IPOs), (5) *Venture_boards* (venture capitalists on boards), and (6) *Institutional investors* (pension funds, insurance companies, mutual funds, banks, foundations, units and investment trusts, venture capital firms, and endowments). Panel A also distinguishes between private placements sold to a single investor and those sold to multiple investors, and it lists private placements sold to foreigners.

Panel A shows that 63% of private placements involve informed investors. This frequency drops to 34% after excluding institutional investors, who may hold relatively small fractions of stocks and cannot access non public information (Demsetz, 1986). Panel B shows that 89% of private placements are restricted, of which 93% are Regulation D private placements. Only 7% of private placements result in investors being given rights to sit on boards.

5. Empirical evidence on the choice of equity-selling mechanisms

This section presents empirical results for tests of the predictions in Section 3.

5.1. The choice of equity-selling mechanisms

In this subsection, I examine the choice of equity-selling mechanisms. First, I will present descriptive statistics on information asymmetry and monitoring in private placements and public offerings. Next, I will present multivariate results regarding the choice of equity-selling mechanisms.

5.1.1. Information asymmetry

I use several measures of information asymmetry (*Age*$_1$, *Underpricing*, *Number of venture*, *Analyst*, *INST*, *INST/Share*, *Age*$_2$, *VOL*, and *Spread*) because no single variable is a perfect measure (for detailed definitions of the variables, please refer to Table 3). To avoid outliers, 5% of the smallest and largest observations for each variable, scaled by the natural log of the asset value, are discarded. Scenarios with other cutoff points as well as the scenario with no cutoff are also examined, and they give similar results. To verify the validity of the null hypothesis, which states that the choice of equity-selling mechanisms is unrelated to whether the firm is backed by venture capitalists in IPOs (*Number of venture*), I do a Chi-square test based on a two-way contingency table. Columns 9–12 of Table 4 show that private placement firms are associated with fewer venture capital backed IPOs; smaller values for *Age*$_1$, *Analyst*, *INST*, *INST/Share*, and *VOL*; and a larger value for *Spread*, compared with public offering firms. These findings indicate that private placement firms are associated with high information asymmetry. The only exception is *Age*$_2$, which is larger for private placement firms than for public offering firms. Columns 1, 2, 7, and 8 of Table 4 indicate that restricted private placements are associated with greater information asymmetry compared with registered private placements.

Restricted private placements are further categorized as Regulation D or Regulation S. It is expected that firms choose Regulation D instead of Regulation

Table 3
Definitions of the variables

Variable	Definitions (sources)
Panel A. Information asymmetry	
Age_1 (years)	The firm's age at the initial public offering (IPO) date
Underpricing (%)	The extent of IPO underpricing if the firms issue shares and not units in IPOs
Venture	A dummy variable that equals one for IPOs backed by venture capitalists and equals zero otherwise. (*Venture Capital Journal* is used to determine whether firms received venture capital prior to IPOs)
Analyst	The number of equity analysts/ln (*asset*) at the end of the previous fiscal year. (The *Nelson's Directory of Investment Research* is used to obtain data on equity analysts)
INST	The number of institutional investors/ln (*asset*) at the end of the previous fiscal year (The Compact Disclosure Database, *Nelson's Directory of Investment Research*, and *Moody's Handbook of Common Stocks* are used to obtain data on institutional investors)
INST/Share (1/million)	The number of institutional investors/the number of shareholders
Age_2 (years)	The amount of time between IPO dates and dates of equity offering announcements
VOL	Trading volume/the average of outstanding shares over the previous two years
Spread (%)	$100(1 - bid/ask)$
Panel B. Ownership structure	
OWN	Ownership of all officers and directors at the end of the previous fiscal year
Block	The number of unaffiliated owners holding at least 5% of shares at the end of the previous fiscal year
Panel C. Risk	
Unit	An indicator variable that equals one for a unit IPO and equals zero otherwise
ln (IPOs)	Natural log of the gross proceeds of the IPOs
Panel D. Operating performance	
Distressed	A firm is in financial distress if it meets one of the following four conditions. (1) There is news about the company that is related to debt restructuring. (2) The company experiences two consecutive years of negative earnings prior to the equity offering. (3) There is news about the company that is related to the sale of assets to raise cash. (4) There is news that the company is facing imminent financial distress
PRO_{y-1}	Industry-adjusted operating profitability; that is, the ratio of operating income before depreciation at the end of the previous fiscal year scaled by lagged firm assets. The benchmark is computed as follows: The performance of each equity offering firm is compared with the median industry performance; the median industry performance is measured using the data from firms that have the same three-digit standard industrial classification code as the equity-offering firms, have the same number of years since the IPOs, and have had no equity offering within the past two years
GRO_{y-1}	Industry-adjusted growth in sales, that is the difference of the natural log of sales in the years $t - 1$ and $t - 2$

Table 3 (*continued*)

Variable	Definitions (sources)
Panel E. Investors' revisions of growth potential	
$\Delta M/B$ equity	The difference between industry-adjusted M/B equity at the end of the previous fiscal year and that of year 0
ΔEPS	The difference between industry-adjusted earning per share at the end of the previous fiscal year and that of year 0
DCA_{IPO} (%)	A measure of the degree of earnings management in IPOs. For a detailed discussion of this procedure, see Teoh et al. (1998)
$Price_{IPO}/Price_{-60}$	Adjusted for stock splits, $Price_{IPO}$ and $Price_{-60}$ are the stock price on the first trading day and 60 days prior to the equity offering announcement date, respectively
Panel F. Fluctuations in industry returns	
$Return[-60, -1]$	The mean buy-and-hold returns from the value-weighted industry indexes in the 60 trading days before the equity offerings. The industry indexes are the equity values of the value-weighted portfolios of firms within the same industry classification, except for firms that issue equity within 60 days of their equity offering announcement date. The composition of the industry indexes may change from event to event. The values for weighting are the equity values at the beginning of the event window
$Return [0, 59]$	The mean buy-and-hold returns from the value-weighted industry indexes in the 60 trading days after the equity offerings
Panel G. Firm size	
ln (*asset size*)	Natural log of book value of assets one fiscal year before the equity offerings
Panel H. Issue size	
ln (*issue size*)	Natural log of gross proceeds of the equity offerings

S private placements when information asymmetry is high, because Regulation S allows issuers to sell shares to both sophisticated and unsophisticated investors. Columns 3–6 indicate that both *INST* and *INST/Share* differ significantly between Regulation D and Regulation S private placements. However, the power of this test is low due to the small number of Regulation S private placements in the sample.

5.1.2. Ownership changes and monitoring

This subsection investigates the extent to which the evidence on ownership changes supports the view that private placements enhance monitoring. I obtain ownership data in the months before and after equity issuance for 190 private placements and 369 public offerings from the Compact Disclosure database. For the remaining equity issuances, I obtain ownership data from annual proxy statements and Forms 10-K. Panel A of Table 5 presents changes in ownership concentration for blockholders.[5] The mean and the median increases in aggregate ownership by blockholders are significantly larger for private placements (1.8% and 0.2%,

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[5] The unreported results for managerial ownership changes, ownership changes by shareholders owning at least 5% ownership, and institutional ownership changes are available upon request.

Table 4
Univariate analysis of information asymmetry. To avoid outliers, 5% of the smallest and largest values (round to the nearest integer) for each variable, scaled by the natural log of the asset value, are discarded. Chi-square statistic based on a two-way contingency table is reported to test the validity of the null hypothesis, which states that the equity-selling mechanism choice is unrelated to whether the firms are backed by venture capitalists in initial public offerings (*Number of venture*). For detailed definitions of the variables, please refer to Table 3.

Variable	Private placements										Public offerings	
	Registered		Restricted						Total			
			Regulation S		Regulation D		Total					
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Age_1	8	5	5	5	5	5	5	5	5*	5*	8	6
N		8		15		187		202		210		528
Underpricing (%)	4.2	0.9	5.8	1.5	9.0	4.5	8.7	4.2	8.0	4.2	11.0	5.0
N		28		12		163		175		203		626
Analyst	2*	2*	1	1	1	1	1	1	1*	1	2	1
N		35		20		213		233		268		529
INST	7*	7*	6*	5	5	5	5	5	5*	5*	7	7
N		34		20		230		250		284		465
INST/Share (1/millions)	64.30*	33.10**	16.99*	13.89**	30.11	18.57	28.66	18.02	31.57*	19.09*	74.00	42.00
N		32		19		191		210		242		332
Age_2	3	3	4	4	4	3	4	3	4*	3*	3	2
N		8		15		187		202		210		528
VOL	5.46	4.64	6.39	4.89	5.60	4.56	5.67	4.58	5.65*	4.60*	7.80	6.14
N		37		22		274		296		333		652
Spread (%)	6.8**	6.7*	7.5	7.2	7.7	7.1	7.7	7.1	7.6*	7.1*	5.9	5.6
N		37		22		274		296		333		652
Total												
Venture		30		7		116		123		153		450
Others		8		15		184		199		207		278
χ^2 (p-Value)	23.094 (0.000)		0.407 (0.523)						33.367 (0.000)			

The superscripts *, **, and *** in the first and second columns indicate that the mean and the median between registered securities and restricted securities for two-tailed tests differ significantly at the 1%, 5%, and 10% levels, respectively. The superscripts *, **, and *** in the third and fourth columns indicate that the mean and median between Regulation S placements and Regulation D placements for two-tailed tests differ significantly at the 1%, 5%, and 10% levels, respectively. The superscripts *, **, and *** in the ninth and tenth columns indicate that the mean and median between private placements and public offerings for two-tailed tests differ significantly at the 1%, 5%, and 10% levels, respectively.

respectively) than for public offerings (−1.3% and −1.1%, respectively). This finding would seem to be consistent with the view that private placements are motivated by a demand for monitoring. However, looking at the pre-issue ownership levels by blockholders indicates that the pre-issue ownership levels are essentially the same for private placement firms and public offering firms.

Changes in aggregate blockholder ownership are then decomposed according to investors' identities. Blockholders are categorized as institutional or non institutional. Pension funds, insurance companies, mutual funds, banks, foundations, units and investment trusts, venture capital funds, and endowments fall into the former category. Individuals, families, and non financial companies fall into the latter category. Institutional blockholders are further sub categorized as monitoring (pension and venture capital funds) or non monitoring. Pension funds are identified from the *Pension Handbook*. Venture and capital funds are identified from *Pratt's Guide to Venture Capital Sources, Who's Who in Venture Capital*, and *Fitzroy Dearborn International Directory of Venture Capital Funds*.

When I decompose ownership changes according to investors' identities, the evidence does not suggest that monitoring is an important determinant of the choice of equity-selling mechanisms. Panel A of Table 5 reveals three important findings. (1) Changes in ownership by pension funds and venture capital funds do not differ significantly between public offerings and private placements. The mean and the median decreases in pension fund ownership do not differ significantly between private placements (−0.8% and −0.1%, respectively) and public offerings (−1.0% and 0.0%, respectively). Similarly, the mean and the median reductions in venture capital ownership do not differ significantly between private placements (−1.6% and −0.4%, respectively) and public offerings (−1.7% and −1.6%, respectively). (2) Non monitoring institutional blockholders increase their ownership significantly more in private placements than in public offerings. The mean and the median increases in non monitoring ownership are significantly higher in private placements (2.8% and 3.1%, respectively) than in public offerings (0.6% and 1.2%, respectively). (3) The median increase in ownership by non institutional blockholders is significantly higher in private placements (3.0%) than in public offerings (0.7%).

Panel B provides further evidence that monitoring is not an important determinant of the choice of equity-selling mechanisms. The pre-issue number of blockholders is essentially the same for private placement firms and public offering firms. Furthermore, the mean change in the number of blockholders does not differ significantly between private placements and public offerings (0.1 and 0.0, respectively). Therefore, there is little evidence that the reason for firms making private placements is their shortage of blockholders and their need for more blockholders in comparison to public offering firms.

I also identify investors whose monitoring incentives are initiated by private placement contract terms [i.e., *Investors with the rights to assign directors* and *Newly created large* ($\geqslant 5\%$) *shareholders*]. These two categories of investors require large price discounts to compensate for their monitoring costs. Price discounts for these two categories of investors are expected to be larger than price discounts for investors outside of these two categories (*Others*). Panel C shows that the discounts

Table 5
Univariate analysis of monitoring. Panel A presents changes in ownership concentration for blockholders. Panel B presents changes in the number of blockholders. I obtain ownership data from the Compact Disclosure database, annual proxy statements, and Forms 10-K. Blockholders refer to unaffiliated owners holding at least 5% of shares. Blockholders are categorized as institutional or non institutional. Pension funds, insurance companies, mutual funds, banks, foundations, units and investment trusts, venture capital funds, and endowments fall into the former category. Individuals, families, and non financial companies fall into the latter category. Pension funds are identified from the *Pension Handbook*. Venture and capital funds are identified from *Pratt's Guide to Venture Capital Sources*, *Who's Who in Venture Capital*, and *Fitzroy Dearborn International Directory of Venture Capital Funds*. Panel C presents ownership changes and discounts for two categories of investors: *Investors with the rights to assign directors* and *Newly created large shareholders*. *Others* refer to investors outside of these two categories. N/A means not available. Panel D presents ownership changes and discounts for two categories of investors: *Existing large shareholders* and *Newly created large shareholders*.

Panel A. Changes in ownership for blockholders

	Pre-issue ownership percentage		Post-issue ownership percentage		Change in ownership percentage		Number of observations
	Mean	Median	Mean	Median	Mean	Median	
Private placements							
Blockholders	21.6	15.1	23.4	19.3	1.8***	0.2***	130
Institutional blockholders							
Pension funds	3.4	2.3	2.6	2.0	−0.8	−0.1	19
Venture capital funds	8.8	6.3	7.2	6.0	−1.6	−0.4	39
Others	6.4	4.0	9.2	7.1	2.8*	3.1*	98
Non institutional blockholders	3.0	2.4	4.4	4.2	1.4***	3.0*	27
Public offerings							
Blockholders	20.3	17.4	19.0	17.8	−1.3	−1.1	250
Institutional blockholders							
Pension funds	3.7	2.5	2.6	2.5	−1.0	0.0	34
Venture capital funds	9.0	7.9	7.3	6.2	−1.7	−1.6	105
Others	5.9	5.1	6.4	6.2	0.6	1.2	186
Non institutional blockholders	1.8	2.1	2.6	2.8	0.8	0.7	61

Panel B. Changes in the number of blockholders

	Pre-issue number		Post-issue number		Change in number		Number of observations
	Mean	Median	Mean	Median	Mean	Median	
Private placements							
Number of blockholders	2.4	2.0	2.5	2.0	0.1	0.0	130
Number of institutional blockholders							
Number of pension funds	0.1	0.0	0.1	0.0	−0.0	0.0	19

	Mean	Median	Mean	Median	Mean	Median	
Number of venture capital funds	0.7	0.0	0.4	0.0	−0.3	0.0	39
Number of others	1.1	1.0	1.1	1.0	0.0	0.0	98
Number of non institutional blockholders	0.5	0.0	0.9	1.0	0.4	1.0	27
Public offerings							
Number of blockholders	2.3	2.0	2.4	2.0	0.0	0.0	250
Number of institutional blockholders							
Number of pension funds	0.2	0.0	0.2	0.0	−0.0	0.0	34
Number of venture capital funds	0.7	1.0	0.5	0.0	−0.3	−1.0	105
Number of others	1.3	1.0	1.4	1.0	0.1	0.0	186
Number of non-institutional blockholders	0.1	0.0	0.1	1.0	0.0	1.0	61

Panel C. Private placement contract terms

	Pre-issue ownership percentage		Post-issue ownership percentage		Discounts percentage		Number of observations
	Mean	Median	Mean	Median	Mean	Median	
Investors with the rights to assign directors	2.5	0.0	13.7	10.0	16.0	19.0	25
Newly created large shareholders	4.0	4.2	7.3	6.1	24.1	33.3	18
Others	N/A	N/A	N/A	N/A	8.2	19.8	294

Panel D. Trading restrictions

	Pre-issue ownership percentage		Post-issue ownership percentage		Discounts percentage		Number of observations
	Mean	Median	Mean	Median	Mean	Median	
Existing large shareholders	16.5	10.2	19.4	14.1	5.0	13.9	51
Newly created large shareholders	4.0	4.2	7.3	6.1	24.1	33.3	18

The superscripts ∗, ∗∗, and ∗∗∗ indicate that the mean and median between private placements and public offerings for two-tailed tests differ significantly at the 1%, 5%, and 10% levels, respectively.

for these two categories of investors are larger than the discounts for *Others*. Although I cannot reject the hypothesis that these discounts are statistically indifferent, the economic magnitude of the difference in price discounts does give some credibility to the monitoring explanation.

5.1.3. Trading restrictions and monitoring

Investors are classified into two categories based on their initial holdings: *Existing large shareholders* and *Newly created large shareholders*. According to the monitoring explanation, *Existing large shareholders* demand smaller price discounts than *Newly created large shareholders* because *Existing large shareholders* obtain larger benefits from monitoring. Panel D shows that the discounts for *Newly created large shareholders* are larger than the discounts for *Existing large shareholders*. Again, although I cannot reject the hypothesis that they are statistically the same, I cannot entirely rule out the possibility that some private placements could be motivated by monitoring.

5.1.4. Multivariate probit analysis of the choice of equity-selling mechanisms

The above univariate evidence suggests that private placements are characterized by high information asymmetry. I now examine the choice of equity-selling mechanisms using multivariate analysis. The multivariate model is

$$I_{i,t} = \alpha + x_{i,t-1}\beta_1 + z_{i,t-1}\beta_2 + \gamma\lambda_{i,\text{IPO}} + \theta_s + \mu_{i,t}, \tag{1}$$

where i indexes a firm, t corresponds to time, and s indexes industry. I equals one for private placements and zero for public offerings. The independent variables fall into two categories: experimental variables (x) and control variables (z). The experimental variables measure information asymmetry and ownership structure. The control variables capture risk, operating performance, investors' revisions of growth potential, fluctuations in industry returns, firm size, and issue size. Table 3 provides detailed definitions for the control variables. The time variable, λ, represents the IPO's calendar year (*IPO cohort*), θ denotes industry fixed effects, and μ is the error term. Table 6 presents estimation results for Eq. (1). Columns 1–2 include experimental variables, control variables, and industry dummies, and Column 3 contains *IPO cohort*.

The basic results are presented in Column 1 of Table 6. Except for Age_2, the proxies for information asymmetry have the same signs as in Section 3.1., and, except for Age_2 and *VOL*, the information asymmetry variables have significant explanatory power. Unreported results using a Wald test show that the information asymmetry variables are jointly significant. I now discuss two potential sources of bias in the information asymmetry variables.

The first source of potential bias is that some information asymmetry variables (*Analyst*, *VOL*, and *Spread*) could be endogenously affected by equity-selling mechanisms. Public offerings disclose a significant amount of information in their prospectuses, whereas private placements are exempt from SEC-mandated disclosure requirements. Consequently, public offerings are more likely than private placements to reduce information asymmetry. This paper uses *Venture* and Age_1 to break the

Table 6
Multivariate probit analysis of the choice of equity-selling mechanisms. The dependent variable equals one for private placements and zero for public offerings. Column 1 reports the basic results. Column 2 uses the Fama and MacBeth (1973) method to account for the lack of independence because of multiple yearly observations per company. Column 3 adds *IPO cohort* (the initial public offering's calendar year) to capture the impact of right truncation. Each equation contains industry dummies at the three-digit level. The *p*-values are in parentheses.

	(1)	(2)	(3)
Const.	−1.174	−1.409	−1.444
	(0.088)	(0.065)	(0.103)
Panel A. Information asymmetry			
Age_1	−0.051	−0.008	−0.016
	(0.020)	(0.103)	(0.099)
Venture	−0.502	−0.255	−0.664
	(0.047)	(0.091)	(0.065)
Analyst	−0.465	−0.205	−0.304
	(0.048)	(0.105)	(0.089)
Age_2	0.019	0.022	0.039
	(0.856)	(0.823)	(0.196)
VOL	−0.002	−0.007	−0.004
	(0.295)	(0.458)	(0.460)
Spread (%)	0.221	0.349	0.343
	(0.080)	(0.064)	(0.089)
Panel B. Ownership structure			
OWN	−0.867	−0.353	−0.634
	(0.705)	(0.675)	(0.669)
Block	0.217	0.225	0.195
	(0.378)	(0.306)	(0.360)
Panel C. Others			
Unit	0.768	0.743	0.680
	(0.056)	(0.075)	(0.084)
ln (*IPO*s)	−0.169	−0.257	−0.536
	(0.045)	(0.035)	(0.047)
Distressed	0.373	0.519	0.536
	(0.000)	(0.018)	(0.009)
PRO_{y-1}	−0.441	−0.459	−0.472
	(0.843)	(0.877)	(0.673)
GRO_{y-1}	−0.451	−0.316	−0.316
	(0.069)	(0.064)	(0.054)
$\Delta M/B$ equity	0.002	0.000	0.000
	(0.797)	(0.866)	(0.823)
ΔEPS	−0.075	−0.143	0.109
	(0.279)	(0.564)	(0.338)
DCA_{IPO} (%)	−0.421	−0.103	−0.365
	(0.735)	(0.560)	(0.716)
$Price_{IPO}/Price_{-60}$	0.140	0.577	0.209
	(0.066)	(0.075)	(0.026)
Return[−60, −1]	−0.010	0.002	0.000
	(0.498)	(0.869)	(0.481)

Table 6 (*continued*)

	(1)	(2)	(3)
Return [0, 59]	−0.025	−0.020	−0.020
	(0.930)	(0.647)	(0.930)
ln (*asset size*)	−0.201	−0.290	−0.343
	(0.094)	(0.098)	(0.051)
ln (*issue size*)	−1.031	−0.718	−0.236
	(0.000)	(0.000)	(0.000)
Industry	Yes	Yes	Yes
IPO cohort			−0.157
			(0.530)
p-value of overall regression	0.000	0.000	0.000
Fraction of correct prediction	0.996	0.954	0.852
Number of observations	330	299	330

simultaneity between information asymmetry and the equity-selling mechanisms. This is because *Venture* and Age_1 are constant over time for each firm. Column 1 shows that these variables are significantly associated with the choice of equity-selling mechanisms. Therefore, the bias due to simultaneity does not seem to be important.

The second source of potential bias is measurement error. Some information asymmetry variables (e.g., *Venture* and *Analyst*) could capture observed firm quality instead of information asymmetry. For example, low-quality firms are less likely to be covered by equity analysts, even in the absence of information asymmetry. Because information asymmetry is unobservable, any empirical attempt to capture information asymmetry requires the use of proxies. Economic theory suggests that firm quality is a good proxy for information asymmetry. A high information asymmetry market is more likely to attract bad-quality firms (Akerlof, 1970, 2002), and bad-quality firms have no incentives to reveal their qualities by reducing information asymmetry (Chemmanur, 1993). Although these arguments suggest that firm quality is a good proxy for information asymmetry, some proxies could capture observed quality instead of information asymmetry. One notable exception is the *Spread* variable, which is widely used in the microstructure literature as a proxy for information asymmetry, not firm quality (Stoll, 1989; Glosten and Harris, 1988). It is clear from Column 1 that *Spread* has a significant impact on the choice between public offerings and private placements, so the bias induced by measurement error does not seem to be important.

I now turn to the impact of ownership on equity-selling mechanism choice. Proxies for the two ownership variables (*OWN* and *Block*) are insignificant, irrespective of individual or joint tests. This implies that monitoring (as proxied for by ownership) is not an important determinant of equity-selling mechanism choice. In unreported tests, I replace *OWN* with log [*OWN*/(1 − *OWN*)], which transforms bounded observations into unbounded observations, and I replace *Block* with blockholders' ownership. The results are similar to those in Column 1.

Columns 2–3 of Table 6 report a number of alternative specifications as a check on the robustness of the results in Column 1. Column 2 uses the Fama and MacBeth (1973) method to account for a lack of independence because of multiple yearly observations per company. There are relatively few equity offerings during 1986–1990, so the cross-sectional estimates for 1986–1990 may be imprecise. Accordingly, Column 2 reports the average coefficients and p-values (in parentheses) during 1991–1997. Overall, the model's significance level is reduced, and the coefficients on the information asymmetry variables (*Venture*, and Age_1) are less significant. Nevertheless, the information asymmetry variables remain jointly significant.

Column 3 estimates the influence of right truncation bias, which could occur because some firms issue equity for the first time after 1997, the last year of the sample period. Truncation is expected to be a more serious problem for IPOs that took place shortly prior to 1997, because these IPOs are more likely to have unrecorded equity issuance after 1997. To capture the impact of right truncation, *IPO cohort* is added to Eq. (1). The coefficient of *IPO cohort* is found to be insignificant, and adding this variable does not affect the conclusions regarding information asymmetry. Therefore, the right truncation bias does not appear to be important.

5.2. The determinants of private placement discounts for managerial investors

In this subsection, I examine private placement discounts for managerial investors to further examine the validity of the monitoring hypothesis. First, I will present descriptive statistics on private placement discounts for managerial investors. Next, I will present multivariate results regarding the determinants of private placement discounts for managerial investors.

5.2.1. Descriptive statistics of private placement discounts for managerial investors

Table 7 compares the discounts for 51 private placements sold to managers to the discounts for 294 private placements in which managers do not participate. The mean discounts for private placements sold to managers are found to be significantly larger than the mean discounts for private placements in which managers do not participate. Table 7 also compares the discounts for 51 private placements sold to managers to the discounts for private placements sold to all other informed buyers (i.e., *Strategic alliance partners*, *Existing large shareholders*, *Venture_IPOs*, *Venture_boards*, and *Institutional investors*). The mean discounts for private placements sold to managers are found to be significantly larger than the mean discounts for private placements sold to *Strategic alliance partners*, *Existing large shareholders*, and *Venture_IPOs*.

There are two possible explanations for this. The first explanation is that private placements sold to managers relate to long-term incentive grants, including employee stock options and restricted stocks. Exercised options are considered to be private placements because they are exempt from registration requirements. Four findings indicate that this explanation is invalid. (1) Employee stock options are usually granted at the money and become exercisable in three to four years (Holderness et al.,

Table 7
Private placement discounts for informed investors. *Managers* refer to managers who participate in the private placements. *Managers with big stakes* (or *Managers with small stakes*) refer to managerial buyers whose initial stakes are above (or below) their median ownership. *Managerial non buyers* refer to managers who do not participate in the private placements. The classifications are not mutually exclusive.

	Number of observations	Pre-issue ownership percentage		Post-issue ownership percentage		Discounts percentage	
		Mean	Median	Mean	Median	Mean	Median
Managers	51	5.3	3.0	7.4	5.2	17.0	21.2
Managers with big stakes	25	—	—	—	—	9.5	13.9
Managers with small stakes	26	—	—	—	—	24.2	25.6
Managerial non buyers	294	32.6*	29.4*	30.4	29.6	7.5***	19.3
Strategic alliance partners	53	4.8	0.0	11.6	6.9	−16.4*	0.8*
Existing large shareholders	51	16.5**	10.2**	19.4	14.1	5.0***	13.9
Venture_IPOs	15	7.8	5.4	9.9	7.9	6.1***	12.0
Venture_boards	25	5.5	4.0	7.0	5.2	13.4	16.9
Institutional investors	160	4.8	0.8	11.3	8.2	13.6	17.4

The superscripts *, **, and *** indicate that the mean and the median between private placements sold to managers and those sold to all other informed investors for two-tailed tests differ significantly at the 1%, 5%, and 10% levels, respectively.

1999). Accordingly, it is assumed that options are granted four years prior to private placement announcement dates or at IPO dates for private placement firms that have been public for less than four years. The mean and the median discounts at the grant dates of the stock options (36% and 50%, respectively) are inconsistent with the fact that options are usually granted at the money. So, private placements sold to managers appear not to be related to employee stock options. (2) The restricted stock grant dates and the number of shares awarded do not match the private placement announcement dates and the number of shares purchased. So, private placements sold to managers are unrelated to awarded restricted stocks. (3) The stated purposes of the 51 private placements do not include managerial compensation. (4) Employee stock options are expected to be exercised by employees alone, but the 51 private placements are not sold to managers alone.

The second explanation is that private placements sold to managers are motivated by self-dealing. Managers are expected to have stronger incentives to engage in self-dealing when they have small initial stakes, because self-dealing results in a transfer of wealth from existing to new shareholders. Two findings support this explanation. (1) Managers are more likely to participate in private placements when their initial stakes are small. Rows 1 and 4 of Table 7 show that the mean and the median initial ownership of managers who participate in the private placements (*Managers*) are 5% and 3%, respectively, compared with 33% and 29% for managers who do not participate in the private placements (*Managerial non buyers*). Both the mean and the median ownership of *Managers* and *Managerial non buyers* differ significantly at the 1% level. (2) Price discounts are larger for managers who have small initial stakes. *Managers* are categorized as *Managers with big stakes* or *Managers with small stakes* based on whether their initial stakes are above or below their median ownership. Rows 2 and 3 of Table 7 show that the mean and the median discounts of *Managers with big stakes* are 9.5% and 13.9%, respectively, compared with 24.2% and 25.6% for *Managers with small stakes*. The mean and median discounts between *Managers with big stakes* and *Managers with small stakes* differ significantly at the 1% and 10% level, respectively.

Together, these findings imply that managers with small initial stakes are more likely to purchase private placements at large discounts.

5.2.2. Multivariate analysis of private placement discounts for managerial investors

The following model tests the managerial self-dealing hypothesis by estimating the determinants of private placement discounts:

$$\Delta P_{i,t} = \alpha + \beta_1 \, Managers + \beta_2 \, Managers\_share + \beta_3 \, Managers$$
$$\times \, Managers\_share + v_{i,t}\gamma + z_{i,t}\theta + \mu_{i,t} \qquad (2)$$

I test the managerial self-dealing hypothesis by including *Managers*, *Managers_share*, and the interaction term *Managers* $\times$ *Managers_share*. Before controlling for managerial ownership, I expect price discounts to be larger when managers participate in private placements ($\beta_1 > 0$). After controlling for managerial ownership, I expect managers to be more likely to obtain large price discounts when their initial stakes are small ($\beta_3 < 0$). The v variables contain five indicators for types

of non managerial investors. These variables capture differences in price discounts among different types of non managerial investors. The z variables capture the characteristics of private placement contracts (*Restricted share*, log(*Gross proceeds*), and [log(*Gross proceeds*)]^2), information asymmetry (*Venture*, *Spread*, *Analyst*, and *Delisted*), risk (*Unit*) (Schultz, 1993), operating performance (GRO_{y-1}), and investors' revisions of growth potential ($Price_{\text{IPO}}/Price_{-60}$). *Delisted* is a binary variable, which equals one if the firms are delisted from the CRSP because of liquidation or poor performance within two years after the offerings and zero otherwise. Table 3 provides detailed definitions for the remaining control variables. μ is the error term.

The estimation results for Eq. (2) are shown in Column 1 of Table 8. The estimated coefficient on *Managers* is positive and statistically significant, indicating that price discounts are larger when managers participate in private placements. I then add *Managers_share* and *Managers* × *Managers_share*. In Column 2, the significant negative coefficient on *Managers* × *Managers_share* reveals that discounts are larger for managerial buyers who have small initial stakes. This result suggests that managerial buyers with small initial ownership gain the most from private placements.

These findings are not explained by the argument that managers receive higher discounts as compensation for less diversified risk. According to this argument, managers who hold small initial stakes (below 5%) are more willing to increase their ownership compared with managers who hold large initial stakes. This is because managers are insensitive to undiversified risk at low ownership (Bagnani et al., 1994). As a result, price discounts should be larger for managers with large initial ownership. In contrast, price discounts are smaller for managerial buyers with large initial ownership (as already shown in Table 8).

As a final robustness check, I partition the sample into price discounts and price premiums to test whether the determinants of price discounts are different from those of price premiums. Columns 3 and 4 present results for the negative and positive price discount samples, respectively. The coefficients on *Managers* and *Managers* × *Managers_share* are significant at the 10% level for both samples. Therefore, managerial investors benefit more from both large price discounts and small price premiums than non managerial buyers.

In summary, the evidence suggests that managers engage in self-dealing. This conclusion is consistent with the lack of evidence for monitoring, as documented in Section 5.1., because managerial self-dealing is expected in circumstances when monitoring is less likely to occur.

6. Conclusions and future research

This paper studies the choice between public offerings and private placements. Theoretical models suggest a close association between firm quality and information asymmetry for two reasons. First, a market characterized by high information asymmetry tends to attract poor-quality firms. Second, poor-quality firms have little

Table 8

Multivariate analysis of the determinants of private placement discounts. The basic results are reported in Column 1. *Managers_share* and *Managers × Managers_share* are added to Column 2. The results for the negative price discount sample are reported in Column 3. The results for the positive price discount sample are reported in Column 4. The *p*-values in parentheses are based on White-corrected standard errors.

	(1)	(2)	(3)	(4)
Const.	−7.240	−17.91	−3.230	−4.734
	(0.014)	(0.009)	(0.065)	(0.037)
Panel A. Managerial self-dealing				
Managers	53.430	50.640	9.167	63.598
	(0.077)	(0.075)	(0.083)	(0.065)
Managers_share		−0.934	−0.114	−1.899
		(0.514)	(0.829)	(0.317)
Managers × Managers_share		−42.920	−7.272	−55.250
		(0.065)	(0.059)	(0.038)
Panel B. Types of non managerial investors				
Strategic alliance partners	−14.680	−14.600	−0.918	−7.581
	(0.028)	(0.028)	(0.084)	(0.053)
Existing large shareholders	−22.970	−22.850	−4.615	−25.054
	(0.122)	(0.121)	(0.087)	(0.104)
Venture_IPOs	−17.860	−18.210	−2.260	−20.872
	(0.519)	(0.508)	(0.226)	(0.194)
Investors with the rights to assign directors	4.060	3.830	0.318	6.083
	(0.847)	(0.854)	(0.178)	(0.123)
Newly created large shareholders	−3.439	−4.221	−0.096	−0.283
	(0.150)	(0.148)	(0.143)	(0.175)
Panel C. Others				
Restricted share	9.061	8.950	2.585	9.120
	(0.131)	(0.131)	(0.112)	(0.074)
log(*Gross proceeds*)	−2.276	−2.310	−0.198	−1.713
	(0.048)	(0.039)	(0.114)	(0.010)
(log(*Gross proceeds*))^2	0.025	0.026	0.004	0.011
	(0.210)	(0.184)	(0.137)	(0.230)
Venture	−1.135	−2.790	−0.213	−0.903
	(0.470)	(0.482)	(0.272)	(0.349)
Spread	2.503	2.446	1.489	0.937
	(0.256)	(0.261)	(0.252)	(0.186)
Analyst	−2.588	−2.414	−1.190	−2.772
	(0.011)	(0.011)	(0.034)	(0.089)
Delisted	23.620	25.830	29.300	27.257
	(0.012)	(0.017)	(0.014)	(0.018)
Unit	9.681	9.310	6.946	5.193
	(0.102)	(0.105)	(0.164)	(0.146)
GRO_{y-1}	−7.921	−7.845	−9.120	−1.592
	(0.102)	(0.103)	(0.169)	(0.187)
$Price_{\text{IPO}}/Price_{-60}$	0.168	−1.228	0.038	0.443
	(0.690)	(0.668)	(0.668)	(0.743)
Number of observations	330	330	123	207
p-value of overall regression	0.000	0.000	0.000	0.000
Adjusted R^2	0.580	0.659	0.324	0.422

incentive to reveal their qualities by reducing information asymmetry. Because information asymmetry is not directly observable, I rely partly on firm quality variables as proxies for information asymmetry, but I also use the bid-ask spread as a proxy. Regardless of the proxy used, the evidence reveals that private placements are characterized by high information asymmetry.

A widely held view is that private placements are motivated by a demand for better monitoring. The extant literature assumes that concentration of ownership contributes to enhanced monitoring and concentration of ownership is a common by-product of private placements. Therefore, it might be expected that private placements improve monitoring. However, managerial objectives could dominate the choice of equity-selling mechanisms if managers are able to influence the resulting ownership structure. This paper contributes to the extant literature by decomposing aggregate ownership according to the identities of blockholders. Consistent with prior research, it is assumed that pension and venture capital funds are more likely to engage in monitoring compared with other institutional investors. Inconsistent with the monitoring explanation, it is found that pension and venture capital funds decrease their ownership whereas other blockholders increase their ownership in private placements.

Evidence suggests that managers engage in self-dealing and managerial self-dealing is expected in circumstances in which monitoring is less likely to occur. Discounts for private placements sold to managers are larger than discounts for private placements in cases in which managers do not participate. Moreover, private placement discounts are significantly larger for managers who hold small initial stakes.

The results on managerial self-dealing indicate that more evidence is needed on managerial participation in private placements. Future research could use a more comprehensive sample of private placements to investigate questions such as: In which types of private placement firms are managers more likely to participate? What types of investors are more likely to participate in private placements with managers? What is the relationship between managerial participation in private placements and future firm performance? Further research on managerial participation in private placements seems promising.

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