# The Choice of Equity Selling Mechanisms: PIPEs versus SEOs

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## Abstract

We examine the firm's choice between an SEO and a PIPE, an innovation in follow-on equity selling mechanism seen in the late 1990s. Our primary finding indicates that the rapid rise of the PIPE market fills the capital needs of firms which may not have access to more traditional alternatives. This lack of access is driven mainly by information asymmetry and weak operating performance. We also show that firms are more likely to choose PIPEs when the general market and the firm's stock are performing poorly. Furthermore, we find that selected firms with access to the public market may prefer a PIPE due to specific cost considerations.



**Key Words:** Private investment in public equity (PIPE); Seasoned equity offering (SEO)

# The Choice of Equity Selling Mechanisms: PIPEs versus SEOs

## 1. Introduction

The advent of the twenty-first century has been accompanied by a dramatic shift in the landscape of equity selling mechanisms. For example, Bortolotti, Megginson, and Smart (2008) document that accelerated seasoned equity offerings (SEOs) have increased substantially in both the U.S. and Europe. Autore, Kumar and Shome (2008) report a resurgence in the popularity of shelf registrations for seasoned equity offerings. The current study extends this literature with a focus on a mechanism which has recently surpassed the traditional SEO in terms of both dollar volume and number of transactions. The private investment in public equity (PIPE) market has emerged as an important choice among corporations for the issuance of follow-on equity financing.

PIPE securities are generally issued pursuant to Section 4(2) of the Securities Act or Regulation D under the Securities Act, the SEC Rule that allows public companies to issue stock privately to a group of accredited investors without the need for public registration prior to the transaction. According to Sagient Research, the PIPE market has experienced dramatic growth over the last 10 years.[1] The number of PIPE transactions has increased from 127 in 1995 to 2,760 in 2006. The total amount of capital raised via PIPEs has increased from $2 billion dollars in 1995 to $88 billion in 2006. In comparison, there were just 742 SEO transactions in 2006 with a total principal amount of $76 billion.[2]

[1] Data summarizing the number of PIPE transactions and the amount of capital raised via PIPEs over the last 10 years are available at http://www.sagientresearch.com/pt/.
[2] The SEO data are from Thomson Financial SDC New Issues Database.

The primary aim of the current paper is to explore potential motivations why certain firms might be attracted to the PIPE market rather than the traditional SEO market. In doing so, we posit three testable hypotheses. Our first hypothesis suggests that some firms may be denied effective access to the SEO market due to pricing considerations, which otherwise, would have been their first choice. These firms are assumed to possess high levels of information asymmetry and weak operating performance. Jointly, these represent characteristics which would be unattractive to the traditional SEO process. Hence, PIPE issuances may represent the last resort for these firms to obtain additional equity capital.[3] The second hypothesis suggests that the firm's choice of equity selling mechanism is influenced by the potential of undervaluation. When the firm's stock is undervalued, the issuer is more likely to turn to private investors expecting that their due diligence will help reduce undervaluation (see Hertzel and Smith (1993)). Thus, we hypothesize that firms are more likely to choose PIPEs when the firm's stock and/or the stock market is performing poorly. Our third testable hypothesis argues that firms discriminate between competing selling mechanisms in order to minimize their issuance costs. For some firms, the cost of raising equity capital through a PIPE may be lower than that if they had raised equity capital through an SEO.

Our three testable hypotheses are not strictly independent. Rationally, we would expect a value maximizing management to select the transaction type on the basis of minimizing total direct and indirect costs. Recall that our last resort hypothesis is based upon the lack of effective access to the SEO market due to pricing considerations.

[3] Although there should exist clearing prices such that firms may utilize any equity selling mechanism, there also exist situations where the cost may simply be too high to justify the transaction type. For ease of presentation, we refer to this condition as either "being barred from the traditional financing options" or "without access to the SEO market".

Hence, the last resort hypothesis and the cost minimization hypothesis bear a close relationship. Where cost considerations are reasonably close between the competing forms, the potential of undervaluation might possibly be the deciding factor favoring a PIPE issuance.

Our full sample analysis includes 2,087 common stock PIPEs and 1,743 primary SEOs for the period 1996-2006. It is likely, however, that many of the PIPE firms are denied access to the traditional SEO market due to their high level of information asymmetry and poor operating performance and thus do not have a "true" choice. As a robustness check, we repeat our procedures using a subsample of firms which conduct both an SEO and a PIPE within a 1-year interval.

The empirical analysis provides evidence that greater information asymmetry and weak operating performance are characteristics more likely to be associated with PIPE offerings. We further examine how public firms discriminate between alternative equity selling mechanisms following unsuccessful SEOs. Consistent with our first set of findings, we observe that firms which subsequently switch to the PIPE market have characteristics suggesting greater information asymmetry and weaker operating performance than firms that are successful with second attempt SEOs. These results support both Chaplinsky and Haushalter (2006) and Brophy, Ouimet, and Sialm (2009) and suggest that a PIPE may be a last resort equity alternative for many firms with such characteristics.

Our findings display some support for the undervaluation hypothesis. We find that when the issuing firm's stock and/or the general stock market is performing poorly, the issuer is more likely to choose a PIPE over an SEO. When we examine the choice

decision using a subsample of firms that utilized both an SEO and a PIPE offering within a 1-year interval, most of the previously significant measures related to the last resort hypothesis fail to obtain significance. Variables related to the firm's stock and general market performance, however, remain significant and negative. The 10-day announcement period abnormal return is positive for PIPEs while it is negative for SEOs. Market-adjusted returns over longer intervals, however, are generally negative for both groups with the PIPEs displaying the weaker performance of the two issuance types. This finding presents an important caveat which partially weakens the undervaluation hypothesis.

Our tests of the cost minimization hypothesis use the Lee (1978) model to provide cost estimates while controlling for a self-selection bias. Following Dunbar (1995) and Ng and Smith (1996), the methodology contrasts the forecasted offering cost, had firms used the alternative equity selling mechanism, to the like measure for the selected offering type. Our results indicate that, after controlling for the specific characteristics of the issuer and its offering, management displays a preference for the less costly alternative.

Our findings extend the work of Wu (2004) who examines the choice between an SEO and a traditional private placement for technology firms during the period 1986-1997. The major result from her choice model is that private placement firms have characteristics associated with higher information asymmetry than do firms who employ public offers. The PIPE offerings considered in this paper are plain-vanilla common stock issuances. They are similar to traditional private placements in many aspects. The primary difference between common stock PIPEs and traditional private placements is

the duration of the resale restrictions on the participating investors. For traditional private placements, the restriction period could be up to two years following purchases. In contrast, PIPEs do not impose such lengthy no-trading intervals, but do require the issuer to register the shares received by participating investors, usually within 30 days after the deal closes. Once the registration statement becomes effective, the new shares can be publicly traded – typically within 90 days. Thus, in comparison to traditional private placements, PIPEs offer enhanced liquidity to participating investors. Due to this advantage of PIPEs, the volume of traditional private placements has declined significantly in recent years. Using the SDC New Issues database, we are able to identify only 148 traditional private placements, compared to 1,780 common stock PIPEs for the period 1996-2006. The current study is the first to provide a comparative study of the financing choice between PIPEs and SEOs.

Previous studies on PIPEs (e.g., Chaplinsky and Haushalter (2006), Brophy, Ouimet, and Sialm (2009)) typically regard a PIPE offering as a last resort equity financing for firms that are barred from traditional financing options. Our empirical results support this view for the majority of PIPE issuers. Here we extend the literature by showing that additional factors play an important role in the issuance type decision. In particular, we show that firms are more likely to issue PIPEs when they are likely undervalued. Furthermore, PIPEs may exhibit a cost advantage over SEOs in selected situations which increases the probability that this issuance form is chosen.

Our findings have implications for interpreting the nature of the PIPE market relative to public offerings. Traditionally, the SEO market rejects firms with high or extreme information asymmetry and weak operating performance. The emergence and rapid

growth of the PIPE market fills the capital need of at least some of these firms; and in doing so, this market also compensates investors willing to bear such risks by offering large risk premia in the form of attractive discounts. Hence, the PIPE market may act as a supplement to the traditional SEO market.

As mentioned above, our findings also suggest that a PIPE may be an attractive equity selling method when the likelihood of undervaluation is high. Hertzel and Smith (1993) suggest that firms are more likely to turn to private investors than public underwritten offerings when managers believe that their stocks are undervalued. This preference follows as, at some cost, these investors can assess firm value better through direct negotiations with management. Additionally, the PIPE market is distinguished by its ability to allow issuers to conduct offerings without the use of an intermediary, should they choose, which eliminates the direct offering cost. These features may be especially attractive to selected issuers where the alternative of the public market remains viable. Such would be the case if a high weight is placed on either the ability to eliminate the direct cost or the potential to negotiate an attractive cost package in cases of perceived undervaluation. Therefore, the PIPE market may also act as a substitute to the traditional SEO market.

The remainder of the paper proceeds as follows. Section 2 provides relevant institutional background with regard to the development and structure of the PIPE market. Section 3 presents our testable hypotheses regarding the choice between equity selling mechanisms. Section 4 discusses our sample selection and provides summary statistics. Section 5 presents our primary empirical findings while section 6 provides a

robustness check using a sample of withdrawn SEOs. Finally, in section 7, we summarize the major findings of the paper and discuss their implications.

## 2. The rise of the PIPE market

A private placement is a sale of unregistered securities by a public company to a selective group of individuals or institutions. PIPE securities are issued pursuant to Section 4(2) of the Securities Act or Regulation D under the Securities Act, the SEC Rule that allows public companies to issue stocks privately to a group of accredited investors without the need for public registration prior to the transaction.[4] This feature makes the PIPE a time-efficient mechanism for issuers to raise equity capital.

The contract structure of a PIPE offering is oftentimes more complex than a traditional SEO. Sagient Research categorizes PIPEs into traditional and structured categories based on whether or not investors are price protected. Securities issued within the traditional class are typically common stocks or convertibles with a fixed conversion price. Conversion prices with structured PIPEs can be adjusted downward if there is an adverse change in either market conditions or the fundamentals of the issuing firm. Hillion and Vermaelen (2004) demonstrate that the equity of firms issuing floating rate convertible bonds tends to perform poorly in the long run. They suggest that such floating convertibles encourage short selling by convertible holders and that the resulting dilution triggers a permanent decline in the share price. Since 2003, the volume of structured

[4] Regulation D Rule (501) defines investors from the following categories as accredited investors: banks, brokers or dealers, insurance companies, registered investment companies or business development companies, small business investment companies, pension funds, directors, executive officers, or general partners of the issuer, corporations, limited liability companies, trusts or partnerships with total assets in excess of $5 million not formed for the specific purpose of acquiring the securities offered, any natural person whose individual net worth, or joint net worth with that person's spouse, at the time of the purchase exceeds $1 million, or income or joint income exceeds $200,000 or $300,000, respectively, in each of the two most recent years, and any entity in which all equity owners are accredited investors.

PIPEs has declined significantly because of legal issues associated with potential market manipulation and insider trading.

The PIPE offerings considered in this paper are plain-vanilla common stock issuances. They are similar to traditional private placements in many aspects. The primary difference between common stock PIPEs and traditional private placements is the duration of the resale restrictions on the participating investors. For traditional private placements, the restriction period could be up to two years following purchases. In contrast, PIPEs do not impose as lengthy a restriction, but do require the issuer to register the shares received by PIPE investors, usually within 30 days after the deal closes. Once the registration statement becomes effective, the new shares can be publicly traded – typically within 90 days. Thus, in comparison to traditional private placements, PIPEs offer enhanced liquidity to participating investors.

The characteristics of PIPE issuers and investors differ from those in the traditional SEO market. Most PIPE issuers are small, young, and risky (see Chaplinsky and Haushalter (2006), Dai (2007), and Brophy, Ouimet, and Sialm (2009)). The major investors in the PIPE market are hedge funds, venture capital funds, and private equity funds, who are often desirous of equity investments with substantial risk premia. Some PIPE transactions are negotiated directly between issuers and investors, eliminating the direct cost or agent fee. Nevertheless, many PIPEs are placed with the help of either a single or a group of placement agents. The major obligations of a placement agent include assisting with preparation of the private placement memorandum, assisting in preparing a road show or investor presentation, and introducing the issuer to potential investors. Because PIPE investors are typically accredited investors, the scale of a PIPE

road show is often smaller than with a traditional SEO. Dai, Jo, and Schatzberg (2009) examine the usage of placement agents within the PIPE market with an emphasis on the quality and price of their services. They find that selected agents are well-known names in the IPO and SEO underwriting business, such as Citigroup, UBS, Lehman Brothers; while others, such as Coastline Capital Partners, Halpern Capital, ThinkEquity Partners, are less well-known and are specialized players in the PIPE market.

Using the SDC New Issues database, we are able to identify only 148 traditional private placements, compared to 1,780 common stock PIPEs and 1,734 primary SEOs for the period 1996-2006. Hence, the current study focuses on the firms' choice between PIPEs and SEOs.

PIPEs can potentially offer several advantages to issuers relative to SEOs. For instance, a PIPE may be the more time efficient mechanism as the issuer can close the transaction and draw down the committed capital before going through a lengthy registration procedure. A second advantage is that the private investor is directly involved in the due diligence process. This feature may help reduce undervaluation, particularly for firms with high levels of information asymmetry. A third advantage is that, if the firm's funding need is relatively small, the issuer may be able to eliminate or reduce certain cost components by negotiating directly with the purchaser. Finally, PIPE investors are accredited investors who typically are willing to and capable of taking large risks. This characteristic opens a financing window for highly risky firms that are otherwise isolated from traditional financing options.

## 3. Development of hypotheses

This section motivates and presents our three testable hypotheses regarding the issuer's choice between SEOs and PIPEs.

*3.1. The last resort hypothesis*

Our first hypothesis is motivated by three recent empirical studies. Chaplinsky and Haushalter (2006) suggest investments in PIPEs involve extreme uncertainty. Dai (2007) provides evidence that one motivation for PIPEs is that they act as a follow-on round of venture capital for companies that went public prematurely in their entrepreneurship development. More recently, Brophy, Ouimer, and Sialm (2009) examine the advantages to the suppliers of capital and suggest that PIPEs are an attractive mechanism for hedge funds to earn short-turn profits in distressed firms. All these studies suggest that issuers utilize the PIPE market when for various reasons, such as information asymmetry and weak operating performance, they are unable to utilize more traditional means of public equity financing. This interpretation gives rise to our hypothesis of last resort whereby we conjecture that firms choose PIPEs because they cannot access the traditional SEO market to raise follow-on equity financing.

*3.2. The undervaluation hypothesis*

The literature has documented that management often attempts to time the market when conducting SEOs. In particular, firms are more likely to issue SEOs in periods preceding price declines (see, for example, Loughran and Ritter (1995), Spiess and Affleck-Graves (1995), and Jegadeesh (2000)). On the other hand, Hertzel and Smith (1993) find that firms often forego SEOs and turn to private placements when the potential degree of undervaluation is high. The authors suggest that, in these situations, private investors can better assess the true value of the firm through their due diligence

and negotiation with management. Consequently, we expect that the choice decision between issuance forms will be influenced by the stock performance of the firm as well as the general market condition.[5] In particular, we anticipate that management will be more likely to choose a PIPE over an SEO when they perceive the firm's stock to be undervalued. Furthermore, we expect that firms are more likely to be undervalued during periods of market decline and thus more likely to turn to PIPE investors during such intervals.

*3.3. The cost minimization hypothesis*

The issuance literature presents evidence that firms discriminate based upon cost when selecting between financing alternatives. For example, Smith (1987) examines the choice of issuance procedures for public utility debt issues and concludes that managers choose between competitive and negotiated offerings on the basis of net interest cost. Dunbar (1995) finds that underpricing and offering costs are lower for IPO firms choosing to use warrants as additional underwriter compensation. His finding supports the view that issuers choose compensation contracts which minimize offering costs. Furthermore, Ng and Smith (1996) report that underwriting costs are reduced for SEO firms choosing to use warrants as additional underwriter compensation.

Motivated by the above-mentioned literature, we hypothesize that some firms select between SEOs and PIPEs on the basis of comparative cost. In doing so, issuers must consider both the direct cost (gross spread or placement agent fee) and the indirect cost (discount).

[5] As discussed earlier, traditional private placements typically have longer restriction periods than do PIPEs. This characteristic may impact the time and effort applied to due diligence on the part of investors. We would like to thank an anonymous referee for this insight.

## 4. Data and summary statistics

Our initial SEO sample includes all primary seasoned equity offerings by U.S. operating companies from 1996 through 2006 as identified in the Thomson Financial SDC new issue database. The sample excludes equity offerings by closed-end mutual funds, real estate investment trusts (REITs), unit investment trusts, beneficial interests, limited partnerships, American Depositary Receipts (ADRs), and unit offerings. Furthermore, we exclude those firms that are not contained in either CRSP or Compustat over our sample period. These restrictions result in a final sample of 1,734 primary SEO transactions.

Our data source for PIPE offerings is Sagient Research. In this paper, we focus on common stock PIPEs for the purpose of comparison with SEOs. Like our SEO sample, we again require CRSP and Compustat data availability over the same time frame. Issuances for firms listed on OTC Bulletin Board or Pink Sheets are excluded due to price availability concerns. These requirements lead to a final PIPE sample of 2,087 common stock offerings from 1996 through 2006.[6]

**[Insert Fig. 1 about here]**

Figure 1 displays the number of common stock PIPE and SEO transactions (primary offerings only) in our sample by year.[7] Our PIPE sample shows rapid acceleration in the

[6] We exclude PIPEs utilizling shelf offerings, also referred to as registered direct PIPEs, from our analysis due to a lack of a meaningful sample size after screening for required CRSP and Compustat coverage. One advantage of a standard PIPE is that issuers are able to close the transaction before filing a registration statement with the SEC. This feature contrasts with a registrered direct PIPE where the registration statement is required before issuance. To enable a consistent comparison between the two issuance forms discussed in our study, we also exclude Rule 415 offerings from our SEO sample. We refer interested readers to Autore, Kumar, and Shome (2008) and Lee and Masulis (2009) for details of Rule 415 offerings.

[7] Many PIPE issuers are OTCBB and Pink Sheet firms which are excluded from our sample due to the lack of price availability. Hence, Figure 1 does not present a complete picture regarding the increasing popularity of PIPEs relative to SEOs. Please see Dai (2009) for a more comprehensive analysis which contrasts the total volume in these two markets.

late 1990s and surpasses the number of primary SEOs by 1999. This lead is sustained through 2003; while in the most recent 3-year period, from 2004 to 2006, the two alternatives maintain relatively equal popularity. As mentioned in our introduction, the complete PIPE market has continued to surpass SEOs (including secondary offerings) in terms of both number of transactions and proceeds.

Table 1 summarizes selected characteristics of our sample. We use three measures of information asymmetry which include the book value of assets measured at the end of previous fiscal year, the maximum number of analysts following the stock during the year prior to the offering as reported by I/B/E/S, and the percentage stock price spread.[8] This latter measure is estimated as the arithmetic daily average of 100*(1-bid/ask) as measured in the 12 months prior to the offering. Table 1 also lists other relevant characteristics of our sample. Our return on assets measure, EBITDA/Assets, is the ratio of EBITDA to fiscal year-end assets from the previous year. BHAR(-6,-1) and BHAR (-12,-1) are the market adjusted buy-and-hold abnormal returns employing the equally-weighted CRSP index over the previous 6 and 12 months, respectively. In accordance with Hodrick (1999), inverse elasticity represents the ratio of the percentage change in price to the percentage change in the supply of shares. The empirical proxy used for this measure is the ratio of the discount to the fraction of the firm offered. We define the discount as the percentage difference between the closing price one day before the offering and the offer price while the fraction offered is computed as the ratio of shares issued to the shares outstanding after the offering.

**[Insert Table 1 here]**

[8] We also use the average number of analysts who make annual earnings forecasts in the previous year as a robustness check. The results are qualitatively similar.

The descriptive statistics are largely consistent with the existing literature (see, for example, Chaplinsky and Haushalter (2006), Dai (2007), and Brophy, Ouimet, and Sialm (2009)), and suggest that PIPE firms are associated with a high degree of information asymmetry. These issuers are small with a mean total asset value of $630.5 million and a median of $30.1 million. Their issue size is also correspondingly small. The mean (median) gross proceeds for PIPEs is $20.9 (7.9) million, while the similar measures for SEOs is $143.6 (75.0) million. Given their size, PIPE firms are often not followed by analysts with only 51.9% of our PIPE sample reporting coverage within I/B/E/S, while 85.5% of SEO issuers are followed by at least one analyst. Furthermore, the price spread for these PIPE firms is typically larger than for SEO issuers.

PIPE issuers' operating performance and stock performance prior to the offering significantly trails that of SEO firms. With regard to the former, the mean and median EBITDA/Assets measures of PIPE firms are -39.2% and -23.8%, respectively, with only 18.5% of the sample displaying profitability. By contrast, the mean and median measures for the SEO firms are -4.1% and 5.0%, respectively, with 60.1% showing positive net income. The median BHAR (-12,-1) of PIPE firms is -16.4%, while the median BHAR (-12,-1) of SEO firms is 8.7%.

Table 1 also shows that the inverse price elasticity of PIPE firms is significantly greater than that of SEO firms. Our sample PIPE offerings show a mean measure of 2.2, with a median of 1.1, while the SEO firms display statistics of 0.4 and 0.2, respectively. Hence, a given percentage increase in shares can be expected to lead to a larger price pressure in the aftermarket for PIPE issuers.

**[Insert Table 2 here]**

Table 2 reports our univariate cost data. Some PIPEs are conducted directly by firms without employing placement agents and thus have zero agent fees. For those PIPEs who do utilize agents, the mean and median agent fees are both 6.0%, while the mean and median gross spread for SEOs are 4.7% and 5.0%, respectively. The data also show that PIPEs typically involve much larger discounts than do SEOs. PIPE issuers offer an average discount of 16.4%, almost four times the average discount of 4.4% for SEOs.

The univariate comparison of actual costs shown in Table 2 may be initially misleading if one assumes that it is primarily the method itself which is responsible for the observed cost differences. In particular, it is not correct to automatically assume that if the average PIPE issuer would have chosen the alternative form, a dramatic reduction in indirect costs would be realized. Instead, it is important to consider that the larger indirect costs observed with PIPEs result from a negotiated sale where the selling firm has specialized characteristics and where the buyer has access to specialized information obtained through due diligence. Likewise, it is equally important to realize that the amount of the discount, had the public issuance form been chosen instead, is unobservable and that it could potentially be quite substantial. In the next section, we control for this self-selection issue using the Lee (1978) model.

## 5. Empirical evidence

### *5.1. Controlling for self-selection*

Our cost minimization hypothesis suggests that the choice between competing issuance forms is influenced by issuance costs. Here we explore this implication by first

addressing the potential for a self-selection bias. Specifically, we adopt the two-stage estimation procedure developed by Lee (1978) for this purpose.

The initial step in this process is to specify the structural choice model as follows:

$$Y_i = \beta_0 + \beta_1(F_{PIPEi} - F_{SEOi}) + \beta_2(D_{PIPEi} - D_{SEOi}) + \gamma(FQ) + \delta(Mkt) + \phi(Control) + e_i \quad (1)$$

where $Y_i$ is the binary dependent variable for offer i which takes the value of one when a PIPE is selected, and zero otherwise. The independent variables $F_{PIPEi}$ and $F_{SEOi}$ are the agent fee of a PIPE offer and the gross spread of an SEO, respectively. Similarly, the independent variables $D_{PIPEi}$ and $D_{SEOi}$ represent the respective discount for each offer type. *FQ* represents a set of firm quality variables relating to information asymmetry and performance. We use three measures of information asymmetry which are comprised of a firm's total assets, its analyst coverage, and its spread, all measured in natural log form. The explanatory factor *Mkt* represents a set of variables relating to potential undervaluation, which include the issuing firm's BHAR (-6,-1), the industry's median market-to-book ratio over the last 6 months, and the market's BHR (-6,-1). Lastly, our control variables include the firm's inverse stock price elasticity as well as both year and industry dummies.

The structural choice model (1) cannot be estimated directly because we cannot observe what the offering costs would have been if the alternative offering method had been chosen. As a consequence, we employ a two-stage procedure to develop estimates for these measures. The regression models for direct costs (PIPE agent fees or SEO gross spreads as indicated with the dependent variable F) and indirect costs (PIPE discounts or SEO discounts as indicated with the dependent variable D) are specified as:

$$F_{PIPEi} = \alpha_{PF} + \beta_{PF} X_{Pi} + e_{PFi}, \quad (2)$$

$$D_{PIPEi} = \alpha_{PD} + \beta_{PD} Y_{Pi} + e_{PDi}, \quad (3)$$

$$F_{SEOi} = \alpha_{SF} + \beta_{SF} X_{Si} + e_{SFi}, \quad (4)$$

$$D_{SEOi} = \alpha_{SD} + \beta_{SD} Y_{Si} + e_{SDi}, \quad (5)$$

where $X_{Pi}$ and $X_{Si}$ are a vector of explanatory variables that relate to the direct cost for a PIPE offer and an SEO, respectively. Similarly, $Y_{Pi}$ and $Y_{Si}$ are a vector of explanatory variables that relate to the discount for a PIPE offer and an SEO, respectively.

Our specifications for discounts and gross spreads are primarily based on prior studies. There is a large body of literature analyzing the determinants of SEO discounts (see, for example, Altinkilic and Hansen (2003), Corwin (2003), and Mola and Loughran (2004)) and gross spreads (see, for example, Altinkilic and Hansen (2000) and Butler, Grullon, and Weston (2005)). These studies document that issuer information asymmetry and offer size impact the magnitude of SEO discounts and gross spreads. A more limited literature exists with regard to private placement discounts (see, for example, Hertzel and Smith (1993), Wu (2004), Dai (2007), and Brophy, Ouimet, and Sialm (2009)). These studies find that the information environment of issuers and offer size impact the observed discount. Furthermore, Dai (2007) and Brophy, Ouimet, and Sialm (2009) show that investor identity has an impact on the magnitude of PIPE discounts. For instance, hedge funds (HF) typically charge higher discounts than other types of PIPE investors. We include a HF dummy which is equal to one if the lead investor (who invested the greatest percentage) is a hedge fund. There is little consensus, however, surrounding the

determinants of agent fees in the private placement market. Consequently, we employ explanatory factors for PIPEs that are known to impact the gross spreads of SEOs. These factors include *Ln(Assets), Ln(Anlayst), Ln(spread)* to control for the information environment, and *Ln (Proceeds)* as a control for the offer size. In all cost specifications, we also include industry and year dummies.

The next step in the Lee (1978) procedure is to specify the reduced-form model as follows:

$$R_i = \alpha + \lambda \Psi_i + e_i^*, \qquad (6)$$

where $\Psi$ is the union of variables *X* and *Y* from equations (2) through (5) along with additional control variables in the structural choice model (1). These additional variables include our proxies for undervaluation comprised of the issuing firm's BHAR (-6,-1), the industry's median market-to-book ratio over the last 6 months, and the market's BHR (-6,-1); along with our previously used measures for inverse elasticity and issuer profitability.

**[Insert Table 3 here]**

Estimates from the reduced-form choice model are presented in Table 3. The data indicate that all variables related to the last resort hypothesis show statistical significance in the anticipated direction. Additionally, all proxies for undervaluation are significant and negatively associated with the selection of a PIPE issuance. Lastly, the estimates also reveal that the preference for a PIPE is increasing in the inverse elasticity of the firm..

We next estimate the inverse Mills ratios for all sample firms based on the regression model (5) reported in Table 3 and analyze the determinants of PIPE and SEO costs by adding this estimate to our second-stage OLS regressions.[9] Initial cost estimates, in total and by component, are then determined for both issuance forms. In doing so, we use the established norm of excluding the inverse Mills ratio whose unique purpose is to adjust for a potential bias in the regressions errors.

The remaining adjustment in developing cost estimates is relevant solely for estimating the alternative direct cost for our SEO sample. In order to estimate this component, we need to consider whether it is likely that a placement agent would have been involved. By definition, the direct cost would be zero if the agent were to be bypassed as the entire compensation to the buyer would be blended with the discount. We address this issue by fitting a probit regression to our PIPE sample and subsequently obtain the fitted probability for SEO firms had they used this form.[10] The final direct cost measure is then defined as the probability weighted average of the forecasted agent fee.

**[Insert Table 4 here]**

Table 4 reports mean projected costs for PIPEs and SEOs as well as their actual costs. Since our structural model (1) is defined in terms of differences in projected costs, our discussion here focuses on this comparison. We also present the percentage of firms who would have lowered their total cost, as well as each of the component costs, by using the alternative issuance process.

[9] The self-selection adjusted regression results for gross spreads and agent fees, as well as those for discounts, are available upon request.

[10] We borrow the model from Dai, Jo, and Schatzberg (2009), who study the matching of placement agent and PIPE issuers. The estimation result is available upon request.

For firms that chose SEOs, the direct cost would have been 4.3% had PIPEs been used, compared to the projected SEO gross spread of around 6.0%. For firms that chose PIPEs, the direct cost would have been 7.9% had SEOs been used, compared to the projected PIPE direct cost of 5.2%. For 73.1% of the SEO firms, the direct cost would have been reduced had PIPEs been used; for all the PIPE firms, the direct cost would have been higher had SEOs been used. The projected reduction in direct costs for the majority of SEO issuers is not completely unexpected given that agent fees may be bypassed with a direct PIPE. Additionally, since SEOs typically involve a larger offer size than do PIPEs (see Table 1), underwriters could be charging a fee premium for their extra efforts related to wide road shows and marketing.[11]

For firms that chose SEOs, the indirect cost or discount would have been 7.6% had the PIPE form been used, compared to the projected SEO discount of 2.0%. For firms that chose PIPEs, the indirect cost would have been 2.7% had SEOs been used, compared to the projected PIPE indirect cost of 13.0%. For only 0.2% of the SEO firms, indirect cost would have been lower had PIPEs been used; for 99.8% of PIPE firms, indirect cost would have been lower had SEOs been used. We suspect that these cost differences likely result from the added risk premia demanded by PIPE investors given the differential information environment previously documented in Table 1 and Table 3.

The projected total cost for firms that chose SEOs would have been 11.9% had PIPEs been used, compared to the projected SEO total cost of 8.0%. The projected total cost for firms that chose PIPEs would have been 10.5% had SEOs been used, compared to the projected PIPE total cost of 18.2%. For 24.6% of the SEO firms, the total cost would have been lower had PIPEs been used; for 85.7% of PIPE firms, the total cost would have

[11] We would like to thank the referee for this suggestion.

been lower had SEOs been used. These percentages suggest that, apart from cost considerations, there exist other factors which also impact the issuance type (e.g., the relative level of information asymmetry and operating performance as shown in our reduced-form model). For firms that have conducted PIPEs, these other factors likely dominate cost considerations.

In the next section, we analyze the impact of projected cost differences on the choice decision using our structural model (1) and explore when a PIPE is likely to be the more cost-effective mechanism in terms of individual firm characteristics.

### *5.2. The equity issuance choice: PIPEs versus SEOs*

#### *5.2.1. Structural model estimates*

Table 5 provides the estimation from our structural model. The dependent variable is a choice variable set to one if a PIPE is selected, and zero otherwise. The main variables of interest relate to information asymmetry and operating performance, prior performance in the equity market both at the firm and market levels, and projected cost differentials estimated using the Lee model.

**[Insert Table 5 here]**

The estimates from our structural model provide evidence consistent with both the last resort hypothesis and the undervaluation hypothesis. Firms possessing characteristics consistent with greater information asymmetry (e.g., smaller size, less analyst coverage, and a greater price spread), along with firms displaying a lower level of operating performance are more likely to conduct PIPE offerings. The effects are also economically significant. For instance, a firm with a negative net income is 22.1% more likely to

choose a PIPE if other aspects remain constant. Additionally, firms are more likely to choose a PIPE when the potential for undervaluation is high. The data indicate that the firm's stock BHAR (-6,-1) and the market BHR (-6,-1) are negatively associated with the probability of utilizing a PIPE. [12] Specifically, a one standard deviation decline in a firm's BHAR (-6,-1) increases the probability that a firm favors a PIPE by about 9.5%, while a one standard deviation decline in the market BHR (-6,-1) increases the probability that a firm favors a PIPE by about 4.2%. These findings suggest firms are more likely to turn to private investors when the equity market performance has been poor and the likelihood for undervaluation may be accentuated.

The cost minimization hypothesis suggests that managers will discriminate at the margin on the basis of costs. Recall that our tests are conducted in terms of cost differentials defined as the projected total cost for the PIPE offering minus the similar measure for the SEO. The hypothesis predicts a negative estimated coefficient on the cost differential since the likelihood of a PIPE should increase given a relative decrease in the forecasted cost differential. Table 5 shows that the coefficient estimate is statistically significant and of the correct sign to support the cost minimization hypothesis.

Our previous results of Table 4 suggest that, for many firms, an SEO appears the more cost effective alternative. We next investigate the extent to which a potential cost advantage for a PIPE may impact the choice of issuance type. Our technique employs a dummy variable, *Total Cost Reduced by PIPE,* which is set to one if the total PIPE cost is lower than that of the SEO, and zero otherwise. The observed positive coefficient on this explanatory variable, shown in column 2 of Table 5, suggests that firms are more likely to

[12] We conduct robustness checks both by examining the sensitivity of our results to the use of the value-weighted market index and by altering our buy-and-hold return interval to 3 and 12 months, respectively, prior to the offering. The results are qualitatively similar and available upon request.

choose the PIPE form when it offers a reduction in issuance expenses. When this condition holds, the probability that a firm chooses a PIPE, rather than an SEO, increases by 19.7%.

**[Insert Table 6 here]**

We next segment our 2,087 PIPE firms into a group of 296 where our projections indicate that costs were minimized and a larger group of 1,781 where our projections suggest the contrary. Table 6 contrasts the respective means and medians of selected firm and offer characteristics between these two groups. The data show that PIPE firms who are cost minimizers share many of the same traits as SEO firms. In particular, these firms display properties consistent with a lower degree of information asymmetry (e.g., larger size, more analyst coverage, and a smaller trading spread) as well as enhanced operating profitability relative to their counterparts. We conjecture that these firms are more likely to have access to the SEO market and that cost considerations are thus relevant for their issuance choice. In contrast, we suspect the second group of PIPE issuers turns to this market as they have no alternative equity financing option and must accept the more costly selling mechanism.

*5.2.2. A robustness check using a sample of firms that conducted both an SEO and a PIPE offering within a 1-year interval*

Here we apply a robustness check using a sample of firms that have conducted both issuance forms within a 1-year interval. The first specification within Panel A of Table 7 is our reduced-form model. For this group of firms, we find that a majority of the variables representing information asymmetry, such as *Ln (Assets), Ln (Analyst), Ln*

*(Spread)*, are no longer found to be significant. We do find, however, that firms with better operating performance continue to be more likely to choose SEOs. As in our previous full sample tests using the full sample, the firm's stock performance and the condition of the overall equity market continue to be significantly and negatively associated with the choice of a PIPE.

**[Insert Table 7 here]**

The second and third specifications within Panel A of Table 7 utilize the structural model and include two additional explanatory variables, Difference in Total Cost and Total Cost Reduced by PIPE dummy, following the procedures of Section 5.1. Once again, our results indicate that for firms with access to both the SEO and the PIPE markets, PIPEs are preferred when the potential of undervaluation is high. Furthermore, the negative coefficient on the PIPE minus SEO cost differential, as well as the positive coefficient on the *Total Cost Reduced by PIPE* dummy, again provide support that some firms select this equity selling mechanism as a function of cost considerations.

Panel B of Table 7 provides a cost comparison in the manner of our earlier Table 4. Here we find that for 18.5% of the SEO firms, the total offering cost would have been reduced had the alternative been chosen. Symmetrically, we also find that 69.7% of PIPE issuers might have lowered their total issuance cost had they instead selected an SEO.

This set of robustness checks demonstrates that issuers with likely access to both markets are more likely to choose PIPEs when the potential of undervaluation is high as proxied for by firm-specific and general market movements. Our finding is consistent with Hertzel and Smith (1993) and suggests that the due diligence provided by private investors helps reduce undervaluation and that firms are more likely to turn to private

investors when they are undervalued. Furthermore, for this set of firms, offering cost is also a relevant criterion in the choice decision. Specifically, firms are more likely to choose PIPEs when this transaction type reduces total costs.

*5.2.3. Returns to common stocks of companies that issue PIPEs and SEOs*

The previous literature has shown that the short-term market reaction around the announcement of SEO issuance is significantly negative while it is significantly positive for the announcement of private placements. Several explanations may account for this latter result. Investors may be pleasantly surprised at the access to capital for these firms, which as a group, are noted for their poor operating and financial market performance.[13] As previously mentioned, it may also be that private placement issuers are undervalued and that the due diligence of investors helps reveal this information to the market (Hertzel and Smith, 1993). A final explanation concerns the monitoring effect which suggests that the positive market reaction is associated with an increase in ownership concentration (Wruck, 1989). Barclay, Holderness, and Sheehan (2007), however, show that private placement investors are typically passive despite their acquisition of block stakes.

**[Insert Table 8 here.]**

Here we examine the returns to common stocks of PIPE and SEO issuers around the announcement and up to 500 trading days following the issuance.[14] Panel A of Table 8 presents mean and median buy-and-hold raw returns (Raw BHR) as well as market-adjusted abnormal returns using both the value-weighted (VW BHAR) and equal-weighted (EW BHAR) market indices for PIPEs and SEOs, respectively. The announcement term market reaction to primary SEO announcements, measured from day

[13] We thank an anonymous referee for this insight.
[14] We use the same time intervals for the event study as shown in Brophy, Ouimet, and Sialm (2008) for comparison purposes.

-4 to day +5 relative to the event, is significantly negative across all measures. In contrast, the similar returns for PIPE issuers are all significantly positive with the means ranging from 5.5% for the EW BHAR to 6.7% for the Raw BHR. Some positive skewness is evident in these measures as the corresponding medians are in the 1% to 2% range while remaining statistically significant. These findings are consistent with the notion that PIPE issuers are likely undervalued and that the investment by PIPE investors sends the market a positive signal regarding the true value of the firm. As would be anticipated from the individual component findings, the computed differences in the means and medians, as provided in the third column for each measure, are statistically significant.

We also investigate three return intervals beyond the 10-day announcement term. Our findings are generally consistent with the existing literature and show that the long-run performance of common stocks for both SEO and PIPE issuers are typically negative with the PIPE investors experiencing the greater loss. As an example, the long-term return measured from day +6 to day +500 relative to the event, shows a median EW BHAR for SEOs of -41.8% and a corresponding measure for PIPEs of -69.3%. This evidence provides some degree of weakness to the undervaluation hypothesis.

Our robustness check presented in Section 5.2.2 suggests that issuers with likely access to both the SEO and PIPE markets are more likely to choose PIPEs when the potential of undervaluation (proxied for by firm-specific and general market movements prior to the issuance) is high. In Panel B of Table 8, we calculate holding-period returns for PIPEs offered by firms that had conducted both PIPEs and SEOs within a 1-year interval. If undervaluation is an important determining factor in the choice of equity

selling mechanisms when firms can access to both the SEO and PIPE markets, we would expect that these firms would have positive announcement returns and non-negative long-run performance.

Here we observe only weak support for the undervaluation hypothesis which is dependent upon the length of the holding period and the specific measure of stock returns. As shown in Panel B of Table 8, the 10-day announcement period returns of firms that have access to both markets are significantly positive but not significantly different from the other PIPE issuers. In contrast, the longer period returns to the joint PIPE/SEO issuers are significantly better than those of the PIPE only issuers. Furthermore, most of the returns of the former group have positive means, which are to some extent supportive of the notion that this group of firms are undervalued before the PIPE, nevertheless, they have negative medians although not significantly different from zero with the exception of the equal-weighted abnormal returns for the [6,250] period.

The literature provides various explanations for the long run performance following SEOs and private placements. For instance, Loughran and Ritter (1997) argue that the poor post-SEO stock performance reflects investors' disappointment that the favorable performance of stocks prior to the SEO does not continue after the issuance. In a related study investigating the poor stock performance following private placements, Hertzel et al (2002) suggest that investors are overly-optimistic that the performance of the issuers will improve in the future. Dai (2007) and Brophy, Ouimet, and Sialm (2009) show that investor identity has an important influence on the long run performance following PIPEs. Specifically, PIPEs invested by venture capital and private equity funds have positive long-run stock returns, while those invested by hedge funds have

significantly negative long-run stock performance. It is not our intention here to extensively examine the post-issuance long-run stock performance; nevertheless, these returns are not fully understood, and as such, represent an interesting topic for future research.

## 6. A robustness check of the last resort hypothesis using a sample of withdrawn SEOs

This section conducts a robustness check of the last resort hypothesis by examining an initial sample of 236 withdrawn SEOs during the period 1996-2003. Among these 236 failed offerings, 40 firms subsequently returned to the SEO market and successfully raised follow-on funds, 23 firms switched to a successful offering in the PIPE market, and the remaining firms were not listed within our data source for either form of follow-on financing.

**[Insert Table 9 here]**

Table 9 presents characteristics pertaining to both the failed and subsequently successful offers (Panel A), the firms at the time of the withdrawn offering (Panel B), and the firms at the time of the successful follow-on financing (Panel C). As shown in Panel B, firms that switched to the PIPE market appear to possess greater information asymmetry and exhibit weaker operating performance than firms that chose to return to the public market. As implied by the corresponding means and medians presented in Panel A, these firms that switched forms were only able to raise a small fraction of what they had originally attempted in the former public filing. This contrasts with the firms who returned to the SEO market where the corresponding statistics display a slight

increase. One potential explanation for the latter finding is that those firms returning to the SEO market may have been timing the market in hopes of achieving a higher offering price. On the other hand, firms that switched to the PIPE market may have been denied access to a second attempt at the SEO market due to their individual characteristics. The tests which follow provide consistency with this latter interpretation for PIPE firms.

We next provide a series of maximum likelihood estimations in order to test the robustness of our last resort hypothesis on a sample of withdrawn SEOs. As with our earlier methodology, we utilize a probit model to study the observed outcome. The dependent variable is a choice variable set to one if the firm subsequently selects the PIPE market for its follow-on equity financing, and zero otherwise. Our independent variables are similar to those used in our earlier tests and include measures related to information asymmetry, operating performance, inverse stock price elasticity, and prior financial market condition.

**[Insert Table 10 here]**

The results presented in Table 10 are similar to those presented earlier and support our last resort hypothesis. The estimates show that smaller firms, firms with less analyst coverage, firms with a greater price spread, and firms with weaker operating performance are more likely to switch to the PIPE market after withdrawing their SEOs. These findings suggest that PIPEs provide an alternative financing option for firms that are unsuccessful in raising equity capital from the traditional SEO market.

## 7. Conclusions

The PIPE market has recently shown substantial growth and has become an important mechanism for obtaining follow-on equity capital for U.S. corporations. The aim of the current paper is to explore and empirically test three potential explanations relating to the relative attractiveness of this market as compared to the more traditional SEO market. The first of our hypotheses, the last resort hypothesis, views the PIPE market as an avenue which is accessible to firms with attributes that might otherwise prove unattractive to public investors. Our second hypothesis relates to undervaluation and suggests that the issuance choice is influenced by both firm-specific and general stock market conditions. Our third hypothesis posits that management will choose the less costly mechanism between the two issuance types.

Our empirical findings show that firms which utilize the PIPE process have weak operating performance and display characteristics consistent with high levels of information asymmetry. In this sense, the PIPE market rises as a supplement to the traditional SEO market. We also show the firm's stock performance and general market condition are negatively associated with the choice of a PIPE, suggesting that firms are more likely to turn to private investors when the potential for undervaluation is high. Additionally, our results show that the likelihood of selecting a PIPE is enhanced when it offers a relative cost advantage.

Since most of the PIPE firms are likely denied access to the SEO market given their high level of information asymmetry and weak operating performance, an SEO should not be considered a true alternative for these issuers. To evaluate the relative importance of last resort financing, undervaluation, and cost considerations when firms have access to both markets, we conduct a robustness check using a sample of firms that utilize both

offering types within a 1-year interval. As could be expected given the conditioning upon access to the SEO market, the explanatory power of our variables related to the last resort hypothesis is limited. The data do, however, suggest that potential undervaluation may be relevant when firms select between alternative mechanisms. In addition, a reduction in total cost also increases the likelihood of favoring a PIPE for selected firms.

Our analysis concludes with a final robustness test concerning the last resort hypothesis. Here we examine a subsample of firms, conditioned on a withdrawn SEO, who successfully raise new equity capital with either a subsequent PIPE or a second-attempt SEO offering. Our results here are consistent with our prior full-sample tests and suggest that those firms possessing either a weak information environment or a diminished level of operating profitability are those most likely to be attracted to private market financing.

Overall, our analysis suggests that an equity issuance in the private market may be preferred to a public sale in those cases where a cost advantage exists, and to some degree, when the potential for undervaluation is high. In other situations, however, we posit that this venue represents the only follow-on equity mechanism available for firms with characteristics unattractive to public investors.

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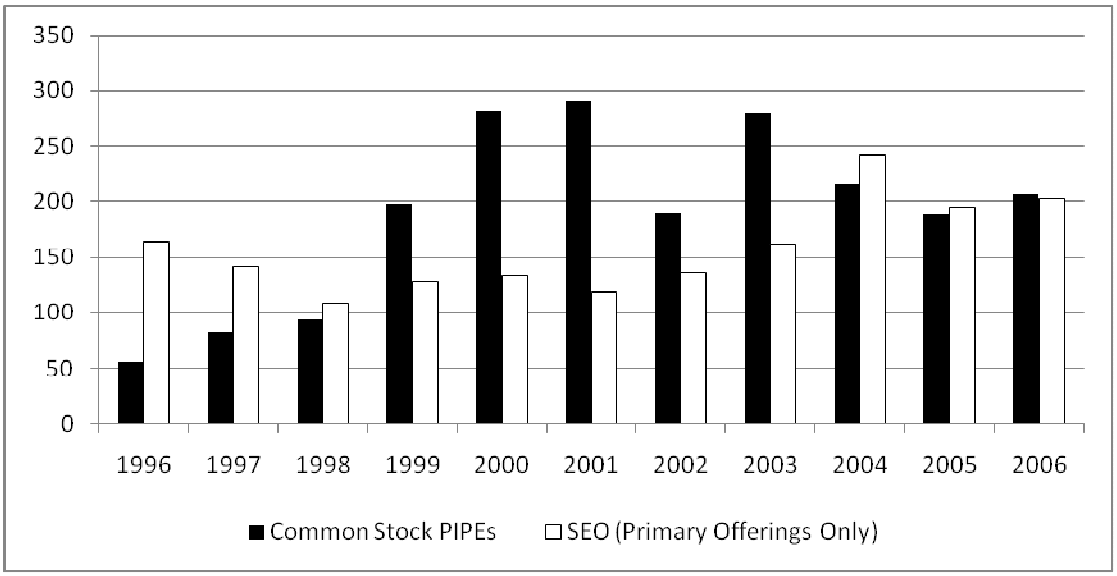


Figure 1. The Volume (number of transactions) of Common Stock PIPEs and SEOs (primary offerings only) 1996-2006

## Table 1
Summary Statistics

This table reports means (medians) from 2,087 common stock PIPEs and 1,734 common stock SEOs (primary offerings only) during the period 1996-2006. Book value of assets is obtained from the most recent fiscal year-end prior to the issuance. Analyst coverage is the number of analysts following the firm in the calendar year before the offering. Spread is the average daily spread, measured as 100(1-bid/ask) in the last 12 months. Book value of assets and EBITDA/Assets reflect the previous fiscal year-end. BHAR (-6,-1) and BHAR (-12,-1) are the buy-and-hold abnormal returns adjusted by the equal-weighted market return in the last 6 or 12 months. Inverse elasticity is measured as the ratio of the discount to the fraction of shares offered. Relative offer size is calculated as the ratio of shares issued to shares outstanding after the offering. *P*-values represent significance levels for tests of differences between means and medians across groups.

| | PIPEs | SEOs | p-Value of Difference |
|---|---|---|---|
| Book value of assets ($ million) | 630.5 | 3,728.8 | 0.000 |
| | (30.1) | (440.1) | 0.000 |
| Analyst coverage | 1.8 | 6.4 | 0.000 |
| | (1.0) | (4.0) | 0.000 |
| Percentage with any analyst coverage | 51.9% | 85.5% | 0.000 |
| Spread | 6.1 | 3.3 | 0.000 |
| | (6.4) | (2.6) | 0.000 |
| EBITDA/Assets | -39.2% | -4.1% | 0.000 |
| | (-23.8%) | (5.0%) | 0.000 |
| Percentage of Profitable Issuers | 18.5% | 60.1% | 0.000 |
| BHAR (-6,-1) | 11.1% | 24.0% | 0.000 |
| | (-6.0%) | (7.6%) | 0.000 |
| BHAR (-12,-1) | 10.7% | 42.2% | 0.000 |
| | (-16.4%) | (8.7%) | 0.000 |
| Inverse Elasticity | 2.2 | 0.4 | 0.000 |
| | (1.1) | (0.2) | 0.000 |
| Gross proceeds ($ million) | 20.9 | 143.6 | 0.000 |
| | (7.9) | (75.0) | 0.000 |
| Relative offer size (Fraction placed) | 15.0% | 14.1% | 0.067 |
| | (10.8%) | (12.4%) | 0.000 |
| N | 2,087 | 1,734 | 0.000 |

## Table 2
Costs of Raising Capital by Offer Size

This table reports mean cost components for PIPEs and SEOs segmented by offering size. Panel A reports direct costs defined as the fee that underwriters/placement agents charge issuers as a percentage of the gross proceeds. Panel B reports indirect costs or discounts measured as the percentage difference between the closing price on the day before the offering and the offer price.[1]

**Panel A: Direct Cost**

| proceeds | PIPEs | | PIPEs with Agents | | SEOs | |
|---|---|---|---|---|---|---|
| ($ million) | N | Agent Fee (%) | N | Agent Fee (%) | N | Gross Spreads (%) |
| <9.9 | 917 | 3.5 | 470 | 6.7 | 40 | 6.9 |
| 10-19.99 | 362 | 4.0 | 245 | 5.8 | 123 | 6.2 |
| 20-39.99 | 232 | 4.0 | 172 | 5.4 | 273 | 5.3 |
| 40-59.99 | 73 | 3.8 | 54 | 5.1 | 243 | 5.1 |
| 60-79.99 | 38 | 3.0 | 22 | 5.2 | 218 | 4.9 |
| 80-99.99 | 11 | 2.2 | 5 | 4.9 | 135 | 4.7 |
| 100-199.99 | 38 | 1.5 | 25 | 2.4 | 344 | 4.4 |
| 200-499.99 | 11 | 1.2 | 3 | 4.3 | 209 | 3.4 |
| 500-up | 5 | 0 | 1 | 2 | 77 | 2.9 |
| Mean | 1687 | 3.6 | 997 | 6.0 | 1662 | 4.7 |
| Median | 1687 | 3.9 | 997 | 6.0 | 1662 | 5.0 |

**Panel B: Indirect Cost**

| proceeds | PIPEs | | PIPEs with Agents | | SEOs | |
|---|---|---|---|---|---|---|
| ($ million) | N | Discounts (%) | N | Discounts (%) | N | Discounts (%) |
| <9.9 | 1161 | 19.1 | 714 | 23.8 | 44 | 9.2 |
| 10-19.99 | 437 | 15.2 | 320 | 18.5 | 127 | 8.1 |
| 20-39.99 | 272 | 12.5 | 212 | 15.4 | 283 | 6.0 |
| 40-59.99 | 94 | 12.1 | 75 | 13.4 | 245 | 4.4 |
| 60-79.99 | 45 | 8.6 | 29 | 10.0 | 222 | 3.6 |
| 80-99.99 | 14 | 9.1 | 8 | 5.1 | 143 | 3.5 |
| 100-199.99 | 45 | 6.3 | 32 | 5.8 | 357 | 3.0 |
| 200-499.99 | 13 | 1.0 | 5 | 12.4 | 225 | 2.3 |
| 500-up | 6 | 3.9 | 2 | 0.3 | 89 | 5.4 |
| Mean | 2087 | 16.4 | 1397 | 19.9 | 1734 | 4.4 |
| Median | 2087 | 12.2 | 1397 | 14.9 | 1734 | 2.9 |

[1] The sample sizes in Panel A are smaller than those in Panel B because some transactions have discount data but do not have gross spread or agent fee data. The first column in both Panel A and Panel B include both direct PIPEs and intermediated PIPEs, while the second column in both Panel A and Panel B only include intermediated PIPEs.

## Table 3
The Reduced-form Choice Model for SEOs and PIPEs

We employ a maximum likelihood estimation of a probit regression where the dependent variable is the choice variable, which is set to one if a PIPE is chosen, and zero otherwise. Book value of assets is obtained from the most recent fiscal year-end prior to the offering. Analyst coverage reflects the number of analysts following the firm in the calendar year immediately before the offering. Spread is the average daily spread, measured as 100(1-bid/ask), in the last 12 months. Profitable Dummy is an indicator variable which is set to one if the issuer has positive net income in the previous fiscal year, and zero otherwise. Firm BHAR (-6,-1) is the issuer's buy and hold abnormal return adjusted by the market equal-weighted BHR (-6,-1). Industry Median M/B ratio is based on two-digit SIC code. Market BHR (-6,-1) is the market buy-and-hold return in the prior six months using the CRSP equal-weighted index. Inverse elasticity is measured as the ratio of the discount to the fraction of shares offered. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Coefficient | 2.484*** | 0.561*** | -1.018*** | 0.280** | 2.208*** |
| | (0.000) | (0.000) | (0.000) | (0.023) | (0.000) |
| *Last resort of equity financing* | | | | | |
| Ln (Assets) | -0.461*** | | | | -0.262*** |
| | (0.000) | | | | (0.000) |
| Ln (Analyst) | | -0.777*** | | | -0.451*** |
| | | (0.000) | | | (0.000) |
| Ln (Spread) | | | 0.954*** | | 0.088 |
| | | | (0.000) | | (0.178) |
| Profitable Dummy | | | | -1.016*** | -0.642*** |
| | | | | (0.000) | (0.000) |
| *Undervaluation* | | | | | |
| Firm BHAR (-6, -1) | -0.274*** | -0.301*** | -0.273*** | -0.204*** | -0.288*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Industry Median M/B | -0.132*** | -0.079* | -0.091** | -0.062 | -0.288*** |
| | (0.006) | (0.090) | (0.039) | (0.153) | (0.000) |
| Market BHR (-6,-1) | -1.140*** | -1.018*** | -1.049*** | -0.799*** | -1.164*** |
| | (0.000) | (0.002) | (0.000) | (0.000) | (0.000) |
| *Control variables* | | | | | |
| Inverse elasticity | 0.005*** | 0.007*** | 0.006*** | 0.008*** | 0.005** |
| | (0.008) | (0.001) | (0.003) | (0.000) | (0.014) |
| Year Dummy Included | Yes | Yes | Yes | Yes | Yes |
| Industry Dummy Included | Yes | Yes | Yes | Yes | Yes |
| N | 3718 | 3718 | 3718 | 3718 | 3718 |
| Adjusted $R^2$ (%) | 33.95 | 31.47 | 21.70 | 22.23 | 39.56 |

**Table 4**
Comparison of Projected and Actual Mean Component Costs and Total Costs

The sample consists of 2,087 common stock PIPEs and 1,734 SEOs (primary offerings only) during the period 1996-2006. Direct cost (gross spread or agent fee; %) is the fee that underwriters/placement agents charge issuers as a percentage of the gross proceeds. Indirect cost (discount; %) is measured as the percentage difference between the closing price on the day before offering and the offer price. The projected direct cost, indirect cost, and total cost for using the alternative offering are based on the second-stage cost regression models excluding the inverse Mills ratios.

| | **SEOs** | **PIPEs** |
|---|---|---|
| Actual direct cost | 4.7 | 3.6 |
| Projected direct cost | 6.1 | 5.2 |
| Projected direct cost if the alternative offering were used | 4.3 | 7.9 |
| The proportion of cases where direct cost would be lower if the alternative offering were used | 73.1% | 0.0% |
| Actual indirect cost | 4.4 | 16.4 |
| Projected indirect cost | 2.0 | 13.0 |
| Projected indirect cost if the alternative offering were used | 7.6 | 2.7 |
| The proportion of cases where indirect cost would be lower if the alternative offering were used | 0.2% | 99.8% |
| Actual total cost | 8.7 | 15.2 |
| Projected total cost | 8.0 | 18.2 |
| Projected total cost if the alternative offering were used | 11.9 | 10.5 |
| The proportion of cases where total cost would be lower if the alternative offering were used | 24.6% | 85.7% |
| N | 1,734 | 2,087 |

## Table 5
The Structural Choice Model for SEOs and PIPEs

We employ a maximum likelihood estimation of a probit regression where the dependent variable is set to one if a PIPE is employed, and zero otherwise. Book value of assets is obtained from the most recent fiscal year-end relative to the issuance. Analyst coverage reflects the number of analysts following the firm in the calendar year immediately before the offering. Spread is the average daily spread, measured as 100(1-bid/ask), in the last 12 months. Profitable Dummy is an indicator variable which is set to one if the issuer has positive net income in the previous fiscal year, and zero otherwise. Firm BHAR (-6,-1) is the issuer's buy and hold abnormal return adjusted by the market equal-weighted BHR (-6,-1). Industry Median M/B ratio is based on two-digit SIC code. Market BHR (-6,-1) is the market buy-and-hold return in the prior six months using the CRSP equal-weighted index. *Difference in Total Cost* is the difference between projected PIPE total cost and the projected SEO total cost. *Total Cost Reduced by PIPE* is a dummy variable which is equal to one if the total cost of PIPE is lower than SEO for the same firm and zero otherwise. Inverse elasticity is measured as the ratio of the discount to the fraction of shares offered. The p-values are reported in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

| | (1) | (2) |
|---|---|---|
| Coefficient | 2.353*** | 1.918*** |
| | (0.000) | (0.000) |
| *Last resort of equity financing* | | |
| Ln (Assets) | -0.281*** | -0.262*** |
| | (0.000) | (0.000) |
| Ln (Analyst) | -0.471*** | -0.454*** |
| | (0.000) | (0.000) |
| Ln (Spread) | 0.722*** | 0.698*** |
| | (0.000) | (0.000) |
| Profitable Dummy | -0.563*** | -0.533*** |
| | (0.000) | (0.000) |
| *Undervaluation* | | |
| Firm BHAR (-6, -1) | -0.279*** | -0.292*** |
| | (0.000) | (0.000) |
| Industry Median M/B | -0.089* | -0.075 |
| | (0.084) | (0.146) |
| Market BHR (-6,-1) | -0.717*** | -0.716*** |
| | (0.002) | (0.002) |
| *Cost Minimization* | | |
| Difference in Total Cost | -0.036*** | |
| | (0.000) | |
| Total Cost Reduced by PIPE | | 0.523*** |
| | | (0.000) |
| *Control Variables* | | |
| Inverse Elasticity | 0.004** | 0.005** |
| | (0.037) | (0.023) |
| Year Dummy Included | Yes | Yes |
| Industry Dummy Included | Yes | Yes |
| N | 3715 | 3715 |
| Adjusted $R^2$ (%) | 43.24 | 43.68 |

## Table 6

Selected Characteristics of PIPE Issuers by Projected Cost Minimization

This table reports selected characteristics of PIPE issuances conditioned on whether or not costs are minimized relative to the alternative of an SEO. Book value of assets is obtained from the most recent fiscal year-end prior to the issuance. Analyst coverage is the number of analysts following the firm in the calendar year before the offering. Spread is the average daily spread, measured as 100(1-bid/ask) in the last 12 months. Book value of assets and EBITDA/Assets reflect the previous fiscal year-end. BHAR (-6,-1) and BHAR (-12,-1) are the buy-and-hold abnormal returns adjusted by the equal-weighted market return in the last 6 or 12 months. Inverse elasticity is measured as the ratio of the discount to the fraction of shares offered. Discount is measured as the percentage difference between closing price the day before offering and offer price. Fraction offered is calculated as the ratio of shares issued to the shares outstanding after the offering. Medians are reported in parentheses. *P*-values of differences between means and medians are also reported.

| | Firms chose PIPEs and minimized cost | Firms chose PIPEs and paid higher cost | p-Value of Difference |
|---|---|---|---|
| Book value of assets ($ million) | 3436.2 | 166.7 | 0.214 |
| | (99.7) | (25.5) | 0.000 |
| Analyst coverage | 3.5 | 1.5 | 0.000 |
| | (2.0) | (0.0) | 0.000 |
| Percentage with any analyst coverage | 71.6% | 49.9% | 0.000 |
| Spread | 3.7 | 6.4 | 0.000 |
| | (2.3) | (6.7) | 0.000 |
| EBITDA/Assets | -20.1% | -42.3% | 0.000 |
| | (-6.1%) | (-27.5%) | 0.000 |
| Percentage of Profitable Issuers | 30.1% | 16.6% | 0.000 |
| BHAR (-6,-1) | -5.7% | 13.9% | 0.000 |
| | (-9.1%) | (-5.31%) | 0.010 |
| BHAR (-12,-1) | -8.9% | 13.9% | 0.000 |
| | (-20.9%) | (-16.4%) | 0.065 |
| Inverse Elasticity | 0.2 | 2.5 | 0.217 |
| | (0.2) | (1.2) | 0.000 |
| Gross proceeds ($ million) | 37.9 | 18.0 | 0.000 |
| | (8.0) | (7.9) | 0.321 |
| Relative offer size (Fraction placed) | 12.0% | 15.5% | 0.038 |
| | (6.6%) | (11.5%) | 0.000 |
| N | 296 | 1,781 | 0.000 |

## Table 7

Robustness Check: Firms that Have Conducted Both PIPEs and SEOs within One Year

Panel A examines the choice between PIPE and SEO using a sample of 277 firms that conducted both offering types within a 1-year interval during the period 1996-2006. We employ a maximum likelihood estimation of a probit regression where the dependent variable is set to one if a PIPE is employed, and zero otherwise. Book value of assets is obtained from the most recent fiscal year-end relative to the issuance. Analyst coverage reflects the number of analysts following the firm in the calendar year immediately before the offering. Spread is the average daily spread, measured as 100(1-bid/ask), in the last 12 months. Profitable Dummy is an indicator variable which is set to one if the issuer has positive net income in the previous fiscal year, and zero otherwise. Firm BHAR (-6,-1) is the issuer's buy and hold abnormal return adjusted by the market equal-weighted BHR (-6,-1). Industry Median M/B ratio is based on two-digit SIC code. Market BHR (-6,-1) is the market buy-and-hold return in the prior six months using the CRSP equal-weighted index. *Difference in Total Cost* is the difference between projected PIPE total cost and the projected SEO total cost. *Total Cost Reduced by PIPE* is a dummy variable which is equal to one if the total cost of PIPE is lower than SEO for the same firm and zero otherwise. Inverse elasticity is measured as the ratio of the discount to the fraction of shares offered. The p-values are reported in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively. Panel B compares the mean projected costs for SEOs and PIPEs in the same manner as Table 4.

**Panel A: Regression Analysis**

| | Reduced-form Model | Structural Model | |
|---|---|---|---|
| | | (1) | (2) |
| Coefficient | 0.444 | 2.331 | 0.645 |
| | (0.584) | (0.449) | (0.437) |
| *Last resort of equity financing* | | | |
| Ln (Assets) | 0.046 | -0.138 | -0.024 |
| | (0.637) | (0.213) | (0.817) |
| Ln (Analyst) | -0.111 | -0.160 | -0.132 |
| | (0.479) | (0.322) | (0.402) |
| Ln (Spread) | 0.045 | 0.132 | 0.033 |
| | (0.900) | (0.723) | (0.528) |
| Profitable Dummy | -0.635** | -1.054*** | -0.770*** |
| | (0.023) | (0.001) | (0.007) |
| *Undervaluation* | | | |
| Firm BHAR (-6, -1) | -0.349*** | -0.251* | -0.320** |
| | (0.000) | (0.083) | (0.013) |
| Industry Median M/B | -0.238 | -0286 | -0.215 |
| | (0.288) | (0.221) | (0.350) |
| Stock Market Return (-6,-1) | -3.256*** | -3.290*** | -2.995*** |
| | (0.000) | (0.000) | (0.000) |
| *Cost minimization* | | | |
| Difference in Total Cost | | -0.075*** | |
| | | (0.000) | |
| Total Cost Reduced by PIPE | | 0.890** | 0.748*** |
| | | (0.033) | (0.003) |
| *Control variables* | | | |
| Inverse elasticity | 0.003 | 0.011 | 0.009 |
| | (0.894) | (0.694) | (0.738) |
| Year Dummy Included | Yes | Yes | Yes |

| | | | |
|---|---|---|---|
| Industry Dummy Included | Yes | Yes | Yes |
| N | 277 | 277 | 277 |
| Pseudo $R^2$ (%) | 16.84 | 22.48 | 19.28 |

**Panel B: Comparison of Projected Costs**

| | **SEOs** | **PIPEs** |
|---|---|---|
| Actual direct cost | 5.7 | 3.0 |
| Projected direct cost | 7.1 | 7.5 |
| Projected direct cost if the alternative offering were used | 10.6 | 7.3 |
| The proportion of cases where direct cost would be lower if the alternative offering were used | 40.0% | 57.8% |
| Actual indirect cost | 6.8 | 10.4 |
| Projected indirect cost | 1.0 | 6.9 |
| Projected indirect cost if the alternative offering were used | 6.2 | 0.9 |
| The proportion of cases where indirect cost would be lower if the alternative offering were used | 3.0% | 97.9% |
| Actual total cost | 12.3 | 10.6 |
| Projected total cost | 8.1 | 14.4 |
| Projected total cost if the alternative offering were used | 16.9 | 8.2 |
| The proportion of cases where total cost would be lower if the alternative offering were used | 18.5% | 69.7% |
| N | 135 | 142 |

## Table 8
## Returns to Common Stocks of PIPE and SEO Issuers

Panel A presents mean (median) raw and market-adjusted holding period returns for both SEO and PIPE issuers. Panel B compares the mean (median) raw and market-adjusted holding period returns for PIPEs of firms that had conducted both PIPEs and SEOs within a 1-year interval and PIPEs of firms that had not. Returns are expressed in percentage form. The VW BHAR is computed by subtracting the value-weighted holding period market return from the corresponding raw return. The EW BHAR is computed in a similar fashion using the equal-weighted market index. Diff is computed as the mean (median) SEO return minus the corresponding measure for PIPEs. ***, **, and * indicate whether the returns, and their differences, are statistically different from zero at the 1%, 5%, and 10% significance levels.

**Panel A: SEOs vs. PIPEs**

| | Raw BHR | | | VW BHAR | | | EW BHAR | | |
|---|---|---|---|---|---|---|---|---|---|
| | SEOs | PIPEs | Diff | SEOs | PIPEs | Diff | SEOs | PIPEs | Diff |
| Announcement | | | | | | | | | |
| Period [-4,5] | -0.7** | 6.7*** | -7.4*** | -1.1*** | 6.3*** | -7.4*** | -1.6*** | 5.5*** | -7.1*** |
| | (-0.8)*** | (1.9)*** | (-2.7)*** | (-1.4)*** | (1.7)*** | (-3.1)*** | (-1.9)*** | (1.1)*** | (-3.0)*** |
| Short Term | | | | | | | | | |
| [6,100] | 3.8*** | 3.7** | 0.1 | 0.5 | 1.5 | -1.0 | -3.6*** | -4.4*** | 0.8 |
| | (1.6)** | (-7.8)*** | (9.4)*** | (-2.1)*** | (-10.1)*** | (8.0)*** | (-5.4)*** | (-15.6)*** | (10.2)*** |
| Medium Term | | | | | | | | | |
| [6,250] | 8.1*** | 2.6 | 5.5* | -1.6 | -2.4** | 1.2 | -11.7*** | -17.2*** | 5.5** |
| | (4.4)*** | (-19.7)*** | (24.1)*** | (-7.0)*** | (-24.5)*** | (17.5)*** | (-15.8)*** | (-38.6)*** | (22.8)*** |
| Long Term | | | | | | | | | |
| [6,500] | 10.9*** | 3.5 | 7.4** | -8.1*** | -6.4*** | -1.7 | -31.9*** | -38.9*** | 7.0*** |
| | (1.2)*** | (-34.3)*** | (35.5)*** | (-19.1)*** | (-37.3)*** | (18.2)*** | (-41.8)*** | (-69.3)*** | (27.5)*** |
| N | 1734 | 2087 | | 1734 | 2087 | | 1734 | 2087 | |

**Panel B: PIPEs of firms that had conducted both PIPEs and SEOs within 1 year vs. PIPEs of firms that had not**

| | Raw BHR | | | VW BHAR | | | EW BHAR | | |
|---|---|---|---|---|---|---|---|---|---|
| | Access to SEO | No-access to SEO | Diff | Access to SEO | No-access to SEO | Diff | Access to SEO | No-access to SEO | Diff |
| Announcement | | | | | | | | | |
| Period [-4,5] | 7.1*** | 6.6*** | 0.5 | 6.7*** | 6.2*** | 0.5 | 5.6*** | 5.4*** | 0.2 |
| | (3.8)*** | (1.7)*** | (2.1) | (2.2)*** | (1.6)*** | (0.6) | (1.9)** | (1.0)*** | (0.9) |
| Short Term | 19.7*** | 2.5 | 17.2*** | 15.1*** | 0.5 | 14.6*** | 7.5 | -5.3*** | 12.8** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| [6,100] | | | | | | | | | |
| | (9.4)*** | (-2.8)*** | (12.2)*** | (4.1)** | (-10.9)*** | (15.0)*** | (-2.9) | (-16.7)*** | (13.8)*** |
| Medium Term | | | | | | | | | |
| [6,250] | 39.6*** | 0.1 | 39.5*** | 33.7*** | -4.8** | 38.5*** | 16.9* | -19.5*** | 36.4*** |
| | (11.3)** | (-21.9)*** | (33.2)*** | (-1.1) | (-25.4)*** | (24.3)*** | (-14.0) | (-39.9)*** | (25.9)*** |
| Long Term | | | | | | | | | |
| [6,500] | 44.4*** | 0.6 | 43.8*** | 32.7** | -9.2*** | 41.9*** | -1.5 | -41.7*** | 40.2*** |
| | (1.9) | (-36.0)*** | (37.9)*** | (-9.1) | (-41.9)*** | (32.8)*** | (-42.5)*** | (-70.4)*** | (27.9)*** |
| N | 142 | 1945 | | 142 | 1945 | | 142 | 1945 | |

## Table 9
Follow-On Financing Subsequent to Withdrawn SEOs

The initial sample includes 236 withdrawn SEOs during the period 1996-2003. Within this sample, 40 firms subsequently were successful with a follow-on SEO offering while 23 firms switched issuance type and were successful with a follow-on PIPE offering. This table summarizes the offering and firm characteristics of these 63 firms at the time of the failed SEO and at the time of the successful follow-on equity financing. Book value of assets is obtained from the most recent fiscal year-end prior to the issuance. Analyst coverage is the number of analysts following the firm in the calendar year before the offering. Book value of assets and EBITDA/Assets reflect the previous fiscal year-end. Spread is the average daily spread, measured as 100(1-bid/ask) in the last 12 months. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

**Panel A: Offering characteristics**

| | SEO to SEO | SEO to PIPE |
|---|---|---|
| Failed offer price | 24.8 | 26.5 |
| | (20.8) | (15.9) |
| Desired gross proceeds of failed offer ($ million) | 114.2 | 60.5 |
| | (58.9) | (37.7) |
| Successful offer price | 27.0 | 18.8 |
| | (20.8)*** | (8.0)*** |
| Gross proceeds of successful offering ($ million) | 121.9*** | 18.5*** |
| | (67.3)*** | (13.1)*** |
| Years between offers | 1.1** | 2.1** |
| | (0.7) | (1.7) |
| N | 40 | 23 |

**Panel B: Firm characteristics at the time of the failed SEOs**

| | SEO to SEO | SEO to PIPE |
|---|---|---|
| Assets ($ million) | 11,660.7 | 50.8 |
| | (227.3)*** | (33.1)*** |
| Analyst Coverage | 4.3*** | 1.6*** |
| | (2.5)** | (1.5)** |
| EBITDA/Assets | -6.2% | -20.1% |
| | (11.2%)** | (-14.3%)** |
| Percentage of Profitable Firms | 61.1%** | 27.8%** |

**Panel C: Firm characteristics at the time of the successful follow-on financing**

| | SEO to SEO | SEO to PIPE |
|---|---|---|
| Assets ($ million) | 17,727.28 | 69.81 |
| | (305.3)*** | (53.6)*** |
| Analyst Coverage | 5.9*** | 2.3*** |
| | (4.0)*** | (1.0)*** |
| EBITDA/Assets | 1.8%*** | -19.5%*** |
| | (13.2%)*** | (-16.1%)*** |
| Spread | 6.9*** | 10.3*** |
| | (6.5)*** | (10.3)*** |
| Percentage of Profitable Firms | 67.50%*** | 13.04%*** |

## Table 10

The Choice of Equity Selling Mechanisms by Firms that Withdrew SEOs

We employ a maximum likelihood estimation of a probit regression. The dependent variable is the choice variable, which is set to one if the firm switched to the PIPE market, and zero if the firm returned to the SEO market. Stock market return (-6,-1) is the market buy-and-hold return in the prior six months. Inverse elasticity is measured as the ratio of the discount to the fraction offered. Discount is measured as the percentage difference between closing price the day before the offering and the offer price. Fraction offered is calculated as the ratio of shares issued to the shares outstanding after the offering. Book value of assets is obtained from the most recent fiscal year-end prior to the issuance. Analyst coverage is the number of analysts following the firm in the calendar year before the offering. Spread is the average daily spread, measured as 100(1-bid/ask) in the last 12 months. Book value of assets and EBITDA/Assets reflect the previous fiscal year-end.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Coefficient | 2.104*** | 0.491 | -5.170*** | -0.368* | -3.661* |
| | (0.002) | (0.142) | (0.000) | (0.081) | (0.083) |
| Stock Market Return (-6,-1) | -1.645 | -1.378 | -0.624 | -0.813 | -1.063 |
| | (0.301) | (0.349) | (0.699) | (0.577) | (0.536) |
| Inverse elasticity | -0.002 | -0.035 | 0.002 | -0.027 | 0.009 |
| | (0.983) | (0.677) | (0.983) | (0.745) | (0.919) |
| Last resort of equity financing | | | | | |
| Ln (Assets) | -0.500*** | | | | -0.228 |
| | (0.001) | | | | 0.258 |
| Ln (Analyst) | | -0.574*** | | | -0.248 |
| | | (0.004) | | | 0.380 |
| Ln (Spread) | | | 2.505*** | | 2.473*** |
| | | | (0.000) | | (0.005) |
| EBITDA/Assets | | | | -1.338** | 0.997 |
| | | | | (0.010) | (0.210) |
| N | 63 | 63 | 63 | 63 | 63 |
| Adjusted $R^2$ (%) | 21.16 | 11.25 | 27.99 | 8.55 | 33.57 |