Financing Under Extreme Uncertainty:

Evidence from Private Investments in Public Equities

Susan Chaplinsky*
Darden Graduate School of Business Administration
University of Virginia
Charlottesville, VA 22906
Tel: (434) 924-4810
chaplinskys@virginia.edu

David Haushalter
Smeal College of Business
The Pennsylvania State University
University Park, PA 16802
Tel: (814) 863-7969
dhaushalter@psu.edu

NOT FOR QUOTATION, Comments Welcome
First Draft: March 2003
Latest Draft: May 2005

*Corresponding Author. We thank Audra Boone, Randall Heron, Mike Hertzel, Laura Lindsey, Antonio Mello, Lei Zhou and seminar participants at the University of Wisconsin, Ohio University, West Virginia University, Miami of Ohio, SUNY Buffalo, and the 2003 FMA meetings for helpful comments. We thank the Batten Institute at the Darden Graduate School of Business Administration and individuals at Placementtracker, especially Robert Kyle, Bobbie Sue Richardson, and Tassanee Sukramule for technical and financial assistance in obtaining the data on PIPEs. Kulwant Rai provided excellent research assistance on the project.

Financing Under Extreme Uncertainty:

Evidence from Private Investments in Public Equities

Abstract

We investigate the motivations and the returns to the firms and investors using Private Investments in Public Equities (PIPE) financing, an increasingly common form of equity-based financing. From 1995-2000, 1,466 firms raised more than $29 billion through 2,626 PIPE issues. We find that PIPE issuers are poorly performing firms, urgently in need of cash that, as a consequence, are without access to traditional forms of financing. The contract terms and embedded options in PIPEs allow investors to alter their exposure to post-issue movements in the value of the issuer's equity. As a result, the returns earned by investors substantially exceed those of shareholders. Hence PIPEs provide incentives for investors to make investments in firms with substantial operating uncertainties, enabling companies barred from traditional capital markets to obtain much needed financing.

Financing Under Extreme Uncertainty: Evidence from Private Investments in Public Equities

1. Introduction

The finance literature has devoted considerable attention to financing constraints and the limitations and costs imposed on firms by a lack of external capital.[1] Companies with operating difficulties or information asymmetries frequently face hurdles in raising capital through traditional financing instruments, such as follow-on equity, public or private debt offerings. Less attention however has focused on marketplace innovations that enable firms to obtain financing in the face of these constraints.

In this study we examine an increasingly common form of equity-based financing, private investments in public equity, generally referred to as PIPEs. PIPEs are negotiated sales of securities by listed firms to private investors which can take the form of Floating Rate Convertible Debt or Preferred Stock, Convertible Resets, Common Stock Resets, Structured Equity Lines, and Common Stock PIPEs. These contracts are common stock or securities that will almost certainly convert into common stock. However, PIPEs differ from traditional equity offerings by providing terms that allow investors to achieve varying degrees of exposure to the post-issue movements in the value of an issuer's equity. From 1995-2000, 1,466 firms issued 2,626 PIPEs that raised more than $29 billion, or almost 25 percent of the public equity that companies issued during this period (see Gomes and Phillips (2004)). Since then, the PIPE market continues to exhibit strong growth with proceeds exceeding $10 billion annually. Our purpose is to investigate the motivations and the returns to firms and investors using this rapidly growing market.

The type of PIPE investments we study differs from the private placements studied by, among others, Wruck, (1989), Hertzel and Smith (1993), Barclay, Holderness, and Sheehan (2003) and Krishnamurthy, Spindt, Subramaniam, and Woidtke (2005) on several dimensions. First, although private placements usually include restricted shares that prevent investors from selling their shares in the public market for a year or longer, the equity issued via a PIPE offering can be publicly traded once it is

[1] For example, see Fazzari, Hubbard, and Petersen (1988), Kaplan and Zingales (1997), Whited (1992), and Hoshi, Kashyap, and Scharfstein (1991).

registered, typically within a few months after the PIPE transaction. Second, these studies of private placements usually eliminate issues that include warrants and those that are convertible into equity. PIPEs generally include warrants along with a wide array of other complex features. Third, Barclay, et al. (2003) document that private investors tend to be long-term shareholders who generally retain a significant ownership stake and monitoring function in the firm. Hedge funds are most frequent investors in PIPEs. These investors retain their stake in an issuer for a matter of months rather than years and tend to be passive investors who are unlikely to monitor the issuer. However, an important similarity between PIPEs and the private placements examined in the aforementioned studies is that both often represent substantial equity investments in the issuer. For example, the average proceeds from a PIPE represents approximately 16 percent of the issuer's equity compared to 17 percent of shares outstanding in Barclay, et. al (2003) and 16 percent of the value of equity in Hertzel and Smith (1993). Coupling the large stakes with the fact that PIPE investors can begin selling their shares shortly after making the investment, the liquidity of the issuer's stock will be a more important concern of PIPE investors than it is for traditional private placement investors.

We start by investigating the characteristics of companies that use this market. By almost any standard, the companies issuing PIPEs have drastically different profiles from those using more traditional forms of financing. For example, a number of studies find that firms making follow-on equity offerings experience average stock price increases of 30 percent or more in the months leading up to the issue and that earnings are positive and growing ahead of the offer.[2] Hertzel and Smith (1993) find that 80 percent of firms making private placements of equity experience positive earnings over the two years prior to issue. Similarly, as shown in Chaplinsky and Hansen (1993) and Denis and Mihov (2003), public and private debt issuers are generally profitable firms in the years prior to issue. By comparison, in the year prior to issue, more than 84 percent of PIPE issuers have negative operating cash flow and over 50

[2] For a discussion of returns and earnings around equity offerings see Heron and Lie (2004), Ritter and Loughran (1997), Korajczyk, Lucas and McDonald (1990), Asquith and Mullins (1986), Masulis and Korwar (1986), and Mikkelson and Partch (1986).

percent of the issuers experience falling stock prices. Moreover, a majority of the companies will be out of cash within a year. Therefore the PIPE market is used primarily by firms that are performing poorly, urgently in need of cash, but likely face significant hurdles raising traditional forms of financing.

To investigate how, despite the uncertainties, these companies are able to raise capital, we focus on the terms negotiated in PIPE contracts and their effect on investor returns. The structure and embedded options employed in PIPEs can differentiate the returns realized by investors from those realized by the issuer's existing shareholders. To analyze the importance of these terms, we classify five frequently issued types of PIPEs into two broad categories based on the investor's degree of exposure to the underlying value of the issuer's equity. "Price Protected" PIPEs are instruments that provide investors with significant downside protection against decreases in the issuer's stock price following the issue. For example, the conversion price of a floating rate convertible PIPE floats downward with the issuer's stock price, mitigating the effect of a decrease in stock price on the investor's principal. In contrast, "Unprotected" PIPEs offer no downside protection to investors but can offer significantly enhanced returns relative to existing shareholders in circumstances of positive post-issue stock price performance.

We find that there are substantial differences in the post-issue returns realized between existing shareholders and PIPE investors. For example, existing shareholders earn average benchmark adjusted returns of –22 percent (median = –49 percent) in companies issuing protected PIPEs and –9 percent (median = –37 percent) in companies issuing unprotected PIPEs in the twelve months following issue. By comparison, when we impute the value of the embedded options and other contract features, the average benchmark adjusted twelve month return to PIPE investors is 27 percent (median = 6 percent) for protected PIPEs and 34 percent (median = –19 percent) for unprotected PIPEs. Because these estimates do not include any costs associated with the illiquidity of PIPE investments, it is difficult to assess whether investors' returns are indeed abnormal on a risk adjusted basis. Nonetheless, our results show that the features of PIPE contracts are effective in positively differentiating the returns earned by PIPE investors from those of existing shareholders.

The paper makes several contributions to the literature. First, prior studies of private placements (Hertzel, Lemmon, Linck, and Rees (2002)) and PIPEs (Hillion and Vermaelen (2004) and Brophy, Ouimet, and Sialm (2005)) document that companies underperform over the longer run, particularly those companies that issue price protected PIPEs (i.e., "death spirals"). Although prior studies of PIPEs find that existing shareholder fare poorly, they do not offer an explanation for why investors *choose to invest* in such poorly performing firms.[3] For the full sample of PIPEs, we estimate that investors outperform shareholders by 50 percent over 12 months and 30 percent over 24 months following issue, although median returns are lower. Our estimation of the large positive return differential earned by PIPE investors over existing shareholders offers understandable motivation for their interest in these securities.

Second, Hillion and Vermaelen (2004) attribute the long run underperformance of PIPE issuers to short selling, largely by PIPE investors, without directly examining the role of short selling. Consistent with the notion that PIPE issues are related to short selling, we find some evidence that short interest increases following a PIPE offering. However, to a larger extent, the characteristics of PIPE issuers, such as low institutional ownership and low market capitalization, make these stocks particularly difficult to short. Asquith, Pathnak, and Ritter (2005) find that underperformance is concentrated in stocks that are "short constrained," or in those stocks for which short interest exceeds institutional ownership as a percentage of shares outstanding.[4] The percentage of short constrained stocks is 46 percent among price protected issuers and 23 percent for unprotected PIPEs. Moreover, regression analysis of long-run returns is unable to detect consistent evidence that short constrained stocks perform significantly worse or that the changes in short selling are associated with the returns. Therefore, the role of short selling, or short selling constraints, in the underperformance of PIPE issuers is inconclusive.

---

[3] We are aware of only two studies that examine PIPEs of a similar nature to our study. Hillion and Vermaelen (2003) examine one type of PIPE, floating rate convertibles, and Brophy, Ouimet, and Sialm (2005) examine the same contracts we do and also include fixed rate convertibles in their study.

[4] See also Miller (1977) and Duffie, Garrleanu, and Pedersen (2002) for arguments regarding the effect of short sell constraints on subsequent stock returns. Chen, Hong, and Stein (2002) and Nagel (2004) also find empirical evidence that is consistent with these arguments.

Third, we provide additional evidence on the contracting arrangements and incentives of private equity investors. Similar to venture capital investments, PIPE contracts generally require an investor to make relatively illiquid investments in companies with substantial operating uncertainties. However, PIPE contracts do not provide control rights to the same extent as the venture capital contracts discussed by Kaplan and Stromberg (2003). Instead, PIPE contracts entice investors to make equity investments by offering cash flow rights beyond those granted to existing shareholders. To determine the magnitude of these rights, we combine the cash flow rights and other protective features contained in PIPEs into an "All in Net Discount." The median protected PIPE is issued at an "All-in" discount of 30 percent and the median unprotected PIPE is issued at a 19 percent all-in discount from the issuer's current market price. From the issuer's perspective, the all-in net discount measures at least part of the cost of financing for firms without ready access to traditional sources of capital. Issuers with a greater degree of operating uncertainty and higher costs of shorting provide investors with higher discounts and more price protection, resulting in higher costs of financing.

Finally, we find that the return characteristics of PIPE investments are similar to venture capital investments. Cochrane (2005) reports average raw returns for venture capital investments of 59 percent compared to average twelve month raw returns of 40 percent for PIPE investments. Consistent with the "hit or miss" characteristics of venture capital investments described by Cochrane (2005), 12 percent of the PIPE issuers in our sample are delisted within 12 months and 28 percent are delisted within 24 months of issue. At the other extreme, the top five percent of investments have twelve month returns greater than 280 percent. The standard deviation of investor returns is 287 percent. It is the high volatility and option like characteristics of these returns more so than the high returns of individual PIPEs that result in high average returns. Said another way, similar to venture capitalists, PIPE investors frequently strike out but occasionally hit huge home runs. In sum, we find that PIPEs are effective in providing incentives for investors to take relatively large stakes in firms that face substantial operating uncertainties, enabling them to raise much needed capital.

The paper is organized as follows. In Section 2, we describe the institutional background of the PIPE market and the sample of PIPEs. In Section 3, we discuss the basic differences among the types of PIPEs and the motivations of investors to invest in a particular type of PIPE. In Section 4, we provide evidence on the contract features and trading characteristics of the stock that affect investors' returns and the announcement date returns to PIPEs. In Section 5, we examine the long run stock performance to the existing shareholders of PIPE issuers and to PIPE investors. In this section we also examine the effects of short selling on long run stock returns. Section 6 gives our conclusions.

2. Institutional Background and Sample Description

2.1 Origins of PIPEs

The strong growth in the PIPE market can be traced to several parallel developments over the course of the 1990s. First, the PIPE market has its origins in the U.S. Security and Exchange Commission's (SEC) adoption of Regulation S in May 1990. Under Regulation S, U.S. companies were permitted to sell unregistered shares to foreign investors at any price in "off-shore" markets without first registering the offer with the SEC or publicly disclosing it. While Reg S was used, for example, by large companies to sell debt in the Eurobond market, a certain segment of the market focused on small cap and troubled companies in need of capital. For these firms, Reg S equity or convertible offerings were sold at steep discounts to the company's current price and investors could resell ("flip") the shares back into the U.S. public markets after a 40 day holding period. Investors shorted the shares of the issuer, thereby locking in the discount – and an average profit of 33 percent – from the first days of the offer (Aggarawal, Gray, and Singer (1999)). Over the next six years a market of U.S investors situated in offshore corporations became involved in targeting companies for Reg S offerings and in trading and unwinding these positions.

Second, over time, a number of instances came to light in the popular press that highlighted abuses of Reg S and prompted the SEC to institute changes in November 1996.[5] The new rules required

[5] See for example, "Easy Money," Jayve Scholl, *Barron's*, April 29, 1996.

issuers to report the sale of Reg S shares in an 8K filing within 15 days of the transactions, as well as in their 10Q filings, and lengthened the period investors were required to hold the securities to one year. These changes alerted shareholders of the potential future sale of shares associated with the offer and eliminated the undisclosed resale option of investors. The net effect of these regulatory changes was that after 1996, the quality of issuers improved and the average purchase discount decreased (Aggarawal, Gray, and Singer (1999)). Broadly speaking, these changes brought Reg S offerings into greater compliance with other private placements issued under Regulation D of Rule 144. Regulation D had always enabled a public company to issue securities to a group of private investors without registering the shares, so long as the investors held the shares for up to two years following purchase.[6] PIPEs eliminate these resale restrictions by requiring the issuer to register the shares received by private investors through the PIPE, in whole via a shelf registration or in part, with the SEC within 30 days after the deal closes. Once the registration becomes effective, the shares can be publicly traded – typically within 90 days of registration. Thus, the registration process is key to transforming what would otherwise be a private (non-liquid) asset into a publicly tradable asset.

A final reason for the strong growth in the PIPE market is demand driven. As documented by Fama and French (2004) there has been a tendency since 1990 for firms to go public at an earlier age. Fama and French (2004) as well as Fink, Fink, Grullon, and Weston (2005) argue that these firms are riskier with less consistent profitability and lower survival rates. The age of PIPE issuers and other characteristics we discuss later are consistent with the deteriorating quality of "new lists." For example, for the PIPE issuers in our sample the average time from the founding date to IPO date is 7.1 years and the median time is four years. The average time from founding date to first PIPE issue is 12 years with a median of seven years.[7] By comparison, Fink, et. al (2005) documents that the average time from

---

[6] PIPE investors do not necessarily need to meet SEC's standards for being an "accredited investor" to participate in the deal. However no more than 30 percent of the investors can be non-accredited. The SEC classifies an investor as "accredited" if it meets one of several requirements. For a full list of these requirements see http://www.sec.gov/answers/accred.htm .

[7] We thank Laura Field and Jay Ritter for data on founding dates. The remainder were gathered from EDGAR.

founding to IPO prior to 1992 was 14 years at a minimum for firms trading on NASDAQ and the median time was six years. Therefore over time there has been an increase in the number of young risky firms in the market with heavy demands for capital. For investors to bear the risks these firms offer, they demand contracting terms that are difficult to obtain using traditional forms of financing, thereby contributing to the overall growth in the PIPE market.

At this point it is reasonable to ask how PIPEs differ from traditional private placements, such as those studied by Wruck (1989), Hertzel and Smith (1993), Barclay, et al. (2003), and Krishnamurthy, et al. (2005).[8] Among these studies, the earliest sample dates from 1979, prior to the adoption of Reg S, and the latest ends in 1997, before the large growth in the PIPE market. Earlier studies exclude from consideration private placements with warrants and those that are convertible into equity to avoid the complexity of having to value these features. Although PIPEs include the "plain vanilla" private placements of earlier studies, they more commonly contain warrants, caps, floors, and other complex features. A second difference is that the private placements previously examined typically were assumed to be issued under Reg D of Rule 144 which, as alluded to above, imposes lengthy resale restrictions on the purchaser. Accordingly these studies focus on the characteristics of the purchasers of private placements with an eye toward uncovering the benefits associated with granting control rights to, presumably long-term, block holders of the firm. By contrast, the most frequent investors in PIPEs are hedge funds (Brophy, Ouimet, and Sialm (2005)) who, generally, are passive investors with little desire to become long-term block holders of the firm. They, as opposed to other institutional investors, have the trading flexibility and expertise to maximize the value of the embedded options in PIPE contracts. Their investments are governed by more technical factors associated with the issuer's stock (e.g., liquidity, volatility, availability to short shares) than traditional private equity investments. For this reason, PIPEs are structured with a preference for obtaining cash flow rights – broadly defined as any feature that allows for the quick return and preservation of investors' capital.

[8] We thank Mike Hertzel for suggesting this comparison.

2.2 Mechanics of a PIPE

A company wishing to issue a PIPE typically employs an investment bank or a placement agent to assist with the offering and to contact potential investors. Investment banks that become agents earn placement fees as an intermediary to market the PIPE to institutional investors and often agree to provide analyst coverage or other services for the issuer.[9] Before agreeing to make a PIPE investment, a potential investor has the opportunity to conduct extensive due diligence on the issuer and to negotiate the terms of the security. This due diligence and negotiation process usually involves an extensive review of public filings and discussions with management. Although these activities do not necessarily result in the investors obtaining non-public information, such activities can potentially enable the investors to overcome some of the informational asymmetries associated with these firms. As discussed in the next section, the terms that PIPE investors negotiates with the issuer has a large effect on their degree of exposure to movements in the issuer's stock price following the offering. These terms likely reflect investors' perception of the issuers' risk and potential future returns.

If the company and investors reach agreement on the terms, the company will issue a press release describing the PIPE transaction at closing.[10] An example of a typical press release is provided in Appendix A. Although the press release is often quite general, the company frequently files an accompanying 8-K or S-3 form with the SEC containing a more detailed description of the terms and a list of the investors participating in the deal.

2.3 Sample Description

We use Sagient Research, Inc.'s *Placementtracker* database to collect a sample of 2,626 PIPEs over 1995 – 2000, which is reduced to 2,145 PIPEs after imposing the requirement that issuers have stock

---

[9] Recognizable names among the top placement agents for PIPEs include Roth Capital, Rodman & Renshaw, SC Cowen Securities, Bank of America Securities, and Lehman Brothers. Observers familiar with the market suggest that after selecting a agent, one month is the typical time to closing.

[10] *Placementtracker*, a market clearing house for PIPE information, internally records the date at which its analysts first learn of a PIPE transaction but this date is not available in the database. For deals offered in 2003 and 2004, it reports a median 2 day time lapse between its first learning of a deal and the closing date it reports. We thank Robert Kyle for providing this information. For a description of *Placementtracker,* see http://www.placementtracker.com.

price data available on *CRSP*. The *Placementtracker* database is to the best of our knowledge an exhaustive list of all PIPEs issued since 1995. This database is also used in Gomes and Phillips (2004) and Brophy, Ouimet, and Sialm (2005). We cut-off the sample at 2000 to allow for several years of post-issue performance. We use *Placementtracker* data to identify the type of PIPE issued, the terms of the contract, and the closing date of the agreement. To be included in our sample the PIPE issuer is required to have data available on *Compustat* and *CRSP*. Upwards of 90 percent of the issuers in our sample are traded on NASDAQ. Table 1 shows summary statistics for five commonly issued PIPE instruments by the sample firms. The two most frequently issued PIPEs are Common Stock PIPEs and Floating Rate Convertibles. Common Stock PIPEs account for almost 50 percent of the total number of PIPEs and roughly 67.0 percent of the capital raised from these transactions. Floating Rate Convertibles account for 37.8 percent of the PIPE transactions and approximately 22.8 percent of the capital raised. Convertible Resets, which are similar to Floating Rate Convertibles, account for an additional six percent of the capital raised. Hence, these three categories account for 96 percent of the $26.7 billion total capital raised by the PIPEs in our sample. The use of Common Stock PIPEs increases each year, whereas Floating Rate Convertibles increase from 30 in 1995 to a peak of 233 in 1997, but then trail off to 89 in 2000. The drop in Floating Rate Convertibles has been attributed to adverse publicity about the controversial nature of the securities (e.g., "death spirals," "toxic converts") and an NASD ruling that introduced certain contract terms which effectively limited the downside protection provided to investors.[11] The number of PIPEs issued and the amount of capital raised through PIPE transactions increases steadily over the sample period, reaching a high of $12.6 billion in 2000. For the entire window between 1995 and 2000, a total of $26.2 million was raised in the PIPE market by these companies, excluding structured equity lines that are

[11]The National Association of Securities Dealers (NASD) views structured equity lines and floating rate convertibles and resets as "future priced securities." Certain NASDAQ listing rules regarding future priced securities are codified in NASD Rule 4350 which was approved in March 2002 after several years of consideration. Under this rule, the issuance of certain PIPEs requires a vote by shareholders if the lowest possible conversion price is below the book or market value of the stock at the time of issuance or if investors can receive more than 20 percent of the shares upon conversion from such low prices. To eliminate the need for shareholder approval, an issuer can place a cap on the number of shares that can be issued upon conversion to 20 percent of the common stock before the issuance of the PIPE or place a floor on the conversion price. See the *Federal Register*, Vol. 67, Number 45, March 7, 2002. Despite this ruling, the incidence of FRCs increased four times in 2004 after reaching a low in 2003.

pending agreements to issue equity. By comparison, Gomes and Phillips (2004) report that public companies issued $112.9 billion in public equity during this period, so that PIPEs equal roughly a quarter of this total. Consequently, the results in Table 1 indicate that PIPEs are an increasingly important source of funding.[12]

2.4 Financial Characteristics of PIPE Issuers

In Tables 2 and 3 we examine the financial characteristics of companies raising capital in the PIPE market and to what extent other forms of financing might be available to them. Table 2 presents information on selected financial and operating characteristics of the companies issuing PIPEs by contract type.[13] Notably, there is evidence of poor performance regardless of the type of PIPE issued. With the exception of Common Stock Resets, all categories of PIPEs experience negative median stock returns in the six months prior to issue and all categories of PIPEs have negative return on assets (ROA). Consistent with the arguments of Almeida, Campello, and Weisbach (2004) that constrained firms appear to hoard cash, the median ratio of cash and marketable securities to total assets ranges from 20.2 percent for issuers of floating rate convertibles to 38.9 percent for firms obtaining structured equity lines. To put these values in perspective, Opler, Pinkowitz, Stulz, and Williamson (1999) report the median ratio of cash to net asset ratio of 6.5 percent for a sample of U.S.- based publicly traded firms. Harford (1999), using a sample of firms from a wide range of industries, reports a median ratio of cash to total assets of 14.7 percent for firms he classifies as cash-rich and 5.3 percent for other firms. The fraction of PIPE issuers with negative operating income ranges from 78 percent for Common Stock PIPEs to 88 percent for Floating Rate Convertibles. Debt usage and the payment of dividends are exceptionally low across the contracts. The ratio of the book market of equity to the market value of equity is 0.19 or less for all types,

---

[12] Since 2000, the PIPE market continues to grow. For example, in 2004 for the five categories of PIPEs we examine, there were 1,585 PIPEs issued which raised a total of $14.2 billion. Of this total, $13.6 billion was raised through 1,379 Common Stock PIPEs and $324.9 million was raised through 90 Floating Rate Convertibles and Convertible Resets. The balance was raised through Common Stock Resets and Structured Equity Lines.

[13] We do not find a strong industry pattern to PIPEs issues. Chemicals (SIC Code 2800) and Business Services (SIC Code 7300) each account for 20 percent of the issues and Instruments and Related Products (SIC Code 3800) accounts for 10 percent. The top two industry groups include firms in respectively, pharmaceutical and biotech, and computer programming, software and system design. The other issues are scattered among a number of industries.

putting these companies in the bottom ten percentile among companies listed on the NYSE during this period.[14] Therefore, although these companies have encountered poor stock performance on average, they are still valued similarly to growth stocks. Finally, in the last two rows of Table 2, we report two summary measures of the cash needs of PIPE issuers. The first, "Cash Burn Rate," measures based on the company's existing cash resources how long it can meet its current operating obligations without new financing. The second measure, "Time Gained," measures the additional time gained through the PIPE to continue operations at the firm's current level of profitability. In all cases, the cash burn rate shows that PIPE issuers have less than a year of cash remaining. With the exception of convertible resets, issuers at least double their median survival time through the PIPE, suggesting that the issue provides some valuable breathing room for the issuer.

2.5 Availability of other forms of financing

Based on the rate at which these companies are burning through cash, it is clear that they will require additional financing in the near term to continue operations. This raises the question of what other forms of financing might be available to them. The generally small size of PIPE issues and issuers, along with their poor operating performance likely rule out public debt issuance and otherwise make other forms of debt difficult to obtain. For example, Denis and Mihov (2003) find that between 1995 and 1996, the median firm issuing public debt has total assets of $2.2 billion and an average return on assets of 13.5 percent in the three years leading up to the debt issue. Although the median company obtaining a bank loan is substantially smaller with assets of $145 million, it also had an average return on assets of 11.2 percent in the three years prior to obtaining the loan. Hovakimian, Opler, and Titman (2001) report that on average companies issuing convertible debt between 1979 and 1997 had total assets of $239 million, stock returns of 61 percent, and return on assets of 11 percent in the two years prior to issue.

The characteristics of PIPE issuers are also much different from public companies that make follow-on equity issues. For example, Heron and Lie (2004) report that between 1980 and 1998, the stock

[14] From Ken French's data library at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

returns for companies making primary equity issues exceeded industry returns by an average of 47 percent and a median of 25 percent in the 250 days preceding the issue. The median ratio of operating income to sales for these firms is 10.3 percent and the median assets are $71 million in the year prior to the issue.[15]

In sum, the pervasive nature of poor pre-issue operating and stock performance, as well as their generally small size, suggests that PIPE issuers are not candidates for debt financing or follow-on stock financing, their best chance, is beyond the reach of many issuers. The foregoing results are consistent with Hillion and Vermalen's (2004) contention that floating rate convertibles represent financing of last-resort – except, we note, this contention applies to a broader range of PIPE instruments.

3. Investors Motivations to Invest in PIPEs

The foregoing results suggest that PIPE issuers generally face substantial uncertainties that will impede their capital raising abilities and this raises the question why investors would choose to fund these firms. In this section, we discuss the important distinctions among the different types of PIPE securities to generate predictions based on the level of exposure an investor undertakes with respect to an issuer's future performance. Our initial discussion of the contracts assumes that investors are *not* able to short the issuer's equity.

3.1 Price Protected PIPEs

Floating Rate Convertible Preferred Stock or Debt (FRC) and Convertible Resets (CVR) offer investors significant downside protection from adverse movements in the issuer's stock price, while preserving the ability to benefit from strong post-issue stock performance.[16] The familiar fixed rate

[15] We also compare PIPEs to all follow-on equity issues (SEOs) made during 1995-2000 on a number of criteria similar to those in Table 2 and later in Table 8 (operating characteristics). The results show that SEO issuers are significantly larger and better performing firms than PIPE issuers. If these characteristics are suggestive of the threshold necessary for a public equity issue, PIPE issuers fail to meet this threshold by a wide margin. For brevity's sake, we do not report the SEO comparisons but they are available from the authors.

[16] A common stock reset (CRS) allows investors to buy common stock at a set price less a discount. The payoffs to CSRs are similar to FRCs and CVRs. However, the contract terms typically allow investors to adjust the purchase price downward only once within a relatively short time, 30 – 90 days, in the event an issuer's stock declines following issue. Thus, its period of price protection is much shorter than Floating Rate Convertibles and Resets.

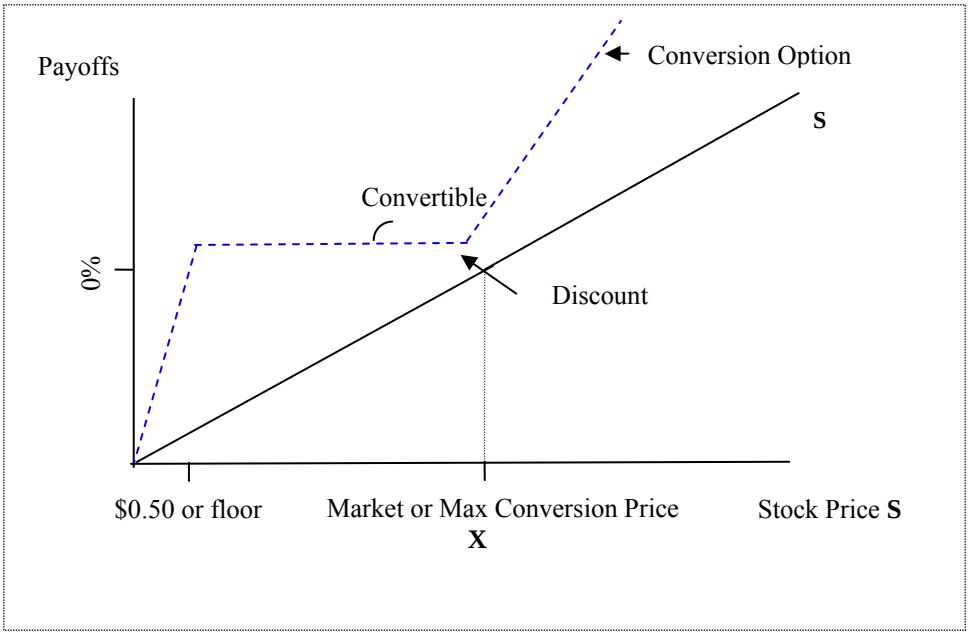
convertible typically has a single conversion price above the current market price of the common stock that is maintained throughout the term of the contract. Relative to fixed rate convertibles, the conversion price (or rate) on a floating rate convertible changes on a daily basis in accordance with movements in the issuer's stock price. Reset convertibles allow for a discrete number of changes of the conversion price at specified intervals (e.g. six months, one year, and two years from closing). Prior to the reset points, the security is convertible only at the last fixed conversion price. Because of this adjustment feature, Brennan (1985) argues that floating rate convertibles are an ideal form of financing for high risk and high asymmetric information firms.[17] However, an most important distinction between a PIPE and a conventional floating rate convertible is that for about half of the issues in our sample the conversion price on the PIPE *can not be adjusted above the offer price*.[18]

Although a number of variations to the basic contract exist, in a typical PIPE an investor purchases an amount ($50 million) in newly issued convertible preferred stock (or analogously convertible debt) from a company for a certain number of shares (5,000) at stated par value per share ($10,000). Following issuance, if the stock price of the issuer falls, the investor will receive more shares upon conversion. If the stock price of the issuer rises, the conversation will usually take place at the originally agreed upon contract price. Therefore, although investors generally benefit from stock price appreciation following issuance of a PIPE, the issuer does not. In addition to these features, PIPEs usually have a purchase price discount and require the payment of dividends or interest. Any payments made on these securities are usually payment in kind rather than cash payments. The payoffs to investors in floating rate and reset convertibles are depicted by a dashed line in the following diagram:

---

[17]If management believes that the firm's equity is currently undervalued and possesses positive information that will eventually lead to a higher price, floating rate convertibles in effect allow shares to be issued at a higher price after the good news is revealed. However, Hillion and Vermaelen (2004) find no evidence that this argument characterizes the performance of floating rate convertibles or resets.

[18]In some instances, PIPEs will allow for the maximum conversion price to be set at a premium over the current price but unlimited upsides are not observed.



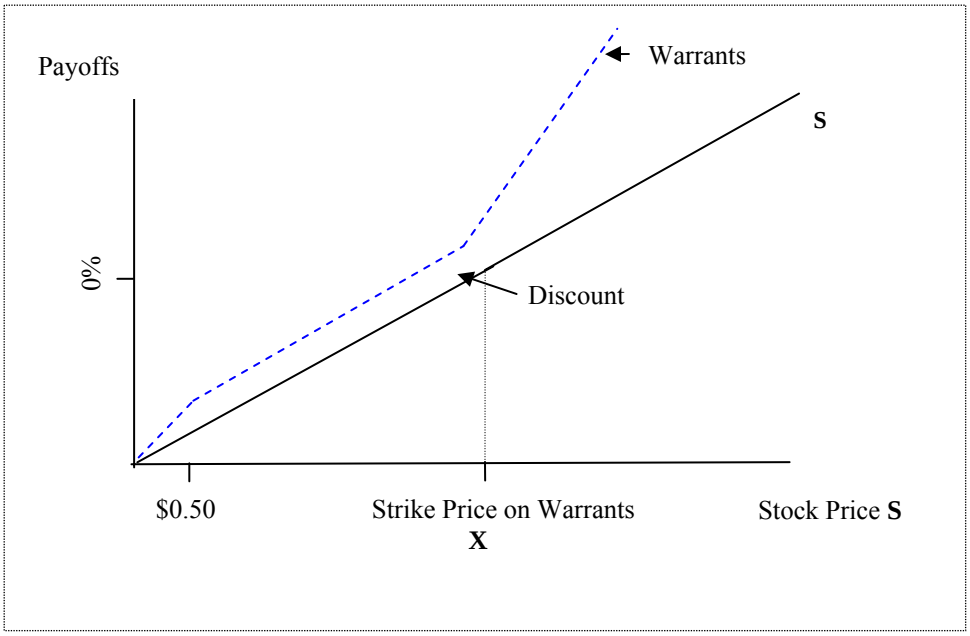
The holder of a floating rate or convertible reset can be viewed as being long stock (S) at the price at which the PIPE is issued (assuming this is the maximum conversion price of the security) and long a put option at this price. The put option or downside protection offered from the contract results from the larger number of shares obtained upon conversion as the price company's stock decreases which maintains the value of investment principal. However, the protection offered by this put option is limited by the degree of liquidity in the stock and can cease to exist as the stock price approaches zero in the event of distress or delisting. This is depicted in the diagram as being short a put at a $0.50 share price (delisting price).[19] To control the liquidation process, PIPE contracts can stipulate a maximum number of shares that can be converted within a given time period. However, if the issuer's stock price drops below some minimum stated price (e.g., $2 or $3 per share), investors have the right to accelerate conversion of the remaining unconverted portion of the security. This permits investors to attempt to liquidate their remaining position ahead of a possible delisting. Finally, because of the floating conversion rate, these instruments are structured to end up in the money at maturity. Therefore, unlike conventional fixed rate convertible bonds or preferred stock, these instruments are almost always converted into common equity.

[19] In theory, if the stock price is delisted or the company declares bankruptcy before the PIPE investor has converted any of the position, the investor could lose his or her entire investment.

3.2 Unprotected PIPEs

In contrast to protected PIPEs, Common Stock PIPEs (CSP) and Structured Equity Lines (SEL) do not allow the purchase price of the shares to be adjusted after the closing date thereby limiting their contractually provided downside protection. These contracts allow investors to purchase the company's stock at a discount to the current market price or some average of prices in a short interval before the issue. CSPs typically involve one upfront purchase of stock while SELs involve several purchases of stock over a specified time interval. These contracts frequently enhance investors' upside with warrants to purchase the company's stock at a price generally at or above the current market price of the stock.

The payoffs to investors in Common Stock PIPEs and SELs are depicted by a dashed line in the diagram below.



In sum, through their choice of PIPE contract, investors can significantly vary their upside and downside exposure to an issuer's common equity.[20]

[20]Our results are robust to various alternative classifications for protected and unprotected PIPEs. For example, the results are similar if we exclude structure equity lines, common stock resets or if we use switch the classification of these instruments between the price protected and unprotected categories.

4. Contract Terms and Trading Characteristics Affecting Returns

As the previous section suggests an investor's outlook for the issuer can affect both the type and terms of the contract negotiated. In this section we examine the contract features of PIPEs and attempt to assess their influence on investors' ex ante returns.

4.1 Cash Flow Rights

As discussed by Kaplan and Stromberg (2003), companies can contract with investors on the basis of cash flow rights and control rights.[21] PIPEs primarily include terms that allocate *supra* cash flow rights to investors which enable them to enhance their returns and reduce risk. In Table 3, we detail the features of PIPE contracts that affect investors' realizations of cash or their risk. Protected PIPEs are smaller than unprotected PIPEs in terms of absolute issue size and relative issue size. Seventy eight percent of protected PIPEs require the payment of interest or dividends and have a median dividend/coupon payment of 6.0 percent. Some 47 percent of protected PIPEs also include warrants. Only 23 percent of the contracts contain a floor, which means that in 77 percent of the cases investors have unlimited downside protection as long as the shares remain liquid. Investors can buy shares at a median purchase discount of 18 percent below the current market price. By comparison, no unprotected PIPEs require the payment of dividends, a smaller percentage have warrants (35 percent), and the purchase discount is lower (median=15.7 percent).

As is often the case, a given PIPE will contain several contract features. Because these features are negotiated to increase the returns investors hope to achieve, we estimate an "All-in Net Discount" that combines the effects of these features. The computation of the "All-in Net Discount" necessitates valuing the embedded options contained within each PIPE contract. To do this, we must make assumptions about the length of time investors hold their position – something which is otherwise unobservable – and value the embedded options and warrants using the Black Scholes model. We initially value the options using a

[21] During the years of our sample, *placementtracker* did not record items related to control rights, such as whether management participated in the deal or investors sat on the board. Since 2003, it has begun to record such data. For all PIPEs issued since 2003, eight percent involve management or investor board participation. We thank Bob Kyle for this information.

holding period of 1.5 years, the issuer's historic stock price volatility prior to closing, and a six-month U.S. Treasury rate at the time of closing. Appendix B details our estimation procedure and provides some sensitivity analysis of alternative assumptions. For the overall sample, the average and median All-in Net Discount for protected PIPEs is –30.0 percent. For unprotected PIPEs these values are –23.5 percent and –19.2 percent. The differences in the discount between the two groups are significant at the one percent level. This is consistent with investors requiring more compensation at the outset for companies issuing protected PIPEs than unprotected PIPEs.

In the bottom panel of Table 3 we attempt to assess how the all-in net discount varies with complexity by categorizing PIPEs into the most and least complex contracts. The least complex contracts are those that contain a single feature; the most complex contracts include several features. For unprotected PIPEs, "plain vanilla" contracts contain only a purchase discount, while for protected PIPEs "plain vanilla" contracts contain only a floating rate or reset feature. As noted earlier, no unprotected PIPEs require the payment of dividends or have floating rate features, caps, or floors, so that the most complex unprotected PIPEs include a maximum of two features – a purchase discount and warrants. The most complex protected PIPEs include floating rate features, purchase discounts, dividends, caps, floors, and warrants. For unprotected PIPEs, one observes a higher frequency of plain vanilla contracts (62.3 percent) than complex contracts (37.6 percent). The reverse holds for protected PIPEs – there is a much higher percentage of complex contracts (26.5 percent) than plain vanilla contracts (2.3 percent). For both groups of PIPEs, the all-in net discount is about two times greater for plain vanilla versus complex contracts. This indicates that the additional terms have an important effect on the perceived value of these contracts to investors.

4.3 Trading Characteristics of the Issuer's Stock

Because returns depend on the ability to realize cash from the sale of shares in the market, liquidity is a major concern of PIPE investors. Therefore in Table 4 we examine several measures of the liquidity of the issuer's stock. In terms of trading volume and volatility, the average daily trading volume

("ADTV") and standard deviation of stock returns do not differ on average between protected and unprotected PIPEs. The "Days to Exit Contract" is the ratio of the amount of shares issued in the PIPE to the average daily trading volume of the issuer's shares. Assuming an investor makes up the entire trading volume of the day, the shares issued in a PIPE are a median 28.2 and 41.7 times ADTV for protected and unprotected PIPEs, respectively. Were investors to attempt to liquidate their position all at once, this evidence suggests that such a sale would likely place unusual demands for liquidity on the market and negatively impact the price received for the shares. The variable "Illiquidity" stems Amihud (2002) and is defined as the average ratio of the absolute value of stock returns to dollar trading volume from day –100 to day –10. This ratio is then multiplied by 10^6. Higher values indicate greater price impact from trading which has been interpreted as greater illiquidity. The average illiquidity ratios of protected and unprotected PIPEs are 1.89 (median=0.33) and 2.42 (median=0.37), respectively. By comparison, the average value of this ratio for other companies on *CRSP* during this period is 0.18 (median=0.17). By all accounts, the shares of PIPE issuers are far less liquid than the typical firm increasing the challenge PIPE investors face exiting their position. Later in section 5.4 when we impute the paper gains and losses to PIPE investors this lack of liquidity likely implies a significant wedge between the gross returns we estimate and the net returns realized by investors.

Another characteristic of the issuer's stock that can potentially affect PIPE investors' returns is the ability to short. If a PIPE investor can short the issuer's equity, the distinctions between protected and unprotected PIPEs narrow but do not completely disappear. By shorting stock against an unprotected PIPE investment, investors can adjust or even eliminate their exposure to the stock. This would allow an investor to lock in the purchase discount on the stock and provides downside protection against a falling stock price similar to a protected PIPE. However, unlike a protected stock position, this requires an investor to be able to short the stock, often in great quantities, relative to the issuer's trading volume. This position also reduces an investor's ability to benefit from an increase in the value of the underlying

stock (i.e., ignoring the discount the payoffs become a horizontal line at the amount invested in the diagram above.)

To get a sense of the ability to short the stock of PIPE issuers, we follow Nagel (2004) and Ali and Trombley (2004) and examine the firm characteristics that D'Avolio (2002) and Geczy, Musto, and Reed (2002) find to be associated with a stock being "hard to borrow." In Table 4, we first consider several variables likely to be related to the supply of shares available to be borrowed. Because institutions are the largest suppliers of stock to the equity lending market, the supply of stock available for loan is likely positively related to the level of institutional ownership. The median institutional ownership as a fraction of outstanding shares for protected PIPE issuers is 1.2 percent which is significantly lower than the 5.0 percent for unprotected PIPE issuers. By comparison, Asquith, Pathak, and Ritter (2005) report that the median percentile of institutional ownership for NASDAQ firms over 1995-2000 is around 15 percent and is considerably higher for NYSE-AMEX firms. The supply of stock available to loan can also be affected by the price level of the stock. The supply of stock in the equity lending market from a brokerage firm is usually the shares that customers purchased on margin. However, if the stock trades for less than $5 per share, most brokerage firms no longer allow investors to buy stock on margin and these shares will cease to be available to short. We find that 55 percent of protected PIPE issuers and 44 percent of unprotected PIPE issuers had a stock price less than $5 at the time of the offering. Also, as discussed above, PIPE issuers have a very low market capitalization. The median market value of equity places protected PIPEs in the fifth percentile of stocks listed NYSE and unprotected PIPE in the tenth percentile of NYSE stocks.

D'Avolio (2002) shows that the demand to borrow stocks is greater for firms with low cash flow, low book to market, high dispersion of analyst forecasts, and high share turnover. Several of these characteristics are shown for our sample firms in Table 4. Greater than 80 percent of PIPE issuers have negative operating income and the median book to market ratio is less than 0.16, which puts them in the bottom decile of stocks listed on the NYSE. With the exception of the book to market ratio, all of these

characteristics indicate that it is significantly harder to obtain shares to short for protected versus unprotected PIPEs.

The level of short interest can be affected by the demand as well as the supply of shares to short. As shown in Table 4, short interest as a percent of shares outstanding averages 3.46 percent (median=1.39 percent) for protected PIPEs and 2.58 percent (median=0.59 percent) for unprotected PIPEs. Following Asquith, et. al (2005), we include the variable "Short Constrained" which is the percentage of firms whose short interest as a fraction of shares outstanding exceeds their institutional ownership as a fraction of shares outstanding. Forty-six percent of protected PIPEs and 23 percent of unprotected PIPEs are short constrained, much higher percentages than reported in Asquith, et. al (2005). Further, note that the median Days to Exit Contract (Proceeds ÷ ADTV) is at least 15 times the median Short Interest ÷ ADTV for both groups of PIPEs. This indicates that the exposure investors face through the PIPE likely exceeds their ability to short against it. Therefore, although investors may seek to short the shares of PIPE issuers to offset a long position, the evidence suggests that it is costly – or even impossible – to fully do so. The implication is that the more costly it is to short, the more likely investors are to choose a PIPE contract that provides the protection they seek.

4.4 Multivariate Analysis of Contract Terms

In this section, we examine some of the determinants of the all-in net discount and the choice of price protection. As the previous analysis suggests the discount and price protection are interrelated so that insight is gained by examining the determinants of each. In Table 5, we perform a regression analysis where the dependent variable is the "All-in Net Discount." This maximum value of this variable is zero as it takes on a more negative value for greater discounts. In the logit analysis the dependent variable is one if the PIPE is unprotected and zero if the PIPE is price protected. In the first specification of each analyses, the independent variables are limited to pre-issue operating performance characteristics of the issuer. The other specifications include variables related to contract terms and trading costs. All else equal, we should observe higher discounts and a higher probability of price protection the greater the

degree of uncertainty regarding the issuer's future performance and the more difficult it is to protect against downside risk due to high trading costs that make shorting costly. With respect to operating performance, the strongest and most consistent result is for the cash depletion rate. Reinforcing the adage that "cash is king," companies that will run out of cash sooner issue PIPEs with significantly greater discounts and a higher probability of price-protection. Several other variables significantly affect the discount or the probability of price protection but not both. Market capitalization is positive and significant for the discount but is mixed in regressions on the price protection variable. This suggests that the PIPEs of smaller firms are associated with higher discounts. The volatility of stock returns appears to have little influence on price protection but is negative and highly significant for the discount. Consistent with intuition, higher volatility results in higher discounts. Poorer pre-issue stock performance results in a significantly higher probability of price protection but has no significant effect on the discount.

Turning to trading costs, the Days to Exit Contract and the Illiquidity variables are, for the most part, insignificant. However, higher percentages of institutional ownership are strongly associated with lower discounts and a higher probability of unprotected PIPE issue. There are two possible interpretations to this result. One is that investors in unprotected PIPE issues look for issuers with higher percentages of institutional ownership because they have a demand to short the shares (i.e., to protect their downside). A second interpretation is that institutions take positions in unprotected PIPEs because they hold a more favorable outlook for the firm. Some caution must be exercised in interpreting the results for institutional ownership because it likely has some endogeneity with the dependent variables. Issuers with stock prices below $5, which might be indicative of greater distress or higher trading costs, are associated with a significantly higher probability of price protection but also lower discounts which appears contrary to intuition. The PIPEs of issuers that are short constrained have significantly higher discounts and are more likely to be price protected. This variable is significant and consistent in sign for both the discount and price protection which may reflect Asquith et. al (2005)'s contention that short constrained is a more accurate measure of trading costs. Overall the regression results support the view that operating

performance and trading characteristics of the issuer's shares affect the discount and the choice of PIPE instrument in reasonable ways.

4.5 Announcement Date Returns to PIPEs

Given the previous results on the factors influencing the choice of PIPE contract, we next examine what information the market infers from the announcement of a PIPE transaction. In previous studies, the announcement date price reactions to private placements of equity have been attributed to information effects (Hertzel and Smith (1993)), greater monitoring due to increased ownership concentration (Wruck (1989)), and liquidity costs due to the resale restrictions on the shares (Silber (1991)) and entrenchment (Barclay, et al. (2003)). Hertzel and Smith (1993) argue that the extended discussions and negotiations between a firm and private investors during a private placement can allow private investors to resolve some of the asymmetric information about a firm's value. PIPE transactions are particularly well suited for testing this "information hypothesis." Given the uncertainty, small size and poor performance of PIPE issuers, it is likely that even greater informational asymmetries exist for these firms than for others. Therefore, the private investors' decision to invest and the type of PIPE selected could be particularly informative to the market. Based on the information hypothesis, one expects that the market will react more favorably to the announcement of an unprotected PIPEs than protected PIPEs.

In Table 6 we report the cumulative abnormal returns around the announcement date of protected and unprotected PIPEs. From Day –1 to +1, unprotected PIPEs experience a significantly positive price reaction of 3.34 percent (median=0.87 percent) at their announcement compared to 1.47 percent (median= −0.54 percent) for protected PIPEs. One also observes in the days leading up to and the days following the announcement that unprotected PIPEs perform substantially better than protected PIPEs. Over the period from Day –10 to +10, unprotected PIPEs increase by 9.58 percent (median=3.09 percent) versus a decrease of −2.55 percent (median=−5.71 percent) for protected PIPEs. The mean and median differences in returns between the groups over the announcement date windows are all significant at the 1 percent

level. A significantly higher percentage of unprotected PIPE issuers have positive returns than protected PIPE issuers over the same interval. We repeat the analysis using CARs that account for the discounts received by the PIPE investor, as described in Hertzel and Smith (1993). As expected, the returns become more positive but unprotected PIPEs continue to experience significantly more positive returns than protected PIPEs. In unreported results, we conduct regressions of the cumulative abnormal return for the –10 to +10 day window around a PIPE issue and the type of PIPE issued.[22] After controlling for other characteristics, the regressions show that the announcement date returns for an unprotected PIPE are significantly greater than for protected PIPEs. Thus, the announcement date results suggest that the market infers different signals about the firm from the contracting terms that investors have negotiated with the PIPE issuer.

5. Long Run Performance of PIPEs

In this section, we examine several questions: (1) what are the long returns realized by existing shareholders of PIPE issuers; (2) what explains the variation in these returns; and (3) how do the returns earned by existing shareholders compare to those earned by PIPE investors? The term "existing shareholders" is used throughout to refer to the shares acquired by individuals or entities apart from the PIPE.

5.1 Long Run Abnormal Returns to Existing Shareholders

To calculate the abnormal post-issue stock performance to an issuer's common shareholders, we compare the monthly performance of a company issuing a PIPE to the performance of a benchmark portfolio. We assign companies to a benchmark portfolio using a similar method to that described in Brav

[22] The regressions appeared in an earlier draft of the paper and are available from the authors. The explanatory variables in the regressions include a dummy variable that indicates whether the PIPE is unprotected (UNPROTECT=1) or protected (PROTECT=0). Other explanatory variables include the relative issue size, purchase discount, the abnormal stock performance for the 12 months prior to the PIPE issue, a dummy variable indicating whether sales increased (1) or not (0) between year –2 and year -1, the cash burn rate, and the log of the market value of equity. We also include the years since the IPO to control for any effect that length of time that a firm has been publicly traded might have on the market's reaction to this announcement.

and Gompers (1997) and Chalmers, Dann, and Harford (2002).[23] We calculate abnormal long run returns using the following approach: $R_{i,T} = \left[\prod_{t0}^{T} (1 + R_{i,t}) - 1 \right]$

$R_{i,t}$ is the monthly return for the sample firm or a size and book-to-market matched benchmark portfolio for month t. If the sample firm is delisted before month T, returns are set equal to zero for the month following delisting until month T. To calculate abnormal returns for the window between t_0 and T, the return on the benchmark portfolio is subtracted is the return for the sample firm.[24]

The abnormal returns for protected and unprotected PIPEs for up to two years following the issue are shown in Table 7. These results indicate that the large majority of existing shareholders in companies issuing PIPEs underperform the market benchmark in the year following issue. The cumulative abnormal returns through 12 months post-issue are negative for 81 percent of protected PIPE issuers and 70 percent of unprotected PIPE issuers. Fifteen percent of price protected PIPE issuers and nine percent of unprotected PIPE issuers are delisted within 12 months of the offering. The average abnormal return for protected PIPEs is –22.2 percent through month +12 and –48.2 percent through month +24. The 12 month abnormal returns for protected PIPEs are consistent with those reported in Hillion and Vermaelen (2004) and Brophy, et. al (2005) for similar instruments. For unprotected PIPE issuers, the average abnormal returns are –9.3 percent through month +12 and –19.3 percent through month +24.

---

[23] Companies are assigned to one of twenty-five benchmark portfolios in the year prior to the PIPE offering using the market value of equity and the ratio of book value to market value. The benchmark portfolios are constructed on an annual basis by first taking the companies appearing in both the *CRSP* and *COMPUSTAT* databases and separating them into quintiles according to the market value of assets as of June of the previous year. Then, each of these quintiles is separated into quintiles based upon the ratio of the book value to the market value of assets in June of the previous year. If a company is delisted within the 12 month window following the PIPE issue, the delisting return (if available) is used as the return for the month of the delisting. The returns for the remaining months are set equal to 0 percent. These returns are then adjusted by the returns on the benchmark portfolio to calculate abnormal returns.

[24] A criticism of this approach is that it is based on "event time" which may create some cross-sectional dependencies in the returns. Brophy, et. al (2005) investigate this issue and calculate calendar time returns using a variety of bench mark models. They find little sensitivity between calendar and event time returns.

Also of note in Table 7 is that the average returns are substantially higher than the median returns. This results because while the vast majority of PIPE issuers perform poorly, some do exceedingly well. The distribution of long run post-issue shareholder returns is shown in Figure 1. Roughly four percent of protected PIPE issuers and six percent of unprotected PIPE issuers have 12 month returns that exceed 150 percent. The positive skewness associated with PIPE returns is in part what attracts investors to these securities. We investigate the returns to investors further in section 5.4

In the bottom portion of Table 7, we perform several robustness tests of the long run abnormal returns. We eliminate issues made in 1999-2000, whose post-issue performance might have been most adversely affected by the sharp decline in equity market returns beginning in 2001, and we restrict the sample to the first PIPE issue made by an issuer, to issues with stock prices above $5 at closing, and to issues that are short constrained. There is strong consistency between the median 12 and 24 month abnormal returns estimated for the sub samples and those reported for the full sample. However, some of the significant differences between the groups attenuates with the smaller number of observations in the sub samples – especially for the short constrained group.

5.2 Operating Performance: Pre versus Post Issue

One potential explanation for the poorer post-issue stock performance of protected PIPEs is that their operating performance deteriorates is an unanticipated way compared to unprotected PIPEs. Although it is difficult to measure this anticipation with any degree of accuracy, in Table 8 we look for any pattern of change in the financial and operating characteristics of protected and unprotected PIPEs over a four year period around the issue (i.e., year –1 to year +2). Given the susceptibility of the sample to outliers, we report only the median values of the variables. Over this period, unprotected PIPE issuers show modest improvement relative to protected PIPE issuers with respect to sales, total assets, and return on assets. Although protected PIPEs also exhibit some improvement on these dimensions, overall they appear to lag the performance of unprotected PIPE issuers. Although both groups experience a cash infusion in year 0, for protected PIPEs the years until cash depletion falls from seven months in year –1 to

six months by the end of year +2. Unprotected PIPE issuers are in only slightly better position with ten months of cash left at the end of year +2. The most one can say is that, on a relative basis, unprotected PIPE issuers have somewhat better post-issue operating performance than protected PIPE issuers. That said, both groups continue to exhibit very poor post-issue operating performance.

5.2 Effects of Short Selling

Hillion and Vermaelen (2004) suggest that an important reason why PIPE issuers experience poor returns is the short selling that occurs with the issue. Their model allows for short selling to occur by the investors or by market participants who short the issuer's shares after the deal is announced. This shorting and the potential dilution that results from it are a primary reason they suggest protected PIPEs are "faulty contracts" (they do not consider unprotected PIPEs). To determine the extent that short selling drives some of the returns experienced by existing shareholders, in Figure 2 we plot the ratio of monthly short interest to monthly trading volume for a 16 month period around the PIPE issue (month –3 to +12). For Protected PIPEs the average of this ratio increases from 5.12 (median=1.82) three months prior to the PIPE issue to 6.33 (median=2.58) twelve months after the issue. For unprotected PIPE issuers the average of this ratio increases steadily from 5.13 (median=1.50) three months prior to the issue to 6.66 (median=2.93) twelve months after the issue. As discussed earlier, the characteristics of PIPE issuers increase the probability that they are difficult to borrow in the equity lending market. Therefore, any increase in short selling around this event does not necessarily fully reflect the demand to so. In unreported results we find that short interest increases significantly from month –3 to month +12 for unprotected PIPEs but not for protected PIPEs. The median increase in short interest between the two groups is significant (p-value=0.06), although the average increase is not. One would expect that if short selling were responsible for the larger post-issue stock price declines in protected PIPEs that we should observe a larger increase in short interest for this group. We investigate the role of short interest further in the next section.

5.3 Regressions on Post-Issue Performance of Existing Shareholders

To gain a better understanding of the factors explaining the long run returns of PIPEs, we estimate pooled regressions of the protected and unprotected PIPEs. We consider several dependent variables in these regressions. In Models 1 and 2 the dependent variables are the cumulative abnormal returns (CARs) from month 0 to +12 and month 0 to +24, respectively. To mitigate the effect of outliers on this analysis we winsorize these returns at ± 5 percent. In Models 3 and 4, we take a similar approach to Hillion and Vermaelen (2004), who noting the high volatility of long run returns examine delistings, and use a dependent variable that is equal to one if the company's stock was delisted following the PIPE issue by the end of 12 or 24 months, respectively and is zero otherwise. The percentages of issuers delisted during these periods were shown in Table 7. The independent variables in all models include a dummy variable, UNPROTECT, which is equal to one for an unprotected PIPE and is zero for a protected PIPE. The other independent variables in the regression include relative issue size, log of market capitalization, the all-in net discount, the issuer's pre-issue stock performance, cash burn rate, illiquidity, and short constrained.

The coefficients on the UNPROTECT dummy in the first two specifications for cumulative abnormal returns are positive and significantly different from zero. After controlling for the other characteristics of the PIPE offering, the +12 and +24 month returns are, respectively, more than 16 and 13 percentage points greater for unprotected PIPEs than protected PIPEs issuers. As shown in Table 7, this difference largely reflects the abnormally poor performance of protected PIPE issuers rather than positive performance of unprotected PIPE issues. The coefficients of All-in Net Discount are positive and significant indicating that higher (less negative) discounts are associated with more positive post-issue returns. For 24 month returns, offers that involve larger stakes and have more time before cash is depleted have significantly more positive post-issue returns. Symptomatic of the high variance of the long run returns, the R-squares of the regressions are extremely low.

In Models 3 and 4 based on delistings, the coefficients of UNPROTECT are negative and significantly so for the issuers delisting within 24 months of the PIPE issue. This indicates that unprotected PIPEs have a significantly lower probability of being delisted within 24 months than protected PIPEs. The odds of being delisted within 12 months are 1.48 times greater for issuers of protected PIPEs than unprotected PIPEs. Through 24 months, this difference increases to 1.55 times. This is consistent with the univariate results in Table 7. The negative coefficients on CAR(–12, –1) reveal that companies that perform better in the 12 months preceding a PIPE issue are less likely to be delisted. The cash depletion rate variable is significantly negatively correlated with the likelihood of being delisted, indicating that companies with higher cash reserves are less likely to be delisted. Judging from the pseudo R-squares of 41 and 65 percent, delistings appear to be helpful in reducing some of the noise of the CAR specifications. All of the results are consistent with unprotected PIPEs outperforming protected PIPEs following the issue.

Although short selling around PIPEs has garnered a great deal of attention, we are unable to find that it consistently plays a role in explaining post-issue returns. The "Short Constrained" dummy is only significant in one of the models. In unreported results we also estimate regressions using the change in short interest from month –3 to month +6, +12, and +24 months, respectively instead of the short constrained variable. The change in short interest from –3 to +6 months is negative and significant for 12 month returns but is not significant for delistings or 24 month returns. The change in short interest from –3 to +12 months and –3 to +24 months is not significant in explaining 12 or 24 month returns. In short, short interest does not appear to have a statistically reliable influence on returns or delistings. Brophy, et. al (2005) also do not find evidence that increases in short interest around PIPEs issues significantly affects long run performance.

5.4 Long Run Returns to PIPE Investors

The evidence so far shows that existing shareholders in PIPE issuers experience highly negative returns and this leaves open the question why PIPE investors are motivated to invest in securities that

seem to yield negative returns. In Table 10, we estimate the long run returns to PIPE investors by building in the paper gains and losses from several of the aforementioned features that can differentiate investors' returns from those of existing shareholders. This analysis takes into account the size of the discount or premium on the purchase of shares, any price protective features, dividends or interest paid on the security, and whether any warrants included in the deal would have been "in-the-money" at the end of the 12 or 24 month window. We assume that investors do not convert any shares or sell any of their equity stake during the 12 months (or analogously 24 months) following the PIPE issue. Appendix B details the estimation procedure and provides a sensitivity analysis of alternative assumptions.

Because investors would be expected to adjust their holdings throughout, we believe our assumptions provide a conservative estimate of their gross returns. For example, if prior to delisting, a PIPE investor exits their position or shorts the issuer's stock, their return will exceed the return we estimate. However, our estimates do not take into consideration any costs that PIPE investors might incur maintaining or unwinding their positions.

The estimated raw returns for investors are shown in Table 10. For this analysis we purposefully do not winsorize the data. The average +12 month raw return is 37 percent for protected PIPE investors and 44 percent for unprotected PIPE investors. The average +24 month returns decrease to 3 percent for protected PIPE investors and 24 percent for unprotected PIPE investors. With the exception of the +24 month returns to protected PIPEs, the average returns are significantly different from zero at the 5 percent level. Again confirming the high degree of skewness in the returns, the median +24 month returns are –0.1 percent for protected PIPEs and –44 percent for unprotected PIPEs. Adjusting these returns by a benchmark portfolio matched on book to market and size ("Abnormal Returns") reduces the mean and median returns but with few exceptions they remain statistically significant.

To estimate the degree by which investors returns exceed those of shareholders, we subtract the long run returns of shareholder reported in Exhibit 7 from those of investors in Table 10. For example, based on median +12 month returns, investors' return exceeds those of shareholders by 40 percent for

protected PIPEs and 11 percent for unprotected PIPEs. The terms of the PIPE prove to be more valuable to investors in riskier firms – namely those investing in protected PIPE issuers. Although this difference appears large, it is important to note that investors' stakes are likely to be relatively illiquid compared to those of shareholders and this estimate does not include any costs of unwinding their positions. Our earlier evidence on the illiquidity of PIPE shares suggests that the costs of exiting this position could be substantial for investors, thereby reducing the net returns to this activity.

The distribution of the returns to PIPE investors is shown in Figure 3. There are parallels between this distribution and other forms of private equity investments, particularly venture capital. For the full sample of PIPEs, investors earn an average +12 month raw return of 40 percent (median= 6 percent). The standard deviation of these returns is 287 percent (untabulated). By comparison, Cochrane (2005) reports average returns of venture capital investments of 59 percent and a standard deviation of 107 percent. Also similar to venture capital, the returns to PIPE investors are largely driven by a few "homeruns." For protected PIPEs the top five percent of investments have +12 month returns over 190 percent with the top one percent realizing +12 month returns over 800 percent. For unprotected PIPEs the gains are even more extreme with the top five percent of investments realizing returns greater than 318 percent and the top one percent realizing returns over 1,100 percent. Cochrane (2005) also documents that the smallest decile of NASDAQ firms exhibit return characteristics similar to venture capital – and based on our earlier evidence of equity breakpoints in Table 4 – this decile likely contains many PIPE issuers. The high volatility and option like characteristics of these returns is more responsible for the high average returns of PIPEs than the high returns per se of individual PIPE investments. These return characteristics therefore help explain the large differences between the average and median returns documented throughout the paper.

Finally, it is also important to note that investors would need to invest an equal dollar amount in each of the deals to realize these large average returns. If we assume that instead investors value weight their investments based on the size of the PIPE offering, the returns decrease substantially. Weighted

average raw returns in Table 10 indicate that although the returns to protected PIPE investors through month +12 are 25 percent for protected PIPEs, they are insignificantly different from zero for unprotected PIPE investors. The weighted average returns through +24 months are insignificant for both groups. Therefore a PIPE investor's ability to correctly select potential issuers can have a pronounced effect on his or her returns, with the greatest returns resulting from some of the smaller issues.

6. Conclusion

This study examines the motivations and the effects on firms and investors using PIPEs (private investments in public equity). The large majority of PIPEs are issued by companies experiencing poor operating and stock performance. More than 80 percent of PIPE issuers have negative operating income and more than 50 percent underperform the market in the year prior to issue. Therefore, PIPEs are usually issued by financially constrained companies for which other forms of financing are not likely available.

We compare PIPE investments with limited downside risk or "price protected" PIPEs (floating rate convertible preferred stock and resets) to "unprotected" PIPEs (common stock and structured equity lines) which allow for enhanced upside returns. These classifications reflect differing investor perceptions about the outlook for an issuer and therefore different exposures to post-issue movements in the value of an issuer's equity. Consistent with this, investors demand significantly more cash flow rights and higher "All-in" net discounts for firms with poorer pre-issue operating performance. Further, we show that poorer pre-issue stock performance, higher cash burn rates, and short constrained stocks are associated with a significantly higher probability of investors choosing to invest in price protected PIPEs.

We examine both the announcement date and long run returns to the shareholders and investors in PIPE issuers. We find that the market reaction to PIPE announcements varies significantly with the degree of downside price protection demanded by investors. That is, the announcement date price reactions are significantly more negative for price protected PIPEs. With respect to long run stock performance, shareholders earn average benchmark adjusted returns of –22 percent in protected PIPEs

and –9 percent in unprotected PIPEs in the year following issue. Because of the structure and embedded options employed in PIPEs, the returns earned by shareholders are not the returns earned by investors. PIPE investors earn average benchmark adjusted returns of 27 percent for protected PIPEs and 34 percent for unprotected PIPEs in the year following issue. The average +12 month return to investors exceeds that of shareholders by 54 percent for protected PIPEs and 46 percent for unprotected PIPEs. Although this difference appears large, it is important to note that investors' stakes are likely to be relatively illiquid compared to shareholders' and our estimate does not include any costs of unwinding their positions. Nevertheless, the large positive differential in investors' versus shareholders' returns offers an important explanation for the rapid growth of the PIPE market. PIPE investors earn positive returns on average from their investments even though PIPE issuers continue to perform poorly on an operating basis post-issuance. Therefore, PIPEs appear to provide investors with incentives to allow companies facing substantial uncertainties to raise capital without fully exposing capital providers to these risks.

References

Aggarawal, R. and I. Gray, and H. Singer, 1999, Capital Raising in Offshore Markets, *Journal of Banking and Finance* 23, 1181-1194.

Ali, A. and M. Trombley, 2004, Short Sales Constraints and Momentum in Stock Returns, University of Arizona, unpublished manuscript.

Almeida, H., M., Campello, and M. Weisbach, 2004, The Cash Flow Sensitivity of Cash, *Journal of Finance* 59, 1777-1804.

Amihud, Y., 2002, Illiquidity and Stock Returns: Cross-section and Time-Series Effects, *Journal of Financial Markets*, 5, 31-56.

Asquith, P. and D. Mullins, 1986, Equity Issues and Offering Dilution, *Journal of Financial Economics* 15, 61-89.

Asquith, P., P. Pathak, and J. Ritter, 2005, Short Interest, Institutional Ownership, and Stock Returns, *Journal of Financial Economics*, forthcoming.

Barclay, M., C. Holderness, and D. Sheehan, 2003, Private Placements and Management Entrenchment, University of Rochester, unpublished manuscript.

Brav, A., and P. Gompers, 1997, Myth or Reality? The Long Run Underperformance of Initial Public Offerings: Evidence from Venture and Non venture Capital-Backed Companies, *Journal of Finance* 52, 1791- 1821.

Brennan, M., 1985, Costless Financing Policies under Asymmetric Information, unpublished manuscript, UCLA.

Brophy, D., P. Ouimet, and C. Sialm, 2005, PIPE Dreams? The Impact of Security Structure and Investor Composition on the Stock Price Performance of Companies Issuing Equity Privately, University of Michigan, February, working paper.

Chalmers, J., L. Dann, and J. Harford, 2002, Managerial Opportunism? Evidence from Directors' and Officers' Insurance Purchases, *Journal of Finance* 57, 609 – 635.

Chen, J., H. Hong, and J. Stein, 2002, Breadth of Ownership and Stock Returns, *Journal of Financial Economics* 66, 171-205.

Chaplinsky, S. and R. S. Hansen, 1993, Partial Anticipation, the Flow of Information and the Economic Impact of Corporate Debt Sales, *Review of Financial Studies* 6, no. 3, 1863-1889.

Cochrane, J., 2005, The Risk and Return of Venture Capital, *Journal of Financial Economics* 75, 3-52.

D'Avolio, G., 2002, The Market for Borrowing Stock, *Journal of Financial Economics* 66, 271-306.

Denis, D. J., and V. Mihov, 2003, The Choice among Bank Debt, Non-Bank Private Debt, and Public Debt: Evidence From New Corporate Borrowings, *Journal of Financial Economics* 70, 3-28.

Duffie, D., N. Garleanu, and L. H. Pedersen, 2002, Securities Lending, Shorting, and Pricing, *Journal of Financial Economics* 66, 307-339.

Fama, E. and K. French, 2004, New Lists: Fundamentals and Survival Rates, *Journal of Financial Economics,* forthcoming.

Fazzari, S. M., Hubbard, R. Glenn, and B. Petersen, 1988, Financing Constraints and Corporate Investment, *Brookings Papers on Economic Activity*, no. 1, 141-195.

Fink, J., Fink, K., G. Grullon, and J. Weston, 2005, IPO Vintage and the Rise of Idiosyncratic Risk, James Madison University, working paper.

Heron, R., and E. Lie, 2004, A Comparison of the Motivations for and the Information Content of Different Types of Equity Offerings, *Journal of Business* 77, 605-632.

Gezcy, C., D. Musto, and A. Reed, 2002, Stocks are Special Too: An Analysis of the Equity Lending Market, *Journal of Financial Economics* 66, 241-269.

Gomez, A., and G. Phillips, 2004, Why Do Public Firms Issue Private and Public Equity, Convertibles and Debt?, Wharton School of Business, working paper.

Gopalan, M., 2004, Short Constraints, Difference of Opinion, and Stock Returns, Fuqua School of Business working paper, Duke University.

Hertzel, M., and L. Rees, 1998, Earnings and Risk Changes Around Private Placements of Equity. *Journal of Accounting, Auditing, and Finance* 13, No. 1, Winter.

Hertzel, M. and R. L. Smith, 1993, Market Discounts and Shareholder Gains for Placing Equity Privately, *Journal of Finance* 48, 459-485.

Hertzel, M., M. Lemmon, J. Linck, and L. Rees, 2002, Long-run Performance Following Private Placements of Equity, *Journal of Finance* 57, 2595-2617.

Hillion, P., and T. Vermaelen, 2004, Death Spiral Convertibles, *Journal of Financial Economics* 71, 381-415.

Hoshi, T., Kashyap, A., and D. Scharfstein, 1991, Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups, *The Quarterly Journal of Economics* 106, no. 1, 33-60.

Hovakimian, A., Opler, T., and S. Titman, 2001, The Debt-Equity Choice. *Journal of Financial and Quantitative Analysis* 36, 1-24.

Hull, J., 2003, Options, Futures, and Other Derivatives. Prentice-Hall, Upper Saddle River, NJ, 5th ed.

Harford, J., 1999, Corporate Cash Reserves and Acquisitions, *Journal of Finance* 54, 1969-1997.

Kaplan, S. N. and L. Zingales, 1997, Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints? *The Quarterly Journal of Economics* 112, no. 1, 169-215.

Kaplan, S. N. and P. Stromberg, 2003, Financial Contracting Theory Meets the Real World: An Empirical Analysis of Venture Capital Contracts, *Review of Economic Studies* 70, no. 2, 281-315.

Korajczyk, R., D. Lucas, and R. McDonald, 1990, Understanding Stock Price Behavior around the Time of Equity Issues, in *Asymmetric Information, Corporate Finance and Investment*, R. Glenn Hubbard, editor, (NBER: University of Chicago Press.)

Krishnamurthy, S., P. Spindt, V. Subramaniam, and T. Woidtke, 2005, Does Investor Identity Matter in Equity Issues? Evidence from Private Placements, *Journal of Financial Intermediation* 14, 210-238.

Masulis, R. and A. Korwar, 1986, Seasoned Equity Offerings: An Empirical Investigation, *Journal of Financial Economics* 15, 91-118.

McDonald, R., 2003, Derivative Markets, Addison Wesley, Boston, MA, 1st ed.

Mikkelson, W. and M. Partch, 1986, Valuation Effects of Security Offerings and the Issuance Process, *Journal of Financial Economics* 15, 30-31.

Miller, E., 1977, Risk, Uncertainty, and Divergence of Opinion, *Journal of Finance* 32, no. 5, 1151-1168.

Nagel, S., 2004, Short Sales, Institutional Investors, and the Cross Section of Stock Returns, *Journal of Financial Economics,* forthcoming.

Ritter, J. and T. Loughran, 1997, The Operating Performance of Firms Conducting Seasoned Equity Offerings, *Journal of Finance* 52, no. 5, 1823-1850.

Silber, W., 1991, Discounts on Restricted Stocks: The Impact of Illiquidity on Stock Prices, *Financial Analysts Journal* 47, 60-64.

Whited, T. M., 1992, Debt, Liquidity Constraints, and Corporate Investment: Evidence from Panel Data, *Journal of Finance* 47, no. 4, 1425-1460.

Wruck, K., 1989, Equity Ownership Concentration and Firm Value: Evidence from Private Equity Financings, *Journal of Financial Economics* 23, 3-18.

Appendix A

Example of Press Release Describing the Issue of a PIPE

Leap Secures $250 Million Equity Financing Commitment

- Agreement Provides Flexible 'As Needed' Funding for Future Growth -

SAN DIEGO - Dec 21, 2000 - Wireless communications carrier Leap Wireless International, Inc. (Nasdaq: LWIN) today announced that it has received a commitment for up to $250 million in common stock equity financing from Acqua Wellington North American Equities Fund, Ltd. Over the next 28 months Leap may, at its discretion, sell registered shares of its common stock to Acqua Wellington at a small discount to the then current market price ranging from 4 to 5 1/2 percent depending on the company's market capitalization at the time the draw request is made. The total amount of Acqua Wellington's future investment in Leap is dependent in part on Leap's stock price, with Leap controlling the amount and timing of stock sold. All shares of common stock to be sold in this financing are registered under Leap's Registration Statement on Form S-3 (No. 333-45388).

The proceeds from any sales to Acqua Wellington will be used to supplement current funds available for acquisitions and spectrum purchases and for general corporate purposes including, but not limited to, future working capital needs.

"This line of credit provides us with the flexibility to raise additional equity on an 'as needed' basis over the coming months on favorable terms, thereby providing Leap access to capital to fund continued growth," said Harvey P. White, Leap's chairman and CEO. "We remain focused on continuing to expand our innovative Cricket service to markets around the country and to pursuing new opportunities in wireless data."

Acqua Wellington Asset Management, LLC acts as an advisor to the Acqua Wellington Family of Funds, which is targeted at investment opportunities among mid-cap and small-cap companies in domestic and global equity markets. Their primary focus is in the technology and life-science sectors.

About Leap Wireless International, Inc.
Leap Wireless International, Inc., headquartered in San Diego, Calif., is dedicated to playing a leading role in transforming wireless communications for the mass consumer market. As a different kind of wireless company, Leap is designing solutions to make the wireless future a reality. Domestically, Leap has launched its innovative Cricket Comfortable Wireless service that lets customers make all their local calls and receive calls from anywhere for one low, flat rate. Leap intends to spark the wireless revolution by offering innovative voice and data services that deliver value to customers. For more information, please visit www.leapwireless.com.

Source: *http://www.leapwireless.com/dindex.html*

Appendix B

Estimating the All-in Net Discount and Returns to PIPE Investors

"All-in Net Discount" to Investors

The all-in net discount to the PIPE investor is an inclusive measure of the value of the equity and other contract features and embedded options PIPE investors receive in exchange for the funds they provide to the issuer at the time of the transaction. In general, the net discount in Table 3 is estimated as $(I / V_0) - 1$, where $\mathbf{V_0}$ is the sum of the underlying market value of equity investors receive in the PIPE company (plus the value of other securities or payments they potentially receive) and **I** is the proceeds the *issuer receives* from PIPE investors.

Unprotected PIPEs

For common stock PIPEs, V_0 is the sum of the market value of equity and the value of warrants, if any, granted to the PIPE investors. The market value of equity is the product of the stock price one day prior to the closing of the transaction times the number of shares *issued to the PIPE investor*. The number of shares issued to the PIPE investor incorporates any purchase price discounts to the current market price. For example, in the absence of warrants, if a common stock PIPE allows an investor to purchase stock at a 20 percent discount below the closing market price of $10 per share, the PIPE investor will receive 125,000 shares ($1 million/$8 per share) in return for a $1 million investment. The all-in net discount, $(I / V_0) - 1$, in this case is simply [($1 million / (125,000 shares × $10 per share) – 1] or –20 percent. For a common stock PIPE issued with warrants, the value of warrants investors receive is added to the market value of equity to obtain V_0.

The warrants are valued using the Black-Scholes model adjusted for the dilution of the warrants (see McDonald (2003)). This value is calculated using the historical volatility of the stock for a 90 day window ending 10 days before the closing of the PIPE, the stock price on the day prior to closing, and the yield on six month Treasury bills. As data are not widely available regarding the expected life of the warrants, an expected life of 1.5 years is assumed for these calculations. Based on the statistical

properties of the returns around these offerings, it is unlikely that the Black-Scholes' assumption of lognormally distributed stock prices holds. However, we are not aware of a bias that this assumption introduces into the results.

For a structured equity line, I represents the proceeds the investors has *agreed in total to provide* to the company. V_0 is unchanged and remains the sum of the market value of equity and the value of the warrants granted to the PIPE investors with the structured equity line. These are valued using the same approach described for the common stock PIPEs.

Protected PIPEs

To the best of our knowledge there is no widely accepted model for valuing floating rate convertibles, convertible resets, or common stock resets. Therefore we value these instruments using a building block approach. For floating rate convertible PIPEs with warrants, V_0 is the sum of the market value of the equity that the bond (or preferred stock) can convert into, the value of any warrants issued to investors, interest or dividends payments, and the value of the floating rate features on the bond (or preferred stock). The market value of equity and the value of the warrants are calculated using the same approach described for the common stock PIPEs. The value of interest or dividend payments is calculated as the product of the interest rate (or dividend yield) times the proceeds from the investor, I.

We consider several floating rate features. The first floating rate feature is a reduction in conversion price if the value of the underlying stock decreases after the issue (as the price decreases the number of shares issued increases.) The payoff structure of this position is similar to having a long put position to accompany the long stock position. However, as the stock price approaches zero, the value of this price reset provision dissipates. For example if the company goes bankrupt, the security will also likely be worthless. Moreover, as the company approaches the point of bankruptcy, uncertainties arise regarding whether the conversion provision will be fully honored and an investor's ability to liquidate his or her shares if the provision is honored. To account for the fact that this reset provision will likely have no value if the company approaches bankruptcy, we value this floating rate feature as an exotic option

referred to as a down-and-out put. With this approach the PIPE investor is assumed to be long a put with a strike price equal to the market price at the time of issue that will be worthless or "knocked-out" if the price of the stock drops below a barrier price. In our calculations we use a barrier price of $0.50. This is roughly the average price at which stocks in our sample are delisted from *CRSP* either because the issue was liquidated or dropped from a major exchange. Because of limited data availability regarding the timing of the reset, we value this option using an expected life of 1.5 years.

If a security has a "floor" that designates the lowest price at which the stock can be converted, the investor is considered to be short a put at this floor price. The size of the short position is set equal to the size of the investor's long put position. The result is a position similar to a put spread in which the value of the price protection is capped by the difference between the closing market price and the floor price.

The second floating rate feature is a cap that limits the increase in the conversion price if the value of the underlying stock increases after issuance (the number of shares issued does not change if the stock price increases). For example a cap allows the conversion price of the bond to increase up to 20 percent above the market price of the stock at closing. In this case, if the market price of the stock at the time of issue is $5, the conversion price of the bond will increase as the stock price increases, but will not exceed $6. We view this provision as a call spread in which the investor is long a call with a strike price equal to the cap, and short a call at the closing market price.

We value these floating rate features using a Black-Scholes model or variations of this model (See Hull (2003) or McDonald (2003)) for a description of the valuation of the down-and-out put.) In making these calculations we use the previously described historic stock price volatility, stock price one day prior to closing, six month yield on Treasury Bills and an expected life of 1.5 years.

Although we use the same general approach to value the floating rate features of a common stock reset , there is greater variation in the way reset provisions are implemented for common stock resets. For example, some common stock resets are very similar to floating rate convertibles in which the investor receives additional shares if the market price is less than the closing prices at the time of the

reset. Other common stock resets have multiple reset dates with adjustments being made to the number of warrants or the exercise price of the warrants rather than the number of shares issued. The main difference between the reset provisions of common stock resets and those of convertibles concerns the maturity of the reset option. Common stock resets typically allow the terms to be adjusted for a 60 to 90 day period following closing whereas floating rate convertibles allow adjustments from 12 to 48 months. Therefore, we follow the same approach described for floating rate convertibles to value the common stock resets but assume an expected life of three months rather than 1.5 years. We note that common stock resets make up a relatively small fraction of the capital raised via PIPEs and our results are qualitatively similar if we use alternative assumptions to value these features or exclude common stock resets from the sample entirely.

Sensitivity of Assumptions

As shown in the table below, our estimates of the discount are not particularly sensitive to alternative assumptions regarding the expected life of the embedded options and warrants or the barrier price (i.e., the price at which the protection provided by the floating rate feature loses its value).

Sensitivity Analysis of Estimates of the All-in Net Discount			
	Barrier Price		
Expected Life (years) of embedded options or warrants[25]	$0.25	$0.50	$1.0
1			Mean 24%, Median 23%
1.5		Mean 27%, Median 26%	
2.0	Mean 28%, Median 28%		

We acknowledge that the data we have for the contracts and our estimates cannot fully capture the dynamics or adjustments investors make in the management of their positions. However absent detailed knowledge of investors' positions and trading in these securities, we believe our estimates are a reasonable approximation of the value of these securities based on the best available public information.

[25] As noted earlier, the common stock resets are assumed to have a three month life in the sensitivity analysis.

Estimates of the Returns earned by PIPE Investors

We estimate the returns realized by PIPE investors at the end of 12 and 24 months assuming that investors have not liquidated any of their position or taken offsetting positions (i.e., shorted shares to hedge the PIPE). The return to the PIPE investors is calculated as: $(V_e / I) - 1$. **I** represents the original investment made in the PIPE issuer, or in the case of the structured equity line, scheduled to be made by investors. $\mathbf{V_e}$ is the sum of the value of the underlying shares and the intrinsic value of warrants investors hold *at the end* of 12 or 24 months, and any interest (or dividends) they receive over the same interval.

The value of the underlying shares is the number of shares held by the investor at the end of 12 or 24 months (henceforth S_e) times the share price at the end of 12 or 24 months (henceforth P_e). With respect to S_e, there is no adjustment necessary to the initial number of shares received by investors in common stock PIPEs. However, for floating rate convertibles, convertible resets, and common stock resets, the number of shares initially granted to PIPE investors can change after the offering. For floating rate convertibles and convertible resets, we calculate S_e as **I**, the initial investment, divided by the lesser of $P_e \times$ (1- discount %) or the maximum conversion price.[26] For example, assume I = $1 million, a purchase discount of 10 percent, and a maximum conversion price of $10. If P_e = $12, the investor will receive 100,000 shares ($1 million / $10), because $10 is less than $12×(1–10%)= $10.8. Alternatively, if P_e=$8.89, the investor will receive 125,000 shares ($1 million / ($8.89×(1-10%)). If there is no purchase discount, S_e is calculated using the lesser of P_e or the maximum conversion price. For common stock resets, we follow a similar approach but calculate S_e based on the stock price three months following the offering. This methodology assumes that reset and floating rate provisions affect the number of shares issued rather than the strike price of the warrants or the number of warrants issued.

To the ending value of equity, we add the intrinsic value of the warrants. The intrinsic value of the warrants is calculated as P_e minus the strike price of the warrants times the number of warrants held

[26] The maximum conversion price is calculated using the variable labeled as "fixed conversion price" or "ceiling" in *Placementtracker*. Discount is calculated using what is referred to as the "variable conversion price" or "floating conversion price" in *Placementtracker*.

by investors. Finally, we add the appropriate interest (or dividend) payments received by investors over the 12 or 24 month period to complete the calculation of V_e.

For structured equity lines the timing of the investment is not known. Therefore, V_e is calculated by multiplying S_i by the issuer's price at closing and adding the intrinsic value of any warrants the investor receives at the end of the period. In this case **I** represents the proceeds that the investor agrees to provide to the company.

Finally, if the stock is delisted or is trading below $0.50 at the end of the period, we assume that contracting terms of the PIPE contract will not be honored and no longer have value at this point. In these cases, we ignore the terms of the PIPE contract and set the return to PIPE investors equal to the return earned by existing shareholders. For delisted firms, these returns are calculated using *CRSP's* delisting return in the month of delisting and a zero percent return in the remaining months of the sample period.

Sensitivity of Assumptions

Based on the assumptions above, we estimate the average return earned by all PIPE investors as 40 percent (median= 6 percent) through +12 months and 14 percent (median= –36 percent) through +24 months following issue (See Exhibit 10). If we assume the terms of the PIPE contract are honored when the stock price drops below $0.50 but it is not delisted, the average return earned by PIPE investors increases to 43 percent (median= 7 percent) through +12 months and 18 percent (median= –24 percent) through +24 months. Investor returns increase further if we assume investors are able to exit their position in the month of delisting. Returns in this case are calculated only for the period up to and including the delisting month. In this case, the average return increases to 51 percent (median= 11 percent) through 12 months and 44 percent (median= 6 percent) through 24 months. It is important to note that the results we present in the text use the most conservative assumptions with respect to estimating investor returns.

Table 1

Private Placements of Public Equity 1995 – 2000

Data on the companies issuing PIPEs are from *Placementtracker*. The table shows values for PIPE issuers between 1995 and 2000 that are also in *CRSP* and *Compustat*.

($ millions)		**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**Total by Type**
Floating Rate Convertibles	Amount Raised	$232.4	$1,307.0	$1,832.9	$1,059.3	$869.4	$782.3	$6,083.3
	No. of issues	30	149	233	194	116	89	811
Convertible Resets	Amount Raised	$9.6	$186.2	$145.8	$92.0	$96.5	$1,079.1	$1,609.2
	No. of issues	2	10	9	9	12	37	79
Common Stock Resets	Amount Raised	$28.3	$7.4	$24.2	$75.0	$145.1	$338.1	$618.1
	No. of issues	5	2	6	13	21	34	102
Structured Equity Lines	Amount Raised	$0.0	$7.5	$41.3	$28.2	$46.1	$368.6	$491.7
	No. of issues	0	1	10	12	10	69	102
Common Stock PIPEs	Amount Raised	$624.3	$1,425.9	$1,544.0	$1,007.5	$3,245.3	$10,032.9	$17,879.9
	No. of issues	58	99	118	127	285	385	1,072
Total Raised per Year		**$894.6**	**$2,934.0**	**$3,588.2**	**$2,262.0**	**$4,402.4**	**$12,682.2**	**$26,682.2**

Table 2

Characteristics of Financial Constraint for Companies issuing PIPEs by Contract Type

The sample includes all security offerings that are identified by *Placementtracker* as a private placement of public equity (PIPE) and that have *CRSP* and *Compustat* data available. Unless otherwise noted, the reported value is the median of the variable in year –1. *CAR(–6,–1)* is the cumulative abnormal stock return from month –6 to month –1 adjusted by a market benchmark based on size and book to market. *% with CAR(–6,–1) Greater than 25%* is the percent of firms with adjusted returns from month –6 to month –1 greater than 25%. *Return on Assets* is the return on assets in year–1. *% with Negative Operating Income* is the percent of firms with operating income less than $0. *Cash ÷ Assets* is the ratio of Cash and Equivalents to Assets. *% Paying Dividends* is the percent of companies paying common dividends. *Book to Market Ratio* is the ratio of the book equity as defined by Fama and French (2000) to market value of equity. *Cash Burn Rate* is calculated as the Cash and Cash Equivalents ÷ the absolute value of cash flow from operations (DATA #308). This variable is computed only for firms with negative cash flow. *Time Gained* is the gross proceeds of the PIPE ÷ the absolute value of cash flow from operations. This variable is also computed only for firms with negative operating income.

	Floating Rate Convertible	Convertible Reset	Common Stock Reset	Structured Equity Line	Common Stock PIPE
CAR(–6,–1) (%)	–9.5	–23.2	12.8	–12.0	–3.5
% with CAR(–6,–1) Greater than 25%	24.8	36.6	54.5	40.5	39.6
Total Assets ($M)	16.8	30.0	20.1	19.9	19.7
Return on Assets (%)	–27.8	–21.3	–27.7	–36.8	–25.3
% with Negative Operating Income	88.2	85.7	80.4	86.2	77.7
Cash ÷ Assets (%)	20.2	27.0	28.9	38.9	29.2
% Paying Dividends	2.7	3.6	2.1	3.4	2.1
Book to Market Ratio (%)	0.16	0.14	0.15	0.15	0.19
Kaplan & Zingales (1997) Index	1.71	1.68	1.80	1.75	1.45
Debt to Assets (%)	14.6	10.0	10.3	8.7	7.5
Cash Burn Rate (Years of Cash Remaining)	0.63	0.88	0.68	0.79	0.98
Time Gained (Years of Cash Gained from PIPE)	0.81	0.42	0.79	1.42	1.32

Table 3
Contract Features and Discounts associated with PIPEs

Contract features for price protected and price unprotected PIPEs are shown. Median values are presented below average values. Price protected PIPEs have a reset provision allowing the conversion price or the number of shares issued to be adjusted if the stock price decreases following the offering. PIPEs in this category include Floating Rate Convertibles, Convertible Resets, and Common Stock resets. Unprotected PIPEs do not have price reset provisions. These include Common Stock PIPEs and Structured Equity Lines. *Proceeds* is the gross proceeds. For structured equity lines this value is the expected proceeds. *Proceeds as Percent of Outstanding Shares* is the ratio of the gross proceeds to the number of shares outstanding prior to the PIPE issue. *Purchase Discount* is the ratio between the price at which shares can be converted or purchased to the market price minus one. *Interest Coupon/Dividend Yield* is the yield stated in the PIPE contract. *Percent with Warrants* is the percent of issues that include warrants. *Percent with Floors* is the percent of issues that include a floor provision (i.e., a minimum conversion price). *All-in Net Discount* combines the value of the Purchase discount, the value of warrants, floating rate features, floors, and caps. See Appendix B for estimation procedure. A price protected PIPE contract is classified as plain vanilla if its only feature is the floating rate. An unprotected PIPE contract is classified as plain vanilla if its only feature is the discount on the initial purchase price.

Contract Features	Protected	Unprotected	p-value of Differences
Proceeds ($M)	9.0 5.0	19.5 6.0	0.01 0.01
Proceeds as Percent of Outstanding Shares	13.9 9.8	17.8 10.4	0.10 0.38
Percent of Contracts including Purchase Discount	90.1	79.8	0.01
Purchase Discount (%)	−18.5 −18.0	–19.7 –15.7	0.14 0.08
Percent of Contracts requiring payment of Interest or Dividends	78.5	0	0.01
Interest Coupon/Dividend Yield (%)	5.1 6.0	--	--
Percent of Contracts with Warrants	46.8	35.0	0.01
Percent of Contracts with Floors	22.7	0	0.01
All-in Net Discount (%)	–30.0 –30.0	–23.5 –19.2	0.01 0.01
Number of observations	577	619	--
Least Complex Contracts ("Plain Vanilla")			
Percent of Contracts only with Purchase Discount Only	--	62.3	--
Percent of Contracts only with Floating Rate Feature	2.3	--	--
All-in Net Discount (%)	–17.9	–14.3	0.27
Most Complex Contracts			
Percent of Contracts with Purchase Discount and Warrants	--	37.6	--
Percent of Contracts with Floating Rate Feature, Purchase Discount, Caps, Floors, Dividend/Interest Payments, and Warrants	26.5	--	--
All-in Net Discount (%)	–34.7	–29.5	0.01

Table 4
Trading Characteristics of Issuer's Stock

Days to Exit Contract is the ratio number of shares issued or shares convertible through the PIPE issue to the average daily trading volume from day –260 to –10. *Illiquidity* is the average ratio of the absolute value of returns to the dollar trading volume from day –100 to –10 × 10^6 (higher values indicate less liquid stocks). *ADTV (–260,–10)* is the average of daily trading volume (DTV) from day –260 to –10. *SD RET(–260,–10)* is the annualized standard deviation of stock returns based on returns from day –260 to –10. *Institutional ownership* is the percentage of shares held by institutions from the month/quarter immediately preceding the PIPE offering as reported in *CDS Spectrum*. *Short Interest* is computed three months immediately preceding the PIPE offering date. *Short Constrained* is a dummy variable equal to 1 if a firm's *Short Interest ÷ Shares Outstanding* is greater than its *%Institutional ownership*. *Fraction with Price < $5* is a dummy variable equal to 1 if the issuer's stock price is less than $5 per share. It is based on the market price on the day immediately prior to the closing of the PIPE offering. *Fama-French Breakpoint* is the market capitalization of the issuer immediately prior to the closing of the PIPE relative the market value of equity of all NYSE stocks using the 5 percent breakpoints available from Ken French's data library. *Book to Market Ratio* is the book to market ratio using Fama-French's definition of book value. *Time from IPO* is the years between the IPO and the closing of the PIPE offering.

	Protected	Unprotected	p-value of Differences
ADTV(–260,–10) (000s)	199.7 103.6	201.2 82.7	0.94 0.03
SD RET(–260, –10) (%)	109.3 94.0	110.4 97.8	0.88 0.51
Days to Exit Contract	47.44 28.16	64.83 41.70	0.01 0.01
Illiquidity	1.89 0.33	2.42 0.37	0.05 0.38
Fama-French Breakpoint (percentile)	11 5	16 10	0.01 0.01
Book to Market Ratio	0.23 0.16	0.24 0.17	0.68 0.12
Time from IPO (years)	6.28 4	5.97 4	0.35 0.44
% with Negative Operating Cash Flow	0.87	0.81	0.01
Fraction with Price < $5 (%)	55	44	0.01
Institutional Ownership (%)	6.3 1.2	14.1 5.0	0.01 0.01
Short Interest ÷ Shares Outstanding (%)	3.46 1.39	2.58 0.59	0.09 0.01
Short Interest ÷ ADTV	5.15 1.81	5.13 1.50	0.97 0.19
Short Constrained (%)	46.5	23.1	0.01

Table 5
Regression Analysis of Discount and Investors' Choice of Price Protection

The dependent variable is the All-in Net Discount (All-in Net Discount<0) or is equal to 1 for a Unprotected PIPE and is 0 for a Protected PIPE. The independent variables include: *Market Cap* is the log of market capitalization. *CAR(–12,–1)* is the issuer's abnormal stock return over month –12 to –1 relative to the PIPE issue. *Cash Depletion Rate* is the ratio of 1 ÷ the ratio of cash and marketable securities to operating income before depreciation. For companies that have positive operating income this variable is set equal to 0 (the greater this variable the more time a company has until it runs out of cash.) *Book to Market Ratio* is the book to market ratio using Fama-French's definition of book value. *Days to Exit Contract* is the ratio of the number of shares the PIPE can be converted into or shares issued to by ADTV (average daily trading volume). *Illiquidity* is the average ratio of the absolute value of returns to the dollar trading volume from day –100 to –10 (higher values indicate less liquid stocks). *SD RET(–260,–10)* is the annualized standard deviation of stock returns based on returns from day –260 to –10. *%Institutional Ownership* is the fraction of shares held by institutions. *Price < $5* is a dummy variable equal to 1 if the issuer's stock price on the day immediately prior to the closing of the PIPE offering is less than $5 per share. *Short Constrained* is a dummy variable equal to 1 if a firm's *Short Interest ÷ Shares Outstanding* is greater than its *%Institutional ownership*. T-statistics and Chi-square statistics are reported in parenthesis.

Dependent Variable	All-In Net Discount			Protected=0 Unprotected=1		
Intercept	–0.332***	–0.282***	–0.261***	0.328	0.566	0.318
	(–18.38)	(–9.51)	(–8.27)	(1.65)	(1.37)	(0.38)
Market Cap	0.021***	0.013**	0.017***	0.001	–0.172**	0.052
	(5.61)	(2.44)	(3.25)	(0.000)	(3.87)	(0.38)
CAR(–12, –1)	–0.001	0.003	0.003	0.088**	0.131**	0.200***
	(–0.60)	(1.01)	(0.84)	(4.65)	(4.61)	(8.14)
Cash Depletion Rate	0.007***	0.009***	0.009***	0.134***	0.092***	0.108***
	(4.52)	(4.45)	(4.16)	(27.91)	(8.73)	(9.70)
Book to Market Ratio	0.012	0.021	0.021	–0.061	–0.359*	–0.510**
	(1.11)	(1.63)	(1.42)	(0.163)	(2.67)	(3.85)
Proceeds ÷ Market Cap (%)		0.146***	0.120*		–0.968	–0.390
		(2.56)	(1.95)		(1.11)	(0.16)
Days to Exit Contract		0.000	0.000		0.007***	0.004
		(0.63)	(0.64)		(9.47)	(1.91)
Illiquidity (%)		–0.001	0.000		0.018	0.037
		(–0.78)	(0.24)		(0.603)	(1.94)
SD RET (–260,–10)		–0.049***	–0.044***		0.130	
		(–5.48)	(–4.40)		(0.84)	
%Institutional Ownership		0.115***			3.45***	
		(3.16)			(24.34)	
Price < $5		0.030***			–0.362*	
		(2.52)			(3.56)	
Short Constrained (%)			–0.032***			–0. 799***
			(–2.67)			(17.41)
N (Protected/Unprotected)	907	683	566	443/465	312/372	253/314
F-Value/Likelihood Ratio	18.55***	11.91***	9.69***	40.26***	77.13***	54.76***
Adjusted/Pseudo R^2	7.18	13.78	13.54	57.3	68.4	67.6

***,**,* denotes significance at the 1, 5, and 10 percent level, respectively.

Table 6

Announcement Date Abnormal Returns to PIPEs

Average cumulative abnormal stock returns for company i the window between day t_0 and day t_1 are calculated using daily returns as: $CAR_i=\left[\prod_{t0}^{t0+t1}\left(\frac{1+R_{i,t}}{1+R_{m,t}}\right)-1\right]$ *Rm* is the return on a benchmark portfolio. Discount Adjusted CARs are computed as using the approach described in Hertzel and Smith (1993). The top (bottom) value in row is the mean (median). The results presented here are calculated using *CRSP's* value-weighted portfolio. The results are similar when we use equally weighted portfolio or alternative measures of abnormal returns. The sample includes PIPEs issued between 1995 and 2000 by companies that are in the *CRSP* database and not missing daily returns during the sample 21 day period. ***, **, * indicates values are significantly different from zero at the 1%, 5%, and 10% level, respectively.

	Protected		Unprotected		p-value of Differences	
Trading Day relative to PIPE issue	CAR	Discount Adjusted CAR	CAR	Discount Adjusted CAR	CAR	Discount Adjusted CAR
Day –10 to –2 (%)	1.30	5.29***	4.59***	9.72***	0.01	0.01
	–1.81**	1.96***	1.06*	5.22***	0.01	0.01
Day –1 to +1.	1.47**	6.11***	3.34***	8.33***	0.01	0.04
	–0.54	3.02***	0.87**	3.75***	0.01	0.02
Day +2 to +10	–3.81***	–0.09	1.61*	6.14***	0.01	0.01
	–5.56***	–2.81**	–1.18	2.05***	0.01	0.01
Day –10 to +10	–2.55**	0.96	9.58***	14.55***	0.01	0.01
	–5.71***	–1.69	3.09***	6.26***	0.01	0.01
% positive, Day –10 to +10	39.88	46.62	56.55	61.04	0.01	0.01

Table 7
Abnormal Long Term Returns to Existing Shareholders around PIPE Issues

Abnormal stock returns for company are calculated as the differences in buy and hold returns between the sample firm and the returns on benchmark portfolio matched on size and book to market. The returns for month 0 begin on announcement of the PIPE offering. The sample includes PIPEs issued between 1995 and 2000 by companies that are in the *CRSP* and *COMPUSTAT* databases. Companies that are delisted during the sample period are assigned *CRSP's* delisting return in the month of the delisting and a 0% return in the remaining months of the sample period. ***, **, * indicates values are significantly different from zero at the 1%, 5%, and 10% level, respectively.

	Protected			Unprotected			p-value of Differences	
Full Sample	N	Mean	Median	N	Mean	Median	Mean	Median
CAR(0, +12)	514	–0.222***	–0.488***	561	–0.093	–0.368***	0.026	0.001
CAR(0, +24)	504	–0.482***	–0.779***	551	–0.193	–0.639***	0.005	0.001
Percent with Negative CAR(0, +12)		0.813			0.704		0.001	
Percent with Negative CAR(0, +24)		0.843			0.773		0.001	
Percent Delisted by +12 months		0.149			0.091		0.001	
Percent Delisted by +24 months		0.325			0.237		0.001	
Eliminating Issues in 1999-2000								
CAR(0, +12)	342	–0.221***	–0.448***	189	–0.132	–0.294***	0.28	0.01
CAR(0, +24)	335	–0.437***	–0.784***	184	–0.004	–0.624***	0.02	0.02
First PIPE Issue Only								
CAR(0, +12)	270	–0.300***	–0.470***	329	–0.088	–0.387***	0.04	0.01
CAR(0, +24)	264	–0.592***	–0.792***	319	–0.121	–0.674***	0.01	0.01
Eliminating Issues with Price < $5								
CAR(0, +12)	212	–0.306***	–0.493***	295	–0.138*	–0.403***	0.12	0.03
CAR(0, +24)	208	–0.535***	–0.785***	289	–0.222*	–0.649***	0.04	0.01
Short Constrained								
CAR(0, +12)	133	–0.108	–0.480***	85	0.066	–0.403**	0.52	0.18
CAR(0, +24)	131	–0.466***	–0.748***	66	–0.017	–0.704***	0.20	0.26

Table 8

Operating Characteristics of Protected and Unprotected PIPEs

Price protected PIPEs (Floating Rate Convertibles and Resets) limit an investor's downside risk to declines in the issuer's stock price Unprotected PIPEs (Common Stock and Structured Equity Lines) are *not* protected against declines in the issuer's stock price. Financial data are from *COMPUSTAT*. Unless otherwise noted, medians of items are reported in $ millions. Year 0 is the year the security is issued.

	Protected	Unprotected	p-value of Differences
Sales			
Year –1	8.42	8.03	0.90
Year +1	11.62	12.99	0.28
Year +2	12.36	15.00	0.11
Total Assets			
Year –1	17.85	19.65	0.05
Year +1	20.94	30.19	0.01
Year +2	20.55	28.23	0.01
Return on Assets			
Year –1	–0.30	–0.29	0.10
Year +1	–0.29	–0.23	0.02
Year +2	–0.28	–0.21	0.02
Cash to Assets			
Year –1	0.21	0.30	0.01
Year +1	0.09	0.28	0.01
Year +2	0.17	0.27	0.01
Cash Burn Rate (Years of Cash Remaining)			
Year –1	0.64	0.97	0.01
Year +1	0.43	0.91	0.01
Year +2	0.51	0.88	0.01
Pct w/Neg. Operating Cash Flow			
Year –1	0.87	0.81	0.01
Year +1	0.83	0.77	0.01
Year +2	0.80	0.84	0.05
Change in operating income to average assets Year –1 to +2	–0.03	–0.02	0.92
No. Observations Year –1	598	728	
No. Observations Year +1	506	643	
No. Observations Year +2	428	553	

Table 9
Regression Analysis of Long Term Returns to Existing Shareholders after PIPE Issues

The dependent variables in models 1 and 2 are the cumulative abnormal returns from month 0 to +12 and month 0 to +24, respectively. The dependent variable in model 3 and 4 is a dummy variable equal to 1 if the company was delisted within 12 or 24 months after the PIPE issue and is 0 otherwise. *UNPROTECT* is a dummy variable that equals 1 if the PIPE is unprotected and is 0 if the PIPE is price protected. *Proceeds ÷ Market Cap* is the ratio of the proceeds from the PIPE offering to the market value of equity for fiscal year prior to offering. *All-in Net Discount* is the estimated discount to PIPE investors. *CAR(–12,–1)* is the issuer's cumulative abnormal stock performance from month –12 to month –1 relative to a size and book to market matched benchmark portfolio. *Cash Depletion Rate* is the ratio of 1 ÷ the ratio of cash and marketable securities to operating income before depreciation. For companies that have positive operating income this variable is set equal to 0. *Log of Market Capitalization* is calculated as shares outstanding and the price per share for the day immediately prior to the offering. *Illiquid* is the average ratio of the absolute value of returns to the dollar trading volume (ADTV) from day –100 to –10. Financial data are from *COMPUSTAT*. *Short Constrained* is a dummy variable equal to 1 if a firm's *Short Interest ÷ Shares Outstanding* is greater than its *%Institutional ownership*. T-statistics or chi-square statistics are in parentheses.

Dependent Variable:	1 CAR(0, +12)	2 CAR(0, +24)	3 Delisted within 12 months	4 Delisted within 24 months
Intercept	–0.066 (–0.40)	–0.277 (–1.46)	–1.820*** (6.55)	–0.381 (0.497)
UNPROTECT	0.164** (2.52)	0.126* (1.70)	–0.391 (2.05)	–0.437** (4.63)
Proceeds ÷ Market Cap	0.223 (0.42)	0.772** (2.44)	0.548 (0.25)	–0.472 (0.272)
All-in Net Discount	0.630*** (2.76)	0.636** (2.43)	–0.704 (0.54)	–1.195* (2.79)
CAR (–12, –1)	0.001 (0.05)	–0.040* (–1.65)	–0.633*** (11.50)	–0.408*** (15.59)
Cash Depletion Rate	0.018 (1.54)	0.031** (2.39)	–0.079* (3.53)	–0.076** (5.06)
Log of Market Capitalization	–0.002 (–1.06)	–0.021 (–0.65)	–0.057 (0.21)	–0.155* (2.72)
Illiquidity	–0.002 (–0.26)	–0.009 (–1.07)	0.005 (0.03)	0.001 (0.01)
Short Constrained	0.047 (0.71)	–0.029 (–0.39)	–0.781*** (6.25)	–0.267 (1.58)
Number of Observations	566	566	71/496	161/406
Adjusted/Pseudo R^2	0.03	0.04	0.41	0.65
P-Value of F-test / Likelihood ratio	0.01	0.01	0.01	0.01

***, **, * indicates values are significantly different from zero at the 1%, 5%, and 10% level, respectively

Table 10
Long Term Post-Issue Returns to PIPE Investors

The results presented here are calculated by estimating the returns to PIPE investors using an approach described in Appendix B that incorporates any discounts, warrants, reset provisions, or interest on the security. *"Investor – Shareholder Returns (0,+12)"* is Investors' raw returns minus Shareholders' raw returns from the announcement of the PIPE offering to month +12. Abnormal returns are calculated by benchmarking the estimated raw returns against the returns on a size and book to market matched portfolio assuming the buy and hold returns. Weighted average returns are weighted by the size of each PIPE offering. Companies that are delisted during the sample period are assigned *CRSP's* delisting return in the month of the delisting and a 0% return in the remaining months of the sample period. Significance of median values is calculated using a sign rank test. ***, **, * indicates values are significantly different from zero at the 1%, 5%, and 10% level, respectively.

	Protected		Unprotected		All PIPEs		p-value of Differences Protected vs Unprotected	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Raw Returns								
Month 0 to +12	0.366***	0.137***	0.436***	–0.109	0.402***	0.060	0.69	0.01
Month 0 to +24	0.028	–0.001***	0.245**	–0.439***	0.142**	–0.365***	0.11	0.30
Investor – Shareholder Returns (0, +12)	0.542***	0.403***	0.459***	0.111***	0.499***	0.191***	0.45	0.01
Investor – Shareholder Returns (0, +24)	0.326***	0.050***	0.284***	0.039***	0.304***	0.043***	0.37	0.31
% with negative raw returns 0 to +12	32		55		44		0.01	
% with negative raw returns 0 to +24	51		67		59		0.01	
Abnormal Returns								
CAR(0, +12)	0.272**	0.061	0.338***	–0.191***	0.307***	–0.050**	0.70	0.01
CAR(0, +24)	–0.202***	–0.405***	0.075	–0.566***	–0.057	–0.474***	0.04	0.96
Weighted Average Raw Returns								
Month 0 to +12	0.252**	--	–0.122	--	–0.015	--	0.01	--
Month 0 to +24	–0.013	--	–0.149	--	–0.110	--	0.37	--
Number of Observations, abnormal	515		560		1,075			

Figure 1

Distribution of Post-Issue Abnormal Stock Returns to Existing Shareholders

Abnormal stock returns are calculated as the differences in buy and hold returns between PIPE issuer and an equally weighted benchmark portfolio matched on size and market to book. Returns are from the date of the closing of the PIPE to end of month +12. The sample includes PIPEs issued between 1995 and 2000 by companies that are in the *CRSP* database. Companies that are delisted during the sample period are assigned *CRSP's* delisting return in the month of the delisting and 0% return in the remaining months of the sample period. PIPEs are classified as protected if the include a reset provision in which a conversion price is reset following the offering.

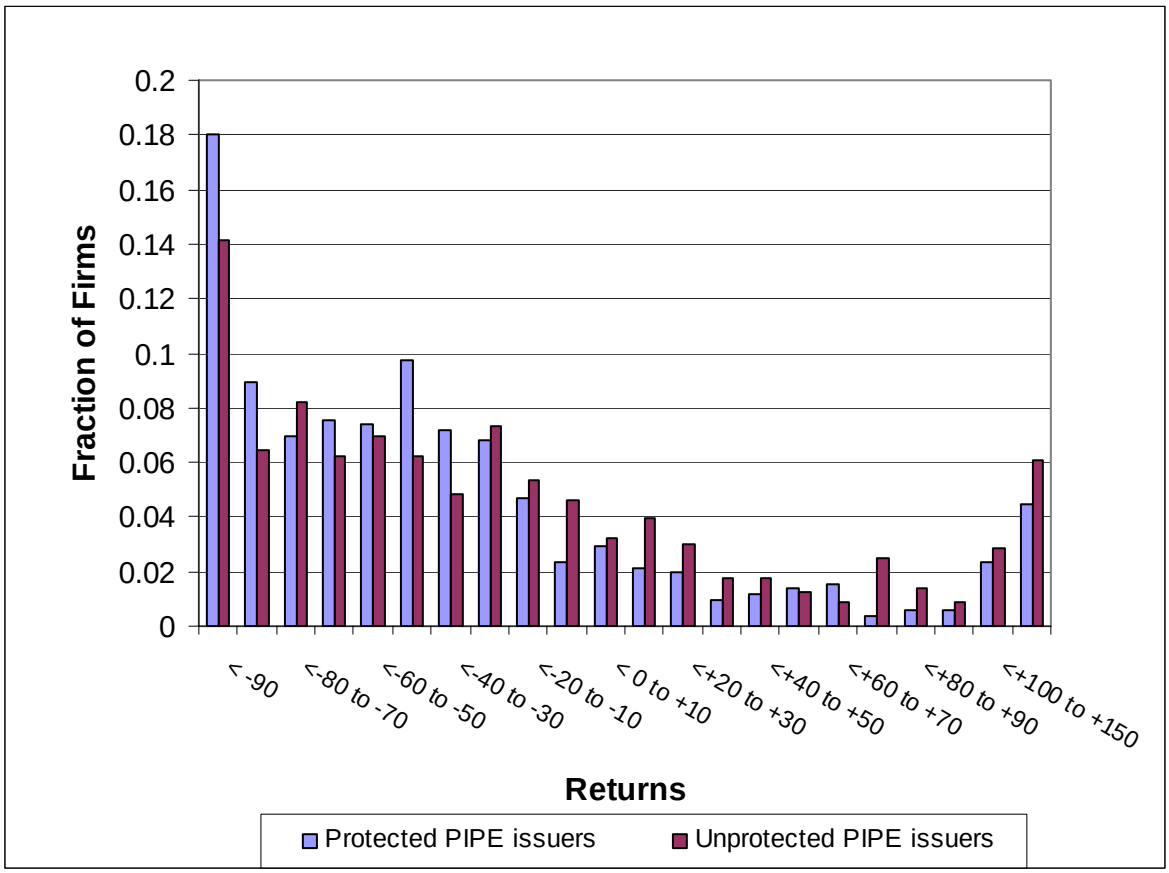


Figure 2

Short Interest around PIPE offerings

The ratio of short interest to volume is calculated as the average ratio of end of month short interest to average monthly trading volume. The ratio is shown for the 16 month window around the PIPE offering. Month 0 is the month the PIPE offering closed. PIPEs are classified as protected if they include a provision in which the conversion price is reset if the stock price decreases following the offering. Short interest and volume data are from NASDAQ and Bloomberg.

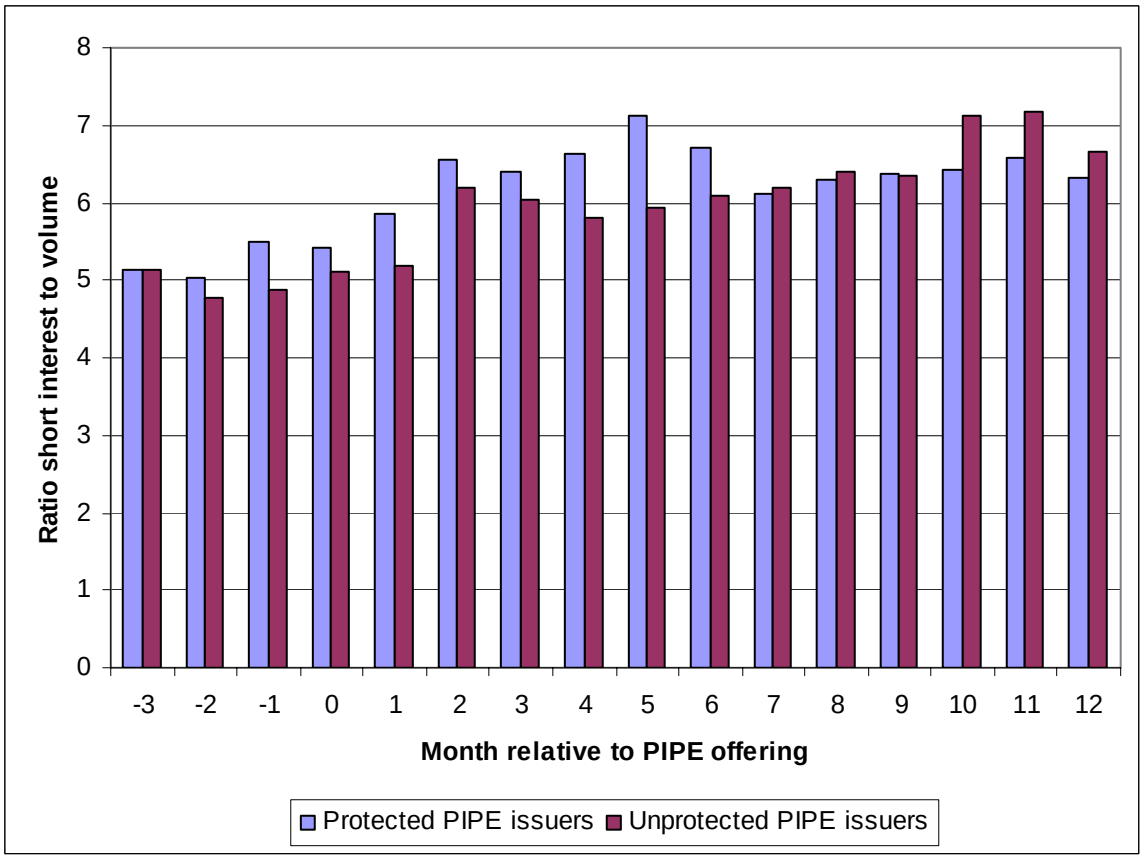


Figure 3

Distribution of Post-Issue Abnormal Stock Returns to PIPE Investors

Abnormal stock returns are calculated as the differences in buy and hold returns between PIPE issuer and an equally weighted benchmark portfolio matched on size and market to book. Returns are from the date of the closing of the PIPE to end of month +12. The sample includes PIPEs issued between 1995 and 2000 by companies that are in the *CRSP* database. Estimated returns to PIPE investors are calculated using an approach described in Appendix B. The sample includes PIPEs issued between 1995 and 2000 by companies that are in the *CRSP* database. Companies that are delisted during the sample period are assigned *CRSP's* delisting return in the month of the delisting and 0% return in the remaining months of the sample period.