Hedge Funds as Investors of Last Resort

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ABSTRACT

Hedge funds recently have become an important source of financing for public companies raising equity privately. This paper analyzes the role of hedge funds using a large sample of companies raising capital through private placements. We find that hedge funds tend to invest in companies that have poor fundamentals and pronounced informational asymmetries. To compensate for these shortcomings, hedge funds protect themselves by requiring substantial discounts, by negotiating repricing rights which protect them against declines in their investments, and by entering into short positions of the underlying stocks of the funded companies. Consistent with their worse fundamentals, we find that companies that obtain financing from hedge funds significantly underperform companies that obtain financing from other investors during the following two years. We argue that hedge funds are investors of last resort and provide funding for companies that would otherwise be constrained from raising equity capital.

1. Introduction

Hedge funds have become an important source of funding for public companies raising equity privately. Financing young, small companies with severe informational asymmetries is an important investment strategy for some hedge funds. Since 1995, hedge funds have participated in more than 50 percent of the private placements of equity securities and have contributed about one-quarter of the capital raised in such equity issuances, a total investment which has exceeded the contributions of other investor classes. This paper sheds light on the role of hedge funds in such private placement transactions.

Hedge funds recently have come under scrutiny due to the perception that their trading activity can increase uncertainty in the market.[1] Hedge funds are subject to limited government oversight and they tend to follow flexible and sophisticated investment strategies involving short-selling and derivative instruments.[2] These transactions enable them to partially or completely immunize their portfolios against potential price declines. For example, hedge funds can obtain equity securities through a private placement at a discount while simultaneously entering into short positions of the underlying stock of the issuing company to effectively eliminate their risk exposure. Hedge funds might therefore be more willing to invest in companies affected by severe informational asymmetries or in companies that are temporarily over-valued. However, these characteristics of hedge funds may deter some firms from obtaining financing from hedge funds.

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[1] Examples of recent negative media attention include "Pipe Dream or Problem?," *The New York Times*, June 5, 2004; "SEC Probes Hedge Funds, Brokers On 'Pipe' Offerings," *The Wall Street Journal*, July 8, 2004; "How Hedge-Fund Trading Sent a Company's Stock on Wild Ride," *The Wall Street Journal*, December 28, 2004.

[2] Other papers discussing the behavior and performance of hedge funds include Fung and Hsieh (1997, 1999, 2000a, 2000b, 2001), Ackermann, McEnally, and Ravenscraft (1999); Brown, Goetzmann, and Ibbotson (1999); Brown, Goetzmann, and Park (2000, 2001); Brown and Goetzmann (2003); and Gupta and Liang (2005). Brunnermeier and Nagel (2004) study the behavior of hedge funds during the technology bubble and question the efficient markets notion that rational speculators always stabilize prices.

In perfect financial markets it should be irrelevant whether a firm obtains funding from hedge funds or from any other investor class. Our paper studies whether the identity of the investors matter. In particular, we investigate three main questions: First, do the characteristics of the companies obtaining financing from hedge funds differ from firms which obtain financing from other investor classes? Second, do the characteristics of the specific security designs depend on whether the investors are hedge funds? And third, is there an association between the stock market and accounting performance of the issuing companies and the identity of the investors? Our evidence suggests that hedge funds often are investors of last resort and provide funding for firms with limited opportunities to access external capital.

To analyze these questions, we use a unique dataset that includes 5,260 transactions of Private Investments in Public Equity (PIPEs), which raised $77 billion between 1995 and 2002.[3] Using these private placements has several advantages for investigating the relevance of certain investor classes as sources of financing. First, private placements are negotiated with a small number of sophisticated investors. Other equity issuances, such as initial public offerings (IPOs) and seasoned equity offerings (SEOs), are generally first sold to an investment bank and then allocated to different investor classes. Thus, the relationship between the issuing companies and the final investors is substantially stronger for private than for public issuances of securities. Second, while public issuances of equity generally result in homogenous securities, the negotiations between the issuing companies and their investors in private issuances result in highly customized securities. This heterogeneity in the specifications of the securities gives us some additional insight into the preferences and the behavior of the different investor classes.

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[3] Other studies on private placements include Wruck (1989); Hertzel and Smith (1993); Hertzel, Lemmon, Linck, and Rees (2002); Hillion and Vermaelen (2004); Wu (2004); Krishnamurthy, Spindt, Subramaniam, and Woidtke (2005); Wu, Wang, and Yao (2005); Barclay, Holderness, and Sheehan (2005); Chou, Gombola, and Liu (2004); Chaplinsky and Haushalter (2005); Gomes and Phillips (2005); Meidan (2005), and Wruck and Wu (2005).

Third, firms issuing private placements tend to be small, young, and poorly performing companies, where informational asymmetries are most severe and where market imperfections are most prevalent, as shown by Wu (2004) and Gomes and Phillips (2005). These qualities complicate external assessments, resulting in significant information asymmetries between firm insiders and the external market. Myers (1984) and Myers and Majluf (1984) propose that the presence of informational asymmetries can reduce the value at which firms are able to sell their securities. These informational asymmetries may limit the investors interested in providing outside capital to these firms and provide unique opportunities for non-traditional investors.[4]

To answer the first question of whether the characteristics of companies obtaining financing from hedge funds differ from companies obtaining financing from other investors, we analyze the stock market and the accounting performance of these companies prior to the PIPE issue. We document that companies that obtain financing from hedge funds tend to be smaller, riskier, and less profitable than companies obtaining funding from other investors. These results indicate that hedge-funded companies are in worse financial shape and encounter more difficulties in raising capital than other companies.

To investigate the second question of whether there is an association between specific security designs and investors, we analyze the security contracts in detail and find substantial differences in the contract specifications between investor groups. First, hedge funds are much more likely than other investors to participate in so-called "Structured PIPEs," which are private placements of variable convertibles that include repricing rights. As shown by Hillion and Vermaelen (2004), these repricing rights effectively protect the investors against price declines in a similar way as short positions. On the other hand, hedge funds are less likely to participate in

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[4] The cost of information production as it relates to the decision to sell equity privately versus publicly is explored in Chemmanur and Fulghieri (1999) and Habib and Johnsen (2000).

so-called "Traditional PIPEs," which are conventional private placements of common stock and fixed convertibles, which do not include such repricing rights. In our sample, hedge funds account for 72 percent of the investments in structured PIPEs and for just 16 percent of the investments in traditional PIPEs. Second, companies that sell their equity to hedge funds are forced to sell their securities at significantly higher average discounts than companies that sell their equity to other investors. The fact that the companies that obtain financing from hedge funds accept larger price concessions and issue more information-insensitive securities further supports our hypothesis that hedge-funded companies exhibit worse fundamentals and have more difficulty obtaining financing than companies funded by other investors.

Interestingly, we observe that the short interest of companies issuing their securities to hedge funds increases substantially around the time of the closing of the deal. These results indicate that either the hedge funds themselves enter into short positions to reduce their risk exposure or that unaffiliated speculators short-sell the stocks of the issuing companies because they perceive hedge fund investors as a negative signal for the prospects of the issuing companies. If hedge funds are able to effectively reduce their risk exposure through short-selling, they may be more willing to provide capital to high-risk firms.

To answer the third question of whether there is an association between investors and the long-term performance of the funded companies, we investigate the stock market and the accounting performance of the companies using various methodologies (event-window returns and calendar-time returns). Our paper shows that there is a significant difference in performance between companies financed by hedge funds and companies financed by other investors even after controlling for the security structure. For example, the common stocks of companies issuing traditional PIPEs purchased by hedge funds decline by 14.33 percent during the first year

following the private placement, while the common stocks of companies issuing traditional PIPEs purchased by other investors increase by 2.25 percent during the first year. Thus, the negative long-term performance of companies issuing equity privately is concentrated among companies that obtain financing from hedge funds. The relatively slow market adjustment can be justified by the fact that companies often do not identify immediately the investors in their private placements. Furthermore, these firms are very small firms with little analyst coverage, which might cause an additional delay in the market reaction.

Unfortunately, we cannot observe the returns of the individual PIPE investors, because we do not know when the investors liquidate their positions and if they enter into offsetting hedging transactions. Despite the poor performance of the common stocks of companies issuing PIPEs to hedge funds, hedge funds still might make significant profits in such deals. First, hedge funds obtain the equity securities at significant discounts. Second, hedge funds might not hold on to these securities for the whole two-year time period we considered in the event study. They are likely to sell their acquired securities soon after the registration of the securities. Third, hedge funds often invest in price-protected securities and short-sell the underlying securities to immunize themselves against price declines. In fact, as argued by Hillion and Vermaelen (2004), manipulative trading strategies of investors in variable convertibles might cause price declines actually benefiting PIPE investors.

We cannot say conclusively whether the poor long-term performance is caused by the involvement of hedge funds. It is possible these companies would have performed better had they obtained funding from other investors. However, it is also possible that many of the companies that obtain funding from hedge funds might not have been able to attract other

investors and would have performed even worse without the hedge fund investment, since many of these companies might have been forced into default or more acute financial distress.

We propose that hedge funds act as investors of last resort for firms with the fewest alternative financing options captured by negative operating performance, large capital needs, and a high degree of asymmetric information. Hedge funds often are more willing to invest in companies with substantial asymmetric information, because they are able to hedge the downside risk by either negotiating PIPE securities with repricing rights or by entering into short positions of the underlying stocks of the issuing companies. This is in sharp contrast to other investors, such as mutual and pension funds, where regulatory requirements or self-imposed trading restrictions limit the use of such strategies.

The remainder of the paper is structured as follows: Section 2 briefly summarizes the literature on private placements. In Section 3, we describe our data sources and give a general overview of PIPE securities. Section 4 studies the characteristics of the companies that obtain funding from different sources. Section 5 investigates in detail the short-selling of the common stocks of companies obtaining financing from different investors and through different security structures. Section 6 analyzes the impact of the security structure and the investor composition on the short- and long-term stock price performance of the issuing companies. In Section 7, we show that the accounting performance of companies issuing PIPEs is generally consistent with the stock price performance. Section 8 provides a brief conclusion.

2. Literature on Private Placements

Since the seminal paper by Wruck (1989), there has been significant interest in analyzing the performance of companies issuing private placements. Wruck (1989) shows that the announcement of a private sale of equity is accompanied by a positive abnormal return during a

short-term event window; this is in contrast to the announcement of public offerings of seasoned equity. She argues that the market perceives these private placements as positive news, because of improved monitoring by active investors. More recently, Hertzel, Lemmon, Linck, and Rees (2002) study the long-term performance of a larger sample of companies issuing private placements and find the puzzling result that positive announcement period returns are followed by abnormally low stock price returns during the next three years. They suggest that investors tend to be overoptimistic about the prospects of the firms. Hillion and Vermaelen (2004) show that companies issuing floating-rate convertibles tend to perform particularly poorly in the long term. They suggest that such floating-priced convertibles encourage short selling by convertible holders and that the resulting dilution triggers a permanent decline in the share price. They also find evidence that supports the hypothesis that these structured securities are a source of last resort financing. In a contemporaneous paper, Chaplinsky and Haushalter (2005) investigate the motivations and the returns to firms and investors using both price-protected and unprotected PIPE securities. They argue that PIPE securities enable companies barred from traditional capital markets to obtain much needed financing. However, none of these prior papers analyze the role of various investor classes in general and of hedge funds in particular.

Several recent papers have studied the cross-sectional variation in the performance of firms depending on the characteristics of the investors. Krishnamurthy, Spindt, Subramaniam, and Woidtke (2005) show that private placements that include an affiliated investor (defined as officers, directors or affiliated institutions and individuals) have no long-run declines in contrast to negative long-run returns when a private placement is sold to unaffiliated investors. Barclay, Holderness, and Sheehan (2005) divide their sample of private placements depending on whether purchasers become active monitors of the issuing firm and whether purchasers are already a top

manager of the issuing company. They show that most of the investors remain passive and that companies obtaining funding from passive investors perform worse. Their results support the entrenchment hypothesis, where management places stock with friendly investors that will remain passive. In a recent paper, Wruck and Wu (2005) examine the value of relationship investing and conclude that relationship investing is valuable to the issuing firm. They show that higher-quality firms are more likely to transact with related investors rather than outside investors. Our paper is the first paper that investigates in detail the role of hedge funds in private placements. Moreover, our paper analyzes a large range of security designs, which gives us important insights into the behavior and the preferences of different investor classes.

3. Data

3.1 Data Sources

Our data set on PIPE transactions was provided by Sagient Research. They collect data on private placements since 1995. The data includes detailed information on the specific characteristics of PIPE transactions and their investors. All the information from Sagient Research comes directly from SEC filings and public announcements made by the companies.[5] Our data set includes 5,260 PIPE transactions.

To obtain accounting and stock price measures of companies issuing PIPEs, we match our PIPE data set with the CRSP/Compustat databases using the ticker symbols and the names of the issuing companies. We can match almost all PIPE companies that are traded on the NYSE, NASDAQ, and AMEX to CRSP. However, we cannot match companies that are traded Over-

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[5] We exclude Regulation S and 144-A placements. Regulation S placements are purchased by foreign institutional investors and have become less prevalent because of changes to SEC regulations. 144-A placements are issued by larger and more mature companies and are not considered PIPEs due to different regulatory treatments. Our qualitative results are not affected if we include the Reg S and the 144-A transactions. We exclude 95 Reg S placements and 469 144-A placements.

the-Counter (Bulletin Board). Of the 5,260 PIPE transactions, 914 companies cannot be matched to CRSP. However, these un-matched transactions raise less than 5 percent of the total proceeds of PIPE transactions. We are able to match most of the companies in our sample to the Compustat database.

We identify public equity and public debt issuances between 1990 and 2003 using the SDC database and merge this dataset with our data. We further identify whether companies which went public within five years of the PIPE issuance are venture-backed using the SDC database. We obtain the number of analysts making EPS forecasts for PIPE companies three months prior to the PIPE issuance according to I/B/E/S. Finally, we obtain data on the monthly short positions of stocks listed on NYSE, AMEX, and NASDAQ directly from the respective stock exchanges. We match these short-interest data with our sample of PIPE companies.

3.2 Security Structures

The specific characteristics of each PIPE transaction are negotiated between the investors and the issuing companies, resulting in numerous different equity-linked security structures. We distinguish between two basic security structures: traditional and structured PIPEs. The main difference between the two is that the underlying securities in traditional PIPEs are sold at a predetermined price, while the underlying securities in structured PIPEs are sold at a price that depends upon the future stock price performance. Consequently, structured PIPEs include repricing rights that protect the new investors against price declines after the private placement. Figure 1 summarizes the future possible payoffs and the impact on the number of securities issued for PIPE securities.[6] We describe in Appendix A additional security structure details.

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[6] Chaplinsky and Haushalter (2005) explain in detail the institutional details of PIPE securities and contrast them to traditional private placements.

3.2.1 Traditional PIPEs

Traditional PIPEs are private placements where the securities are sold at a predetermined price and include common stock, fixed convertible preferred stock, and fixed convertible debt. In a common stock PIPE a fixed number of shares is issued and sold at a predetermined discount or premium to the market price. As shown in the first column of Figure 1, the future value of the investor's position increases proportionally with the stock price. Thus, investors in common stock PIPEs are exposed to future stock price declines because they generally cannot dispose of their shares immediately. However, they can hedge their risk by simultaneously taking out short positions in the underlying stocks. In this case, investors can capture the discount while minimizing their risk exposure.

Another basic traditional security is a fixed convertible security. Fixed convertibles yield a current return through interest or dividend payments and can be converted into a fixed number of shares of the company's common stock at a predetermined conversion ratio, as shown in the second column of Figure 1. If the future stock price is above the conversion price, then the value of a convertible security is proportional to the value of the common stock; otherwise, the PIPE security is not converted into common stock. This inherent protection against decreases in equity prices can partially mitigate some of the concerns of investors regarding asymmetric information. However, the value of a position in a fixed convertible can still fall below the principal value of the embedded bond security if the issuing company defaults. Many hedge funds follow convertible arbitrage strategies by purchasing a fixed convertible security and at the same time dynamically hedging the risk exposure. In this case, they can take advantage of the effective discount often provided in the pricing of the PIPE.

3.2.2 Structured PIPEs

Structured PIPEs are equity-based securities, where the investor can convert the PIPE security into a variable number of common stocks during the conversion period. A basic structured PIPE is a variable convertible, where the conversion price is based on market prices of the common stock during a fixed time period following the issuance. This feature partially protects the investor if the price of the common stock decreases after the PIPE deal is closed, since the investor will receive a larger number of shares following a decreasing stock price. For example, a basic variable convertible states that the convertible security can be redeemed for common stock with a fixed value V on the conversion date. Thus, if the stock price during the future conversion period[7] is p, then the company would issue V/p shares to the owner of the floating convertible. Thus, the value of the investor's position in variable convertible securities would always be equal to V, unless the total value of the equity in the issuing company is less than V. The implication of this security is that decreasing stock prices will result in a greater number of shares issued and greater dilution of existing shareholders, as shown in the third column of Figure 1. Variable convertibles often include caps and floors that limit the possible range of conversion prices.

This variable security is essentially "adverse-selection-proof" equity (Stein, 1992), because all parties in the transaction can agree that this security has a fixed value of V on the conversion date – assuming the firm does not declare bankruptcy before the maturity date of the security. These repricing rights are effectively very similar to an embedded short position, which immunizes the investors from changes in the price of the underlying stock after the PIPE

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[7] The conversion period can be as short as one day or as long as the lifetime of the security. The conversion period is typically between one and four weeks. Prices calculated as an average during the conversion period are then used to determine the number of new shares to be issued upon conversion of the variable security.

issuance. However, these same attributes restrict such firms in their dealings in the debt market due to higher probabilities of and costs associated with financial distress.

Though structured PIPEs theoretically may be an ideal source of financing for firms with a high degree of asymmetric information, arguments also have been made that these contracts are faulty and leave the issuing firm prey to market manipulation. As described by Hillion and Vermaelen (2004), by short selling the underlying equity shares during the conversion period, PIPE investors might be able to temporarily depress stock prices, resulting in a more favorable conversion ratio. In such an instance, variable PIPE investors would receive a larger number of undervalued common stocks through the convertible security, and this excessive dilution would permanently reduce the stock value for the original stockholders. The U.S. Securities and Exchange Commission has expressed concern after investigating cases of market manipulation surrounding the issuance of variable convertible PIPEs and has warned that these securities present the temptation for investors "to engage in manipulative short selling of the issuer's stock in order to receive more shares".[8]

3.3 Summary Statistics

Panel A of Table 1 summarizes the characteristics of the PIPE securities issued between 1995 and 2002. These PIPE deals raised a total of $76.7 billion. Traditional PIPEs account for the majority of proceeds raised through PIPE transactions. The 3,592 traditional PIPEs raised $65.0 billion, and the 1,668 structured deals raised $11.8 billion. The PIPE transactions increase the funds available for companies substantially: The average ratio of the proceeds of a PIPE and the market capitalization of the company exceeds 20 percent. The number of investors per deal ranges between one and 84, with most PIPE transactions having only one investor. Many

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[8] See http://www.sec.gov/news/press/2003-26.htm.

companies are involved in multiple PIPE transactions over our sample period. While 1,560 companies issue exactly one PIPE, 1,134 companies issue more than one PIPE.[9]

Panel B of Table 1 summarizes the composition of the investors in PIPE securities. The investors can be identified for more than 80 percent of the capital raised in our sample. Each investor is classified in one of 11 different groups. Hedge funds are the largest investor class, accounting for 24.57 percent of the total investments in PIPE securities by identified investors. Corporations, mutual funds, venture capital, and private equity funds also are important investors in this market and account for more than 10 percent of capital raised. Individual investors, who are often executives as shown by Wruck and Wu (2005), account for just 6.18 percent of the total investments in PIPE securities. However, individual investors often are involved in PIPE securities as minority partners, contributing less than 50 percent of the total proceeds.

The investor composition differs dramatically between the two basic security structures. Hedge funds account for 15.63 percent of the investment in traditional PIPEs and for 71.72 percent of the investments in structured PIPEs with known investor classifications. The remaining investors in structured PIPEs are dispersed across several investor classes. Thus, we find a very strong clientele effect for the two security structures, showing that hedge funds are associated with securities that protect them against price declines.

Sagient Research categorizes the companies issuing PIPEs into 11 industries listed in Panel C. Most companies issuing PIPEs are in high-tech industries, such as communications, healthcare, consumer cyclicals, and technology.

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[9] The composition of these deals has changed considerably over time. Between 1995 and 1998, structured PIPEs accounted for 53.0 percent of the PIPE transactions and for 36.9 percent of the capital raised. Between 1999 and 2002, structured PIPEs accounted for just 24.4 percent of the PIPE transactions and for just 10.3 percent of the total proceeds.

4. Security and Investor Choice

Companies issuing PIPEs simultaneously select the investors and the specific security structure. In this section, we summarize the characteristics of the transactions and the companies issuing PIPEs and study the security and investor choice using a multinomial logistic regression.

4.1 Characteristics of PIPE Securities

The detailed specification of PIPE securities is customized to the needs of the investors and the issuing companies. Thus, we should expect the detailed contract provisions to differ between the different investor classes. Table 2 summarizes the characteristics of PIPE transactions by the two investor classes (hedge funds vs. other investors) and by the security structure (traditional vs. structured PIPEs). PIPE transactions are allocated to "Hedge Funds" if hedge funds account for more than 50 percent of the total proceeds and to "Other Investors" if other known investors account for more than 50 percent.[10] For some deals, we do not know the identity of the investor or we do not know the investor classification (hedge funds, corporations, etc.). Therefore, we cannot allocate all PIPE transactions to the two investor classes considered here.[11] We find that hedge funds are majority investors in 26.5 percent of traditional PIPEs with known investors and they are majority investors for 74.6 percent of structured PIPEs. The table summarizes the means of various characteristics. To determine whether there is a statistical difference in the characteristics between the two security structures and the two investor classes, we test for the differences using a *t*-test for the means taking into account clustering by individual firms, since the same firm can issue multiple PIPEs during our sample period. The

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[10] We use this classification method for most of this paper. However, our qualitative results are not affected significantly if we use alternative cutoff levels to identify investor classes.

[11] We do not include deals with unknown or unclassified investor classes in the category "Other Investors" because these investors also might be hedge funds. Hedge funds might be more likely to be unknown or unclassified than other investor classes such as corporations, mutual funds, brokers, banks, or insurance companies because hedge

pairs, where the means are significantly different from each other at the ten percent confidence level, are indicated in italics.

Companies obtaining financing from hedge funds tend to obtain significantly smaller investments than other companies, indicating that investors might be unwilling to take a large stake in such companies. The average hedge funded PIPE raises $9.20 million or 12.25 percent of market capitalization, while the average non-hedge funded PIPE raises $25.18 million or 21.73 percent of market capitalization. The difference in these means is statistically significant at a five percent level, as indicated by the font in italics. In addition, hedge funds tend to invest less capital in the companies conditional on each security structure, although the difference in the means is not statistically significant for structured PIPEs.

Investors in PIPEs are often induced to participate in these deals because of favorable contract specifications, which include significant discounts and valuable warrants. Discounts have been discussed as compensation to investors for providing monitoring services and advice (Wruck, 1989), for illiquidity of the security (Silber, 1991), for information production (Hertzel and Smith, 1993), and as a compensation to purchasers for allowing managerial entrenchment (Barclay, Holderness, and Sheehan, 2005). On the other hand, warrants have not received much attention, although they constitute a significant value to the investors.

We compute the discount of common stocks as the difference between the market price and the purchase price divided by the market price. The discount of variable convertibles does not need to be computed since it is already included in the specifications of the contract. For example, a variable convertible security might state that securities are sold at a 20 percent

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funds generally are not as well known as these other investor classes, which are in direct contact with retail investors and customers.

discount relative to the market price three months after the closing of a PIPE transaction.[12] The value of the warrants is computed by Sagient Research with the Black-Scholes model using the historical standard deviation over the month prior to the close.

The total costs associated with issuing PIPEs can be very significant. Companies issuing common stock PIPEs to hedge funds accept an average discount of 16.86 percent, whereas companies issuing common stock PIPEs to other investors accept an average discount of only 9.02 percent. The discounts on variable convertibles are larger for both investor classes. Moreover, a significant fraction of PIPE transactions include additional warrants, which effectively increase the discount of PIPE securities. We find that hedge-funded PIPEs are significantly more likely to include warrants. The average value of the warrants included in private placements is substantial and is estimated at 14.84 percent of the proceeds of PIPEs. In addition, issuing companies also need to pay fees to the placement agents and might have additional costs due to legal and regulatory requirements. Thus, private placements appear to be an expensive means for companies to raise equity.[13]

4.2 Characteristics of PIPE Companies

PIPE issuers tend to be young, small, growth companies in high-technology sectors. Table 3 summarizes some characteristics of firms issuing PIPEs prior to the issuance of the PIPE transactions. Panel A reports several stock market measures, and Panel B reports several

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[12] We can compute the discounts for common stock PIPEs and for variable convertibles, but we cannot compute the discount of fixed convertibles since we do not have sufficient information on the convertibility features to compute a reliable value of the convertible bonds, which consists of a straight bond and a call option. When calculating the discount for common stock PIPEs and variable convertibles, we exclude the additional value derived from any warrants attached to the deal. Thus, our methodology captures a conservative floor on the discount and the presence of warrants increases the effective discount.

[13] Median (2005) analyzes the determinants of the discounts in detail and shows that discounts have an important impact in explaining long-term performance.

accounting measures. The tables summarize the means of the corresponding variables. Significant differences in the characteristics are again identified by a font in italics.

Companies issuing PIPEs tend to be relatively young and small companies.[14] The majority of companies were listed less than five years prior to the issuance of a PIPE transaction. The average company has a market capitalization of $239.7 million. Companies obtaining financing from hedge funds are substantially smaller than companies obtaining financing from other identified investors.

Companies placing equity to hedge funds tend to be more risky and more subject to asymmetric information. Hedge-funded companies exhibit significantly higher standard deviations and higher CAPM-betas during the year prior to the PIPE issuance compared to other PIPE companies. Furthermore, companies issuing structured PIPEs to hedge funds have significantly less analyst coverage than companies issuing traditional PIPEs. Since the number of analysts following a security is often used as a proxy for asymmetric information,[15] this difference confirms our view that companies issuing structured PIPEs are potentially more subject to informational asymmetries and might have more difficulties in raising capital publicly.

Although companies obtaining financing from hedge funds tend to be significantly smaller, they exhibit higher trading volumes and higher short interest positions six months prior to the close of the PIPE transaction than other companies. This relationship might be caused by the fact that hedge funds prefer to purchase companies that are more liquidly traded since they often pursue more aggressive trading strategies involving short-sales and dynamic trading.

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[14] For each company we determine the age relative to the fist listing in the CRSP database.
[15] See Brennan and Subrahmanyam (1995), Aboody and Lev (2000) and Wu (2004). Diether, Malloy, and Scherbina (2002) show that the dispersion of the earnings forecasts by analysts is a measure of asymmetric information. We also find that companies issuing structured PIPEs have a significantly higher dispersion of earnings forecasts than companies issuing traditional PIPEs. However, we do not use this alternative proxy of asymmetric information, since this dispersion information often is not available for our sample of PIPE companies because 79.6 percent of PIPE companies have no or only one analyst following their earnings.

Brav and Gompers (1997) show that venture capital backing adds value even after the initial public offering: Venture-backed companies outperform non-venture-backed firms in the public aftermarket. In our sample, 25.7 percent of the PIPE companies that went public during the five years prior to the PIPE issuance are venture-backed. Companies that obtain funding from hedge funds are significantly less likely to be venture-backed, indicating that venture backing also has an impact on the opportunities to raise funds subsequent to the IPO. Venture-backing decreases the probability that companies obtain financing using structured PIPEs.

Panel B reports several accounting measures during the fiscal year prior to the issuance of the PIPE transactions.[16] Companies obtaining financing through structured PIPEs and hedge funds tend to have relatively smaller asset bases and book values. Companies in our sample experience poor operating performance during the fiscal year prior to the issuance of the PIPEs. The return on assets for the average company issuing a PIPE is -62.8 percent. We obtain similar results using returns on equities. Though 71.0 percent of companies in Compustat have positive returns on assets, only 14.6 percent of companies issuing PIPEs have positive returns on assets.

Companies issuing PIPEs make substantial capital expenditures and research and development investments despite their poor operating performance. We do not find that companies obtaining funds from hedge funds have significantly different capital expenditures and research and development investments. These companies need to raise external funds to maintain their investment levels.

The dismal operating performance may pose difficulties in raising capital through public debt markets and secondary equity offerings. According to SDC, just 0.20 percent of PIPE companies issue public debt and 3.2 percent of PIPE companies make secondary equity offerings

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[16] We give the exact definitions of the accounting variables in Appendix D. All the accounting measures are winsorized at the 1-percent level to eliminate the impact of extreme outliers.

in the year of PIPE transactions. This supports our earlier contention that firms which issue PIPEs are limited, due to their size and recent poor performance, in their abilities to raise financing in the more conventional public debt and equity markets.

4.3 Multinomial Logit Estimation

To better understand the security and investor choice, we estimate a multinomial logit model. This estimation method allows us to explore the determinants of the security and investor structure for PIPE issuances. We sort all PIPE transactions with known investors into four groups based on the two security structures (traditional and structured PIPEs) interacted with the two investor groups (hedge fund and non-hedge fund investor). The first group (traditional PIPE and non-hedge investor) is the largest and accounts for 47.8 percent of the observations, while the third group (structured PIPE and non-hedge investor) is the smallest and accounts for 8.1 percent of the observations. Thus, we have multiple possible outcomes $y = \{1, 2, 3, 4\}$. The numerical values of the dependent variable in a multinomial logit estimation are arbitrary.

The vector of independent variables, *X,* includes several characteristics of the companies issuing PIPEs. All these explanatory variables are taken prior to the closing of the PIPE transaction. The accounting variables are taken at the end of the fiscal year prior to the PIPE issuance. The multinomial logit model has the following specification for the four categories:

$$\Pr(y = i) = \frac{e^{X\beta^i}}{\sum_{j=1}^{4} e^{X\beta^j}} \quad \text{for} \quad i \in \{1,2,3,4\}. \tag{1}$$

To ensure that the model is identified, we use traditional PIPEs with non-hedge fund investors ($y = 1$) as the comparison group by setting the vector β^1 to zero. For example, the

relative probability of issuing a traditional PIPE from hedge fund investors ($y = 2$) compared to issuing a traditional PIPE from non-hedge fund investors ($y = 1$) is as follows:

$$\frac{\Pr(y=2)}{\Pr(y=1)} = e^{X\beta^2} \ .$$

(2)

Table 4 summarizes the results for the maximum-likelihood multinomial logit estimations. The first column reports the coefficient vector β^2 and compares the companies that issue traditional PIPEs to hedge funds relative to the companies that issue traditional PIPEs to non-hedge fund investors. The second and third columns report the coefficient estimates β^3 and β^4, respectively. The specification includes unreported year- and industry-fixed effects. Moreover, the standard errors adjust for clustering by PIPE company.

We observe that smaller companies are relatively more likely to raise capital through structured PIPEs and hedge funds rather than through traditional PIPEs and other investors, because the coefficient on the logarithm of the market value is significantly negative for group 4. The coefficients on the book-to-market ratio are negative for all three groups. This indicates that companies with higher book-to-market ratios (value companies) tend to be more likely to raise capital through traditional PIPEs from non-hedge fund investors, while lower book-to-market ratios (growth companies) tend to raise capital either through structured PIPEs or from hedge fund investors. We also observe that companies with less extensive analyst coverage are relatively more likely to obtain financing from hedge funds. An important predictor of the security structure and the investor composition is the indicator variable of whether the company has been venture-capital funded. We find that venture capital-funded companies are substantially less likely to issue structured PIPEs. Thus, companies where asymmetric information is potentially more important (i.e., smaller companies with relatively smaller book values and

companies with less analyst coverage and no relationship to a venture capitalist) are relatively more likely to issue variable convertibles and to obtain financing from hedge funds. The multinomial logit results also suggest that companies receiving funding from hedge funds tend to have significantly higher trading volumes and slightly higher short interest six months prior to the PIPE issuance. Although the coefficients on the trading volume are statistically significant at the one percent level, the coefficients on the short interest are usually not significant at conventional significance levels. Hedge funds are interested in trading liquid securities, and they choose to invest in companies with high volumes, which can be short-sold easily.

5. Short Interest of PIPE Issuing Companies

Hedge fund investors often use short-selling or derivative securities. Other investors are probably more likely to be buy-and-hold investors because of regulatory requirements or a lack of knowledge and experience using sophisticated trading strategies. In Section 3.2.1, we argue that investors in common stock and fixed convertible PIPEs might want to hedge their exposure by entering into short positions of the underlying common stock security. If an investor purchases stocks in a common stock PIPE at a 10 percent discount, then the investor can lock in a risk-free profit of 10 percent if the underlying securities can be short-sold immediately and if there are no trading costs or other frictions. Investors in fixed convertibles also can hedge their exposure. However, they need to follow dynamic hedging strategies because the delta of their convertible bond position will change with time. In any case, the hedging demand for convertible securities should be less than the hedging demand for common stock for the same investment amounts.

Hillion and Vermaelen (2004) suggest that a structured PIPE might be a faulty contract due to the incentives for investors to manipulate the price downward in order to receive a higher

percentage of the firm upon conversion. One way to temporarily reduce the effective price is to short-sell the stocks aggressively during the conversion window. In this case, we should observe an increase in the short interest for companies that issue structured PIPEs to hedge funds. In addition, even non-manipulating investors in structured PIPEs may want to hedge their exposure because of limits to the number of securities which can be issued or because of the possibility of default.

To investigate the short-selling behavior around the closing date of the PIPE securities, we compute the average ratio between securities shorted in a specific month and the total number of securities outstanding for firms surrounding the PIPE transaction. Our results are not affected qualitatively if we define short interest by dividing the shares shorted in a particular month by the shares outstanding in the previous month or if we normalize the short interest relative to matched companies.[17]

Unfortunately, we do not observe the identity of the short-sellers. Thus, we do not know whether short-selling is driven by the investors in the deals or whether it is driven by unaffiliated short-sellers that perceive the announcement of a specific private placement as a negative signal. Also, if investors are attempting to manipulate a security, they have an incentive to hide their actions, making it more difficult for us to pick up an effect.

Figure 2 and Table 5 report the short interest of companies issuing traditional and structured PIPEs for hedge fund and non-hedge fund investors. We find that traditional PIPE companies that obtain financing from hedge funds have higher initial levels and larger increases

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[17] We also compute an alternative measure of short interest that uses the lagged shares outstanding. Dividing by the current shares outstanding might possibly make it more difficult to identify stock manipulation, since both the short interest and the number of shares outstanding could potentially increase dramatically in the conversion month of a variable convertible security. However, this issue does not affect our results: First, it often takes several months until converted securities are reflected in the CRSP database. Second, we also analyze the shares outstanding of structured PIPEs and do not find that this issue is a substantial concern.

in the short interest around PIPE issuances.[18] This result is consistent with hedge funds eliminating their risk exposure after investments in PIPE securities by taking short positions in the underlying stocks. The increase is larger for common stock than for fixed convertible PIPEs. This also should be expected since the optimal hedge ratio is substantially larger for common stock than for fixed convertible securities. Moreover, we find that the short interest of traditional PIPE companies that obtain financing from hedge funds decreases gradually within the first two years after the PIPE issuances. This result is consistent with hedge funds closing out their short positions as they dispose of the stocks acquired through their original PIPE purchase.[19]

For structured PIPEs, we find that the short interest increases for transactions done by both hedge and non-hedge fund investors. Hedgers who want to protect themselves against price declines have a smaller incentive to short-sell the underlying stocks of structured PIPEs because the repricing rights already protect them partially against price declines, as discussed in Section 3. Thus, hedging investors would need to short-sell less aggressively for structured PIPEs compared to traditional PIPEs. On the other hand, Hillion and Veramaelen (2004) argue that investors in structured PIPEs have an incentive to temporarily manipulate the stock prices of companies issuing structured PIPEs so that they can obtain a larger number of undervalued shares. Thus, such manipulating investors would need to short-sell aggressively to drive down

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[18] The short interest of companies issuing traditional PIPEs to hedge funds increases on average by 0.93 percent of the shares outstanding. This increase appears to be relatively small compared to the median proceeds, which equals 9.91 percent of the market value. However, it should not be expected that the short-interest increases by the whole amount of the proceeds. First, investors also might hedge using derivative securities or using off-shore markets (such as the Berlin-Bremen stock exchange). Second, the optimal hedge ratio for convertible securities is less than 100 percent. Third, it might be difficult to short-sell some less liquid securities (see D'Avolio (2002)). We find that the increase in short-selling is concentrated in a relatively small number of companies.

[19] We observe that the short-interest of companies with other investors is increasing gradually over the two years after the PIPE issuance. This results due to an increasing trend in the aggregate short interest during our sample period. Companies matched by industry, size, book-to-market, and momentum (as described in Section 6) also experience a gradually increasing level of short-interest during our sample period. The increasing trend for non-hedge-funded companies disappears if we normalize the short-interest by the short interest for matched companies. On the other hand, the temporary increase in the short interest for hedge-funded companies remains after normalizing by the short-interest of matched companies.

the prices during the conversion window. We find that the increase in short interest is less pronounced for companies issuing structured PIPEs to hedge funds than for companies issuing traditional PIPEs to hedge funds. This seems inconsistent with a systematic increase in short interest due to market manipulation. Though short sales are specified in the original faulty contract hypothesis of Hillion and Vermaelen (2004), shorting is but one of several ways hedge funds can manipulate the underlying equity, and we cannot rule out all possible methods of manipulating stock prices.

Table 6 analyzes the relationship between the short interest after the PIPE issuance using a multivariate regression. Three dependent variables are considered based on the average short interest during the first six months, the second six months, and the second year after the PIPE issuance. The independent variables include indicator variables for the security structure and the investor composition, the lagged value of short interest, and additional control variables. All regressions include year- and industry-fixed effects and correct the standard errors for clustering.

The regression results are consistent with Figure 2 and indicate that companies that issue traditional PIPEs to hedge funds have significantly higher short interest than other companies during the first year after the issue of a PIPE. Furthermore, we also find that companies that issue structured PIPEs experience an increase in short interest. However, the results for the security structure tend to be less significant than the results for the investor classification.

These results indicate there is a significant association between short interest and investor classifications. We find that companies that issue traditional PIPEs to hedge funds and companies that issue structured securities experience a significant increase in short interest in the month after the PIPE issuance. This increase might be due either to the hedging demand of the investors or to short-selling of other unaffiliated investors who speculate that these particular

companies will perform poorly. In any case, such an increase in short-selling for specific PIPE companies can potentially have an impact on the short- and long-term performance, which will be analyzed in the following section.

6. Stock Price Performance

This section studies the short- and long-term stock performance of companies that issue PIPEs. The stock return analysis estimates the returns that original shareholders of common stocks would have experienced had they held their stocks for several years post issuance. The return of these original investors will, in general, be different from the return of the new investors who purchase the PIPEs. Unfortunately, we cannot compute the returns of the investors in these transactions for several reasons: First, we do not know when the investors exercise their conversion rights and liquidate their positions. Thus, we cannot compute holding period returns for the different investors.[20] Second, we do not observe whether the investors hold other positions in the issuing firm. As described in the previous section, investors might acquire short positions in the common stocks of the issuing companies to hedge their risk exposure. Thus, hedged institutional investors might not be affected significantly if the companies they invest in experience poor long-term returns. Alternatively, previous investors in the company might want to purchase additional securities in a company they already own. Third, PIPE securities are usually sold at significant discounts and often include warrants, various convertibility features, repricing rights, and other option-like characteristics. We generally do not have sufficiently

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[20] Companies cannot generally sell the securities on the open market before their registration statement to the SEC is declared effective. If there are no material problems with the registration statement, it can generally be declared effective within 20 days. Unfortunately, we do not have these effective dates for most of our PIPE transactions. However, we checked a sample of 1,757 PIPE transactions between 2003 and 2005 and found that the median filing date occurs 32 days after the close of the PIPE transaction and the median effective date occurs 71 days after the close. The inter-quartile range between the closing and the filing date is 17—58 days and the inter-quartile range between the closing and the effective date is 38—118 days.

detailed information to price these various security components and to determine the effective purchase prices for the investors.[21]

Figure 3 depicts the average daily buy-and-hold returns 250 trading days before and 500 trading days after the closing. The PIPE companies are divided into four groups according to the security structure (traditional vs. structured PIPE) and according to the investor classification (hedge funds and other investors). The buy-and-hold returns are normalized to one on the closing day.[22] Consistent with Hertzel, Lemmon, Linck, and Rees (2002), we find a negative relation between short- and long-term returns for traditional PIPEs. Though PIPE issuing companies experience, on average, a positive short-term announcement performance, they experience a negative long-term performance. However, we find the stock price performance differs dramatically between the two investor classes. Companies issuing traditional PIPEs to hedge funds perform significantly worse than companies that issue traditional PIPEs to other investors. For structured PIPE companies, we find a significant decline in the market value for both companies issuing securities to hedge funds and to other investors. The results for the structured PIPEs are similar to the ones reported by Hillion and Vermaelen (2004), who study floating convertible PIPEs issued between January 1995 and August 1998. The remainder of this section tests the robustness of these results using various different risk-adjustments.

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[21] A related literature investigates the performance of investors in private equity. Moskowitz and Vissing-Jørgensen (2002) investigate the returns on non-public traded equity. Lerner, Schoar, and Wong (2005) compute the performance of different investors in private equity fund investments and show substantial heterogeneity in the performance of different classes of limited partners.

[22] The abnormal returns between trading days [6, 500] after the PIPE issues include only a portion of the abnormal returns for PIPE issuances in 2002, because we only have available stock return data until December 2003. The results do not change qualitatively if we only analyze the PIPE deals issued between 1995 and 2001, which have complete return series.

6.1 Short-Term Stock Price Performance

The performance of stock prices of PIPE companies for different time windows is summarized in Panels A (raw buy-and-hold returns) and B (abnormal returns relative to the benchmark) of Table 7. We follow Barber and Lyon (1997) and benchmark performance by using a single control firm for each PIPE firm. We analyze the performance of the stock price during a three-year window around the closing of the PIPE transaction. We match each company in our sample to a comparable company according to its industry, market capitalization, book-to-market ratio, and momentum characteristics in the previous month, as described in more detail in Appendix C.[23] Abnormal returns are defined as the difference between the buy-and-hold return of the PIPE company and the buy-and-hold return of the matched company.

Companies issuing PIPEs to non-hedge investors experience a strong positive return during a 10-day event window around the close of the PIPE transaction (first row labeled [-4, 5]), whereas companies issuing PIPEs to hedge investors experience no significant positive return during the announcement period. This result is partially due to the fact that hedge funds are more likely to participate in structured PIPEs, which tend to have lower announcement effects. The announcement effect of non-hedge fund PIPEs is in contrast to the negative average abnormal return during a short-term window surrounding the announcement of a public offering of seasoned equity.[24]

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[23] We also compute results using alternative benchmarks (e.g., market return; the appropriate size and book-to-market matched portfolio by Fama and French; industry and size matched firms; industry, size, and book-to-market matched firms; and SEO-matched firms). The results are not significantly different using these alternative benchmarks and are not reported because of space constraints.

[24] See, for example: Smith (1986), Asquith and Mullins (1986), Masulis and Korwar (1986), Mikkelson and Partch (1986), and Cornett and Tehranian (1994).

6.2 Long-Term Stock Price Performance

Table 7 divides the long-term performance of the stock returns after the PIPE issuance into three different time periods (i.e., [6, 100], [6, 250], and [6, 500]). We observe in the first column of Panel B that companies issuing PIPEs to hedge funds tend to underperform the matched companies by 31.73 percent over the two years after the PIPE issuance. On the other hand, the underperformance of non-hedge funded companies is just 13.16 percent over the same time period.[25] A long-term underperformance is consistent with the prior literature on private placements and also can be found for initial public offerings and for seasoned equity offerings.[26] We also find that companies issuing structured PIPEs perform significantly worse in the long term than companies issuing traditional PIPEs.[27] The dismal performance of these companies justifies the earlier observation that these firms offer securities with repricing rights to enable investors to protect themselves against price declines.

We also find performance differences between hedge funded and non-hedge funded companies after conditioning on the security structure. Companies issuing traditional PIPEs to hedge funds underperform their benchmarks by 19.71 percent in the two years following the PIPE issue. However, companies obtaining traditional financing from other investors do not underperform their benchmarks sufficiently to generate statistically significant results. Thus, the poor performance of companies issuing traditional PIPEs is particularly significant for the relatively small subset of deals which are funded by hedge funds.

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[25] Choosing non-overlapping time periods does not affect qualitatively the results. For example, hedge funded companies experience excess returns of -12.51*** percent during [101, 250] and -12.75*** percent during [251, 500], whereas non-hedge funded companies experience excess returns of -8.75*** percent during [101, 250] and -6.69 percent during [251, 500]. The paper uses overlapping data in the base case because we are interested in the overall performance of the stocks after the issuances and because non-overlapping time periods give relatively more weight of companies that declined substantially in value during the previous time periods.

[26] See, for example: Spiess and Affleck-Graves (1995) and Loughran and Ritter (1995, 1997).

[27] A similar result also can be found in a concurrent paper by Chaplinsky and Haushalter (2005). However, they do not analyze the difference in performance by investor class.

Companies issuing structured PIPEs and companies obtaining funding from hedge funds experience a substantial deterioration of their stock valuations over the two years considered here. These abnormal returns are economically and statistically highly significant. On the other hand, the underperformance of companies issuing traditional PIPEs to non-hedge investors is less pronounced, particularly during the first year following the PIPE issuance. The statistical inference is not affected much if the standard errors are estimated using bootstrap-simulations following Lyon, Barber, and Tsai (1999).[28]

The poor performance of companies issuing structured PIPEs is broadly consistent with the manipulation hypothesis of Hillion and Vermaelen (2004). However, the poor performance of companies issuing traditional PIPEs to hedge funds cannot be explained by market manipulation, because investors in traditional PIPEs do not have a possibility to increase the value of their position through short-selling pressure during the conversion period. Instead, we argue that hedge funds are investors of last resort for troubled firms. At the time of the closing of the PIPE, the market may not have been fully aware of the troubled state of the issuing firm. Subsequently, as the market becomes informed, prices decline. The relatively slow market adjustment can be justified by the fact that companies often do not identify immediately the investors in their private placements. Furthermore, these firms are very small firms with little analyst coverage, which might cause an additional delay in the market reaction. Hedge funds are ideally suited to be investors of last resort as they have few restrictions in establishing short positions to hedge any possible downside risk associated with investing in troubled firms, as

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[28] A relatively large number of companies issue multiple PIPEs over our sample period. Thus, the returns of these companies are weighted more heavily. However, our results are not affected significantly if we exclude multiple deals. Moreover, our results do not change qualitatively if we exclude companies with stock prices below $5 on the closing day of the transaction or if we exclude companies with market capitalizations below $10 million. For example, excluding companies with stock prices below $5 reduces the excess two-year return of hedge funded companies from -31.73 to -32.16 percent and increases the excess return of non-hedge funded companies from

described in Section 5. In Appendices A and B, we analyze in more detail the short- and the long-term performance of PIPE companies using a more detailed definition of PIPE securities (Table 11) and using additional investor categories (Table 12). Our results remain consistent using these alternative classifications.

6.3 Distribution of Long-Term Returns

We plot in Figure 4 the cumulative probabilities of the raw buy-and-hold returns during the 250 trading days following the closing of the PIPE deals to investigate whether the averages of the long-term stock price performance are driven by outliers. The cumulative probability functions of the returns of hedge-funded companies lie almost everywhere to the left of the ones of non-hedge-funded companies regardless of the security structure. For both security structures, we can reject the Kolmogorov-Smirnov tests that the two distributions are identical. Thus, our results are not driven by outliers.

6.4 Calendar Time Portfolios

In this section, we compute calendar-time abnormal returns of companies that issue PIPEs. Fama (1998) and Mitchell and Stafford (2000) argue that the event study methodology does not appropriately take into account cross-sectional dependencies in returns. In a first step, we form a buy-and-hold portfolio of all the common stocks of companies that issue PIPEs during the past 500 trading days between 1996 and 2002.[29] In a second step, we compute the abnormal returns using various factor models. The equally weighted portfolio invests $1 in each PIPE issuing company the day after the close of the PIPE transaction. Thus, the portfolio holds each position for 500 days.

-13.16 to -12.05 percent. See Ball, Kothari, and Shanken (1995) for a discussion of potential problems caused by low-price stocks.

Due to the low liquidity in some of the companies issuing PIPEs, daily closing prices often are stale. Therefore, we analyze the weekly instead of daily returns for the calendar time portfolios. In addition, we include lagged factor returns to control for the staleness of equity prices.[30] We compute abnormal returns using different factor models. The first model simply computes the average excess return relative to the market return. The second model estimates the abnormal return using the one-factor CAPM. The third model follows Fama and French (1993) and includes a market, a size, and a book-to-market factor. The fourth model adds a momentum factor following Carhart (1997).[31] The fifth model follows the conditional model of Ferson and Schadt (1996) and uses predetermined instruments to capture time-varying factor loadings. Our specification includes interaction terms between the Carhart factor returns and various demeaned macro-economic variables.[32] We obtain similar results if we use a conditional model based on a one- or a three-factor model. The sixth model is based on Eckbo, Masulis, and Norli (2000), who show that equity issuances lower the leverage of companies and increase the liquidity of the stocks of the issuing companies. They argue that this affects the exposure of companies to unexpected inflation and default risks, thus decreasing their stock's expected returns relative to matched firms. We also estimate their factor model that includes six macro factors.[33]

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[29] The results are consistent if we only include companies which issued PIPEs in the last 100 or 250 trading days.

[30] We obtain similar results if we use daily returns and if we do not include the lagged factor returns. Actually, the standard errors tend to be lower with daily returns because of the larger sample size.

[31] The daily factor returns for the three-factor model are obtained from Kenneth French's Web site: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library. The daily momentum return is constructed following the description on French's website.

[32] The macro variables of Ferson and Schadt (1996) are the one-month Treasury bill yield, the dividend yield of the CRSP value-weighted index, the Treasury yield spread (10-year minus 1-year Treasury bond yields), the quality spread in the corporate bond market (AAA minus BAA corporate bond yields), and an indicator variable for January.

[33] The macro factors of Eckbo, Masulis, and Norli (2000) are the value-weighted market index, the return spread between Treasury bonds with 10-year and 1-year maturities, the return spread between 90- and 30-day Treasury bills, the seasonally adjusted percent change in real per capita consumption of nondurable goods, the difference in the monthly yield change on BAA- and AAA-rated corporate bonds, and unexpected inflation The Treasury and corporate bond yields are obtained from the Web site of the Board of Governors of the Federal Reserve System: http://www.federalreserve.gov/releases/. The Treasury bill yields are obtained from CRSP. Per capita non-durable

Table 8 summarizes the annualized abnormal returns for various portfolios of PIPE issuing companies, according to the investor composition and the security structure. The first row shows that a portfolio including all the stocks that issue PIPEs to hedge funds during the previous two years has an average annualized excess return above the market of -32.37 percent per year, which is significantly positive. On the other hand, a corresponding portfolio of companies obtaining financing from other investors does not exhibit a significantly negative excess return above the market. The calendar time portfolios confirm our previous results that companies issuing structured PIPEs and companies raising capital from hedge fund investors perform poorly.

We also find that the abnormal returns of the portfolios of companies selling equity to hedge funds are more negative than the portfolios of companies selling equity to other known investor classes for both security structures. Companies issuing traditional PIPEs to non-hedge investors always have negative abnormal returns. However, the abnormal returns are never significantly different from zero at conventional significance levels.

The results using calendar-time portfolios confirm the results using the event-study methodology. Thus, our results are not driven by common variation in risk levels and risk premia or by changes of the fundamentals of the companies which result from equity issuances.

6.5 Determinants of Stock Price Performance: Regression Evidence

This section analyzes whether our results on the impact of security structure and investor composition are robust if we include additional control variables in a multi-variate regression

consumption is obtained from the NIPA accounts of the Bureau of Economic Analysis (http://www.bea.doc.gov), and the consumer price inflation is obtained from the Bureau of Labor Statistics (http://www.bls.gov/cpi/). The estimation of expected inflation follows Eckbo, Masulis, and Norli (2000) by running a regression of real T-bill returns on a constant and 12 of its lagged values. We regress the daily portfolio returns on the original raw factor series, as reported in Panel D from Table 9 of Eckbo, Masulis, and Norli (2000).

specification. The dependent variable is the excess buy-and-hold return of a PIPE issuing company relative to one of the six Fama-French size and book-to-market portfolios. The independent variables are indicator variables for the security structure and the investor composition. All estimations include again year- and industry-fixed effects.

We estimate three specifications using different time horizons: The first two specifications control for the security structure and the investor composition. The third specification includes additional lagged accounting variables as controls. The number of observations is smaller in the third specification since accounting data are not available in Compustat for all our companies. All the accounting variables are winsorized at the 1 percent level to eliminate the impact of extreme outliers. The standard errors are robust and corrected for clustering of observations by the same company.

Table 9 summarizes the regression results. The first column summarizes the results over the 10-day event window using the first specification. We find that companies obtaining financing from hedge funds perform substantially worse during the 10 days around the PIPE issuance even after controlling for the security structure. Moreover, the results indicate that companies issuing structured PIPEs also perform significantly worse than companies receiving funding from other investor classes. The third column adds control variables for the characteristics of the issuing company. These additional control variables do not significantly affect the estimated impact of the security structure and the investor composition on the short-term returns.

The remaining columns summarize the regression results using the long-term excess returns over two different time periods ([6, 250], and [6, 500]) as the dependent variables. The indicator variables for hedge fund investors and for structured PIPEs enter significantly and

confirm the previous results. These results are not affected substantially if we control for additional variables. Companies with larger market capitalizations experience larger underperformance than smaller companies. An important determinant of stock price performance is the indicator variable for whether a company recently received venture capital funding. Companies that are venture capital backed outperform companies that are not venture capital backed by a substantial margin.

By controlling for the investor composition, security structure, and accounting characteristics, we are able to partially resolve the puzzle originally raised by Hertzel, Lemmon, Linck, and Rees (2002) of the contradiction between short-term gains of private placements followed by long-term losses. We find that negative returns (short- and long-term) are primarily associated with companies issuing structured PIPEs and companies with hedge fund investors, companies which experience less pronounced short-term appreciations.

7. Accounting Performance

This section studies whether the long-term stock price performance of PIPE issuing companies is generally consistent with the accounting performance. In particular, we analyze whether there is some association between security structure and investor composition with the long-term accounting performance.

Table 10 summarizes the determinants of the accounting performance after the issuance of PIPE securities. The dependent variable is the return of assets during the first fiscal year after the PIPE issuance (columns (1)-(3)) and during the second fiscal year after the PIPE issuance (column (4)-(6)). The dependent variable is winsorized at the 1 percent level to diminish the effect of a small number of outliers. The return on assets is regressed on the PIPE structure and the interaction effects between traditional and structured PIPEs and hedge fund investors. In

addition, we include the accounting variables discussed previously as well as year and sector fixed effects. The accounting variables also include the return on assets during the fiscal year prior to the PIPE issuance as a control variable.

The results indicate that companies obtaining financing from hedge funds and through structured PIPEs tend to experience worse operating performance after the PIPE issuance, although the results are not always statistically significant. We must interpret these results with caution since these regressions only use the surviving companies because accounting data are unavailable for companies that are delisted from major exchanges. In our sample, companies receiving funding from hedge funds are more likely to be delisted within two years of the PIPE issuance. For example, in the two years following the PIPE issuance, 34.6 percent of companies receiving funding from hedge funds and just 25.6 percent of companies receiving funding from other known investors are delisted.[34] The additional control variables are able to explain some additional fraction of the variation in the return in assets. The lagged return on assets is particularly important because it is highly auto-correlated.

8. Conclusions

This paper discusses the role of hedge funds in private placements. We find that both the structure of the security issued and the composition of investors matter in understanding why firms issue the security and the subsequent performance of the issuing firm. We find investments by hedge funds are associated with significantly negative long-run performance of the underlying equity, even after controlling for the security type. On the other hand, we find little to no

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[34] This survivorship bias does not affect our stock return performance results to a similar degree since we also include delisted companies in our stock-performance analysis. The returns of delisted companies are replaced by the returns of the matched company after being delisted.

abnormal performance in firms issuing traditional private placements to non-hedge fund investors.

We find evidence consistent with the fact that firms that sell their equity to hedge funds might have few alternatives to raise external finance due to the presence of severe information asymmetries and poor operating performance. Firms that obtain equity financing from hedge funds tend to be smaller and riskier and are less likely to have analyst coverage, compared to firms that obtain financing from other investor classes. The firms that obtain equity financing from hedge funds also are more likely to sell their securities at a greater discount and with more warrants and shorter times to first conversion.

Hedge funds are well suited to act as investors of last resort. Either by negotiating repricing rights, shorting the underlying security, or through other means hedge funds are able to reduce their risk in what could otherwise be a high-risk and illiquid position. Thus, hedge funds might be more willing to lend capital to firms that otherwise would be shut out of the external capital market. Our results are consistent with the hypothesis that hedge funds act as investors of last resort, playing an important role in the market for young, high-risk firms with substantial asymmetric information and large capital needs.

Appendix

A. Detailed Security Structures

This appendix describes the various PIPE securities in more detail and reports the stock-price performance results for the various securities. Securities (1) – (4) are traditional PIPEs and securities (5) – (10) are structured PIPEs.

(1) The most basic security is a *common stock PIPE*, where a fixed number of shares are issued and sold at a predetermined discount or premium to the market price. Common stock PIPEs sometimes include warrants that let the investor purchase additional shares at a predetermined price during a specific time period.

(2) *Fixed convertible preferred stock PIPEs* represent equity ownership that is ranked higher than common stock in case of bankruptcy or liquidation. Fixed convertibles yield a current return through dividend payments and can be converted by the investors into a fixed number of shares of the company's common stock at a predetermined ratio. The implied fixed conversion price is usually above the current market price. Investors in fixed convertibles exchange their securities for common stocks if the stock price is sufficiently high on the conversion date.

(3) *Fixed convertible debt PIPEs* is a loan obligation of the company that ranks higher than any equity securities and that pays a current interest rate. The other specifications are identical to fixed convertible preferred stock.

(4) A small number of PIPEs are *shelf sales of common stocks*, which are sales of a company's common stock from an existing shelf registration statement. The registration allows the company to sell the securities over a period of time.

(5) *Floating convertible preferred stock PIPEs* have a variable conversion price that is based on future market prices of the common stock after the issuance but before the time of conversion. This feature protects the investor if the price of the common stock changes after the PIPE deal is closed, because the investor will receive increasing numbers of shares if stock prices decrease. Floating convertibles often include caps and floors, which limit the possible range of conversion prices.

(6) *Floating convertible debt PIPEs* have very similar specifications as floating convertible preferred stock PIPEs, except for the ranking in case of bankruptcy or liquidation.

(7) A *structured equity line* is an agreement that requires the investor to purchase a predetermined value of the company's common stock over a certain period of time. The price of the stock is usually determined as an average of the closing price during a pre-specified period in the future minus a fixed discount.

(8) A small number of common stock private placements are classified as *common stock reset PIPEs*. These deals include repricing rights, which allow the investor to receive additional shares of common stocks if the market price decreases after the closing date. The repricing rights clause functions very similarly to a floating convertible in that the number of shares issuable can change every day.

(9) *Reset convertible preferred stock PIPEs* have a fixed conversion price that is subject to a number of resets at specific times after following the closing date. At the time of each of the resets, the fixed conversion price is adjusted as a percentage of the current market price and then remains fixed at this new price until the next reset date.

(10) *Reset convertible debt PIPEs* are similar to reset convertible preferred stock PIPEs except for the ranking in case of bankruptcy or liquidation.

In Table 11, we subdivide the PIPEs according to these more detailed specifications of the securities issued and compute the mean buy-and-hold returns. The short- and long-term performance of the underlying common stocks after the PIPE issuance for the detailed security structures does not differ significantly within the two basic security structures. The companies issuing any of the six different variable convertible structures perform poorly relative to companies that issue common stock or fixed convertible PIPEs. We obtain similar results if we adjust the returns for risk using different methods.

B. Detailed Investor Composition

This section reports the stock-price performance results for a more detailed classification of investors. Table 12 summarizes the short- and the long-term returns for eight groups of known investors and one group of unknown investors. The number in brackets corresponds to the number of PIPE transactions with the corresponding combination between investor and structure characteristics. Companies obtaining funding from hedge funds continue to perform relatively poorly compared to companies obtaining funding from other investor classes. We obtain similar results if we adjust the returns for risk using different methods.

C. Estimation Methodology

This section explains the methodology used to perform the event study in Section 6. First, we download at the end of each calendar year from CRSP the SIC codes and the market capitalizations of all the common stocks that are not closed-end funds, ADRs, REITs, and that are headquartered in the U.S. We merge this data set with the corresponding book-to-market ratios from Compustat. For companies with fiscal-year-ends before October, we use the book value at the end of the current fiscal year; and for companies with fiscal-year-ends after September, we use the book values at the end of the previous fiscal year to allow some time delay for the publication of the accounting values after the end of the fiscal year.

Second, we match companies according to their industry classification, size, book-to-market ratio, and momentum. We classify all the companies into 48 industries according to the SIC codes, as described in Fama and French (1997).[35] We rank the companies in each of these 48 industries by their market capitalization, their book-to-market ratio, and their return during the previous 12 months. At the end of each month, we match each company to another company in the same industry that did not issue a PIPE in the previous two years such that the sum of the absolute deviations of the size, the book-to-market ratio, and the momentum rankings is smallest. If either the size, the book-to-market ratio, or the momentum returns are missing, then we match the company to another company in the same industry group with missing size, book-to-market ratio, or momentum returns. The distribution of the characteristics for the PIPE and the comparable companies is very close.[36]

Third, we compute the daily buy-and-hold returns for all companies in our sample during a 750 trading day window starting 250 days prior to the close of the PIPE transaction. If the

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[35] The industry classification can be obtained from Kenneth French's Web site: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library.

[36] For example, companies issuing PIPEs have a median size of $64.7 million, a median book-to-market ratio of 0.20, and median past-year returns of -15.0 percent. Companies matched according to industry, size, book-to-market ratio, and momentum have a median size of $62.2 million, a median book-to-market ratio of 0.24, and median past-year returns of -15.4 percent. The companies also match well with respect to other relevant characteristics that were not matched. For example, the median age of a PIPE company is 4.6 years, while the median age of the matched company is 5.2 years. 84.3 percent of PIPE companies and 78.4 percent of matched companies trade on NASDAQ.

returns for a company that issues a PIPE are not available in CRSP, we set the returns equal to the returns of the matched company. This avoids the introduction of a delisting bias, because companies that are delisted perform, on average, poorly before delisting. If the holding period returns for a matched company are not available in CRSP, then we replace this company with the company that had the next-closest match at the end of the calendar year prior to the closing date of the PIPE.

Fourth, we compare these average returns for different PIPE deals over various sample periods. The abnormal return is defined as the difference between the buy-and-hold return of the PIPE company and the buy-and-hold return of the matched company.

D. Compustat Data Definitions

The Compustat data items to calculate the ratios, total assets (item 6), market-adjusted leverage (book debt (total liabilities (item 181) + preferred stock liquidating value (item 10, if unavailable, preferred stock redemption value (item 56)) – deferred taxes (item 35) – convertible debt (item 79))/(book debt + market capitalization)), book to market (book equity (item 60)/(common shares used to calculate EPS (item 54) * fiscal year close price (item 199))), return on equity (income before extraordinary items (item 237)/book equity (item 60)), operating profit (operating income before depreciation (item 13)), capital expenditures & research and development/total assets (capital expenditures (item 128) + research and development expense (item 46)/total assets (item 6)).

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Figure 1: Basic Security Structures in PIPE Transactions
We depict the valuation diagrams and the number of shares issued in three basic PIPE securities: Common Stocks, Fixed Convertibles, and Variable Convertibles.
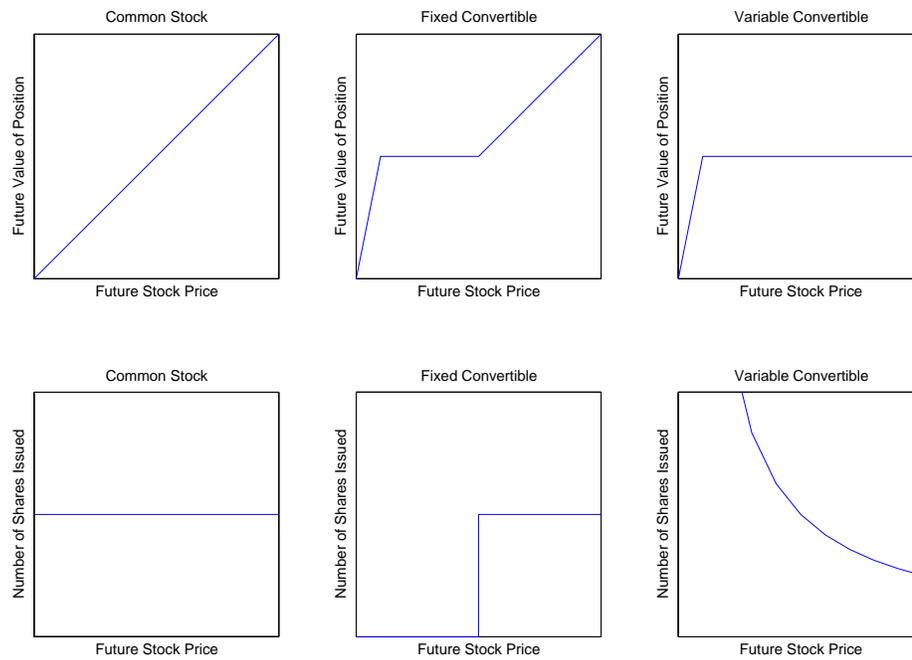
Figure 2: Short Interest for Companies Issuing PIPEs
We depict the short interest of companies issuing PIPEs by security structure and investor. Short interest is defined as the proportion of shares sold short relative to shares outstanding. PIPE transactions are allocated to "Hedge Funds" if hedge funds account for more than 50 percent of the investment and to "Other Investors" if other known investors account for more than 50 percent of the investment.
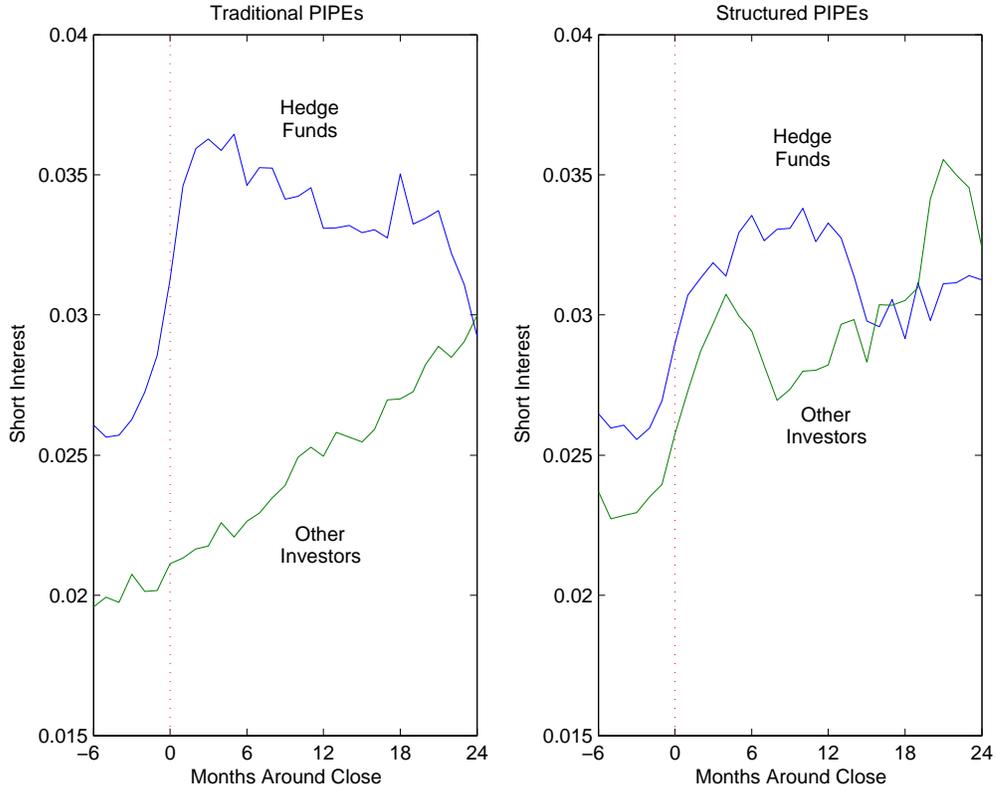
Figure 3: Performance of Companies Issuing PIPEs by Security Type
The figure depicts the average buy-and-hold return of companies that issue PIPEs by security structure (Traditional and Structured PIPE) and by Investor (Hedge Funds and Other Investors). PIPE transactions are allocated to "Hedge Funds" if hedge funds account for more than 50 percent of the investment and to "Other Investors" if other known investors account for more than 50 percent of the investment.
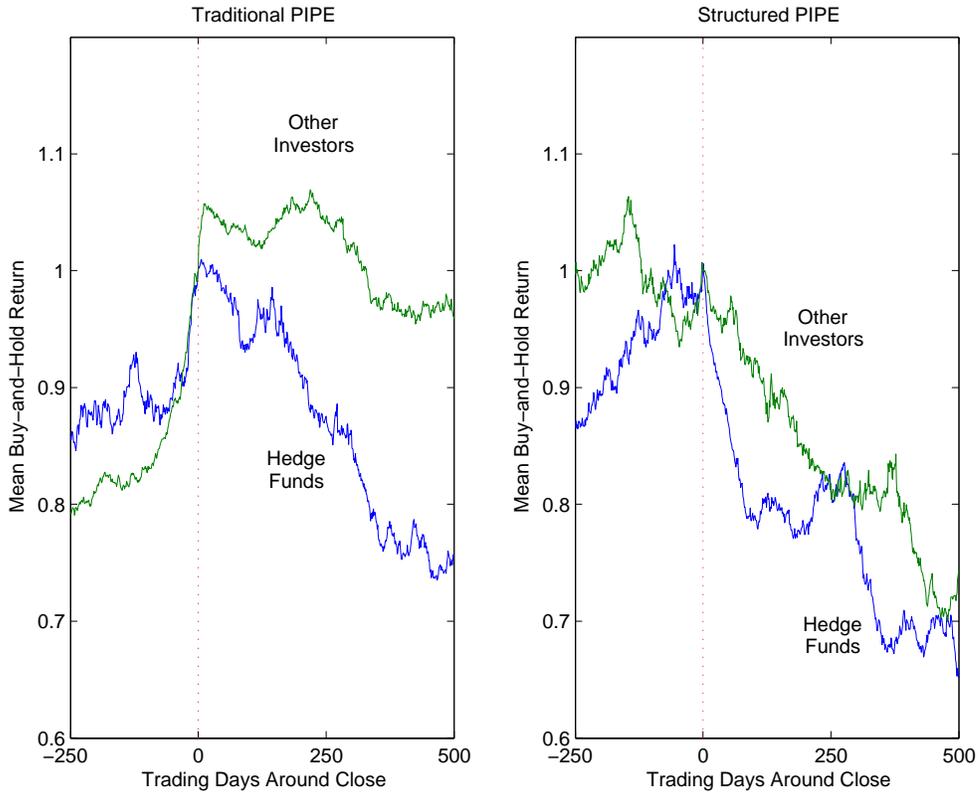
Figure 4: Distribution of Performance of Companies Issuing PIPEs by Security Type
This figure depicts the cumulative probabilities of the buy-and-hold returns of companies that issue PIPEs. The buy-and-hold returns are computed over the 250 trading days following the close of the PIPE. PIPE transactions are allocated to "Hedge Funds" if hedge funds account for more than 50 percent of the investment and to "Other Investors" if other known investors account for more than 50 percent of the investment.
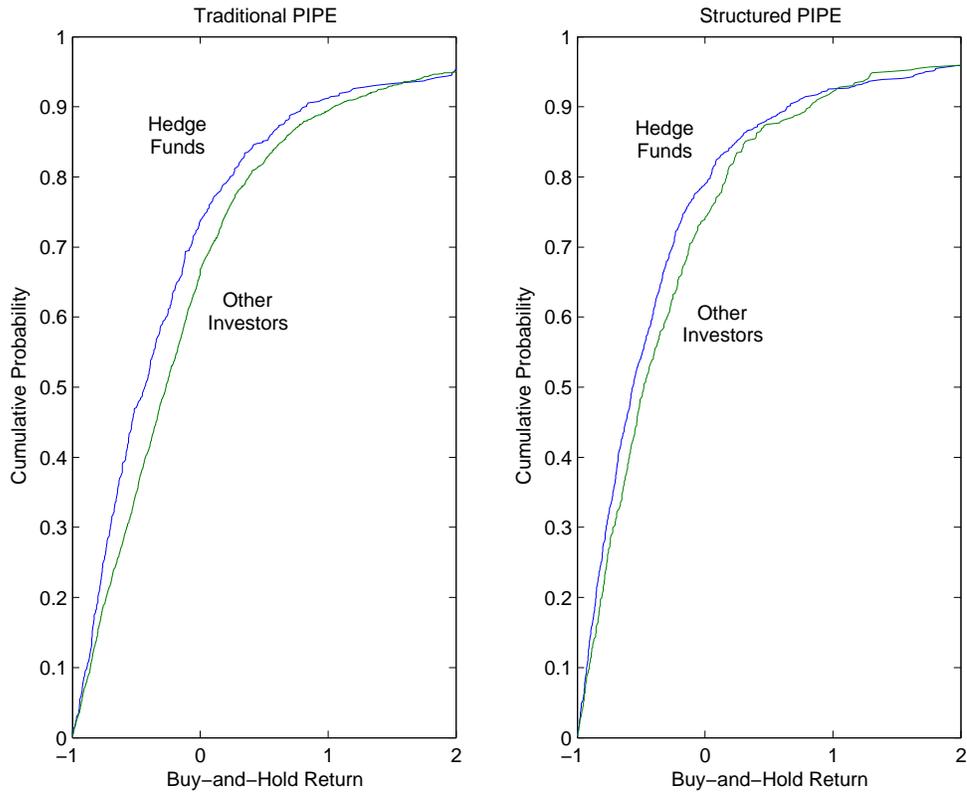
Table 1: Summary Statistics

This table summarizes the characteristics of PIPE transactions.

Panel A: Characteristics of PIPE Transactions

	All PIPEs	Traditional PIPEs	Structured PIPEs
Number of Transactions	5,260	3,592	1,668
Total Capital Raised (in Millions)	76,743	64,985	11,758
Mean Capital Raised (in Millions)	14.66	18.19	7.05
Median Capital Raised (in Millions)	4.50	5.00	3.30
Mean Capital Raised to Market Value (in Percent)	20.87	22.80	16.69
Median Capital Raised to Market Value (in Percent)	9.91	10.77	8.51
Mean Number of Investors per Deal	4.45	5.02	3.22
Median Number of Investors per Deal	1	2	1

Panel B: Proportion of Capital Raised by Various Investor Classes (in Percent)

	All PIPEs	Traditional PIPEs	Structured PIPEs
Hedge Funds	24.57	15.63	71.72
Corporations	17.23	19.58	4.85
Mutual Funds and Institutional Advisors	16.94	19.67	2.55
Venture Capital	11.76	12.92	5.63
Buyout Firm and Private Equity	11.51	13.56	0.69
Various Individual Investors	6.18	6.49	4.53
Brokers and Dealers	6.15	6.12	6.32
Banks	2.19	2.11	2.64
Insurance Companies	2.01	2.25	0.80
Pension Funds	0.90	1.06	0.09
Charitable, Educational, and Family Trusts	0.55	0.62	0.18

Panel C: Proportion of Capital Raised by Industry Composition (in Percent)

	All PIPEs	Traditional PIPEs	Structured PIPEs
Communications	37.16	37.47	35.46
Healthcare	20.20	19.86	22.13
Consumer Cyclical	9.79	10.46	6.03
Technology	8.60	7.40	15.27
Industrial	7.31	7.23	7.77
Financial	7.19	7.92	3.09
Energy	3.33	3.46	2.65
Consumer Noncyclicals	2.83	2.39	5.27
Utilities	2.31	2.57	0.86
Basic Materials	1.18	1.18	1.21
Diversified	0.09	0.06	0.27

Table 2: Characteristics of PIPE Transactions

The table summarizes the characteristics of the PIPE transactions by investor type (Hedge Funds vs. Other Investors) and by security structure (Traditional vs. Structured). PIPE transactions are allocated to "Hedge Funds" if hedge funds account for more than 50 percent of the investment and to "Other Investors" if other known investors account for more than 50 percent of the investment. We test for the differences between the two investor classes (hedge funds and other investors) using a t-test for the means taking into account clustering by firm. The pairs that are significantly different at the ten percent confidence level are indicated in italics.

	All PIPEs		Traditional PIPEs		Structured PIPEs	
	Hedge Funds	Other Investors	Hedge Funds	Other Investors	Hedge Funds	Other Investors
Number of Observations	1,373	1,824	587	1,561	786	263
Capital Raised (in Millions)	*9.20*	*25.18*	*10.61*	*27.95*	8.15	8.72
Capital Raised to Market Capitalization (in Percent)	*12.25*	*21.73*	*13.56*	*22.72*	*11.27*	*15.84*
Discount for Common Stocks (in Percent)	*14.10*	*9.02*	*14.10*	*9.02*		
Discount for Variable Convertibles (in Percent)	16.86	17.36			16.86	17.36
Fraction of Deals with Warrants (in Percent)	*49.52*	*29.41*	*46.56*	*28.23*	*51.73*	*36.40*
Relative Value of the Warrants (in Percent)	*17.18*	*13.07*	*19.66*	*12.67*	15.33	15.43
Term for Convertible Securities (in Months)	*35.95*	*55.39*	*43.80*	*63.83*	*34.57*	*39.79*
Days to First Conversion for Convertible Securities	*32.84*	*43.95*	*15.13*	*32.78*	*38.09*	*72.64*

Table 3: Characteristics of PIPE Companies

The table summarizes in Panel A the stock market characteristics of the PIPE transactions by investor type (Hedge Funds vs. Other Investors) and by security structure (Traditional vs. Structured). PIPE transactions are allocated to "Hedge Funds" if hedge funds account for more than 50 percent of the investment and to "Other Investors" if other known investors account for more than 50 percent of the investment. Panel A summarizes stock market measures of PIPE companies. Panel B compares accounting variables of PIPE companies using Compustat data. We test for the differences between the two investor classes (hedge funds and other investors) using a *t*-test for the means taking into account clustering by firm. The pairs that are significantly different at the ten percent confidence level are indicated in italics.

Panel A: Stock Market Characteristics of PIPE Companies

	All PIPEs		Traditional PIPEs		Structured PIPEs	
	Hedge Funds	Other Investors	Hedge Funds	Other Investors	Hedge Funds	Other Investors
Number of Observations	1,373	1,824	587	1,561	786	263
Market Capitalization (in Millions)	*153.08*	*304.97*	*177.02*	*328.60*	135.20	164.73
Stock Return in Year Prior to Close (in Percent)	41.78	31.81	*41.64*	*31.69*	41.90	32.49
Standard Deviation in Year Prior to Close (in Percent)	*113.02*	*102.52*	*111.46*	*103.24*	*114.27*	*98.50*
Beta in Year Prior to Close	*1.22*	*1.14*	*1.27*	*1.16*	*1.19*	*1.01*
Volume Six Months Prior to Close (in Percent)	*253.98*	*152.51*	*229.79*	*146.67*	*274.07*	*186.47*
Short Interest Six Months Prior to Close (in Percent)	*2.63*	*2.03*	*2.61*	*1.97*	2.65	2.40
Companies with Analyst Coverage (in Percent)	39.11	42.27	*49.57*	*44.27*	31.30	30.42
Number of Analysts	*1.27*	*1.62*	1.68	1.69	0.97	1.15
Venture Capital Backed for Recent IPOs (in Percent)	*22.94*	*27.85*	27.43	28.64	19.59	23.19
Age (in Years)	7.10	6.63	7.61	6.66	6.71	6.46

Panel B: Accounting Characteristics of PIPE Firms

	All PIPEs		Traditional PIPEs		Structured PIPEs	
	Hedge Funds	Other Investors	Hedge Funds	Other Investors	Hedge Funds	Other Investors
Number of Observations	1,265	1,694	566	1,459	699	235
Total Assets (in Million $)	*108.94*	*237.75*	*133.50*	*260.52*	89.04	96.36
Book-to-Market Ratio (in Percent)	*33.44*	*45.61*	*35.22*	*48.42*	31.97	28.03
Leverage (in Percent)	*55.86*	*60.63*	*54.96*	*61.29*	56.60	56.59
Positive Return on Assets (in Percent)	*11.89*	*16.55*	15.48	17.48	8.97	10.57
Return on Assets (in Percent)	-63.42	-61.06	-64.85	-60.15	-62.26	-66.85
Relative Capital Expenses and R&D (in Percent)	33.34	32.54	*36.79*	*32.29*	30.54	34.09

Table 4: Determinants of Security Structure and Investor Compositions: Multinomial Logit Estimation
This table summarizes the estimates of a maximum-likelihood multinomial logit estimation. The dependent variable corresponds to the four combinations between security structure and investor composition: (1) traditional PIPEs and non-hedge fund investors; (2) traditional PIPEs and hedge fund investors; (3) structured PIPEs and non-hedge fund investors; and (4) structured PIPEs and hedge fund investors. The first group is taken as the comparison group. The multinomial logit estimation includes year- and sector-fixed effects that are not reported. The standard errors are robust, corrected for clustering of observations by the same company and are summarized in parentheses. The significance levels are denoted by '*', '**', and '***' and indicate whether the results are statistically different from zero at the 10, 5, and 1 percent confidence levels.

Explanatory Variables	Traditional PIPE and Hedge Investors Compared to Traditional PIPE and Non-Hedge Investors	Structured PIPE and Non-Hedge Investors Compared to Traditional PIPE and Non-Hedge Investors	Structured PIPE and Hedge Investors Compared to Traditional PIPE and Non-Hedge Investors
Log of Market Value at Close	0.0054	-0.0557	-0.1957***
	(0.0618)	(0.0948)	(0.0684)
Book-to-Market Ratio at Fiscal Year Prior to Close	-0.3331***	-0.5243*	-0.1988
	(0.1237)	(0.2756)	(0.1500)
Excess Return During Two Years Prior to Close	0.0000	-0.0905	-0.0243
	(0.0191)	(0.0610)	(0.0361)
Log of Trading Volume Six Months Prior to Close	0.2494***	0.1359*	0.4227***
	(0.0526)	(0.0747)	(0.0586)
Short Interest Six Months Prior to Close	1.2216	2.5242	2.9264*
	(1.5214)	(2.0969)	(1.6896)
Venture Capital Funded During Prior Five Years	-0.2195	-0.5944***	-0.5099***
	(0.1512)	(0.2154)	(0.1537)
Return of Assets at Fiscal Year Prior to Close	0.0465	-0.0958	-0.0243
	(0.0908)	(0.1189)	(0.0929)
Leverage at Fiscal Year Prior to Close	-0.0909	-0.1958	-0.2447*
	(0.1380)	(0.1740)	(0.1322)
Number of Analysts	-0.0816***	-0.0417	-0.0951***
	(0.0257)	(0.0468)	(0.0284)
Pseudo R-Squared (in Percent)	11.53		
Number of Observations	2,407		

Table 5: Short-Interest by Investor and Security Structure
The table summarizes the short interest of the common stocks of companies issuing PIPEs by investor type (Hedge Funds vs. Other Investors) and by security structure (Traditional vs. Structured). PIPE transactions are allocated to "Hedge Funds" if hedge funds account for more than 50 percent of the investment and to "Other Investors" if other known investors account for more than 50 percent of the investment. The short interest is defined relative to the number of shares outstanding and is expressed in percent. The standard errors for the means are reported in parentheses and are corrected for clustering by firm. The significance levels are denoted by '*', '**', and '***' and indicate whether the results are statistically different from zero at the 10, 5, and 1 percent confidence levels. We test for the differences between the two investor classes (hedge funds and other investors) using a *t*-test for the means taking into account clustering by firm. The pairs that are significantly different at the ten percent confidence level are indicated in italics.

Panel A: Level of Short-Interest

	All PIPEs		Traditional PIPEs		Structured PIPEs	
	Hedge Funds	Other Investors	Hedge Funds	Other Investors	Hedge Funds	Other Investors
Observations with Available Short Data	1,208	1,582	546	1,353	662	229
Short Interest Six Months Before Close	*2.68****	*2.10****	*2.69****	*2.05****	2.37***	2.67***
	(0.17)	(0.13)	(0.20)	(0.13)	(0.32)	(0.23)
Short Interest First Six Months After Close	*3.39****	*2.34****	*3.54****	*2.24****	3.27***	2.95***
	(0.18)	(0.13)	(0.24)	(0.13)	(0.24)	(0.34)
Short Interest Second Six Months After Close	*3.42****	*2.51****	*3.42****	*2.45****	3.42***	2.89***
	(0.20)	(0.14)	(0.27)	(0.14)	(0.26)	(0.37)
Short Interest Second Year After Close	3.20***	2.97***	3.02***	2.88***	3.32***	3.42***
	(0.20)	(0.19)	(0.30)	(0.19)	(0.24)	(0.54)

Panel B: Changes in Short Interest Relative to Six-Month Period Prior to PIPE Close

	All PIPEs		Traditional PIPEs		Structured PIPEs	
	Hedge Funds	Other Investors	Hedge Funds	Other Investors	Hedge Funds	Other Investors
Observations with Available Short Data	532	1,523	532	1,304	621	221
Change in Short Interest During First Six Months	*0.78****	*0.23****	*0.93****	*0.18***	0.66***	0.55***
	(0.09)	(0.07)	(0.15)	(0.07)	(0.12)	(0.19)
Change in Short Interest During Second Six Months	*-0.08*	*0.13**	*-0.14*	*0.18***	-0.03	-0.15
	(0.08)	(0.07)	(0.12)	(0.07)	(0.11)	(0.18)
Change in Short Interest During Second Year	*-0.42****	*0.32****	*-0.26**	*0.32****	*-0.53****	*0.35*
	(0.12)	(0.11)	(0.15)	(0.11)	(0.17)	(0.26)

Table 6: Determinants of Short Interest

This table summarizes the results of regressing the average short interest during several time periods after the close of the PIPE transaction on the characteristics of the PIPE and firm attributes. All regressions include indicator variables for the years of the close of the deal and the industry sectors. The standard errors are robust and corrected for clustering of observations by the same company and are summarized in parentheses. '*', '**', and '***' denote estimates that are statistically different from zero at the 10, 5, and 1 percent confidence levels.

Dependent Variables:	Short Interest During the First Six Months After Close (in Percent)		Short Interest During the Second Six Months After Close (in Percent)		Short Interest During the Second Year After Close (in Percent)	
Short Interest During the Six Months Before Close	0.86*** (0.03)	0.80*** (0.03)	0.69*** (0.03)	0.61*** (0.04)	0.55*** (0.05)	0.43*** (0.05)
Structured PIPE	0.36* (0.20)	0.61*** (0.22)	0.32 (0.29)	0.62** (0.31)	0.57 (0.44)	0.83* (0.44)
Traditional PIPE and Hedge Fund Investor	0.79*** (0.16)	0.85*** (0.16)	0.61*** (0.22)	0.69*** (0.22)	-0.00 (0.30)	0.15 (0.29)
Structured PIPE and Hedge Fund Investor	0.21 (0.23)	0.15 (0.24)	0.35 (0.32)	0.25 (0.34)	-0.39 (0.47)	-0.31 (0.47)
Log of Proceeds of PIPE Transaction		0.14** (0.06		0.23** (0.10)		0.26** (0.12)
Log of Market Value at Close		0.46*** (0.08)		0.72*** (0.13)		0.97*** (0.15)
Book-to-Market Ratio in Year Prior to Close		-0.00 (0.10)		0.01 (0.15)		0.32 (0.33)
Excess Return in Year Prior to Close		0.12*** (0.03)		0.12** (0.05)		0.04 (0.05)
Log of Trading Volume Six Months Before Close		-0.07 (0.05)		-0.15** (0.07)		-0.24*** (0.08)
Venture Capital Funded During Prior Five Years		-0.15 (0.13)		-0.09 (0.20)		-0.12 (0.31)
Return on Assets at Fiscal Year Before Close		-0.02 (0.09)		0.07 (0.13)		-0.16 (0.21)
Book Leverage at Fiscal Year Prior to Close		-0.18* (0.10)		-0.07 (0.14)		0.05 (0.24)
Number of Analysts		0.03 (0.03)		0.05 (0.05)		0.12* (0.07)
Number of Observations	2,676	2,362	2,390	2,124	1,577	1,414
R-Squared (in Percent)	63.46	67.66	39.66	44.87	24.88	32.68

Table 7: Returns to Common Stocks of Companies That Issue PIPEs

The table summarizes the mean raw and abnormal return for companies issuing PIPEs by investor type (Hedge Funds vs. Other Investors) and by security structure (Traditional vs. Structured). PIPE transactions are allocated to "Hedge Funds" if hedge funds account for more than 50 percent of the investment and to "Other Investors" if other known investors account for more than 50 percent of the investment. Abnormal returns are computed by subtracting the raw return for companies matched in the month prior to the PIPE deal according to industry, size, book-to-market ratio, and momentum from the return of PIPE companies. The returns are expressed in percent. The standard errors for the means are reported in parentheses and are corrected for clustering by firm. The significance levels for each individual raw and abnormal return are denoted by '*', '**', and '***' and indicate whether the results are statistically different from zero at the 10, 5, and 1 percent confidence levels. We test for the differences between the two investor classes (hedge funds and other investors) using a *t*-test for the means taking into account clustering by firm. The pairs that are significantly different at the ten percent confidence level are indicated in italics.

Panel A: Raw Buy-and-Hold Returns

	All PIPEs		Traditional PIPEs		Structured PIPEs	
	Hedge Funds	Other Investors	Hedge Funds	Other Investors	Hedge Funds	Other Investors
Observations with Available Data	1,247	1,615	554	1,372	693	243
Announcement Term [-4, 5]	*1.24*	*6.91****	*3.63****	*7.69****	-0.67	2.49
	(0.81)	(0.76)	(1.13)	(0.85)	(1.15)	(1.64)
Short Term [6, 100]	*-14.65****	*-2.22*	*-7.50***	*-0.96*	-20.38***	-9.33**
	(2.14)	(1.88)	(3.64)	(2.08)	(2.47)	(4.18)
Medium Term [6, 250]	*-18.93****	*-0.34*	*-14.33****	*2.25*	-22.69***	-14.98**
	(3.61)	(3.70)	(4.93)	(4.18)	(4.88)	(6.32)
Long Term [6, 500]	*-31.45****	*-8.59**	*-27.50****	*-6.30*	-33.92***	-19.90**
	(4.12)	(5.01)	(5.48)	(5.61)	(5.66)	(8.93)

Panel B: Excess Buy-and-Hold Returns Relative to Matched Companies

	All PIPEs		Traditional PIPEs		Structured PIPEs	
	Hedge Funds	Other Investors	Hedge Funds	Other Investors	Hedge Funds	Other Investors
Observations with Available Data	1,247	1,615	554	1,372	693	243
Announcement Term [-4, 5]	*1.42*	*5.65****	*3.73****	*6.21****	-0.43	2.48
	(0.93)	(0.88)	(1.24)	(0.98)	(1.33)	(1.82)
Short Term [6, 100]	*-10.93****	*-3.99**	-5.00	-1.65	-15.67***	-17.21***
	(2.56)	(2.15)	(4.19)	(2.32)	(3.00)	(4.94)
Medium Term [6, 250]	*-18.32****	*-7.45**	-11.13**	-2.60	-24.07***	-34.80***
	(3.94)	(4.16)	(5.47)	(4.42)	(5.33)	(11.97)
Long Term [6, 500]	*-31.73****	*-13.16**	-19.71***	-7.86	-39.27***	-39.33***
	(5.86)	(7.00)	(6.99)	(7.89)	(8.17)	(12.24)

Table 8: Returns of Calendar Time Portfolios of Companies That Issue PIPEs
This table summarizes the abnormal returns of a portfolio that includes all the stocks of companies which closed a PIPE deal during the last 500 trading days. The abnormal returns are expressed in percent and are annualized. The standard errors are summarized in parentheses. '*', '**', and '***' denote abnormal returns that are statistically different from zero at the 10, 5, and 1 percent confidence levels. We also test for the differences between the characteristics of traditional and structured PIPEs and for the two investor classes (hedge funds and other investors) by computing the intercept of the factor regressions using the difference in the raw returns of the two portfolios as the dependent variable. The pairs that are significantly different at the ten percent confidence level are indicated in italics.

	All PIPEs		Traditional PIPEs		Structured PIPEs	
	Hedge Investors	Other Investors	Hedge Investors	Other Investors	Hedge Investors	Other Investors
Excess Return Above Market	*-32.37***	*-11.83*	-16.50	-7.24	*-42.03***	*-24.49*
	(11.62)	(9.97)	(12.45)	(10.05)	(12.16)	(12.59)
CAPM Alpha	*-35.85***	*-14.86*	-19.77*	-9.90	*-45.99***	*-28.69**
	(10.91)	(9.39)	(11.77)	(9.49)	(11.47)	(12.04)
3-Factor Fama-French Alpha	*-29.78***	*-10.52*	-13.99*	-5.71	-39.99***	-24.81**
	(7.19)	(5.91)	(8.22)	(6.15)	(8.58)	(10.00)
4-Factor Carhart Alpha	*-27.54***	*-11.22*	-14.44*	-6.71	-36.05***	-22.64**
	(7.35)	(6.02)	(8.42)	(5.87)	(8.74)	(10.23)
4-Factor Ferson-Schadt Alpha	*-29.61***	*-13.23**	-16.53*	-8.84	-37.07***	-24.91**
	(7.15)	(5.87)	(8.51)	(6.10)	(8.59)	(10.61)
6-Factor Eckbo-Masulis-Norli Alpha	*-35.43***	*-14.51*	-19.41*	-9.56	*-45.51***	*-28.39**
	(10.76)	(9.27)	(11.72)	(9.40)	(11.28)	(11.84)

Table 9: Determinants of Short- and Long-Term Stock Performance

This table summarizes the results of regressing the excess returns during several time periods around and after the close of the PIPE transaction on the characteristics of the PIPE. The excess returns are computed by subtracting the appropriate return of the six Fama-French size/book-to-market portfolios from the return of the individual stocks. All regressions include indicator variables for the years of the close of the deal and the industry sectors. The standard errors are robust, corrected for clustering of observations by the same company and are summarized in parentheses. '*', '**', and '***' denote estimates that are statistically different from zero at the 10, 5, and 1 percent confidence levels.

	Announcement-Term Excess Return (in Percent, [-4, 5])			Medium-Term Excess Return (in Percent, [6, 250])			Long-Term Excess Return (in Percent, [6, 500])		
Hedge Fund Investor	-5.62***	-3.96***	-3.87***	-17.47***	-12.55***	-13.48***	-26.59***	-17.77***	-16.52**
	(1.06)	(1.10)	(1.15)	(4.71)	(4.59)	(5.04)	(6.19)	(5.93)	(6.82)
Structured PIPE		-4.29***	-4.32***		-12.78***	-10.99**		-20.80***	-19.92***
		(1.19)	(1.19)		(5.01)	(5.59)		(6.80)	(7.47)
Log of Proceeds from PIPE			0.94			0.54			1.51
			(0.60)			(2.67)			(3.84)
Log of Market Value at Close			-1.24*			-6.87**			-10.91***
			(0.74)			(3.15)			(4.17)
Book-to-Market Ratio in Year Prior to Close			2.53**			3.50			-1.28
			(1.25)			(4.57)			(6.57)
Excess Return in Year Prior to Close			-0.72**			-1.57			-3.69***
			(0.30)			(1.10)			(1.18)
Log of Trading Volume Six Months Before Close			0.22			2.61			1.14
			(0.50)			(2.41)			(2.39)
Short Interest Six Months Prior to Close			-24.68*			-76.97			-96.12
			(14.79)			(51.71)			(72.35)
Venture Capital Funded During Prior Five Years			0.64			14.48**			20.68**
			(1.29)			(7.38)			(9.15)
Return of Assets at Fiscal Year Before Close			-1.85			4.72			1.55
			(1.35)			(3.91)			(6.13)
Leverage at Fiscal Year Before Close			0.63			17.30**			24.07**
			(1.19)			(7.31)			(10.42)
Number of Analysts			0.05			1.37*			5.30***
			(0.22)			(0.83)			(1.20)
Number of Observations	2,862	2,862	2,407	2,862	2,862	2,407	2,470	2,470	2,049
R-Squared (in Percent)	2.50	2.84	4.39	8.13	8.31	9.54	6.47	6.83	9.73

Table 10: Determinants of Accounting Performance
This table summarizes the determinants of the accounting performance of companies issuing PIPEs during two time periods after the close of the PIPE transaction. We report the ordinary least squares regression of the return on assets at three different time periods on past characteristics of companies. The return on assets is winsorized at the 1 percent level. All regressions include indicator variables for the years of the close of the deal and the industry sectors. The standard errors are robust, corrected for clustering of observations by the same company, and are summarized in parentheses. '*', '**', and '***' denote estimates that are statistically different from zero at the 10, 5, and 1 percent confidence levels.

	Return on Assets During the First Fiscal Year after the PIPE Issuance (in Percent)			Return on Assets During the Second Fiscal Year after the PIPE Issuance (in Percent)		
Hedge Fund Investor	-29.54***	-18.63**	-17.75**	-19.26***	-6.58	-1.62
	(7.81)	(8.23)	(8.37)	(6.77)	(6.83)	(6.88)
Structured PIPE		-28.23***	-19.67*		-29.34***	-21.04**
		(9.80)	(11.35)		(8.60)	(8.22)
Log of Proceeds from PIPE Transaction			2.66			1.28
			(3.50)			(3.21)
Log of Market Value at Close			1.83			3.04
			(5.89)			(3.72)
Book-to-Market Ratio at Fiscal Year Prior to Close			6.67			11.60
			(7.61)			(5.84)
Excess Return During Year Prior to Close			5.50***			0.52
			(1.74)			(1.53)
Log of Trading Volume Six Months Prior to Close			-1.29			-4.71
			(3.63)			(3.25)
Short Interest Six Months Prior to Close			-10.59			38.37
			(120.86)			(99.17)
Venture Capital Funded During Prior Five Years			3.00			-3.82
			(7.79)			(9.19)
Return of Assets at Fiscal Year Prior to Close			0.55***			0.56***
			(0.11)			(0.09)
Leverage at Fiscal Year Prior to Close			31.25***			21.82*
			(8.96)			(11.97)
Number of Analysts			4.42***			3.00***
			(1.22)			(1.00)
Number of Observations	2,465	2,465	2,003	1,865	1,865	1,508
R-Squared (in Percent)	6.33	6.90	14.19	5.76	5.76	15.79

Table 11: Buy-and-Hold Returns of Companies issuing PIPEs by Detailed Security Type
The table summarizes the mean abnormal returns for companies issuing PIPEs by the detailed security type and by investor type (Hedge Funds vs. Other Investors). PIPE transactions are allocated to "Hedge Funds" if hedge funds account for more than 50 percent of the investment and to "Other Investors" if other known investors account for more than 50 percent of the investment. Abnormal returns are computed by subtracting the raw return for companies matched in the month prior to the PIPE deal according to industry, size, book-to-market ratio, and momentum from the return of PIPE companies. The returns are expressed in percent. The standard errors for the means are reported in parentheses and are corrected for clustering by firm. The significance levels for each individual abnormal return are denoted by '*', '**', and '***' and indicate whether the results are statistically different from zero at the 10, 5, and 1 percent confidence levels. The numbers in brackets denote the number of PIPE transactions with the corresponding characteristics.

	Announcement Term Abnormal Return [-4, 5]		Long-Term Abnormal Return [6, 250]	
	Hedge Funds	Other Investors	Hedge Funds	Other Investors
Traditional PIPEs				
Common Stock	4.05***	7.31***	-8.33***	-0.67
	(1.55)	(0.99)	(6.08)	(5.16)
	[356]	[868]	[356]	[868]
Fixed Convertible Preferred Stock	7.55*	5.53**	2.46	-8.57
	(4.18)	(2.76)	(17.01)	(9.90)
	[69]	[326]	[69]	[326]
Fixed Convertible Debt	-1.31	0.79	-25.76	5.42
	(2.77)	(2.59)	(17.71)	(12.86)
	[79]	[158]	[79]	[158]
Common Stock – Shelf Sale	4.19	12.57	-26.71	-52.80
	(3.53)	(7.47)	(17.10)	(32.84)
	[50]	[20]	[50]	[20]
Structured PIPEs				
Floating Convertible Preferred Stock	1.45	-0.23	-22.89***	-17.76
	(2.26)	(2.11)	(8.70)	(11.70)
	[297]	[109]	[297]	[109]
Floating Convertible Debt	3.59*	6.23	-16.03***	-23.87
	(2.09)	(6.58)	(11.63)	(14.86)
	[154]	[48]	[154]	[48]
Structured Equity Lines	-1.72	3.76	-24.68***	-44.02
	(2.63)	(5.20)	(7.61)	(27.67)
	[136]	[20]	[136]	[20]
Common Stock – Reset	0.73	0.52	-49.87**	-133.72
	(4.14)	(6.02)	(20.35)	(118.39)
	[43]	[23]	[43]	[23]
Reset Convertible Preferred Stock	-11.68**	5.18	-31.60**	-18.38
	(5.19)	(3.42)	(15.67)	(23.84)
	[42]	[28]	[42]	[28]
Reset Convertible Debt	-28.05**	6.49	-27.80	-60.29*
	(10.96)	(6.61)	(46.42)	(29.60)
	[21]	[15]	[21]	[15]

Table 12: Buy-and-Hold Returns of Companies Issuing PIPEs by Detailed Investor Type

The table summarizes the mean abnormal returns for companies issuing PIPEs by the major investors in the PIPE securities. Abnormal returns are computed by subtracting the raw return for companies matched in the month prior to the PIPE deal according to industry, size, book-to-market ratio, and momentum from the return of PIPE companies. The returns are expressed in percent. The standard errors for the means are reported in parentheses and are corrected for clustering by firm. The significance levels for each individual abnormal return are denoted by '*', '**', and '***' and indicate whether the results are statistically different from zero at the 10, 5, and 1 percent confidence levels. The numbers in brackets denote the number of PIPE transactions with the corresponding characteristics.

	Announcement Term Abnormal Return [-4, 5]			Long-Term Abnormal Return [6, 250]		
	All PIPEs	Traditional PIPEs	Structured PIPEs	All PIPEs	Traditional PIPEs	Structured PIPEs
Hedge Funds	1.42	3.73***	-0.43	-18.32***	-11.13**	-24.07***
	(0.93)	(1.24)	(1.33)	(3.94)	(5.47)	(5.33)
	[1,247]	[554]	[693]	[1,247]	[554]	[693]
Corporations	9.58***	10.23***	-0.28	-7.73	-7.73	-7.89
	(2.13)	(2.23)	(5.30)	(7.26)	(6.91)	(42.66)
	[228]	[214]	[14]	[228]	[214]	[14]
Mutual Funds	2.53	2.83	-2.73	9.55	13.08	-52.49***
	(1.86)	(1.94)	(4.87)	(10.95)	(11.51)	(16.41)
	[223]	[211]	[12]	[223]	[211]	[12]
Venture Capital	8.50**	11.80**	0.81	-13.88	-3.46	-38.19**
	(3.77)	(5.22)	(2.85)	(12.54)	(16.32)	(15.00)
	[210]	[147]	[63]	[210]	[147]	[63]
Private Equity Funds	8.30***	8.52***	-0.19	-11.46	-11.84	2.94
	(2.76)	(2.83)	(9.18)	(15.63)	(16.03)	(39.28)
	[77]	[75]	[2]	[77]	[75]	[2]
Individual Investors	5.33***	4.66***	9.72**	-14.30	-12.24	-27.74
	(1.64)	(1.79)	(3.85)	(9.02)	(10.09)	(16.81)
	[391]	[339]	[52]	[389]	[339]	[52]
Brokers and Dealers	4.45	8.62*	-2.52	3.89	4.48	2.92
	(3.06)	(4.41)	(2.97)	(12.93)	(16.85)	(20.51)
	[80]	[50]	[30]	[80]	[50]	[30]
Other Known Investors	3.73**	4.03**	2.28	-8.17	1.92	-56.58
	(1.74)	(1.85)	(4.72)	(9.01)	(7.44)	(37.44)
	[406]	[336]	[70]	[406]	[336]	[70]
Unknown Investors	4.04***	5.41***	0.70	-8.65	-4.16	-19.58*
	(1.02)	(1.26)	(1.89)	(5.46)	(5.93)	(11.00)
	[907]	[643]	[264]	[907]	[643]	[264]