

Non-Underwritten Equity Private Placements and their Agents

Siyuan Fan
School of Business,
Quincy University

Ioannis V. Floros
Lubar School of Business,
University of Wisconsin – Milwaukee

Leonardo Madureira
Weatherhead School of Management,
Case Western Reserve University

Ajai K. Singh*
College of Business,
University of Central Florida

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Abstract

We examine private placements of non-underwritten equity. We posit that better firms place their equity directly with investors, whereas issuers' reliance on agents indicates relative weakness. Indeed, the market reaction to non-intermediated equity placement announcements is significantly positive. In contrast, the corresponding market reaction to intermediated deals is sharply negative. Consistent with short-term performance, we show that non-intermediated deals are issued by firms of a relatively superior quality and exhibit significantly higher long-run stock performance. After analyzing the surrounding information environment, we find that their analyst coverage, but not the level of optimism, is related to the choice of intermediation.

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*Corresponding author. Siyuan Fan is an Assistant Professor of Finance at Quincy University, Quincy, IL 62301. Email: s.fan55@quincy.edu. Ioannis V. Floros is an Associate Professor of Finance at the University of Wisconsin-Milwaukee, Milwaukee, WI 5.3211. Email: ivfloros@uwm.edu. Leonardo Madureira is a Professor of Banking and Finance at Case Western Reserve University, Cleveland, OH 44106. Email: llm17@case.edu. Ajai Singh is a Professor of Finance at the University of Central Florida, Orlando, FL 32816. Email: aks@ucf.edu, Phone: 407-823-0761, Fax: 407-823-6676. Singh gratefully acknowledges the support of the SunTrust Endowment. We thank Dan Bradley, Anna Pinedo, Eshwar Venugopal, and especially Vladimir Gatchev for valuable comments. All remaining errors are our own.

Non-Underwritten Equity Private Placements and Their Agents

Abstract

We examine private placements of non-underwritten equity. We posit that better firms place their equity directly with investors, whereas agent-intermediated placements indicate relative weakness. Indeed, the market reaction to announcements of non-intermediated, direct placements of equity is significantly positive. In contrast, the corresponding market reaction to intermediated deals is sharply negative. Consistent with short-term performance, we show that firms of a relatively superior quality make non-intermediated placements and exhibit significantly higher long-run stock performance. After analyzing the surrounding information environment, we find that their analyst coverage, but not the level of optimism, is related to the choice of intermediation.

1. Introduction

The bulk of prior literature analyzing the role of financial intermediaries has focused primarily on public offerings, both initial public offers (IPOs) and follow-on offers of seasoned equity (SEOs). A different kind of financial intermediary—henceforth a placement agent—features in a separate segment of the corporate capital acquisition activity. Placement agents are financial intermediaries who assist firms in their capital acquisition process through best-efforts deals involving seasoned equity, among other securities. These agents are also active in the placement of shares through PIPEs (Private Investments in Public Equity). In marked contrast to the typical investment banker’s involvement in public offerings, placement agents do not provide firm-commitment underwriting to the issuer in either best-efforts deals or PIPEs.¹

There is extensive literature examining PIPEs; best-effort deals have also been examined, but primarily in the context of initial public offers (IPOs).² On the other hand, the role of agents in non-underwritten, best-effort, placement of seasoned equity has received limited scrutiny. The relatively scant attention given to studying the role of placement agents in PIPEs, or best-effort deals, has naturally led to an absence of comparative analyses of agent-intermediated versus non-intermediated placements of seasoned equity by firms.³ We address the lacuna in the existing literature by analyzing non-underwritten placements of seasoned equity and comparing direct

¹ Investment bankers provide firm-commitment underwriting, which mitigates the information asymmetry and adverse selection issues facing firms engaged in the public equity offer (Myers and Majluf 1984). Beatty and Ritter (1986), and Carter and Manaster (1990) model the role of investment bankers as certification agents.

² For best-efforts deals, in the context of IPOs, see Ritter (1984), Beatty and Ritter (1986), Booth and Smith (1986), and Smith (1986). For PIPE related evidence see Brophy, Ouimet and Sialm (2009), Chaplinsky and Haushalter (2010), Chakraborty and Gantchev (2013), Billett et al. (2015), and Lim et al. (2021).

³ We use the terms disintermediated, non-intermediated, non-underwritten, and directly marketed/placed interchangeably throughout the paper. We also interchangeably use the terms private placements and PIPEs.

placements (non-intermediated) with intermediated deals.

We posit that better firms place their shares directly with investors. The capability of firms to place shares directly with investors, without the support of a financial intermediary, is a testament to their strength (Chemmanur and Fulghieri, 1994). On the other hand, issuers' reliance on agents is an indication of their relatively weak bargaining power *vis-à-vis* investors with whom their shares are placed.

Consistent with the above proposition, we find that announcements of non-intermediated deals evoke a significantly positive market response from the market. The average 5-day announcement period cumulative abnormal return (CAR) is +9.01% for non-intermediated deals. In marked contrast, intermediated-deal announcements evoke a significantly negative price reaction; their average 5-day announcement period CAR is -2.63%.⁴ In line with their significantly negative announcement period returns, we find that intermediated deals are placed at significantly higher price discounts. We also present evidence that intermediated deals are in general of a relatively inferior quality. They are more likely to be made by issuers with lower profitability, more likely to involve pre-registered securities and have a greater likelihood of including warrants. They also tend to have hedge funds as their lead investors.

We further show that non-intermediated deals exhibit significantly higher long-run stock returns, both raw and abnormal, over several event windows (six-month, twelve-month, twenty-four-month and thirty-six-month) following the deal closings. Non-intermediated deals' better long-term stock performance is consistent with the generally better-quality profile of their issuers, their significantly smaller price discounts, and higher announcement returns.

⁴ The median CARs associated with non-intermediated placements are +4.23%, and -4.73% for the intermediated deals.

There is an extensive literature analyzing the information environment around public equity offerings and the role of analyst coverage by financial intermediaries underwriting the issuer. We extend this analysis to the context of private placements and their placement agents, a scenario where information production and relevance might differ. In particular, we aim a better understanding of the information creation by placement agents when deals are confidentially and privately negotiated. We explore the information environment around private placements by looking at the frequency and quality of analysts' coverage before and after deals, the analysts' ties with the agents intermediating the deals and their level of optimism when covering these transactions.

We find that analysts' coverage is very common ahead of intermediated and non-intermediated deals. However, following the consummation of the deal, the number of analysts covering the firm drifts upward more markedly for the intermediated placements. The presence of coverage, but not the level of optimism reflected in that coverage, is related to the choice of becoming an intermediated deal.

There is ample evidence that coverage is used by brokers as currency to attract underwriting business or is an implicit part of the contract by which firms hire a broker to assist in raising equity (e.g., Cliff and Denis, 2004; Bradley et al., 2006). Consistent with prior literature, we find that analyst coverage is used as currency in intermediated private placements as well. Coverage by agents in intermediated deals is especially common, both before and after the deal, and the associated analyst's coverage itself is a strong predictor of whether a broker becomes the placement agent.

Analysts associated with agents exhibit greater optimism towards an issuer, compared to analysts associated with non-agent brokers. The optimism is significantly related to market

reactions to the deal, but only for non-intermediated deals. The result suggests that investors discount the optimism in intermediated deals, given the potential for conflicts of interest in the agents' behavior.

We make several contributions to the literature. We provide a detailed analysis of non-underwritten seasoned equity placements, as well as a comparative analysis of agent-intermediated versus non-intermediated deals. To the best of our knowledge, ours is the first study to identify the distinct, and significant, effect and role of intermediation in private placements of equity. Relative to intermediated deals, non-intermediated deals have lower discounts, experience higher announcement wealth effects and better long-term performance. The finding that non-intermediated deals exhibit superior performance contributes to the literature initiated by Hertz et al. (2002), which identifies factors significantly associated with long-term stock performance following private placements. We are also the first to examine the role of the information environment provided by analysts and the coverage by agent-affiliated analysts in non-underwritten equity placements.

The rest of the paper is structured as follows. Section 2 presents a review of the literature on private placements. Section 3 discusses the data and sample selection. Section 4 presents the paper's main results. Section 5 concludes.

2. Literature review

The role of intermediation in the context of public equity offerings and its association to the offerings' pricing, for both IPOs and SEOs, has attracted a lot of interest in the earlier literature (Leland and Pyle, 1977, Campbell and Kracaw, 1980, Beatty and Welch, 1996, Kumar et al., 1998, Krigman et al., 2001). In public equity offerings, investment banks act as credible information producers who certify the information conveyed by the issuers through their registration

documents. They underwrite the offerings and commit to selling them to institutional investors by creating demand for the offering during road shows. Gao and Ritter (2010) show that marketing efforts increase institutional demand elasticity especially for fully marketed deals, which justifies higher fees charged by the more reputable investment bankers. Investors gauge underwriters' evaluation of issuers' quality based on the success of the earlier transactions these investment banks underwrote.

Intermediation in privately-placed securities does not involve any underwriting services. Placement agents intermediate and exert their best efforts (without though committing) to complete the private offerings. They are not liable to litigation and do not conduct any roadshows. Their role in the privately-placed securities pricing is an open question as information is concurrently, privately and confidentially conveyed by the issuers.

Earlier empirical literature on private placements documents that issuers are loss-generating, high-growth and high-cash-burn-rate firms that seek financing of last resort through non-underwritten privately-placed securities; and that the capital sought is provided primarily by hedge funds. Prior research reports that hedge-fund-financed deals exhibit deep discounts, high short interest in the period surrounding the deals' closing date, and long-term underperformance (see Brophy et al., 2009). Related literature also focuses on the role of the investor type on the non-underwritten transactions' pricing, and the choice of contractual terms.⁵

⁵ For more information, we refer the reader to Dai (2007) and Billett et al. (2015). Unlike the case in public equity offerings, the contractual terms employed in PIPEs and best-efforts deals are frequently disclosed along with the investor type(s) and the name(s) of investor(s) who provide the funds. Chaplinsky and Haushalter (2010) note the important role played by the contractual terms in managing the risk of their investments, for investors financing the private placements. Chaplinsky and Haushalter (2010) report that discount-only private placements are, on average, in a better financial condition, compared to the transactions that involve price resets or warrants. However, as risk increases, price-resets or warrants are preferred over pure-discount private placement contracts.

However, more recent studies (e.g., Billett et al., 2021) show that post-2007 other corporations operating in the same industry as the issuer constitute the major investor type in non-underwritten private placements, with the highest total purchased amount. These are arguably strategic investments, wherein the corporate investors have significant technological overlap with the research projects led by the issuer. Further, these corporate investors are significantly and positively associated with the issuer's future innovation activities. The corporation-led non-underwritten investments and the overall upward drift towards strategic investors who choose to engage in privately-placed transactions suggest a significant shift in the non-underwritten, privately-placed financing arena towards strategic long-term investors (e.g., corporations, venture capital firms, private equity firms).

The surge in long-term investors, the credible threat of prosecution of issuers associated with insider trading in privately-placed deals (as reported for the period 2003-2005 in Bengtsson et al., 2014), the utilization of new types of contractual terms (early registration, board-seat requests, rights of first refusal, prohibitions of concurrent public equity offerings), the shortening of the Rule 144 restriction period to six months for filers with up-to-date SEC filings in 2008, the registration deregulation in December 2007, the utilization of new "hybrid" security offering types (i.e., the At-The-Market Offerings, the Confidentially Marketed Public Offerings) and the resurgence of best-efforts deals make it imperative to conduct in-depth analyses of recent privately-placed offerings and the associated "hybrid" offerings along with their characteristics. In the aforementioned "hybrid" offerings, we specifically refer only to those non-underwritten, best-efforts deals that are characterized by some of the attributes of a PIPE transaction.⁶ As discussed

⁶ We specifically omit all underwritten deals. Besides being underwritten, At-The-Market offerings and Confidentially Marketed Public Offerings have distinct features that do not permit their comparison with non-underwritten deals.

later in the data section, we focus on the post-deregulation period (2008-2017) to be free of any associated bias caused by the deregulation and the restructuring of the related placement agents' market.

Placement agents do not commit their own principal. In their role as agents, they do not underwrite the deals, and they do not provide firm-commitment marketing efforts. Their services mirror the best-effort deals, popular in the days of yore. After a non-disclosure agreement is signed and the placement memorandum has been finalized, issuers share a large information set with the placement agent. In our analysis we address several questions. What is the role of placement agents and is their presence a credible signal for the type of financing (arms-length vs. strategic)? Do their services matter for the deal's pricing and the related announcement wealth effects? How do issuers and placement agents choose each other? What is the surrounding information environment for these privately-negotiated transactions? In our analysis we also explore whether intermediation, or the lack thereof, can distinguish between long-term investments and the arms-length, liquidity financing events.

In addition, we analyze the information environment surrounding privately-placed securities. In private placements of securities, the issuer has the chance to share confidential information with a select group of investors by signing confidentiality agreements. The role of the research provided by analysts in such deals remains an open question. There is extensive literature exploring the role of analyst coverage in companies issuing equity. The evidence shows that coverage is used by brokers as currency to attract underwriting business or that coverage is an implicit part of the contract by which the firm hires a broker to assist in raising equity (e.g., Cliff and Denis, 2004; Bradley et al., 2006). There is also ample evidence that analysts associated with brokers, who have business relations with the covered firm tend to be more optimistic in their recommendations (e.g.,

Dugar and Nathan 1995; Michaely and Womack 1999; Krigman et al. 2001; Kadan et al., 2009). Much of the evidence, though, is developed with respect to IPOs and SEOs. We expand on the literature by examining the role of the information environment provided by analysts and the coverage provision by agents in non-underwritten equity placements. Specifically, this is a setting wherein the issuer is able to privately convey information to a select group of investors. As such, the role of the placement agents and analysts may be different than in the public equity offerings.

3. Data and sample selection

We obtain our sample of PIPEs from the *PrivateRaise* database provided by *The Street Inc.* The *PrivateRaise* database is the leading data source for private placements, reverse takeovers, shelf registrations and Special Purpose Acquisition Companies (SPACs). Our initial sample covers all 24,431 PIPEs and best-effort deals closed between 1/1/2001 and 12/31/2017.

We exclude observations related to issuers that operate in the financial sector (SIC codes 6000s), the utilities' industry (SIC codes 4900s) and observations that do not have CRSP share codes 10 and 11 and are identified as non-U.S. common stock. When we limit our sample only to the deals involving all security types with non-missing CRSP pricing information surrounding their closing date between 1/1/2001 and 12/31/2017, we obtain 6,902 transactions, of which 4,116 are common stock placements.

Consistent with Gustafson and Iliev (2017), we report a significant consolidation in the placement agent market post-deregulation in December 2007. To circumvent issues pertaining to the sporadic presence of certain placement agents prior to deregulation (2001-2007), and their disappearance from the later sub period (2008-2017), our analysis focuses on the later subperiod. In this post-deregulation period (2008-2017), the sample contains in total 1,804 common stock

deals, made by 817 distinct issuers.⁷ For our analyses, we have information regarding the investor type, contractual terms, pricing, security type, and placement agent pertaining to PIPEs.⁸

A major part of our analysis is centered on the role of placement agents in PIPEs. Towards this end, we obtain our initial sample of agents from the *PrivateRaise* database. We hand-check the content and the validity of the name(s) reported for each PIPE transaction. We make sure that the names are reported with consistency, and do not change across PIPEs (we refer to the usage of brackets, investment bank business type, affiliation). For this extensive hand-checked data, we use the registration document, or alternatively the accompanying 8-K document.

We obtain analyst coverage data (earnings estimates and forecasts, recommendations, and target prices) for our sample of issuers between 1/1/2007 and 12/31/2018 from the Refinitiv I/B/E/S (Institutional Brokers Estimate System) database. To identify the coverage by analysts working for placement agents, we hand-match the names of IBES brokerage house and the placement agents.

4. Empirical findings

4.1 Univariate results

In Table 1, we report the annual distribution of the count and the percentage of intermediated and the non-intermediated PIPEs throughout the entire time period from 2001 to 2017 for which we have data available from the database *PrivateRaise*. We find that, apart from years 2001 and

⁷ In Table 7, we include deals of all security types to gauge the impact of security type on the issuer-placement agent choice. Consequently, only for this table, the number of observations increases to a total of 3,025 observations.

⁸ We identify the leading investor type for each transaction as the one that has purchased the highest percentage of the gross proceeds raised in the deal. We classify our final PIPE sample into those that are hedge-fund-led versus the rest and utilize this classification in our multivariate analyses. We can identify the investor type for 74% of the 1,804 deals in our sample period 2008-2017.

2012, intermediated PIPEs are the more frequently encountered transactions. The percentage of intermediated PIPEs ranges from 48% to 69% still leaving a considerable percentage of PIPEs that is directly offered. On the bottom of the table, we show the total count and respective percentages of intermediated and non-intermediated deals for each of the two subperiods (2001-2007 and 2008-2017). We show that in the later time period, which constitutes the sample period for our main analysis, the presence of non-intermediated PIPEs slightly increases.

<Insert Table 1 here>

In Table 2, we present summary characteristics for the sample of deals and issuers classified by whether the deal is intermediated. In Panel A of Table 2, we report issuers' main annual financial attributes as of the year preceding the deal's closing date. We focus on size, liquidity, profitability, capital structure, expenditures, growth options and asset tangibility measures for the issuers ahead of the transaction's issuance year. We report the number of observations, mean and median values, and then compare the mean and median across the two samples. We find that intermediated issuers are smaller, younger, burn cash faster, are more loss generating companies, exhibit lower leverage levels and report higher expenditures—suggesting that information asymmetries may be exacerbated for intermediated issuers compared to the non-intermediated ones, and as a result issuers may need more of the marketing efforts from placement agents.

<Insert Table 2 here>

Panel B of Table 2 presents summary statistics on deal characteristics. The market capitalization of issues in intermediated deals is lower on average, while these issuers demonstrate the ability of raising a higher percentage of their size as gross proceeds when compared to issuers in non-intermediated deals. When we turn to the contractual terms they utilize, issuers in intermediated deals use control terms (board seats) less frequently and are financed more often by

arms-length investors (namely, hedge funds) and less frequently by long-term investors (such as other corporations, venture capital firms, private equity firms). The contractual terms utilized and the investor types financing intermediated deals signal that these deals may be costlier. To summarize, intermediated deals exhibit higher expenditures and are in greater need of immediate financing, suggesting the need of the assistance and marketing efforts from placement agents.

4.1.1 *Market reaction*

In Table 3, we report and compare mean and median pricing and market reaction values for intermediated and non-intermediated deals. Pricing is computed as the percentage change difference between the offering price and the price the day before either the definitive agreement/pricing date, announcement date and closing date (in order of preference). A positive (negative) percentages indicate discount (premium). Market reactions are computed over a symmetric five trading-day window whereby day zero is the earlier of the announcement and the closing date. We compute abnormal cumulative returns over the five trading-day window after adjusting daily raw returns by the CRSP value-weighted index.⁹

<Insert Table 3 here>

We find that non-intermediated deals exhibit significantly lower mean (-1.43% vs 9.77%) and median (0% vs 10.2%) discounts and significantly higher mean (9.01 vs -2.63%) and median (4.23% vs -4.73%) announcement market reactions when compared to intermediated deals. The findings are consistent with non-intermediated transactions being most likely greeted as long-term,

⁹ We prefer market-adjusted returns rather than any asset pricing model as we do not want to count on an estimation window that may induce any bias in our announcement returns mingling with preceding deals. In detail, for our market reaction's event date, we use the earlier of the deal's closing date and the announcement date; when the announcement date is not available, the closing date is treated as the event date. Our results remain qualitatively similar when we use a three-day event window.

strategic transactions by the select group of investors participating in the transaction as well as the public investors, while intermediated transactions are probably characterized as transactions meeting immediate operating needs with the investors' main intention being the quick cashing out.

4.1.2 *Analyst coverage*

In Table 4, we turn our focus to the analysts' coverage, the analysts' association with placement agents, their levels of optimism and the associated market's reaction to optimism in the analysts' output. We define coverage before (after) a deal to denote that at least one analyst covers the issuer in the 365-day preceding (following) the issuance date. Panel A shows analyst coverage is very common in our sample: approximately 69% of the deals have coverage by analysts in the year before the transaction. Coverage becomes more frequent in the year following the deal, more so for the intermediated (73.35%) compared to the non-intermediated (72.17%) deals.¹⁰ As per the depth of coverage, an average of 2.65 (3.33) analysts cover an intermediated (non-intermediated) issuer prior to the deal date, and the number of analysts covering the issuer significantly increases for both types of deals in the year following the deal date.

<Insert Table 4 here>

Similarly, the average number of agents in intermediated deals providing coverage significantly jumps from 0.37 to 0.54 around the issuance date. Notice that some agents cannot provide coverage if they do not operate in the sell-side research arena. Panel B shows that amongst the 1,329 pairs of (deal, placement agent) in our sample, 1,064 involve agents operating as sell-side brokers. Amongst these brokers that can provide coverage, approximately 35.24% provide

¹⁰ In unreported results, the increase in proportion of coverage from before to after a deal is significantly bigger for intermediated deals vs. non-intermediated deals.

coverage in the year prior to the issuance date, while, more notably, 21.68% start providing coverage after the issuance date. In sum, about 56.92% of the agents provide coverage to the deal sometime in the two-year period surrounding the deal.

We next examine analysts' levels of optimism towards issuers as measured by analysts' recommendations and target prices. We map each recommendation to a categorical variable that takes the value of 2 for optimistic (buy or strong buy), 3 for neutral, and 4 for pessimistic (sell or strong sell) recommendations.¹¹ For each target price, we follow the literature (e.g., Brav and Lehavy, 2003) to define its implied return $iret = (TP_0 - P_{-1}) / P_{-1}$, where TP_0 is the target price, and P_{-1} is the stock price one day before the target price issuance date. Panel C of Table 4 reports average recommendations and median implied returns for both agents and non-agents, separated by whether an issuer receives coverage by non-agent brokers only, agent brokers only, or both. Optimism, measured from either recommendations or implied returns, is higher when coming from brokers also operating as agents. For example, for the deals covered by both agents and non-agents, average recommendation (median implied return) for agents is 2.17 (100.00%), significantly more optimistic than the corresponding measures of 2.33 (85.19%) for non-agents.

Panel D of Table 4 explores whether the optimism towards issuers is related to the market reaction to the deal. The table reports mean and median market reactions to subsamples of deals formed based on the revealed optimism of analysts covering the deals' issuers. More optimistic and more pessimistic samples are split by the median values of the recommendation or implied returns. The average and median reaction to the announcement is significantly higher for deals in the high-optimism subsample when optimism is proxied by implied returns, but only for non-

¹¹ The use of three-tier rating systems became much more prevalent among sell-side brokers starting in 2002 (see Kadan et al., 2009), which predates the start of our sample period.

intermediated deals. In fact, for intermediated deals, median (but not average) reactions are *lower* for the high-optimism subsample. Given the excess optimism revealed by agents in intermediated deals, this last result is consistent with investors discounting the optimism from potentially conflicted agents.

4.2 Multivariate results

4.2.1 *Determinants of intermediation*

We start our analysis by examining the factors that significantly predict an agent's engagement in intermediated deals, along with the attributes that predict the composition of intermediation (solitary versus multiple agents). In Panel A of Table 5 we examine the characteristics related to whether the deal is intermediated (as against being placed directly by the issuer). We use a linear probability model employing year fixed effects.¹² We present four specification models depending on whether the model incorporates the pre-registered identification of the deals, the discount, and the leading investor types as our explanatory variables.

<Insert Table 5 here>

We find that deals with warrants, greater discount, and pre-registered securities are more likely to be intermediated. Younger issuers are more likely to use intermediation. Also, larger deals, and issuers with higher profitability but with lower liquidity preceding the transaction are more likely to be intermediated. Intermediated deals have hedge funds as their lead investors more often, and the issuers grant board seat(s) less frequently in such deals. These results broadly confirm the inferences obtained with the univariate analysis in Table 2.

¹² As a robustness check, we also estimate the regressions with logit specification and find qualitatively similar results (available upon request).

The presence of analysts' coverage in the year ahead of the deal is also positively associated with intermediation, though the effect is small: deals with covered firms are between 4.3% and 5.7% more likely to be intermediated. This finding may be capturing the proclivity of agents in an intermediated deal to provide coverage for the issuer, or the proclivity of potential agents in providing coverage when competing for a deal.¹³ We will explore this conjecture later in the paper.

We next analyze which factors predict the intermediation by multiple agents instead of just a solitary agent. Panel B of Table 5 shows the results from Poisson regression models predicting the utilization of additional agents. We find that deal size, the age of the issuer, the leading investor type and the registration status significantly explain the presence of multiple placement agents. Specifically, deal size and the leading investor type (the registration status and the age of the issuer) are positively (negatively) associated with the probability to hire the services of multiple placement agents.

The magnitude of the effect is large and significant. For example, we find that every unit of increase in the deal size is associated on average with an increase in the probability of engaging multiple agents that ranges from 3.8% to 5.1% depending on the estimation model. Further, the deals that are financed by hedge fund investors are associated on average with an increase of 12.2% in the probability to engage multiple agents. This last result suggests the need for multiple agents spreading the marketing efforts to advertise a deal targeting a select group of investors when these investors are arms-length investors (hedge funds).

Overall, these findings corroborate Chemmanur and Fulghieri (1994) empirical propositions

¹³ Notice that this result contrasts with the univariate statistics from Table 4, where the proportion of deals with some coverage by analysts in the year before the transaction date was similar for the intermediated (67.41%) and the non-intermediated deals (70.75%).

positing that unless it is extremely costly, firms with higher information asymmetry procure the services of a financial intermediary. More placement agents are more likely to be needed when the deals are of greater size, entail pre-registered stock or warrants, are financed by hedge funds and issued by younger and less liquid issuers.

4.2.2 *Issuers and placement agents match*

Next, we examine how issuers and placement agents choose each other. First, we examine the factors based on which issuers choose their optimal lead placement agents, among all possible choices available with similar characteristics. Similarly, we estimate the factors that influence the choice of the leading placement agent for their optimal issuer, given all other available issuers with similar characteristics.

The attributes of the choice between placement agents and issuers in the unregistered PIPEs and the best-efforts transactions have not been analyzed before. Given the fact that these transactions tend to frequently serve immediate operating needs (similar to the financing events outlined in DeAngelo et al., 2010), they take place in short time intervals and their main issuer-placement agent selection attributes are of particular importance, as they will repeatedly influence the speed and the cost of their financing events. Fernando et al. (2005) analyze the association of issuers and underwriters in IPOs and compare it with the one in subsequent SEOs. The relative change in the quality of the firm and the reputation of the underwriters determines the possible switch of the underwriter from the IPO to the SEO. Earlier studies (Benveniste et al., 2003) focus on the issuer's choice of underwriter (assuming that it is one-directional). Calomiris et al. (2021) analyze the role of underwriters in SEOs and, after addressing endogeneity concerns, they show that underwriter reputation has no price impact for the fully marketed deals. Reputation effects are

not always present depending on the endogenous matching between the issuer and the placement agent.

We estimate the placement agent's and the issuer's choice in two separate regressions. Our exercise is the one-sided version of the matching approach pursued by Venugopal and Yerramilli (2020), where the matching is conducted based upon the characteristics that startups and directors use to choose each other. In a related setting, Akkus et al. (2021), use a tractable structural model to determine the matching equilibrium between underwriters and equity-issuing firms after estimating the determinants of their relationship.

For each actual issuer and placement agent match in a PIPE and best-effort deal, we construct eight control pairs of issuer and agent combinations that exhibit similar characteristics as the one chosen, but which did not become the actual match. In other words, when analyzing the issuer's choice of placement agents (Panel A of Table 6), we construct eight possible alternate matches of placement agents that were not chosen and compare them with the issuer's actual choice. Likewise, in Panel B of Table 6 we construct eight possible alternate matches of issuers that were not chosen and compare them with the placement agent's actual choice. Following Venugopal and Yerramilli (2020), we use linear probability regressions instead of probit regressions to avoid incidental parameter issues that could arise due to the large number of fixed effects. Nevertheless, we still make sure that our results hold when we build five, six, or seven control pairs of issuers and placement agents, respectively (or when we count on probit specifications).

<Insert Table 6 here>

Panel of Table 6 presents the results of the model explaining the issuer's choice of placement

agent.¹⁴ When choosing its placement agent, the issuer shows a preference for the agent being operational in the same 2-digit SIC code industry, having a prior financing relationship with the issuer in the previous three years, and having issued the same security type with the same registration status, in a similar financing event within the three previous years of the actual transaction. We conjecture that the issuer chooses its optimal agent after securing that the chosen agent has enough, prior and similar exposure ahead of the deal closing.

The analysis also looks at the relationship between analyst coverage and the choice of placement agent. A dealer with sell-side research operations, even if it does not provide coverage for the issuer, is more likely to become the placement agent—other things equal, just being an agent that can provide coverage is associated with a 3.4% increase in the probability of being chosen as the placement agent for the deal. The most relevant effect, though, comes from dealers that did provide coverage to the issuer in the year preceding the deal: Having provided coverage significantly increases the likelihood of becoming the placement agent by 36.2%.

In similar fashion, in Panel B of Table 6, we construct and estimate the factors that significantly explain how the lead placement agent chooses its optimal issuer. We find that for its optimal intermediated deal the placement agent prefers the issuer to have at least one prior similar financing relationship within the previous three years, and to have issued the same security type, with the same registration status in a similar financing event within three previous years of the actual transaction. We also report that the placement agents prefer engaging with issuers for whom they have provided analyst coverage within one year preceding the deal. We consider all these factors to resolve information asymmetry about the issuers' identify ahead of the consummation

¹⁴ This is the only tabulated analysis where we count on all security type transactions, to estimate the impact of having been engaged in similar security type PIPE transactions when the issuer chooses the agents, and vice versa.

of the deal.

4.2.3 *Contractual terms and announcement wealth effects*

We next turn to the multivariate analysis of deals' contractual terms and announcement wealth effects. As described in Floros et al. (2022), PIPE markets offer a financing platform to confidentially share private information with select investors. We posit that placement agents play an integral role in the effort to solicit investors' interest and complete the non-underwritten transaction. The agents conduct their own due diligence before committing to market the private transaction to their own network of investors. We assume that these efforts matter for both the likelihood of the transaction being completed, as well as the pricing and the contractual terms achieved, and the total cost associated with the non-underwritten transaction (i.e., discount and announcement wealth effects). We posit that the pricing and wealth effects we observe surrounding deals are impacted by the issuer's decision to procure the services of agents.

<Insert Table 7 here>

We employ a two-stage, endogenous treatment effect model to assess the difference in the discounts (Table 7, Panel A) and wealth effects (Table 7, Panel B), when the issuer has already chosen to be intermediated or decided to place the deal directly. In the first stage, we employ a probit model to estimate the choice of engaging placement agents. In the second stage, we estimate a linear regression that has the discounts (Panel A) or the announcement wealth effects (Panel B) as the dependent variable. First and second stage regressions do not have the same set of variables, because in the decision whether to be intermediated, we assume that the issuer's firm age, capital structure and market valuation may also matter. Following Li and Prabhala (2007) exclusion restrictions, we determine two different sets of variables that differ by at least one variable driving

the selection choice constituting an instrument for selection, but not an explanatory variable for the the level of discounts or announcement wealth effects.

Along with the estimates of the first and the second stage regressions, we also include the estimated correlations between the treatment-assignment errors from the first stage probit regression and the outcome errors from the second stage regression. This allows us to infer the impact of the unobservable variables of the intermediation choice in the first stage on the discount or the announcement wealth effects in the second stage.¹⁵ We focus on the correlations that are significant revealing that there is a significant selection issue underlying the estimation of discounts and announcement CARs. In Panel A, the error term in the selection regression is significantly and positively correlated with the error term in the discount regression for the non-intermediated sample (Rho_2), indicating that firms who choose not to be intermediated exhibit lower discounts than a random firm from this non-intermediated sample. In Panel B, both correlation coefficients (Rho_1 and Rho_2) are significant. This implies that regardless of the choice of intermediation, as the probability of choosing either is higher, the shock in CARs is larger.

The second-stage regression estimates indicate that warrants are positively associated with the levels of discounts, and negatively associated with announcement wealth effects for the non-intermediated deals. The presence of hedge funds as lead investors is positively associated with discounts for both the intermediated and the non-intermediated deals and the size of the deal is positively (negatively) associated with discounts for the non-intermediated (intermediated) deals.

¹⁵ Turning our focus to the correlation between the first and the second stage, we show that the correlation factor is significant for both panels there is a significant bias between the intermediation selection and the levels of discounts or announcement wealth effects.

Early registration status of the shares in the deal is positively (negatively) associated with discounts (wealth effects) for the non-intermediated deals. From the financial control variables, liquidity and profitability significantly explain both discounts and wealth effects for the non-intermediated deals and profitability for the intermediated deals.

We also examine the extent to which the analysts' optimism relates to the selection choice and to the outcome variables. To measure optimism we rely on implied returns computed from target prices written on the issuer in the year preceding the deal. Given the skewness of the implied return measure, we scale the measure to be between 0 and 1 and adopt the percentile of the median implied return for the issuer (*score_iret*) as our explanatory variable. The results in Table 7 show that analysts' optimism does not affect the selection choice in either model: together with the results in Table 5, this suggests that the presence of coverage, but not the optimism implied by that coverage, relates to the selection decision on going intermediated. Regarding the outcome variables, Panel B shows that analysts' optimism is positively associated with announcement wealth effects, but only in non-intermediated deals (p -value=0.052). Given the univariate patterns that optimism is in fact exacerbated for agents in an intermediated deal, these results suggest that investors take the optimism in non-intermediated deals, where potential conflicts are less severe, as more genuine.

Finally, we present the estimated Average Treatment on Treated (ATTs) appearing at the bottom of Model (1). ATT reveals the difference between the actual and hypothetical discounts and CARs for the intermediated deals in our sample. The difference in the deals' discounts is positive and significant, and it is negative and significant when we focus on the announcement wealth effects as our outcome variable. These estimated treatment effects on the treated (intermediated) sample reveal that issuers resort to intermediation when they face greater

challenges from the new investors who ask for higher discounts and from the public investors who greet negatively the announcement of the intermediators' involvement compared to their counterfactual (the case that they would not have been treated).

4.2.4 Long-run performance

In our last analysis we examine the issuer's long-term stock performance. Table 8 shows the six-, twelve-, twenty-four- and thirty-six-month long-term stock performance following the deal closing month in three different ways. All measures rely on monthly returns whereby month zero is the month of the deal closing. In Panel A, we present and compare mean and median values of the compounded raw returns for the intermediated and the non-intermediated deals, respectively. In Panel B, we repeat the analysis based on the Daniel, Grinblatt, Titman and Wermers (1997) (henceforth, DGTW) 125 size, book-to-market and momentum portfolio returns. In Panel C, we estimate the calendar time portfolios using the Fama-French 4-factor model and present the intercept term (alpha factor) which represents the average monthly excess returns.¹⁶ The findings for the three measures point to the same direction: non-intermediated deals' long-term performance is significantly higher than the intermediated deals' one across all four event windows we analyze. Also, both mean and median long-term performance for non-intermediated deals does not necessarily deteriorate when we turn to longer event windows as is the case for the intermediated deals.

<Insert Table 8 here>

The long-term performance results support the earlier pricing and announcement short-term

¹⁶ The portfolio returns at month t refer to an equally weighted portfolio of stocks that belong to the intermediated and the non-intermediated deals, respectively. Our model also includes the risk-free rate, the market return at month t and the monthly returns on the Fama-French size, book-to-market and momentum factors in month t as retrieved from Professor Kenneth French website.

performance results, namely that the type of investors financing non-intermediated deals and the initial market reaction from public investors were in the right direction. Non-intermediated deals prove to be the better performers in the long-run that will better compensate the investors who decide to retain their holdings for a longer time period following the deal closing.

5. Concluding remarks

In this paper, we provide a detailed analysis of private placements of non-underwritten equity transactions. We compare non-intermediated versus intermediated deals, while studying placement agents, who are the financial intermediaries that operate in the latter. Placement agents function very differently from the traditional underwriters engaged in public equity offerings. They neither formally purchase the shares being issued nor do they make any principal commitment. It can also be argued that they do not certify the issuers' projects given that information is privately and confidentially conveyed by the issuers to their select group of investors. These differences highlight the importance of analyzing the role of placement agents in non-underwritten equity issuance.

We find evidence consistent with the idea that higher quality firms can privately and directly place their shares with investors. The need for placement agents' assistance suggests a firm's relatively weak bargaining power *vis-à-vis* investors with whom its shares are placed. First, we show that markets respond positively (negatively) to non-intermediated (intermediated) deals. These findings suggest that non-intermediated PIPEs are no longer the financings of last resort. Instead, they are frequently associated with strategic, long-term investors.

Our evidence indicates that relatively inferior quality issuers engage in intermediated deals. For example, intermediated deals have higher discounts, are more likely involve pre-registered

securities and include warrants. They are made by issuers with lower profitability, and typically have hedge funds as their lead investors. Finally, analysis of long-term returns corroborates the view they are relatively poorer quality issuers. Intermediated deals exhibit significantly lower long-term performance.

We also look at the attributes of placement agents' intermediation. Specifically, we analyze the factors that influence the way issuers and placement agents choose each other along with their surrounding information environment. We find that placement agents procure the services of analysts. The analysts' coverage is high ahead of their deals, and, following the transactions' consummation, the analysts' presence increases more for the intermediated deals, relative to that for the non-intermediated PIPEs. We also show that placement agents who are also sell-side brokers appear to use coverage as a bargaining tool: agents that provide analyst coverage to the issuer prior to a deal are much more likely to become the placement agent for that deal. These agent-brokers also demonstrate higher optimism in their recommendations, issuing higher target prices for issuers compared to non-agent brokers. We find that analysts' optimism is significantly related to market reactions only for non-intermediated deals, suggesting that investors discount the optimism exhibited for intermediated deals. Last, as expected, the choice between issuers and placement agents is not random and is based on a two-sided matching. Both parties pay attention to their counterparty's analyst coverage in prior transactions, security types and their registration status. Overall, we conjecture that both counterparties build a knowledge base by engaging in similar types of transactions as consummated before.

Appendix A: Variable definitions

Variables	Variable definition
Board term	Binomial variable that takes the value of one if board seat(s) are granted by the issuer, and zero otherwise
Cash burn rate	Net cash flow from operations (OIBDP) over cash and cash equivalents (CHE) (note: following Chaplinsky and Haushalter (2010), for the issuers with positive cash flow, the cash burn rate is set to zero)
Cash ratio	Cash and cash equivalents (CHE) over book value of total assets (AT)
Common stock indicator	Binomial variable that takes the value of one if security type is common stock, zero otherwise
Coverage	Binomial variable that takes the value of one if at least one analyst provides earnings forecast/target price/recommendation for the issuer in the 365-day period prior to the PIPE closing date, and zero otherwise
Cov_A	Binomial variable that takes the value of one if a potential agent had provided coverage to the issuer in the 365-day preceding the placement, and zero otherwise
Cov_I	Binomial variable that takes the value of one if an agent had provided coverage to a potential issuer in the 365-day preceding the placement, and zero otherwise
CT alpha	Excess return that cannot be explained by Carhart four-factor model. We report alphas based on the prior 6-, 12-, 24- and 36-month event windows
DGTW adjusted return	Excess return relative to the return on a portfolio of firms matched on market equity, market to book ratio and prior one-year return quintiles. We report 6-, 12-, 24- and 36-month average DGTW adjusted return after the PIPE closing date
Discount	Percentage difference between closing price one trading day prior to the deal's closing date, and the offer price. A continuous variable with deals at discounts taking values greater than 0, at-par deals taking values of 0, and deals placed at a premium taking values below 0
EBITDA ratio	Operating income (OIBDP) over book value of total assets (AT)
Firm age	The years' difference between the CRSP beginning date and the CRSP closing date for each transaction
Five-day CAR	Announcement returns computed over the 5-day event window [-2, +2], using the CRSP value-weighted market adjusted returns
Hedge fund investor indicator	Binomial variable that takes the value of one if the leading investor type is a hedge fund company, and zero otherwise
Intermediation dummy	Binomial variable that takes the value of one if a transaction is intermediated by at least one placement agent, and zero otherwise
Iret (Implied return)	Iret is defined as $iret = (TP_0 - P_{-1}) / P_{-1}$, where TP_0 is the target price, and P_{-1} is the stock price one day before the target price is issued
Leading investor type	The investor type with the highest purchased amount
Leverage ratio	Long term debt (DLTT) plus debt in current liabilities (DLC), divided by book value of assets (AT)
Long-term investor indicator	Binomial variable that takes the value of one if the lead investor is one of the following investor types: Private equity firms/venture capital firms, other corporations, or corporate insiders, and zero otherwise
Mandatory registration indicator	Binomial variable that takes the value of one if a transaction is attached with mandatory registration rights, and zero otherwise
Market capitalization at closing (\$ M)	Issuer's market capitalization of equity as of one trading day preceding the deal's closing date, in millions of 2017 USD

Market share	Continuous ranking variable using the relative market share, over the previous three-year period, for each placement agent
Market-to-book of assets	Book value of liabilities (DLTT+DLC) plus market value of common equity (CSHO*PRCC F), divided by book value of assets (AT)
Net PPE ratio	Net Property Plant and Equipment (PPENT) over book value of total assets (AT)
Number of agents	Number of unique placement agents in a transaction
Pre-registered indicator	Binomial variable that takes the value of one if a transaction has pre-registered securities, and zero otherwise
Prior-relation_A	Indicator variable that takes the value of one if the potential/actual placement agent(s) intermediated any of the current issuer's transactions in past three years, and zero otherwise
Prior-relation_I	Indicator variable taking the value of one if the potential/actual issuer (s) hired the actual placement agent in past three years, and zero otherwise
Proportion of unregistered deals three-year rolling	Ranking variable that is computed as the number of unregistered-share deals over the total number of transactions for a placement agent, during the previous three years
Proportion of unregistered deals two-year rolling	Ranking variable that is computed as the number of unregistered-share deals over the total number of transactions for a placement agent, during the previous two years
Rec	An Analyst (A)'s last recommendation to a firm (F) before the closing date. We use a 3-tier mapping system, where optimistic (buy or strong buy) is mapped to rec=2, neutral is mapped to rec=3, and pessimistic (sell or strong sell) is mapped to rec=4
Register_A	Indicator variable that takes the value of one if the potential/actual agents have intermediated deals with the same share registration status as the current transaction during the previous three years, and zero otherwise
Register_I	Binomial variable taking the value of one if potential/actual issuers (s) conducted transactions with the same share registration status as the current intermediated deal during the previous three years, and zero otherwise
ROA	Net income (NI) over book value of total assets (AT)
Score_iret	The percentile of the median implied return for the issuer
Security type indicator_A	Indicator variable that takes the value of one if the potential/actual placement agent(s) intermediated transactions utilizing the same security as the current transaction, and zero otherwise
Security type indicator_I	Indicator variable taking the value of one if the potential/actual issuer (s) issued deals utilizing the same security type as the current deal, and zero otherwise
SellSide_A	Binomial variable that takes the value of one if a potential agent is also a sell-side broker, and zero otherwise
SIC_twodigit_A	Indicator variable equal to one if the potential/actual placement agent(s) have intermediated at least one issuer that operated in the same industry as the current issuer in previous three years, and zero otherwise
Syndicate dummy	Binomial variable that takes the value of one if a transaction is intermediated by more than one agent (a syndicate), and zero if intermediated by one agent
Target price	A target price by analyst A towards firm F is a statement about the analyst's expectation of F's stock price in the next 12 months
Three-year average sales growth	The average of the three years' percentage change of sales preceding the transaction closing year

Tobin's Q	Book value of assets (AT) minus book value of common equity (CEQ) plus the market value of common equity (CSHO*PRCC_F), divided by book value of assets (AT)
Total Assets (\$ M)	Book Value of total assets (AT), in millions of 2017 USD
Total expenditures ratio	Capital expenditures (CAPX) and R&D (XRD) expenditures over book value of total assets (AT)
Total proceeds ratio	Natural logarithm of the total gross proceeds, over the book value of total assets
Total proceeds_A/market capitalization_A/Discounts_A	Average values of total gross proceeds amount/market capitalization at closing/discounts that potential or actual placement agent(s) have intermediated in previous three years
Total gross proceeds_I/market capitalization_I/Discounts_I	Average values of total gross proceeds amount/market capitalization at the deal's closing/discount that potential or actual issuers conducted in previous three years
Warrant indicator	Binomial variable that takes the value of one if a transaction is packaged with warrants and zero otherwise

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Table 1**Annual count and proportion by the presence of intermediation**

Table 1 reports the annual distribution of the count and the respective proportion of intermediated and non-intermediated deals on the common stock deals sample during the entire period of period 2001-2017. It also summarizes the count and proportion values of intermediated and non-intermediated deals for the entire sample period and each of the two subperiods: 2001-2007 and 2008-2017.

Year	Total	Non-intermediated deals		Intermediated deals	
	#	#	%	#	%
2001	409	208	51%	201	49%
2002	287	117	41%	170	59%
2003	382	118	31%	264	69%
2004	367	121	33%	246	67%
2005	269	88	33%	181	67%
2006	294	90	31%	204	69%
2007	304	118	39%	186	61%
2008	188	83	44%	105	56%
2009	258	92	36%	166	64%
2010	209	76	36%	133	64%
2011	142	62	44%	80	56%
2012	128	66	52%	62	48%
2013	127	57	45%	70	55%
2014	168	76	45%	92	55%
2015	159	75	47%	84	53%
2016	198	93	47%	105	53%
2017	227	96	42%	131	58%
2001-2007	2312	860	37%	1452	63%
2008-2017	1804	776	43%	1028	57%
2001-2017	4116	1636	40%	2480	60%

Table 2

Issuer and deal characteristics by the presence of intermediation

Table 2 presents the mean and median values of common stock issuers and common stock deal characteristics over our sample period 2008-2017, based on 1,804 common stock transactions, split by the presence of intermediation. Mean and median values of characteristics for non-intermediated deals are reported in columns (3) and (6) whereas those for intermediated deals are reported in columns (4) and (7). Column (5) and column (8) exhibit the p-values from the two-sample Satterthwaite t-test comparison of unequal variances and the median non-parametric Wilcoxon comparison test on the characteristics between non-intermediated and intermediated deals, respectively. For the binomial variables listed in Panel B (board term, hedge fund investor indicator and long-term investor indicator), we report the chi-square values in column (5) generated by the chi-square test of equal frequencies. All financial variables are calculated as of the fiscal year preceding each transaction closing year. All variable definitions are included in Appendix A.

Panel A: Issuer characteristics

Description	(1) N: Non-intermediated	(2) N: Intermediated	(3) Mean: Non-intermediated	(4) Mean: Intermediated	(5) <i>p</i> - value (3)=(4)	(6) Median: Non-intermediated	(7) Median: Intermediated	(8) <i>p</i> - value (6)=(7)
Total assets (\$M)	701	909	597.913	204.715	0.001	57.944	26.184	0.000
Cash ratio	701	909	0.416	0.433	0.293	0.338	0.383	0.190
Cash burn rate	701	908	2.072	3.227	0.021	0.749	1.175	0.000
EBITDA ratio	701	908	-0.485	-0.754	0.000	-0.309	-0.538	0.000
ROA	701	908	-0.611	-0.900	0.000	-0.380	-0.597	0.000
Tobin's Q	701	909	3.443	3.951	0.012	2.299	2.563	0.041
Market_to_book	696	907	3.063	3.540	0.015	1.988	2.198	0.026
Three-year average sales growth	410	455	1.666	1.236	0.410	0.091	0.136	0.144
Leverage ratio	696	907	0.249	0.187	0.000	0.114	0.071	0.009
Net PPE ratio	701	909	0.192	0.181	0.320	0.080	0.081	0.722
Total expenditures ratio	698	906	0.333	0.476	0.000	0.205	0.290	0.000
Firm age	776	1,028	11.176	9.541	0.001	8.092	6.141	0.000

Panel B: Deal characteristics

Description	(1) N: Non-intermediated	(2) N: Intermediated	(3) Mean: Non-intermediated	(4) Mean: Intermediated	(5) p-value (3)=(4)	(6) Median: Non-intermediated	(7) Median: Intermediated	(8) p-value (6)=(7)
Market capitalization at closing (\$ M)	776	1,028	623.133	148.324	0.000	110.626	57.550	0.000
Total proceeds ratio	701	909	0.357	0.451	0.055	0.140	0.264	0.000
Board term	746	1,012	19.973%	3.261%	0.000	0	0	N/A
Hedge fund investor indicator	695	631	25.612%	71.157%	0.000	0	1	N/A
Long-term investor indicator	695	631	52.806%	13.312%	0.000	1	0	N/A

Table 3**Announcement market reactions and offer discounts by the presence of intermediation**

Table 3 presents and compares the mean and median values of announcement returns and offer discounts by the presence of intermediation. These results are based on 1,804 common stock transactions for our sample period 2008-2017. Announcement returns are computed over the 5-day event window [-2, +2] using the CRSP value-weighted market adjusted returns. The mean and median values of abnormal returns and discounts for non-intermediated deals are reported in columns (3) and (6) and those for intermediated deals are reported in columns (4) and (7). Column (5) and column (8) exhibit the *p*-values from the two-sample Satterthwaite t-test comparison of unequal variances and the median non-parametric Wilcoxon comparison test between intermediated and non-intermediated deals. All variable definitions are included in Appendix A.

Description	(1) N: Non-intermediated	(2) N: Intermediated	(3) Mean: Non-intermediated	(4) Mean: Intermediated	(5) <i>p</i> -value (3)=(4)	(6) Median: Non-intermediated	(7) Median: Intermediated	(8) <i>p</i> - value (6)=(7)
Discount	773	1,028	-1.43%	9.77%	0.000	0.00%	10.20%	0.000
Five-day CAR	776	1,028	9.01%	-2.63%	0.000	4.23%	-4.73%	0.000

Table 4**PIPE transactions' analyst coverage and optimism by the presence of intermediation**

Table 4 presents the summary statistics on analyst coverage for PIPE transactions. The results are based on 1,804 common stock transactions for our sample period 2008-2017. Panel A focuses on the analyst coverage (number of brokers and number of affiliated brokers) the years before and after the transaction date. Average number of brokers covering the issuer the year before and the year after the transaction date closing year are displayed in columns (3) and column (4). Average number of agent-brokers covering the issuer the year before and after the transaction date are displayed in columns (6) and column (7). Columns (5) and (8) exhibit the p -values from the two-sample Satterthwaite t-test mean comparison of unequal variances for the number of brokers and agent-brokers covering PIPE issuers the year before and the year after the transaction date. Panel B shows the percentage of agents in intermediated deals with analyst coverage the year before and the year after the transaction date. Panel C presents analyst optimism for the non-underwritten equity deal issuer measured by analyst recommendation and implied returns. Analyst recommendations are measured by a categorical variable that takes the value of 2 for optimistic (buy or strong buy), 3 for neutral, and 4 for pessimistic (sell or strong sell) recommendations. Implied return from a target price ($iret$) is calculated as $iret=(TP_0 - P_{-1})/ P_{-1}$, where TP_0 is the target price, and P_{-1} is the stock price one day before the target price issuance date. P -values from the two-sample Satterthwaite t-test mean comparison of unequal variances for recommendations and implied returns between agent brokers and non-agent-brokers in deals covered by both types of brokers are reported in the last column. Panel D reports five-day announcement returns' mean and median values by the level of analysts' optimism. More optimistic and more pessimistic samples are split by the median values of the recommendation or implied returns. Column (3) and (6) exhibit the p -values from the two-sample Satterthwaite t-test comparison of unequal variances and the median non-parametric Wilcoxon comparison test for the five-day CARs for optimistic versus pessimistic samples. All variable definitions are included in Appendix A.

Panel A: Analyst coverage before and after the PIPE deal

Type of PIPE deal	(1) % deals with coverage year before	(2) % deals with coverage year after	(3) Avg # of brokers covering year before	(4) Avg # of brokers covering year after	(5) p -value (2)=(3)	(6) Avg # of agents covering year before	(7) Avg # of agents covering year after	(8) p -value (5)=(6)
All	68.847%	72.838%	2.646	2.933	0.000	0.209	0.305	0.000
Non-intermediated	70.747%	72.165%	3.327	3.566	0.000	.	.	.
Intermediated	67.412%	73.346%	2.131	2.456	0.000	0.367	0.536	0.000
P-value	0.130	0.576	0.000	0.000	.	.	.	.

Panel B: Analyst coverage by agent before and after the PIPE deal

# pairs (deal, agent)	# pairs (deal, agent) where agent is IBES broker	% of IBES agents with coverage before and after	% of IBES agents with coverage only before	% of IBES agents with coverage only after
1,329	1,064	28.007%	7.230%	21.684%

Panel C: Analyst optimism by affiliation

Recommendation								
	Coverage by non-agent only		Coverage by agent only		Coverage by both			
	(1) N: deals	(2) Mean rec: non-agent	(3) N: deals	(4) Mean rec: agent	(5) N: deals	(6) Mean rec: non-agent	(7) Mean rec: agent	(8) <i>p</i> -value (6)=(7)
All	892	2.353	58	2.086	186	2.325	2.171	0.000
Non-intermediated	493	2.376	.	.	.	.	.	.
Intermediated	399	2.325	58	2.086	186	2.325	2.171	0.000
Implied return								
	Coverage by non-agent only		Coverage by agent only		Coverage by both			
	(1) N: deals	(2) Median iret: non-agent	(3) N: deals	(4) Median iret: agent	(5) N: deals	(6) Median iret: non-agent	(7) Median iret: agent	(8) <i>p</i> -value (6)=(7)
All	916	68.417%	73	109.538%	253	85.185%	100.000%	0.058
Non-intermediated	549	60.000%	.	.	.	.	.	.
Intermediated	367	82.604%	73	109.538%	253	85.185%	100.000%	0.058

Panel D: Market reaction and optimism

Recommendation								
	(1) N: Deals with more optimistic rec	(2) N: Deals with more pessimistic rec	(3) Mean CAR: Deals with more optimistic rec	(4) Mean CAR: Deals with more pessimistic rec	(5) <i>p</i> value (3)=(4)	(6) Median CAR: Deals more optimistic rec	(7) Median CAR: Deals with more pessimistic rec	(8) <i>p</i> -value (6)=(7)
All	567	569	0.027	0.020	0.6778	-0.007	-0.002	0.5667
Non-intermediated	246	247	0.087	0.075	0.4709	0.051	0.033	0.2113
Intermediated	321	322	-0.016	-0.025	0.7140	-0.051	-0.035	0.2129
Implied return								
	(1) N: Deals with lower iret	(2) N: Deals with higher iret	(3) Mean CAR: Deals with lower iret	(4) Mean CAR: Deals with higher iret	(5) <i>p</i> -value (3)=(4)	(6) Median CAR: Deals with lower iret	(7) Median CAR: Deals with higher iret	(8) <i>p</i> -value (6)=(7)
All	622	620	0.021	0.023	0.8832	-0.016	0.007	0.0076
Non-intermediated	275	274	0.097	0.066	0.0522	0.058	0.035	0.0803
Intermediated	347	346	-0.028	-0.023	0.8134	-0.062	-0.025	0.0035

Table 5
Predicting intermediation

Table 5 presents two linear probability regressions (LPMs) predicting intermediation (Panel A) and syndicate intermediation (Panel B). We sequentially add the pre-registered stock binomial variable in the second column, the discount continuous variable in the third column and the hedge fund leading investor type binomial variable in the fourth column, respectively. Panel A provides regression results based on 1,804 common stock transactions in our sample period 2008-2017, panel B depends on 1,028 intermediated common stock transactions during the sample period. All financial variables are calculated as of the fiscal year preceding each PIPE issuance closing year. We include year fixed effects across all models in both panels. *P*-values are shown in parentheses. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All variable definitions are included in Appendix A.

Panel A: Predicting intermediation

	(1)	(2)	(3)	(4)
Intermediation dummy	Year FE	Year FE	Year FE	Year FE
Coverage	0.043* [0.094]	0.043* [0.070]	0.054** [0.020]	0.057** [0.034]
Warrant indicator	0.366*** [0.000]	0.298*** [0.000]	0.288*** [0.000]	0.277*** [0.000]
Discount			0.428*** [0.000]	0.341*** [0.000]
Total proceeds ratio	0.072*** [0.000]	0.063*** [0.000]	0.062*** [0.000]	0.060*** [0.000]
Leverage ratio	-0.138*** [0.000]	-0.081** [0.028]	-0.058 [0.111]	-0.030 [0.438]
Total expenditures ratio	0.052* [0.089]	0.028 [0.328]	0.034 [0.225]	0.010 [0.734]
EBITDA ratio	0.026 [0.190]	0.018 [0.326]	0.022 [0.206]	0.016 [0.409]
Cash ratio	-0.183*** [0.000]	-0.204*** [0.000]	-0.165*** [0.000]	-0.093** [0.047]
Net PPP ratio	0.015 [0.793]	0.034 [0.506]	0.029 [0.563]	-0.016 [0.785]
Log of Firm age	-0.016 [0.131]	-0.024** [0.012]	-0.025*** [0.008]	-0.035*** [0.001]
Hedge fund investor indicator				0.284*** [0.001]
Pre-registered indicator		0.358*** [0.000]	0.324*** [0.000]	0.142*** [0.001]
Intercept	0.591*** [0.000]	0.459*** [0.000]	0.436*** [0.000]	0.331*** [0.001]
Observations	1,596	1,596	1,594	1,175
R-squared	0.201	0.322	0.349	0.385

Panel B: Predicting syndicate intermediation

	(1)	(2)	(3)	(4)
Syndicate dummy	Year FE	Year FE	Year FE	Year FE
Coverage	0.073** [0.017]	0.069** [0.023]	0.070** [0.022]	0.042 [0.281]
Warrant indicator	-0.035 [0.239]	-0.032 [0.292]	-0.031 [0.297]	-0.026 [0.515]
Discount			0.032 [0.739]	0.005 [0.963]
Total proceeds ratio	0.051*** [0.000]	0.051*** [0.000]	0.051*** [0.000]	0.038** [0.037]
Leverage ratio	-0.020 [0.727]	-0.028 [0.619]	-0.027 [0.639]	-0.091 [0.143]
Total expenditures ratio	0.051 [0.186]	0.053 [0.162]	0.055 [0.154]	0.010 [0.834]
EBITDA ratio	0.056** [0.019]	0.057** [0.017]	0.058** [0.016]	0.039 [0.146]
Cash ratio	0.008 [0.880]	0.014 [0.793]	0.015 [0.781]	0.108 [0.111]
Net PPP ratio	0.076 [0.264]	0.073 [0.282]	0.072 [0.287]	0.065 [0.446]
Log of Firm age	-0.038*** [0.003]	-0.035*** [0.005]	-0.036*** [0.005]	-0.056*** [0.000]
Hedge fund investor indicator				0.122*** [0.003]
Pre-registered indicator		-0.053* [0.069]	-0.054* [0.066]	-0.118*** [0.002]
Intercept	0.334*** [0.000]	0.362*** [0.000]	0.359*** [0.000]	0.297*** [0.000]
Observations	904	904	904	554
R-squared	0.047	0.051	0.051	0.088

Table 6

One-sided matching for issuers and agents

Table 6 presents two one-sided matching regressions estimating factors that issuers or agents consider when they choose their counterparty for their transactions. We use all security types in our sample period 2008-2017. For each actual issuer-agent combination, we create eight control pairs for which the issuer is paired up with a potential, similar agent who could have been chosen, but was not. The potential set of agents is the group of agents that are located in the same state as the actual agent. Similarly, we create eight control pairs in which the agent is paired up with a potential issuer who could have issued the intermediated deal but did not. The potential set of issuers for an agent is defined as issuer firms that are located in the same state as the actual issuer firm. If we have more than eight matches fulfilling our criteria, we randomly choose eight controls. Linear probability regressions are estimated using a sample that includes both the actual pairs and the control pairs from the issuer side and agent side. The dependent variable is an indicator variable equal to one if the issuer-agent pair is an actual match, and zero otherwise. Panel A and Panel B provide regression results based on 1,339 intermediated transactions from 2008 to 2017. Panel A examines the factors influencing the issuer's choice of the agent. We have a total of 603 groups in Panel A. Likewise, Panel B presents the factors influencing the agent's choice for the issuer. We identify 292 groups in Panel B. We apply group fixed effects. *P*-values are shown in parentheses. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All variable definitions are included in Appendix A.

Panel A: Factors influencing issuers' placement agent choice

Variables	(1) Panel A Choosing Agent	(2) Panel A Choosing Agent
SellSide_A	0.034*** [0.000]	
Cov_A	0.362*** [0.000]	
Total gross proceeds_A	-0.027 [0.500]	-0.001 [0.980]
Market capitalization_A	-0.001 [0.767]	0.000 [0.978]
Discounts_A	0.004 [0.872]	-0.0081 [0.729]
SIC_twodigit_A	0.096*** [0.000]	0.117*** [0.000]
Prior-relation_A	0.592*** [0.000]	0.742*** [0.000]
Security type indicator_A	0.065*** [0.000]	0.082*** [0.000]
Register_A	0.057*** [0.000]	0.067*** [0.000]
Intercept	-0.072*** [0.000]	-0.063*** [0.000]
Observations	5,427	5,427
R-squared	0.434	0.374
Number of groups	603	603
Adjusted R-squared	0.362	0.295

Panel B: Factors influencing placement agents' issuer choice

Variables	(1) Panel B Choosing Issuer	(2) Panel B Choosing Issuer
Cov_I	0.081*** [0.000]	
Total gross proceeds_I	-0.007 [0.947]	-0.008 [0.939]
Market capitalization_I	0.002 [0.777]	0.004 [0.636]
Discounts_I	0.032 [0.317]	0.025 [0.432]
Prior-relation_I	0.471*** [0.000]	0.503*** [0.000]
Security type indicator_I	0.053*** [0.000]	0.057*** [0.000]
Register_I	0.046*** [0.000]	0.046*** [0.000]
Intercept	-0.013 [0.281]	-0.008 [0.495]
Observations	2,628	2,628
R-squared	0.270	0.265
Number of groups	292	292
Adjusted R-squared	0.176	0.171

Table 7

Estimating discounts and deal announcement abnormal returns accounting for selection

Table 7 presents the results of the two-stage switching regression models' analysis of discounts (Panel A) and five-day announcement abnormal return (Panel B) for 1,804 common stock transactions in our sample period 2008-2017. Model (3) is the first-stage probit regression estimating the intermediation choice. Models (1) and (2) are the second-stage regressions that have deal discounts (Panel A) and five-trading-day cumulative abnormal returns CARs (Panel B) as the dependent variables, respectively. Model (1) includes our non-intermediated sample whereas model (2) the intermediated one. Correlation coefficients ($\rho 1$ and $\rho 2$) between error terms from the first-stage and the second-stage equations are reported below r , where $\rho 1$ is the correlation coefficient between error terms from selection model and outcome equation for intermediated transactions, while $\rho 2$ is the correlation coefficient between error terms from selection model and outcome equation for non-intermediated transactions. The average treatment effect on the treated (ATT) is shown at the bottom, which gives the difference between actual and hypothetical discount & CARs. P -values are shown in parentheses. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All variable definitions are included in Appendix A.

Panel A: Discount as the second stage dependent variable

	(1) Without intermediation	(2) With intermediation	(3) Selection
Discount			
Score_iret	0.049 [0.292]	-0.047 [0.113]	0.025 [0.888]
Warrant indicator	0.156*** [0.000]	-0.012 [0.550]	0.723*** [0.000]
Hedge fund investor indicator	0.203*** [0.000]	0.060*** [0.006]	0.895*** [0.000]
Total proceeds ratio	0.023** [0.020]	-0.023*** [0.004]	0.166*** [0.000]
Total expenditures ratio	0.003 [0.953]	-0.052** [0.037]	0.038 [0.826]
EBITDA ratio	-0.020 [0.500]	-0.031* [0.052]	0.049 [0.650]
Cash ratio	-0.266*** [0.000]	-0.025 [0.400]	-0.637*** [0.001]
Leverage ratio	-0.083** [0.049]	-0.056* [0.083]	
Pre-registered indicator	0.111*** [0.000]	0.012 [0.480]	0.439*** [0.000]
Net PPE ratio	-0.056 [0.354]	0.017 [0.647]	-0.197 [0.397]
Log of Market capitalization at closing			-0.047 [0.135]
Log of Firm age			-0.033 [0.314]
Intercept	0.147*** [0.002]	0.039 [0.350]	0.687 [0.283]
	Rho_1	0.044	
	Rho_2	0.949***	
Observations	846	846	846
ATT (Average treatment effects on the treated)	0.123***		

Panel B: Five-day CAR as the second stage dependent variable

	(1) Without intermediation	(2) With intermediation	(3) Selection
Five-day CAR			
Score_iret	0.072* [0.052]	-0.004 [0.923]	-0.019 [0.917]
Warrant indicator	-0.105*** [0.000]	0.012 [0.629]	0.657*** [0.000]
Hedge fund investor indicator	-0.121*** [0.000]	0.031 [0.256]	0.904*** [0.000]
Total proceeds ratio	-0.007 [0.357]	0.040*** [0.000]	0.206*** [0.000]
Total expenditures ratio	0.000 [0.995]	0.084** [0.023]	0.095 [0.545]
EBITDA ratio	0.020 [0.368]	0.057** [0.017]	0.113 [0.252]
Cash ratio	0.078** [0.050]	-0.021 [0.632]	-0.418** [0.026]
Leverage ratio	0.078** [0.016]	-0.043 [0.365]	-0.148 [0.393]
Pre-registered indicator	-0.082*** [0.001]	-0.049** [0.041]	0.350*** [0.000]
Net PPE ratio	-0.030 [0.537]	-0.011 [0.846]	-0.050 [0.829]
Log of Market capitalization at closing			-0.103*** [0.003]
Log of Firm age			-0.051 [0.145]
Intercept	-0.025 [0.511]	-0.058 [0.264]	1.714** [0.014]
	Rho_1	0.781***	
Rho_2	-0.900***		
Observations	848	848	848
ATT (Average treatment effects on the treated)	-0.109***		

Table 8

Long-term performance by the presence of intermediation

Table 8 presents long-term monthly stock returns following non-underwritten equity issuance. Panel A reports and compares mean and median raw returns and Daniel, Grinblatt, Titman and Wermers (1997) (DGTW) portfolio adjusted returns between intermediated deals and non-intermediated deals. DGTW adjusted returns are calculated as: $r_{dgtw_adj,t} = r_{i,t} - r_{dgtw,t}$, where $r_{i,t}$ refer to the returns on stock i in month t , and $r_{dgtw,t}$ refers to the return on DGTW size, book-to-market and momentum portfolio in month t . We present 6-, 12-, and 24- and 36-month average DGTW adjusted returns ($r_{dgtw_adj,t}$) following non-underwritten equity issuance closing. Mean and median values of returns for non-intermediated PIPEs are reported in columns (3) and (6) whereas those for intermediated deals are reported in columns (4) and (7). Column (5) and column (8) exhibit the p -values from the two-sample Satterthwaite t -test comparison of unequal variances and the median non-parametric Wilcoxon comparison test of returns between intermediated and non-intermediated deals. Panel B reports the Fama-French 4-factor alphas generated using the calendar time portfolio approach by the presence of intermediation: $R_{i,t} - R_{f,t} = \alpha_i + \beta_1(R_{mkt,t} - R_{f,t}) + \beta_2SMB_t + \beta_3HML_t + \beta_4MOM_t$, where $R_{f,t}$ and $R_{mkt,t}$ are the risk-free rate and the return on the market at month t , and SMB_t , HML_t and MOM_t are the monthly returns on the Fama-French size, book-to-market, and moment factors in month t . All four risk factors are drawn from Professor Kenneth French's website. Similar to Panel A, we report the intercept terms (alphas) of the regressions based on the 6-, 12-, 24-, and 36-month event windows. These results are based on 1,804 common stock transactions for our sample period 2008-2017. P -values of intercepts (alphas) are presented in parentheses. The symbols *, ** and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. All variable descriptions are included in Appendix A.

Panel A: Raw returns 6, 12, 24 and 36 months after the non-underwritten equity issuance

Description (%)	(1) N: Non-intermediated	(2) N: Intermediated	(3) Mean: Non-intermediated	(4) Mean: Intermediated	(5) p value (3)=(4)	(6) Median: Non-intermediated	(7) Median: Intermediated	(8) p value (6)=(7)
6-month raw return	773	1,027	12.710%	-9.914%	0.000	-0.730%	-21.014%	0.000
12-month raw return	773	1,027	16.913%	-13.844%	0.000	-14.068%	-33.803%	0.000
24-month raw return	773	1,027	43.609%	-13.053%	0.000	-23.500%	-54.023%	0.000
36-month raw return	773	1,027	42.498%	-7.653%	0.000	-33.163%	-65.500%	0.000

Panel B: DGTW adjusted returns 6, 12, 24 and 36 months after the non-underwritten equity issuance

Description (%)	(1) N: Non-intermediated	(2) N: Intermediated	(3) Mean: Non-intermediated	(4) Mean: Intermediated	(5) p value (3)=(4)	(6) Median: Non-intermediated	(7) Median: Intermediated	(8) p value (6)=(7)
6-month DGTW adjusted return	637	805	0.671%	-2.642%	0.000	-0.059%	-3.093%	0.000
12-month DGTW adjusted return	681	896	-0.255%	-2.206%	0.000	-0.959%	-1.902%	0.000
24-month DGTW adjusted return	713	945	-0.314%	-1.977%	0.000	-0.167%	-1.587%	0.000
36-month DGTW adjusted return	722	965	-0.572%	-1.849%	0.000	-0.205%	-1.349%	0.000

Panel B: Alphas from calendar time portfolio approach 6, 12, 24, and 36 months after the non-underwritten equity issuance

	(1) Non-intermediated Alpha (P value in parenthesis)	(2) Intermediated Alpha (P value in parenthesis)
6-month CT alpha	-0.464% [0.404]	-2.825%*** [0.000]
12-month CT alpha	-0.896%** [0.042]	-2.463%*** [0.000]
24-month CT alpha	-0.818%** [0.024]	-2.066%*** [0.000]
36-month CT alpha	-0.461% [0.357]	-1.2%*** (0.002)