

# Litigation and Information Effects on Private Sales of Securities

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## Abstract

We analyze the resolution of information asymmetry in transactions of private investments in public equity (PIPEs) in which the issuer has experienced class action lawsuits. We explain the associated wealth and pricing effects (*information effects*). We show that litigated PIPEs are associated with higher announcement wealth effects and lower levels of discounts than non-litigated PIPEs. We find that disclosure, prior investors' ownership, early registration, and intermediation have positive information effects on incumbent and new investors when issuers concurrently pursue the desired corporate actions (proxied by the auditor changes). We conclude that PIPE issuers can mitigate information effects from prior litigation.

**JEL classification:** G14; G23; K41; K42

**Keywords:** Law and Finance; Information Effects; Private Investment in Public Equity (PIPE); Private Placements; Mitigation Actions

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## 1. Introduction

Our study focuses on the information effects on private investments in public equity (PIPEs) when there are prior securities class-action lawsuits. PIPEs have gained increasing importance in the U.S. as an equity or equity-linked financing venue by publicly traded firms. Chakraborty and Gantchev (2013) note the increasing economic significance of PIPEs in the secondary equity-issuance arena for financially troubled firms during 1995 to 2007. Floros, Sivaramakrishnan, and Zufarov (2021) documented the mushrooming of PIPE transactions when facing high proprietary costs compared to seasoned equity offerings (SEOs) with an increasing percentage of PIPE issuers tapping the PIPE and SEO markets interchangeably. It is evident that PIPE transactions do not solely address the financing needs of last resort for firms that hoard cash. Within the last decade, the PIPE industry has been reshaped from the financing of last resort that had been primarily saturated by arm's-length investments to also include strategic, long-term investments. In 2001, closed PIPE transactions in the U.S. raised approximately \$17.41M by issuers with average closing market capitalization \$42.41M. Median values of issuers' closing market capitalization increase from 48.96M (in 2001) to \$73.83M (in 2018), respectively.

PIPE transactions refer to privately placed securities whereby the PIPE issuer and the PIPE investor(s) privately exchange information and sign a confidentiality agreement (private placement memorandum, PPM) that is not shared with the wider investor base. PIPE issuers—frequently along with engaged placement agents—can share extensive information through the PPM with PIPE investor(s) and convince them of the firm's quality and financial condition, which lowers information asymmetry with potential PIPE investor(s). Is such a private information-sharing process efficient in weathering increased information-asymmetry levels ahead of a PIPE transaction in the presence of ongoing litigation? What are the associated *information effects* as measured by the announcement wealth effects, the discounts, and the discount-adjusted wealth effects of these PIPE transactions? When are PIPE issuers able to efficiently disclose their corporate mitigation actions influencing PIPE transactions' wealth effects and pricing? These are the questions we tackle in our study.

Seminal papers on private placements<sup>1</sup> have offered possible explanations for the positive announcement wealth effects and high discounts reported in such placements. Specifically, Wruck (1989) show evidence in support of the *Monitoring Hypothesis*, as active shareholders provide a certain ownership concentration that serves as a catalyst to align manager and shareholder interests as positively correlated with announcement wealth effects. Hertz and Smith (1993) view their findings as an extension to Myers and Majluf (1984), as private investors can assess (at some cost) a firm's value after their private negotiations with management. Hertz and Smith (1993) analyze the information effects associated with private placements and argued that when the value of the firm is more difficult to assess and thus more important to assess carefully, investors expend additional resources to determine firm value and require higher discounts (the *Costly Information Acquisition Hypothesis*). As a result, they find that information effects will be higher (*Information Hypothesis*) for placements with the potential for a high degree of undervaluation. Our findings revisit the *Information Hypothesis* as we analyze securities class actions that occur ahead of PIPE transactions, which inevitably are associated with heightened information-asymmetry levels. To better gauge the impact of litigation on PIPE pricing and associated wealth effects, we delve into class-action litigation severity and analyze the possible actions PIPE issuers might take to rectify the reputation damage caused by securities class actions ahead of raising capital.

We consider securities class actions to be the ideal platform to test the information effects, as we expect such effects are associated with high information-asymmetry levels. McTier and Walt (2011) posited that securities class-action lawsuits are associated with agency problems and place a cost on managerial malfeasance. Securities class-action lawsuits may lead to a deterrence of bad

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<sup>1</sup> Private placements can be divided into three broad categories/legal structures: PIPEs, Rule 144-As, and Reg Ss. In this study, we focus on PIPE transactions. PIPEs are considered any type of Reg D Offerings, Shelf Sales, or Equity Line Arrangements. As documented by Chen, Dai, and Schatzberg (2010), the main difference between PIPEs and private placements is the duration of resale restrictions imposed on participating investors. It is common practice in PIPEs to ask the issuer to register the shares within 30 days of deal closure. Specifically, in the case of Registered Directs, PIPE-issued stock is registered prior to deal closure. Private placements refer to earlier data samples up to the mid-1990s. As outlined in our Data section, PrivateRaise started covering PIPE transactions in 2001.

actions and the cleaning up of bad practices. DuCharme, Malatesta, and Sefcik (2004) focused on firms' post-lawsuit corrective actions and their association with subsequent real investment, cash holdings, payouts, and risk. Similar to Kothari, Shu, and Wysocki (2009), we argue that the filings of securities class actions reveal that the defendants (later PIPE issuers) may have withheld bad news, suggesting higher information-asymmetry levels with outside investors. Also, the majority of the securities class actions remain ongoing at the time of the subsequent PIPE transaction closings, leaving public investors uncertain whether managers can fully address existing legal concerns. We gauge whether PIPE issuers can form an information environment that attenuates any negative information effects at the PIPE closing due to prior litigation. We do not necessarily claim causal effects between litigation actions and our outcome variables, which measure information effects for incumbent and new investors (discounts, announcement wealth effects, and announcement discount-adjusted wealth effects).

To the best of our knowledge, this is the first study to analyze information effects and potential mitigating actions of litigation ahead of equity offerings in which private diffusion of information occurs between an issuer and a select group of investors. Autore, Hutton, Peterson, and Smith (2014) analyzed the predictive power of prior litigation actions on tapping external capital markets for debt or equity. Their study reported that litigated firms experience a significant reduction in future capital and research and development expenditures. Chen, Cheng, and Lo (2013) found that firms with material restatements are less likely to tap external equity capital and more likely to access external debt capital. Graham, Li, and Qiu (2008) found that bank loans of borrowers with earnings restatements exhibit significantly higher loan spreads, lower maturities, and more covenant restrictions. Last, Hribar, and Jenkins (2004) noted a lower perceived earnings quality of equity issuers after experiencing an accounting restatement, and that such restatements are associated with higher levels of cost of capital and higher investors' required rates of return.

In contrast, the research design we pursue in our analysis assumes the consummation of a PIPE transaction as a feasible financing path with a focus on the preceding information environment. We posit that wealth effects of a prior litigation action on a subsequent equity event

is not trivial, particularly when the issuer can privately share information with a select group of potential investors and concurrently employ mitigation actions. We ask whether and under which conditions a PIPE issuer takes mitigation actions to reveal more information, and whether these actions suffice to rectify the reputation capital damage ahead of the PIPE transaction. We analyze incumbent and new investors' wealth effects on the PIPE-issuing firm. Gande and Lewis (2009) argued that securities class actions are pursued when corporate governance and other methods to redress the defendant have failed. We control for other possible confounding disclosure events that frequently accompany litigation actions (e.g., SEC enforcement actions, material events reported in 8-Ks, and legal proceedings disclosed in 10-Ks).

We show that litigated PIPEs exhibit significantly higher PIPE announcement (and discount-adjusted) wealth effects than non-litigated PIPEs. In addition, litigated PIPEs are associated with lower discounts when compared to non-litigated PIPEs. These findings suggest that PIPE issuers are able to convey a clear signal of their mitigation plans and reasons why they are litigated whereby they also convince public investors that they are undervalued and plan to pursue high-growth options following their PIPE transaction. We further classify litigated PIPEs according to their lawsuit severity level and find that the most severely litigated PIPE issuers experience the highest wealth effects at PIPE announcements and at the highest level of discounts.

Turning to our multivariate analysis, we show that lawsuit severity is positively associated with PIPE announcement wealth effects after controlling for other confounding disclosure events (i.e., SEC enforcement actions and the number of other legal cases preceding the PIPE transaction closing date), firm characteristics, and PIPE attributes significantly associated with PIPE announcement wealth effects as documented in prior literature. We document consistent evidence of higher wealth effects (and discount-adjusted wealth effects) for more severely litigated PIPEs. We show that PIPE investors' prior equity ownership is negatively associated with PIPE announcement wealth effects, but for higher levels of PIPE investors' prior ownership, there is a positive non-linear relationship with PIPE announcement wealth effects. These results suggest that greater access to private information prior to the PIPE transaction is achieved when PIPE investors

own high-equity stakes ahead of the transaction. We report that for more severely litigated PIPEs, intermediation has a possible certification effect and is associated with higher wealth effects whereas PIPE warrants, early registration, or price resets are associated with negative wealth effects.

We note that our findings shed light on the way announcement wealth effects (and discount-adjusted wealth effects) are formed when PIPE issuers face high uncertainty about issuer's fundamental value. We revisit the *Information Hypothesis* when ongoing litigation exists, which implies higher uncertainty about the issuer's prospects and the PIPE issuer's mitigation actions are still in process. PIPE issuers might privately communicate their corrective actions to interested investors and thereby convince them that their firms are undervalued prior to the PIPE issuance announcement. We focus on securities class actions preceding PIPE transactions, since such actions create heightened levels of information asymmetry prior to privately placed securities. It has been shown that in public equity offerings, issuers alter discretionary accruals and window-dress in order to lower issuance costs (Teoh, Welch, and Wong, 1998). What happens in privately placed securities transactions? Are issuers able to weather any potential, adverse information effects caused by a litigation event and still communicate that their company is undervalued? Our study contributes to the way the market reassesses firm value at a PIPE's announcement and analyzes the compensation to PIPE investors.

The rest of the paper is as follows. Section 2 includes institutional details about the private information-sharing process in PIPE transactions. Section 3 outlines the sample selection criteria along with a description of the dependent and the independent variables. Section 4 includes our univariate and multivariate empirical findings, and Section 5 concludes.

## **2. Institutional Background**

As outlined by Dresner (2009), an important distinction exists between private investments in public equity (PIPEs) and public offerings—that is, the confidential nature of PIPE marketing to a limited investor base prior to completion. As a general rule, all offers and sales of securities must be registered with the Securities and Exchange Commission (SEC) under the Securities Act

of 1933 unless otherwise exempted. Section 3 of the Act outlines exemptions for specific types of securities, and Section 4 outlines exemptions for certain types of transactions. Section 4(2) exempts transactions that do not involve a public offering. Floros, Sivaramakrishnan, and Zufarov (2021) pointed out the factors considered by the SEC in distinguishing between a private placement or public offering include the following: (a) sophistication of the investors, (b) the number of investors in the new shares, and (c) the method of solicitation of new shares (general or private). As described by Pinedo and Tannenbaum (2017), PIPE transactions may be generally solicited or generally advertised, which had been prohibited by Section 4(a)(2) prior to the Jumpstart Our Business Startups Act (JOBS) Act.

Exemption Rule 506 of Regulation D is the most common registration exemption PIPE issuers rely upon in PIPE transactions. Any private offering exempt from registration according to this rule is also exempt from registration pursuant to Section 4(2) of the Securities Act. PIPE investors cannot trade on privately issued shares when there is no effective registration document. Alternatively, PIPE investors have to wait until the Rule 144 holding period relaxes, and their issued shares become available for public resale.<sup>2</sup> The reason for the holding period is that PIPE investors receive additional information ahead of the closing and sign a confidentiality agreement that they will not share or trade on this information. PIPE investors sign a Private Placement Memorandum (PPM) with the PIPE issuer, which is a legal document for prospective investors that never reaches the public and contains information that appears in a registration document. The exact disclosures contained in a PPM vary according to the specific registration exemption.

In essence, PIPE issuers can—usually with a placement agent’s marketing efforts—gauge the interest of potential investors by privately sharing their financial profiling, without releasing proprietary information in conference calls or roadshows, building their book with a wide base of institutional investors. Confidentiality in privately negotiated securities could be the key in previously litigated transactions in order for PIPE issuers to share the operational details of their mitigation efforts without focusing on price runups or price revisions during the roadshow period.

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<sup>2</sup> The SEC adopted proposed changes to Rule 144 and Rule 145 which made privately placed securities more liquid. Rule 144 holding period was shortened to six months from one year.

In the case of litigated PIPEs, confidentiality pertaining to the transactions may allow PIPE issuers to explain their litigation mitigation strategy in detail to prospective PIPE investors.

### **3. Data and Methodology**

#### **3.1 Sample Construction**

We use data from several databases. To identify prior PIPE firms' shareholder litigation, we collect information on securities class action lawsuits from the Stanford Law School's *Securities Class Action Clearinghouse (SCAC)*. The SCAC database provides information on the dates of case filings, the start and end dates of class action lawsuits, case statuses, court information, and lists of plaintiffs (mostly law firms). We obtain 5,568 class-action lawsuit cases filed from 1996 (the first year when such information became available) to December 2019. Our hand-checking of the SCAC data reveals that several named defendants are investment bankers due to their intermediary role in security issuance. In such cases, we read the filing documents and manually identify the defendant firms whose securities were subject to class action lawsuits. Next, we exclude financial and utility firms (SIC codes starting with 6 and 49), as firms in these industries face a different regulatory environment from those in unregulated industries (McTier and Wald, 2011).

To construct our sample of securities class-action lawsuits preceding PIPEs, we hand-collect other lawsuit attributes that could only be obtained from court filings. We collect the settlement amount from the original court order filings if the case was settled, and we cross-check this amount with statistics provided by the *Audit Analytics Litigation* database. After identifying the allegation type for each lawsuit, we classify class action lawsuits into 10 different allegation categories.<sup>3</sup> Additionally, we collect the number of individual defendants (top executives and board members in most cases) and check if lawsuits were consolidated from several related cases. We also check whether all members of the board of directors were litigated as defendants, whether

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<sup>3</sup> We refer to existing litigation literature to identify allegation categories of securities class-action lawsuits (Crutchley et al., 2015; Pukthuanthong et al., 2017). The construction and description of these 10 allegation categories are presented in Appendix II.



the underwriter was litigated as a defendant, and finally whether the external auditor was litigated as a defendant in a financial misreporting (or accounting fraud) lawsuit.<sup>4</sup> Appendix II provides a detailed description of our lawsuit data hand-collection process.

To construct our sample of PIPE transactions, we first obtain 23,480 PIPE transactions from the PrivateRaise database provided by *The Deal* for the time period of January 1, 2001 to December 31, 2018.<sup>5</sup> For each PIPE transaction, the PrivateRaise database includes detailed information on: (a) the private equity-issue pricing (discounts, warrants, contingent price protection terms), (b) the security types, (c) the contractual terms, and (d) the placement agents. Following the existing literature on PIPEs (see, e.g., Brophy, Ouimet, and Sialm, 2009; Floros and Sapp, 2012; Lim, Schwert, and Weisbach, 2021), we exclude Rule 144A offerings. We exclude any PIPE transactions conducted with an underwriter (rather than a placement agent), as these transactions resemble public security offerings. We further remove litigated PIPEs in which the case filing date is between the PIPE's announcement and closing dates.

For our PIPE sample, we obtain financial data from Compustat. We use Compustat SIC codes to create a 49-industry indicator variable in accordance with the latest industry classification by Fama and French (1997). We next eliminate any firms without pricing information in the Center for Research in Security Prices (CRSP) database. Our final sample with available stock price data

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<sup>4</sup> We count the number of individual defendants in both the first identified complaint and the reference complaint filed to the court. These two numbers do not vary much from each other.

<sup>5</sup> The only venues offering securities that a limited investor base concerning pre-registered securities are Confidentiality Marketed Public Offerings (CMPOs) and Registered Directs (RDs). We exclude any CMPO offerings from our sample as clearly distinct from PIPE transactions. We include RDs, which we consider "hybrid" offerings and separately control for in our multivariate analysis (*pre-registered*). Similar to PIPEs, RDs are offered to a limited investor base, do not involve any underwriting, are frequently considered private placements by the U.S. stock exchanges and, as such must abide by the shareholder approval rules. Also, RDs also have public-offering attributes, as they involve the sale of registered shares for which a prospectus is available to the public ahead of the RD issue date. We separately control for the presence of RDs in our multivariate analysis.

contains a total of 5,935 PIPEs (2,184 distinct PIPE issuers), allowing us to execute the analysis of PIPE announcement wealth effects.<sup>6</sup>

After matching our PIPEs and class action lawsuits on the PIPE issuer's/defendant firm's trading symbol, we identify 571 securities class actions filed within five years prior to the PIPE issue date. In cases of multiple same-issuer PIPEs following the same lawsuit, we only keep the earliest PIPE transaction to avoid any bias on the cases' filing-date cumulative abnormal returns (CARs) from earlier litigation actions. We calculate the CARs around PIPE announcements for the earliest PIPE transaction by issuer following post-lawsuit PIPEs for 440 of the 571 pre-litigation PIPE transactions.

### **3.2 Key Variables**

#### **Litigation and Lawsuit Severity**

We construct the indicator variable *Litigation*, which equals 1 if the PIPE issuer is sued in a securities class-action lawsuit identified in SCAC within five years prior to the PIPE closing date.<sup>7</sup> To further measure the severity of the preceding securities class-action lawsuit, we calculate the market reaction around the lawsuit filing. We use the lawsuit filing date as the event date ( $t=0$ ) and calculate the market-adjusted abnormal returns over the pre-event window  $[-30, -1]$ . We use a 30-day window before the lawsuit filing date, because the existing literature has documented that this date may be preceded by the date associated with the first information release of misconduct (Deng, Willis, and Xu, 2014; Haslem, Hutton, and Smith, 2017; Karpoff, Koester, Lee, and Martin, 2017). Therefore, we allow a longer pre-event window preceding the case filing date to capture any information leakage before the date. To prevent a possible bias from choosing the wrong event

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<sup>6</sup> In our sample, we find that 57.43% of our stocks are quoted on the over-the-counter (OTC) market at the time of the PIPE offering.

<sup>7</sup> Our empirical results do not qualitatively change using an alternative three-year window to identify securities class-action lawsuits initiated prior to the PIPE closing date. Table 2 shows that 76.18% of the litigated PIPEs still face ongoing lawsuits within five years prior to the PIPE. With a three-year window, the lawsuits should be more impactful (with 85.56% ongoing). In this sense, our results based on five-year window should only underestimate the information effect. These findings are available upon request.

date, we also hand-collect the first press release date for each lawsuit filing announcement from *Factiva* offered by Dow Jones. We find that 74% of the press release dates (on the lawsuit filing announcement) and the SCAC lawsuit filing dates are within three calendar days of each other (Deng, Willis, and Xu, 2014).<sup>8</sup>

We collect pricing data and calculate the abnormal returns around the lawsuit filing date for 263 out of the 571 class lawsuits in the final sample. The mean CARs [-30, -1] is -24.10% and -24.40% using the lawsuit filing date and the first press release date as the event date, respectively. Using the earlier lawsuit filing date and the first press release date as the event date, the mean CARs [-30, -1] are -23.3%. Therefore, in our sample, the potential downward bias from the discrepancy in the lag of the lawsuit filing date to the initial revelation of the misconduct, is minimal.<sup>9</sup>

The large, average negative-abnormal return around the lawsuit filing date suggests that the loss in the defendant firm's market value causes substantial reputational cost to the sued firm. The lower the abnormal return around the lawsuit filing date, the more impactful the lawsuit to the corporate defendant. Therefore, based on the CARs [-30, -1] around the lawsuit filing date, we create a categorical variable *Lawsuit severity*, which is set to 3 if the litigated PIPE is in the lowest CARs [-30,-1] tercile; set to 2 in the middle CARs [-30,-1] tercile; set to 1 in the highest CARs [-30,-1] tercile; and set to 0 if the PIPE firm did not incur litigation within five years prior to the offering.

Aside from identifying securities class-action lawsuits initiated by firms' shareholders, we further identify the SEC enforcement actions and the firm's total number of lawsuits (including non-securities class action lawsuits) before the PIPE offering. We separately collect SEC

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<sup>8</sup> We collect the first press release date of the lawsuit filing announcement from *Factiva* using the search string "company name and (sue or sued or lawsuit or class action or shareholder litigation)."

<sup>9</sup> For robustness purposes, we also calculate the cumulative abnormal returns (CARs) over a 20-day window before the lawsuit filing. The mean CARs [-20, -1] using the lawsuit filing date as the event date (t=0) are -21.18%. The mean CARs [-20, -1] using the first press release date as the event date are -20.22%. We argue that changing the length of our pre-event window does not qualitatively affect our results.

Accounting and Auditing Enforcement Releases (AAER) data from the SEC website (<https://www.sec.gov/divisions/enforce/friactions.htm>) and the Audit Analytics Litigation database.<sup>10</sup> SEC enforcements are federal court actions initiated by the SEC. Although shareholder lawsuits that follow SEC enforcement actions might be more severe, we find only two securities class-action lawsuits that were filed following an SEC enforcement action in our sample. On the other hand, 11 securities class-action lawsuits were filed prior to an SEC enforcement action. The median number of total lawsuits from a litigated PIPE firm amounts to two. The inclusion of SEC enforcement actions and the presence of all other types of lawsuits allow us to control for the total effect of litigation on PIPEs.<sup>11</sup>

### **Market Reaction to the PIPE Announcement**

To analyze the market's reaction to the announcement of a PIPE transaction, we calculate the CARs using a market-adjusted model (counting on the equally weighted CRSP market index) over the [-2,+2] and [-1,+1] window around the PIPE announcement date, respectively. Consistent with the existing literature, the mean CARs [-2,+2] and CARs [-1,+1] around the PIPE announcement date are 2.48% and 1.68%, respectively (similar announcement wealth effects are reported in Hertz and Smith (1993) and in Hertz, Lemmon, Linck, and Rees (2002)).

### **Discount-adjusted Cumulative Abnormal Returns**

To further examine the information effects around the PIPE announcement, we embed the impact of discount into market reactions at the PIPE announcement event using the discount-adjusted CARs, following existing literature (Wruck, 1989; Hertz and Smith, 1993). This is a measure of the information effects at the PIPE announcement that separates firm value revisions (the first component of our formula) from the compensation to the PIPE purchaser (the second component of our formula). As argued by Wruck (1989), in this measure we adjust announcement

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<sup>10</sup> We also utilize the AAER data from the USC Leventhal School of Accounting (Dechow, Ge, Larson, and Sloan, 2011) to match with our PIPE data. We code the AAER data from the website directly and mainly use the USC AAER data to obtain the CIK information.

<sup>11</sup> The other types of lawsuits from the Audit Analytics Litigation database include but are not limited to class action, securities, derivatives, civil rights, property damage, personal injury, patent law, and 95 other categories.

wealth effects for the purchaser's compensation that will be the *total information effect* associated with the PIPE announcement transaction:

$$CAR_{adj} = \left[ \frac{1}{1 - \alpha} \right] [CAR] + \left[ \frac{\alpha}{1 - \alpha} \right] \left[ \frac{P_b - P_0}{P_b} \right].$$

In this equation, CAR is the abnormal stock return using a market-adjusted model over the three-day or five-day window around the announcement of the PIPE offering,  $\alpha$  is the ratio of shares placed to shares outstanding after the placement,  $P_b$  is the stock price at the end of the day prior to the event window, and  $P_0$  is the issue price. We only use the issue price of PIPE transactions in which the security types are common stock and convertibles and thus avoiding any potential bias in the discount calculation.<sup>12</sup> For common stock PIPEs, the PIPE issue price is the purchase price. For PIPEs with fixed convertibles, the PIPE issue price is the conversion price. Wruck (1989) argued that by adjusting announcement abnormal returns for the compensation reflected in the share price, one can better measure the abnormal returns from changes in the net present value of the firm. As explained in Bradley and Wageman (1983) and Wruck (1989), the discount-adjusted CARs measure consists of the abnormal returns' component to (a) nonparticipating, incumbent shareholders, and (b) PIPE-issued equity purchasers. Positive values indicate incentive alignment and contributions to firm value and negative values indicate managerial entrenchment. When compared to announcement CARs, the discount-adjusted CARs measure offers a more complete delineation of wealth effects to incumbent shareholders and PIPE purchasers.

### 3.3 Samples' Preprocessing Construction Methodology

Securities class-action litigation imposes a substantial negative shock to defendant firms. While litigated firms are not self-selected into this event, the information environment and performance metrics of such firms may significantly change subsequent to the litigation event. In

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<sup>12</sup> We exclude non-equity, linked security types such as straight debt and non-convertible preferred stock. We also exclude equity lines and unknown security types.

such a case, the characteristics of the litigated firms may be intrinsically different from those of non-litigated firms. We use multivariate matching via entropy balancing to address the concern that PIPE firms with prior securities class-action lawsuits are inherently different from those without such litigation. Introduced by Hainmueller (2012) and implemented by Hainmueller and Xu (2013), entropy balancing identifies weights for each control sample observation to equalize the mean, variance, and skewness of underlying determinants across the treatment and control samples. Entropy balancing assigns continuous weights for the control sample observations that achieve covariate balance, which is the goal of matching. Hainmueller (2012) noted that entropy balancing is a generalization of weighting approach used in propensity score matching. However, unlike propensity score matching, entropy balancing does not generate random matches, nor does it randomly prune observations that often lead to a large portion of imbalance and bias (Gaver and Utke, 2019; King and Nielsen, 2019).

Our treatment group consists of litigated PIPEs, and the control group consists of non-litigated PIPEs. Following the existing literature on entropy balancing, we reweight each observation in the control group to achieve a covariate balance on the mean, variance, and skewness between the treatment group and the control group (for similar approaches, we refer the reader to Shroff, Verdi, and Yost, 2017; McMullin and Schonberger, 2020; Dey and White, 2021).

## **4. Empirical Results**

### **4.1 Summary Statistics**

Table 1 presents the sample distribution of litigated PIPEs and non-litigated PIPEs across years and industries. Panel A indicates that PIPE issuance is most active in 2007 (1,550 out of 17,166, or 9.03%) and least active in 2015 (674 out of 17,166, or 3.93%). Overall, in 3.33% (571 out of 17,166) of the PIPEs in our sample, issuing firms incurred pre-PIPE shareholder lawsuits. Panel B reports the number of PIPE issues across industries and shows that wholesale, retail, laundries, repair shops (37 or 7.16%), business equipment (186, or 7.05%), and chemicals (13, or

5.65%) are the top three industries most likely to experience at least one securities class-action lawsuit preceding a PIPE offering.<sup>13</sup> In our multivariate analysis we employ industry fixed effects.

**[Insert Table 1 about here]**

Table 2 presents the allegation types of securities class-action lawsuits and other attributes. Panel A presents lawsuit allegation types. Based on the complaint files of each lawsuit from the SCAC database, we categorize 10 allegation types.<sup>14</sup> The majority of the securities class-action lawsuits involve allegations against directors and officers making materially false statements and omissions pursuant to the securities laws under the Securities Act of 1933, the Securities Exchange Act of 1934 or Rule 10b-5 promulgated by the SEC. Misleading and false statements or the failure to disclose material information is alleged in almost all the securities class-action lawsuits. The misconduct of releasing false statements or the failure to disclose material information is likely to be most severe in cases with specific allegations of misrepresentation in the firm's business, products, patents, or technology (50.61%) cases related to security offerings (48.86%), and cases involving financial misreporting or accounting malpractice (48.51%). One should also note that more than one-third of the cases are associated with insider trading.<sup>15</sup>

Panel B of Table 2 presents summary statistics about the case status of pre-PIPE securities class-action lawsuits and other lawsuit attributes. Out of the 571 lawsuits in our final sample, only 59 were settled *prior* to the PIPE. Seventy-seven lawsuits were dismissed, and the remaining 435

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<sup>13</sup> For brevity, we use the Fama-French 12 industry classification in Table 1. In our multivariate analysis, we use the Fama-French 49 industry classification.

<sup>14</sup> The percentages of individual allegation types do not add up to 100%, as one lawsuit may include multiple allegations.

<sup>15</sup> In securities class-action lawsuits, the plaintiffs frequently allege that the defendants gave misleading statements or omitted important adverse facts about the firm to boost up the share price, and thus the inflated share price facilitates insider trading (selling), the issuance of overvalued new securities, and acquisitions in which the firm uses the overvalued shares as a currency.

lawsuits were still ongoing at the time of the PIPE transaction.<sup>16</sup> With regard to the outcomes of lawsuits that were ultimately settled by 2019 (our sample ending year), we are able to extract the settlement amount of 345 settled lawsuits from the court filings. The settlement amount is highly skewed. The mean settlement amount is \$9.72 million while the median is \$3.35 million. The highest settlement amount to recover a plaintiff's loss is \$334 million. We also track the settlement amount covered by the insurance carriers of sued firms. In the SCAC database, such information is reported in 200 lawsuits. On average, the insurance carrier paid about \$5.34 million for each lawsuit.

The average *Problem Duration* (the time period between the class begin date to the class end date) is 407 days and the median is 299 days. Plaintiffs typically act fast once the problem and damage are identified, as the average *Action Duration* (the time period from the class end date until the lawsuit filing date) is 101 days while the median is 19 days. However, it usually takes a long time for both parties to settle a securities class-action lawsuit. The average *Settlement Duration* is 1,635 days, and the median is 1,291 days. With regard to the number of individual defendants listed in the court filing, a securities class-action lawsuit typically has four individual defendants. 76.71% of the lawsuits are consolidated from several related actions against the same defendant firm around the same period. In 15.41% of the lawsuits, the entire board of directors is sued by plaintiffs, and 25.39% and 5.08% of the lawsuits also list the underwriter and the auditor as a defendant, respectively.

**[Insert Table 2 about here]**

## **4.2 Univariate Results**

Table 3 presents the results of univariate tests (two-sample t-tests) on the differences in the financial characteristics and the PIPE characteristics of litigated vs. non-litigated issuers. The mean-comparison tests of financial characteristics (as reported in Panel A) indicate that litigated

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<sup>16</sup> The overall dismissal rate of the 571 lawsuits in our sample is 38% as of December 2019. Only 13.48% of the cases are dismissed before the PIPE offering. Therefore, the lawsuit status preceding the PIPE offering is unlikely to make our sample biased from frivolous litigation.



PIPE firms and non-litigated PIPE firms are quite different in several aspects. Specifically, litigated PIPE firms are typically larger in terms of both book and market values as well as sales, but they have lower capital expenditures and lower market-to-book ratios. Panel B reports the results of mean-comparison t-tests of differences in PIPE characteristics. The results indicate that litigated PIPE issuers more frequently assign new board seats to PIPE investors, and they tend to be pre-registered more frequently compared to non-litigated PIPEs. However, litigated PIPE issuers are less likely to have warrants in their contract design or be intermediated by placement agents. We conjecture that PIPE issuers with prior litigation acknowledge the heightened information asymmetry with prospective PIPE investors, are willing to grant them monitoring rights even without warrants, need the certification and marketing efforts exerted by placement agents, and register the PIPE-issued new shares in order not to impede PIPE investors' quick exit, if necessary.

**[Insert Table 3 about here]**

We use entropy balancing to achieve a better covariate balance between litigated and non-litigated PIPEs. In Table 4, we present the summary statistics of covariates used in our final sample of the market reaction analysis before and after entropy balancing. Table 4, Panel A, reports the mean, the variance, and the skewness of these covariates before entropy balancing. It indicates that litigated PIPEs and non-litigated PIPEs are significantly different in several aspects, similar to what is reported in Table 3, which is based on our initial sample before removing observations with non-available CARs at the PIPE announcement. Table 4, Panel B, reports the summary statistics of those covariates after entropy balancing and shows that all covariates are aligned in terms of the mean, the variance, and the skewness after reweighting.

McMullin and Schonberger (2020) find that entropy balancing markedly improves covariate balance and achieves superior specification than ordinary least squares and propensity score matching, while they point out the concern that entropy balancing may assign extreme weights to a small subset of control observations. We conduct two diagnostic tests to examine this issue. First, following McMullin and Schonberger (2020), we compute the Weight Ratio that measures the relative percentage of control sample observations receiving above equal weight,

where higher ratios indicate a larger pool of entropy balancing-matched observations. For example, the Weight Ratio of Column (2), in our later Table 8 is 15.57. Second, we compute the Max\_Lev as outlined in McMullin and Schonberger (2020) to assess whether entropy balancing assigns large weights to outlying observations. The Max\_Lev is the mean across the maximum values of the regression leverage measured from each 1000 randomly drawn sample multiplied by the weight assigned to each observation (one for ordinary least squares). In our later Table 8, column 2, the Max\_Lev is 0.13 of entropy balancing and is 0.76 of OLS. This evidence indicates that in our sample, smaller weights are assigned to extreme observations in entropy balancing to achieve covariate balance.

**[Insert Table 4 about here]**

Table 5 compares the PIPE announcement wealth effects and the PIPE price-discount offers (dependent variables in our subsequent multivariate regression analyses) in litigated PIPEs vs. non-litigated PIPEs. Our results show that the market reacts more favorably to the announcement of litigated PIPEs than the announcement of non-litigated ones. Specifically, the average announcement CARs [-1, +1] and CARs [-2, +2] for litigated PIPEs are 5.04% and 6.08% compared to the average wealth effects of 1.41% and 2.20% over the same time window around the announcement of non-litigated PIPEs. When incorporated with the impact of discount, the discount-adjusted CARs [-1, +1] (discount-adjusted CARs [-2, +2]) are on average 3.41% (4.19%) higher for the litigated PIPE issuers than the non-litigated PIPE issuers. The result that litigated PIPEs receive a significantly higher market reaction around the PIPE announcement date than non-litigated PIPEs corroborates our conjecture that the market agrees that litigated PIPEs are more undervalued at the PIPE announcement compared to non-litigated PIPEs. We also show that litigated PIPEs exhibit lower discounts than non-litigated PIPEs. We posit that these univariate test results are in accordance with the *Information Hypothesis* as outlined by Hertz and Smith (1993).

**[Insert Table 5 about here]**

As discussed earlier, and to further explore the variability in the severity of lawsuits prior to a PIPE transaction, we measure litigation severity based on the market reaction around the securities class-action lawsuit filing date. Figure 1 presents the CARs over a 60-day trading symmetric window surrounding the lawsuit filing date (event date) and depicts the negative stock performance preceding the lawsuit filing date. The abnormal stock return starts to deteriorate at least one month before the filing date, which suggests information leakage before the lawsuit filing date (Crutchley, Minnick, and Schorno, 2015). Figure 1 also shows that the loss in market value of a corporate defendant in a securities class-action lawsuit is not temporary because the drop in the cumulative abnormal return is not reversed after the lawsuit filing. Table 6 provides more detailed information about the mean CARs using different event windows: [-30, -1], [-20, -1], [0, +1], [+1, +20], and [+1, +30]. It shows that the market reactions around the lawsuit filing date are significantly negative. In our Internet Appendix II, we show the daily abnormal returns over the 60-day symmetric trading window surrounding the lawsuit filing date.

**[Insert Table 6 about here]**

Shareholder class-action lawsuits vary in the degree to which they have a negative impact on a defendant firm. The severity of the lawsuit is not only manifested in the monetary (settlement) penalty that a losing defendant is obligated to pay, but also in the reputation cost reflected as substantial loss in the defendant firm's market value (Gande and Lewis, 2009). As previously reported, the mean settlement amount of the securities class action lawsuits in our sample is \$9.72 million, which amounts to approximately 18.91% of the average PIPE issuers' closing market capitalization. In contrast, the mean dollar-value loss in the market value of the defendant firm is \$147.6 million (-24% times \$615 million of the mean-market cap of a litigated firm at lawsuit filing). Thus, the potential loss in the market value of a corporate defendant is a more concerning consequence of shareholder litigation.

Based on the negative market reaction to the shareholder lawsuit, we classify PIPE class-action lawsuits into three groups: the group belonging to the lowest CARs tercile represents the most severe lawsuits, the group belonging to the middle CARs tercile represents the moderately

severe lawsuits, and the group classified in the highest tercile represents litigations with the least-severe lawsuits (inconsequential lawsuits). In Table 7, Panel A, we present the PIPE characteristics according to the tercile distribution of CARs [-30, -1] around the lawsuit filing date.<sup>17</sup> We gain several important insights from these results: (1) the PIPEs of firms with the most severe lawsuits exhibit the highest market reaction at the PIPE announcement date. Both the CARs [-1, +1] and CARs [-2, +2] around the PIPE announcement dates are substantially greater in the most severe group than the CARs in the least severe group. The average announcement CARs [-1, +1] and CARs [-2, +2] are 7.37% and 11.42%, respectively, in the most severely litigated group compared to the corresponding CARs of 2.54% and 6.48% in the least severely litigated group; (2) The discount-adjusted market reactions are the highest in the most severe group. The PIPE issuers with the most severe pre-PIPE lawsuits have average discount-adjusted CARs [-1, +1] (CARs [-2, +2]) of 8.07% (13.72%), compared to the PIPE issuers with the least-severe lawsuits and corresponding discount-adjusted CARs [-1, +1] of 4.97% (9.52%); and (3) PIPEs of firms with the most severe lawsuits issue their post-lawsuit PIPEs at significantly larger discounts. Litigated PIPE issuers in the most severe group offer a 3.98% discount on average in a post-lawsuit PIPE while litigated PIPE issuers in the least severe group issue equity at a 3.51% *premium*. However, the distribution of discount across terciles from most severe to non-litigated is not monotonic.

Recall that our univariate test results (Table 5) show that litigated PIPEs exhibit significantly higher announcement wealth effects than non-litigated PIPEs. The results reported in Table 7, Panel A, show that the significantly higher announcement abnormal returns are mainly driven by the subsample of litigated PIPEs with the most severe lawsuits. On average, the announcement wealth effect for litigated PIPEs in the most severe group is 4.94% higher than that of the issuers in the least severe group. These results are consistent with our conjecture that more severely litigated PIPEs are associated with a more positive information effect. *Ex ante*, equity

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<sup>17</sup> Our results do not qualitatively change if we use the event window around the date of the lawsuit's first press release. In more detail, our findings are robust to using the CARs [-20, -1] around the lawsuit filing date (Deng et al., 2015; Haslem et al., 2017). Our main results are robust when we use *quartiles* of CARs [-30, -1] or CAR [-20, -1] around the lawsuit filing date to measure *Lawsuit severity*.

market participants likely expect that probability of consummating a privately placed security issue is lower for more severely litigated PIPEs than for less severely litigated PIPEs. Also, our univariate results reveal that the market believes PIPE issuers that have undergone the most severe litigation are the most undervalued at their issuance announcement.

To further investigate the change in information environment from lawsuit filing to PIPE offering, we calculate the change in the bid-ask spread from one quarter post-case filing to one quarter pre-PIPE closing date. It is expected that a higher increase in the bid-ask spread represents a higher degree of information asymmetry, thus indicating that the firm is more difficult to value. We further extract investor equity-holding data from *Thomson-Reuters Institutional Holdings* (13F Filings) and hand-match the PIPE investor names. Since new security purchases by existing shareholders demonstrate a certification effect on a PIPE deal, we identify whether a PIPE investor is an existing shareholder in the company. For the PIPE investors with prior holdings, we calculate their average percentage ownership over the four quarters before the PIPE offering.

Judging by the comparisons of PIPE deal characteristics across class-action severity terciles presented in Table 7, Panel A, we draw the following conclusions with regard to the mitigating actions of litigated PIPEs: (1) PIPE issuers facing the most severe lawsuits have lower ownership from existing shareholders that are also PIPE investors (but overall *Average percentage ownership* is higher in litigated issuers than non-litigated issuers); (2) PIPE issuers facing the most severe lawsuits have a smaller increase in bid-ask spread from the quarter after the case filing date to the quarter before the PIPE offering date; and (3) PIPE issuers classified as the most severely litigated firms are more likely to have warrants and less likely to have board seats assigned to investors in their PIPE contracts. Furthermore, they are more likely to be intermediated and be registered at the time of the PIPE closing. The higher frequency of intermediation and registration contributes to our conjecture that the most severely litigated are surrounded by higher levels of disclosure that are shared with the public investors (through the associated registration document) and through placement agents and issuers (when intermediated). In summary, we find that the differences in the change in information environment, existing shareholders' ownership, and contingent contracting claims are all related to the level of the uncertainty around a litigated issuer.

These variables may illustrate a signaling effect of the degree of undervaluation a PIPE issuer may incur shortly following a securities class-action lawsuit.

In Table 7, Panel B, we tabulate several lawsuit attributes across terciles of lawsuit severity as measured by the loss in market value around the lawsuit filing date. We observe that most severely litigated PIPEs are more frequently associated with the defendant firm's business or products. As verification of the validity of our lawsuit severity measure, we observe a monotonic increase in the settlement amount moving from the least- to the most-severe litigation actions. We find that the most severe lawsuits (1) tend to consolidate from several similar cases against the firm, and that plaintiffs in more severe lawsuits tend to sue the entire board of directors as well as the auditors of the firm; (2) tend to be filed more quickly once the problems triggering the lawsuits are disclosed, and (3) trigger the fastest filing of respective litigation and are associated with the largest monetary penalties.

**[Insert Table 7 about here]**

### **4.3 Multivariate Results**

In our multivariate empirical setting, we analyze the association of class action lawsuits preceding PIPE financing with the announcement wealth effects of subsequent PIPE offerings. The univariate tests reported in Table 5 and Table 7 indicate that litigated PIPEs have higher announcement returns than non-litigated PIPEs and within litigated PIPEs, PIPEs with the most severe class action lawsuits experience the highest announcement CARs. In addition, litigated PIPEs exhibit lower discounts than non-litigated PIPEs but within the litigated PIPEs, the most severely litigated cases are associated with the highest levels of discounts. We further test the validity of these results in a multivariate setting counting on the entropy-balanced litigated and non-litigated PIPEs, investigating issuers' actions during the time period between the securities class actions and the PIPE closing. What are the issuers' actions that improve information effects for firms concurrently undergoing securities class actions that make it possible for investors to accurately assess them without expending additional resources? Our multivariate analysis is separated into three different sets: first, we present in Tables 8 and 9 the information effects of the

severity of class action lawsuits on announcement CARs, discounts, and discount-adjusted CARs. Second, in Table 10 we present the impact of class-action lawsuit types and their attributes on the discounts revealing their impact on the cost of processing additional information by the incumbent shareholders. Lastly, in Table 11, we present the impact of mitigation actions (auditor changes) on announcement CARs, discounts, and discount-adjusted CARs conditional on class-action lawsuit severity.

In detail, the impact of class-action lawsuits on the announcement wealth effects of PIPE transactions is reported in Table 8, in which the dependent variables are the five trading-day PIPE announcement CARs. The independent variable of interest is *Lawsuit severity* as previously defined. The larger the value of the discrete categorical variable *Lawsuit severity*, the more severe the lawsuit. In Column (1), we report the results using a base model including litigation-related variables, an information variable (*Percentage change in Bid-Ask spread*), ownership variables (*Average percentage ownership* and *Average percentage ownership square*), a disclosure variable (*Mean growth rate in 8K filings*), PIPE characteristics, and firm-level controls. In Column (2), we interact *Lawsuit severity* with the information variable, the ownership variables, and the disclosure variable along with the PIPE characteristics (*Warrants*, *Price resets*, *Pre-registered*, *Intermediated*, *Board seats*).

The coefficient of the variable *Lawsuit severity* is significantly positive across both specifications, suggesting that PIPEs preceded by more severe lawsuits experience higher announcement returns, which is in accordance with our univariate results presented in Tables 5 and 7. *Ceteris paribus*, on average, a one-tercile increase in *Lawsuit severity* is associated with a 2.3% increase in PIPE announcement return over a five-day window. The severity of pre-PIPE litigation is associated with higher PIPE announcement wealth effects. These results are also consistent with the univariate evidence reported in Table 7, suggesting that issuers with more severe prior shareholder lawsuits are undervalued more, and thus their return to the capital market to raise private equity financing receives a more positive greeting from public investors at the subsequent PIPE announcement.

One should also note that the regression specifications in Table 8 control for the total litigation effect and document that PIPE firms experience lower CARs if they experience prior SEC enforcement actions or other types of lawsuits prior to PIPE issuance. Prior SEC enforcement actions (rather infrequent in our setting) are an alternative indication of severity in our setting.

Next, we find that the effect of percentage ownership of participating PIPE investors who are current shareholders of the firm is nonlinear. Wruck (1989) reported that changes in firm value around private sales of equity are positively related to ownership changes at low- and high-ownership levels, but not for the middle-ownership level (middle levels promote managerial entrenchment). We show that the impact of *Average percentage ownership* on CARs is significantly negative and the impact of *Average percentage ownership square* on CARs is significantly positive, reflecting a nonlinear and U-shaped relationship of ownership and market value (Morck, Shleifer, and Vishny, 1988). We argue that when owning a really low-equity (or really high-equity) stake in the PIPE issuer, PIPE investors perceive the PIPE issuing firm as highly undervalued. Really low ownership levels reveal possible PIPE issuer transparency whereas when prior ownership exceeds a certain level, it creates a certification effect to new outside investors about the firm's prospects. Therefore, the PIPE investors' ownership levels ahead of the PIPE transaction convey an important signal about the true firm value. These findings, revealing the nonlinear impact of the ownership structure on the announcement wealth effects, corroborate Wruck (1989) and show that high prior-ownership levels by PIPE investors are greeted positively by the market, as they signal improved managerial performance and aligned interests that could be under scrutiny due to the preceding class action. In terms of PIPE characteristics, we also document that announcement CARs are smaller if PIPE issuances are accompanied by warrants and registered ahead of the offering.

Column (2) of Table 8 shows the interactions of *Lawsuit severity* and variables related to the PIPE issuer's information asymmetry. We focus on the information environment that the PIPE issuer is facing after the lawsuit filing and before the PIPE offering. We find that the litigated issuers who disclosed more 8K filings from the case filing to the PIPE offering are associated with



lower abnormal announcement returns. This is consistent with the information effect that the market is less surprised about the post-litigation capital-raising event because the firm has been actively conveying information to outside investors. Furthermore, the coefficient of *Percentage change in Bid-Ask spread* is significantly positive (coefficient=0.014) while the interaction of *Lawsuit severity* and *Percentage change in Bid-Ask spread* is significantly negative (coefficient=-0.014) related to the CARs at the PIPE announcement. This indicates that for a severely litigated PIPE issuer, if the information environment prior to the PIPE offering is more transparent—with more mitigation actions detailed from the PIPE issuer and potentially the placement agent(s); that is, a smaller increase in bid-ask spread—the market will respond positively and be more confident in the PIPE issuer’s valuation at issuance announcement. We note that when the interaction terms with *Lawsuit severity* are introduced, the effects of the prior ownership levels (*Average percentage ownership* and *Average percentage ownership square*) become insignificant.

PIPE investors usually request contingent contract claims such as warrants and price resets, when the issuer’s risk is high (Chaplinsky and Haushalter, 2010). We find that the inclusion of warrants and price resets in PIPE contracts reduces the CARs at the PIPE announcement. We also find that both the coefficients of the interaction terms *Lawsuit severity* × *Warrants* and *Lawsuit severity* × *Price resets* are significantly negative. Warrants and price resets are deal sweeteners that help facilitate the sale of the securities. If a litigated PIPE issuer undergoes a more severe shareholder lawsuit pre-PIPE, it may be more difficult to market the securities in the following private equity placement. Thus, the market may react negatively to the inclusion of contingent claims in the PIPE contract, thus reflecting that without such claims, the firm might not be able to issue the security. In our context, a lawsuit filing from shareholders shortly before a PIPE offering indicates a higher risk, and information effects are expected to be larger when resolution of state-of-the-world risk is essentially dichotomous (uncertain).

Next, we find that for a severely litigated PIPE issuer, having a placement agent’s help in marketing the deal is beneficial. The interaction of *Lawsuit severity* and *Intermediated* is significantly positive. Financial intermediaries play an important certification role in equity sales that should reduce adverse selection and information asymmetry (Chemmanur and Fulghieri,

1994). Our findings indicate that the market responds positively to severely litigated PIPEs using a placement agent, and this positive effect is stronger for more severely litigated issuers.

Last, we document that registration status may imply the market's assessment of the firm value. For a severely litigated firm, registering securities ahead of the PIPE transaction increases the propensity to cash out, which is negatively perceived by the market. This evidence is in accordance with Hertz and Smith (1993).

**[Insert Table 8 about here]**

In Table 9, we repeat the analysis for the discounts and the discount-adjusted CARs at the PIPE announcement. Specifically, in Column (1), the dependent variable is the PIPE discount. Our evidence validates the *information effects* as set out by Hertz and Smith (1993). Litigated firms face a higher degree of information asymmetry after the case filing, and it becomes costly for investors to acquire and process related information about the firm. However, if the firm is dedicated to disclosing more information and, in this way mitigates any information asymmetry impact of prior litigation, the issue cost in the PIPE offering can then be controlled. In particular, when we include the *Mean growth rate in 8K filings* and interact it with the *Lawsuit severity* variable, we find a negative effect on the discount levels. Also, we report that presence of existing shareholders in PIPE investors are significantly associated in a U-shaped relationship with discounts, while the relation of prior ownership with discount is nonlinear for severely litigated issuers.<sup>18</sup> We conjecture that, in contrast to outside investors, prior ownership levels have a significant effect for inside investors who negotiate the levels of discounts with the issuers and the placement agents when present. Having high prior ownership levels particularly in severely litigated firms, reveals a need for monitoring the information revelation process ahead of the closing of the transaction, which is costly for the issuer as manifested in high levels of discounts.

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<sup>18</sup> In untabulated findings, we incorporate the binomial variable of the presence of corporate insiders and find that sales to corporate insiders are associated with an even smaller discount than for the more severe litigation cases. Our findings are consistent with Leland and Pyle (1977), namely that increased managerial holdings signal undervaluation and certify the quality of the PIPE issuer. This signaling mechanism has also been reported in Hertz and Smith (1993) who documented a negative association of management buyers with discounts inferring that managers incur lower (or zero) information costs.

Last, we report a negative association of intermediation on the PIPE discount with intermediation providing certification to incumbent investors. Also, intermediated PIPE transactions have been promoted to potential investors more extensively, thus lowering the levels of discount requested for the high information asymmetry. When PIPE-issued securities are pre-registered, a required higher discount is not necessary in order to be compensated for the anticipated illiquidity. We conclude that our estimates in Column (1) support the *Information Hypothesis* in a heightened information-asymmetry environment when litigation is still ongoing.

In Column (2), the dependent variable is the *Discount-adjusted CARs [-2, +2] at PIPE Announcement*. We examine the potential impact of pre-PIPE class action litigation on the discount-adjusted abnormal returns in a multivariate setting controlling for our entropy-balanced financial covariates. We want to separately analyze the impact of the same specification model presented in Table 8 on the total announcement-effect measure (*Discount-Adjusted CARs*) that impounds both the issuer's market value revision as well as compensation to the purchaser.

As shown in Column (2), the positive and significant coefficient of *Lawsuit severity* in all specification models indicates that PIPEs preceded by more severe lawsuits experience a higher discount-adjusted CAR. We find similar results for our key variables compared with column (2) of Table 8. Furthermore, the coefficient signs of our key variables and their interactions with *Lawsuit severity*, do not qualitatively change from the estimates presented in Table 8. Consistent with the *Information Hypothesis*, since investors of PIPE issuers with prior shareholder litigation are subject to more severe adverse selection, credible signals of undervaluation (decrease in the *Percentage change in Bid-Ask spread*, less frequent use of contingent terms, and *Intermediation*) can generate a surprisingly positive announcement effect, and this relation is more pronounced among the more severely litigated firms.

**[Insert Table 9 about here]**

In Table 10, we analyze the information effects the various litigation types and attributes have on PIPEs and specifically their pricing using the same estimation models as those presented in Tables 8 and 9. Our dependent variable is the PIPE discount. In Panel A, we present the pricing

impact of litigation types presented in Table 2. We find that several litigation types are positively associated with PIPE discounts, as they raise uncertainty about the issuer's reporting and corporate actions. We show that litigation types raising more doubts about issuer's disclosure and corporate actions' integrity are positively associated with discounts, as the investors must expend greater resources to evaluate the issuer's misbehavior. Specifically, we document that financial misreporting, filing of restatements as an outcome of prior securities class actions, auditors' litigation and analyst misrepresentation of issuer's prospects raise more doubts about the issuer's prospects and usage of proceeds raised and thus, they are consequently associated with higher discounts.

Interestingly, in Panel B, we show that when litigation actions remain ongoing and consequently the issuer's mitigation actions not fully revealed at the time of the PIPE closing, discounts are higher. In contrast, when securities' class actions are settled and the issuers' reactions are fully revealed, discounts are lower. The length of the time between the securities class actions and PIPE closing is negatively associated with PIPE discounts. We argue that this result indicates that the greater the intervening time, the more chances the issuers have to voluntarily disclose, which is conditional on their actions convincingly revealing the intent to rectify any reputational damage caused by prior litigation (for instance by changing auditors as shown next in Table 11). Summarizing our results in Table 10, we conclude that the type of litigation and the managerial actions after the lawsuit, which might lead to its settlement, have significant information effects for later securities' private sales. Litigation types and their attributes matter for PIPE discounts requested by incumbent investors, and their impact remains significant despite any private information confidentially shared with private investors.

**[Insert Table 10 about here]**

In Table 11, we essentially estimate the same regression models having announcement *CARs* (Table 8) and *Discounts* and *Discount-adjusted CARs* (Table 9) as our dependent variables by incorporating auditor changes in the previously shown specification models. In Table 11, we gauge the potential association of mitigation actions (auditor changes) with PIPE's information effects even when conditioned on *Lawsuit Severity* levels. Specifically, in Panel A (B), we add the

binomial variable *NB6toB6* (*B6toNB6*) that takes the value of 1 when there is a turnover from a non-Big6 (Big6) auditor to a Big6 (Non-Big6) auditor and 0 otherwise. We argue that auditor changes proxy for a shift in the issuer's information control environment. Related literature has documented that higher-quality auditors provide more credible information to investors and creditors (Schwartz and Menon, 1985). Also, switching from (to) a non-brand name to (from) a brand name auditor is associated with positive (negative) market reactions (Dunn et al., 1999, Knechel et al., 2007). Our main variable of interest is the three-way interaction variable among the *Lawsuit severity*, the *NB6toB6*, and the *Mean growth rate in 8K filings* variables.<sup>19</sup> We would like to gauge the impact in the voluntary disclosure increase for the severely litigated cases when there is a change in the issuer's auditor ahead of the PIPE transaction. We show that, conditional on each level of lawsuit severity, additional voluntary disclosure has a positive (negative) impact on wealth and discount-adjusted wealth effects, and a negative (insignificant) impact on discounts when the issuer changes from *NB6 to B6* (*B6 to NB6*) during the time period between the securities class action and the PIPE transaction closing. We conjecture that voluntary disclosure growth has a positive information effect when there is a high investor demand for it—namely, when the issuer switches to a more credible auditor (switching from a non-Big6 to a Big6). We show the opposite information effects associated with voluntary disclosure growth when the issuer switches from a Big6 to a non-Big6 auditor that could be perceived as a concerning signal associated with the Big6 auditor demanding more information disclosure under the ongoing litigation actions.

**[Insert Table 11 about here]**

## **5. Concluding Remarks**

It has been well documented that privately placed securities are associated with positive announcement wealth effects and high discounts that trend downward in later years. Hertz and Smith (1993) analyzed the information effects of private placements and find that higher discounts are requested as compensation for the costly process of acquiring information and higher

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<sup>19</sup> We conduct variance inflation factor (VIF) tests regarding the potential collinearity concern of the models including three-way interactions. The VIF values of the specifications in Table 11 are 2.01, 2.02, and 1.97 respectively.

announcement wealth effects as a signal of higher issuer undervaluation at the time the PIPE transaction is announced. We revisit testing the *Information Hypothesis* when there is ongoing securities litigation ahead of PIPE transactions that will be associated with a heightened information-asymmetry environment. We document the issuers' mitigation actions that efficiently convey information about issuers following litigation actions.

Specifically, we analyze the announcement wealth effects at the PIPE announcement after delving into the issuers' mitigation actions following the litigation action filing and preceding the PIPE transactions' closing. We measure the class action severity and find that more severely litigated PIPEs are positively greeted by outside investors at PIPE announcement. We also show that severely litigated PIPEs when they are intermediated are positively associated with PIPE announcement CARs and negatively associated with prior increases in the bid-ask spread levels. PIPE transaction "sweeteners" (warrants, price resets) and prior registration are greeted negatively by the market for the more severely litigated PIPE transactions.

We argue that our findings lend credence to the *Information Hypothesis*, as the most severely litigated PIPEs exhibit the highest announcement wealth effects. Our findings hold both when the PIPE announcement CARs, as well as the discount-adjusted PIPE announcement CARs, are utilized as dependent variables. We also show that higher litigation severity is positively associated with discount levels of investors asking to be compensated for the most severely litigated cases. Specifically, prior ownership stake of PIPE investors is U-shaped associated with discounts, with really low and high values of prior PIPE investors' ownership being associated with high levels of discounts. The greater the PIPE issuer's 8K material event disclosure for severely litigated PIPEs the lower the levels of discounts as PIPE issuer's intentions get revealed on how they plan to address ongoing class-action lawsuits.

Our findings on the association of the changes in disclosure and the levels of discount reveal that higher disclosure partly resolves heightened information asymmetry following security litigation actions, and that such asymmetry is associated with lower discounts for severely litigated cases. Issuers' voluntary disclosure growth has a positive information effect when there is a high

investor demand for it—namely, when the issuer switches to a more credible auditor. This finding indicates that when the PIPE issuer commits to higher disclosure, PIPE investors need not expend a lot of resources to value the issuer. We show that voluntary disclosure bundled with appropriate corporate actions is associated with lower PIPE discount levels, as investors need not expend a lot of resources to value PIPE issuer’s growth prospects. Last, we also identify the litigation types that are more difficult to evaluate by new investors. We find that the status of prior litigation (ongoing vs. settled) at the time of the PIPE closing is significant for the discounts requested.

We conclude that in our unique setting of heightened information asymmetry levels due to ongoing securities class-action lawsuits, we are able to present the information effects of PIPE transactions. Such effects occur when the issuer is certified through intermediation, is well monitored through prior ownership from PIPE investors, discloses more voluntarily to the market, and does not register PIPE securities early or provides any deal “sweeteners.” PIPE transactions are not necessarily costly funding venues even when securities class-action lawsuits are ongoing and thus pose a threat of potentially adverse *information effects*.

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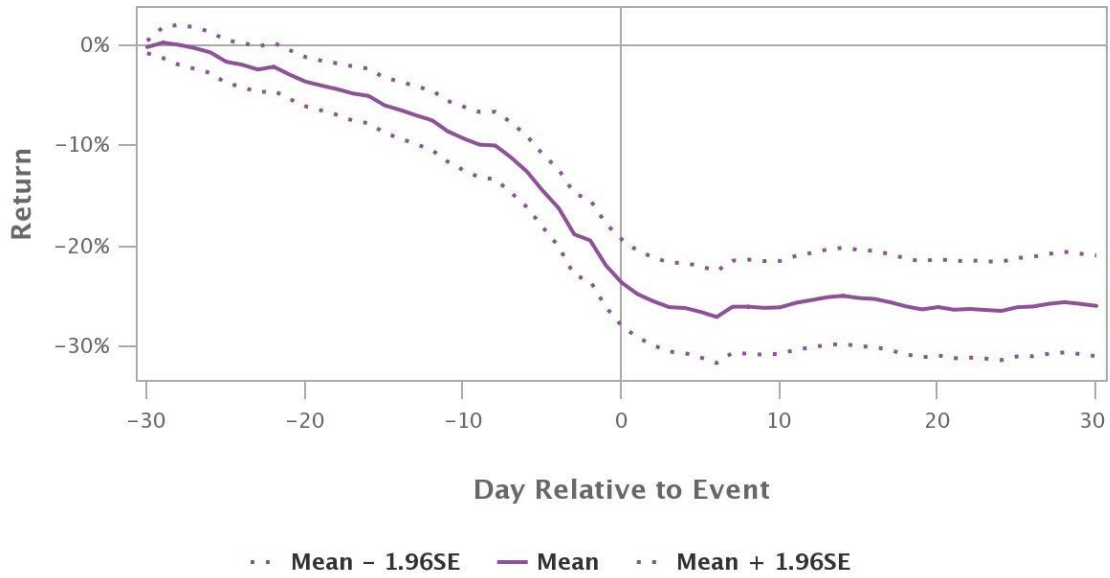
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**Figure 1**

**Stock performance around the class action lawsuit filing date.**

Figure 1 presents the cumulative abnormal returns calculated over the [-30, +30] day window around the lawsuit filing date (event date 0) using a market-adjusted model (with equally weighted CRSP market index).



**Table 1****Distribution of Pre-PIPE Lawsuits across Years and Industries**

Table 1 presents the distribution of the number of PIPEs and the number of PIPEs that incur pre-PIPE securities class action lawsuits (litigated PIPEs) across year and industry. It also presents the proportion of litigated PIPEs in each year/industry to the total number of litigated PIPEs, the proportion of litigated PIPEs in each year/industry to non-litigated PIPEs, and the proportion of litigated PIPEs in each year/industry to the total number of PIPEs.

Panel A: Distribution across Years						
PIPE Year	Num of PIPEs	Num of Litigated PIPEs	Num of Non-Litigated PIPEs	% of Litigated per year to Total Litigated	% of Litigated to Non-Litigated	% of Litigated to Total
2001	926	64	862	11.21%	7.42%	6.91%
2002	770	57	713	9.98%	7.99%	7.40%
2003	994	53	941	9.28%	5.63%	5.33%
2004	1,279	43	1,236	7.53%	3.48%	3.36%
2005	1,228	27	1,201	4.73%	2.25%	2.20%
2006	1,463	32	1,431	5.60%	2.24%	2.19%
2007	1,550	23	1,527	4.03%	1.51%	1.48%
2008	961	15	946	2.63%	1.59%	1.56%
2009	856	16	840	2.80%	1.90%	1.87%
2010	1,023	12	1,011	2.10%	1.19%	1.17%
2011	824	11	813	1.93%	1.35%	1.34%
2012	704	18	686	3.15%	2.62%	2.56%
2013	702	17	685	2.98%	2.48%	2.42%
2014	755	28	727	4.90%	3.85%	3.71%
2015	674	31	643	5.43%	4.82%	4.60%
2016	742	42	700	7.36%	6.00%	5.66%
2017	855	37	818	6.48%	4.52%	4.33%
2018	860	45	815	7.88%	5.52%	5.23%
Total	17,166	571	16,595		3.44%	3.33%

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Panel B: Distribution across Industries

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FF12 Industry	Num of PIPEs	Num of Litigated PIPEs	Num of Non-Litigated PIPEs	% of Litigated per industry to Total Litigated	% of Litigated to Non-Litigated	% of Litigated PIPEs
Non-durables	307	10	297	1.75%	3.37%	3.26%
Durables	267	8	259	1.40%	3.09%	3.00%
Manufacturing	578	28	550	4.90%	5.09%	4.84%
Energy	1,054	14	1,040	2.45%	1.35%	1.33%
Chemicals	230	13	217	2.28%	5.99%	5.65%
Business equipment	2,639	186	2,453	32.57%	7.58%	7.05%
Telecom	286	16	270	2.80%	5.93%	5.59%
Wholesale, retail, laundries, and repair shops	517	37	480	6.48%	7.71%	7.16%
Healthcare, medical equipment, and drugs	4,088	180	3,908	31.52%	4.61%	4.40%
Other	7,200	79	7,121	13.84%	1.11%	1.10%
Total	17,166	571	16,595		3.44%	3.33%

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**Table 2****Securities Class-Action Lawsuit Types and Characteristics**

Table 2 presents summary statistics of the distribution and characteristics of securities class-action lawsuits. Panel A presents the number of pre-PIPE lawsuits by allegation. The fractions of all allegation types do not add up to 100%, as complaints may include multiple allegations. Panel B presents lawsuit attributes, current case statuses, and the case status prior to the PIPE closing date.

Panel A: Lawsuit Distributions Across Allegation Types		
Lawsuit Allegation Types	Freq.	Percent
Misleading and false statements/Failure to disclose	568	99.47%
Business/Product/Patent/Technology-related	289	50.61%
Financial Misreporting/Accounting Malpractice	277	48.51%
Restatements	96	16.81%
Insider trading	215	37.65%
IPO/SEO/Security offerings	279	48.86%
Mergers and Acquisitions-related	113	19.79%
Analyst/Stock Promoter/Third-party-related	16	2.80%
IPO 300 laddering lawsuits	79	13.84%
Others	12	2.10%
Total	571	100%

Panel B: Summary Statistics of Lawsuits Attributes and Outcomes						
	Count	Mean	SD	p25	Median	p75
Settlement amount (in millions)	345	9.716	28.620	1.953	3.350	8.200
Insurance carrier paid amount (in millions)	200	5.337	8.916	1.953	1.953	6.400
Problem duration (days from class begin date to class end date)	571	406.914	359.643	161.000	299.000	548.000
Action duration (days from class end date to filing date)	571	100.898	155.009	5.000	19.000	169.000
Settlement duration (days from filing date to Settlement/case status date)	345	1635.412	928.247	886.000	1291.000	2660.000
Number of individual defendants (first complaint)	567	3.637	2.511	2.000	3.000	4.000
Number of individual defendants (Reference complaint)	531	4.593	3.428	2.000	3.000	6.000
Consolidated case	571	0.767	0.423	1.000	1.000	1.000
Entire board litigated	571	0.154	0.361	0.000	0.000	0.000
Underwriter litigated	571	0.254	0.436	0.000	0.000	1.000
Auditor litigated	570	0.051	0.220	0.000	0.000	0.000
Case status prior to PIPE	Freq.	Percent				
Dismissed	77	13.49%				
Settled	59	10.33%				
Ongoing	435	76.18%				
Total	571	100%				

**Table 3****Comparison of Financial and PIPE Characteristics by Litigation**

Table 3 reports the univariate tests including mean tests of the financial and PIPE characteristics of our PIPE sample between 2001 and 2018. Panel A presents the mean test of financial characteristics. The financial variables are measured at the fiscal year prior to the PIPE issuance year. Panel B presents the mean test of PIPE characteristics. Variables are winsorized at 1% level. The variables are defined in Appendix I.

Panel A: Financial Characteristics						
	Non-litigated PIPEs	Litigated PIPEs	Diff	N <sub>1</sub>	N <sub>2</sub>	p-value
Firm Size	3.524	4.689	-1.165	11398	518	0.000
Market Value (in millions)	238.980	665.601	-426.621	16533	570	0.000
CARs [-6, -1]	0.079	0.021	0.059	5965	465	0.119
Cash holdings	0.337	0.362	-0.025	11208	514	0.070
Leverage	0.304	0.345	-0.041	11398	518	0.139
CAPEX/Assets	0.073	0.047	0.026	11398	518	0.000
R&D/Assets	0.213	0.246	-0.032	11398	518	0.087
Sales/Assets	0.524	0.771	-0.247	11208	514	0.000
Cash burn rate	4.146	4.018	0.128	16548	569	0.850
M/B ratio	5.463	3.489	1.974	11075	509	0.000

Panel B: PIPE Characteristics						
	Non-litigated PIPEs	Litigated PIPEs	Diff	N <sub>1</sub>	N <sub>2</sub>	p-value
Deal size/Market cap	0.238	0.225	0.013	16524	570	0.474
Warrants	0.567	0.403	0.164	16595	571	0.000
Price resets	0.342	0.040	-0.006	16595	571	0.435
Board seats	0.089	0.194	-0.105	16595	571	0.000
Intermediated	0.554	0.469	0.085	16595	571	0.000
Pre-registered	0.095	0.189	-0.094	16595	571	0.000



**Table 4****Covariate Summary Statistics Before and After Entropy Balancing**

Table 4 reports the summary statistics of the mean, variance, and skewness of covariates before and after entropy balancing. We perform the entropy balancing to align the covariates to the third moment. Variables are winsorized at the 1% and 99% level. The variables are defined in Appendix I.

Panel A: Before Entropy Balancing	Non-litigated Control Units: 5553			Litigated Treated Units: 435		
	mean	variance	skewness	mean	variance	skewness
Common stock	0.709	0.206	-0.921	0.644	0.229	-0.600
Warrants	0.464	0.249	0.145	0.375	0.235	0.518
Board seats	0.105	0.094	2.584	0.198	0.159	1.518
Intermediated	0.533	0.249	-0.132	0.462	0.249	0.152
Pre-registered	0.208	0.165	1.438	0.209	0.166	1.430
CARs [-6, -1]	0.088	0.590	4.478	0.027	0.781	5.343
Firm size	4.137	2.826	0.872	4.917	3.187	0.437
Deal size/mMarket cap	0.200	0.109	5.132	0.199	0.056	3.134
Cash holdings	0.360	0.096	0.600	0.378	0.081	0.483
Leverage	0.245	0.167	4.964	0.304	0.201	3.562
CAPEX/aAssets	0.055	0.008	3.066	0.041	0.005	4.061
R&D/aAssets	0.223	0.129	3.122	0.230	0.128	3.564
Sales/aAssets	0.589	0.486	1.931	0.776	0.646	1.484
Cash burn rate	2.913	119.5	8.543	2.446	105.0	8.105
M/B ratio	3.504	20.02	5.804	2.612	11.65	11.97

Panel B: After Entropy Balancing	Non-litigated Control Units: 5553			Litigated Treated Units: 435		
	mean	variance	skewness	mean	variance	skewness
Common stock	0.643	0.229	-0.597	0.644	0.229	-0.600
Warrants	0.375	0.234	0.515	0.375	0.234	0.518
Board seats	0.198	0.159	1.514	0.198	0.159	1.518
Intermediated	0.462	0.249	0.152	0.462	0.249	0.152
Pre-registered	0.209	0.166	1.426	0.209	0.166	1.430
CARs [-6, -1]	0.027	0.781	5.344	0.027	0.781	5.343
Firm size	4.915	3.186	0.439	4.917	3.187	0.437
Deal size/Market cap	0.198	0.056	3.143	0.198	0.056	3.134
Cash holdings	0.378	0.081	0.484	0.378	0.081	0.483
Leverage	0.304	0.201	3.564	0.304	0.201	3.562
Capex/Assets	0.041	0.005	4.062	0.041	0.005	4.061
R&D/Assets	0.230	0.128	3.565	0.230	0.128	3.564
Sales/Assets	0.776	0.645	1.486	0.776	0.645	1.484
Cash burn rate	2.446	104.9	8.106	2.446	105.0	8.105
M/B ratio	2.612	11.65	11.97	2.612	11.65	11.97

**Table 5****Announcement Wealth Effect and Discount Comparisons by Litigation**

Table 5 reports t-test of the market reactions and the discount-adjusted market reactions around the PIPE announcement by litigation. Cumulative abnormal returns are calculated over [-1, +1] and [-2, +2] days around the PIPE announcement date using a market-adjusted model. Discount-adjusted cumulative abnormal returns are calculated as  $CAR_{adj} = [1/(1-\alpha)][CAR] + [\alpha/(1-\alpha)][(P_b - P_0)/P_b]$ , where CAR is the cumulative abnormal stock return estimated over a three-day window and five-day window around the PIPE announcement date using a market-adjusted model.  $\alpha$  is the ratio of shares placed to shares outstanding after the placement,  $P_b$  is the market price at the end of the day prior to the event window, and  $P_0$  is the placement price, following Hertz and Smith (1993). The variables are winsorized at the 1% and 99% level. The variables are defined in Appendix I.

	Non-litigated PIPEs	Litigated PIPEs	Diff	N <sub>1</sub>	N <sub>2</sub>	p-value
CARs [-1, +1] at PIPE announcement	1.412%	5.042%	-0.036	5496	439	0.000
CARs [-2, +2] at PIPE announcement	2.197%	6.084%	-0.039	5495	439	0.000
Discount-adjusted CARs [-1, +1] at PIPE announcement	2.854%	6.259%	-0.034	5385	431	0.005
Discount-adjusted CARs [-2, +2] at PIPE announcement	3.868%	8.061%	-0.042	5384	432	0.003
Discount	5.441%	-0.343%	0.058	16357	568	0.000

**Table 6****Stock Performance Around the Securities Class-Action Lawsuit Filing Date**

Table 6 presents the cumulative abnormal returns calculated using alternative event windows around the lawsuit filing date and the statistical significance. Cumulative daily returns are adjusted using the CRSP equally-weighted index. The total count of daily positive and negative returns are shown. The standardized, parametric Patell Z-statistic is used for statistical significance along with the respective p-values.

<b>Cumulative Abnormal Returns Around the Lawsuit Filing Date</b>					
Days	N	Mean Cumulative Abnormal Return	Positive: Negative	Patell Z Statistic	p-value
[-30,-1]	463	-24.01%	100:363<<<	-23.706	<.0001
[-20,-1]	461	-21.18%	113:348<<<	-25.944	<.0001
[0,+1]	449	-3.02%	164:285<<<	-10.925	<.0001
[+1,+20]	453	-4.45%	190:263<	-3.376	0.0004
[+1,+30]	454	-5.32%	186:268<	-3.334	0.0004

**Table 7****PIPE Characteristics and Lawsuit Attributes for Each Litigation Severity Tercile and Non-Litigated PIPEs**

Table 7 presents the summary statistics of the PIPE characteristics and lawsuit attributes distributed by each tercile of the CARs [-30,-1] at the securities class-action lawsuit filing date. Panel A presents the distributions of PIPE characteristics. Panel B presents the lawsuit attributes. Variables are winsorized at the 1% and 99% level. The variables are defined in Appendix I.

Panel A: PIPE characteristics								
	Most Severe Lawsuits Lowest Tercile		Severe Lawsuits 2 <sup>nd</sup> Tercile		Least Severe Lawsuits Highest Tercile		No Lawsuits Non-Litigated PIPEs	
	N	Mean	N	Mean	N	Mean	N	Mean
CARs [-1, +1] at PIPE Announcement	77	7.37%	74	5.65%	78	2.54%	5496	1.41%
CARs [-2, +2] at PIPE announcement	77	11.42%	74	5.74%	78	6.48%	5495	2.20%
Discount-Adjusted CARs [-1, +1] at PIPE announcement	76	8.07%	73	4.57%	78	4.97%	5385	2.85%
Discount-Adjusted CARs [-2, +2] at PIPE announcement	76	13.72%	73	5.21%	78	9.52%	5384	3.87%
Discount	88	3.98%	88	0.43%	87	-3.51%	16357	5.44%
Mean growth rate in 8K filings	80	0.652	83	0.621	81	0.732	11088	1.133
Change in sum of 8K CAR [-1, +1]	64	0.087	65	0.035	60	0.087	9419	0.017
Average percentage ownership	88	0.004	88	0.005	87	0.013	16595	0.002
Percentage change in Bid-Ask spread	51	0.137	51	0.558	57	0.380	2742	0.303
Warrants	88	0.409	88	0.398	87	0.368	16595	0.567
Price resets	88	0.045	88	0.045	87	0.035	16595	0.034
Board seats	88	0.102	88	0.205	87	0.229	16595	0.089
Intermediated	88	0.489	88	0.455	87	0.437	16595	0.554
Pre-registered	88	0.250	88	0.125	87	0.138	16595	0.095

Panel B: Lawsuit Attributes						
	Most Severe Lowest Tercile		Severe 2 <sup>nd</sup> Tercile		Least Severe Highest Tercile	
	N	Mean	N	Mean	N	Mean
Business/product related	88	0.602	88	0.466	86	0.500
Settlement amount (in millions)	56	23.053	52	8.491	50	7.526
Action duration (days from class end date to filing date)	88	36.375	88	99.273	87	167.759
Settlement duration (days from filing date to case status date)	88	1208.716	88	1366.432	87	1420.172
Consolidated	88	0.898	88	0.784	87	0.793
Entire board litigated	88	0.125	88	0.091	87	0.092
Auditor litigated	88	0.068	88	0.034	86	0.035

## Table 8

### Estimation of the Lawsuit Severity Impact on PIPE Announcement Wealth Effects

Table 8 presents the impact of the severity of the previous lawsuit on the market reactions to the subsequent PIPE offerings. The regressions are performed with weights adjusted in covariates from entropy balancing. The dependent variable is the cumulative abnormal returns using market-adjusted model over [-2, +2] days around the PIPE announcement date. The independent variables *Lawsuit severity*, *SEC enforcement*, *Total number of lawsuits*, and control variables are defined as in Appendix I. The control variables are measured at the fiscal year prior to the PIPE issuance year. Variables are winsorized at the 1% and 99% level. All specifications include industry fixed effects. All standard errors are clustered at the firm and industry level. Standard errors are reported in the parentheses. Asterisks \*\*\*, \*\*, \* represent significance at the 1%, 5%, and 10% levels respectively.

	(1) CAR [-2, +2] at PIPE Announcement	(2) CAR [-2, +2] at PIPE Announcement
Lawsuit Severity	0.023** (0.009)	0.050*** (0.017)
SEC enforcement	-0.087*** (0.029)	-0.086** (0.040)
Total number of lawsuits	-0.008*** (0.002)	-0.007*** (0.002)
Average percentage ownership	-1.154*** (0.446)	-0.881 (0.659)
Average percentage ownership square	1.573** (0.710)	1.833 (1.812)
Mean growth rate in 8K filings	-0.004 (0.005)	0.005 (0.004)
Percentage change in Bid-Ask spread	0.006 (0.005)	0.014*** (0.005)
Warrants	-0.082*** (0.022)	-0.048** (0.020)
Price resets	-0.088* (0.046)	-0.024 (0.048)
Pre-register	-0.098*** (0.019)	-0.045** (0.018)
Intermediated	-0.027 (0.022)	-0.071*** (0.017)
Board seats	0.001 (0.026)	0.012 (0.023)
Lawsuit severity × Average percentage ownership		-0.822 (0.691)
Lawsuit severity × Percentage ownership square		0.541 (1.681)
Lawsuit severity × Mean growth rate in 8K filings		-0.015* (0.008)
Lawsuit severity × Percentage change in Bid-Ask spread		-0.014** (0.006)
Lawsuit severity × Warrants		-0.055*** (0.021)
Lawsuit severity × Price resets		-0.080*** (0.027)
Lawsuit severity × Pre-registered		-0.067*** (0.021)
Lawsuit severity × Intermediated		0.056** (0.023)
Lawsuit severity × Board seats		-0.010 (0.020)
Constant	0.085 (0.068)	0.068 (0.064)
Observations	1988	1988
R <sup>2</sup>	0.122	0.168
Controls	Yes	Yes



**Table 9**

**Estimation of the Impact of Lawsuit Severity on PIPE Discount-Adjusted Announcement Wealth Effects and PIPE Discounts**

Table 9 presents the impact of the severity of the previous lawsuit on the discount-adjusted announcement abnormal returns and discounts of the subsequent PIPE offerings. The regressions are performed with weights adjusted in covariates from entropy balancing. The first dependent variable *Discount* is measured as one minus the purchase conversion price divided by the market price prior to the PIPE closing (following Krishnamurthy (2005) and Hertz and Smith (1993)). The second dependent variable *Discount Adjusted CARs [-2, +2]* is calculated as  $CAR_{adj} = [1/(1-\alpha)][CAR] + [\alpha/(1-\alpha)][(P_b - P_0)/P_b]$ , where CAR is the cumulative abnormal stock return estimated over a five-day window on the PIPE announcement [-2, +2].  $\alpha$  is the ratio of shares placed to shares outstanding after the placement,  $P_b$  is the market price at the end of the day prior to the event window, and  $P_0$  is the placement price, following Hertz and Smith (1993). The independent variables *Lawsuit severity*, *SEC enforcement*, *Total number of lawsuits*, and control variables are defined as in Appendix I. The control variables are measured at the fiscal year prior to the PIPE issuance year. Variables are winsorized at the 1% and 99% level. All specifications include industry fixed effects. All standard errors are clustered at firm level. Standard errors are reported in the parentheses. Asterisks \*\*\*, \*\*, \* represent significance level at the 1%, 5%, and 10% levels, respectively.

	(1) Discount	(2) Discount Adjusted CAR [-2, +2]
Lawsuit Severity	0.062 <sup>***</sup> (0.019)	0.061 <sup>***</sup> (0.020)
SEC enforcement	-0.033 (0.083)	-0.147 <sup>**</sup> (0.070)
Total number of lawsuits	0.003 (0.003)	-0.007 <sup>*</sup> (0.004)
Average percentage ownership	1.803 <sup>**</sup> (0.752)	-0.991 (0.786)
Average percentage ownership square	-4.868 <sup>***</sup> (1.641)	0.840 (2.346)
Mean growth rate in 8K filings	-0.003 (0.012)	0.009 (0.006)
Percentage change in Bid-Ask spread	-0.011 (0.008)	0.015 <sup>**</sup> (0.006)
Warrants	0.018 (0.023)	-0.045 <sup>**</sup> (0.023)
Price resets	0.040 (0.050)	-0.008 (0.056)
Pre-register	0.076 <sup>***</sup> (0.017)	-0.062 <sup>***</sup> (0.021)
Intermediated	0.083 <sup>***</sup> (0.021)	-0.072 <sup>***</sup> (0.021)
Board seats	-0.014 (0.035)	0.011 (0.033)
Lawsuit severity × Average percentage ownership	-1.767 <sup>***</sup> (0.643)	-0.805 (0.847)
Lawsuit severity × Percentage ownership square	5.081 <sup>***</sup> (1.543)	1.747 (2.241)
Lawsuit severity × Mean growth rate in 8K filings	-0.023 <sup>**</sup> (0.014)	-0.021 <sup>**</sup> (0.010)
Lawsuit severity × Percentage change in Bid-Ask spread	-0.007 (0.006)	-0.021 <sup>**</sup> (0.008)
Lawsuit severity × Warrants	0.000 (0.016)	-0.065 <sup>**</sup> (0.026)
Lawsuit severity × Price resets	-0.049 (0.055)	-0.090 <sup>**</sup> (0.044)
Lawsuit severity × Pre-registered	-0.018 (0.020)	-0.075 <sup>***</sup> (0.025)
Lawsuit severity × Intermediated	-0.036 <sup>**</sup> (0.017)	0.066 <sup>**</sup> (0.029)
Lawsuit severity × Board seats	-0.001 (0.022)	-0.006 (0.023)
Constant	-0.066 (0.068)	0.099 (0.074)
Observations	2000	1945
R <sup>2</sup>	0.261	0.194
Controls	Yes	Yes

**Table 10**

**Estimation of the Impact of Lawsuit Allegation Types and Attributes on PIPE Discounts**

Table 10 presents the impact of the types and attributes of the previous lawsuit on the discounts of the subsequent PIPE offerings. The regressions are performed with weights adjusted in covariates from entropy balancing. The dependent variable *Discount* is measured as one minus the purchase conversion price divided by the market price prior to the PIPE closing (following Krishnamurthy (2005) and Hertz and Smith (1993)). In Panel A, the independent variables are indicator variables featuring lawsuit allegation types hand-collected from complaints file and classified in Panel A, Table 2. In Panel B, the independent variables are *Ongoing*, which is a dummy variable that takes value 1 if the lawsuit is still ongoing at the time of the PIPE; *Settled*, which is a dummy variable that takes value 1 if the lawsuit is settled (with the defendant losing the case by paying a monetary penalty to the plaintiff) at the time of the PIPE; and *Time to PIPE*, which is the natural logarithm of the days from the lawsuit filing date to the PIPE closing date. The independent variables *Lawsuit severity*, *SEC enforcement*, *Total number of lawsuits*, and control variables are defined as in Appendix I. The control variables are measured at the fiscal year prior to the PIPE issuance year. The control variables include the mitigating variables reported in Table 8. Variables are winsorized at the 1% and 99% level. All specifications include industry fixed effects. All standard errors are clustered at firm level. Standard errors are reported in the parentheses. Asterisks \*\*\*, \*\*, \* represent significance level at the 1%, 5%, and 10% levels, respectively.

Panel A: Allegation Types									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Discount	Discount	Discount	Discount	Discount	Discount	Discount	Discount	Discount
Business/Product/Patent/Technology related	-0.069 (0.052)								
Financial misreporting/Accounting Malpractice		0.127*** (0.047)							
Restatements			0.095* (0.056)						
Auditor litigated				0.216*** (0.076)					
Insider trading					0.039 (0.047)				
IPO/SEO/Security offerings						0.010 (0.049)			
Mergers and Acquisitions related							0.014 (0.056)		
Analyst/Promoter/Third-party related								0.147*** (0.051)	
IPO 300 laddering lawsuits									0.088 (0.072)
SEC enforcement	-0.056 (0.038)	-0.049 (0.051)	-0.062 (0.050)	-0.071 (0.046)	-0.046 (0.042)	-0.031 (0.040)	-0.038 (0.039)	-0.051 (0.038)	-0.055 (0.039)
Total number of lawsuits	0.001 (0.004)	-0.001 (0.004)	0.000 (0.004)	-0.000 (0.004)	-0.002 (0.003)	-0.001 (0.003)	0.000 (0.004)	0.001 (0.004)	0.000 (0.004)
Constant	-0.071 (0.060)	-0.138** (0.061)	-0.110* (0.063)	-0.093 (0.064)	-0.099 (0.063)	-0.075 (0.062)	-0.095 (0.067)	-0.067 (0.062)	-0.104 (0.063)
Observations	2106	2106	2106	2106	2106	2106	2106	2106	2106
R <sup>2</sup>	0.231	0.247	0.222	0.218	0.237	0.236	0.225	0.216	0.213
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Lawsuit Attributes			
	(1)	(2)	(3)
	Discount	Discount	Discount
Ongoing	0.150** (0.075)		
Settled		-0.166* (0.094)	
Time to PIPE			-0.062** (0.028)
SEC enforcement	-0.086** (0.035)	-0.078** (0.039)	-0.074* (0.040)
Total number of lawsuits	-0.004 (0.006)	-0.003 (0.006)	-0.005 (0.006)
Mean growth rate in 8K filings	0.047*** (0.015)	-0.036 (0.022)	-0.093 (0.060)
Average percentage ownership	-0.528 (4.453)	1.685 (1.240)	-13.280 (13.990)
Average percentage ownership square	5.376 (22.810)	-2.621 (1.975)	136.621 (158.137)
Percentage change in Bid-Ask spread	-0.017 (0.013)	-0.010 (0.013)	0.104 (0.135)
Warrants	0.128*** (0.052)	0.094*** (0.034)	0.136 (0.186)
Price resets	0.112 (0.200)	-0.179 (0.209)	-1.179*** (0.410)
Pre-register	0.101 (0.063)	0.092** (0.038)	0.146 (0.207)
intermediate	0.075 (0.063)	0.003 (0.036)	-0.373* (0.205)
Board Seats	0.064 (0.077)	-0.043 (0.048)	-0.538*** (0.197)
Constant	-0.280** (0.119)	-0.155 (0.102)	0.168 (0.162)
Observations	230	230	230
R <sup>2</sup>	0.404	0.378	0.417
Controls	Yes	Yes	Yes

**Table 11**

**Estimation of the Interaction of Lawsuit Severity with Auditor Change and Disclosure on PIPE Announcement Wealth Effects and Discounts**

Table 11 presents the interactions of the severity of the previous lawsuit with auditor change and disclosure on the PIPE announcement wealth effects and discounts of the subsequent PIPE offerings. The regressions are performed with weights adjusted in covariates from entropy balancing. The first dependent variable is the cumulative abnormal returns using market-adjusted model over  $[-2, +2]$  days around the PIPE announcement date. The second dependent variable *Discount Adjusted CARs*  $[-2, +2]$  is calculated as  $CAR_{adj} = [1/(1-\alpha)][CAR] + [\alpha/(1-\alpha)][(P_b - P_0)/P_b]$ , where CAR is the cumulative abnormal stock return estimated over a five-day window on the PIPE announcement  $[-2, +2]$ .  $\alpha$  is the ratio of shares placed to shares outstanding after the placement,  $P_b$  is the market price at the end of the day prior to the event window, and  $P_0$  is the placement price, following Hertz and Smith (1993). The third dependent variable *Discount* is measured as one minus the purchase conversion price divided by the market price prior to the PIPE closing (following Krishnamurthy (2005) and Hertz and Smith (1993)). *NB6toB6* (*B6toNB6*) is a dummy variable equal to 1 if the PIPE firm replaces the auditor from a non-Big6 (Big6) auditor firm with a Big6 (non-Big6) auditor firm during the intervening period from the lawsuit filing to the PIPE offering for litigated issuers, and from five years prior to the PIPE offering for non-litigated issuers. The independent variables *Lawsuit severity*, *SEC enforcement*, *Total number of lawsuits*, and control variables are defined as in Appendix I. The control variables are measured at the fiscal year prior to the PIPE issuance year. Variables are winsorized at the 1% and 99% level. All specifications include industry fixed effects. All standard errors are clustered at firm level. Standard errors are reported in the parentheses. Asterisks \*\*\*, \*\*, \* represent significance level at the 1%, 5%, and 10% levels respectively.

Panel A: NB6 to B6	(1) CARs [-2, +2] at PIPE Announcement	(2) Discount Adjusted CARs [-2, +2]	(3) Discount
Lawsuit Severity	0.035*** (0.012)	0.047*** (0.016)	0.039*** (0.011)
SEC enforcement	-0.092*** (0.031)	-0.132*** (0.035)	-0.058 (0.048)
Total number of lawsuits	-0.005** (0.002)	-0.006** (0.003)	0.003* (0.002)
Mean growth rate in 8K filings	-0.003 (0.003)	-0.008 (0.005)	0.009 (0.013)
Lawsuit severity × Mean growth rate in 8K filings	-0.004 (0.007)	-0.007 (0.008)	-0.003 (0.009)
NB6toB6 × Mean growth rate in 8K filings	-0.004 (0.014)	-0.017 (0.022)	0.008 (0.018)
Lawsuit severity × NB6toB6 × Mean growth rate in 8K filings	0.643*** (0.036)	0.718*** (0.046)	-0.200*** (0.047)
Average percentage ownership	-0.370 (0.377)	-0.540 (0.504)	0.718 (0.467)
Average percentage ownership square	0.176 (1.014)	0.528 (1.320)	-1.563 (1.035)
Lawsuit severity × Average percentage ownership	-0.405 (0.390)	-0.412 (0.494)	-0.780*** (0.263)
Lawsuit severity × Percentage ownership square	0.939 (0.957)	1.013 (1.197)	1.838** (0.763)
NB6toB6	0.032 (0.033)	0.086 (0.054)	0.039 (0.028)
Lawsuit severity × NB6toB6	-0.360*** (0.030)	-0.419*** (0.040)	0.178*** (0.029)
Warrants	-0.027** (0.013)	-0.035* (0.018)	0.017 (0.015)
Lawsuit severity × Warrants	-0.060*** (0.017)	-0.074*** (0.021)	0.002 (0.013)
Price resets	-0.026 (0.028)	-0.033 (0.035)	-0.079 (0.048)
Lawsuit severity × Price resets	-0.068** (0.027)	-0.078*** (0.027)	0.092** (0.039)
Pre-registered	-0.058*** (0.013)	-0.086*** (0.015)	0.046*** (0.013)
Lawsuit severity × Pre-registered	-0.036* (0.021)	-0.035 (0.025)	-0.014 (0.014)
Intermediated	-0.076*** (0.012)	-0.094*** (0.018)	0.101*** (0.021)
Lawsuit severity × Intermediated	0.045** (0.021)	0.048* (0.025)	-0.029** (0.013)
Board Seats	0.037** (0.016)	0.062** (0.024)	-0.005 (0.023)
Lawsuit severity × Board seats	-0.003 (0.022)	-0.013 (0.027)	-0.003 (0.015)
Constant	0.039 (0.040)	0.075 (0.058)	-0.002 (0.044)
Observations	4399	4319	4750
R <sup>2</sup>	0.141	0.135	0.162
Controls	Yes	Yes	Yes

Panel B: B6 to NB6	(1)	(2)	(3)
	CAR [-2, +2] at PIPE Announcement	Discount Adjusted CAR [-2, +2]	Discount
Lawsuit Severity	0.031** (0.012)	0.042*** (0.016)	0.038*** (0.011)
SEC enforcement	-0.093*** (0.031)	-0.135*** (0.035)	-0.059 (0.049)
Total number of lawsuits	-0.005** (0.002)	-0.006** (0.003)	0.003* (0.002)
Mean growth rate in 8K filings	-0.003 (0.003)	-0.003 (0.004)	-0.001 (0.009)
Lawsuit severity × Mean growth rate in 8K filings	-0.001 (0.006)	-0.003 (0.008)	-0.005 (0.010)
B6toNB6 × Mean growth rate in 8K filings	-0.004 (0.025)	0.039 (0.040)	0.068** (0.029)
Lawsuit severity × B6toNB6 × Mean growth rate in 8K filings	-0.271*** (0.089)	-0.309** (0.120)	-0.108 (0.077)
Average percentage ownership	-0.335 (0.378)	-0.523 (0.505)	0.718 (0.466)
Average percentage ownership square	0.057 (1.018)	0.449 (1.319)	-1.533 (1.022)
Lawsuit severity × Average percentage ownership	-0.417 (0.386)	-0.411 (0.489)	-0.770*** (0.261)
Lawsuit severity × Percentage ownership square	1.026 (0.956)	1.059 (1.190)	1.792** (0.743)
B6toNB6	0.040 (0.038)	0.015 (0.045)	-0.118** (0.052)
Lawsuit severity × B6toNB6	0.017 (0.045)	0.030 (0.054)	0.028 (0.051)
Warrants	-0.025* (0.013)	-0.031* (0.018)	0.019 (0.015)
Lawsuit severity × Warrants	-0.055*** (0.017)	-0.070*** (0.022)	0.001 (0.013)
Price resets	-0.025 (0.028)	-0.031 (0.034)	-0.075 (0.047)
Lawsuit severity × Price resets	-0.071*** (0.027)	-0.079*** (0.026)	0.091** (0.040)
Pre-registered	-0.055*** (0.013)	-0.082*** (0.016)	0.050*** (0.013)
Lawsuit severity × Pre-registered	-0.029 (0.022)	-0.026 (0.026)	-0.019 (0.014)
Intermediated	-0.078*** (0.012)	-0.088*** (0.016)	0.084*** (0.014)
Lawsuit severity × Intermediated	0.045** (0.021)	0.048* (0.025)	-0.025** (0.013)
Board Seats	0.036** (0.016)	0.063** (0.025)	-0.001 (0.022)
Lawsuit severity × Board seats	-0.002 (0.022)	-0.011 (0.026)	-0.006 (0.016)
Constant	0.037 (0.041)	0.071 (0.059)	0.017 (0.043)
Observations	4399	4319	4750
R <sup>2</sup>	0.122	0.119	0.161
Controls	Yes	Yes	Yes



## Appendix I

### Variable Definitions

Variables	Definitions
<i>Dependent Variables</i>	
CARs [-1, +1] at PIPE announcement	Cumulative abnormal returns using market-adjusted model at [-1, +1] days around the PIPE announcement date.
CARs [-2, +2] at PIPE announcement	Cumulative abnormal returns using market-adjusted model at [-2, +2] days around the PIPE announcement date.
Discount-adjusted CARs [-1, +1]	$CAR_{adj} = [1/(1-\alpha)][CAR] + [\alpha/(1-\alpha)][(P_b - P_0)/P_b]$ , where CAR is the cumulative abnormal stock return estimated over a three-day window on the PIPE announcement [-1, +1]. $\alpha$ is the ratio of shares placed to shares outstanding after the placement, $P_b$ is the market price at the end of the day prior to the event window, and $P_0$ is the placement price, following Hertz and Smith (1993).
Discount-adjusted CARs [-2, +2]	$CAR_{adj} = [1/(1-\alpha)][CAR] + [\alpha/(1-\alpha)][(P_b - P_0)/P_b]$ , where CAR is the cumulative abnormal stock return estimated over a five-day window on the PIPE announcement [-2, +2]. $\alpha$ is the ratio of shares placed to shares outstanding after the placement, $P_b$ is the market price at the end of the day prior to the event window, and $P_0$ is the placement price, following Hertz and Smith (1993).
Discount	One minus the purchase conversion price divided by the market price prior to the PIPE closing (following Krishnamurthy (2005) and Hertz and Smith (1993)).
<i>Independent Variables</i>	
Lawsuit severity	A categorical variable that equals 3 if the litigated PIPE is in the lowest tercile of CARs [-30,-1] around the lawsuit filing date; equals 2 if the litigated PIPE is in the 2nd tercile of CARs [-30,-1] around the lawsuit filing date; equals 1 if the litigated PIPE is in the highest tercile of CARs [-30,-1] around the lawsuit filing date; equals 0 if the PIPE did not incur litigation within five years prior to the offering.
CARs [-30, -1] at lawsuit filing	Cumulative abnormal returns using market-adjusted model at [-30, -1] days preceding the case filing date.
Litigation	Dummy variable equal to 1 if the PIPE issuing firm is sued in a securities class action lawsuit filed within five years prior to the PIPE.
SEC enforcement	The number of SEC enforcement actions against a PIPE issuer within five years preceding the PIPE.
Total number of lawsuits	The number of total lawsuit cases reported in Audit Analytics where the firm is a defendant within the five years preceding the PIPE.
Ongoing	Indicator for lawsuit status. It is a dummy variable equal to 1 if the case status is ongoing at the time of the PIPE and 0 otherwise.
Settled	Indicator for lawsuit status. It is a dummy variable equal to 1 if the case status is settled (with the defendant losing the case by paying a monetary penalty to the plaintiff) at the time of the PIPE and 0 otherwise.
Time to PIPE	The natural logarithm of the days from the lawsuit filing date to the PIPE closing date.
Firm size	The natural logarithm of the firm's total (book) assets.

Common stock	Indicator for security type choice. It is a dummy variable equal to 1 if the security type is “common stock” and 0 if the security type is “convertible debt” or “convertible preferred stock.”
Mean growth rate in 8K filings	The average growth rate in the firm’s 8K filings from the year of case filing to the PIPE year for litigated issuers and from five years prior to the PIPE year for non-litigated issuers.
Change in sum of 8K CAR [-1, +1]	The change in the sum of three-day cumulative abnormal returns around all 8K reports filed within three months after the lawsuit filing to within three months prior to the PIPE offering.
Percentage change in Bid-Ask spread	The percentage change in bid-ask spread from the quarter following the lawsuit filing date to the quarter before the PIPE placement closing date. for litigated issuers and from 12 quarters before the PIPE to the quarter before the PIPE for non-litigated issuers.
Average percentage ownership	The mean prior ownership (in percentage) of the PIPE investors that are from the PIPE firm’s existing shareholders across the four quarters preceding the PIPE.
NBtoB6	A dummy variable equal to 1 if the PIPE firm replaces the auditor from a non-Big6 auditor firm with a Big6 auditor firm during the intervening period from the lawsuit filing to the PIPE offering for litigated issuers, and from five years prior to the PIPE offering for non-litigated issuers.
B6toNB6	A dummy variable equal to 1 if the PIPE firm replaces the auditor from a Big6 auditor firm with a non-Big6 auditor firm during the intervening period from the lawsuit filing to the PIPE offering for litigated issuers, and from five years prior to the PIPE offering for non-litigated issuers.
Warrants	A dummy variable equal to 1 if the PIPE contract includes warrants.
Price resets	A dummy variable equal to 1 if the PIPE contract includes price resets.
Board seats	A dummy variable equal to 1 if the PIPE contract includes board seat terms.
Corporate insider	A dummy variable equal to 1 if the corporate executive/officer is among the PIPE investors.
Intermediated	A dummy variable equal to 1 if the PIPE is conducted with a placement agent.
Pre-registered	A dummy variable equal to 1 if the PIPE is pre-registered before offering.
Deal size/Market cap	The PIPE deal size scaled by the market capitalization of the firm on the PIPE closing date.
CARs [-6, -1]	Cumulative abnormal returns using market adjusted model at [-6, -1] months before the PIPE closing date.
Cash holdings	The firm’s cash and equivalents scaled by total assets.
Leverage	The firm’s long-term and short-term debts scaled by total assets.
CAPEX/Assets	The firm’s capital expenditure scaled by total assets.
R&D/Assets	The firm’s R&D expense scaled by total assets.
Sales/Assets	The firm’s revenues scaled by total assets.
Cash burn rate	The absolute value of the firm’s EBITDA scaled by cash and equivalents. Takes value of 0 if the firm’s EBITA is positive.
M/B ratio	The firm’s market-to-book ratio calculated as market value scaled by book value.

## Appendix II

### Hand-Collection Process of Securities Class-Action Lawsuits

We collect our lawsuit sample in following steps.

First, we use scraping techniques and download the lawsuit basic information from the Stanford Class Action Clearinghouse database (<http://securities.stanford.edu/>) from 1996 (the beginning year of the database) to 2019. The basics include filing date, filing name, case status, industry and sector, court name, civil docket number, class period start date, and class period end date. We have a total of 5568 lawsuit cases as the raw sample. Next, we identify the lawsuits filed before the PIPE closing date. As such, we need to match the lawsuit actions to our PIPE sample. Although ticker symbols of the firms are given by the Stanford database, ticker symbols are changeable over time (due to change of firms' names, M&As, delisting, etc). To ensure accurate matching, we manually identify the CIKs for both the litigated firms and PIPE issuers using SEC Edgar. We match 5468 CIKs for 5568 lawsuit actions and 22,338 CIKs for 23,480 PIPE placements. Using a combination of CIK and ticker symbols, we are able to identify 1135 lawsuits that were filed before the PIPE placement date.

Second, we collect lawsuit specifics and attributes. We count the number of individual defendants listed in the U.S. District Court Civil Docket document.<sup>20</sup> We collect the settlement amount (if settled), the director and officer insurance copay amount (if there is specific statement on that) in the Stipulation and Agreement of Settlement document.<sup>21</sup> In addition, we extract securities class-action lawsuits data from the Audit Analytics Litigation database. We match the AA database with the Stanford lawsuit database by filing the date, court name, and civil docket number. We find that the AA database has 4232 overlapped cases with the Stanford database. Although the AA database provides the settlement amount and allegation types., we find that the the allegation types in the AA database are too extensive and the settlement amount is often missing and sometimes incorrectly entered (according to the official documents released from the court). Therefore, we reclassify the allegation types by reading the class action complaints and then collect the settlement amount in the court documents published on the SCAC website.

After careful consideration, we classify the securities class-action lawsuits into 10 categories: (1) Misleading and false statements, failure to disclose, or omission about important adverse facts (which accounts for most of our sample); (2) Business, Product, Technology, or Patent related (could be a subset of the first category); (3) Financial Misreporting or Accounting Malpractice (violation of GAAP standards falls into this category); (4) Restatement (if the accounting malpractice leads to a restatement of the old financial reports, which could be a subset of category 3); (5) IPO/SEO/Securityofferings related (including debt offerings and private placements); (6) M&A related; (7) Insider trading (identified by individual defendants who are usually firm directors and officers and their related family members that sold shares during the inflated stock price period); (8) Analysts/Stock promoters/Third party (i.e., a broker firm that gives false encouraging recommendations on buying a firm's stock); (9) Auditor litigated (if the external auditor is listed as a defendant); and (10) Others (i.e., breaching fiduciary duty).

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<sup>20</sup> The number of listed individual defendants listed be different in the first-identified class action complaint and consolidated amended class-action complaint. Plaintiffs may add more related individuals as defendants as the investigation proceeds.

<sup>21</sup> The documents that help us identify the settlement amounts include but are not limited to "Notice of Pendency and Proposed Settlement of Class Action," "Proposed Order Preliminary Approving Settlement and Scheduled Final Settlement Hearing," "Order Approving Plan of Allocation of Settlement Proceeds," and so forth based on availability.

These allegations could be related and overlap. For example, restatement and auditor litigated are likely to come together with financial reporting/accounting malpractice. Mergers and acquisitions could be related to a firm's business information it was supposed to release or communicate in the proxy statement (to all of its shareholders). Most notably, it is prevalent that the defendants are alleged to have misrepresented or released false and misleading information and failed to disclose material adverse facts about the firm to inflate its stock price. During the inflated stock-price period, it is observed that the defendants usually sold their withholding shares (insider trading), issued new securities, or raised new capital at the inflated price, or make mergers and acquisitions using the inflated shares as a currency. Among those, insider trading is identified most frequently in our sample. Therefore, the defendants seemed to have made these plans *ex ante* as initial motives to push up the share price by misrepresenting or releasing misleading information about the firm.

In addition, we further collect the specifics on whether: (a) the case was consolidated, (b) the entire board was sued, (c) the case is IPO/SEO/Security offerings related, or (d) the underwriter was litigated.<sup>22</sup> Our classification of the allegation types is substantially different from the AA database and we supplement the missing settlement amount in the AA database to a large extent.

Lastly, we note that among the 1135 collected lawsuits, 103 of them belong to a large group of long-running IPO laddering litigation. All of these lawsuits were filed in 2001, but achieved settlement in 2009. The global gross amount of the settlement was \$586 million. We identify them in the allegation type as well. The lawsuit summary statistics of the 1135 cases are presented below (before excluding the financial and utility firms).

Panel A: Lawsuit summary statistics					
Year filed	Freq.	Percent	FF12 Industries	Freq.	Percent
1996	16	1.41	Nondurables	27	2.38
1997	30	2.64	Durables	15	1.32
1998	47	4.14	Manufacturing	45	3.96
1999	39	3.44	Energy	29	2.56
2000	56	4.93	Chemicals	24	2.11
2001	160	14.1	Business Equipment	318	28.02
2002	61	5.37	Telecom	43	3.79
2003	47	4.14	Utilities	18	1.59
2004	64	5.64	Wholesale, retail, laundries, and repair shops	65	5.73
2005	50	4.41	Healthcare, medical equipment, and drugs	264	23.26
2006	34	3.00	Finance	153	13.48
2007	47	4.14	Other	134	11.81
2008	48	4.23	Total	1135	100
2009	27	2.38	Lawsuit Allegation Types	Freq.	Percent
2010	35	3.08	Misleading and False statements/Failure to disclose	1089	95.95
2011	42	3.70	Business/Product/Patent/Technology related	581	51.19
2012	38	3.35	Financial misreporting/Accounting malpractice	622	54.80
2013	41	3.61	Restatements	198	17.44

<sup>22</sup> The court will often order all the cases involving the same allegations of the defendant firm to be consolidated into one case number.

2014	42	3.7	Insider trading	383	33.74
2015	49	4.32	IPO/SEO/Security offerings	485	42.73
2016	39	3.44	Mergers and Acquisitions related	276	24.32
2017	57	5.02	Analyst/Stock Promoter/Third party related	61	5.37
2018	37	3.26	IPO 300 laddering lawsuits	103	9.07
2019	29	2.56	Others	46	4.05
<b>Total</b>	<b>1135</b>	<b>100</b>	<b>Total</b>	<b>1135</b>	<b>100</b>

Panel B: Summary Statistics of Lawsuits' Attributes and Outcomes

	Count	Mean	SD	p25	Median	p75
Settlement amount (in millions)	606	23.93	123.33	1.95	4.25	10.5
Insurance carrier paid amount (in millions)	363	8.66	36.01	1.70	1.95	6.5
Problem duration (days from class begin date to class end date)	1133	440.91	432.27	156	307	580
Action duration (days from class end date to filing date)	1133	104.44	169.22	4	20	152
Settlement duration (days from filing date to settlement/case status date)	606	1667.571	894.23	906	1326	2638
Number of individual defendants (First complaint)	1128	3.93	3.77	2	3	5
Number of individual defendants (Reference complaint)	1058	5.12	6.20	2	4	7
Consolidated case	825	0.73	0.45	0	1	1
Entire board litigated	183	0.16	0.37	0	0	0
Underwriter litigated	243	0.21	0.41	0	0	0
Auditor litigated	65	0.06	0.23	0	0	0
Case Status (as of Dec 2019)	Freq.	Percent				
Settled	623	54.9				
Dismissed	441	38.85				
Ongoing	71	6.25				
<b>Total</b>	<b>1135</b>	<b>100</b>				

## Internet Appendix I

### Definitions of Corporate Events Disclosed in 8K Filings

Item 1.01	Entry into a Material Definitive Agreement
Item 1.02	Termination of a Material Definitive Agreement
Item 1.03	Bankruptcy or Receivership
Item 2.01	Completion of Acquisition or Disposition of Assets
Item 2.02	Results of Operations and Financial Condition
Item 2.03	Creation of a Direct Financial Obligation or an Obligation Under an Off-balance Sheet Arrangement of a Registrant.
Item 2.04	Triggering Events That Accelerate or Increase a Direct Financial Obligation or an Obligation Under an Off-balance Sheet Arrangement
Item 2.05	Costs Associated with Exit or Disposal Activities
Item 2.06	Material Impairments
Item 3.01	Notice of Delisting or Failure to Satisfy a Continued Listing Rule or Standard; Transfer of Listing
Item 3.02	Unregistered Sales of Equity Securities
Item 3.03	Material Modification to Rights of Security Holders
Item 4.01	Changes in Registrant's Certifying Accountant
Item 4.02	Non-reliance on Previously Issued Financial Statements or a Related Audit Report or Completed Interim Review
Item 5.01	Changes in Control of Registrant
Item 5.02	Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers
Item 5.03	Amendments to Articles of Incorporation or Bylaws; Change in Fiscal Year
Item 5.04	Temporary Suspension of Trading Under Registrant's Employee Benefit Plans
Item 5.05	Amendments to the Registrant's Code of Ethics, or Waiver of a Provision of the Code of Ethics
Item 5.06	Change in Shell Company Status
Item 5.07	Submission of Matters to a Vote of Security Holders
Item 6.01	ABS Informational and Computational Material
Item 6.02	Change of Servicer or Trustee
Item 6.03	Change in Credit Enhancement or Other External Support
Item 6.04	Failure to Make a Required Distribution
Item 7.01	Regulation FD Disclosure
Item 8.01	Other Events

## Internet Appendix II

### Market-adjusted Abnormal Returns around Lawsuit Filing Date using an Equally Weighted Index

Days	N	Mean Abnormal Return	Positive: Negative	Uncorrected Patell Z	p-value
-30	464	-0.38%	203:261	-2.072	0.0191
-29	464	0.33%	217:247	1.953	0.0254
-28	464	0.09%	217:247	-0.31	0.3784
-27	463	-0.43%	203:260	-1.126	0.1301
-26	463	-0.23%	206:257	-1.68	0.0464
-25	462	-0.70%	200:262	-2.246	0.0124
-24	462	0.03%	221:241	-0.03	0.4882
-23	462	-0.89%	187:275<	-4.179	<.0001
-22	461	0.05%	202:259	-0.606	0.2724
-21	461	-0.80%	200:261	-3.968	<.0001
-20	462	-0.33%	211:251	-1.434	0.0757
-19	462	-0.72%	183:279<<	-3.46	0.0003
-18	462	-0.43%	205:257	-2.071	0.0192
-17	462	-0.15%	209:253	-1.134	0.1284
-16	462	-0.58%	198:264	-3.443	0.0003
-15	462	-1.20%	191:271<	-6.507	<.0001
-14	462	-0.60%	209:253	-3.211	0.0007
-13	462	-0.70%	199:263	-4.173	<.0001
-12	461	-0.52%	206:255	-2.272	0.0115
-11	462	-0.81%	193:269(	-4.058	<.0001
-10	462	-0.73%	213:249	-4.099	<.0001
-9	462	-0.72%	192:270<	-3.301	0.0005
-8	462	-0.66%	195:267(	-3.379	0.0004
-7	462	-0.99%	207:255	-5.451	<.0001
-6	460	-1.23%	182:278<<	-6.295	<.0001
-5	460	-1.54%	188:272<	-8.041	<.0001
-4	461	-1.60%	190:271<	-9.817	<.0001
-3	460	-2.94%	172:288<<<	-17.298	<.0001
-2	454	-2.02%	197:257	-11.103	<.0001
-1	454	-3.05%	172:282<<<	-15.846	<.0001
0	450	-1.85%	183:267<	-11.486	<.0001
1	451	-1.13%	178:273<<	-3.927	<.0001
2	452	-0.82%	178:274<<	-3.396	0.0003
3	452	-0.19%	181:271<	-0.147	0.4417
4	452	-0.40%	193:259	-1.193	0.1163
5	452	-0.22%	187:265<	-1.071	0.1421
6	453	-0.85%	190:263(	-1.782	0.0374

7	452	0.18%	198:254	0.577	0.2821
8	451	-0.18%	196:255	0.219	0.4132
9	453	-0.37%	188:265<	-1.868	0.0309
10	453	0.42%	215:238	1.45	0.0736
11	453	0.16%	216:237	0.959	0.1688
12	453	0.64%	227:226>	1.716	0.0431
13	453	-0.27%	202:251	-0.472	0.3183
14	453	0.41%	216:237	2.53	0.0057
15	453	-0.30%	185:268<	-1.567	0.0586
16	453	-0.20%	194:259	0.166	0.4341
17	452	-0.26%	207:245	-1.098	0.1361
18	452	-0.67%	173:279<<	-2.641	0.0041
19	452	-0.74%	190:262(	-3.618	0.0002
20	452	0.18%	198:254	0.882	0.1888
21	452	-0.35%	201:251	-2.21	0.0136
22	452	-0.03%	194:258	0.104	0.4585
23	452	0.18%	217:235	1.865	0.0311
24	453	-0.39%	194:259	-1.358	0.0872
25	453	0.04%	197:256	0.963	0.1677
26	453	0.18%	207:246	0.229	0.4093
27	453	0.03%	201:252	-0.091	0.4638
28	453	0.12%	204:249	0.514	0.3038
29	452	-0.20%	204:248	-0.262	0.3966
30	452	-0.51%	205:247	-2.593	0.0048

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### Internet Appendix III

#### Estimation of the Lawsuit Severity Interaction with the Total Count of Auditor Changes and Disclosure on PIPE Announcement Wealth Effects and Discounts

Table 10 presents the interaction of the previous lawsuit severity with auditors' change and disclosure on the PIPE announcement wealth effects and discounts of the subsequent PIPE offerings. The regressions are performed with weights adjusted in covariates from entropy balancing. The first dependent variable is the cumulative abnormal returns using a market-adjusted model over  $[-2, +2]$  days around the PIPE announcement date. The second dependent variable *Discount Adjusted CARs*  $[-2, +2]$  is calculated as  $CAR_{adj} = [1/(1-\alpha)][CAR] + [\alpha/(1-\alpha)][(P_b - P_0)/P_b]$ , where the CAR is the cumulative abnormal stock return estimated over a five-day window on the PIPE announcement  $[-2, +2]$ ;  $\alpha$  is the ratio of shares placed to shares outstanding after the placement;  $P_b$  is the market price at the end of the day prior to the event window; and  $P_0$  is the placement price, following Hertz and Smith (1993). The third dependent variable, *Discount*, is measured as one minus the purchase conversion price divided by the market price prior to the PIPE closing (following Krishnamurthy (2005) and Hertz and Smith (1993)). *Count Auditor Change* is the total number of auditor changes during the intervening period from the lawsuit filing to the PIPE offering for litigated issuers and from five years prior to the PIPE offering for non-litigated issuers. Variables are winsorized at 1% and 99% level. All specifications include industry fixed effects. The control variables are measured at the fiscal year prior to the PIPE issuance year. All standard errors are clustered at the firm level. Standard errors are reported in the parentheses. Asterisks \*\*\*, \*\*, \* represent significance level at the 1%, 5%, and 10% levels, respectively.

	(1) CAR [-2, +2] at PIPE Announcement	(2) Discount Adjusted CAR [-2, +2]	(3) Discount
Lawsuit Severity	0.030** (0.012)	0.040*** (0.016)	0.032*** (0.012)
SEC enforcement	-0.081** (0.032)	-0.120*** (0.037)	-0.058 (0.045)
Total number of lawsuits	-0.005** (0.002)	-0.007** (0.003)	0.003* (0.002)
Mean growth rate in 8K filings	-0.004 (0.003)	-0.005 (0.004)	-0.002 (0.011)
Lawsuit severity × Mean growth rate in 8K filings	-0.002 (0.007)	-0.004 (0.009)	-0.002 (0.010)
Count Auditor Change × Mean growth rate in 8K filings	0.004 (0.005)	0.009 (0.008)	0.013 (0.011)
Lawsuit severity × Count Auditor Change × Mean growth rate in 8K filings	0.044*** (0.010)	0.046*** (0.013)	-0.021** (0.009)
Average Percentage Ownership	-0.382 (0.378)	-0.569 (0.509)	0.701 (0.463)
Average Percentage Ownership Square	0.181 (1.023)	0.569 (1.333)	-1.561 (1.022)
Lawsuit severity × Average percentage ownership	-0.364 (0.397)	-0.353 (0.502)	-0.763*** (0.265)
Lawsuit severity × Percentage ownership square	0.894 (0.973)	0.923 (1.214)	1.839** (0.752)
Count Auditor Change	-0.001 (0.012)	0.001 (0.016)	-0.031* (0.016)
Lawsuit severity × Count Auditor Change	0.019 (0.023)	0.025 (0.028)	0.029** (0.013)
Warrants	-0.026** (0.013)	-0.033* (0.018)	0.018 (0.015)
Lawsuit severity × Warrants	-0.066*** (0.017)	-0.082*** (0.021)	0.002 (0.013)
Price resets	-0.026 (0.028)	-0.033 (0.034)	-0.074 (0.048)
Lawsuit severity × Price resets	-0.064** (0.027)	-0.070*** (0.027)	0.093** (0.040)
Pre-registered	-0.057*** (0.013)	-0.085*** (0.016)	0.051*** (0.013)
Lawsuit severity × Pre-registered	-0.035* (0.020)	-0.033 (0.024)	-0.018 (0.013)
Intermediated	-0.078*** (0.012)	-0.088*** (0.016)	0.084*** (0.014)
Lawsuit severity × Intermediated	0.048** (0.020)	0.051** (0.025)	-0.025** (0.013)
Board Seats	0.037** (0.016)	0.063*** (0.024)	-0.001 (0.023)
Lawsuit severity × Board seats	-0.007 (0.022)	-0.016 (0.027)	-0.007 (0.016)
Constant	0.035 (0.042)	0.065 (0.060)	0.019 (0.044)
Observations	4399	4319	4750
R <sup>2</sup>	0.144	0.137	0.161
Controls	Yes	Yes	Yes