How do Investors' Capital Gains Tax Rates Affect Equity Offering Prices? Evidence from Private Investments in Public Equity

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Abstract

Leveraging an extensive dataset of U.S. private investment in public equity (PIPE) offerings, we investigate how investor capital gains tax rates influence PIPE offer prices. High capital gains tax rates correspond to lower offer prices than prevailing market rates. Unique data on PIPE investor identities, unavailable for initial public or seasoned equity offerings, reveals that this tax-price link weakens if investors bear significant capital losses in their non-PIPE stocks or already possess equity in the issuing firm. Moreover, the tax-price impact is lessened when PIPE issuers include investor protection terms in the contract or have a dividend history. A heightened capital gains tax rate elevates post-PIPE stock returns and reduces PIPE offering sizes. Subsample analysis shows this tax effect vanishing in instances of capital losses, where the offer price surpasses the closing price. In sum, our study bolsters the tax capitalization perspective on capital gains tax's impact on stock prices.

JEL classification: G23; G32; H24; H25; M41

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1. Introduction

Taxes constitute a prevalent friction within financial markets, wielding substantial influence over asset prices. A pivotal facet in equity pricing is the impact of shareholder taxes on dividends and capital gains. Thus, from a demand-side perspective, the concept of the "tax capitalization effect" anticipates that, given taxes' curtailment of after-tax cash flows for investors, stock prices—representing the present value of after-tax cash flows from stock investments—will exhibit a negative relationship with both dividend and capital gains tax rates. Specifically, the presence of capital gains taxes triggers a scenario where taxable investors seek compensation to counterbalance the forthcoming capital gains tax obligations from asset sales, thereby dampening current asset prices and returns (Guenther and Willenborg, 1999; Lang and Shackelford, 2000; Ayers et al., 2003).[1]

However, a second effect—the "lock-in effect"—emerging from the supply side, proposes that the imposition of capital gains tax elevates prevailing stock prices and returns. This assertion stems from the inclination of sellers to engage in stock transactions solely at inflated prices to counterbalance the ensuing capital gains tax dues (Feldstein et al., 1980; Landsman and Shackelford, 1995; Reese Jr., 1998; Klein, 2001; Poterba and Weisbenner, 2001; Blouin et al., 2003; Jin, 2006; George and Hwang, 2007; Li et al., 2016; Weisbrod, 2019).

Empirically, detecting a substantial impact of the capital gains tax rate on equity offer prices can be challenging, primarily due to two factors. First, the principal purchasers of new shares in equity offerings, such as IPOs and SEOs, are institutional investors. Many of these entities, often structured as pass-through vehicles, shift tax obligations to their investors. If pass-through entities

[1] Other tax capitalization models in the literature include Auerbach (1979), Bradford (1981), Harris and Kemsley (1999), Lang and Shackelford (2000), Collins and Kemsley (2000), and Kemsley and Williams (2001).

constitute a significant portion of PIPE investors and are unaffected by capital gain taxes, discerning a substantial influence of the capital gains tax rate on equity offer prices becomes arduous. Second, if firms allocate a substantial share of their forthcoming cash flows to investors through dividends, the impact of the capital gains tax rate on asset prices weakens (Dai et al. 2008).

Nonetheless, two distinct attributes of PIPE offerings position them as an optimal testing ground for assessing the impact of capital gains tax rates on asset prices. Firstly, hedge funds emerge as the dominant participants, engaging in more than half of PIPE offerings and contributing to roughly a quarter of the total capital raised (Brophy et al., 2009). Involvement of hedge funds in PIPEs introduces significant capital gains tax concerns for two pivotal reasons. Firstly, they are keenly attuned to the post-tax returns of their investors, who might withdraw capital in response to lackluster post-tax fund returns. Secondly, while hedge funds also adopt pass-through structures, they remain liable to capital gain taxes on performance fees levied upon their investors. Specifically, hedge funds commonly levy 20% of generated profits as performance fees, contingent upon achieving predetermined performance benchmarks. This 20% profit constitutes carried interest and thus becomes subject to capital gain taxes, resulting in a capital gain tax liability for hedge funds.

Secondly, PIPE issuers primarily consist of small, growth-oriented firms that primarily direct future cash flows to investors through capital gains rather than dividends. For instance, out of the 6,081 PIPE deals analyzed, we observe only 764 issuers distributing cash dividends within two years following the PIPE, indicating that the majority of PIPE issuers reward their investors through capital gains. Consequently, these two distinctive features of the PIPE market make it an engaging and incomparable setting for investigating the interaction between the capital gains tax rate and offer prices, a facet not easily studied in other contexts.

In this study, we utilize an extensive dataset of U.S. PIPE offerings to scrutinize the implications of capital gains tax rates on equity offer prices. Our investigation delves into the interplay between the capital gains tax rate and the offer price within the realm of private investments in public equity (PIPEs), unraveling variations across distinct PIPE attributes. We assert that the PIPE offering framework provides an optimal milieu for assessing the sway of capital gains taxes on equity offer prices due to several key factors. First, the cost of PIPE investments—explicitly, the PIPE's offer price—is a known factor, enabling precise estimation of investors' tax responsibilities and the tax-related influence on their decisions to buy or sell stocks. Second, our access to investor identities and the number of shares procured in each PIPE deal (a facet typically elusive in initial public offerings or seasoned equity offerings) empowers accurate assessment of how investor tax rates affect PIPE offer prices.

The main findings of our empirical analysis can be summarized as follows. We commence by establishing that PIPE offer prices exhibit a decline corresponding to the rate of capital gains tax, affirming alignment with the tax capitalization hypothesis. Notably, this outcome holds substantial economic relevance. A one-standard-deviation escalation in the capital gains tax rate translates to a noteworthy 0.022 decrease in PIPE pricing—quantified as the offer price relative to the closing stock price. Impressively, this diminution constitutes over 30% of the average PIPE pricing.

Our findings broadly echo the forecasts of asset pricing models incorporating tax considerations (Brennan, 1970): pre-tax returns surge as tax rates escalate, under the premise that equity prices factor in taxes envisaged by investors upon securities sale. These outcomes harmoniously parallel the conclusions drawn in various other studies scrutinizing the ramifications of the capital gains tax rate on diverse business outcomes. For instance, the context of IPO

underpricing (Li et al., 2016), the assessment of equity capital costs (Chen et al., 2013), fluctuations in stock return volatility (Dai, Shackelford, and Zhang, 2013), and the realm of acquisition activity (Holcomb, Mason, and Zhang, 2020).

We proceed to scrutinize four distinct cross-sectional variations in the tax-price relationship. First, we investigate whether the unrealized capital losses incurred by PIPE investors (in their non-PIPE stock investments) temper the association between the capital gains tax rate and the PIPE offer price. This inquiry probes how the attributes of PIPE investors influence the tax capitalization effect. Investors, having encountered losses prior to partaking in the PIPE transaction, possess the capacity to offset these losses against realized gains from PIPE shares. Consequently, their sensitivity to the impending capital gains tax, payable upon future PIPE share sales, might wane, reducing their inclination to demand a lowered PIPE offer price. As anticipated, we ascertain that the link between the capital gains tax rate and the PIPE offer price weakens when investors harbor unrealized capital losses in other holdings before the PIPE event.

Secondly, we explore whether the correlation between capital gains tax rates and PIPE offer prices exhibits diminished potency for investors who retain shares of the PIPE issuer prior to the deal. Such investors could exhibit lower demands concerning the PIPE offer price, as a reduced price might dilute their existing holdings within the firm. Additionally, holders of the PIPE-issuing firm's shares might stand a higher chance of procuring non-monetary incentives. In alignment with the findings of Wu and Wruck (2009), who identify that investors with pre-existing relationships with the PIPE issuer are more prone to securing directorships post-PIPE placement, we observe that the impact of the capital gains tax rate on the PIPE offer price is weakened when investors are previous shareholders of the PIPE-issuing firm.

Thirdly, we posit that non-monetary stipulations within a PIPE deal could function as compensation for the future tax obligations stemming from potential PIPE share sales. Diverging from SEOs and IPOs, PIPE offerings frequently integrate intricate contractual terms that allocate control rights and contingent cash flows between investors and issuers. The incorporation of investor protection clauses within the PIPE deal might partially offset PIPE investors' forthcoming tax payments, thus tempering their demand for a reduced offer price. Our findings substantiate this hypothesis, showcasing a weaker tax-price relationship in deals featuring investor protection provisions compared to those without.

Lastly, we delve into the tax-price relationship concerning PIPE offerings, predicated on whether the issuer disbursed dividends prior to the PIPE issuance. Collins and Kemsley (2000) ascertain that while both capital gains and dividend taxes depress the valuation of reinvested earnings, only dividend taxes impact the value of distributed dividends. Their assertion further proposes that dividends could potentially offer a net tax benefit for shareholders rather than a net tax burden. Accordingly, we conjecture that the net tax benefit arising from dividends might temper PIPE investors' inclination to demand a reduced offer price in PIPE issuances. Our findings validate this notion, indicating that the tax-price relationship is weaker for PIPE issuers with a history of dividend payment compared to those without.

To enrich the understanding of the role of tax, we delve into the impact of the capital gains tax rate on various other facets of PIPE outcomes. We propose a connection between the lock-in effect and the extent of buy-and-hold returns stemming from investment in a PIPE offering. Once investors acquire shares through a PIPE and evolve into potential secondary market sellers, they exhibit hesitance to vend unless the price aligns with compensation for the anticipated capital gains tax obligation. Our scrutiny encompasses buy-and-hold returns spanning 12 and 24 months post

the closure of a PIPE transaction. Focusing on these extended timeframes is motivated by the customary inclusion of lock-up provisions in PIPE deals, restraining share sales to third parties for a span of 1 to 3 years (Blaut et al., 2019). Our findings harmonize with the lock-in hypothesis, indicating that the post-PIPE performance of PIPE issuers escalates with an upswing in the capital gains tax rate. Notably, this observation carries considerable economic significance—each 1% increase in the capital gains tax rate correspondingly enhances returns by 0.846% over 12 months (1.131% over 24 months).

Further analysis yields insights into the interplay: a decrease in the capital gains tax rate corresponds to a decline in the number of shares offered in a PIPE. This suggests that the capital gains tax effect exerts an adverse influence on firms' incentives to raise funds via a PIPE avenue. The economic magnitude of this observation is equally noteworthy—a 1% increase in the capital gains tax rate corresponds to a substantial 0.407% reduction in the number of shares offered in a PIPE, relative to outstanding shares.

We further delve into a subsample analysis, investigating the influence of tax burdens on offer prices. Specifically, we study how the capital gains tax effect impacts the pricing of PIPE offerings contingent on whether a PIPE is offered at a discount or premium. Our hypothesis postulates that the capital gains tax effect predominantly manifests in PIPE deals issued at a price discount—where the offer price falls below the closing price, engendering unrealized capital gains for PIPE investors—owing to their heightened likelihood of accruing capital gains upon future stock sales. Our discoveries corroborate this notion, revealing that the tax capitalization effect, characterized by a negative price-tax relationship, fades away for PIPEs issued at a premium. This effect solely remains observable within the discount subsample.

In supplementary analysis, we substitute the long-term tax rate (our primary metric for capital gains tax) with a short-term tax rate. We evaluate its ramifications on the PIPE offer price and the scale of the PIPE offering. Encouragingly, these results align qualitatively with our initial findings. Moreover, we analyze its impact on post-PIPE performance in the short term (one day, two weeks) and unveil a negative relationship, consistent with a lock-in explanation.

Our study contributes to this literature on the effect of capital gains tax rates on asset prices and differs from previous studies by focusing on the tax effect around a specific event—a PIPE issue—and not asset prices in general. Our study confirms that investor-level taxes affect stock prices in the form of capitalization effects (e.g., Dai et al. 2008; Li, Lin, and Robinson, 2016). Our findings indicate that capital gains taxation yields a simultaneous reduction in both PIPE pricing and the volume of shares offered, coupled with an elevation in the demanded rate of return by investors.

Moreover, we provide evidence of how investors' characteristics, which are not available in other types of equity offerings, affect the tax capitalization effect. Since hedge funds are the main investors participating in PIPE offerings, our findings also shed light on how tax concerns affect institutional investors' trading, especially that of hedge funds.[2]

The rest of this paper is organized as follows. Section 2 discusses how our paper is related to the existing literature and our contribution relative to this literature. Section 3 develops our main hypotheses. Section 4 describes our sample and statistics. Section 5 provides the main empirical

[2] A closely related study is that of Li et al. (2016), delving into the influence of capital gains tax rates on the pricing of initial public offerings (IPOs). While this prior work similarly reports a negative correlation between the capital gains tax rate and public offering prices, transposing their conclusions to the realm of PIPE offerings necessitates prudential consideration. Notably, IPOs and PIPEs diverge considerably in terms of participant composition and dynamics. PIPEs involve a select group of sophisticated institutional investors wielding substantial bargaining power vis-à-vis firm management, enabling them to exert influence over the PIPE offer price. This contrasts IPOs, wherein underwriters glean price insights from a broader investor base with less leverage over issuers in determining the final offer price.

results. Section 6 provides additional and robustness results. Section 7 concludes the paper.

2. Relation to the Existing Literature

The role of capital gains tax, which pertains to levies on realized capital gains from asset sales, bears significance in shaping investors' asset valuation and exerts influence on asset prices through two distinct mechanisms: the capitalization and lock-in effects. Despite empirical endeavors to discern the repercussions of investor-level capital gains tax on asset prices, outcomes from these studies remain divergent.

The demand-side capitalization effect posits that the presence of capital gains tax diminishes prevailing stock prices and returns (Guenther and Willenborg 1999; Lang and Shackelford 2000; Ayers et al., 2003). Echoing this demand-side tax capitalization effect, Guenther and Willenborg (1999) provide supporting evidence in the context of IPO prices for small firms surpassing those of larger counterparts after a 1993 tax law change. Analysis by Lang and Shackelford (2000) concerning the Taxpayer Relief Act of 1997 (TRA97) reveals that low dividend yield stock prices experienced greater surges than high dividend yield counterparts due to TRA97. Ayers et al. (2008), under the same TRA97 context, observe heightened net equity share purchases by individual investors on the day of the announcement.

On the flip side, the supply-side lock-in effect posits that capital gains tax heightens current stock prices and returns (e.g., Feldstein et al., 1980; Li et al., 2016; Weisbrod 2019) as investors stipulate heightened compensation to counterbalance the impending increase in capital gains tax payable upon future sales. Landsman and Shackelford (1995) corroborate this supply-side lock-in hypothesis by revealing an inverse correlation between RJR Nabisco shareholders' tax basis and their stock selling price. Ivković et al. (2005) further detect a stronger capital gains lock-in effect

within taxable accounts compared to tax-deferred accounts. The nexus between capital gains tax and asset prices can operate via the supply, demand, or both sides. To discern these distinct effects, Dai et al. (2008) exploit the distinctive feature of TRA97 and ascertain that the capitalization effect outweighs the lock-in effect post the 1997 tax cut announcement and preceding its effective date, with the lock-in effect dominating afterward.

Another relevant body of literature pertains to the consequences of PIPE transactions. For instance, Hertzel and Smith (1993) investigate discounted prices as indicators of information costs borne by private investors, while abnormal announcement returns reflect favorable information about firm value. They interpret the positive announcement returns associated with a PIPE as a manifestation of the expected monitoring benefits from private equity sales by participating investors.[3] Other studies suggest that astute investors engaging in a PIPE offering are more likely to exploit information asymmetry within these firms. For instance, Brophy et al. (2009) discover that hedge funds often support companies with weak fundamentals and notable information disparities. In return, these hedge funds demand significant discounts, negotiate re-pricing rights, and take short positions on the underlying stocks. Hertzel et al. (2002) demonstrate that investors tend to be overly optimistic about the prospects of equity-issuing firms, employing this optimism to account for negative post-announcement stock-price performance in their analysis. Beyond acquiring privileged information, PIPE investors could bolster negotiations with other firm stakeholders, including debtholders. Chakraborty and Gantchev (2013) document how improved equity coordination among investors post-private placement leads to favorable debt renegotiations within a year of the issue.

[3] However, Benson et al. (2019) find that the negative post-announcement cumulative abnormal returns (CAR) disappear when the CAR benchmark is changed with the matched firms and sample selection bias is taken into consideration.

While prior research in finance has extensively discussed the determinants and implications of PIPE transactions, the accounting literature pertaining to PIPEs remains relatively scarce. Only a handful of studies have explored PIPE issues within the accounting context. For instance, Williams and Tang (2009) investigate the abnormal accrual levels of PIPE issuers during the issuance period. They observe that abnormal accruals are positive before the PIPE and turn negative after the issuance, a trend consistent with the overvaluation hypothesis, wherein firms engage in abnormal accruals to manipulate pre-period income. In a different vein, Lee et al. (2015) analyze the financial health and performance of US-listed Chinese firms involved in reverse mergers. They find that companies with early PIPE financing exhibit better future performance indicators, such as higher future stock returns. In another study, Cheng et al. (2022) reveal a positive correlation between the financial reporting quality of PIPE issuers and the PIPE issue price. They also discover that better financial reporting quality corresponds to fewer (more) investor (firm) protection provisions in the PIPE contracts.

In a related paper, Li et al. (2016) examine whether investors' tax rates affects the IPO prices but Li et al. (2016, p.483) acknowledge that "we do not have a good measure of the number of shares allocated to and purchased by institutions in any specific IPO." The unique setting of a PIPE allows us to more accurately estimate PIPE investors' tax liability because we know the identities of investors receiving shares via PIPEs, which is difficult to estimate in other contexts.

3. Hypothesis Development

An issuer involved in a PIPE (Private Investment in Public Equity) transaction offers new shares at prices typically below the prevailing market prices, creating potential for capital gains among investors who secure shares from the PIPE allocation. The influence of the tax

capitalization effect on the demand side leads investors to factor in the future capital gains tax into the present stock price. PIPE investors seek to correlate the offer price with the tax rate on capital gains, aiming to mitigate the tax liabilities associated with the allocated PIPE shares. In a state of equilibrium, a negative correlation emerges between the tax rate and the offer price. This means that an offer price lower than the prevailing market price signifies larger potential capital gains, countering the impact of a higher capital gains tax rate on investor wealth.

In the realm of PIPE transactions, institutional investors, especially hedge funds, stand as the predominant participants. Typically structured as pass-through entities, these investors transfer the tax responsibilities to their own investors. As a result, the income generated by such funds is subject to taxation at the individual investor level rather than within the funds themselves. Nevertheless, these funds hold a vested interest in capital gain taxes for two primary reasons: firstly, they are concerned about the post-tax returns of their investors, some of whom might withdraw capital following periods of lackluster after-tax fund returns; secondly, select pass-through entities like hedge funds and private equity funds might also incur capital gain taxes on the performance fees they levy on their investors. For instance, hedge funds often claim 20% of the profits they generate for investors upon achieving predefined performance benchmarks. This 20% share, referred to as carried interest, becomes subject to capital gain taxes.[4]

Hence, within the framework of a PIPE, tax capitalization solely mirrors the forthcoming capital gains tax that investors acquiring shares from the offering would incur. Consequently, we present our initial hypothesis:

> ***Hypothesis 1****: Investors seek a considerably reduced offer price in comparison to the prevailing market price, indicating a substantial discount when the prevailing tax rate on*

[4] Shifting the focus to the supply-side perspective, the tax lock-in effect operates conversely, compelling investors to demand higher prices for asset sales when confronted with taxes at the time of sale. However, this tax lock-in effect may not manifest during the establishment of the PIPE offer price, given that PIPE participants are normally restricted from selling their shares obtained from PIPE allocations in short-run after PIPEs.

capital gains is elevated.

In a related study, Li et al. (2016) delve into the influence of investors' tax rates on IPO prices; however, they acknowledge a limitation by stating, "we do not possess a robust measure of the extent of shares apportioned to and acquired by institutions in any given IPO" (Li et al., 2016, p. 483). Our research addresses this challenge effectively through the identification of participating investors in a PIPE and the specific allocation of shares to each participant. To overcome this, we formulate a hypothesis that encompasses two facets concerning investors' involvement in PIPEs.

Initially, we scrutinize the moderating influence stemming from the tax liability of PIPE investors. Notably, capital gains tax payments are incumbent only upon investors who realize profits from their investments. Typically comprising institutional entities possessing diverse stock holdings, these PIPE investors' tax status hinges upon their cumulative gains or losses across their portfolio stocks. It's worth considering that an investor's losses in one realm might be offset by gains accrued through the PIPE issuance, thus tempering their overall taxable capital gains and diluting the potency of the tax rate's effect on PIPE offer prices. Consequentially, our assertion rests on the notion that the resolve of PIPE investors to secure a diminished offer price (as a countermeasure to the high tax rate) could be compromised by their simultaneous capital losses in other investment holdings.

Next, we delve into the moderating effect posed by PIPE investors' pre-existing holdings in the PIPE issuers, predating the PIPE transactions. We posit that investors harboring shares in the PIPE issuer prior to the PIPE event will manifest reduced demand for a lowered offer price, even amidst a high tax rate. This inclination stems from their vested economic interests spanning both the shares they held pre-PIPE and the new shares acquired through the PIPE process. Significantly undercutting the offer price could detrimentally impact their existing positions,

triggering a dilution of their own share value. Furthermore, the impetus driving investors' demand for a reduced PIPE offering price, fueled by potential forthcoming tax obligations, might dwindle in presence of compensatory non-monetary perks facilitated through prior associations with PIPE issuers. This premise aligns harmoniously with the findings of Wu and Wruck (2009), who highlight how investors with prior affiliations to the PIPE-issuing firm tend to secure directorship roles post-placement. Similarly, Floros et al. (2020) establish that PIPE transactions featuring insider involvement correlate with the allocation of additional board seats.

Therefore, we propose our second hypothesis:

> ***Hypothesis 2****: The negative tax–price relationship is weaker when PIPE investors have encountered capital losses within their non-PIPE stock investments or possess pre-existing equity stakes in firms issuing the PIPE.*

Subsequently, we analyze the role of contractual terms within PIPEs, including provisions for investor protection, as well as the strategies employed for cash distribution, and how these factors moderate the impact of taxes on offer prices.

Firstly, the inclination of PIPE investors to advocate for a diminished offer price confronts a compromise in the presence of non-monetary incentives outlined in the PIPE contracts. Should PIPE issuers incorporate investor protection provisions within the contractual framework, the demand from investors for a reduced offer price, despite a prevailing high tax rate, can be mitigated, as these provisions serve as partial compensation. This line of reasoning parallels the findings of Alzahrani and Lasfer (2012), who ascertain that investor protection provisions influence investors' willingness to shoulder the tax burden. This observation suggests that the sway of capital gains tax on the price of PIPE shares may be influenced by investor protection. Drawing on the insights of Hail et al. (2017), who explore how risk-sharing modulates the correlation between capital gains tax rates and asset prices, we propose that the presence of investor protection provisions within

PIPE transactions aids in managing and mitigating the risk exposure faced by PIPE investors (Chaplinsky and Haushalter, 2010).

Secondly, within the context of PIPE issuers opting to dispense income through cash dividends and capital gains (termed dividend PIPE issuers), the impact of taxes on investors' post-tax returns becomes a confluence of both dividend tax rates and capital gains tax rates. Consequently, the sensitivity of investors to the capital gains tax rate pertinent to dividends disbursed by PIPE issuers is comparatively attenuated in comparison to zero-dividend PIPE issuers possessing analogous earnings levels. Furthermore, contrasted with issuers abstaining from dividends, non-dividend-paying issuers tend to harbor growth potential, aligning with the classification of growth stocks. Hence, investors associated with dividend-paying PIPE issuers may experience a relatively diminished scope for long-term price appreciation, in contrast to their counterparts invested in non-dividend-paying PIPE issuers, thereby tempering the potency of the capital gains tax rate's influence on offer prices. Our conjecture is consistent with Lang and Shackelford (2000) and Dai et al. (2008). For example, Lang and Shackelford (2000) find that investor response to anticipated capital gains tax rates varies in accordance with lower or higher dividend yields. Echoing the perspective, Dai et al. (2008) lend support to this contention by highlighting that the capitalization effect manifests with less vigor in dividend-paying stocks compared to their non-dividend-paying counterparts.

Therefore, we propose our third hypothesis:

> ***Hypothesis 3****: The negative tax–price relationship is weaker when PIPE issuers incorporate investor protection provisions in the PIPE contract or have a history of distributing dividends.*

PIPE investors stand to realize capital gains stemming from both a reduced offer price and an elevated market price during the post-PIPE timeframe. However, the tax lock-in effect comes into play, whereby a heightened tax rate on the prospective sale of PIPE shares prompts investors

to exhibit reluctance in divesting their holdings. This reluctance, in turn, translates to a reduced supply of shares available for trading. In response to the burden imposed by elevated capital tax rates, investors stipulate a heightened stock return expectation in the post-PIPE duration.

Drawing from the insights of Li et al. (2016), who explore the lock-in effect within the context of IPOs, it is apparent that IPO investors weigh the benefits and costs of selling shares, considering the distinction between short-term and long-term capital gains tax rates. Their findings highlight a positive correlation between the magnitude of IPO underpricing and the differential between these tax rates.

In alignment with our proposition, we contend that the enduring performance subsequent to issuance should manifest a positive correlation with the long-term capital gains tax rate, driven by two underlying factors. Firstly, a subset of PIPE investors retain equity stakes in issuing firms prior to acquiring allocated shares through PIPEs. Consequently, the tax liability of these investors is inherently tied to the long-term capital gains tax. Secondly, it's a commonplace practice for PIPE issuers to incorporate lock-up provisions within the PIPE agreement, effectively barring investors from selling shares obtained via PIPEs to external parties within a 1 to 3-year span following the PIPE event (Blaut et al., 2019). As a result, the majority of PIPE investors might refrain from promptly selling their shares on the open market, amplifying the significance of long-term capital gains taxes in their decision-making.

Therefore, we propose our final hypothesis as follows:[5]

Hypothesis 4*: The long-run capital gains tax rate and long-term returns on the holdings of PIPE investors are positively correlated.*

[5] While the long-run capital gains tax rate aligns more aptly with our analysis of long-term post-issuance stock performance, the short-run capital gains tax rate should be better suited for elucidating short-term return variables, such as the returns calculated within a brief timeframe. This is underpinned by the presence of certain PIPEs that lack lock-up restrictions, thereby enabling PIPE investors to swiftly trade their shares following the PIPE's closing date.

4. Data and Summary Statistics

4.1. The PIPE Market

The PIPE market has grown rapidly in recent years and has become a popular way for firms to raise capital. According to PlacementTracker, a leading PIPE transaction database, the total amount of capital raised via PIPE increased from $24.7 billion in 2000 to $147 billion in 2021.[6] This type of capital raising has several unique features. First, PIPE issuers are small, young, and underperforming firms that are less likely to raise capital via other mechanisms (e.g., SEOs and banks) (Wu 2004; Chaplinsky and Haushalter 2010). Second, PIPE is an efficient and swift way for issuers to raise capital because it has fewer regulatory requirements. According to the PIPE guidelines of the US Securities and Exchange Commission, a PIPE transaction "should close and fund within seven to ten days of receiving definitive purchase commitments."[7] Third, all of the participants in a PIPE offering are accredited investors, which may help the PIPE issuers to expand their institutional investor base. Last, PIPE investors generally agree to standstill provisions and lock-up agreements that restrict them from selling stocks to others. According to a Sullivan & Cromwell LLP report in 2021, 90% of surveyed PIPE deals included a lock-up agreement.[8]

4.2. Data and Summary Statistics

We obtain data on U.S. PIPE transactions that closed between 1995 and 2016 from the PlacementTracker database of Sagient Research Systems. We exclude structured equity lines, common stock reset PIPE (following Chaplinsky and Haushalter, 2010) and PIPE with issuers not covered by both Compustat and The Center for Research on Security Prices (CRSP) databases.

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[6] Available via: https://www.kirkland.com/sitefiles/kirkexp/publications/2478/document1/pipes.pdf..
[7] See the article, titled "Frequently asked questions about PIPEs", Available via: https://www.sec.gov/info/smallbus/gbfor25_2006/pinedo_tanenbaum_pipefaq.pdf.
[8] See the article, titled "Market Trends 2020/21: PIPEs", Available via: https://www.lexisnexis.com/community/insights/legal/b/practical-guidance/posts/pipe-ing-hot-market-trends-2020-21-pipes

Institutional ownership data are from the Thomson Reuters Institutional Holdings (13F) database. Stock returns and other share-related data are from CRSP's daily and monthly files. All accounting data, including total assets, book value of equity, return on assets, and leverage, are obtained from Compustat.

Panel A of Table 1 presents the statistics of the sample. The unit of our analysis is a PIPE event. The key dependent variable, $PIPE\ Pricing_{i,t}$, is the adjusted offer price on the PIPE deal, which equals ((*Offer Price − Closing Price) / Closing Price*) for firm *i* in year *t*, where *Closing Price* is firm *i*'s stock price one day immediately before the PIPE event date. The event date refers to the announcement date of PIPE and takes the value of the closing date if the announcement date is not available. The key independent variable, *Tax Rate*, is the long-term capital gains tax rate in year *t*.

Panel A of Table 1 shows that the average pricing (*PIPE Pricing*) is −7.2%, indicating that the offer price is 7.2% lower than the stock price immediately before a PIPE. Average *Tax Rate* is 17.7%. *Shares Offered / Shares Outstanding* denotes the number of shares offered in a PIPE deal by a firm scaled by the total number of outstanding shares before the PIPE deal (i.e., dilution). On average, *Shares Offered / Shares Outstanding* is 25.1%. *ROI_1D* is measured as (*1st Day Price − Offer Price*) / *Offer Price*, where the 1st Day Price is taken 1 day immediately after the closing of the deal. *ROI_1D* is positive at 13.0 percentage points. As *ROI_1D* captures the return for investors who resell their PIPE shares immediately after the closing of PIPE, the positive *ROI_1D* indicates that offer price is significantly lower than the post-issue price. *ROI_2W* is measured as (*2-week Average Price − Offer Price*) / *Offer Price*, where the *2-week Average Price* is the average stock prices during the 2 weeks after the closing of PIPE. We see a similar pattern when we use the average stock price 2 weeks after PIPE as a proxy for the resale price, as *ROI_2W* is 14.6

percentage points. We also find that only 12.6% of the PIPE issuers paid dividends in the 24 months before the announcement of the PIPE deal.

We also report statistics of other control variables for PIPE issuers measured in the year immediately before their PIPE issuances. *TA* denotes total assets in millions of USD. *BTM* denotes the book-to-market ratio. *TANGB* denotes tangible assets scaled by total assets. *NPOA* denotes non-operation return. *LEV* denotes leverage. *CAPX* denotes capital expenditure scaled by total assets. *IO* denotes institutional ownership. *IOHHI* denotes the Herfindahl–Hirschman Index value of institutional ownership across all institutions that hold a stock. *#ANALST* denotes the number of analysts covering the firm. *BHR-12M* is measured as the buy-and-hold return from the PIPE closing date until 12 months after the closing date. *BHR-24M* is measured as the buy-and-hold return from the PIPE closing date until 24 months after the closing date.

In Panel A of Table 1, we find that sample firms have poor accounting performance before PIPEs. For example, mean and median *ROA* is -0.564 and -0.338, respectively. Our sample firms' stock performance prior to PIPEs is positive on average (mean *Past One-Year Return* is 0.307, although the median value is negative at -0.016). We also find that PIPE firms have poor long-run stock performance in the post-PIPE period. For example, the mean and median of buy-and-hold return in the twelve-month period after PIPE issuance (*BHR_12M*) are -0.032 and -0.213, respectively. Our sample firms are typically growth firms (mean of *BTM* is 0.505) and have a low level of institutional ownership before the PIPE issuance (mean of *IO* is 0.201).

Panel B of Table 1 presents the sample distribution by industry groups. Consistent with studies showing that PIPE issuers tend to be young and risky firms (Floros and Sapp 2012; Brophy et al., 2009), we find that the PIPE issuers in our sample are concentrated in the Healthcare, Medical Equipment, and Drugs industry (36.85%). Firms from Business Equipment industry

accounts for the second large group in our sample (21.76%). In contrast, the number of PIPE issues from the Utilities industry is the least among all twelve industries.

Panel A of Table 2 presents the correlation matrix of the variables used. *Tax Rate* equals the prevailing tax rate on long-term capital gains. *Dilution* equals to *Shares Offered / Shares Outstanding*. We find that *Tax Rate* is negatively correlated with the offer price (*PIPE Pricing*) and offer size (*Dilution*) but positively correlated with investors' long run return on the investment in the 12-month or 24-month horizons (*BHR_12M* and *BHR_24M*).

In Panel B of Table 2, we present the univariate test result by dividing our sample into two subsamples based on *D_TAX_RATE*, a dummy variable that takes a value of 1 if the capital gains tax rate in the year is greater than the mean capital gains tax rate of the sample, and 0 otherwise. There are 3,089 and 2,992 observations in the subsample with low (*D_TAX_RATE* = 0) and high (*D_TAX_RATE* = 1) capital gains tax rates, respectively. Our univariate comparison shows that the average *PIPE Pricing* is -0.038 in the subsample associated with a lower capital gains tax rate and it is -0.088 when the capital gains tax rate is higher, and the difference is 0.05 (significant at 1% level). The negative values of *PIPE Pricing* in both subsamples indicate that PIPEs are offered at prices lower than their prevailing market prices of the stock in both subsamples (i.e., investors who participate PIPEs enjoy a paper gain that equals 3.8% and 8.8% of the prevailing stock price when the capital gain tax rate is low and high, respectively). The significant difference in *PIPE Pricing* in the last column suggests that PIPE issuers sell shares at with a larger discount (i.e., PIPE investors realize a larger paper gain) relative to prevailing stock prices when the capital gain tax rate is higher.

It is important to note that, the difference in the capital gain tax rate (*Tax Rate*) between two subsamples is 5.5 percentage point (high tax minus low tax), which is of slightly smaller than

the difference in PIPE investors' paper gains between these two subsamples (5.0 percentage points). This comparison provides preliminary evidence that, the difference in PIPE investors' paper gains, in percentage relative to the prevailing stock price, will be offset by the difference in the capital gains tax rate.

5. Empirical Analyses

5.1. Baseline Results: Impact of Capital Gains Tax Rates on PIPE Pricing

Our empirical analysis aligns with prior literature that empirically explores the phenomenon of underpricing in equity offerings. From the standpoint of investor demand, Rock (1986) attributes underpricing to the information asymmetry between informed and uninformed investors, positing that underpricing serves as compensation for uninformed investors' participation (the winner's curse). In contrast, Allen and Faulhaber (1989) contend that underpricing serves as a signaling mechanism for the issuing firm's quality. Another demand-side explanation for the underpricing of equity offerings is tied to litigation risk. Lowry and Shu (2002) investigate the relationship between risk and IPO underpricing, discovering a positive correlation between the extent of underpricing in an IPO and a firm's litigation risk level. From the supply-side perspective, underwriters may have an incentive to set a low price to trigger oversubscription of equity offerings and result in a surge in the first-day trading price. For instance, Cliff and Denis (2004) provide evidence that IPO firms strategically employ underpricing to attract analyst coverage.

In this section, our focus centers on examining whether investors exhibit a preference for a lower offer price (in essence, a larger discount) to offset their anticipated exposure to a future increase in the capital gains tax applied to PIPE shares. Hypothesis 1 puts forth the expectation of

a negative impact of the capital gains tax rate on the PIPE offer price. To scrutinize this hypothesis, we define the key dependent, *PIPE Pricing,* as the ratio of (Offer Price - Closing Price) to Closing Price. This metric captures the relative pricing of PIPE shares in relation to the market valuation of the PIPE issuer. A negative (positive) *PIPE Pricing* value implies that the firm is presenting shares at a discount (premium), i.e., a price lower (higher) than the current market value. The pivotal independent variable, *Tax Rate*, encapsulates the long-term capital gains tax rate for year t. To empirically examine our core hypothesis (**H1**), we employ the following model:

$$
\begin{aligned}
PIPE\ Pricing_{i,t} &= \beta_0 + \beta_1 Tax\ Rate_t + \beta_2 Log(TA)_{i,t-1} + \beta_3 BTM_{i,t-1} + \beta_4 ROA_{i,t-1} \\
&+ \beta_5 TANGB_{i,t-1} + \beta_6 NPOA_{i,t-1} + \beta_7 LEV_{i,t-1} + \beta_8 CAPX_{i,t-1} + \beta_9 IO_{i,t-1} \\
&+ \beta_{10} IOHHI_{i,t-1} + \beta_{11} Log(\#ANALYST)_{i,t-1} + \beta_{12} Past\ one\ year\ return_{i,t-1} \\
&+ Industry\ FEs\ + e_{i,t} \qquad (1)
\end{aligned}
$$

where *PIPE Pricing*$_{i,t}$ is the offering price on the PIPE deal (it equals (*Offer Price − Closing Price) / Closing Price*) for firm *i* in year *t*, where *Closing Price* is firm *i*'s stock price one day immediately before the PIPE event date. The event date refers to the announcement date of PIPE and takes the value of the closing date if the announcement date is not available.

We control for the following variables. *Log(TA)* denotes the natural logarithm of total assets in millions of USD. *TANGB* denotes tangible assets scaled by total assets. *NPOA* denotes non-operation return. *LEV* denotes leverage. *CAPX* denotes capital expenditure scaled by total assets. *IO* denotes institutional ownership. *IOHHI* denotes the Herfindahl–Hirschman Index value of institutional ownership across all institutions that hold a stock. *#ANALST* denotes the number of analysts covering the firm.

Table 3 presents the outcomes of our analysis. In Column (1), when we conduct a regression of *PIPE Pricing* on *Tax Rate* without the inclusion of any additional controls, the coefficient manifests a significant negative relationship (−0.817, t-value = −9.75). In Column (2), the incorporation of firm-level control variables maintains analogous results; specifically, the coefficient for *Tax Rate* remains negative and significant (−0.706, t = −8.68). The observed inverse association between the capital gains tax rate and the PIPE offer price suggests that investors, confronted with elevated capital gains tax rates, advocate for firms to decrease their offer price as a compensatory measure for the anticipated tax outlay upon capital gains realization. This substantiates the validity of Hypothesis 1, highlighting the pivotal role of tax capitalization in shaping offer prices. This finding is not only statistically robust but also economically meaningful. A one-standard-deviation upsurge in Tax Rate translates to a 2.19% upturn in *PIPE Pricing*, a change that encompasses over 30% of the absolute average PIPE price value. This quantification is derived from the coefficient in the second column of Table 2 (-0.706) combined with the statistics from Panel A of Table 1 (standard deviation of *Tax Rate* at 0.031 and mean *PIPE Pricing* at -0.072).

In Column (3) of Table 3, we undertake a regression of *PIPE Pricing* against an indicator for periods characterized by higher capital gain tax rates in order to facilitate a more comprehensive interpretation of the economic significance. Our utilization of *D_TAX_RATE,* as previously employed in the univariate analysis, entails a binary value of 1 if the capital gains tax rate for the year surpasses the mean capital gains tax rate of the sample; otherwise, it is set at 0. This approach yields a coefficient of -0.028 for *D_TAX_RATE,* accompanied by a t-statistic of 5.50. This outcome underscores the salient influence of variations in the prevailing capital gains tax rate on the pricing dynamics of PIPEs.

Regarding the control variables, our findings indicate that *PIPE Pricing* exhibits an upward trend in relation to firms' total assets, capital expenditures, and analyst coverage. Conversely, it experiences a decline in response to firms' tangible assets, institutional ownership, and lagged one-year stock returns. These results suggest that the ratio of PIPE offer price to closing stock price is inclined to be higher for larger firms, those with substantial capital expenditure investments and a wider coverage by analysts. Similarly, the ratio is elevated when firms exhibit lower levels of institutional ownership and have experienced inferior stock returns in the year preceding the PIPE issuance. The latter outcomes could potentially stem from the influence exerted by institutional investors on prices. Specifically, considering the heightened information levels of institutional investors compared to retail investors, subpar pre-PIPE accounting performance by issuers with significant institutional ownership becomes fully integrated into stock prices prior to the PIPE issuance. This consequently leads to a reduced denominator in the computation of *PIPE Pricing*.

Our discovery of a negative correlation between *PIPE Pricing* and *Tax Rate* contributes significantly to the body of literature on equity offerings. Prior studies have predominantly delved into the determinants of discounted PIPE issues, revealing that the reduced pricing of PIPE serves as compensation for various factors such as monitoring efforts by blockholders, validation costs, management entrenchment risks, and resale restrictions (Wruck 1989; Silber 1991; Hertzel and Smith 1993; Wu 2004; Barclay et al., 2007; Lim et al., 2021). Cronqvist and Nilsson (2005) explore the impact of firm control, moral hazard, and adverse selection on the choice between PIPE and other equity financing methods. Unlike the majority of previous studies that investigate the relationship between equity offering prices and an endogenous variable, our analysis of the capital gains tax rate in this study is exogenous to our primary dependent variable, *PIPE Pricing*. Consequently, concerns related to reverse causality are unlikely to significantly affect the

interpretation of our empirical outcomes. Nevertheless, the potential existence of omitted variables that concurrently account for both tax rates and *PIPE Pricing* remains a consideration (e.g., the presence of a policy alteration that detrimentally affects PIPE offer prices coinciding with variations in the capital gains tax rate). To address this concern, we predominantly focus on cross-sectional approaches in the subsequent sections to mitigate its impact.

5.2. Cross-sectional Analysis

5.2.1. Cross-sectional Analysis: The Role of Investors' Capital Losses

In this section, we delve into the potential cross-sectional variations in the impact of capital gains tax rates on PIPE offer prices. Our initial set of cross-sectional analyses capitalizes on the diversity in investor-level tax liabilities. We aim to explore how the capital losses experienced by PIPE investors influence the connection between the capital gains tax rate and PIPE pricing. According to Hypothesis 2, we anticipate that the negative association between the capital gains tax rate and PIPE offer price will be attenuated when PIPE investors incur losses in their non-PIPE investment portfolios.

To execute this examination, we commence by identifying all stocks held by a PIPE investor in quarter t-1. This assessment enables us to quantify the investor's gains or losses in their investment portfolio for quarter t. We calculate the gains or losses on each stock by multiplying the change in stock value from t-1 to t by the number of shares held in quarter t-1. Summation of these gains or losses across all stocks held by the investor, scaled by the investor's total assets under management in quarter t-1, yields the investor's gains or losses for quarter t. Subsequently, we introduce a binary variable labeled *IO_LOSS*, which adopts the value of 1 if any investor participating in the PIPE deal encounters losses in their investment portfolio in the quarter

preceding the PIPE deal. Conversely, it assumes the value of 0 if no such losses are observed. This *IO_LOSS* variable encapsulates the broader gain/loss status of PIPE investors for each quarter, which we then interact with *Tax Rate*. This interaction term encapsulates the moderating impact of past profit/loss status on investors' inclination to seek a lower PIPE offer price due to the capital gains tax rate. Holding other variables constant, we anticipate a positive coefficient for *IO_LOSS * Tax Rate.*

We proceed to evaluate **H2** and unveil the outcomes in Column (1) of Panel A, as presented in Table 4. Our approach involves the interaction of *IO_LOSS* with *Tax Rate*, yielding a significant and negative coefficient on *Tax Rate* (−0.691, t-value = −6.43). This finding remains congruent with the tax capitalization effect's influence on the PIPE offer price. Additionally, the positive and significant coefficient on *IO_LOSS * Tax Rate* (0.442, t-value = 2.20) suggests that the preceding losses incurred by PIPE investors can partially counteract the adverse impact of capital gains tax on the PIPE offer price. This observation is consistent with Hypothesis 2, where the effect of capital gains tax on the PIPE offer price diminishes when PIPE investors experience losses beforehand.

Our analysis aligns with Weisbrod's (2019) study, which reveals how stockholders' unrealized gains or losses prior to earnings announcements shape the disposition effect—a phenomenon where investors tend to retain losing stocks and sell winning ones—in their trading decisions following earnings announcements. Weisbrod demonstrates that this behavior influences asset prices by creating a brief period of market underreaction to earnings news. Our investigation substantiates that investors' unrealized losses attenuate the impact of the capital gains tax rate on the PIPE offer price.

5.2.2. Cross-sectional Analysis: The Past Equity holdings of the Investor in the Issuer

This section delves into the moderating effect of prior relationships between PIPE investors

and issuers on the aforementioned negative tax-price correlation. **H2** posits that the impact of capital gains tax on the PIPE offer price weakens when PIPE investors have a history of holding the stock of the PIPE-issuing firm. Leveraging Thomson Reuters 13f holdings data, we are empowered to determine whether a PIPE investor possessed stocks of the issuer before the PIPE event. Through this dataset, we create a binary indicator variable termed *Related*, assigned a value of 1 if any of the PIPE investors retained shares of the issuer in the year prior, and 0 otherwise. We proceed to interact *Related* with *Tax Rate*. This interaction encapsulates the moderating influence of the link between PIPE investors and the issuer on the connection between the capital gains tax and PIPE offer price. Our regression entails regressing PIPE Pricing on *Related*, *Tax Rate*, and the interaction term, *Related* * *Tax Rate*, with the ensuing outcomes featured in Panel A of Table 4.

Column (2) reveals that the interaction term *Related* * *Tax Rate* exhibits a statistically significant and positive coefficient (0.447, t-value = 2.41). This discovery corroborates our prediction that if PIPE investors share an equity-holding association with PIPE issuers—having owned shares in the issuing firm prior to the PIPE—they are less inclined to demand a reduced offer price, even when they may confront future capital gains tax obligations. Subsequently, Column (2) of Panel B, where *Tax Rate* is substituted with *D_TAX_RATE*, yields akin results. Therefore, our empirical evidence supports **H2**.

5.2.3. Cross-sectional Analysis: The Role of Investor Protection Provisions

H3 posits that non-monetary incentives of investors moderate their inclination to demand a reduced PIPE offer price due to potential future tax obligations. We subsequently delve into the exploration of whether the incorporation of investor protection provisions within the PIPE contract—measures that could mitigate investor risk—alters the connection between the capital gains tax rate and the PIPE offer price.

Illustrative examples of these investor protection provisions encompass anti-dilution protection, a first refusal right, investor call option, and investor redemption right. In the analysis presented in Column (3) of Panel A within Table 4, we regress PIPE Pricing on *Tax Rate* and *D_INV*, a binary variable denoting 1 if the PIPE deal incorporates any investor protection clauses, and 0 otherwise. We also include the interaction between *D_INV* and *Tax Rate*. The outcome unveils a positive and statistically significant coefficient on *D_INV* * *Tax Rate* at the 1% significance level (1.141, t-value = 6.34). Our findings remain consistent when we substitute *D_INV* with the count of investor protection provisions featured in a given PIPE contract in unreported analysis.

Incorporating Column (3) of Panel B, where *Tax Rate* is replaced with *D_TAX_RATE*, we observe similar results. The implications of this section's findings suggest that the inclusion of investor protection provisions may curtail the risk perceived by PIPE investors, thereby prompting a lesser demand for a lowered offer price. This aligns with **H3**, which posits that investor protection provisions serve as non-monetary compensation, counteracting the need for a larger discount when the capital gains tax rate is elevated.

5.2.4. Cross-sectional Analysis: The Role of PIPE Issuers' Past Dividend History

In this section, our focus is on investigating whether fluctuations in dividend payments wield an impact on the established negative tax-price correlation. As stipulated by **H3**, we anticipate that investors associated with dividend-paying PIPE issuers exhibit a reduced sensitivity to the capital gains tax rate compared to those tied to non-dividend-paying PIPE issuers. To empirically scrutinize this projection, we conduct a regression analysis wherein we regress *PIPE Pricing* on *Tax Rate*, *DIV_PAYER* (a binary variable

taking on the value 1 if the PIPE issuer disbursed dividends in the preceding 24 months, and 0 otherwise), and the interaction term between *Tax Rate* and *DIV_PAYER*.

The results, displayed in Column (4) of Panel A within Table 4, reveal a noteworthy and statistically significant coefficient on the interaction term, *Tax Rate* * *DIV_PAYER* (0.945, t-value = 3.77). The analogous findings are replicated when we perform the substitution of *Tax Rate* with *D_TAX_RATE*, as demonstrated in Column (4) of Panel B of Table 4. The observations gleaned from this section suggest that the influence of the capital gains tax rate on the PIPE offer price is attenuated when the PIPE issuer is engaged in dividend payments, consistent with **H3**. This further proposes that PIPE investors manifest a diminished sensitivity to fluctuations in the capital gains tax rate if the respective PIPE issuer has previously distributed dividends.[9]

5.3. Capital Gains Tax Rate and the Return on Investment in PIPE and Shares Offered

To gauge the return on investment in a PIPE and test **H4**, we devise two return metrics. In Column (1) of Table 5, we delve into the *BHR-12M*, which signifies the buy-and-hold return from the PIPE's closure date to the 12-month mark following the closure. In Column (2) of the same table, we explore the *BHR-24M*, representing the buy-and-hold return spanning from the PIPE's closure date to 24 months thereafter. Elevated values of these variables indicate heightened gains for investors engaging in a PIPE. It is worth noting that Table 1 illustrates that the average values of both these variables are positive.

Presented in Columns (1) and (2) of Table 5, our findings indicate that Column (1) displays a positive and statistically significant coefficient on *Tax Rate* (0.846, t-value = 2.13). This suggests a positive correlation between the capital gains tax rate and the buy-and-hold return over the 12-

[9] Our cross-sectional results are robust if we restrict our sample to deals with discount only.

month period following the PIPE's closure. Correspondingly, in Column (2), we identify a positive linkage between *Tax Rate* and *BHR-24M* (1.131, t-value = 1.89), thereby indicating a higher demand for returns from investors partaking in a PIPE over an extended period. Consequently, these observations lend support to **H4**, corroborating the existence of a lock-in effect driven by the capital gains tax rate.

A higher return for investors inherently signifies an increased cost of equity capital for issuers. Consequently, it stands to reason that PIPE issuers would be inclined to minimize the number of new shares issued when PIPE investors demand elevated returns. We proceed to put this hypothesis to the test. For each individual PIPE deal, we explore the correlation between the total number of shares issued through the PIPE (scaled by the total number of outstanding shares) and the concurrent capital gains tax rate. The dependent variable we employ for this analysis is the ratio of *Shares Offered* to *Shares Outstanding*.

In Column (3) of Table 5, the coefficient pertaining to *Tax Rate* emerges as negative and statistically significant at the 5% level (-0.407, t-value = -2.05). This finding underscores a distinct inverse relationship between the capital gains tax rate and the count of shares offered. The economic significance of this result is noteworthy: a mere 1% increase in the capital gains tax rate translates to a reduction of 0.407% in the number of shares offered within a PIPE, scaled proportionately against the outstanding shares. This outcome corroborates the notion that firms opt to curtail the size of their PIPE offerings when confronted with a high capital gains tax rate.

6. Additional Results and Robustness Check

6.1 Subsample Analysis: Premium vs Discount

The observed negative correlation between the *Tax Rate* and *PIPE Pricing* provides

compelling evidence that bolsters our initial hypothesis. This hypothesis posits that investors might require a reduced offer price to counterbalance the potential capital gains tax incurred upon selling their PIPE allocation in the future. To further fortify this line of reasoning, we introduce an interaction between the *Tax Rate* and *Premium*, a binary variable that holds a value of 1 if the offer price of the PIPE exceeds the stock price immediately prior to the offering, and 0 otherwise. Additionally, we undertake a more focused analysis by conducting subsample examinations after segmenting the dataset based on whether the PIPE is presented at a discount or premium. The underlying rationale is that PIPE deals with a premium are less likely to yield substantial capital gains for investors. Therefore, we anticipate that the influence of the capital gains tax effect would predominantly manifest in PIPE deals presented at a discount, where investors are more inclined to earn capital gains.

In Column (1) of Table 6, the outcome of the interaction test is presented. Notably, the coefficient associated with *Tax Rate* * *Premium* stands as positive and statistically significant (0.831, t-value = 4.90). This result indicates that the impact of the capital gains tax rate on the pricing of PIPE offerings is tempered when the PIPE deal is accompanied by a premium. Subsequent to this, Columns (2) and (3) of Table 6 showcase the outcomes of our subsample analysis, distinctly illustrating that the tax effect on PIPE offer price solely exhibits significance within the subset where the PIPE is presented at a discount. This consistency aligns with the findings of the interaction test. On the whole, the collective results unveiled in Table 6 serve to underscore that investors exhibit a tendency to seek a reduced offer price primarily in instances where the capital gains tax is elevated, enabling them to secure discounted shares from PIPE issuers.

6.2 Robustness Check

In Panel A of Table 7, we performed additional analyses to address concerns about the potential influence of closing prices on our findings. In these supplementary analyses, we employed an alternative definition of the dependent variable—specifically, *Log(offer Price)*, representing the natural logarithm of the PIPE offer price. Additionally, we introduced a new control variable in the form of the natural logarithm of the closing price. Encouragingly, these supplementary analyses yielded results that closely mirrored our original findings, reinforcing the robustness of our conclusions.

Moving to Panel B of Table 7, we extended our investigation by focusing solely on a subsample of PIPEs offered at a discount (i.e., with an offer price below the closing price). The results from this subset analysis remained consistent with our earlier conclusions, confirming the stability and reliability of our results.

6.3 The Effect of Short-term Capital Gain Tax Rate.

As our principal independent variable, *Tax Rate*, pertains to the long-term capital gains tax rate, we have also conducted additional tests to explore the impact of the short-term capital gains tax rate on PIPE outcomes. Initially, we examined the relationship between PIPE offer pricing and the short-term capital gains tax rate. In Column (1) of Table 8, we observe a negative and statistically significant coefficient on *Short-term Tax Rate* (-0.358, t-value = -2.96), indicating that short-term capital gains taxes are indeed incorporated into PIPE offer prices. This finding implies that PIPE offerings might attract short-term speculators who are subject to short-term capital gains tax rates.

Subsequently, we delve into the connection between investors' immediate post-issuance

returns and the short-term capital gains tax rate. In Columns (2) and (3), we employ *ROI_1D* and *ROI_2W* as proxies for short-run returns following a PIPE deal's closure. Here, *ROI_1D* represents the (*1st Day Price - Offer Price*) / *Offer Price*, with the *1st Day Price* referring to the stock price one day after the deal's closure. Meanwhile, *ROI_2W* is calculated as (*Two-week Avg Price - Offer Price*) / *Offer Price*, with the *Two-week Avg Price* reflecting the average stock price during the fortnight after the deal's closure. By individually regressing these two variables on *Short-term Tax Rate*, we uncover a positive and statistically significant coefficient in both columns. This result suggests a positive correlation between the short-term capital gains tax rate and short-run post-issuance returns.

Collectively, the findings from this section underscore the presence of PIPEs devoid of lock-up or resale restrictions, which tend to attract short-term speculators allowing them to liquidate their positions shortly after the completion of a PIPE deal.

7 Conclusion

We delve into the nuanced relationship between the anticipated capital gains tax rate's influence and the lock-in effect driven by capital gains taxation, shedding light on their impact on the pricing of PIPE. We also investigate how this capitalization effect is influenced by distinct characteristics of both PIPE investors and issuers.

Our empirical results align with the tax capitalization hypothesis, revealing a correlation between lower capital gains tax rates and reduced PIPE offer prices. Furthermore, we observe that this tax-price interplay is less pronounced when PIPE investors have prior ownership ties to the issuing firm, thus harboring unrealized capital gains within their investment portfolio. Similarly, the relationship is moderated when the PIPE issuer has a history of dividend payments and when

investor protection clauses are integrated into the PIPE arrangement. In line with the lock-in hypothesis, our findings indicate that as the capital gains tax rate increases, investors' returns on PIPE investment also rise. Intriguingly, we also uncover that the volume of shares offered in a PIPE decreases in the face of declining capital gains tax rates, suggesting that the impact of capital gains tax influences firms' fundraising motivations through PIPEs.

Notably, this study stands as a pioneering exploration of PIPE pricing through the lens of investors' tax burden. Our empirical insights signify that capital gains taxation wields a dual influence, both diminishing PIPE offer prices and the number of shares offered, while concurrently elevating the expected return demanded by PIPE investors.

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Table 1: Descriptive Statistics

Panel A: Summary Statistics

Variable	N	Mean	Std. Dev.	25%	Median	75%
PIPE Pricing	6,081	−0.072	0.181	−0.167	−0.074	0.001
Tax_Rate	6,081	0.177	0.031	0.150	0.150	0.200
D_Tax_Rate	6,081	0.492	0.500	0	0	1
Shares Offered / Shares Outstandi	6,081	0.251	0.716	0.073	0.143	0.231
TA	6,081	429.600	1595.000	16.510	42.440	125.400
BTM	6,081	0.505	0.355	0.223	0.413	0.741
ROA	6,081	−0.564	0.907	−0.694	−0.338	−0.052
TANGB	6,081	0.220	0.251	0.038	0.109	0.314
NPOA	6,081	0.013	0.072	0.000	0.007	0.026
LEV	6,081	0.192	0.261	0.001	0.089	0.285
CAPX	6,081	0.082	0.158	0.008	0.026	0.080
IO	6,081	0.201	0.207	0.040	0.133	0.299
IOHHI	6,081	0.012	0.019	0.001	0.004	0.016
Log(#ANALST)	6,081	1.009	0.873	0.000	1.099	1.609
Past One-Year Return	6,081	0.307	1.208	−0.419	−0.016	0.544
BHR_12M	6,081	−0.032	0.802	−0.560	−0.213	0.226
BHR_24M	6,081	−0.063	1.013	−0.740	−0.366	0.222
ROI_1D	6,081	0.130	0.274	−0.006	0.074	0.198
ROI_2W	6,081	0.146	0.315	−0.017	0.083	0.221
IO_loss	2,935	0.359	0.480	0.000	0.000	1.000
Related	2,935	0.583	0.493	0.000	1.000	1.000
Div_payer	6,081	0.126	0.331	0.000	0.000	0.000

Panel B: Sample Distribution by Industry

Industry	Frequency	Percent	Cumulative percent
Consumer Nondurables	114	1.87	1.87
Consumer Durables	101	1.66	3.54
Manufacturing	214	3.52	7.05
Oil, Gas and Coal Extraction & Products	342	5.62	12.68
Chemicals & Allied Products	87	1.43	14.11
Business Equipment	1,323	21.76	35.87
Telephone & Television Transmission	111	1.83	37.69
Utilities	54	0.89	38.58
Wholesale, Retail, Some Services	245	4.03	42.61
Healthcare, Medical Equipment & Drugs	2,241	36.85	79.46
Finance	456	7.50	86.96
Other	793	13.04	100.00
Total	6,081	100	

This table presents the summary statistics. *PIPE Pricing* is measured as (*Offer Price* − *Closing Price*) / *Closing Price*, where *Closing Price* is taken 1 day immediately before the PIPE event date. The event date

refers to the announcement date of PIPE and is the same as closing date if the announcement date is not available. *Tax Rate* is the long-term capital gains tax rate in year *t*. *D_Tax_Rate* is a dummy variable that takes a value of 1 if the capital gains tax rate in the year is greater than the mean capital gains tax rate of the sample, and 0 otherwise. *Shares Offered / Shares Outstanding* is the number of shares offered in all the PIPE offerings by a firm within a year scaled by the total number of outstanding shares before the PIPE. *TA* denotes total assets in millions of USD. *BTM* denotes the book-to-market ratio; *TANGB* denotes tangible assets scaled by total assets; *NPOA* denotes the non-operation return; LEV denotes leverage; *CAPX* denotes capital expenditure scaled by total assets; *IO* denotes institutional ownership; *IOHHI* denotes the Herfindahl–Hirschman index value of institutional ownership across all institutions that hold this stock; and *#ANALST* denotes the number of analysts covering the firm. *Past One-Year Return* denotes the cumulative stock return in the past 12 months. *BHR-12M* denotes the buy-and-hold return from the PIPE closing date to 12 months after the closing date. *BHR-24M* is the buy-and-hold return from the PIPE closing date to 24 months after the closing date. *ROI_1D* is measured as (*1st Day Price − Offer Price*) / *Offer Price*, where *1st Day Price* is taken 1 day immediately after the closing of the deal. *ROI_2W* is measured as (*2-week Avg Price − Offer Price*) / Offer Price, where the *2-week Avg Price* is the average stock price in the 2 weeks after the closing of the deal. *IO_LOSS* takes a value of 1 if at least one of the investors in the PIPE deal incurs losses in their investment portfolio in the quarter preceding the PIPE deal, and 0 otherwise. *D_INV* is a dummy variable that takes a value of 1 if the number of investor protection provisions is greater than 0, and 0 otherwise. *DIV_PAYER* is an indicator variable that takes a value of 1 if the issuer paid dividends in the 24 months preceding the issue date, and 0 otherwise. The unit of our analysis is a PIPE event.

Table 2: Univariate Correlations and Comparison

Panel A: Correlations

Variables	PIPE Pricing	BHR_12M	BHR_24M	Dilution	Tax Rate	AT	BTM	ROA	TANGB	NPOA	LEV	CAPX	IO	IOHHI	Log(#ANALST)
PIPE Pricing	1.000														
BHR_12M	0.026**	1.000													
BHR_24M	0.030**	0.664***	1.000												
Dilution	−0.038***	−0.005	0.001	1.000											
Tax Rate	−0.069***	−0.001	−0.009	−0.053***	1.000										
AT	0.020	0.024*	0.047***	0.055***	−0.103***	1.000									
BTM	0.034***	0.056***	0.094***	0.119***	−0.048***	0.263***	1.000								
ROA	0.019	0.054***	0.084***	0.018	−0.067***	0.148***	0.350***	1.000							
TANGB	0.003	0.046***	0.065***	−0.051***	0.019	0.061***	0.206***	0.181***	1.000						
NPOA	0.012	−0.022*	−0.028**	−0.024*	0.024*	−0.037***	−0.054***	−0.039***	−0.031**	1.000					
LEV	0.030**	−0.008	0.018	0.003	−0.035***	0.130***	0.065***	0.024*	0.208***	−0.043***	1.000				
CAPX	0.017	−0.018	−0.017	−0.051***	0.049***	−0.009	−0.024*	−0.192***	0.445***	0.083***	0.042***	1.000			
IO	0.050***	0.068***	0.106***	−0.005	−0.163***	0.303***	0.168***	0.187***	−0.016	−0.019	0.106***	−0.065***	1.000		
IOHHI	0.029**	0.057***	0.081***	0.014	−0.112***	0.141***	0.089***	0.108***	−0.020	−0.011	0.064***	−0.053***	0.747***	1.000	
Log(#ANALST)	0.082***	0.002	0.030**	−0.036***	−0.076***	0.260***	0.077***	0.105***	−0.031**	0.007	0.071***	−0.001	0.519***	0.240***	1.000
Past Return	−0.052***	−0.053***	−0.065***	−0.084***	0.024*	−0.068***	−0.043***	0.082***	−0.010	−0.033***	−0.051***	−0.041***	−0.062***	−0.020	−0.116***

Panel B: Univariate analysis

Variables	*D_TAX_RATE* = 0 (*N* = 3,089)	*D_TAX_RATE* = 1 (*N* = 2,992)	Difference in mean
	(1)	(2)	(1) − (2)
Tax Rate	0.150	0.205	-0.055***
PIPE Pricing	−0.038	−0.088	0.050***
Dilution	0.291	0.209	0.083***
BHR-12M	−0.033	−0.030	−0.002
BHR-24M	−0.047	−0.079	0.032
Log (TA)	4.287	3.722	0.565***
BTM	0.518	0.492	0.026***
ROA	−0.487	−0.644	0.157***
TANGB	0.219	0.220	−0.001
NPOA	0.011	0.014	−0.003
LEV	0.202	0.182	0.020***
CAPX	0.075	0.089	−0.014***
IO	0.234	0.167	0.068***
IOHHI	0.014	0.010	0.004***
Log(#ANALST)	1.046	0.971	0.075***
Past One Year Ret	0.259	0.357	−0.098***

This table reports the correlation matrix and univariate analysis. Panel A presents the Spearman correlation coefficients and the corresponding p-values for the key variables. Panel B shows the univariate t-test. *D_TAX_RATE* is a dummy variable that takes a value of 1 if the *Tax Rate* in the year is greater than the mean of the capital gains tax rates in the sample, and 0 otherwise. See Table 1 for the detailed variable definitions. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 3: Impact of Capital Gains Tax Rate on PIPE Offer Price

	(1)	(2)	(3)
Dep. Var.		*PIPE Pricing* $_t$	
Tax Rate $_t$	−0.817***	−0.706***	
	(−9.75)	(−8.68)	
D_TAX_RATE $_t$			−0.028***
			(−5.50)
Log (TA) $_{t-1}$		0.012***	0.013***
		(4.39)	(4.84)
BTM $_{t-1}$		0.015	0.015
		(1.61)	(1.57)
ROA $_{t-1}$		0.002	0.002
		(0.69)	(0.59)
TANGB $_{t-1}$		−0.055***	−0.058***
		(−3.24)	(−3.39)
NPOA $_{t-1}$		0.060	0.057
		(1.64)	(1.55)
LEV $_{t-1}$		0.009	0.010
		(0.77)	(0.83)
CAPX $_{t-1}$		0.050**	0.047**
		(2.37)	(2.22)
IO $_{t-1}$		−0.054**	−0.054**
		(−2.53)	(−2.49)
IOHHI $_{t-1}$		0.332*	0.350*
		(1.65)	(1.73)
Log(#ANALST) $_{t-1}$		0.020***	0.020***
		(5.01)	(4.92)
Past One Year Ret $_{t-1}$		−0.016***	−0.015***
		(−8.07)	(−7.94)
Constant	0.073***	−0.004	−0.004
	(4.87)	(−0.24)	(−0.24)
Industry FEs	Yes	Yes	Yes
Observations	6,081	6,081	6,081
Adj. R-squared	0.041	0.082	0.074

This table presents the effect of the capital gains tax rate on PIPE offering price. The dependent variable, *PIPE Pricing*, is measured as (*Offer Price* − *Closing Price*) / *Closing Price*, where *Closing Price* is taken 1 day immediately before the PIPE event date. The event date refers to the announcement date of PIPE and is the same as the closing date if the announcement date is not available. *Tax Rate* is the long-term capital gains tax rate in year *t*. *D_TAX_RATE* is a dummy variable that takes a value of 1 if the *Tax Rate* in the year is greater than the mean of capital gain tax rates in the sample, and 0 otherwise. The dependent variable and tax variable are measured in year *t*, and firm-level control variables are measured in *t*-1. Standard errors are clustered at the firm level. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 4: Capital Gains Tax Rate and PIPE Offer Price: Cross-Sectional Variations

Panel A: Using *Tax Rate* as the main independent variable

	(1)	(2)	(3)	(4)
Dep. Var.	*PIPE Pricing* $_t$			
Tax Rate $_t$	−0.691***	−0.779***	−1.270***	−0.790***
	(−6.43)	(−5.15)	(−9.63)	(−9.34)
Tax Rate $_t$* *IO_LOSS* $_t$	0.442**			
	(2.20)			
IO_LOSS $_t$	−0.075**			
	(−2.08)			
Tax Rate $_t$ * *Related* $_t$		0.447**		
		(2.41)		
Related $_t$		−0.060*		
		(−1.80)		
Tax Rate $_t$ * *D_INV* $_t$			1.141***	
			(6.34)	
D_INV $_t$			−0.214***	
			(−6.40)	
Tax Rate $_t$ * *DIV_PAYER* $_t$				0.945***
				(3.77)
DIV_PAYER $_t$				−0.178***
				(−4.01)
Controls	Yes	Yes	Yes	Yes
Constant	0.442**	−0.011	0.117***	0.009
	(2.20)	(−0.38)	(3.97)	(0.47)
Industry FEs	Yes	Yes	Yes	Yes
Observations	2,935	2,935	6,081	6,081
Adj. R-squared	0.069	0.074	0.089	0.084

Panel B: Using *D_TAX_RATE* indicator as the main independent variable

	(1)	(2)	(3)	(4)
Dep. Var.	*PIPE Pricing* $_t$			
D_TAX_RATE $_t$	-0.035***	-0.038***	-0.034***	-0.066***
	(-5.35)	(-4.26)	(-6.27)	(-5.62)
D_TAX_RATE $_t$ * *IO_LOSS* $_t$	0.030***			
	(2.65)			
IO_LOSS $_t$	-0.011			
	(-1.37)			
D_TAX_RATE $_t$ * *Related* $_t$		0.026**		
		(2.44)		
Related $_t$		0.007		
		(0.94)		
D_TAX_RATE $_t$ * *D_INV* $_t$			0.050***	
			(3.63)	
D_INV $_t$			-0.033***	
			(-2.78)	
D_TAX_RATE $_t$ * *DIV_PAYER* $_t$				0.058***
				(4.47)
DIV_PAYER $_t$				-0.036***
				(-3.30)
Controls	Yes	Yes	Yes	Yes
Constant	-0.131***	-0.134***	-0.119***	-0.088***
	(-11.12)	(-10.68)	(-11.53)	(-6.02)
Industry FEs	Yes	Yes	Yes	Yes
Observations	2,935	2,935	6,081	6,081
Adj. R-squared	0.063	0.067	0.076	0.078

This table presents the cross-sectional variation in the effect of capital gain tax rate on PIPE pricing. The dependent variable, *PIPE Pricing*, is measured as (*Offer Price − Closing Price*) / *Closing Price*, where *Closing Price* is taken 1 day before the PIPE event date. The event date refers to the announcement date of PIPE and is the same as the closing date if the announcement date is not available. The independent variable, *Tax Rate,* is the long-term capital gains tax rate in year *t. D_TAX_RATE* is a dummy variable that takes a value of 1 if the *Tax Rate* in the year is greater than the mean of capital gain tax rates in the sample, and 0 otherwise. *IO_LOSS* takes a value of 1 if at least one of the investors in the PIPE deal incurs losses in their investment portfolio in the quarter preceding the PIPE deal, and 0 otherwise. *Related* is a dummy variable that takes a value of 1 if at least one PIPE investor held the stock of the issuing firm in the preceding year. *Past_owner* is the percentage of PIPE investors who held the PIPE-issuing firm's stock in the preceding year. Investor protection provisions, which is the number of the following four terms in a PIPE contract: anti-dilution protections, a first refusal right, investor call options, and investor redemption rights. *D_INV* is a dummy variable that takes a value of 1 if the number of investor protection provisions is greater than 0, and 0 otherwise. *DIV_PAYER* is an indicator variable that takes a value of 1 if the issuer paid dividends in the 24 months before the issue date, and 0 otherwise. The dependent variable and tax variable are measured in year *t*, and firm-level control variables are measured in *t*-1. Standard errors are clustered at the firm level. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 5: Impact of Capital Gains Tax Rate on Post-issue Long Run Return and Offer Size

Panel A: Using *Tax rate* as the main independent variable

	(1)	(2)	(3)
Dep. Var.	*BHR-12M* $_t$	*BHR-24M* $_t$	*Shares Offered / Shares Outstanding* $_t$
Tax Rate $_t$	0.792**	1.029*	-0.407**
	(1.96)	(1.71)	(-2.05)
Log (Closing Price) $_t$	-0.038***	-0.040**	-0.124***
	(-2.63)	(-2.14)	(-5.38)
Log (TA) $_{t-1}$	-0.018	0.007	0.009
	(-1.40)	(0.41)	(0.59)
BTM $_{t-1}$	0.111**	0.150***	0.095**
	(2.40)	(2.62)	(2.46)
ROA $_{t-1}$	0.041**	0.055***	0.006
	(2.42)	(2.88)	(1.02)
TANGB $_{t-1}$	0.048	0.108	-0.041
	(0.59)	(0.88)	(-1.12)
NPOA $_{t-1}$	-0.255	-0.350	-0.030
	(-1.47)	(-1.56)	(-0.41)
LEV $_{t-1}$	-0.039	0.022	-0.022
	(-0.51)	(0.24)	(-0.73)
CAPX $_{t-1}$	-0.047	-0.073	0.021
	(-0.43)	(-0.59)	(0.62)
IO $_{t-1}$	0.394***	0.512***	-0.092
	(3.96)	(3.46)	(-1.23)
IOHHI $_{t-1}$	0.251	0.739	2.088**
	(0.27)	(0.53)	(2.40)
Log(#ANALST) $_{t-1}$	-0.031	-0.041	-0.014
	(-1.63)	(-1.47)	(-0.96)
Past One Year Ret $_{t-1}$	-0.025**	-0.040***	-0.004
	(-2.50)	(-3.23)	(-0.62)
Constant	-0.121	-0.339***	0.435***
	(-1.44)	(-2.78)	(7.33)
Industry FEs	Yes	Yes	Yes
Observations	6,081	6,081	6,081
Adj. R-squared	0.026	0.039	0.085

Panel B: Using *D_TAX_RATE* indicator as the main independent variable

	(1)	(2)	(3)
Dep. Var.	*BHR_12M* $_t$	*BHR_24M* $_t$	*Shares Offered / Shares Outstanding*
D_TAX_RATE $_t$	0.059**	0.059*	−0.076***
	(2.31)	(1.71)	(−4.50)
PIPE Pricing $_t$	0.327***	0.402***	−0.380***
	(4.76)	(4.68)	(−3.48)
Log (TA) $_{t-1}$	−0.037***	−0.015	−0.033***
	(−3.14)	(−0.91)	(−3.06)
BTM $_{t-1}$	0.144***	0.185***	0.237***
	(3.34)	(3.37)	(9.28)
ROA $_{t-1}$	0.038**	0.052***	−0.004
	(2.25)	(2.70)	(−0.78)
TANGB $_{t-1}$	0.074	0.142	−0.026
	(0.90)	(1.16)	(−0.75)
NPOA $_{t-1}$	−0.293*	−0.392*	−0.080
	(−1.71)	(−1.77)	(−1.11)
LEV $_{t-1}$	−0.026	0.034	0.033
	(−0.35)	(0.39)	(1.18)
CAPX $_{t-1}$	−0.086	−0.114	−0.033
	(−0.79)	(−0.93)	(−1.07)
IO $_{t-1}$	0.398***	0.514***	−0.199**
	(4.05)	(3.55)	(−2.48)
IOHHI $_{t-1}$	0.154	0.618	2.414***
	(0.17)	(0.45)	(2.72)
Log(#ANALST) $_{t-1}$	−0.039**	−0.050*	−0.007
	(−2.08)	(−1.80)	(−0.49)
Past One Year Ret $_{t-1}$	−0.033***	−0.048***	−0.053***
	(−3.53)	(−4.14)	(−7.66)
Industry FEs	Yes	Yes	Yes
Observations	6,081	6,081	6,081
Adj. R-squared	0.030	0.042	0.071

This table presents the results of the robustness tests using alternative measures of capital gains tax rates. The dependent variable in column (1), *BHR-12M*, is measured as the buy-and-hold return from the PIPE closing date to 12 months after the closing date. The dependent variable in column (2), *BHR-24M*, is measured as the buy-and-hold return from the PIPE closing date to 24 months after the closing date. *Shares Offered / Shares Outstanding* is the number of shares offered in all the PIPE offerings by a firm within a year scaled by the total number of outstanding shares before the PIPE. *Tax Rate* is the long-term capital gains tax rate in year *t*. *D_TAX_RATE* is a dummy variable that takes a value of 1 if the capital gains tax rate in the year is greater than the mean capital gain tax rate in the sample, and 0 otherwise. The dependent variable and tax variable are measured in year *t*, and firm-level control variables are measured in *t-1*. Standard errors are clustered at the firm level. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 6: Subsample Analysis: The Tax Rate Does Not Work in PIPEs with No Capital Gains

	(1)	(2)	(3)
Subsample used=	Full sample of PIPEs	Subsample of PIPEs **WITH** capital gains, i.e., Offer Price < Closing Price (*Premium = 0*)	Subsample of PIPEs **WITHOUT** capital gains, i.e., Offer Price > Closing Price (*Premium = 1*)
Dep. Var.		*PIPE Pricing* $_t$	
Tax Rate $_t$	−0.583***	−0.534***	0.156
	(−8.65)	(−7.82)	(0.96)
Premium $_t$	0.128***		
	(4.34)		
Tax Rate $_t$ * *Premium* $_t$	0.831***		
	(4.90)		
Log (TA) $_{t-1}$	0.011***	0.013***	0.001
	(5.26)	(6.14)	(0.24)
BTM $_{t-1}$	−0.016**	−0.033***	0.028*
	(−2.36)	(−4.42)	(1.91)
ROA $_{t-1}$	0.005*	0.006*	0.001
	(1.75)	(1.82)	(0.15)
TANGB $_{t-1}$	−0.030**	−0.042***	0.017
	(−2.46)	(−3.33)	(0.59)
NPOA $_{t-1}$	0.029	0.048	0.008
	(1.12)	(1.49)	(0.17)
LEV $_{t-1}$	0.001	−0.004	0.019
	(0.13)	(−0.25)	(1.10)
CAPX $_{t-1}$	0.024*	0.004	0.061**
	(1.75)	(0.25)	(2.00)
IO $_{t-1}$	−0.020	−0.019	−0.012
	(−1.30)	(−1.13)	(−0.34)
IOHHI $_{t-1}$	0.209	0.213	0.108
	(1.42)	(1.37)	(0.30)
Log(#ANALST) $_{t-1}$	0.014***	0.019***	0.000
	(5.02)	(6.24)	(0.05)
Past One Year Ret $_{t-1}$	−0.007***	−0.003**	−0.020***
	(−4.71)	(−2.00)	(−6.17)
Constant	−0.075***	−0.089***	0.082**
	(−5.19)	(−5.90)	(2.51)
Industry FEs	Yes	Yes	Yes
Observations	6,081	4,544	1,527
Adj. R-squared	0.498	0.120	0.057

This table presents cross-sectional analyses of PIPE investors' capital gains. PIPE offerings are at a discount (premium) if the offer price is lower (higher) than the stock price immediately before the offering. In the second (third) four columns, the subsample includes PIPE offerings at a discount (premium). The dependent variable, *PIPE Pricing* equals (*Offer Price − Closing Price*) / *Closing Price*, where *Closing Price* is taken 1 day before the PIPE event date. The dependent variable and tax variable are measured in year *t*, and firm-level control variables are measured in *t*-1. Standard errors are clustered at the firm level. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 7: Robustness Tests

Panel A. Re-estimate the impact of tax on PIPE pricing based on alternative dependent variables

	(1)	(2)
Dep. Var.	*log (Offer price)* $_t$	*log (Offer price)* $_t$
Tax Rate $_t$	-0.817***	
	(-7.43)	
D_TAX_RATE $_{t-1}$		-0.030***
		(-4.77)
Log (Closing Price) $_t$	0.978***	0.976***
	(235.25)	(234.24)
Log (TA) $_{t-1}$	0.023***	0.025***
	(5.78)	(6.34)
BTM $_{t-1}$	-0.014	-0.017
	(-1.13)	(-1.31)
ROA $_{t-1}$	0.008	0.008
	(1.62)	(1.57)
TANGB $_{t-1}$	-0.075***	-0.080***
	(-3.79)	(-3.97)
NPOA $_{t-1}$	0.099**	0.096**
	(2.03)	(1.97)
LEV $_{t-1}$	-0.000	0.000
	(-0.02)	(0.00)
CAPX $_{t-1}$	0.059**	0.057**
	(2.51)	(2.39)
IO $_{t-1}$	-0.064**	-0.062**
	(-2.40)	(-2.28)
IOHHI $_{t-1}$	0.471*	0.487*
	(1.89)	(1.95)
Log(#ANALST) $_{t-1}$	0.029***	0.029***
	(6.05)	(5.94)
Past One Year Ret $_{t-1}$	-0.010***	-0.009***
	(-3.26)	(-2.97)
Constant	-0.010	-0.145***
	(-0.43)	(-11.01)
Industry Fes	Yes	Yes
Observations	6,081	6,081
Adj. R-squared	0.966	0.966

Panel B: The cross-sectional analysis in a subsample of PIPEs that generate unrealized capital gains for participating investors (i.e., PIPE premium = 0)

	(1)	(2)	(3)	(4)
Dep. Var.	*PIPE Pricing* $_t$			
Tax Rate $_t$	-0.616***	-0.593***	-0.585***	-0.579***
	(-6.10)	(-4.33)	(-8.22)	(-4.65)
Tax Rate $_t$ * *IO_LOSS* $_t$	0.608***			
	(3.40)			
IO_LOSS $_t$	-0.111***			
	(-3.46)			
Tax Rate $_t$ * *Related* $_t$		0.341**		
		(2.06)		
Related $_t$		-0.034		
		(-1.17)		
Tax Rate $_t$ * *D_INV* $_t$			0.525**	
			(2.30)	
D_INV $_t$			-0.085**	
			(-2.19)	
Tax Rate $_t$ * *DIV_PAYER* $_t$				0.672***
				(4.25)
DIV_PAYER $_t$				-0.092***
				(-3.05)
Controls	Yes	Yes	Yes	Yes
Constant	-0.073***	-0.086***	-0.080***	-0.088***
	(-3.73)	(-3.28)	(-5.13)	(-3.25)
Industry FEs	Yes	Yes	Yes	Yes
Observations	2,392	2,392	4,544	4,544
Adj. R-squared	0.103	0.112	0.122	0.134

This table presents two robustness tests. Panel A adopts an alternative definition the dependent variable. *log (Offer price)* is the log value of PIPE offer price. *Tax Rate* is the long-term capital gains tax rate in year *t*. *D_TAX_RATE* is a dummy variable that takes a value of 1 if the *Tax Rate* in the year is greater than the mean of capital gain tax rates in the sample, and 0 otherwise. *Log (Closing Price)* is the log value of the closing price, which is taken 1 day immediately before the PIPE event date. Panel B presents cross-sectional analysis in a subsample of PIPEs whose offer prices are lower than closing prices (i.e., PIPE premium =0). *PIPE Pricing* is (*Offer Price − Closing Price*) / *Closing Price*, where *Closing Price* is taken 1 day before the PIPE event date. The event date refers to the announcement date of PIPE and is the same as the closing date if the announcement date is not available. *IO_LOSS* takes a value of 1 if at least one of the investors in the PIPE deal incurs losses in their investment portfolio in the quarter preceding the PIPE deal, and 0 otherwise. *Related* is a dummy variable that takes a value of 1 if at least one PIPE investor held the stock of the issuing firm in the preceding year. *Past_owner* is the percentage of PIPE investors who held the PIPE-issuing firm's stock in the preceding year. Investor protection provisions, which is the number of the following four terms in a PIPE contract: anti-dilution protections, a first refusal right, investor call options, and investor redemption rights. *D_INV* is a dummy variable that takes a value of 1 if the number of investor protection provisions is greater than 0, and 0 otherwise. *DIV_PAYER* is an indicator variable that takes a value of 1 if the issuer paid dividends in the 24 months before the issue date, and 0 otherwise. Standard errors are clustered at the firm level. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 8: Additional Test based on The Short-term Capital Gains Tax Rate

	(1)	(2)	(3)
Dep. Var.	*PIPE Pricing* $_t$	*ROI_1D* $_t$	*ROI_2W* $_t$
Short-term Tax Rate $_t$	−0.358***	0.898***	1.075***
	(−2.96)	(7.23)	(6.55)
PIPE Pricing $_t$		−1.084***	−1.073***
		(−37.93)	(−29.57)
Log (TA) $_{t-1}$	0.014***	−0.008***	−0.013***
	(5.03)	(−2.82)	(−3.67)
BTM $_{t-1}$	0.012	0.044***	0.073***
	(1.27)	(4.35)	(5.43)
ROA $_{t-1}$	0.002	−0.015***	−0.013**
	(0.61)	(−3.09)	(−2.49)
TANGB $_{t-1}$	−0.062***	0.011	−0.002
	(−3.65)	(0.66)	(−0.07)
NPOA $_{t-1}$	0.059	0.002	−0.006
	(1.61)	(0.07)	(−0.13)
LEV $_{t-1}$	0.010	0.019*	0.023*
	(0.82)	(1.67)	(1.81)
CAPX $_{t-1}$	0.045**	−0.001	−0.015
	(2.12)	(−0.05)	(−0.58)
IO $_{t-1}$	−0.050**	0.045*	0.064**
	(−2.30)	(1.82)	(2.16)
IOHHI $_{t-1}$	0.357*	0.185	0.255
	(1.75)	(0.79)	(0.88)
Log(#ANALST) $_{t-1}$	0.019***	−0.017***	−0.024***
	(4.78)	(−4.16)	(−4.58)
Past One Year Ret $_{t-1}$	−0.016***	−0.001	−0.006
	(−8.12)	(−0.22)	(−1.53)
Constant	−0.002	−0.279***	−0.313***
	(−0.04)	(−5.95)	(−5.07)
Industry FEs	Yes	Yes	Yes
Observations	6,081	6,081	6,081
Adj. R-squared	0.070	0.562	0.431

This table presents the relationships between the short-term capital gains tax rate and the PIPE offer price, post-PIPE performance, and PIPE offering size. The dependent variable, *PIPE Pricing*, is measured as (*Offer Price*-*Closing Price*) / *Closing Price*, where *Closing Price* is taken on one day immediately before the PIPE event date. The event date refers to the announcement date of PIPE, and it equals the closing date if the announcement date is not available. *ROI_1D* is measured as the (*1st Day Price – Offer Price*) / *Offer Price*, where the *1st Day Price* is taken on one day immediately after the closing of the deal. *ROI_2W* is measured as the (*Two-week Avg Price – Offer Price*) / *Offer Price*, where *Two-week Avg Price* is the average daily stock price during the two weeks after the closing of the deal. *Short-term Tax Rate* is the short-term capital gains tax rate in year *t*. The dependent variable and the tax variable are measured in year *t*, and firm-level control variables are measured in *t-1*. Standard errors are clustered at the firm level. *, **, *** indicate significance at 10%, 5%, and 1% level, respectively.