The Real Effects of Equity Issuance Frictions

Matthew Gustafson and Peter Iliev

September 10th, 2015

ABSTRACT

We study the consequences of an exogenous U.S. deregulation allowing small firms to accelerate public equity issuance. Post-deregulation, firms double their reliance on public equity (both overall and compared to a control group), transition away from private investments in public equity, and increase their total annual equity issuance by 45%. This is accompanied by a significant reduction in equity issuance costs, an 18% increase in investment, and a 12% decline in financial leverage. The effects are larger for growth firms and financially constrained firms. Our findings provide evidence that reducing issuance frictions benefits issuers even in highly developed markets.

Keywords: Issuance Frictions, Seasoned Equity Offerings, PIPEs, Capital Structure, Investment, Shelf Registrations.

JEL Classification: G32, G18.

Matthew Gustafson (mtg15@psu.edu) and Peter Iliev (pgi1@psu.edu) are at the Smeal College of Business at the Pennsylvania State University. We wish to thank Michelle Lowry, Xiaohui Gao, Dennis Sheehan, Svetla Vitanova, David Haushalter, Laura Field, Don Autore, Diane Del Guercio, Richard Sloan, Wayne Ferson, and seminar participants at the U.S. Securities and Exchange Commission, the University of Oregon Summer Finance Conference, the Pennsylvania State University, George Mason University, and George Washington University for their helpful comments and discussions.

Introduction

In recent decades, corporations have drastically changed the way they raise equity. Twenty years ago, the vast majority of equity offerings were traditional public seasoned equity offerings (SEOs) and involved a month-long U.S. Securities and Exchange Commission (SEC) review and underwriter marketing process.[1] Around 2000, firms began transitioning toward quicker issuance methods involving less regulatory delay. Large firms started to use shelf registrations to accelerate public SEO issuance, while smaller firms, which the SEC prohibited from using shelf registrations, turned to private investments in public equity (PIPEs) for quick equity financing. These contemporaneous trends suggest that accelerating equity issuance may benefit firms by reducing issuance frictions, such as delayed access to equity financing or high transaction costs. However, the gradual and simultaneous adoption of these financing technologies makes identifying a causal effect difficult.

This study exploits an exogenous shock allowing firms to access accelerated public equity offerings to provide new evidence on the effect of issuance frictions on capital acquisition, investment, and capital structure. Until 2008, the SEC prohibited the one-quarter of all public firms with public float (the part of traded equity not held by insiders) less than $75 million from raising equity via shelf registrations. This prohibition exogenously increases equity issuance frictions for small firms because it denies them the option of conducting accelerated SEOs, which provide quicker access to capital than do traditional SEOs and have lower issuance

[1]We define equity offerings of registered shares as public equity offerings or SEOs. We refer to offerings of unregistered shares as private equity offerings or PIPEs.

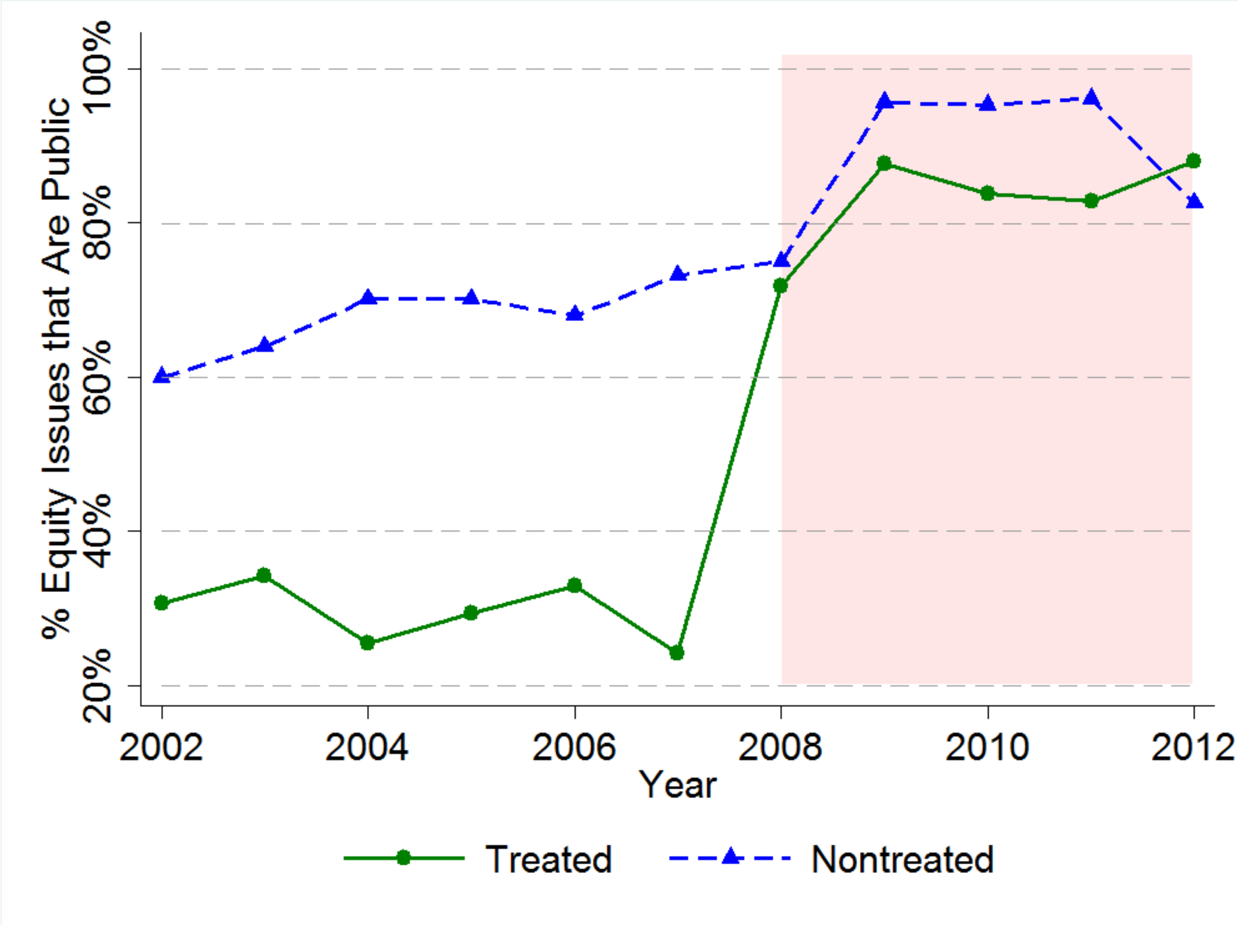
costs compared with both non-accelerated SEOs and PIPEs.[2] In 2008 the SEC relaxed this restriction, allowing small firms to accelerate SEOs via shelf registrations for the first time. Whether this deregulation relaxes a binding financing constraint for small public firms is an empirical question. For example, the effects of the deregulation will be limited if it remains optimal for most small firms to continue relying on the more flexible PIPE contracts, which Chaplinsky and Haushalter (2010) and Gomes and Phillips (2012) argue are more capable of mitigating agency problems and information asymmetries.

Our identification strategy is to focus on a set of firms near the $75 million public float threshold used in the 2008 rule. We use a difference-in-differences analysis to compare the pre- and post-rule outcomes of firms below $75 million in public float that gain access to shelf registrations in 2008 (i.e., treated firms) and firms above this threshold with access to shelf registrations throughout our sample period (i.e., untreated firms). Specifically, we focus on firms with public floats of less than $150 million, resulting in a test sample that includes approximately 40% of U.S. exchange listed firms, which are responsible for more than 55% of equity offerings.

Figure 1 shows that enabling firms to use shelf registrations has a dramatic effect on how they raise equity. Prior to 2008, untreated firms conducted approximately two-thirds of their equity offerings as public SEOs, while treated firms conducted approximately two-thirds of their equity offerings via PIPEs. Since the 2008 deregulation, however, firms on both sides of the $75 million line raise equity in similar manners. Both groups now conduct over 80% of their equity offerings in the public markets.

[2] Bortolotti, Megginson, and Smart (2008), Gao and Ritter (2010), Henry and Koski (2010), and Gustafson (2015) all show that accelerated SEOs are associated with lower issuance costs than traditional public SEOs. The unique costs of PIPEs relative to SEOs are also well established (see, e.g., Wruck 1989 and Silber 1991).

Figure 1. The Use of Public Equity Issues.



The figure depicts the percentage of equity issues that are public for firms that were given the ability to use shelf registrations after 2008 (Treated) and firms that had this ability over the sample period (Nontreated). We define common stock offerings of registered shares as public offerings and offerings of unregistered shares as private offerings.

Along with this transition toward public equity offerings, treated firms increase their total equity issuance relative to untreated firms following the 2008 deregulation. The increase is economically large: Treated firms increase their proceeds from equity issuances by 45% and are almost 50% more likely to issue equity each year. This increase in equity issuance by treated firms stems from an even bigger increase in shelf-registered public SEO proceeds that is partially offset by a statistically significant decline in PIPE proceeds. Consistent with our difference-in-differences specification isolating the causal effect of the 2008 deregulation on issuance behavior, placebo analyses at artificial cutoffs provide no evidence of a general transition of small firms toward public securities offerings. We also find that the increase in public issuance leads to a 6.8 percentage point drop in offering discounts for treated firms relative to the control sample, which for a firm with a 12% cost of capital implies an approximate 1 percentage point reduction in the cost of equity.[3] Although other less tangible dimensions of issuance frictions, such as costs arising from the use of warrant and reset provisions, also undoubtedly change, this result demonstrates how transitioning away from PIPEs can lower the cost of capital.

Our unique setting provides a natural testing ground for the effects of issuance frictions on firm investment and financing behavior. Modigliani and Miller (1958) argue that under certain strong assumptions, the value of the firm does not depend on the financing decision and that firm investment will be "completely unaffected by the type of securities the firm used to finance the investment." Researchers have extensively studied the effects of relaxing the crucial assumptions behind this seminal result. Most such empirical work focuses on the effects of introducing taxes and bankruptcy costs. Recent examples are Doidge and Dyck (2015), who find that an exogenous increase in corporate taxes affects both leverage and investment, and Heider and Ljungqvist (2015), who document increases in long-term leverage in response to increases in state taxes. We conduct the first similar analysis surrounding an exogenous decrease in issuance frictions.

Consistent with the theory of optimal investment and financing, we expect that treated

[3] The precise pretax cost of equity reduction attributable to the reduced discount depends on the level of SEO issuance costs and the cost of capital. For example, a firm with pre transaction costs of equity of 12% and 5% issuance costs has an effective pretax cost of equity of (12%/0.95) or 12.63%. Increasing issuance costs by 6.8 percentage points raises the pretax cost of equity to (12%/0.882) or 13.61%.

firms will increase their investment and lower their financial leverage following the exogenous decrease in equity issuance frictions. Our evidence supports these predictions. Treated firms increase their capital expenditures by approximately 18% and reduce their leverage by 12% relative to untreated firms. All three of our main findings—the transition from private to public equity issuance, the increased investment, and the reduced financial leverage—are robust to methods isolating within-firm variation and are largest for growth firms, suggesting that firms with profitable projects benefit from the deregulation most.

Finally, we conduct an event study to investigate whether the market views the aggregate effects of the rule positively. We find that treated firms outperform untreated firms during the days surrounding the rule's announcement. This result suggests that the benefits from the operating improvements we document are anticipated and outweigh any potential decrease in investor protections associated with the ability to conduct public SEOs quickly. These findings contribute to the recent literature investigating the costs and benefits of deregulating the securities issuance process for small firms. For example, Dambra, Field, and Gustafson (2015) find that the Jumpstart Our Business Startups Act (JOBS), which reduces the risks and burdens of going public for small firms, makes accessing the public markets more attractive, even though it also increases investor uncertainty (Barth, Landsman, and Taylor 2014; Chaplinsky, Hanley, and Moon 2015). We provide evidence that similar benefits extend to small already-public firms and offer a reduced cost of equity, increased investment, and lower leverage as mechanisms through which this value is created.

Our findings extend the securities issuance literature by showing that the benefits to shelf-registered SEOs are more pervasive than previously suggested. Despite evidence that small firms should be less likely than large firms to benefit from accelerated SEOs relative to either PIPEs (Chaplinsky and Haushalter 2010 and Gomes and Phillips 2012) or non-accelerated public offerings (Denis 1991 and Gao and Ritter 2010), we show that many small firms still use and benefit from the option to accelerate public equity issuance. We also add to recent research on the determinants of firm capital structure decisions that has identified the first-order effect of taxes on capital structure and investment (Graham 2000; Becker, Jacob, and Jacob 2013; Doidge and Dyck 2015; and Heider and Ljungqvist 2015) as well as the importance of market timing (Baker and Wurgler 2002), stock appreciation (Welch 2004), macroeconomic conditions (Korajczyk and Levy 2003), and industry peer effects (Leary and Roberts 2014) in determining capital structure. We show that issuance frictions are likewise important inputs into firms' investment and capital structure decisions.

Overall, our findings provide important causal evidence on the real economic consequences of reductions in issuance frictions. These large effects are particularly interesting because the deregulation occurs in the United States. Thus, our results complement international evidence that higher quality financial institutions facilitate growth (La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1998) by encouraging external financing (Demirguc-Kunt and Maksimovic 1998). We find that even in the highly developed markets of the United States, frictions associated with delayed access to public equity financing are an important determinant of corporate behavior.

The remainder of this paper is organized as follows. Section 2 presents the institutional setting behind the new rule. Section 3 describes the data and our empirical strategy. Section 4 analyzes how the new rule affects firm equity issuance activity. Section 5 reports the effects on capital structure, investment, and firm value. Section 6 performs additional checks, and Section 7 concludes.

2. The Setting: An Exogenous Shock to Equity Issuance Frictions

2.1 The 2008 Deregulation as a Shock to Issuance Frictions

We study a 2008 decision by the SEC to eliminate the $75 million public float requirement for shelf registration eligibility, which previously prevented one-quarter of all U.S. public firms from conducting shelf-registered SEOs.[4] Shelf registrations have become an important mechanism through which eligible firms raise capital. They allow firms to pre-file expected securities offerings and subsequently issue all, part, or none of the registered securities with little regulatory delay. Moreover, shelf issuers need not specify the type of security until immediately before issuance, can incorporate by reference reports filed under the Exchange Act, and can automatically update the registration as opposed to having to file new or amended registration statements with the SEC for review.[5] Thus, shelf registrations offer benefits compared to either PIPEs or non-shelf public equity offerings. According to Feldman Weinstein and Smith LLP, "Shelf-registered securities are the lowest cost form of equity available to any given public company, due to the speed of execution and the fact that the securities are immediately tradable in the hands of the purchasers."[6]

The final text of the rule further recognizes these benefits by stating that "the ability to

[4] The new 2008 rule updates a 1992 rule in which the SEC established the public float threshold for using Form S-3 to be $75 million (SEC Release No. 33-6964).
[5] See comment letter by the American Bankers Association, File Number s7-10-07, filed with the SEC on Aug. 27, 2007.
[6] See comment letter by the David N. Feldman, Esquire, Managing Partner, Feldman Weinstein and Smith LLP, File Number s7-10-07, filed with the SEC on Aug. 17, 2007.

conduct primary offerings on Form S-3 (i.e., shelf registrations) confers significant advantages on eligible companies."[7] The SEC went on to explain that the new process provided significant benefits in speed, flexibility, and costs over the alternatives. Importantly, the SEC believes that "the 1,400 companies that we estimate will be affected by the rule change would have conducted more registered securities offerings had they been able to use Forms S-3 and F-3, because of the benefits of forward incorporation and the ability to utilize shelf registration to maximize market opportunities."[8] Not only was this opinion widely shared by market participants commenting on the proposed rule,[9] but it is also supported by the recent academic literature.

According to Autore, Kumar, and Shome (2008), more than two-thirds of shelf-eligible issuers used shelf registrations for their SEO issuances in 2003. Subsequent research suggests several reasons for the popularity of such offerings. Accelerated SEOs, which can only be conducted off of shelf registrations in the United States, have been shown to be cheaper than non-accelerated SEOs in terms of underwriting fees, SEO underpricing, and SEO period stock returns (Bortolotti, Megginson, and Smart 2008; Gao and Ritter 2010; and Gustafson 2015). Moreover, because accelerated SEOs sell registered shares, they are subject to smaller issue discounts than PIPE offerings. Thus, accelerated SEOs offer the speed of PIPEs combined with

[7] Final rule titled "Revisions to the Eligibility Requirements for Primary Security Offerings on Form S-3 and F-3," SEC Release No. 33-8878, Dec. 19, 2007.

[8] Form S-3 is used by U.S.–headquartered issuers, and Form F-3 is used by foreign private issuers. While this rule extends the ability to use shelf issuances to a small number of foreign issuers with public floats under $75 million, we choose to focus on U.S. companies. Foreign private issuers do not report their public floats because they do not file Form 10-K, and therefore we cannot verify if they were affected by the new rule.

[9] Commenters showing strong support for the rule ranged from investment banks, law firms helping issuers to go public, and over-the-counter exchanges (Pink Sheets) to various associations like the American Bar Association, the Society of Corporate Secretaries, broker-dealer associations, and government offices (The Office of Advocacy at the Small Business Administration). All comments to the rule are available at http://www.sec.gov/comments/s7-10-07/s71007.shtml.

the registered shares and broad-based marketing of public offerings and have lower transaction costs than either PIPEs or non-accelerated SEOs. In this way, the 2008 SEC deregulation allowing issuers with under $75 million in public float to conduct shelf-registered SEOs for the first time represents a shock to equity issuance frictions.

2.2 The Exogeneity of the 2008 Deregulation

Before identifying the consequences of the 2008 deregulation, it is important to discuss the extent to which the deregulation can be treated as an exogenous change. First, the new rule was proposed in an effort to improve market access for small firms and not as a reaction to the financial crisis of 2008. The timing of the rule was prompted by findings of the Commission's Advisory Committee on Smaller Public Companies, which in its 2006 public report recommended that all reporting companies listed on a national securities exchange or trading on the Over-the-Counter Bulletin Board be made eligible to use shelf registrations.[10] The advisory committee recognized that these small companies have the same reporting obligations as the largest public companies and, therefore, provide sufficient public disclosures for the use of shelf registrations. The report stated, "We believe strongly that all reporting companies should have the same efficient access to the market as large reporting companies."[11]

Second, we find no evidence of other contemporaneous regulations likely to differentially affect the issuance behavior of firms above and below the $75 million public float threshold. The only event we identify that could potentially affect our firms' issuance behavior is an SEC final

[10] See "Final Report of the Advisory Committee on Smaller Public Companies to the United States Securities and Exchange Commission," April 23, 2006.
[11] The actual rule, however, restricted this new ability to non–shell companies listed on a national exchange.

rule passed in 2007 that shortens the holding period requirement and reduces the restrictions to the resale of securities under Rule 144.[12] However, that rule does not treat firms under the $75 million threshold differently. Moreover, it may lead to heavier reliance on private issuance,[13] which is opposite to the predicted effect of the rule we investigate.

The period we study includes the 2007-2008 financial crisis. To avoid the direct effects of the crisis, we exclude firm-years for which more than six months fall within the NBER-defined recessionary period (see Section 3 for more detail). We also investigate the possibility that the crisis had longer lasting effects that might threaten our identification strategy. In particular, if the private equity markets collapsed during the crisis period and did not recover *and* firms below the $75 million public float threshold were more reliant on private equity financing, then it is possible we will observe a post-2008 relative increase in public equity offerings for small firms that is caused by a change in the supply of equity. We investigate this alternative and find little evidence that the private equity market permanently collapsed during the financial crisis. Appendix I shows that the set of firms unaffected by the new rule because they were not listed on a major exchange experienced only a temporary reduction in their PIPE activity during the crisis period and later recovered to their pre-crisis level of PIPE issuance.[14]

We find no evidence of significant omitted factors that coincide with or determine the

---

[12] The final rule was titled "Revisions to Rules 144 and 145," SEC RELEASE NO. 33-8869, Dec. 17, 2007.

[13] In a typical PIPE transaction, the firm registers for resale on behalf of investors some or all of the shares issued; however, if the firm is unable to register the shares, the private investors have to rely on Rule 144 to be able to resell these shares. These PIPE transactions usually result in large discounts because investors buy illiquid securities.

[14] For this test, we select firms with a Compustat exchange code of either 14 or 19 because these firms are listed over-the-counter and thus do not qualify for the new rule. We further confirm that we use firms that cannot be merged with the CRSP database and therefore are not listed on one of the three major U.S. exchanges. We do not use this set of firms in our remaining tests because they might not be the best control group for listed firms, and they lack pricing data.

passage of the deregulation that would prevent us from identifying its economic consequences.

3. Data Description and Empirical Approach

This section details our test sample, discusses the empirical strategy for identifying the effect of the 2008 rule, and provides summary statistics for our key control and outcome variables.

3.1 Sample and Variable Construction

Since 2002, firms have been required to report their public floats in their 10-K SEC filings as of the end of the second fiscal quarter.[15] For instance, if a firm's fiscal year ends on December 31, 2012, then it is required to report its public float as of June 30, 2012. We collect public float information from firm 10-K SEC filings in the Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) between 2002 and 2013. We use Perl script to extract the public float as reported on the first page of the annual report.[16] We merge the resulting list of 10-K filers with officially reported public float data that have annual accounting data from Compustat and monthly stock returns data from the Center for Research in Securities Prices (CRSP).

We exclude financial (SIC codes 6000–6999) and regulated (SIC 4900–4950) firms as

[15] The public float is formally defined as "the aggregate market value of the voting and nonvoting common equity held by non-affiliates of the registrant" (General Instruction I.B. of Form S-3). Therefore, the public float excludes the holdings of management, directors, and large shareholders, and it is reported on the first page of the company 10-K. It is important to collect the actual public float from 10-Ks rather than imputing a value because firms have to define "affiliates" when calculating their public float; hence, the definition of a firm's public float depends on the company circumstances. In 1997, the SEC defined affiliate as follows: "A person shall be deemed not to be an affiliate for purposes of this section if the person: (i) is not the beneficial owner, directly or indirectly, of more than 10% of any class of equity securities of the issuer; (ii) is not an officer of the issuer; and (iii) is not a director of the issuer." But the SEC left the option that "members of one or more of these classes may contend, nevertheless, that they are not affiliates because they are not in a 'control' position. For such persons, the determination of affiliate status would be a 'facts and circumstances' test." (SEC Release No. 33-7391)

[16] We verify that this procedure is 99% accurate in identifying the public float number on the company 10-K filings by hand-collecting a cross-section of public float data.

these firms might face different financing and investment environments. We further require 12 months of CRSP returns prior to the public float report date. We drop shell firms and firms not listed on national exchanges in either Compustat or CRSP because the new regulation does not apply to them. Finally, to ensure that the financial crisis does not drive our results, we exclude observations for which more than six months fall within the NBER-defined contraction, which corresponds to the financial crisis.[17]

To measure issuance behavior, we obtain public and private offerings of equity, debt, and convertible securities from the Thomson SDC and PlacementTracker databases, and bank loan initiations from the Thomson DealScan database. We merge these data with Compustat using CUSIP/year matching and the DealScan/Compustat linking file provided by Chava and Roberts (2008). To ensure that the public float, which defines treatment status, is not determined by issuance or investment behavior, we study securities issuances and investments that occur during the 12 months following each public float report date. All other control variables are measured in the period preceding the issuances we study.

We classify all equity offerings as public or private. We consider all equity offerings of registered shares as public offerings (i.e., SEOs), and all equity offerings of unregistered shares as private offerings (i.e., PIPEs). Gomes and Phillips (2012) employ a similar definition of private equity offerings and highlight several important institutional details that differentiate

[17] We use the dates for U.S. Business Cycle Expansions and Contractions available at http://www.nber.org/cycles.html. NBER defines the latest contraction as December 2007 to June 2009. NBER defines recession as a period when economic activity is contracting. We exclude observations with a fiscal year end between June 2008 and December 2009. Our results are robust to alternative definitions of the crisis. For example, our results do not change if we use a more conservative definition and exclude observations with any overlap with the official NBER recession definition (observations with fiscal year ends between December 2007 and May 2010).

private and public offerings. In contrast to public offerings that are marketed to a broad base of potential investors, the typical PIPE is marketed to a small group of potential investors and conducted in accordance with the "safe harbor" provisions of Regulation D of the 1933 Securities Act (i.e., marketed primarily to accredited investors). In addition, potential investors are subject to a confidentiality agreement.

Our primary source for public equity offerings is the Thomson SDC database. We consider all SEOs (i.e., SDC Dealtype = "C") that contain primary shares to be public offerings. Our principal source for private equity offerings is the PlacementTracker database, which we rely on to identify PIPEs because Park (2011) shows that this database has almost three times the PIPE coverage as Thomson's SDC. We consider all PIPEs with a security type of "Common Stock" in the PlacementTracker database to be private equity offerings.[18] Two types of offerings that PlacementTracker classifies as PIPEs are actually shelf offerings of public shares: confidentially marketed public offerings (CMPOs) and shelf-registered direct offerings. Thus, we supplement our SDC public offerings with these public offerings from PlacementTracker.[19] See Appendix II for definitions of all variables used throughout the analysis.

3.2 Identification Strategy

Ideally, we want to compare a random sample of firms affected by the issuance deregulation to identical unaffected firms. In practice, the second-best approach is to compare

[18] Results are similar if we merge PlacementTracker and SDC private offerings and then eliminate duplicate offerings.

[19] If the two databases lead to multiple offerings by the same firm with proceeds within $1 million of each other occurring within two days, then we drop the SDC observation because PlacementTracker classifications are more reliable. Results are not sensitive to alternative de-duplicating algorithms.

firms that experience similar economic pressures but, due to exogenous reasons, differ in their exposure to the economic shock. To achieve this, we use the exogenous rule threshold of $75 million and restrict our sample to firms with reported public floats between $10 million and $150 million.[20] This approach ensures that our firms are similar with respect to the rule decision variable: the size of their publicly traded equity. Because we can only measure public floats in the middle of each fiscal year, we further exclude observations with a public float too close to the $75 million threshold. Specifically, we exclude firm-years whose reported public float in the middle of the year is between $70 million and $80 million, as these firms are likely to change treatment status over the course of the year.[21] Therefore, our treated firms fall within the $10 million to $70 million range of public float, and our untreated firms fall in the $80 million to $150 million range. This procedure results in an estimation sample of 2,858 unique firms and 8,778 firm-year observations for our issuance analyses.

Within this sample, we test whether treated firms changed their corporate policies differently from untreated firms following the deregulation. This set-up is a reverse difference-in-differences design because the two groups are in the same regulatory environment during the post-period, but the treated firms are prohibited from accessing shelf registrations in the pre-period. Thus, we expect treated and untreated firms to be similar (or exhibit parallel trends) in

[20] In Section 6, we discuss the robustness of our results to tighter bands around the $75 million threshold.

[21] In a perfect world, we would observe each firm's public float for every trading day. In practice, we observe only the firm's annual reported public float, which occurs at the end of the second fiscal quarter. Importantly, this makes the expected amount of time spent by each firm above the $75 million threshold over the next year, and thus the expected access to shelf registrations, very similar for firms near either side of the $75 million threshold. For example, firms with reported public floats of $74.9 and $75.1 million are equally likely to be shelf-eligible over the next year. Therefore, to be conservative, we exclude firms with public floats too close to the $75 million threshold as of the middle of the fiscal year. The lack of an expected discontinuity in corporate behavior at the $75 million reported public float threshold also means we cannot effectively employ a regression discontinuity design. Our results are similar if we retain the observations with public floats between $70 and $80 million in our sample.

the post-period but to behave differently in the pre-regulation period. Empirically, the coefficient of interest is β_1 in the following specification:

$$Outcome_{it} = \beta_0 + \beta_1 * Pre - Deregulation_t * Treated_{it} + \beta_2 * Treated_{it} + X_{it}\theta + \gamma_j + \mu_t + \varepsilon_{it}, \quad (1)$$

where $Treated_{it}$ is an indicator for firms with less than \$75 million in public float and $Pre - Deregulation_t$ indicates the years when the old rule constrained treated firms. X_{it} is a matrix of controls that differs depending on the outcome but always includes a continuous measure of public float and its interaction with treatment status.[22] We also include industry (γ_j) and year (μ_t) fixed effects, and allow for heteroscedastic error terms that are clustered at the firm level (ε_{it}). We do not include a separate $Pre - Deregulation_t$ term because it is subsumed by the year fixed effects, which provide a more flexible set of controls for time-varying changes in the outcome variable. The strength of this specification is that β_1 identifies the differential effect of the deregulation after controlling for known differences in the firm size, firm and industry characteristics, and overall time trends.

This specification exploits both within- and between-firm variation to identify the effect of deregulation. Between-firm variation is important because the average firm only remains in our sample for three years. Even if firms stay in our sample for just one year, we still have a valid design that tests whether firms right above the \$75 million threshold behave differently relative to those under the threshold before and after the regulation change. In Section 6.2.1, we limit identification to within-firm variation. We first replicate our main results but include firm

[22] Results are robust to including nonlinear controls for public float and their interaction with treatment status.

fixed effects rather than industry fixed effects. We then present our leverage results using a change specification to simultaneously isolate within-firm variation and address the significant persistence of leverage as documented by Lemmon, Roberts, and Zender (2008). Reassuringly, we find similar economic results, although we lose some statistical power.

3.3 Descriptive Statistics

Table 1 provides descriptive statistics for the variables used throughout the analysis. Consistent with there being more firms below than above the $75 million threshold, Panel A shows that the average firm in our sample has a public float of $59 million. The average firm has $180 million in total assets, a market-to-book ratio of 1.6, and 22% tangible assets. The average firm is unprofitable as measured by its net income but is growing, with average equity returns of 13%.

The firms we study are also investing at a high rate—the annual capital expenditures stand at 4.3% of lagged firm assets and 31% of lagged property, plant, and equipment. Finally, our firms use financial leverage to finance their operations. The average ratio of liabilities to total assets is 45%, with significant financing coming from long-term debt. The average long-term debt is 12% of the book value of assets.

Panel B of Table 1 provides summary statistics about the firms' issuance activity, with our proceeds measures winsorized at the 2.5% level. The firms in our sample are active equity issuers. The average firm raises 4.2% of their market capitalization in equity issues each year, with roughly two-thirds being raised via public SEOs and one-third via PIPEs. Most of the public SEO proceeds are raised via shelf offerings. Finally, our firms also rely on debt financing, mainly through nonconvertible debt proceeds, which come almost exclusively in the form of bank loans and private debt offerings.[23]

We next document the frequency of equity issuance, which is insensitive to outliers. Approximately 14% of the firms raise equity each year. More than half of these firms raise equity via public SEOs (8%), while PIPE offerings (6%) comprise the majority of the remaining equity offerings.[24] Approximately 80% of the public SEOs are conducted via shelf registrations.

Next, in Panel A of Table 2, we compare firm characteristics and our key outcome variables for the firms below and above the $75 million cut-off in the pre- and post-deregulation periods. Unsurprisingly, the treated firms are smaller than the untreated firms in their public floats and total assets. However, these firms are comparable to untreated firms in terms of market-to-book ratio, asset tangibility, and performance. In addition, treated and untreated firms have similar market-to-book, annual returns, profitability, tangibility, and cash-to-assets in the pre- and post-deregulation periods. These findings suggest that untreated firms represent a suitable control sample for investigating how the deregulation affected the issuance behavior of treated firms.

During the pre-regulation period, treated firms issue somewhat less equity on average, but the larger difference is in how treated and untreated firms acquire equity capital. Treated

[23] The SEC final rule also lets firms use shelf registrations to offer non-investment-grade debt and convertible debt securities. All firms were able to offer nonconvertible investment grade debt securities on Form S-3 before this regulation. We have only four public debt offerings in our sample of 6,547 years, which is consistent with Gomes and Phillips (2012), who find that the smallest quartile of public firms raise 99% of their debt in the private markets. Therefore, we have not conducted a thorough analysis of public debt offerings. The most common debt offerings are private debt offerings and bank loans. Many of these bank loans are revolving lines of credit, in which case we approximate proceeds using the maximum stated withdrawal limit.

[24] Note that total equity offerings do not equal the sum of PIPE and public equity offerings. Firms may raise capital through multiple methods in a given year.

firms rely mostly on the private market, while untreated firms rely more on the public equity market. In contrast, post-regulation, treated firms conduct more total equity offerings, the vast majority of which are in the public markets. We find a similar shift in investment and financial leverage between the two groups in the pre- and post-deregulation periods. After deregulation, treated firms invest more and take on less leverage compared to untreated firms than they did in the pre-regulation period.

Panel B of Table 2 breaks the sample down by the 49 Fama-French industries and treatment status. In each case, the three most common industries are pharmaceutical products, computer software, and electronic equipment. These three industries comprise approximately 30% of both the treated and untreated firm-years in our sample. Based on this evidence, we do not expect that our results will be driven by different industry composition of the two groups of firms. We also include industry (or firm) fixed effects in all estimations.

In summary, we construct a representative sample of public companies near the rule compliance threshold that includes approximately 40% of all U.S. public companies. We identify firms that received the ability to use shelf SEOs after 2008 (treated firms) and those that had this ability throughout our sample period (untreated firms). Next, we test the effect of the new rule on firm issuance, cost of capital, investment, and capital structure.

4. Effect on Issuance

Prior to the 2008 deregulation, smaller firms relied heavily on the private equity markets

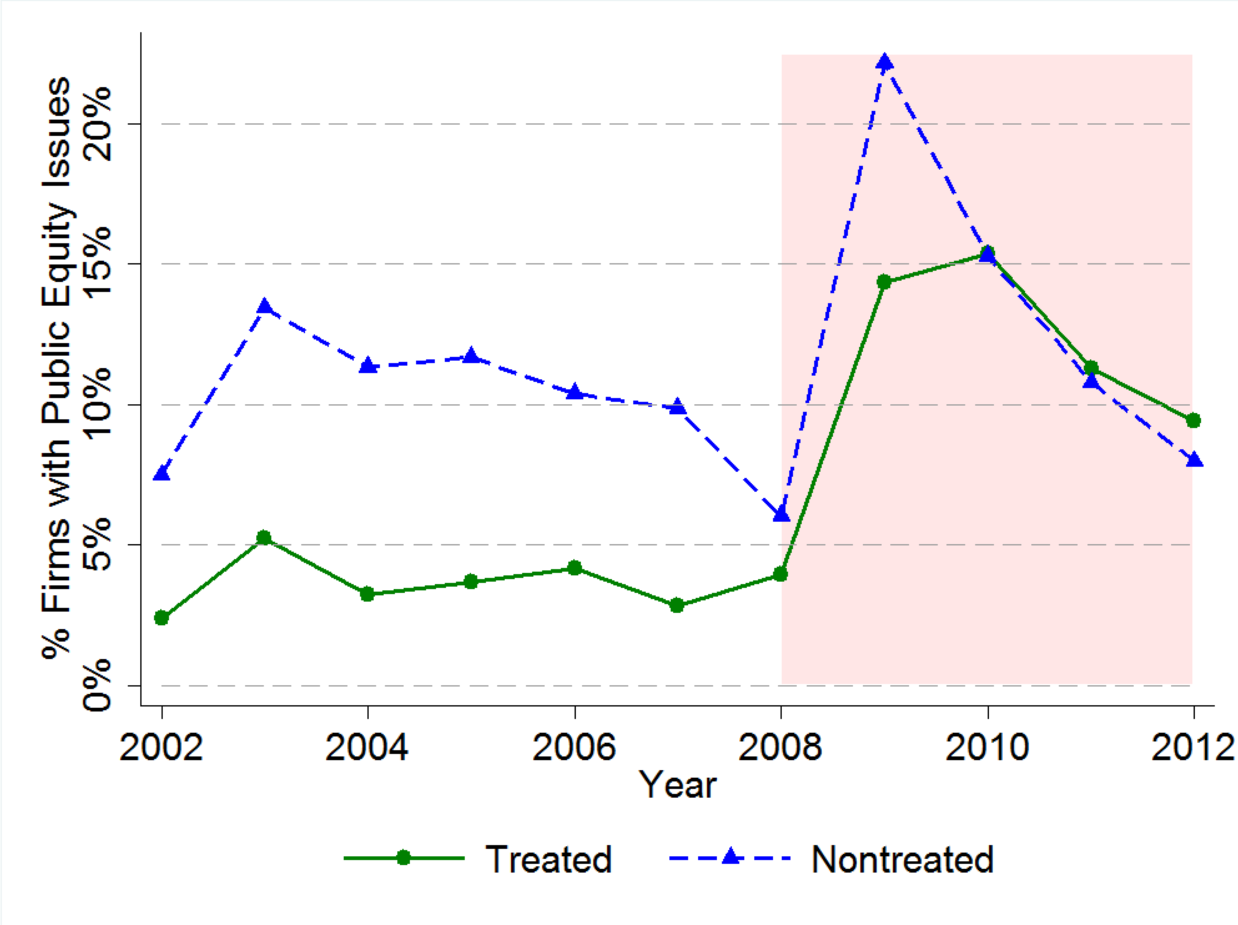
(PIPEs), while larger firms were more likely to turn to the public equity market.[25] Even though both the SEC and existing literature suggest several channels through which deregulating the financing process for small firms may affect issuance behavior, it remains possible that the deregulation relaxed a nonbinding constraint on small firm financing and thus had limited real effects. For example, Chaplinsky and Haushalter (2010) argue that a primary benefit of PIPEs is that they allow for more complex contracts capable of mitigating adverse selection, moral hazard, and agency problems. Moreover, even within the SEO market, the information asymmetry usually attributed to small firms may make shelf-registered SEOs prohibitively expensive (Smith 1986; Denis 1991; and Blackwell, Marr, and Spivey 1990). Therefore, it is possible that firms under the $75 million public float threshold will continue to rely primarily on PIPEs even once they are allowed to use shelf SEOs.

4.1 Univariate Evidence

We start our analysis of the effect of the 2008 deregulation on issuance behavior by examining the evolution of the reliance on public equity before and after the rule by the two sets of firms we study. We look at both the percentages of equity issuances that are public (Figure 1, in introduction) and the percentage of firms that conduct a public equity issue each year (Figure 2). The evidence in Figures 1 and 2 suggests that the benefits from shelf registrations extend to small firms. After firms under $75 million in public float are granted access to shelf registrations in 2008, they double their reliance on public equity offerings and their issuance behavior begins to closely resemble that of the firms in our control group.

[25] For example, Gomes and Phillips (2012) show that between 1995 and 2003 the firms in the smallest size quartile conduct more than 60% of their equity offerings in the private markets (mainly through PIPEs), while the largest 50% of firms conduct over 75% of their equity offerings in the public markets.

Figure 2. The Frequency of Public Equity Issues.



The figure depicts the percentage of firms that conduct a public equity issue each year for two groups of firms: firms that were given the ability to use form S-3 after 2008 (Treated) and firms that had this ability throughout the sample period (Nontreated). We define public offerings as common stock offerings of registered shares. We align issuance with the mid-fiscal year report dates for public floats, and we define year as the corresponding fiscal year end date (which is in the middle of each 12-month issuance period).

Figure 1 graphs the percentage of equity issues that are public for the groups below and above the rule threshold. In 2012, both groups conducted approximately 85% of their equity offerings in the public markets. Figure 2 plots the overall probability of conducting a public equity issue over time separately for treated and untreated firms. Prior to 2008, firms with public float below $75 million were less than half as likely to issue public equity (less than 4% of firms under $75 million in public float issued public equity in 2004) as slightly larger firms that had the ability to use shelf registrations (11% of firms with public float above $75 million issued public equity in 2004). However, since 2008, the two groups have been approximately equally likely to raise public equity in any given year. This suggests that many PIPEs were a second-best alternative used because small firms could not access the more efficient shelf registration process.

4.2 Empirical Tests of Changes in Issuance Behavior

To formally test whether treated firms increased their reliance on public equity, we conduct a difference-in-differences analysis comparing changes in issuance behavior for firms above and firms below the $75 million public float threshold surrounding the 2008 deregulation. We include industry and year fixed effects, and allow for heteroscedastic error terms that are clustered at the firm level. This approach isolates the effect of the deregulation by controlling for general trends in issuance activity over time and contemporaneous shocks to the business environment that affect both groups.

Column 1 of Table 3 reports results when the dependent variable is total equity proceeds over the course of a year. Consistent with the lack of access to shelf-registered public offerings being a binding constraint, treated firms raise 1.7 percentage points less annual equity proceeds scaled by market capitalization compared to untreated firms prior to the deregulation. Given that the average annual proceeds as a percentage of market capitalization for the untreated firms before the new rule was 3.9 percentage points, this is an economically significant increase of approximately 45%.[26]

Columns 2–4 investigate the types of equity offerings that drive the increased issuance. Column 2 suggests that a 2.2 percentage point increase in public equity proceeds, which is more than double the treated firms' pre-deregulation average, drives the increase. Column 3 further shows that this increased public market issuance activity is primarily attributable to a rise in the treated firms' use of shelf offerings, suggesting that the relaxed regulatory environment drives the overall increase. Interestingly, the increase in the use of public equity is combined with a statistically significant and economically meaningful decline in the use of private equity, measured as proceeds from PIPEs. Finally, Column 5 combines debt and equity issuance results to show that there is an overall increase in total capital raised via new issuance.[27] Taken together, our evidence is consistent with both a substitution from private to public equity issuance and an overall increase in both equity issuance and total issuance.

Next, we analyze the frequency of offerings, relying on a linear probability model because recent econometric research has highlighted the difficulties in interpreting interaction terms in nonlinear probability models.[28] Table 4 shows that treated firms issue public equity more often than untreated firms after the SEC deregulation. Pre-deregulation, treated firms are approximately 50% less likely to issue equity: the probability of an equity issue increases by 6.1 percentage points compared to the overall probability of 12.3 percentage points for treated firms

[26] We calibrate the economic magnitude of the effects by scaling the implied increase in the outcome variable for the treated firms by the pre-rule mean level of the outcome variable for the treated firms (as reported in Table 2).

[27] In unreported tests, we do not find statistically significant post-deregulation change in the combination of convertible and nonconvertible debt offerings or non-shelf registered public equity offerings.

[28] We achieve similarly significant results if we use nonlinear probability models. However, Ai and Norton (2003) and Greene (2010) show that drawing inferences from interaction terms in nonlinear models is problematic because the marginal effects are nonlinear functions of the coefficients and the values of the explanatory variables.

prior to the deregulation. Again, this increase is driven by more frequent public equity offerings and less frequent private equity offerings. In particular, we document an 8.5 lower probability of public equity issuance in the pre-deregulation period paired with a 1.6 percentage point higher probability of a private equity issue. Of the public equity issues, the change is again concentrated in the shelf issues that were made easier by the new rule.[29]

We thus conclude that after deregulation, treated firms transition away from the PIPE market and toward shelf-registered public SEOs both in terms of the total proceeds raised and the number of issuances. Importantly, this transition also leads to a significantly higher overall amount of proceeds from equity offerings.

4.3 Changes in Issuance Costs

A possible explanation for this transition toward public equity issuance is that accelerated SEOs are cheaper than private offerings and therefore issuers switch to them once they are available. Research shows that private investors in equity need to be compensated for the lower liquidity (Silber 1991), increased monitoring (Wruck 1989), and additional due diligence responsibilities (Hertzel and Smith 1993). The most tangible way that these investors are compensated for the additional risks and responsibilities involved in a private transaction is through a large offer discount, which is the percentage difference between the offer price and the next day's opening price. The average offer discount for PIPEs in the PlacementTracker database is approximately 15% across our sample period, which is similar to evidence from earlier periods (Chaplinsky and Haushalter 2010 and Hertzel, Lemmon, Linck, and Rees 2002). In contrast,

[29] In untabulated tests, we confirm that the amounts a firm issues at each issuance episode are not statistically different before and after the new rule.

public offerings are typically sold at an offer discount of approximately 3% (Corwin 2003).

Although we restrict our subsequent empirical analysis to the most tangible issuance costs, including the discount and underwriter/placement agent fees, it is important to recognize that transitioning to the public market also changes the cost of capital in other ways. For example, Chaplinsky and Haushalter (2010) document that in addition to high discounts, PIPE investors often receive warrants or reset provisions. Therefore, PIPE issuers might face additional costs that are hard to value at the time of the transaction by only using the observable offer discounts and underwriter fees. However, it is also possible that PIPE investors provide more extensive services, such as monitoring and certification, than purchasers of SEOs. Thus, any evidence we find regarding the relation between access to the shelf issuance process and discounts or fees is likely to be a lower bound on the total savings afforded by access to accelerated public offerings, and may exclude certain nonmonetary benefits of PIPE offerings.

Table 5 examines how equity issuance costs change for treated and untreated firms following the 2008 deregulation. In Columns 1 and 2, the dependent variables are issue discount and issue fees, respectively. Each cost is measured as a percentage of offer proceeds and averaged across all offerings made during a firm-year. Thus, the sample includes only firm-years during which a firm raises equity.

Our results suggest that the 2008 deregulation reduced the cost of equity issuance for treated firms relative to untreated firms. The positive coefficient on the Treated x Pre indicator is consistent with the issue discount being a disproportionately large cost for private offerings and treated firms being more reliant on PIPEs in the pre-deregulation period. Treated firms experienced an economically large issue discount reduction of 6.1% following the 2008 deregulation. Compared to the pre-2008 mean issue discount for treated firms of 13.42%, this result suggests that the deregulation caused a 46% decline in the issue discount of treated firms. The table also documents that neither issue fees nor pre-issue stock returns are significantly different before and after the new rule. Therefore, the overall observable effect of the new rule on equity issuance transaction is equivalent to an economically large reduction in issuance discounts that is not paired with a countervailing increase in fees.

5. Effect on Investment, Financial Leverage, and Firm Value

Given this sizeable reduction in the treated firms' cost of equity issuance, the implied change in the overall cost of capital, and the observed increase in equity issuance activity, we expect that treated firms will change their optimal investment and financial leverage policies and that the deregulation will be good news for shareholders. We test these predictions in this section.

5.1 Effect on Investment

We posit that the access to shelf registrations, and the resulting increase in equity issuance and decrease in the cost of equity capital, will lead to more investment. To test this hypothesis, we rely on a difference-in-differences framework, similar to the one we used in Section 4. Our primary measures of investment are capital expenditure scaled by the beginning-of-period firm assets, and capital expenditures scaled by the beginning-of-period value of property, plant, and equipment.[30]

[30] In untabulated tests, we document no significant effects on firms' propensity to engage in mergers & acquisitions or research & development activity. While these are two alternative investment channels, these types of investments are less frequent and consequently we have less power to identify meaningful changes.

Model 1 in Table 6 shows that before the new deregulation, treated firms' investment scaled by assets was 0.76 percentage points lower than that of untreated firms. Benchmarking to the pre-deregulation treated firms mean investment rate of 4.19 percentage points, this suggests that the lack of access to shelf registrations led to 18.1% less capital expenditure. Model 2 in Table 6 yields similar estimates when scaling capital expenditures by physical capital, which measures investment relative to the capital replacement rate. Following the 2008 deregulation, treated firms increased their investment relative to their physical capital by 17.8%.

Our results provide direct evidence of a link between frictions in the financing process and corporate investment, which is consistent with the persistent finding in structural investment models that the costliness of external funds depresses the path of investment (Hennessy and Whited 2007). These findings are also complementary to the large literature arguing that financially constrained firms exhibit higher investment cash-flow sensitivities (for example, see Kaplan and Zingales 1997; Moyen 2004; and Almeida and Campello 2007) as well as the evidence in Butler and Cornaggia (2011) that access to bank loans improved private producers' productivity when faced with a strong shock to demand for ethanol.

The finding of real effects stemming from an exogenous change in a firm's ability to acquire capital also contributes to the literature linking the development of the financial system to real output. Our results demonstrate that even in one of the most developed markets in the world, improved access to the public equity market has economically meaningful effects—a result often highlighted for developing markets (Demirguc-Kunt and Maksimovic 1998).

5.2 Effect on Financial Leverage

The previous subsection shows that the switch to public equity issuance has a significant and lasting impact on firm investment. Given the magnitude of the issuance shock and the economically significant change in investment activity, theories of optimal capital structure imply that firms will change their capital structure toward using more equity financing. Indeed, the new rule reduces the adjustment costs of raising equity both directly, in terms of issue discounts, and indirectly, by providing a more cost-effective way to time market demand. Leary and Roberts (2005) underscore the importance of adjustment costs in the process of raising capital. Baker and Wurgler (2002) find that market timing is an important determinant of firm issuance, and Butler, Cornaggia, Grullon, and Weston (2011) document that the relationship between market timing and subsequent results does not appear to be driven by the debt-equity choice.

Somewhat surprisingly, even though small changes in issuance costs can have large effects on the firm's capital structure (Fischer, Heinkel, and Zechner 1989), our setting produces one of the first empirical tests of the prediction that lower equity issuance costs will cause a reduction in financial leverage. Despite the theoretical appeal of this hypothesis, equity issuance costs are not currently identified as an important determinant of firm financing choices (see, e.g., Fama and French 2002 and Frank and Goyal 2009 for commonly identified determinants of capital structure). Gilson (1997) provides rare evidence on the topic by showing that many firms have to wait until they enter Chapter 11 to reorganize their capital structure because of the high transaction costs to doing so outside of court.

In our first test, we follow Welch (2011) and focus on the ratio of total liabilities to firm assets. This measure of financial leverage treats all sources of debt-like financing equally and isolates the ratio of debt instruments to the total firm capital. Model 1 in Table 7 shows a statistically significant and economically large reduction in this financial leverage ratio for firms that were affected by the new rule. We estimate that treated firms' ratio of liabilities to assets is 5.4 percentage points higher than untreated firms before versus after the deregulation. This implies an 11.6% decrease in the firm's reliance on non-equity financing compared to the pre-2008 average of 46.4% for treated firms. Columns 2 and 3 of Table 7 show that this significant decrease in leverage is robust to alternate measures. The ratio of total debt to assets falls by 14.2%, while the ratio of long-term debt to assets falls by 20.9%. We interpret this leverage decline as a lower bound on the true effect because, unlike investment and issuance, leverage is likely to adjust slowly toward its new optimum level (see, e.g., Lemmon, Roberts, and Zender 2008).

Our results show that on top of using the new funds to finance investments, firm are also tilting their capital structure toward equity financing. Further, the magnitude of our results indicate that the speed and cost of equity financing is a first-order determinant of the firms' optimal capital structure. This result has been shown in structural simulations (Strebulaev 2007) and international studies (Rajan and Zingales 1998), but not conclusively demonstrated within a developed capital market such as the United States. A likely reason for this gap in the literature is that most changes in capital markets occur gradually over time. Our setting is well-suited for causal tests because an exogenous deregulation suddenly and significantly reduced the equity issuance frictions for a large subsection of the public equity market.

5.3 Effect on Firm Value

Thus far, we have documented several key changes in the firms' issuance, investment, and financing decisions after the new SEC rule gave them the ability to use shelf registrations. To the extent that these changes are anticipated by the market, the efficient market hypothesis suggests that the firms expected to benefit from the deregulation will experience a positive market reaction at the time of the rule's announcement. However, it is not clear that the rule has wholly positive effects. Indeed, in the final rule release, the SEC speculated that the ability to conduct public offerings quickly bypasses the due diligence performed by underwriters and might lead to market abuse.[31] This issue is particularly acute for small firms that might suffer from significant information asymmetries, raising the possibility that the market will predict no benefit or perhaps a net cost to the 2008 deregulation.

To test whether the market anticipated net benefits from the new rule, we perform event studies at the time the new rule was announced. We compare the differential impact of the rule announcement on firms that gain the ability to conduct shelf offerings and those that had this ability before the new rule. This set-up has the natural advantage of providing a treatment and control group, which allows us to directly measure the expected benefits of the new shelf SEO mandate.

---

[31] The commission argued that "In addition, the short time horizon of shelf offerings also may reduce the time that participating underwriters have to apply their independent scrutiny and judgment to an issuer's prospectus disclosure. By reducing this staff and underwriter oversight, there is a risk that these securities offerings may be more vulnerable to abuses…. If there is a perception that smaller public company securities offered through shelf registration statements are more prone to abuse because of the lack of involvement by the Commission staff, this may erode investor confidence in these offerings generally. This could, in turn, make it more difficult for these companies to raise capital and significantly negate some of the benefits of the rule." See page 54 from "Revisions to the Eligibility Requirements for Primary Security Offerings on Form S-3 and F-3," SEC Release No. 33-8878, Dec. 19, 2007.

In Table 8, we use a market model and the four common risk factors identified in Fama and French (1993) and Jegadeesh and Titman (1993). We form three portfolios to study the effect of the new rule: an equal-weighted portfolio that buys all companies that were expected to be affected by the new rule (the long portfolio), an equal-weighted portfolio that buys all companies that were not expected to be affected by the new rule (the short portfolio), and an equal-weighted portfolio that buys all companies expected to be affected by the new rule and sells all those not expected to be affected as of the event date (long-short portfolio).[32] We posit that the long-short portfolio will measure the average effect of the rule for the treated firms while subtracting away any uncontrolled-for movements that are common to the treated and untreated firms. Table 8 reports all three portfolio returns.

We focus on two announcement dates. The June 20, 2007 new rule proposal included the details of the break for firms under $75 million in public float.[33] Consistent with the idea that the proposed rule had a significant impact on the targeted companies, we find a statistically significant difference in the three-day event window abnormal returns between the affected and unaffected firms around the rule's proposal date. Firms that were set to benefit from the new rule have an abnormal return of 1.45% compared to firms that already had full access to shelf registrations. The observed positive reaction of the market is consistent with the finding that small firms actively used shelf registrations after the rule took effect, and that shelf registrations

---

[32] We use the firm's last public float reported before each announcement date as a best predictor of the firm's eligibility for the new rule. Thus, we use the public information available to the investors at the time of the announcement.

[33] See SEC Release No. 33-8812, "Revisions to the Eligibility Requirements for Primary Securities Offerings on Forms S-3 and F-3," June 20, 2007.

affected firm issuance, investment, and financing activities.[34]

Table 8 also shows no differences in the abnormal returns of the treated and nontreated firms on the day the rule was passed: December 11, 2007.[35] This is not surprising because the final rule was similar to the proposed rule. Moreover, all public comments about the proposed rule were overwhelmingly positive, making adoption of the rule a foregone conclusion. Overall, we find that the market anticipated that shelf registrations would provide a significant boost for small firms.

6. **Additional Analyses**

This section presents evidence on the types of firms that benefit most from the new rule as well as detailing additional robustness checks.

6.1 Who Benefits Most from Reduced Issuance Frictions?

6.1.1 Partitioning on Growth Opportunities

First, we examine whether firms with the most growth opportunities benefit most from the deregulation. Growth firms are most likely to have profitable projects, making it more likely they will need to raise capital and hence will benefit from reduced issuance frictions. To test this idea, we split the observations in our dataset by the median value of the ratio of the market value of equity and debt to the book value of assets (*Market to Book*) of 1.09. The rationale behind this split is that if the marketable securities of the firm are valued high relative to its assets in place,

[34] Even though we document positive returns for the long-short portfolio around the first event, we do not document a statistically significant return in the long or the short portfolio. However, the long-short portfolio set-up is the most suitable test for our question, because it provides better controls for risk specific to small firms and for unobservable contemporaneous events that affect both groups of relatively small firms.

[35] See SEC Press Release No. 2007-259, "SEC Facilitates Smaller Company Access to Capital Markets," Dec 11, 2007.

then the firm can increase its value by issuing more securities and using the proceeds to invest in profitable projects.[36] We hypothesize that a reduction in issuance frictions will have greater impact when firms have better investment opportunities.

Table 9 provides evidence that the increase in equity issuance is indeed concentrated in firms with high *Market to Book* ratios. We split the sample used in Column 1 of Table 3 into observations with above (Columns 1 and 2 of Table 9) and below (Columns 3 and 4 of Table 9) median *Market to Book* ratios and find that the deregulation has much bigger effects for firms with above-median ratios. The implied increase in public equity proceeds and the decrease in PIPE proceeds are concentrated in firms with above-median *Market to Book* ratios.

Panels B and C of Table 9 similarly test whether this distinction is also true for our investment and capital structure results. Both panels confirm that the economic consequences of the rule are much larger for firms with high *Market to Book* ratios, implying that the same firms that are more likely to use the new rule to issue public equity because of their better investment opportunities are also increasing their investment and reducing their financial leverage. These results suggest that issuance frictions are especially important for firms with good investment opportunities.

6.1.2 Partitioning on Financial Constraints

If the 2008 deregulation improves access to the public securities markets for firms that were not able to issue equity, as opposed to just reducing the issuance costs and therefore leading

[36] This ratio is a measure of the average Tobin's q, the ratio of the market value of the installed capital to its replacement cost. The average Tobin's q is, in turn, related to the marginal Tobin's q, the ratio of the market value of an additional unit of capital to its replacement cost (Tobin 1969). To the degree that this is an imperfect measure of the firm's investment opportunities, our results might understate the importance of this distinction.

to lower cost of capital, then financially constrained firms will benefit most from the deregulation process. Measuring financial constraints is empirically challenging. Both Hadlock and Pierce (2010) and Farre-Mensa and Ljungqvist (2015) investigate the merits of the traditional KZ (Kaplan and Zingales 1997) and WW (Whited and Wu 2006) measures of financial constraints. Hadlock and Pierce argue that age and firm size best approximate financial constraints, while Farre-Mensa and Ljungqvist find that firms with high probabilities of default act the most financially constrained. Because our sample is composed of relatively small firms, we follow Farre-Mensa and Ljungqvist and define a financially constrained firm as one with more than a 25% probability of default according to the naïve Merton's model used in Bharath and Shumway (2008).[37]

In Table 10, we partition our sample on financial constraints. There are 294 firm-years in our sample with more than a 25% probability of default. Notably, the constrained firms make up a small portion of our sample and thus do not drive our full sample results (see Columns 1 and 2). However, Column 3 of Table 10 shows that the deregulation has an economically large effect on these severely constrained firms. After deregulation, constrained firms increase annual equity issuance by approximately 6.7% of market capitalization, which is close to three times the effect on unconstrained firms. Panel C of Table 10 indicates that the deregulation leads constrained firms to reduce financial leverage, although the effect is statistically insignificant. We find no evidence that constrained firms significantly increase their investment post-deregulation. This

[37] Moreover, the traditional measures of financial constraints were developed using the full cross-section of firms and thus are unlikely to be strong predictors of financial constraints in our sample of relatively small firms. Therefore, we opt to use a more direct measure that does not rely on the cross-sectional distribution of financial constraints.

result is not surprising because firms close to default are most likely to use the proceeds to shore up their short-term finances rather than to invest in long-term projects. Overall, our results suggest that reducing financial frictions has large effects on the equity issuance of financially distressed firms. Note that this phenomenon relates to less than 5% of our sample and does not drive our overall findings.

6.2 Robustness Tests

6.2.1 Within-Firm Variation

As discussed in Section 3.2, we rely on a design that uses both within- and between-firm variations. As a robustness check, in Table 11, we provide tests that use only the time-series variation in firm outcomes. This alternative specification provides additional controls for non-observable firm-constant characteristics, but this comes at the high cost of ignoring a substantial part of the useful variation, and therefore reduces the power of our tests.

Panel A of Table 11 replicates our primary issuance results, originally presented in Table 3, but with the addition of firm fixed effects. Notably, the estimated effects on equity issuance in Table 11 and Table 3 are of similar magnitude. Three of the five results remain statistically significant at the 10% level or better. However, as expected, the significance levels fall due to a power reduction: The typical firm only remains in our sample for three years. We find similar results in Panel B with respect to our investment results. The coefficients are comparable to their original levels (Table 6), but the significance drops from the 1% to the 5% level.

Unlike issuance and investment, which change relatively quickly, leverage is very persistent. Lemmon, Roberts, and Zender (2008) show that leverage can drift for 20 years toward a new target level. Thus, it is unreasonable to expect firms to fully adjust their leverage immediately following the deregulation, especially when less than a quarter of firms raise capital each year. Rather, we expect that treated firms will begin drifting toward their new, potentially lower, target leverage post-2008. We test this prediction using a change in leverage specification that relies solely on within-firm variation. In Panel C of Table 11, two of the three measures presented in Table 7 confirm our finding that treated firms significantly reduce their leverage after deregulation, while the third has a T-statistic 1.03 in the expected direction. Overall, the evidence in Table 11 suggests that firm fixed effects or change specifications have little impact on our estimates.

6.2.2 Defining the Sample Around the $75 Million Threshold

We focus our analysis on firms with a public float under $150 million. We choose this sample because it balances the need for statistical power with our assumption that the treated and untreated firms are similar. However, the firms in the treated group are smaller than those in the non-affected group (see Table 2). We deal with this issue in two different ways. First, we explicitly control for firm size by including controls for the firm's public float, its interaction with our treated indicator, the natural log of market capitalization, and the natural log of total assets. Second, in robustness checks, we further focus on firms in a tighter band around our treatment group. We obtain qualitatively similar (albeit slightly less statistically significant) results by focusing on firms in a much tighter $50 million to $100 million band around the $75 million cutoff.[38] Notably, this tighter band also increases the potential measurement error in

[38] This narrower band cuts our sample from 8,779 to 2,971 observations. All previously documented results in Table 3 remain significant at the 10% level or better, except for the PIPE proceed decline. All investment results in Table 6 remain significant at the 5% level, and all capital structure results in Table 7 remain qualitatively similar with T-statistics of -1.91, -1.54, and -2.36 in Columns 1, 2, and 3, respectively.

defining treatment status—some of the firms might cross the $75 million threshold and change their status in between our annual public float numbers, which are measured at the end of the second fiscal quarter.

6.2.3 Strategic Exchange Listings

A potential concern with our results might be that firms strategically decide to list on an exchange after the rule takes effect in order to issue equity using Form S-3. This could bias our results because firms that take these actions might be nonrandom. For example, firms self-selecting into Form S-3 eligibility might be more likely to use public equity markets. If small firms are becoming exchange-listed in order to use the new rule, we would see more exchange-listed firms under the $75 million cutoff after the 2008 rule. However, we do not find any evidence that more small firms become exchange-listed in the post-2008 versus pre-2008 period. This finding, combined with our evidence that our results remain consistent when using only within-firm variation, makes it unlikely that our study suffers from such a bias.

6.2.4 Placebo Tests

Finally, we perform two placebo tests. We examine whether our results are driven by small firms becoming significantly more likely to use public equity issues right around the rule's 2008 effective date for reasons unrelated to the rule. Our placebo tests use subsamples of firms under the $75 million and firms between $75 million and $150 million in public float. Specifically, we denote all firms below the median public float in each respective subsample ($32.3 million for the below $75 million subsample and $110.7 million for the above $75 million subsample) as treated firms and all firms above this artificial thresholds as untreated firms. Table

12 indicates no significant differences in issuance, investment, or capital structure behavior between the treated and nontreated firms in these placebo tests. All four coefficients on the *Pre x Treated* indicator for our issuance specifications are negative whereas our estimates in Table 3 are positive. Therefore, we conclude that our results are not mechanically driven by a sudden change in the propensity of small firms to issue public equity.

7. Conclusion

The strength of this paper lies in its unique setting and novel findings. We exploit the exogenous variation in the ability to access the public equity markets created by a 2008 SEC decision to grant a large fraction of U.S. public firms the ability to accelerate the SEO issuance process for the first time. We find that the sharp reduction in issuance frictions had an economically large and statistically significant effect on firms' equity issuance behavior. Prior to the deregulation, firms prohibited from using shelf registrations conducted approximately 70% of their equity offerings in the PIPE market, whereas firms with shelf access conducted only 30% of their offerings in the PIPE market. After the 2008 deregulation, this gap has disappeared so that in 2012 both groups raised over 85% of their equity in the public markets. This transition of small firms toward public equity offerings has led to simultaneous increases in total equity capital raised and decreases in equity issuance costs.

Importantly, we also show that the deregulation had an economically significant impact on the investment and capital structure decisions of the affected firms. Consistent with the lower cost of equity capital, affected firms increase their investment by 18% and reduce their financial leverage by 12%. These effects are larger for growth firms.

Our findings provide important causal evidence on the real economic consequences of reductions in issuance frictions. These large effects are particularly interesting because the deregulation occurs in the United States. Thus, our results complement the findings in the development literature that suggest that higher quality financial institutions facilitate growth (La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1998) by encouraging external financing (Demirguc-Kunt and Maksimovic 1998). We find that even in the highly developed markets of United States, issuance frictions are an important determinant of corporate behavior.

REFERENCES

Ai, Chunrong, and Edward C. Norton, 2003, Interaction Terms in Logit and Probit Models, *Economics Letters* 80, 123–129.

Almeida, Heitor and Murillo Campello, 2007, Financial Constraints, Asset Tangibility, and Corporate Investment, *Review of Financial Studies* 20, 1429–1460.

Autore, Don, Raman Kumar, and Dilip Shome, 2008, The Revival of Shelf Registered Corporate Equity Offerings, *Journal of Corporate Finance* 14, 32–50.

Baker, Malcolm, and Jeffrey Wurgler, 2002, Market Timing and Capital Structure, *Journal of Finance* 57, 1–32.

Barth, Mary, Wayne Landsman, and Daniel Taylor 2014, The JOBS Act and Information Uncertainty in IPO Firms, Unpublished working paper, Stanford University.

Becker, Bo, Marcus Jacob and Martin Jacob, 2013, Payout Taxes and the Allocation of Investment, *Journal of Financial Economics* 107, 1–24.

Bharath, Sreedhar and Tyler Shumway, 2008, Forecasting Default with the Merton Distance to Default Model, *Review of Financial Studies* 21, 1339–1369.

Blackwell, David, M. Wayne Marr, and Michael Spivey, 1990, Shelf Registration and the Reduced due Diligence Argument: Implications of the Underwriter Certification and the Implicit Insurance Hypotheses, *Journal of Financial and Quantitative Analysis* 25, 245–259.

Bortolotti, Bernando, William Megginson, and Scott Smart, 2008, The Rise of Accelerated Seasoned Equity Underwritings, *Journal of Applied Corporate Finance* 20, 35–57.

Butler, Alexander W., Jess Cornaggia, Gustavo Grullon, and James Weston, 2011, Corporate Financing Decisions, Managerial Market Timing, and Real Investment, *Journal of Financial Economics* 101, 666–683.

Butler, Alexander, and, Jess Cornaggia, 2011, Does Access to External Finance Improve Productivity? Evidence from a Natural Experiment, *Journal of Financial Economics* 99, 184–203.

Chaplinsky, Susan, Kathleen Hanley, and S. Katie Moon, 2015, The JOBS Act and the Costs of Going Public, Unpublished working paper, University of Virginia.

Chaplinsky, Susan, and David Haushalter, 2010, Financing under Extreme Uncertainty: Contract Terms and Returns to Private Investment in Public Equity, *Review of Financial Studies* 23, 2789–2820.

Chava, Sudheer and Michael R. Roberts, 2008, How Does Financing Impact Investment? The Role of Debt Covenants, *Journal of Finance* 63, 2085–2121.

Corwin, Shane, 2003, The Determinants of Underpricing for Seasoned Equity Offers, *Journal of Finance* 58, 2249–2279.

Dambra, Michael, Laura Field, and Matthew Gustafson, 2015, The JOBS Act and IPO Volume: Evidence that Disclosure Costs Affect the IPO Decision, *Journal of Financial Economics* 116, 121–143.

Demirguc-Kunt, Asli, and Vojislav Maksimovic, 1998, Law, Finance, and Firm Growth, *Journal of Finance* 53, 2107–2137.

Denis, David, 1991, Shelf Registration and the Market for Seasoned Equity Offerings, *Journal of Business* 64, 189–212.

Doidge, Craig, and Alexander Dyck, 2015, Taxes and Corporate Policies: Evidence from a Quasi Natural Experiment, *Journal of Finance* 70, 45–89.

Fama, Eugene F., and Kenneth R. French, 1993, Common Risk Factors in the Returns of Stocks and Bonds, *Journal of Financial Economics* 33, 3–56.

Fama, Eugene F., and Kenneth R. French, 2002, Testing Trade-off and Pecking Order Predictions about Dividends and Debt, *Review of Financial Studies* 15, 1–33.

Farre-Mensa, Joan, and Alexander Ljungqvist, 2015, Do Measures of Financial Constraints Measure Financial Constraints? *Review of Financial Studies*, forthcoming.

Fischer, Edwin O., and Robert Heinkel, and Josef Zechner, 1989, Dynamic Capital Structure Choice: Theory and Tests, *Journal of Finance* 44, 19–40.

Frank, Murray, and Vidhan K. Goyal, 2009, Capital Structure Decisions: Which Factors are Reliably Important? *Financial Management* 38, 1–37.

Gao, Xiaohui and Jay Ritter, 2010, The Marketing of Seasoned Equity Offerings, *Journal of Financial Economics* 97, 33–52.

Gilson, Stuart G., 1997, Transactions Costs and Capital Structure Choice: Evidence from Financially

Distressed Firms, *Journal of Finance* 52, 161–196.

Gomes, Armando and Gordon Phillips, 2012, Why Do Public Firms Issue Private and Public Securities?, *Journal of Financial Intermediation* 21, 619–658.

Graham, John R., 2000, How Big are the Tax Benefits of Debt?, *Journal of Finance* 55, 1901–1941.

Greene, William H., 2010, Testing Hypotheses about Interaction Terms in Nonlinear Models, *Economic Letters* 107, 291–296.

Gustafson, Matthew, 2015, The Consequences of Accelerating Seasoned Equity Offerings, Working Paper.

Hadlock, Charles and Joshua Pierce, 2010, New Evidence on Measuring Financial Constraints: Moving Beyond the KZ Index, *Review of Financial Studies* 23, 1909–1940.

Heider, Florian, and Alexander Ljungqvist, 2015, As Certain as Debt and Taxes: Estimating the Tax Sensitivity of Leverage from State Tax Changes, *Journal of Financial Economics*, forthcoming.

Hennessy, Christopher A. and Toni M. Whited, 2007, How Costly Is External Financing? Evidence from a Structural Estimation, *Journal of Finance* 62, 1705–1745.

Henry, Tyler R., and Jennifer L. Koski, 2010, Short Selling Around Seasoned Equity Offerings, *Review of Financial Studies* 23, 4389–4417.

Hertzel, Michael, Michael Lemmon, James S. Linck, and Lynn Rees, 2002, Long-Run Performance Following Private Placements of Equity, *Journal of Finance* 57, 2595–2617.

Hertzel, Michael, and Richard L. Smith, 1993, Market Discounts and Shareholder Gains from Placing Equity Privately, *Journal of Finance* 48, 459–485.

Jegadeesh, Narasimhan and Sheridan Titman, 1993, Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency. *Journal of Finance* 48, 65–91.

Kaplan, Steven and Luigi Zingales, 1997, Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints? *Quarterly Journal of Economics* 112, 169 –215.

Korajczyk, Robert A., and Amnon Levy, 2003, Capital Structure Choice: Macroeconomic Conditions and Financial Constraints, *Journal of Financial Economics* 68, 75–109.

La Porta, Rafael, F. Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 1998, Law and Finance, *Journal of Political Economy* 106, 1113–1155.

Leary, Mark and Michael Roberts, 2005, Do Firms Rebalance Their Capital Structures? *Journal of Finance* 60, 2575–2619.

Leary, Mark and Michael Roberts, 2014, Do Peer Firms Affect Corporate Financial Policy? *Journal of Finance* 69, 139–178.

Lemmon, Michael L., and Michael R. Roberts, and Jamie F. Zender, 2008, Back to the Beginning: Persistence and the Cross-Section of Corporate Capital Structure, *Journal of Finance* 63, 1575–1608.

Modigliani, Franco and Merton H. Miller, 1958, The Cost of Capital, Corporation Finance and the Theory of Investment, *American Economic Review* 48, 261–297.

Moyen, Nathalie, 2004, Investment-Cash Flow Sensitivities: Constrained versus Unconstrained Firms, *Journal of Finance* 59, 2061–2092.

Park, James, L., 2011, Equity Issuance and Returns to Distressed Firms, *Publicly Accessible Penn Dissertations*, Paper 372.

Rajan, Raghuram G. and Luigi Zingales, 1998, Financial Dependence and Growth, *American Economic Review* 88, 559–586.

Silber, William L., 1991, Discounts on Restricted Stock: The Impact of Illiquidity on Stock Prices, *Financial Analysts Journal* 47, 60–64.

Smith, Clifford W., 1986, Investment Banking and the Capital Acquisition Process, *Journal of Financial Economics* 15, 3–29.

Strebulaev, Ilya A., 2007, Do Tests of Capital Structure Theory Mean What They Say?, *Journal of Finance* 62, 1747–1788.

Tobin, James, 1969, A General Equilibrium Approach To Monetary Theory, *Journal of Money, Credit and Banking* 1, 15–29.

Welch, Ivo, 2004, Capital Structure and Stock Returns, *Journal of Political Economy* 112, 106–131.

Welch, Ivo, 2011, Two Common Problems in Capital Structure Research: The Financial-Debt-to-Asset Ratio and Issuing Activity Versus Leverage Changes, *International Review of Finance* 11, 1–17.

Whited, Toni and Guojun Wu, 2006, Financial Constraints Risk, *Review of Financial Studies* 19, 531–559.

Wruck, Karen H., 1989, Equity Ownership Concentration and Firm Value: Evidence from Private Equity Financings, *Journal of Financial Economics* 23, 3–28.

Appendix I. PIPE Issuance by Unaffected Firms.

Figure I.1. Percentage of OTC Firms that Issue PIPEs.

The figure presents the percentage of over-the-counter firms with total assets greater than $1 million conducting PIPE offerings each year between 2002 and 2012. OTC firms are defined as any Compustat firm with an exchange code of 14 or 19 that cannot be merged with the CRSP database. To align the years with our public float dates presented in Figures 1 and 2, each year begins in July, meaning that 2002 represents July 2002 through June of 2003.

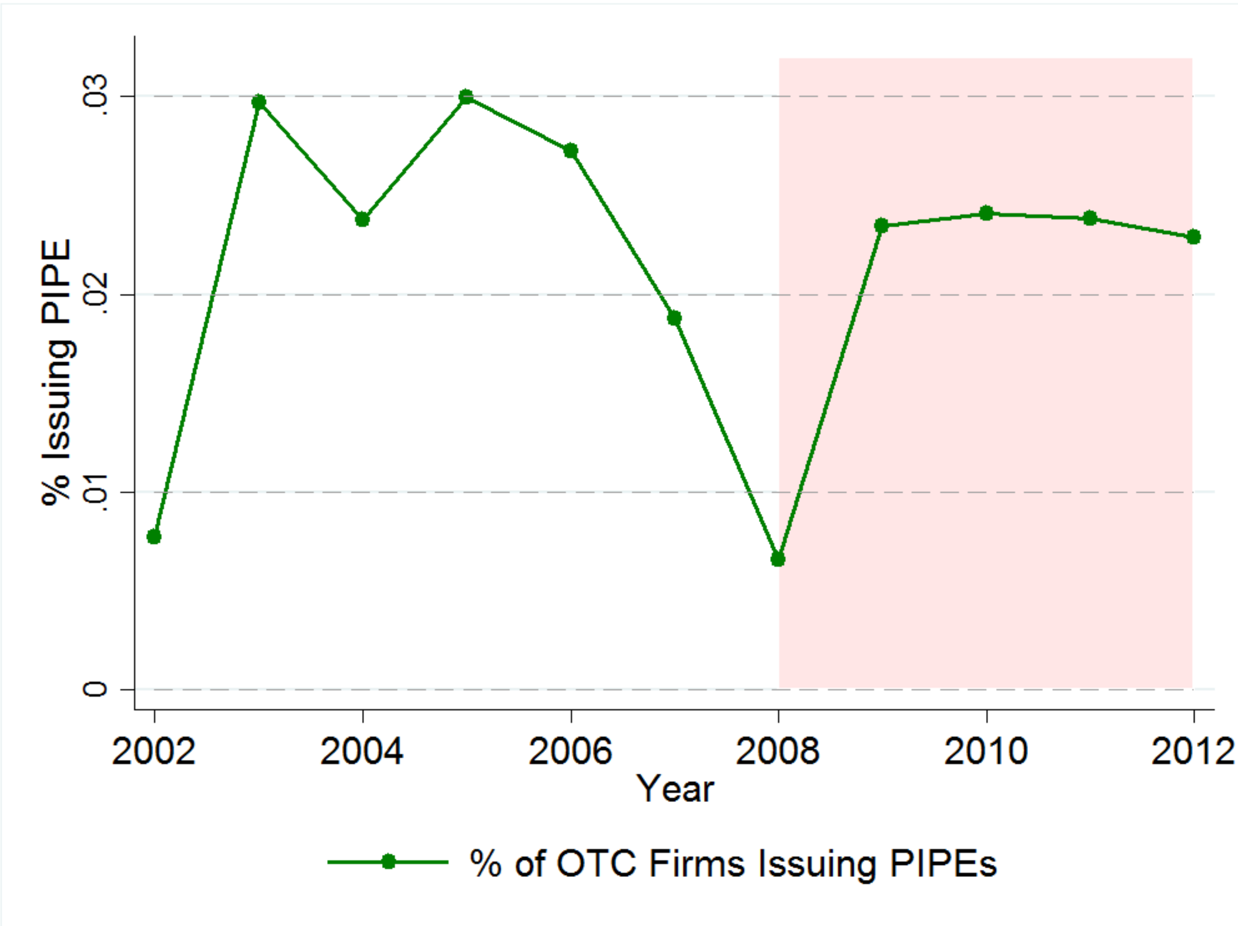
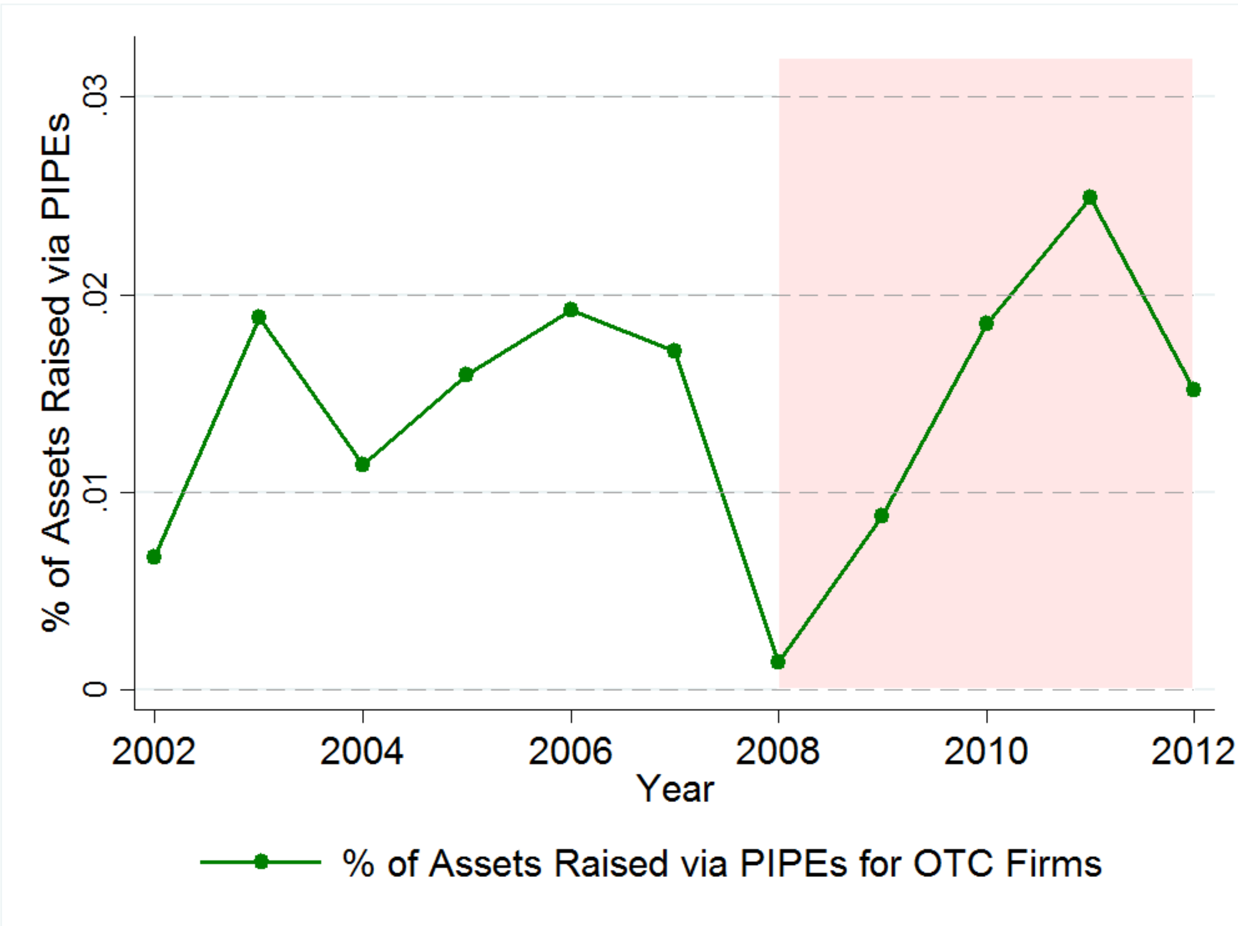


Figure I.2. Percentage of OTC Firms' Assets Raised via PIPEs.

The figure presents the average amount of PIPE proceeds scaled by total assets for OTC firms with total assets greater than $1 million each year between 2002 and 2012. OTC firms are defined as any Compustat firm with an exchange code of 14 or 19 that cannot be merged with the CRSP database. To align the years with our public float report dates presented in Figures 1 and 2, each year begins in July, meaning that 2002 represents July 2002 through June of 2003.



Appendix II. Variable Descriptions.

Panel A: Firm Characteristics. All Compustat ratio variables are winsorized at the 2.5% level.

Variables	Definition (Sources)
Public Float	The part of equity not held by management or large shareholders, as reported on the first page of the company's 10-K filing. (EDGAR)
Total Assets	The company total assets (AT) in 2012 $ millions (Compustat)
Market Cap	Market value of equity (|PRCC_F|*CSHO). (Compustat)
Market to Book	The value of debt (DLTT+DLC) plus the market value of equity (|PRCC_F|*CSHO), all divided by total assets (AT). (Compustat)
Previous Year Return	The compounded monthly stock returns in the twelve months ending prior to the public float report date. (CRSP)
Profitability	Operating income before depreciation (OIBDP) divided by total assets (AT). (Compustat)
Tangibility	Gross property plant and equipment (PPEGT) divided by total assets (AT). (Compustat)
Cash	Cash and equivalents (che) divided by noncash total assets (at-che). (Compustat)
Institutional Ownership	The percentage of common stock held by institutions as reported on Form 13-F with the SEC. (Thomson Reuters)
Years Public	Year of most recent Compustat filing minus the first year the firm appears in Compustat. (Compustat)
Investment	Capital expenditure (CAPX) as a percentage of beginning-of-period total assets (AT). (Compustat)
Capx to Physical Capital	Capital expenditure (CAPX) as a percentage of beginning-of-period property plant and equipment (PPENT). (Compustat)
Liabilities to Assets	Total liabilities (LT) divided by total assets (AT). Multiplied by 100 when used as a dependent variable. (Compustat)
Debt to Assets	Long-term debt (DLTT) plus short-term debt (DLC) divided by total assets (AT). Multiplied by 100 when used as a dependent variable. (Compustat)
Long-Term Debt to Assets	The value of long-term debt (DLTT) divided by total assets (AT). Multiplied by 100 when used as a dependent variable. (Compustat)
Default Probability	We use the naïve Merton's measure (Bharath and Shumway 2008). Distance to default (DD) = $[\ln((E+F)/F) + r - 0.5\sigma^2] / \sigma$. E equals market capitalization: CRSP items (|PRCC_F|*CSHO)/1000. F equals the face value of debt: Compustat dlc + dltt. "r" equals the 12-month compounded monthly equity returns. "σ" equals E/(E+F) times σ_E plus E/(E+F) times ($0.05+0.25 \times \sigma_E$). σ_E equals the standard deviation of monthly equity returns over the past year. If F>0, the default probability is then N(-DD), where N is the standard normal CDF. If F=0, the default probability is zero. (Compustat; CRSP)

Panel B: Issuance Variables. All ratio variables are winsorized at the 2.5% level.

Variables	Definition (Sources)
Equity Proceeds	Annual proceeds raised via primary public equity or PIPEs as a percentage of the beginning-of-year market value of equity (|PRCC_F|*CSHO). Equity Proceeds is the sum of our Public Equity Proceeds and PIPE proceeds measures. (SDC; PlacementTracker; Compustat)
Public Equity Proceeds	Annual proceeds raised via public equity offerings containing primary shares as a percentage of the beginning-of-year market value of equity (|PRCC_F|*CSHO). We consider common stock offerings of registered shares public offerings. In SDC, a public equity offering is one with an SDC DealType of "C." In PlacementTracker, a public offering is a registered direct shelf sale or a confidentially marketed public offering. (SDC; PlacementTracker; Compustat)
Public Shelf Proceeds	Annual proceeds raised via shelf registered primary public equity as a percentage of the beginning-of-year market value of equity (|PRCC_F|*CSHO). (SDC; PlacementTracker; Compustat)
PIPE Proceeds	Annual proceeds raised via private investments in public equity as a percentage of the beginning-of-year market value of equity (|PRCC_F|*CSHO). We consider common stock offerings of unregistered shares PIPEs. In PlacementTracker, a private offering has Security Type = "Common Stock." (PlacementTracker; Compustat)
Debt Proceeds	Annual proceeds raised via debt as a percentage of the beginning-of-year market value of equity (|PRCC_F|*CSHO). Includes both nonconvertible and convertible debt (nonrevolving bank loans, public, private, and Rule 144A offerings are all included). (SDC; PlacementTracker; Compustat)
Total Issue Proceeds	Annual proceeds raised via equity or debt as a percentage of the beginning-of-year market value of equity (|PRCC_F|*CSHO). This variable is the sum of Equity Proceeds and Debt Proceeds. (SDC; PlacementTracker; Compustat)
Equity Indicator	Equals one if Equity Proceeds is greater than zero in a given year. (SDC; PlacementTracker)
Public Equity Indicator	Equals one if Public Equity Proceeds is greater than zero in a given year. (SDC; PlacementTracker)
Public Shelf Indicator	Equals one if Public Shelf Proceeds is greater than zero in a given year. (SDC and PlacementTracker)
PIPE Indicator	Equals one if PIPE Proceeds is greater than zero in a given year. (SDC and PlacementTracker)
Debt Indicator	Equals one if Debt Proceeds is greater than zero in a given year. (SDC, PlacementTracker, DealScan)
Any Issue Indicator	Equals one if Total Issue Proceeds is greater than zero in a given year. (SDC; PlacementTracker)
Issue Discount	Average across all of a firm's annual equity offerings of the percentage increase

	from an equity issue offer price to the opening stock price the following day. (SDC;PlacementTracker; CRSP)
Issue Fees	Average across all of a firm's annual equity offerings of the underwriter fees (placement agent fees) as a percentage of offer proceeds for public equity offerings (PIPES). (SDC; PlacementTracker)
Pre-Issue Price Decline	The compounded negative returns in the three trading days before the equity offering (CRSP).

Table 1. Descriptive Statistics.

The sample includes firm-year observations between 2002 and 2012 with a Public Float between $10 million and $150, where the Public Float is the part of equity not held by management or large shareholders, as reported on the first page of the company's 10-K filing. All Compustat ratio and issue proceeds variables are winsorized at the 2.5% level. The sample contains 2,858 unique firms over the ten years. All variables are defined in Appendix II.

Panel A: Firm Characteristics.

Variable	Units	Mean	SD	Median	Obs.
Public Float	millions	59	41	46	8,778
Total Assets	millions ($2012)	180	432	83	8,778
Market Cap	millions ($2012)	112	101	78	8,778
Market to Book	ratio	1.62	1.46	1.09	8,778
Previous Year Return	ratio	0.13	0.70	-0.02	8,778
Profitability	ratio	-0.05	0.29	0.05	8,778
Tangibility	ratio	0.22	0.21	0.14	8,778
Cash to Assets	ratio	0.27	0.27	0.17	8,778
Institutional Ownership	%	0.28	0.20	0.22	8,778
Years Public	Years	16.4	10.6	13.0	8,778
Investment	%	4.25	5.31	2.38	8,778
Capx to Physical Capital	%	30.5	34.2	19.0	8,752
Liabilities to Assets	%	45.2	27.8	40.3	8,767
Debt to Assets	%	17.0	21.5	8.42	8,765
Long-Term Debt to Assets	%	12.3	18.6	2.25	8,765

Panel B: Issuance Variables.

Variable	Units	Mean	SD	Median	Obs.
Equity Issue Proceeds	%	4.23	13.60	0.00	8,778
Public Equity Proceeds	%	2.24	8.96	0.00	8,778
Public Shelf Proceeds	%	1.42	6.13	0.00	8,778
PIPE Proceeds	%	1.02	4.28	0.00	8,778
Debt Proceeds	%	4.28	17.00	0.00	8,778
Total Issue Proceeds	%	12.00	34.60	0.00	8,778
Equity Issue Indicator	indicator	0.14	0.34	0.00	8,778
Public Equity Indicator	indicator	0.08	0.26	0.00	8,778
Public Shelf Indicator	indicator	0.06	0.24	0.00	8,778
PIPE Indicator	indicator	0.06	0.25	0.00	8,778
Debt Indicator	indicator	0.10	0.30	0.00	8,778
Total Issue Indicator	indicator	0.22	0.41	0.00	8,778
Issuance Discount	%	9.17	13.10	6.54	1,107
Issuance Spread	%	6.08	1.20	6.00	904
Pre-Issue Price Decline	%	1.33	9.42	1.66	1,101

Table 2. Performance and Industry Comparison.
Panel A presents key firm characteristics and outcome variables split by treatment status. We summarize these variables in the pre- and post-rule periods. There are 1,602 (4,409) firm year observations of treated firms in the post (pre) period and 776 (1,191) firm year observations of nontreated firms in the post (pre) period with nonmissing total assets. Panel B decomposes the sample by the Fama-French 49 industry classifications and by whether a firm falls in the *Treated* group. *Treated* firms are firms with public floats in the $10–70 million range, and *Nontreated* firms are those with public floats in the $80–150 million range. We restrict the table to the ten most common Fama-French 49 industries.

Panel A. Performance and Outcome Comparison

	Pre-Deregulation				Post-Deregulation			
	Treated		Nontreated		Treated		Nontreated	
Variable	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
a) Size Measures								
Public Float	34	(17)	112	(20)	34	(17)	113	(21)
Total Assets	125	(249)	280	(446)	155	(704)	289	(407)
Market Cap	74	(70)	209	(109)	63	(57)	176	(96)
b) Other Controls								
Market to Book	1.56	(1.42)	1.99	(1.63)	1.36	(1.28)	1.58	(1.42)
Previous Year Return	0.10	(0.69)	0.16	(0.69)	0.13	(0.70)	0.22	(0.71)
Profitability	-0.06	(0.29)	-0.03	(0.28)	-0.06	(0.30)	-0.03	(0.28)
Tangibility	0.22	(0.22)	0.20	(0.19)	0.20	(0.21)	0.23	(0.23)
Cash to Assets	0.25	(0.26)	0.30	(0.28)	0.26	(0.26)	0.30	(0.27)
c) Issuance								
Equity Issue Proceeds	3.90	(13.29)	4.41	(13.08)	4.97	(14.83)	4.12	(13.49)
Public Equity Proceeds	1.26	(7.13)	2.87	(9.62)	3.67	(11.29)	3.24	(10.37)
PIPE Proceeds	1.46	(5.09)	0.82	(3.76)	0.48	(2.98)	0.18	(1.70)
d) Issuance Costs								
Issuance Discount	13.42	(14.23)	7.25	(9.78)	3.94	(12.65)	3.07	(7.80)
Issuance Spread	6.31	(1.36)	5.76	(0.97)	6.22	(1.04)	5.62	(0.92)
e) Investment								
Investment	4.19	(5.31)	4.69	(5.51)	3.92	(5.18)	4.15	(4.98)
Capx to Physical Capital	28.54	(32.70)	35.13	(35.87)	31.03	(36.46)	28.73	(32.00)
f) Leverage								
Liabilities to Assets	46.37	(28.00)	42.66	(27.27)	44.48	(27.38)	46.22	(28.56)
Debt to Assets	17.91	(21.65)	15.94	(21.18)	15.98	(20.46)	17.22	(22.89)

Panel B. Industry Distribution

Top 10 Industries	Treated		Nontreated	
	Count	Percentage	Count	Percentage
Pharmaceutical Products	599	9.96	412	14.90
Computer Software	688	11.44	314	11.35
Electronic Equipment	535	8.90	195	7.05
Business Services	447	7.43	173	6.26
Medical Equipment	315	5.24	159	5.75
Retail	245	4.08	143	5.17
Petroleum and Natural Gas	190	3.16	78	2.82
Wholesale	266	4.42	92	3.33
Communication	157	2.61	97	3.51
Measuring and Control Equipment	228	3.79	70	2.53

Table 3. Effect on Proceeds from Issuance.

This table estimates OLS regressions where the dependent variables is the proceeds raised over a year as a percentage of beginning-of-year market capitalization (i.e., 100*Proceeds $_{t-t+1}$ ÷ Market Capitalization $_t$). The dependent variables are total proceeds from equity offerings (Column 1), proceeds from primary public equity offerings (Column 2), proceeds just from shelf-registered public offerings (Column 3), proceeds from PIPEs (Column 4), and proceeds from all equity offerings plus debt offerings, including convertible, bank, public, privately placed, and Rule 144-A offerings (Column 5). All explanatory variables are defined as of the beginning of the year over which we measure issuance activity. *Treated* is an indicator equal to one if the firm has a public float less than $75 million. The *Pre* period is defined as fiscal years ending before December 2008. All other variables are defined in Appendix II. We include year and Fama-French 49 industry fixed effects. Below the coefficients, we present t-statistics using robust standard errors clustered at the firm level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) Total Equity Proceeds	(2) Public Equity Proceeds	(3) Shelf Equity Proceeds	(4) PIPE Proceeds	(5) Equity + Debt Proceeds
Treated x Pre	-1.737**	-2.248***	-1.502***	0.310**	-2.798*
	(-2.57)	(-4.34)	(-3.90)	(2.04)	(-1.68)
Public Float	0.007	0.004	0.007	-0.000	0.095***
	(0.59)	(0.50)	(1.06)	(-0.03)	(2.78)
Log(Total Assets)	-1.218**	-0.610*	-0.405**	-0.270*	5.904***
	(-2.49)	(-1.94)	(-2.00)	(-1.80)	(3.73)
Log(Market Cap)	-1.221**	0.052	-0.036	-0.486***	-10.033***
	(-2.26)	(0.15)	(-0.16)	(-2.88)	(-5.66)
Log(Market-to-Book)	-3.183***	-1.813***	-0.964**	0.032	4.313
	(-3.10)	(-2.73)	(-2.15)	(0.09)	(1.42)
Previous Year Return	1.164***	0.977***	0.354***	0.040	1.797***
	(4.23)	(5.08)	(2.91)	(0.52)	(2.76)
Profitability	-10.232***	-4.790***	-3.667***	-3.060***	-18.271***
	(-12.03)	(-8.44)	(-8.70)	(-10.37)	(-9.45)
Tangibility	1.386	1.557**	1.250**	0.116	2.560
	(1.41)	(2.17)	(2.57)	(0.40)	(0.74)
Debt to Assets	4.860***	2.337***	1.475**	0.773*	20.778***
	(3.81)	(2.69)	(2.43)	(1.92)	(5.94)
Cash to Assets	-0.004	0.622	0.655*	-0.565**	-3.351*
	(-0.00)	(1.18)	(1.76)	(-2.08)	(-1.76)
Institutional Ownership	-1.669**	-1.333**	-0.931**	0.018	-2.785
	(-2.06)	(-2.26)	(-2.30)	(0.08)	(-1.14)
Log(Years Public)	-2.199***	-1.316***	-0.761***	-0.355***	-2.623***
	(-7.25)	(-6.34)	(-5.47)	(-3.81)	(-3.19)
Treated	-4.966***	-1.526	-1.084	-1.406***	-3.667
	(-3.30)	(-1.35)	(-1.29)	(-3.55)	(-0.87)
Treated x Public Float	0.099***	0.047***	0.032***	0.024***	0.149***
	(6.11)	(4.08)	(3.79)	(4.80)	(3.27)
Adj. R-squared	0.142	0.105	0.137	0.098	0.104
Observations	8,778	8,778	8,778	8,778	8,778

Table 4. Effect on Issuance Frequency.

This table estimates OLS regressions where the dependent variables are indicators for various types of issuances. The dependent variables are indicators for equity offering (Column 1), primary public equity offerings (Column 2), shelf-registered public offerings (Column 3), and private equity offerings (Column 4). Finally, the dependent variable in Column 5 is an indicator for any securities offering in a given firm-year, including equity, debt, and convertible offerings. All explanatory variables are defined as of the beginning of the year over which we measure issuance activity. *Treated* is an indicator equal to one if the firm has a public float less than $75 million. The *Pre* period is defined as fiscal years ending before December 2008. All other variables are defined in Appendix II. We include year and Fama-French 49 industry fixed effects. Below the coefficients, we present t-statistics using robust standard errors clustered at the firm level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) Total Equity Issue	(2) Public Equity Issue	(3) Shelf Equity Issue	(4) PIPE Issue	(5) Equity + Debt Issue
Treated x Pre	-0.061***	-0.085***	-0.071***	0.016*	-0.049**
	(-3.66)	(-5.41)	(-4.69)	(1.74)	(-2.51)
Public Float	0.000	0.000	0.000*	-0.000	0.000
	(0.23)	(1.37)	(1.89)	(-1.07)	(1.09)
Log(Total Assets)	-0.022**	-0.014	-0.010	-0.009	0.004
	(-1.98)	(-1.60)	(-1.32)	(-1.05)	(0.29)
Log(Market Cap)	-0.007	0.013	0.005	-0.022**	-0.020
	(-0.53)	(1.33)	(0.60)	(-2.27)	(-1.23)
Log(Market-to-Book)	0.045*	-0.009	0.003	0.052**	0.082***
	(1.81)	(-0.43)	(0.15)	(2.48)	(2.79)
Previous Year Return	0.022***	0.019***	0.007	0.002	0.016**
	(3.48)	(3.57)	(1.62)	(0.51)	(2.11)
Profitability	-0.337***	-0.168***	-0.164***	-0.196***	-0.415***
	(-14.89)	(-9.04)	(-9.22)	(-11.55)	(-16.96)
Tangibility	0.058**	0.047**	0.049**	0.019	0.048
	(2.25)	(2.16)	(2.56)	(1.08)	(1.41)
Debt to Assets	0.075**	0.061**	0.044*	0.011	0.209***
	(2.32)	(2.29)	(1.82)	(0.45)	(5.51)
Cash to Assets	-0.041*	0.009	0.014	-0.059***	-0.157***
	(-1.94)	(0.56)	(0.93)	(-3.69)	(-6.32)
Institutional Ownership	-0.058***	-0.072***	-0.061***	-0.002	-0.031
	(-2.76)	(-4.10)	(-3.76)	(-0.11)	(-1.11)
Log(Years Public)	-0.057***	-0.036***	-0.028***	-0.021***	-0.055***
	(-7.80)	(-5.88)	(-5.02)	(-4.03)	(-6.28)
Treated	-0.080**	0.005	0.004	-0.085***	-0.065
	(-2.08)	(0.15)	(0.13)	(-3.58)	(-1.41)
Treated x Public Float	0.002***	0.001**	0.001**	0.001***	0.002***
	(5.27)	(2.34)	(2.18)	(4.96)	(4.47)
Adj. R-squared	0.204	0.142	0.164	0.111	0.170
Observations	8,778	8,778	8,778	8,778	8,778

Table 5. Effect on Issuance Costs.

This table presents OLS results where the unit of observation is a completed equity offering. In Column 1, the dependent variables is *Issue Discount*, which is defined as the percentage increase from the equity issue offer price to the opening stock price the following day. In Column 2, the dependent variable is *Issue Fees*, which are the underwriter fees as a percentage of offer proceeds for public equity offerings and the placement agent fees as a percentage of proceeds for private equity offerings. In Column 3, the dependent variable is *Pre-Issue Price Decline*, which is the compounded negative returns in the three trading days prior to the equity sale. *Treated* is an indicator equal to one if the firm has a public float less than $75 million. The *Pre* period is defined as fiscal years ending before December 2008. All other variables are defined in Appendix II. We include year and Fama-French 49 industry fixed effects. Below the coefficients, we present t-statistics using robust standard errors clustered at the firm level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) Issue Discount	(2) Issue Fees	(3) Pre-Issue Price Decline
Treated x Pre	6.119***	-0.068	-1.063
	(3.44)	(-0.55)	(-0.90)
Public Float	-0.049**	-0.001	0.046**
	(-2.21)	(-0.43)	(2.65)
Log(Total Assets)	-0.424	-0.101	0.268
	(-0.26)	(-0.75)	(0.28)
Log(Market Cap)	-1.917	-0.139	0.234
	(-1.41)	(-0.88)	(0.22)
Log(Market-to-Book)	2.806	0.140	-0.525
	(0.92)	(0.61)	(-0.25)
Previous Year Return	-0.471	-0.100**	0.091
	(-0.95)	(-2.33)	(0.37)
Profitability	-3.054	-0.200	2.387
	(-1.41)	(-1.18)	(1.40)
Tangibility	0.734	-0.727***	-1.791
	(0.43)	(-4.06)	(-0.68)
Debt to Assets	-2.748	-0.029	-0.241
	(-1.01)	(-0.17)	(-0.14)
Cash to Assets	-2.454	-0.658***	0.775
	(-1.32)	(-4.40)	(0.56)
Institutional Ownership	0.246	-0.386*	-1.585
	(0.14)	(-1.84)	(-1.24)
Log(Years Public)	-1.060*	-0.087	0.510
	(-1.80)	(-1.08)	(1.05)
Treated	-5.039**	0.266	2.673
	(-2.08)	(1.11)	(0.94)
Treated x Public Float	-0.022	0.000	0.000
	(-0.64)	(0.12)	(0.00)
Adj. R-squared	0.166	0.116	0.049
Observations	1,107	904	1,101

Table 6. Effect on Investment.

This table presents OLS regression results. In Columns 1, the dependent variable equals annual capital expenditure as a percentage of beginning of period total assets (i.e., 100*Capex $_{t-t+1}$ ÷ Total Assets $_t$). In Column 2, we instead measure annual capital expenditure as a percentage of beginning-of-period property, plant, and equipment. All explanatory variables are defined as of the beginning of the year over which we measure investment. *Treated* is an indicator equal to one if the firm has a public float less than $75 million. The *Pre* period is defined as fiscal years ending before December 2008. All other variables are defined in Appendix II. We include year and Fama-French 49 industry fixed effects. Below the coefficients, we present t-statistics using robust standard errors clustered on the firm level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) Investment to Assets	(2) Investment to PPENT
Treated x Pre	-0.758***	-5.081***
	(-3.07)	(-3.04)
Public Float	0.002	0.018
	(0.56)	(0.66)
Log(Total Assets)	-1.228***	-2.221*
	(-6.41)	(-1.96)
Log(Market Cap)	0.844***	-1.326
	(4.11)	(-1.06)
Log(Market-to-Book)	0.435	16.706***
	(1.09)	(6.10)
Previous Year Return	0.573***	4.746***
	(7.55)	(7.77)
Profitability	1.707***	16.809***
	(5.55)	(8.06)
Tangibility	10.620***	-47.755***
	(18.51)	(-17.69)
Debt to Assets	-0.650	-3.449
	(-1.34)	(-1.13)
Cash to Assets	-0.658**	10.503***
	(-2.26)	(4.14)
Institutional Ownership	-0.317	1.668
	(-0.98)	(0.74)
Log(Years Public)	-0.383***	-4.190***
	(-2.90)	(-5.24)
Treated	-0.192	-0.680
	(-0.40)	(-0.20)
Treated x Public Float	0.012**	0.065*
	(2.29)	(1.77)
Adj. R-squared	0.375	0.204
Observations	8,778	8,752

Table 7. Effect on Capital Structure.

This table presents OLS regression results. In Column 1, the dependent variable equals total liabilities as a percentage of total assets (i.e., 100*Liabilities $_t$ ÷ Total Assets $_t$). In Column 2, the dependent variable equals book leverage, measured as long-term debt plus short-term debt as a percentage of total assets, and in Column 3 the dependent variable is long-term debt as a percentage of total assets. *Treated* is an indicator equal to one if the firm has a public float less than $75 million. The *Pre* period is defined as fiscal years ending before December 2008. All other variables are defined in Appendix II. We include year and Fama-French 49 industry fixed effects. Below the coefficients, we present t-statistics using robust standard errors clustered at the firm level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) Liabilities to Assets	(2) Debt to Assets	(3) Long-Term Debt to Assets
Treated x Pre	5.388***	2.535***	2.228***
	(4.17)	(2.80)	(2.63)
Public Float	-0.037*	-0.017	-0.018
	(-1.75)	(-1.15)	(-1.26)
Log(Total Assets)	27.563***	24.940***	20.390***
	(32.24)	(33.83)	(28.73)
Log(Market Cap)	-21.903***	-21.032***	-16.606***
	(-22.59)	(-26.67)	(-22.38)
Log(Market-to-Book)	48.066***	46.165***	37.314***
	(24.43)	(30.39)	(26.50)
Previous Year Return	0.826**	0.052	0.594**
	(2.12)	(0.18)	(2.42)
Profitability	-24.638***	-5.559***	-2.251*
	(-13.00)	(-3.92)	(-1.85)
Tangibility	-5.795**	8.035***	11.261***
	(-2.42)	(4.33)	(6.49)
Cash to Assets	-33.461***	-19.417***	-10.437***
	(-18.45)	(-14.13)	(-8.54)
Institutional Ownership	-1.094	-1.543	2.121
	(-0.56)	(-1.09)	(1.62)
Log(Years Public)	1.674**	-0.876*	0.660
	(2.52)	(-1.78)	(1.44)
Treated	2.578	3.250*	0.851
	(0.95)	(1.70)	(0.48)
Treated x Public Float	-0.124***	-0.096***	-0.057***
	(-4.15)	(-4.46)	(-2.92)
Adj. R-squared	0.394	0.478	0.435
Observations	8,765	8,765	8,765

Table 8. Event Study Estimations around the SEC Proposed Rule.

The table presents event study results. In model (1), the dependent variable is the equal-weighted portfolio that buys all companies that were expected to be affected by the new rule (the long portfolio); in model (2), the dependent variable is the equal-weighted portfolio that buys all companies that were not expected to be affected by the new rule (the short portfolio); and in model (3), the dependent variable is the equal-weighted portfolio that buys the portfolio of all companies that were expected to be affected by the new rule and sells the portfolio of all companies that were not expected to be at the event date (long-short portfolio). The results are based on a 60-day estimation window immediately before the event window. We estimate the following models: $R_{it}=\alpha_i+\beta_{i1}\cdot MKTRF_t+\varepsilon_{it}$ (market model), and $R_{it}=\alpha_i+\beta_{i1}\cdot MKTRF_t+ \beta_{i2}\cdot SMB_t+ \beta_{i3}\cdot HML_t+ \beta_{i4}\cdot UMD_t+\varepsilon_{it}$ (four factor model), $E(\varepsilon_{it})=0$, $var(\varepsilon_{it})=\sigma^2$, for the 60-day estimation window. R_{it} is the portfolio return. $MKTRF_t$, SMB_t, HML_t, and UMD_t are the return on the market, the Fama-French size, book-to-market, and momentum factors. We use the predicted normal portfolio returns for the five-day event window to calculate cumulative abnormal returns (MacKinley 1997). Two-sided t-statistics are reported in brackets. ∗, ∗∗, and ∗∗∗ denote two-sided statistical significance at the 10%, 5%, and 1% levels, respectively.

	Cumulative Abnormal Return		
	(1)	(2)	(3)
Date & Event	Portfolio of affected firms (long)	Portfolio of unaffected firms (short)	Portfolio of affected minus unaffected firms (long-short)
June 20, 2007: SEC Proposes Revising the Eligibility Requirements for Form S-3 Offerings to give Access to Capital for Smaller Companies (SEC Proposal 33-8812)	0.749% (1.06)	-0.701 (-1.16)	1.450%*** (2.86)
Dec 11, 2007: SEC Announces the unanimous Adoption of the Final Rule Giving Smaller Companies Faster and Easier Access to Capital (SEC Press Release 2007-259)	0.703% (0.616)	0.620% (0.59)	0.084% (0.111)

Table 9. Partitioning on Firm Growth Opportunities.

This table partitions our main results from Tables 3, 6, and 7 by the median market-to-book ratio. In each panel, Columns 1 and 2 contain firms with above-median market-to-book ratios (1.09), while Columns 3 and 4 contain only firms with below-median market-to-book ratios. Panel A replicates Columns 3 and 5 of Table 3 for the high and low market-to-book subsamples, respectively. Panel B similarly replicates our investment results in Table 6, and Panel C replicates our leverage results from Columns 1 and 3 of Table 7. All explanatory variables are defined as of the beginning of the year. *Treated* is an indicator equal to one if the firm has a public float less than $75 million. The *Pre* period is defined as fiscal years ending before December 2008. All models contain the same control variables as in Tables 3, 6, and 7, which are defined in Appendix II. For brevity, we do not present the coefficient estimates. Below the coefficients, we present t-statistics using robust standard errors clustered at the firm level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Issuance and Firm Growth Opportunities

	(1) High MTB Public Eq. Proceeds	(2) High MTB PIPE Proceeds	(3) Low MTB Public Eq. Proceeds	(4) Low MTB PIPE Proceeds
Treated x Pre	-3.541***	0.382	-1.848***	-0.050
	(-4.32)	(1.44)	(-3.42)	(-0.25)
Adj. R-squared	0.153	0.108	0.046	0.079
Observations	4,390	4,390	4,387	4,387

Panel B: Investment and Firm Growth Opportunities

	(1) High MTB Inv. to Assets	(2) High MTB Inv. to PPENT	(3) Low MTB Inv. to Assets	(4) Low MTB Inv. to PPENT
Treated x Pre	-0.958***	-7.780***	-0.412	-1.523
	(-2.83)	(-2.91)	(-1.33)	(-0.94)
Adj. R-squared	0.402	0.171	0.368	0.182
Observations	4,390	4,375	4,387	4,376

Panel C: Capital Structure and Firm Growth Opportunities

	(1) High MTB Liabilities to Assets	(2) High MTB LTD to Assets	(3) Low MTB Liabilities to Assets	(4) Low MTB LTD to Assets
Treated x Pre	6.945***	3.632***	3.014**	0.582
	(3.63)	(2.85)	(2.20)	(0.65)
Adj. R-squared	.349	.435	.52	.679
Observations	4,380	4,380	4,381	4,381

Table 10. Partitioning on Default Probability.

This table partitions our main results from Tables 3, 6, and 7 by 12-month default probability (computed using the naïve Merton's measure in Bharath and Shumway 2008). In each panel, Columns 1 and 2 contain firms with a default probability below 25%, while Columns 3 and 4 contain only firms with default probabilities over 25%. Panel A replicates Columns 3 and 5 of Table 3 for the high and low default probability subsamples, respectively. Panel B similarly replicates our investment results in Table 6, and Panel C replicates our leverage results from Columns 1 and 3 of Table 7. All explanatory variables are defined as of the beginning of the year. *Treated* is an indicator equal to one if the firm has a public float less than $75 million. The *Pre* period is defined as fiscal years ending before December 2008. All models contain the same control variables as in Tables 3, 6, and 7, which are defined in Appendix II. For brevity, we do not present the coefficient estimates. Below the coefficients, we present T-statistics using robust standard errors clustered at the firm level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Issuance and Default Probability

	(1) Low P(Default) Public Eq. Proceeds	(2) Low P(Default) PIPE Proceeds	(3) High P(Default) Public Eq. Proceeds	(4) High P(Default) PIPE Proceeds
Treated x Pre	-2.417***	0.163	-6.707**	0.120
	(-4.94)	(1.00)	(-2.37)	(0.15)
Adj. R-squared	0.105	0.101	0.018	0.074
Observations	8,484	8,484	294	294

Panel B: Investment and Default Probability

	(1) Low P(Default) Inv. to Assets	(2) Low P(Default) Inv. to PPENT	(3) High P(Default) Inv. to Assets	(4) High P(Default) Inv. to PPENT
Treated x Pre	-0.848***	-5.378***	0.922	-0.861
	(-3.60)	(-3.38)	(1.16)	(-0.16)
Adj. R-squared	0.381	0.200	0.277	0.111
Observations	8,484	8,459	294	293

Panel C: Capital Structure and Default Probability

	(1) Low P(Default) Liabilities to Assets	(2) Low P(Default) LTD to Assets	(3) High P(Default) Liabilities to Assets	(4) High P(Default) LTD to Assets
Treated x Pre	5.509***	2.217***	7.216	7.758
	(4.46)	(2.84)	(1.03)	(0.98)
Adj. R-squared	.354	.398	.429	.466
Observations	8,468	8,468	294	294

Table 11. Results based on Within-Firm Estimations.
This table replicates our main results from Tables 3, 6, and 7 exploiting only within-firm variation. On average, each firm remains in our sample for approximately three years, as we have 2,858 unique firms and 8,779 firm-years. Panel A replicates the issuance results (Table 3) but includes firm fixed effects. Panel B replicates the investment results (Table 6) but includes firm fixed effects. Panel C replicates the capital structure results (Table 7) using a change specification. All explanatory variables are defined as of the beginning of the year. *Treated* is an indicator equal to one if the firm has a public float less than $75 million. The *Pre* period is defined as fiscal years ending before December 2008. All models contain the same control variables as in Tables 3, 6, and 7, which are defined in Appendix II. For brevity, we do not present the coefficient estimates. Below the coefficients, we present T-statistics using robust standard errors clustered at the firm level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Issuance Results with Firm Fixed Effects

	(1) Total Equity Proceeds	(2) Public Equity Proceeds	(3) Shelf Equity Proceeds	(4) PIPE Proceeds	(5) Equity + Debt Proceeds
Treated x Pre	-1.077	-1.936**	-1.305**	0.531*	-2.813
	(-0.97)	(-2.38)	(-2.17)	(1.84)	(-1.03)
Adj. R-squared	0.259	0.253	0.279	0.158	0.246
Observations	8,778	8,778	8,778	8,778	8,778

Panel B: Investment Results with Firm Fixed Effects

	(1) Investment to Assets	(2) Investment to PPENT
Treated x Pre	-0.749**	-5.412**
	(-2.37)	(-2.29)
Adj. R-squared	0.589	0.365
Observations	8,778	8,752

Panel C: Capital Structure Results with Change Specification

	(1) Change in Liabilities to Assets	(2) Change in Debt to Assets	(3) Change in Long-Term Debt to Assets
Treated x Pre	0.628	2.965***	2.333***
	(1.03)	(3.52)	(2.97)
Adj. R-squared	0.056	0.476	0.434
Observations	8,765	8,765	8,765

Table 12. Placebo Tests.

This table presents OLS results for two placebo tests related to the results in Tables 3, 6, and 7. In Columns 1 and 2 of each panel, the sample contains only firms with public floats between $10 and $70 million. In these columns, *Treated* equals one for firms with a public float less than the sample median of $31.6 million. In Columns 3 and 4, the sample contains only firms with public floats between $80 and $150 million. In these columns, *Treated* equals one for firms with a public float less than the sample median of $110.8 million. Panel A replicates Columns 3 and 5 of Table 3 for the high and low market-to-book subsamples, respectively. Panel B similarly replicates our investment results in Table 6, while Panel C replicates our leverage results from Columns 1 and 3 of Table 7. All explanatory variables are defined as of the beginning of the year. The *Pre* period is defined as fiscal years ending before December 2008. All models contain the same control variables as in Tables 3, 6, and 7, which are defined in Appendix II. For brevity, we do not present the coefficient estimates. Below the coefficients, we present T-statistics using robust standard errors clustered at the firm level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Issuance Results Placebo Test

	(1) Lower Placebo Equity Proceeds	(2) Lower Placebo Shelf Proceeds	(3) Upper Placebo Equity Proceeds	(4) Upper Placebo Shelf Proceeds
Treated x Pre	-0.220	-0.362	-0.901	-0.355
	(-0.28)	(-0.84)	(-0.90)	(-0.61)
Adj. R-squared	0.130	0.126	0.177	0.146
Observations	6,012	6,012	2,766	2,766

Panel B: Investment Results Placebo Test

	(1) Lower Placebo Inv. to Assets	(2) Lower Placebo Inv. to PPENT	(3) Upper Placebo Inv. to Assets	(4) Upper Placebo Inv. to PPENT
Treated x Pre	-0.430	-0.541	0.225	-0.044
	(-1.50)	(-0.26)	(0.63)	(-0.02)
Adj. R-squared	0.351	0.185	0.435	0.236
Observations	6,012	5,990	2,766	2,762

Panel C: Capital Structure Results Placebo Test

	(1) Lower Placebo Liabilities to Assets	(2) Lower Placebo LTD to Assets	(3) Upper Placebo Liabilities to Assets	(4) Upper Placebo LTD to Assets
Treated x Pre	-0.190	-0.068	1.036	0.995
	(-0.17)	(-0.11)	(0.58)	(0.83)
Adj. R-squared	.389	.434	.425	.483
Observations	6,000	6,000	2,762	2,762