

The Real Effects of Equity Issuance Frictions

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ABSTRACT

We study the consequences of an exogenous 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 6.1 percentage point reduction in equity issuance costs, a 19% 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.

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Introduction

Over the past several 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 turned to private investments in public equity (PIPEs) for quick equity financing. Although these contemporaneous trends suggest that issuers may benefit from reduced issuance frictions, the gradual adoption of these capital acquisition technologies makes identifying a causal effect difficult.

In this study we exploit an exogenous shock to issuance frictions to provide new evidence on the effect of issuance frictions on capital acquisition, investment, and capital structure. Until 2008, the SEC prohibited over one-quarter of all public firms from raising capital via shelf registrations because their public float (the part of trade equity not held by insiders) was less than \$75 million. Thus, small firms faced higher public equity issuance frictions than larger firms. In 2008 the SEC relaxed this restriction, allowing small firms to accelerate SEOs via shelf registrations for the first time. If the reduced frictions associated with accelerating SEO issuance are valuable, we expect this deregulation to cause issuers below the \$75 million threshold to transition towards public shelf equity offerings and away from PIPEs.² An alternative hypothesis

¹We 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.

² While Denis (1991) shows that shelf issuances were not popular when introduced in 1982, Autore, Kumar, and Shome (2008) document that almost two-thirds of shelf-eligible SEO issuers conduct shelf offerings in 2003. Gao and Ritter (2010) show that accelerated SEOs are popular amongst large firms with elastic demand for equity.

is that small firms will not benefit from more flexible public equity financing because they suffer from informational asymmetries that make it optimal to rely primarily on private contracts capable of mitigating adverse selection and moral hazard problems.³

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 float less than \$150 million, resulting in a test sample that includes approximately 40% of U.S. exchange listed firms, which are responsible for over 55% of equity offerings.

First, in Figure 1 we document that enabling firms to use shelf registrations has a dramatic effect on how firms 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.

³ See the evidence in Chaplinsky and Haushalter (2010) and Gomes and Phillips (2012).

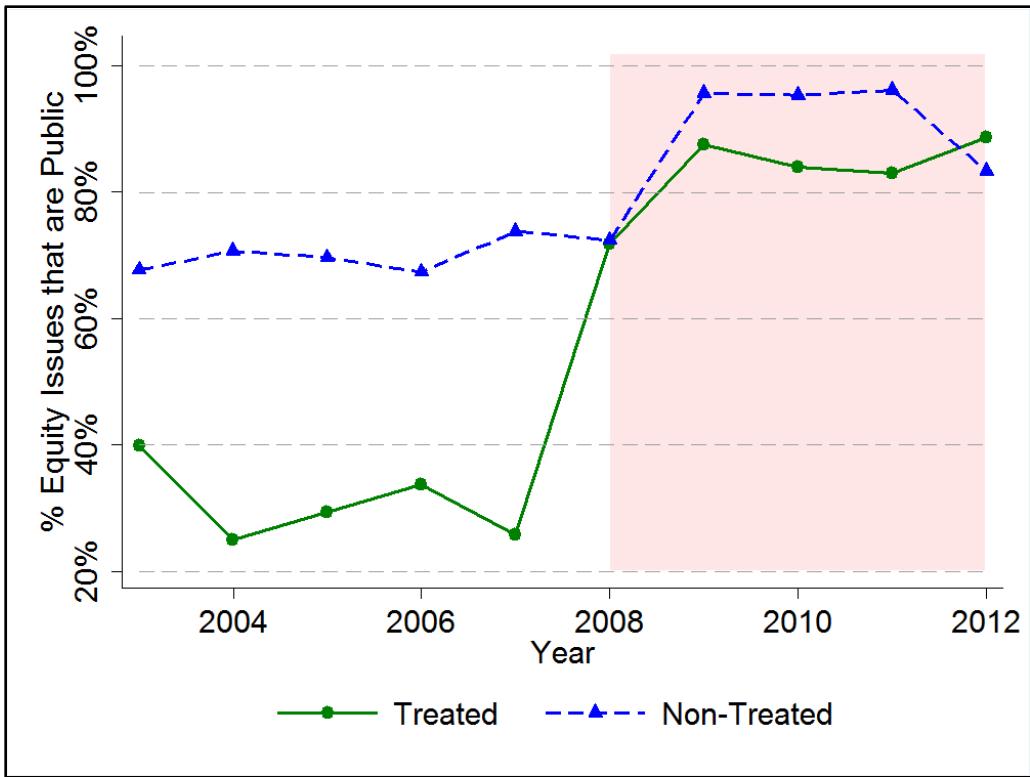


Figure 1. The Use of Public Equity Issues.

The figure depicts the percentage of equity issues that are public for firms that were given the ability to use form S-3 after 2008 (Treated) and firms that had this ability over the sample period (Non-Treated). We define common stock offerings of registered shares as public offerings and offerings of unregistered shares as private offerings. We align issuance with the mid-fiscal year report dates for public floats, and define year as the corresponding fiscal year end date (in the middle of each 12-month issuance spell).

In addition, our results show that 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 is comprised of 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 6.1% drop in offering discounts, which implies a reduction in the overall cost of equity for treated firms relative to the control sample.

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 been studying extensively the effects of relaxing the crucial assumptions behind this seminal result. Notably, most 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 firms will increase their investment and lower their financial leverage following the exogenous decrease in issuance frictions. The evidence supports these predictions. Treated firms increase their capital expenditures by approximately 19% and reduce their leverage by 12% relative to untreated firms. All three of our main findings – the increased public equity issuance, the increased investment, and the reduced financial leverage – are concentrated in growth firms. This result suggests that the firms with the most profitable projects benefit from the deregulation.

Moreover, using Merton's probability of default to proxy for financial constraints, as suggested by Farre-Menas and Ljungqvist (2014), we also find evidence that the deregulation impacts equity offerings and financial leverage in the 3% of our sample estimated to be financially constrained.

Our findings extend the securities issuance literature by showing that the benefits to shelf registered SEOs are more pervasive than previously thought. The existing literature casts doubt on the impact that granting small firms access to shelf registrations will have. According to this literature, the monitoring and flexibility offered by PIPEs are better suited to deal with frictions often prevalent in small firms, such as agency concerns (Chaplinsky and Haushalter 2010) and informational asymmetry (Gomes and Philips 2012). Moreover, other characteristics common to small firms, such as inelasticity of demand for equity or demand for underwriter certification, reduce the attractiveness of quickly sold SEOs compared to traditional SEOs with more extensive underwriting services (Denis 1991 and Gao and Ritter 2010). We show that many small firms still benefit from the option to accelerate public equity issuance. Thus, we add issuance frictions to the list of explanations for the dichotomy in the way small and large firms raised equity prior to 2008.

Our findings also provide causal evidence that frictions associated with public market access directly impact firm issuance behavior, capital structure, and investment. Our results compliment the recent research on the determinants of firm capital structure decisions that has pointed out 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), 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). We show that issuance frictions are likewise important inputs into firms' investment and capital structure decisions.

The rest 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 presents the effect of the new rule on 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

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 public firms from conducting shelf registered SEOs.⁴

The timing of the rule was prompted from 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.⁵ The Advisory Committee recognized that small reporting companies have the same reporting obligations as the largest public companies, and therefore provide sufficient public disclosures for the use of Form S-3. The

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 in public float (SEC Release No. 33-6964).

⁵ See "Final report of the Advisory Committee on Smaller Public Companies To the United States Securities and Exchange Commission", Published: April 23, 2006.

report stated that “we believe strongly that all reporting companies should have the same efficient access to the market as large reporting companies.”⁶ Therefore, 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 ability to use form S-3 is crucial because it permits an issuer to incorporate by reference reports filed under the Exchange Act to satisfy the form’s disclosure requirements. Unlike other registration forms, form S-3 allows for automatic updating of the registration statement.⁷ Without this ability, issuers would have to continuously update the information in the registration statement and file new or amended registration statements with the SEC for review. Moreover, form S-3 also permits companies to offer shelf-registered securities in one or more tranches in reaction to market conditions without the need to seek further SEC approval. The company can also decide whether to issue common stock or preferred stock without delaying the process. Importantly, a shelf registration does not represent a commitment to issue.

In the final rule text, the SEC commented that “the ability to conduct primary offerings on Form S-3 confers significant advantages on eligible companies.”⁸ The SEC went on to explain that the new process provided significant advantages 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

⁶ The actual rule, however, restricted this new ability to non-shell companies listed on a national exchange.

⁷ See comment letter by the American Bankers Association, File Number s7-10-07, filed with the SEC on Aug. 27, 2007.

⁸ Final Rule titled “Revisions to the Eligibility Requirements for Primary Security Offerings on Form S-3 and F-3,” SEC RELEASE NO. 33-8878. Published: Dec. 19, 2007.

the ability to utilize shelf registration to maximize market opportunities.”⁹ This opinion was widely shared by market participants commenting on the proposed rule, who often cited the extreme speed and ease granted by this type of financing.¹⁰ For example, Feldman Weinstein and Smith LLP commented that “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.”¹¹ In sum, the SEC and commenting market participants all believed that the rule will provide significant benefits to the affected firms.

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 identified that can potentially affect our firms’ issuance behavior is an SEC final 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 and therefore should affect all firms similarly. Moreover, it may

⁹ Forms 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 float under \$75 million, we choose to focus on U.S. companies. Foreign Private Issuers do not report their public float because they do not file on form 10-K, and therefore we cannot verify if they were affected by the new rule.

¹⁰ 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 association, and government offices (The Office of Advocacy at Small Business Administration). All comments to the rule are available at <http://www.sec.gov/comments/s7-10-07/s71007.shtml>.

¹¹ 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.

¹² Final Rule titled “Revisions to Rules 144 and 145,” SEC RELEASE NO. 33-8869. Published: Dec. 17, 2007.

lead to heavier reliance on private issuance,¹³ which works against us finding lower reliance on private equity for smaller firms after the rule we study.

3. Data Description and Empirical Approach

In this section we detail our test sample, discuss the empirical strategy for identifying the effect of the 2008 rule, and provide summary statistics for our key control and outcome variables.

3.1 Sample and Variable Construction

Since 2002, firms have been required to report public float in their 10-K as of the end of the second fiscal quarter.¹⁴ For instance, if a firm's fiscal year ends on December 31st 2012 then it is required to report its public float as of June 30th 2012. We collect public float information from firm 10-K SEC filings in the Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) between 2003 and 2013. We use dedicated perl script to extract the public float as reported on the first page of the annual report.¹⁵ We merge the resulting list of 10-K filers with

¹³ In a typical PIPE transaction the firm registers for resale on behalf of investors some or all the shares issued, but 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 The public float is formally defined as “the aggregate market value of the voting and non-voting 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 is reported on the first page of the company 10K. It is important to collect the actual public float from 10-Ks rather than impute a value because firms have to define “affiliates” when calculating their public float, and hence the definition of a firm’s public float depends on the company circumstances. In 1997, the SEC defined affiliate as: “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 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)

¹⁵ We verify that this procedure is 99% accurate in identifying the public float number on the company 10-K filings by hand collecting one cross-section of public float data.

officially reported public float data with annual accounting data from Compustat and monthly stock returns data from CRSP.

We exclude financial (SIC codes 6000-6999) and regulated (SIC 4900-4950) firms, and drop firms with less than \$1 million in total assets, as these firms might face different financing and investment environments. We further require twelve months of CRSP returns prior to the public float report date. We drop shell firms and firms that are not listed on national exchanges in either Compustat or CRSP because the new regulation does not apply to these firms. Finally, to ensure that the financial crisis does not drive our results we exclude observations for which more than six months of these report years are during the NBER contraction, which corresponds to the financial crisis.¹⁶

To measure issuance behavior we obtain public and private offerings of equity, debt, and convertible securities from both Thomsons SDC and PlacementTracker databases, and bank loan initiations from Thomsons 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 make sure that public float, which defines treatment status, is not determined by issuance behavior, we study securities issuances that occur during the twelve months following each public float report date. All other control variables are measured in the period preceding the issuances we study.

¹⁶ We used 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 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's recession definition (observations with fiscal year ends between December 2007 and May 2010).

We classify all equity offerings as public or private. The rule we follow is to classify 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 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, conducted in accordance to the “safe harbor” provisions of Regulation D of the 1933 Securities Act (i.e., marketed primarily to accredited investors), and subject to a confidentiality agreement on the part of potential investors.

Our primary source for public equity offerings is Thompson’s SDC database. We consider all seasoned equity offerings (i.e., SDC Dealtypes = “C”) that contain primary shares public offerings. Our primary source for private equity offerings is the PlacementTracker database. We rely on PlacementTracker to identify PIPEs because Park (2011) shows that PlacementTracker has almost three times the PIPE coverage as Thomson’s SDC. Specifically, we consider all PIPEs with Security Type equal to “Common Stock” in the PlacementTracker database private equity offerings.¹⁷ Although most of the offerings in PlacementTracker are private investments in public equity (PIPEs), 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

¹⁷ Results are similar merging PlacementTracker and SDC private offerings and then eliminating duplicate offerings.

public offerings from PlacementTracker.¹⁸ See Appendix A for detailed definitions of all variables used throughout the analysis.

3.2 Empirical Approach

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 firms that experience similar economic pressures, but differ in their exposure to the economic shock due to exogenous reasons. To achieve this, we use the exogenous rule threshold at \$75 million and restrict our sample to firms with reported public float between \$10 million and \$150 million.¹⁹ This approach ensures that our firms are similar with respect to the rule decision variable: the size of their publicly traded equity. Since we can only measure public float in the middle of each fiscal year, we further exclude observations with public float too close to the \$75 million threshold. In particular, we exclude firm-years where the 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.²⁰ Therefore, our treated firms are firms in the \$10 million to \$70 million range of public float while our untreated firms are firms in the \$80 million

¹⁸ If the two databases lead to multiple offerings by the same firm, with proceeds within one million dollars of each other, occurring within two days then we drop the SDC observation because PlacementTracker classifications are more reliable. Results are not sensitive to alternate de-duplicating algorithms.

¹⁹ In Section 6 we discuss that focusing on a tighter set of firms around the \$75 million cutoff does not change our results.

²⁰ Ideally, 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 regression discontinuity design. Our results are similar if we retain the observations with public float between \$70 million and \$80 million in our sample.

to \$150 million range. This procedure results in an estimation sample of 2,904 unique firms and 7,308 firm-year observations for our issuance analyses.

Within this sample, we perform a difference-in-differences analysis to identify the effect of deregulating shelf registration eligibility. Specifically, we test whether treated firms changed their corporate policies differently than untreated firms following the deregulation. Empirically, the coefficient of interest is β_1 in the following specification:

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

where $Post_t$ is an indicator variable for post-deregulation years, $Treated_{it}$ is an indicator for firms with less than \$75 million in public float, and X_{it} is a matrix of controls that differs depending on the outcome but always includes a continuous measure of public float. We also include industry (γ_j) and year (μ_t) fixed effects, and allow for heteroscedastic error terms that are clustered on the firm level (ε_{it}). We do not include a separate $Post_t$ 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. In effect, the sample of similar unaffected firms before and after the rule effective date provides the best control group to isolate the consequences of the new rule.

3.3 Descriptive Statistics

Table 1 provides descriptive statistics on the variables used throughout the analysis. Consistent with there being more firms below the \$75 million threshold than above the threshold,

Panel A of Table 1 shows that the average firm in our sample has public float of \$68 million.²¹ The average firm has \$169 million in total assets, a market-to-book ratio of 1.7, and 21% tangible assets. The average firm is unprofitable as measured by its net income, but is growing its sales at a 15% annual rate and has average equity returns of 18%. Our firms also have negative cash flows suggesting that they need to rely on external financing.

The firms we study are also investing at a high rate – the annual capital expenditures stand at 4.6% of lagged firm assets and 34% 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 through long-term debt. The average long-term debt is 12.4% of the book value of assets.

Panel B of Table 1 provides summary statistics about the firms' issuance activity. We find that the firms we study are active equity issuers. The average firm raises 4.5% of their market capitalization in equity issues each year, with roughly two-thirds being raised via public SEOs (3.1% of their market capitalization) and one-third via PIPEs (1.5% of their market capitalization). More than eighty percent of the public SEO proceeds are raised via shelf offerings. Finally, our firms also rely on debt financing, mainly through non-convertible debt proceeds, which come almost exclusively in the form of bank loans and private debt offerings.²²

²¹ We report the values of public float and total assets in constant 2012 dollars. We also use constant dollars for our measures of public float and firm size in our tests [$\text{Log}(\text{Public Float})$ and $\text{Log}(\text{Total Assets})$]. However, consistent with the SEC rule, we use nominal values of each firm's public float to assign firms to the treated and non-treated groups.

²² The SEC final rule also let firms use shelf registrations to offer non-investment grade debt and convertible debt securities. All firms were able to offer non-convertible 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.

The summary statistics are similar if we instead look at the frequency of equity issuance. Approximately 14% of the firms raise equity each year. More than half of these firms raise equity via public SEOs (9%), while PIPE offerings (7%) comprise the majority of the remaining equity offerings.²³ Again, more than eighty percent of the public SEOs are conducted via shelf registrations. Finally, Panel B of Table 1 also shows that firms often resort to debt issuance through non-convertible debt proceeds.

Next, we compare firm characteristics and our key outcome variables between the firms that were not allowed and the firms that were allowed to use the shelf process in the pre-rule period. Panel A of Table 2 documents that, unsurprisingly, the treated firms are smaller than untreated firms in terms of public float and total assets. However, these firms are comparable to untreated firms in terms of market-to-book ratio, asset tangibility, and performance. Table 2 also shows that our sample contains approximately twice as many treated observations as untreated observations, underscoring the fact that many of the U.S. public firms are small in size. Treated and untreated firms issue similar amounts of equity, but treated firms rely more on the private market while untreated firms utilize the public equity market more often. Finally, Panel A shows that both sets of firms did not exhibit huge differences in their investment rates and financial leverage. However, untreated firms tended to invest less and rely less on equity in their capital structure in the period before the new rule took effect.

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.

²³ Note that total equity offerings do not equal the sum of PIPE and public equity offerings. Firms may raise capital using multiple methods in a given year.

Panel B of Table 2 breaks the sample down by the 49 Fama-French industries and treatment status. The ordering of industries is exactly the same for the treated and untreated groups. 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 samples. 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 fixed effects in all estimations.

In summary, we construct a representative sample of public companies near the rule compliance threshold which represents approximately 40% of all U.S. public companies. We identify firms that received the ability to use shelf SEOs after 2008 (treated firms) and firms 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 rule smaller firms relied heavily on the private equity markets (PIPEs) while larger firms relied more on the public equity market.²⁴ 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. Gomes and Phillips (2012) show that PIPEs are most popular amongst firms with high levels of informational asymmetry. Thus, one rationalization for the observed equilibrium outcome is that small firms have more

²⁴ For example, Gomes and Phillips (2012) show that between 1995 and 2003 the firms in the smallest size quartile conduct over 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.

demand for the complex PIPE contracts to mitigate informational asymmetry or agency problems.

Moreover, smaller issuers might benefit less from accelerating public issuance than larger companies. Smith (1986) argues that the quick issuance process afforded by shelf registrations will be least beneficial for informationally sensitive offerings. Subsequent studies confirm this by showing that quicker offering methods are associated with more negative market reactions (Denis 1991) and higher fees for informationally sensitive issuers (Blackwell, Marr, and Spivey 1990). Therefore, it is possible that firms under the \$75 million line will continue to rely primarily on the private market for equity even once they are allowed to use shelf SEOs.

Although these studies suggest that the benefits of shelf registrations decrease with size and informational asymmetries, they say little about the extent to which small firms will benefit from using shelf registrations. If the benefits to shelf registrations are large enough, then it may be optimal for firms of all sizes to raise equity via shelf registrations. In fact, many studies document different channels through which issuers can reduce SEO issuance costs by accelerating the issuance process (Gao and Ritter 2010; Henry and Koski 2010; Bortolotti, Megginson, and Smart 2008; and Gustafson 2014). Therefore, an alternative hypothesis is that small firms will greatly benefit from the ability to use the quick shelf issuance process.

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 study both the percentages of equity issuances that are public (Figure 1, in

introduction) and the percent of firms that conduct a public equity issue each year (Figure 2). The evidence in Figures 1 and 2 suggest 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.

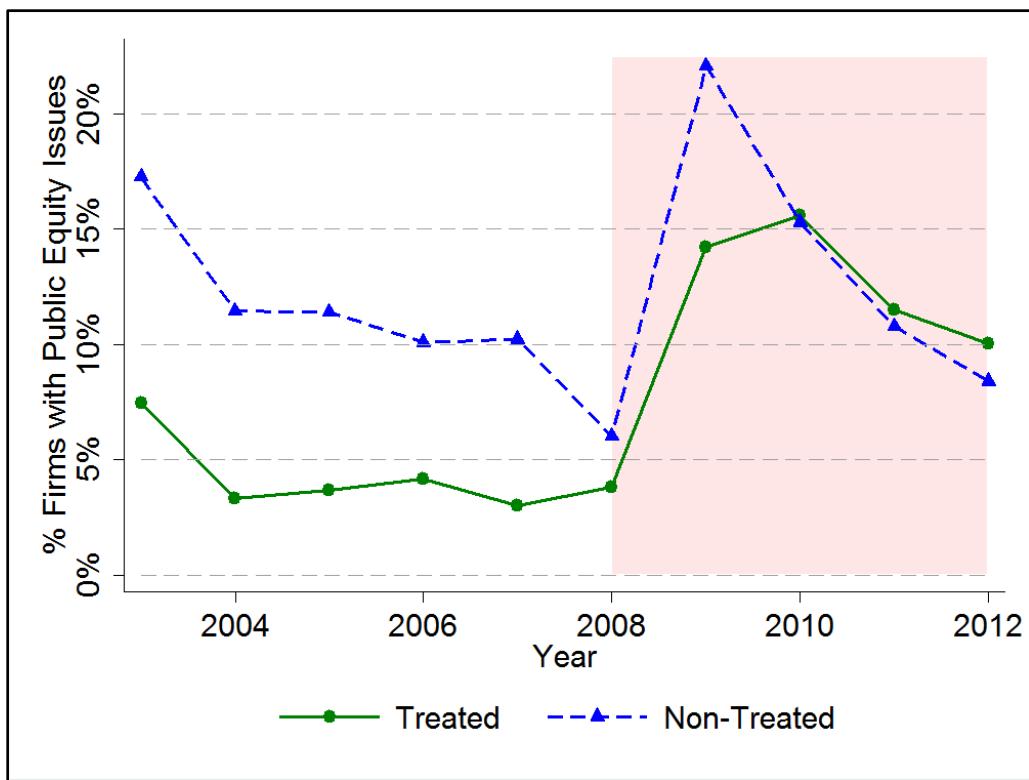


Figure 2. The Frequency of Public Equity Issues.

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 over the sample period (Non-Treated). 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 spell).

Figure 1 graphs the percentage of equity issues that are public for the groups below and above the rule threshold. The figure shows that 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 (only 4% of firms under \$75 million float issued public equity in 2004) when compared to slightly larger firms that had the ability to use shelf registrations (11% of firms above \$75 million float issued public equity in 2004). However, since 2008 the two groups have been approximately equally likely to raise public equity in a given year. If it was the case that the majority of small firms optimally choose to conduct PIPE offerings prior to 2008 we would expect them to continue using PIPE offerings after 2008. Rather, the figures suggest 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. As discussed in Section 3.2, we include industry and year fixed effects, and allow for heteroscedastic error terms that are clustered on 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 where the dependent variable equals total equity proceeds over the course of a year. Post-deregulation, treated firms raise 1.8 percentage points more annual equity proceeds scaled by market capitalization compared to untreated firms. Given

that the average annual proceeds as a percentage of market capitalization for the untreated firms before the new rule was 4.1 percentage points, this is an economically significant increase of approximately 45%.²⁵

Columns 2 through 4 investigate the types of equity offerings that drive this increase in equity issuance. The results in column 2 suggest that this increase is driven by an overall expansion of public equity issuance, with the implied effect being a more than doubling of the proceeds raised from public equity issuances. Notably, Column 3 shows that this increased SEO activity can be directly attributed to an increase in the propensity of treated firms to conduct shelf offerings, suggesting that the relaxed regulatory environment drives the overall increase. Interestingly, the increase in 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. Lastly, in Columns 5 and 6 we do not find similar statistically significant post-deregulation change in either convertible or non-convertible debt offerings. Taken together, our evidence is consistent with both a substitution from private to public equity issuance and an overall increase in equity issuance.

Next, we analyze the frequency of offerings. We are testing the hypothesis that firms issue equity (and in particular public equity) more often once they have the ability to perform quick shelf issuances. We rely on a linear probability model because recent econometric research has highlighted the difficulties in interpreting interaction terms in non-linear probability

²⁵ 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).

models.²⁶ Table 4 documents that firms issue public equity more often after the SEC rule. Post-regulation, treated firms are almost 50% more likely to issue equity: the probability of an equity issue increased by 5.9 percentage points compared to the overall probability of 12.2 percentage points for treated firms 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 a 9.1 percentage points increase in the probability of public equity paired with a 2.4 percentage point decrease in the probability of a private equity issue. Of the public equity issues, the increase is again concentrated in the shelf issues that were made easier by the new rule.²⁷

Therefore, we conclude that post-legislation treated firms transition away from the PIPE market and towards 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 towards public equity issuance is that accelerated SEOs are cheaper than private offerings and therefore issuers switch to them once they are available. Indeed, it is recognized 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

²⁶ We achieve similarly significant results if we use non-linear probability models. However, Ai and Norton (2003) and Greene (2010) show that drawing inferences from interaction terms in non-linear models is problematic because the marginal effects are non-linear functions of the coefficients and the values of the explanatory variables.

²⁷ In untabulated tests we confirm that the amounts a firm issue at each issuance episode are not statistically different before and after the new rule.

these investors are compensated for the additional risks and responsibilities involved in a private transaction is through a large offer discount, which is the percent 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% over our sample period, which is similar to evidence from earlier periods (Chaplinsky and Haushalter 2010; Hertzel, Lemmon, Linck, and Rees 2002). In contrast, 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 are often also provided with warrants or reset provisions. Therefore, PIPE issuers might face additional costs that are hard to value at the time of the transaction by just 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 transition to the shelf issuance process reducing discounts or fees is likely to be a lower bound on the total savings afforded by access to accelerated public offerings, but may exclude certain non-monetary benefits of PIPE offerings.

In Table 5 we examine 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 reduces the cost of equity issuance for treated firms relative to untreated firms. Consistent with the issue discount being a disproportionately large cost for private offerings, this cost reduction is economically and statistically large. We estimate that issue discount declines by approximately 6.1% more for treated firms (compared to untreated firms) following the 2008 deregulation. Compared to the pre-2008 mean issue discount for treated firms of 13.2%, this result suggests that the deregulation causes a 47% decline in the issue discount of treated firms. The table also documents that neither issue fees nor pre-issue stock returns significantly change 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 by a countervailing increase in fees. Given this sizeable change in the firm cost of issuance, and the implied change in the overall cost of capital, we expect that treated firms will change their optimal investment and financial leverage. This reduction in issuance costs should be good news for shareholders. We test these predictions in the next section.

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

Section 5 tests whether the deregulation allowing small firms to conduct shelf registered SEOs has an economically meaningful impact on investment, capital structure, and firm value.

5.1 Effect on Investment

We expect 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 4.3. 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.

Model 1 in Table 6 shows that treated firms increase their investment scaled by assets by 0.86 percentage points relative to untreated firms. The estimated increase in the firm's investment activity is a 19.0% increase in the investment rate relative to the pre regulation treated firms mean investment rate of 4.55 percentage points. The next model in Table 6 confirms that our results also hold when scaling capital investment by physical capital. This alternate measure captures whether treated firms invested over and above their usual replacement rate after they were given the ability to access the public equity market by the new rule. The results with this alternative measure are also statistically significant and economically large. We find that treated firms increase their investment relative to their physical capital by 14.6% following the 2008 deregulation.

Our results provide direct evidence of a link between frictions in the capital acquisition 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). Our paper also supplements the large literature arguing that financially constrained firms exhibit higher investment cash-flow sensitivities (for example, see

Kaplan and Zingalis 1997; Moyen 2004; and Almeida and Campello 2007). Our evidence is also complementary to the finding in Butler and Cornaggia (2011) that access to bank loans improves 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

In the previous subsection, we document 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, it is reasonable to expect that firms will change their capital structure towards 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 while Baker and Wurgler (2002) find that market timing is an important determinant of capital structure.

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. Indeed, despite the theoretical appeal of this hypothesis, equity

issuance costs are not currently identified as an important determinant of the 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. Specifically, treated firms' ratio of liabilities to assets falls by 5.7 percentage points more than untreated firms after the deregulation. This fall represents a 12.4% decrease in the firm's reliance on non-equity financing compared to the pre-2008 average of 46.2% for treated firms. Columns 2 and 3 of Table 6 show that this significant decrease in leverage is robust to alternate measures. The ratio of total debt to assets falls by 14.4%, while the ratio of long-term debt to assets falls by 18.5%. We interpret this leverage decline as a lower bound on the true effect because, unlike investment and issuance, leverage is likely to adjust slowly towards 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 2009) and international studies (Rajan and Zingales 1998), but not conclusively demonstrated within a

developed capital market such as the U.S. 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 issuance frictions for a large sub-section 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 after the new SEC rule gave them the ability to use shelf registrations. To the extent that these benefits 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 unanimously 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.²⁸ This issue is particularly acute for small firms that might suffer from significant informational asymmetries, raising the possibility that the market will predict no benefit to the 2008 deregulation.

To test whether the market anticipated net benefits to the new rule, we perform event studies at the time the new rule was announced. We compare the differential impact of the rule

²⁸ 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." and "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. Published: Dec. 19, 2007.

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.

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 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).²⁹ We expect 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. For the sake of completeness, we report all three portfolio returns in Table 8.

We focus on two announcement dates. The June 20th, 2007 proposal of the new rule included the details of the break for firms under \$75 million public float.³⁰ 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

²⁹ We use the latest firm's public float reported before each announcement date as a best predictor of the firm's eligibility for the new rule. This way we use the public information available to the investors at the time of the announcement.

³⁰ See SEC Release No. 33-8812, "Revisions to the Eligibility Requirements for Primary Securities Offerings on Forms S-3 and F-3," Jun 20th, 2007.

affected and unaffected firms around the rule's proposal date. Firms that were set to benefit from the new rule had 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 registration after the rule took effect, and that shelf registrations affected firm issuance, investment, and financing activities.³¹

Table 8 also reports that we do not find differences in the abnormal returns of the treated and non-treated firms on the day the rule was passed: Dec 11th, 2007.³² This is not surprising because the final rule was similar to the proposed rule. Moreover, all public comments to the proposed rule were overwhelmingly positive, making the adoption of the proposed 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

In this section we present evidence on the types of firms that benefitted from the new rule as well as 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 deregulations. Growth firms are most likely to have profitable projects, making it more likely

³¹ 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 the long-short portfolio provides better controls for risk specific to small firms and for unobservable contemporaneous events that affect both groups of relatively small firms.

³² See SEC Press Release No. 2007-259, "SEC Facilitates Smaller Company Access to Capital Markets," Dec 11th, 2007.

they will need to raise capital and hence 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 1.11. The rationale behind this split is that if the marketable securities of the firm are valued high relative to its assets in place then the firm can increase its value by issuing more securities and using the proceeds to invest in profitable projects.³³ Our hypothesis is reduced 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* ratio. When we split the sample used in Column 1 of Table 3 into observations with above median *Market to Book* ratio (Column 1 of table 9) and observations with below median *Market to Book* ratio (Column 4 of table 9), we find that the deregulation has much bigger effect for firms with above median *Market to Book* ratios. The post-deregulation increase in equity issuance is more than twice as large for firms with above median market to book ratios. Similarly, we document that the increase in public equity proceeds and the decrease in PIPE proceeds is concentrated in firms with above median *Market to Book* ratios.

Next, we test whether this distinction is also true for firm's investment (in Table 10) and capital structure (Table 11) policy. Both tables confirm that the economic consequences of the rule are much bigger for firms with high *Market to Book* ratios, implying that the same firms that

³³ 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 (see Tobin 1969). To the degree that this is an imperfect measure of the firm's investment opportunities, our results might underestimate the importance of this distinction.

are more likely to use the new rule to issue public equity because of their better investment opportunities are also increasing investment and reducing 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 the 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 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 (2014) investigate the merits of the traditional KZ (Kaplan and Zingales 1997) and WW (Whited and Wu 2006) measures of financial constraints. Hadlock and Pierce (2010) argue that age and firm size best approximate financial constraints while Farre-Mensa and Ljungqvist (2014) find that firms with high probabilities of default to act most financially constrained. Because our sample is comprised of only small firms, we follow Farre-Mensa and Ljungqvist (2014) by defining a financially constrained firm as one with over 25% probability of default according to the naïve Merton's model used in Bharath and Shumway (2008).³⁴

In Tables 12 and 13 we partition our sample on financial constraints. There are 208 firm-years in our sample with over a 25% probability of default.³⁵ Column 1 of Table 12 shows that

³⁴ 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.

³⁵ This amounts to 2.8% of our sample being financially constrained, which is similar to the percentage suggested Farre-Mensa and Ljungqvist (2014) over our sample period (see their Figure 4).

the deregulation has an economically large effect on these severely constrained firms. Post-deregulation constrained firms increase annual equity issuance by approximately 14% of market capitalization, which is approximately eight times as large as the effect on unconstrained firms. Notably, the constrained make up a small portion of our sample and thus do not drive full sample results (see Columns 4 through 6). We still document that firms that do not suffer from a high probability of default have a statistically significant and economically meaningful increase in equity issuance.

Table 13 provides some evidence that the deregulation leads constrained firms to reduce financial leverage. The negative coefficients are more than three times the magnitude of the full sample coefficients, although only one of the two is statistically significant at the 5% level. In unreported results, we find no evidence that constrained firms significantly increase their investment post-deregulation. This result is not surprising because close to default firms are most likely to use the proceeds to shore up their short term finances rather than invest on long term projects.

Overall, our results suggest that reducing financial frictions has large effects for firms that are financially distressed. Notably, this phenomenon relates to only 5% of our sample and does not drive our overall findings.

6.2 Robustness Tests

6.2.1 Defining the Sample Around the \$75 million Threshold

We focus our analysis on firms with 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 (as discussed in Section 3 and presented in Table 2). We deal with this issue in two different ways. First, we explicitly control for firm size by including controls for both the firm's public float and 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. Notably, these tighter bands also increase the potential measurement error in 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.

7.2.2 Strategic Exchange Listings

A potential concern with our results might be that firms strategically decide to list on an exchange after the rule took effect in order to issue equity using form S-3. This might bias our results because firms that take these actions might be non-random. 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 in our data that there are 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 period than in the pre-2008 period. We conclude that our study is not likely to suffer from such a systematic bias.

7.2.3 Placebo Tests

Finally, we perform two placebo tests. If our results are driven by small firms becoming significantly more likely to use public equity issues right around the rule 2008 effective date for reasons unrelated to the rule, then we should see similar effects to the ones we document in Table 3 if we perform placebo tests in the subsamples of firms under the \$75 million and in the subsample of firms above \$75 million. Specifically, we denote all firms below the median public float in each respective subsample (\$32.3 million for the below \$75 million sub-sample and \$110.7 million for the above \$75 million subsample) as treated firms and all firms above this artificial thresholds as untreated firms. Table 14 shows that there are no significant differences in issuance behavior between the treated and non-treated firms in these placebo tests. Indeed, all four coefficients on the *Post x Treated* indicator are negative while 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 the 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 has 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 towards 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 19% and reduce their financial leverage by 12%. These effects are larger for growth firms. We also find that financially constrained firms have the highest increase in issuance and use the proceeds to reduce leverage.

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 compliment the findings in the development literature, which suggests 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.

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Appendix A. Variable Descriptions.

Panel A: Firm Characteristics. All Compustat ratio variables are winsorized at the 1% level.

Variables	Definition (Sources)
Total Assets	The company total assets (AT) in 2012 \$ millions (Compustat)
Public Float	The part of equity in 2012 \$ millions not held by management or large shareholders, as reported on the first page of the company's 10-K filing. (EDGAR)
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)
Tangibility	Gross property plant and equipment (PPEGT) divided by total assets (AT). (Compustat)
Profitability	Operating income before depreciation (OIBDP) 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)
Institutional Ownership	The percentage of common stock held by institutions as reported on Form 13-F with the SEC. (Thomson Reuters)
Cash Flow to Assets	Income before extraordinary items (IB) plus depreciation and amortization (DP) divided by total assets (AT). (Compustat)
Sales Growth	The percent change in sales (SALE) over the past year. (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)
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)
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+0.25x σ_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, default probability is zero. (Compustat; CRSP)

Panel B: Issuance Variables. All ratio variables are winsorized at the 1% level.

Variables	Definition (Sources)
Equity Proceeds	Annual proceeds raised via primary public equity or PIPEs as a percentage of beginning of the year market value of equity ($ PRCC_F *CSHO$). Equity Proceeds is the sum of our Public Equity Proceeds and PIPE proceeds measures. (SDC; PlacementTracker; Compustat)
Public Equity Proceeds	Annual proceeds raised via public equity offerings containing primary shares as a percentage of beginning of the year market value of equity ($ PRCC_F *CSHO$). We consider common stock offerings of registered shares public offerings. In SDC a public equity offering is one with SDC DealType equal to "C." In PlacementTracker a public offering is a registered direct shelf sale or a confidentially marketed public offering. (SDC; PlacementTracker; Compustat)
Public Shelf Proceeds	Annual proceeds raised via shelf registered primary public equity as a percentage of beginning of the year market value of equity ($ PRCC_F *CSHO$). (SDC; PlacementTracker; Compustat)
Public Non-Shelf Proceeds	Annual proceeds raised via non-shelf registered primary public equity as a percentage of beginning of the year market value of equity ($ PRCC_F *CSHO$). (SDC; Compustat)
PIPE Proceeds	Annual proceeds raised via private investments in public equity as a percentage of beginning of the year market value of equity ($ PRCC_F *CSHO$). We consider common stock offerings of unregistered shares PIPEs. In PlacementTracker a private offering has Security Type = "Common Stock." (PlacementTracker; Compustat)
Convertible Proceeds	Annual proceeds raised via convertible bonds (including public, private and Rule 144A offerings) as a percentage of beginning of the year market value of equity ($ PRCC_F *CSHO$). (SDC; PlacementTracker; Compustat)
Non-Convertible Debt Proceeds	Annual proceeds raised via non-convertible debt (bank loans, public, private, and Rule 144A) as a percentage of beginning of the year market value of equity ($ PRCC_F *CSHO$). (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)
Public Non-Shelf Indicator	Equals one if Public Non-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)

Convertible Indicator	Equals one if Convertible Proceeds is greater than zero in a given year. (SDC and PlacementTracker)
Non-Convertible Debt Indicator	Equals one if Non-Convertible Debt Proceeds is greater than zero in a given year. (SDC, PlacementTracker, DealScan)
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 2003 and 2012 with *Public Float* between \$10 million and \$150 where *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 variables are winsorized at the 1% level. The sample contains 2,904 unique firms over the nine years. All variables are defined in Appendix A.

Panel A: Firm Characteristics.

Variable	Units	Mean	SD	Median	Obs.
Public Float	millions (\$2012)	68.20	46.50	53.90	7,309
Total Assets	millions (\$2012)	169.00	423.00	78.50	7,309
Market to Book	ratio	1.69	1.71	1.11	7,309
Tangibility	ratio	0.21	0.22	0.13	7,309
Profitability	ratio	-0.05	0.33	0.05	7,309
Previous Year Return	rate	0.18	0.79	0.00	7,309
Institutional Ownership	%	0.27	0.23	0.22	7,309
Cash Flow to Assets	ratio	-0.10	0.36	0.04	7,305
Sales Growth	rate	0.15	0.61	0.06	7,128
Investment	%	4.55	6.52	2.38	7,309
Capex to Physical Capital	%	34.10	46.00	20.00	7,277
Liabilities to Assets	%	45.30	29.80	39.80	7,300
Debt to Assets	%	17.10	23.10	7.84	7,298
Long Term Debt to Assets	%	12.40	20.10	2.05	7,298

Panel B: Issuance Variables.

Variable	Units	Mean	SD	Median	Obs.
Equity Issue Proceeds	%	4.49	14.4	0.00	7,309
Public Equity Proceeds	%	3.05	12.4	0.00	7,309
Public Shelf Proceeds	%	2.51	11.5	0.00	7,309
Public Non-Shelf Proceeds	%	0.53	4.32	0.00	7,309
PIPE Proceeds	%	1.45	6.75	0.00	7,309
Convertible Proceeds	%	0.99	5.74	0.00	7,309
Non-Convertible Debt Proceeds	%	9.36	37	0.00	7,309
Equity Issue Indicator	indicator	0.144	0.351	0.00	7,309
Public Equity Indicator	indicator	0.085	0.278	0.00	7,309
Public Shelf Indicator	indicator	0.072	0.258	0.00	7,309
Public Non-Shelf Indicator	indicator	0.017	0.129	0.00	7,309
PIPE Indicator	indicator	0.066	0.248	0.00	7,309
Convertible Indicator	indicator	0.041	0.198	0.00	7,309
Non-Convertible Debt Indicator	indicator	0.107	0.310	0.00	7,309
Issuance Discount	%	8.62	14.7	6.00	986
Issuance Spread	%	6.05	1.26	6.00	811
Pre-Issue Price Decline	%	1.64	10.30	1.99	979

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-rule period and we use the values to calibrate the effect of the new rule. Panel B decomposes the sample by Fama-French 49 industry classification and whether a firm is *Treated* firm. *Treated* firms are firms with public float in the \$10 million to \$70 million range, and *Non-Treated* firms are firms with public float in the \$80 million to \$150 million range. We restrict the table to the ten most common Fama-French 49 industries.

Panel A. Performance and Outcome Comparison

Variable	Treated				Non-Treated			
	Mean	SD	Median	Obs	Mean	SD	Median	Obs
a) Size and Assets Measures								
Public Float	35	17	32	3,319	112	20	111	1,614
Total Assets	90	171	45	3,319	203	285	120	1,614
Market to Book	1.65	1.67	1.11	3,319	2.11	2.00	1.43	1,614
Tangibility	0.22	0.22	0.14	3,319	0.20	0.20	0.13	1,614
b) Performance Measures								
Profitability	-0.06	0.32	0.05	3,319	-0.04	0.32	0.06	1,614
Previous Year Return	0.17	0.80	-0.01	3,319	0.20	0.74	0.03	1,614
Cash Flow to Assets	-0.11	0.38	0.03	3,315	-0.08	0.32	0.04	1,614
Sales Growth	0.14	0.58	0.06	3,260	0.22	0.68	0.09	1,579
c) Issuance Proceeds								
Equity Issue Proceeds	4.11	13.37	0	3,319	4.57	13.51	0	1,614
Public Equity Proceeds	1.77	9.83	0	3,319	3.59	12.39	0	1,614
PIPE Proceeds	2.33	8.68	0	3,319	0.99	4.84	0	1,614
d) Issuance Costs								
Issuance Discount	13.17	16.34	10.5	433	6.96	11.26	4.98	254
Issuance Spread	6.28	1.43	6.00	337	5.78	1.04	6.00	221
e) Investment								
Investment	4.55	6.55	2.30	3,319	5.08	7.03	2.77	1,613
Capx to Physical Capital	32.93	45.38	19.22	3,298	38.68	46.99	24.38	1,612
f) Financial Leverage								
Liabilities to Assets	46.19	30.01	40.39	3,315	42.97	29.40	37.13	1,611
Book Leverage	17.74	23.21	9.23	3,315	16.16	23.26	5.82	1,611
Long Term Book Leverage	12.15	19.44	2.65	3,315	13.21	21.26	2.47	1,611

Panel B. Industry Distribution

Top 10 Industries	Treated		Non-Treated	
	Count	Percentage	Count	Percentage
Pharmaceutical Products	504	10.3	373	15.6
Computer Software	528	10.7	260	10.9
Electronic Equipment	442	9.0	171	7.2
Business Services	373	7.6	145	6.1
Medical Equipment	261	5.3	140	5.9
Retail	198	4.0	123	5.1
Petroleum and Natural Gas	149	3.0	72	3.0
Wholesale	222	4.5	75	3.1
Communication	130	2.6	84	3.5
Measuring and Control	187	3.8	56	2.3

Table 3. Effect on Proceeds from Equity Issuance.

This table estimates OLS regressions where the dependent variables is the proceeds raised as a percentage of beginning of year market capitalization (i.e., $100 * \text{Proceeds}_{t-t+1} / \text{Market Capitalization}_t$). The dependent variable in Column 1 includes the annual proceeds from equity offerings, Column 2 contains only proceeds from primary public equity offerings, while Column 3 further restricts the sample to only shelf registered public offerings. The dependent variables in Columns 4, 5, and 6 include proceeds from private equity, convertible debt, and non-convertible debt offerings, respectively. 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 public float less than \$75 million. The *Post* period is defined as fiscal years ending after December 2008. All other variables are defined in Appendix A. We include year fixed effects and industry fixed effects using the Fama-French 49 industries. 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) Total Equity Proceeds	(2) Total Public Equity Proceeds	(3) Public Shelf Proceeds	(4) PIPE Proceeds	(5) Convertible Proceeds	(6) Non-Convertible Debt Proceeds
Treated x Post	1.842** (2.43)	2.624*** (3.62)	2.270*** (3.24)	-0.771*** (-3.15)	0.067 (0.25)	1.605 (0.89)
Treated	0.823 (1.34)	-0.291 (-0.53)	-0.444 (-0.88)	1.100*** (3.78)	-0.073 (-0.28)	-0.015 (-0.01)
Log(Total Assets)	-2.197*** (-7.36)	-1.193*** (-4.58)	-1.207*** (-4.99)	-0.921*** (-6.89)	-0.188 (-1.54)	8.023*** (8.97)
Market to Book	-1.521*** (-8.37)	-1.048*** (-6.80)	-0.975*** (-6.53)	-0.454*** (-4.47)	-0.273*** (-3.75)	0.728*** (2.70)
Liabilities to Assets	3.861*** (4.49)	2.384*** (3.26)	2.219*** (3.22)	1.652*** (3.78)	1.154*** (3.07)	16.912*** (9.18)
Profitability	-11.193*** (-11.23)	-7.097*** (-8.13)	-6.683*** (-8.05)	-4.089*** (-7.95)	-2.462*** (-6.11)	0.759 (0.66)
Previous Year Return	0.665*** (2.58)	0.705*** (2.99)	0.407* (1.89)	-0.032 (-0.28)	0.070 (0.65)	2.139*** (3.06)
Log(Public Float)	3.508*** (7.74)	2.662*** (6.79)	2.551*** (7.02)	0.799*** (3.53)	0.192 (0.96)	-4.302*** (-3.58)
Institutional Ownership	-2.049** (-2.27)	-1.484* (-1.76)	-1.233 (-1.60)	-0.499 (-1.41)	-0.842** (-2.10)	5.089** (1.99)
Adj. R-squared	0.156	0.106	0.111	0.089	0.026	0.117
Observations	7,309	7,309	7,309	7,309	7,309	7,309

Table 4. Effect on Equity Issuance Frequency.

This table estimates linear probability models where the dependent variables equal one if a firm issues a given type of equity during the year. All explanatory variables are defined as of the beginning of the year over which we measure issuance activity. The dependent variable in Column 1 indicates a firm that conducts an equity offering (either a primary public offering or private, PIPE, offering) in a given year. Column 2 indicates only primary public equity offerings, while Column 3 further restricts the sample to only shelf registered public offerings. Columns 4, 5, and 6 indicate PIPE, convertible debt, and non-convertible debt offerings, respectively. *Treated* is an indicator equal to one if the firm has public float less than \$75 million. The *Post* period is defined as fiscal years ending after December 2008. All other variables are defined in Appendix A. We include year fixed effects and industry fixed effects using the Fama-French 49 industries. 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) Total Equity Issue	(2) Total Public Equity Issue	(3) Shelf Public Equity Issue	(4) PIPE Issue	(5) Convertible Issue	(6) Non-Convertible Debt Issue
Treated x Post	0.059*** (3.34)	0.091*** (5.62)	0.082*** (5.20)	-0.024** (-2.45)	-0.005 (-0.58)	0.030* (1.91)
Treated	0.018 (1.17)	-0.033*** (-2.67)	-0.035*** (-3.16)	0.048*** (4.04)	0.004 (0.43)	-0.014 (-0.99)
Log(Total Assets)	-0.033*** (-5.12)	-0.012** (-2.32)	-0.014*** (-2.88)	-0.023*** (-4.76)	-0.004 (-1.07)	0.046*** (7.72)
Market to Book	-0.001 (-0.20)	-0.005 (-1.29)	-0.004 (-1.10)	0.002 (0.51)	-0.002 (-0.73)	-0.000 (-0.12)
Liabilities to Assets	0.053** (2.56)	0.035** (2.01)	0.032* (1.90)	0.020 (1.38)	0.029** (2.36)	0.117*** (8.37)
Profitability	-0.297*** (-12.98)	-0.167*** (-8.66)	-0.159*** (-8.55)	-0.158*** (-9.23)	-0.102*** (-7.85)	0.019* (1.76)
Previous Year Return	0.011* (1.77)	0.009* (1.74)	0.002 (0.35)	0.001 (0.16)	-0.004 (-1.08)	0.006 (1.19)
Log(Public Float)	0.075*** (7.32)	0.053*** (6.70)	0.052*** (7.26)	0.029*** (3.60)	0.004 (0.53)	-0.001 (-0.07)
Institutional Ownership	-0.067*** (-3.10)	-0.066*** (-3.59)	-0.059*** (-3.47)	-0.018 (-1.23)	-0.037*** (-2.75)	0.080*** (3.49)
Adj. R-squared	0.189	0.140	0.160	0.101	0.039	0.113
Observations	7,309	7,309	7,309	7,309	7,309	7,309

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 public float less than \$75 million. The *Post* period is defined as fiscal years ending after December 2008. All other variables are defined in Appendix A. We include year fixed effects and industry fixed effects using the Fama-French 49 industries. 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) Issue Discount	(2) Issue Fees	(3) Pre-Issue Price Decline
Treated x Post	-6.124*** (-3.37)	0.085 (0.45)	0.789 (0.53)
Treated	2.269 (1.45)	0.219 (1.35)	0.362 (0.30)
Log(Total Assets)	-2.220*** (-3.03)	-0.225*** (-3.20)	1.153* (1.91)
Market to Book	-0.145 (-0.49)	-0.021 (-0.68)	0.166 (0.81)
Liabilities to Assets	-0.357 (-0.24)	-0.269 (-1.60)	-2.418** (-2.27)
Profitability	-2.987* (-1.82)	-0.076 (-0.43)	1.598 (1.35)
Previous Year Return	-0.359 (-0.58)	-0.078 (-1.43)	0.372 (0.91)
Log(Public Float)	-1.442 (-0.98)	-0.015 (-0.12)	1.409 (1.41)
Institutional Ownership	-1.012 (-0.43)	-0.551** (-2.28)	-1.229 (-0.68)
Adj. R-squared	0.133	0.107	0.050
Observations	986	811	979

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., $100 \cdot \text{Capex}_{t-t+1} / \text{Total Assets}_t$). In Columns 3 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, except for Cash Flow to Assets and Sales Growth, which are measured over the same year as capital expenditure. *Treated* is an indicator equal to one if the firm has public float less than \$75 million. The *Post* period is defined as fiscal years ending after December 2008. All other variables are defined in Appendix A. We include year fixed effects and industry fixed effects using the Fama-French 49 industries. 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 Post	0.863*** (3.18)	4.806** (2.24)
Treated	-0.191 (-0.81)	-1.053 (-0.56)
Log(Total Assets)	-1.029*** (-9.44)	-5.192*** (-6.54)
Market to Book	0.361*** (4.15)	4.100*** (6.09)
Liabilities to Assets	0.166 (0.58)	-2.133 (-0.94)
Tangibility	11.661*** (19.64)	-62.739*** (-19.65)
Cash Flow to Assets	0.886*** (2.61)	0.106 (0.03)
Sales Growth	1.088*** (6.34)	7.590*** (5.07)
Log(Public Float)	0.982*** (5.83)	3.716*** (2.78)
Profitability	1.836*** (3.95)	16.575*** (4.33)
Institutional Ownership	-0.398 (-1.28)	1.997 (0.82)
Adj. R-squared	0.360	0.158
Observations	7,124	7,105

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., $100 * \text{Liabilities}_t / \text{Total Assets}_t$). 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 equals long-term debt as a percentage of total assets. *Treated* is an indicator equal to one if the firm has public float less than \$75 million. The *Post* period is defined as fiscal years ending after December 2008. All other variables are defined in Appendix A. We include year fixed effects and industry fixed effects using the Fama-French 49 industries. 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) Liabilities to Assets	(2) Debt to Assets	(3) Long-Term Debt to Assets
Treated x Post	-5.743*** (-3.60)	-2.556** (-2.16)	-2.251** (-2.10)
Treated	0.758 (0.59)	-0.683 (-0.70)	-0.465 (-0.56)
Market to Book	3.655*** (7.22)	3.693*** (9.16)	3.097*** (8.66)
Tangibility	9.911*** (3.27)	19.024*** (7.32)	18.721*** (7.83)
Log(Total Assets)	14.563*** (20.66)	12.045*** (19.77)	9.733*** (17.72)
Profitability	-21.545*** (-10.27)	-7.360*** (-4.90)	-3.739*** (-3.28)
Log(Public Float)	-12.836*** (-13.09)	-10.641*** (-13.70)	-7.343*** (-10.99)
Institutional Ownership	-5.342** (-2.22)	-5.924*** (-3.08)	-1.289 (-0.76)
Adj. R-squared	0.229	0.280	0.279
Observations	7,295	7,295	7,295

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 estimations 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), $E(\varepsilon_{it})=0$, $\text{var}(\varepsilon_{it})=\sigma^2$, 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.

Date & Event	Cumulative Abnormal Return		
	(1)	(2)	(3)
	Portfolio of affected firms (long)	Portfolio of unaffected firms (short)	Portfolio of affected minus unaffected firms (long-short)
June 20th, 2007: SEC Proposes to Revise 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 11th, 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. Issuance and Firm Growth Opportunities.

This table estimates OLS regressions where the dependent variables is the equity proceeds raised by a given method scaled by beginning of year market capitalization. Columns 1 through 3 contain firms with above median market-to-book ratios (1.11), while Columns 4 through 6 contain only firms with below median market-to-book ratios. The dependent variable in Columns 1 and 4 measures the scaled annual proceeds from any equity offering (i.e., $100 * \text{Proceeds}_{t-t+1} / \text{Market Capitalization}_t$). Columns 2 and 5 include only proceeds from primary public equity offerings, while Columns 3 and 6 include only proceeds from private (PIPE) offerings. All explanatory variables are defined in Table 3 and Appendix A. We include year fixed effects and industry fixed effects using the Fama-French 49 industries. 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) High MTB Equity Proceeds	(2) High MTB Public Proceeds	(3) High MTB PIPE Proceeds	(4) Low MTB Equity Proceeds	(5) Low MTB Public Proceeds	(6) Low MTB PIPE Proceeds
Treated x Post	2.724** (2.05)	3.846*** (2.99)	-1.122*** (-2.77)	1.247 (1.41)	1.736** (2.11)	-0.489 (-1.41)
Treated	1.088 (1.25)	-0.128 (-0.16)	1.215*** (2.90)	0.873 (0.97)	-0.071 (-0.09)	0.944** (2.24)
Log(Total Assets)	-2.271*** (-5.20)	-1.335*** (-3.23)	-0.936*** (-5.03)	-1.935*** (-4.27)	-0.630* (-1.65)	-1.305*** (-5.23)
Market to Book	-1.397*** (-6.94)	-1.178*** (-6.58)	-0.220** (-2.01)	-1.033 (-0.82)	-0.258 (-0.25)	-0.776 (-1.16)
Liabilities to Assets	2.500** (2.36)	1.196 (1.26)	1.304** (2.40)	6.870*** (5.22)	3.504*** (3.15)	3.366*** (4.33)
Profitability	-10.317*** (-10.00)	-6.978*** (-7.74)	-3.340*** (-6.26)	-17.315*** (-5.55)	-9.409*** (-3.65)	-7.906*** (-4.83)
Previous Year Return	0.641* (1.94)	0.705** (2.21)	-0.064 (-0.51)	0.710* (1.80)	0.791** (2.35)	-0.081 (-0.40)
Log(Public Float)	3.637*** (5.32)	3.069*** (5.08)	0.569* (1.73)	3.463*** (5.26)	2.020*** (3.76)	1.443*** (3.92)
Institutional Ownership	0.988 (0.68)	0.646 (0.45)	0.341 (0.66)	-4.034*** (-3.66)	-2.767*** (-2.89)	-1.268*** (-2.62)
Adj. R-squared	0.198	0.150	0.103	0.109	0.049	0.094
Observations	3,656	3,656	3,656	3,652	3,652	3,652

Table 10. Investment and Firm Growth Opportunities.

This table presents OLS regression results. Columns 1 and 2 contain firms with above median market-to-book ratios (1.11), while Columns 3 and 4 contain only firms with below median market-to-book ratios. In Columns 1 and 3 the dependent variable equals annual capital expenditure as a percentage of beginning of period total assets (i.e., $100 \times \text{Capex}_{t-t+1} / \text{Total Assets}_t$). In Columns 2 and 4 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, except for Cash Flow to Assets and Sales Growth, which are measured over the same year as capital expenditure. *Treated* is an indicator equal to one if the firm has public float less than \$75 million. The *Post* period is defined as fiscal years ending after December 2008. All other variables are defined in Appendix A. We include year fixed effects and industry fixed effects using the Fama-French 49 industries. 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) 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 Post	1.162*** (2.66)	9.294** (2.30)	0.395 (1.14)	1.169 (0.56)
Treated	-0.198 (-0.55)	-4.657 (-1.48)	-0.108 (-0.35)	3.005 (1.48)
Log(Total Assets)	-0.770*** (-4.20)	-5.925*** (-4.05)	-0.959*** (-7.33)	-4.328*** (-4.63)
Market to Book	0.376*** (3.57)	3.579*** (4.36)	0.402 (1.00)	5.647* (1.86)
Liabilities to Assets	-0.208 (-0.53)	-2.808 (-0.86)	0.067 (0.18)	0.304 (0.12)
Tangibility	14.425*** (14.03)	-84.255*** (-14.30)	9.927*** (13.60)	-46.370*** (-13.70)
Cash Flow to Assets	1.139*** (2.58)	1.654 (0.37)	0.448 (1.20)	-2.797 (-0.59)
Sales Growth	0.934*** (4.70)	6.304*** (3.55)	1.343*** (4.48)	11.250*** (4.26)
Log(Public Float)	0.685** (2.39)	2.058 (0.82)	1.020*** (5.17)	5.012*** (3.57)
Profitability	0.810 (1.40)	14.186*** (2.91)	4.801*** (6.97)	22.513*** (3.96)
Institutional Ownership	0.134 (0.29)	8.266* (1.92)	-0.810** (-2.03)	-3.991 (-1.54)
Adj. R-squared	0.395	0.129	0.345	0.153
Observations	3,500	3,495	3,624	3,610

Table 11. Capital Structure and Firm Growth Opportunities.

This table presents OLS regression results. Columns 1 and 2 contain firms with above median market-to-book ratios (1.11), while Columns 3 and 4 contain only firms with below median market-to-book ratios. In Columns 1 and 3, the dependent variable equals total liabilities as a percentage of total assets (i.e., $100 * \text{Liabilities}_t / \text{Total Assets}_t$). In Columns 2 and 4, the dependent variable equals long-term debt as a percentage of total assets. *Treated* is an indicator equal to one if the firm has public float less than \$75 million. The *Post* period is defined as fiscal years ending after December 2008. All other variables are defined in Appendix A. We include year fixed effects and industry fixed effects using the Fama-French 49 industries. 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) 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 Post	-7.893*** (-3.00)	-3.465** (-2.12)	-3.090* (-1.72)	-0.272 (-0.21)
Treated	1.779 (0.91)	0.586 (0.49)	-0.570 (-0.37)	-1.100 (-1.02)
Market to Book	2.630*** (4.47)	2.267*** (5.55)	15.586*** (6.30)	25.161*** (14.85)
Tangibility	19.778*** (3.96)	20.318*** (5.45)	2.815 (0.93)	17.693*** (7.48)
Log(Total Assets)	15.126*** (11.44)	11.167*** (11.91)	16.343*** (21.43)	11.546*** (18.94)
Profitability	-25.344*** (-10.41)	-7.132*** (-5.51)	-9.264*** (-2.84)	-0.723 (-0.43)
Log(Public Float)	-14.005*** (-8.33)	-8.455*** (-7.58)	-14.397*** (-12.61)	-9.599*** (-12.93)
Institutional Ownership	-6.334* (-1.66)	-2.307 (-0.85)	-4.030 (-1.58)	0.060 (0.03)
Adj. R-squared	0.189	0.236	0.338	0.432
Observations	3,648	3,648	3,647	3,647

Table 12. Issuance and Financial Constraints.

This table presents OLS regressions. Columns 1 through 3 contains financially constrained firms, while Columns 4 through 6 contain unconstrained firms. We follow Farre-Mensa and Ljungqvist (2014) by defining a constrained firm as one with a one-year probability of default of over 25% according to the naïve Merton's model (Bharath and Shumway 2008). The dependent variable in Columns 1 and 4 measures the scaled annual proceeds from any equity offering (i.e., $100 \times \text{Proceeds}_{t-t+1} / \text{Market Capitalization}_t$); columns 2 and 5 include only proceeds from primary public equity offerings; columns 3 and 6 include only proceeds from private (PIPE) offerings. All explanatory variables are defined in Table 3 and Appendix A. We include year fixed effects and industry fixed effects using the Fama-French 49 industries. 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) Constrained Equity Proceeds	(2) Constrained Public Proceeds	(3) Constrained PIPE Proceeds	(4) Unconstrained Equity Proceeds	(5) Unconstrained Public Proceeds	(6) Unconstrained PIPE Proceeds
Treated x Post	13.582** (2.29)	10.723* (1.89)	2.859 (1.25)	1.611** (2.09)	2.485*** (3.37)	-0.874*** (-3.57)
Treated	-0.620 (-0.10)	-2.056 (-0.34)	1.435 (0.54)	0.772 (1.25)	-0.269 (-0.49)	1.040*** (3.53)
Log(Total Assets)	-7.924*** (-3.30)	-4.546** (-1.99)	-3.378** (-2.28)	-2.023*** (-6.74)	-1.148*** (-4.17)	-0.875*** (-6.41)
Market to Book	-11.937** (-2.01)	-2.028 (-0.48)	-9.909** (-2.56)	-1.475*** (-8.06)	-1.040*** (-6.61)	-0.435*** (-4.24)
Liabilities to Assets	12.259* (1.78)	1.783 (0.38)	10.476* (1.96)	3.944*** (4.52)	2.419*** (3.15)	1.525*** (3.46)
Profitability	-11.297 (-1.13)	-8.433 (-0.82)	-2.865 (-0.76)	-11.244*** (-11.22)	-7.062*** (-8.04)	-4.183*** (-8.09)
Previous Year Return	0.935 (0.14)	-0.587 (-0.09)	1.522 (0.52)	0.762*** (2.94)	0.741*** (3.10)	0.021 (0.19)
Log(Public Float)	11.020*** (3.07)	6.857** (2.01)	4.163* (1.79)	3.338*** (7.22)	2.636*** (6.54)	0.702*** (3.09)
Institutional Ownership	0.350 (0.07)	0.970 (0.17)	-0.620 (-0.35)	-2.196** (-2.37)	-1.669* (-1.92)	-0.527 (-1.43)
Adj. R-squared	0.088	-0.033	0.042	0.157	0.107	0.092
Observations	209	209	209	7,100	7,100	7,100

Table 13. Capital Structure and Financial Constraints.

This table presents OLS regression results. Columns 1 and 2 contains financially constrained firms, while Columns 3 and 4 contain unconstrained firms. We follow Farre-Mensa and Ljungqvist (2014) by defining a constrained firm as one with a one-year probability of default of over 25% according to the naïve Merton's model (Bharath and Shumway 2008). In Columns 1 and 3, the dependent variable equals total liabilities as a percentage of total assets (i.e., $100 \times \text{Liabilities}_t / \text{Total Assets}_t$). In Columns 2 and 4, the dependent variable equals long-term debt as a percentage of total assets. *Treated* is an indicator equal to one if the firm has public float less than \$75 million. The *Post* period is defined as fiscal years ending after December 2008. All other variables are defined in Appendix A. We include year fixed effects and industry fixed effects using the Fama-French 49 industries. 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) Constrained Liabilities to Assets	(2) Constrained LTD to Assets	(3) Unconstrained Liabilities to Assets	(4) Unconstrained LTD to Assets
Treated x Post	-19.600** (-2.20)	-10.668 (-1.10)	-5.302*** (-3.29)	-2.044* (-1.92)
Treated	-2.164 (-0.27)	9.105 (1.08)	0.504 (0.39)	-0.883 (-1.07)
Market to Book	54.612*** (7.24)	33.934*** (3.52)	3.246*** (6.37)	2.807*** (7.86)
Tangibility	-22.135** (-2.49)	10.540 (1.11)	11.460*** (3.79)	19.258*** (8.20)
Log(Total Assets)	13.966*** (4.07)	9.374*** (2.68)	12.794*** (18.63)	8.585*** (16.28)
Profitability	-6.836 (-0.51)	12.637 (0.59)	-20.814*** (-10.02)	-3.394*** (-3.01)
Log(Public Float)	-14.921*** (-2.94)	-0.234 (-0.04)	-11.367*** (-11.41)	-6.733*** (-10.09)
Institutional Ownership	9.560 (0.95)	4.129 (0.36)	-5.547** (-2.33)	-1.411 (-0.84)
Adj. R-squared	.515	.437	.195	.242
Observations	209	209	7,087	7,087

Table 14. Placebo Tests.

This table presents OLS results for two placebo tests. In Columns 1 and 2 the sample contains only firms with public float between \$10 and \$70 million. In these columns treated equals one for firms with public float less than the sample median of \$32.3 million. In Columns 3 and 4 the sample contains only firms with public float between \$80 and \$150 million. In these columns treated equals one for firms with public float less than the sample median of \$110.7 million. The dependent variable in Columns 1 and 3 are annual proceeds from equity offerings as a percentage of market capitalization (i.e., $100 * \text{Proceeds}_{t-t+1} / \text{Market Capitalization}_t$). The dependent variable in Columns 2 and 4 is the proceeds from shelf registered equity offerings scaled by market capitalization. All explanatory variables are defined as of the beginning of the year over which we measure issuance activity. The *Post* period is defined as fiscal years ending after December 2008. All other variables are defined in Appendix A. We include year fixed effects and industry fixed effects using the Fama-French 49 industries. 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) Lower Placebo Equity Proceeds	(2) Lower Placebo Shelf Proceeds	(3) Upper Placebo Equity Proceeds	(4) Upper Placebo Shelf Proceeds
Treated x Post	-0.227 (-0.26)	-0.244 (-0.32)	-0.534 (-0.48)	-0.149 (-0.14)
Treated	0.258 (0.34)	0.597 (1.07)	-0.388 (-0.35)	-0.761 (-0.75)
Log(Total Assets)	-1.841*** (-5.62)	-0.969*** (-3.66)	-2.990*** (-5.10)	-1.892*** (-3.43)
Market to Book	-1.474*** (-6.20)	-0.814*** (-4.45)	-1.673*** (-5.85)	-1.320*** (-4.88)
Liabilities to Assets	3.950*** (3.76)	1.531** (1.97)	4.555*** (3.34)	3.400** (2.55)
Profitability	-12.080*** (-9.41)	-6.535*** (-6.33)	-8.855*** (-5.74)	-7.089*** (-4.65)
Previous Year Return	0.575* (1.89)	0.307 (1.31)	0.866* (1.77)	0.549 (1.19)
Log(Public Float)	3.515*** (4.61)	2.818*** (4.75)	0.900 (0.30)	-0.489 (-0.18)
Institutional Ownership	-1.533 (-1.21)	-0.577 (-0.58)	-2.734** (-2.16)	-1.829 (-1.55)
Adj. R-squared	0.149	0.100	0.165	0.120
Observations	4,919	4,919	2,390	2,390