At The Market (ATM) Offerings

by

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ABSTRACT

Introduced in 2008, "At-the-market" (ATM) equity offerings are direct share issuances to secondary market investors. Their use has grown markedly, and in 2015 the number of ATMs relative to SEOs was 40%, while total ATM proceeds relative to total SEO proceeds was nearly one-fourth. ATMs forgo underwriters and shares are "dribbled-out" over many months. Firms' choices between SEOs (either accelerated or fully-marketed) and ATMs, support the costly certification hypothesis of Chemmanur and Fulghieri (1994). Ex-post, firms' ATM proceeds largely correlate with cash buildup. We conclude that ATMs are likely a permanent fixture in the follow-on equity issuance landscape.

Keywords: At-the-market offering; ATM; seasoned equity offering; equity issuance; certification
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Equity issuance in the U.S. has traditionally followed the firm commitment process (Eckbo, Masulis, Norli (2007)). Explanations for the dominance of this underwritten offering approach include the certification that investment banks provide to issuers of uncertain quality, as well as liquidity provision and marketing services (Booth and Smith (1986), Beatty and Ritter (1986), Gao and Ritter (2010)). While the needs for and costs of certification, liquidity provision and marketing likely vary among firms, across time, and with the intended use of proceeds, few follow-on equity issues bypassed the underwriting services of an investment bank. However, that changed in 2008 with the introduction of "at-the-market" (ATM) equity issues.[1]

Regulatory changes in 2005 and 2008 (Securities Offering Regulation, SOR, and amendments to forms S-3 and F-3) opened the door to ATM issuances. These are non-underwritten share issuances in the secondary market with an additional wrinkle – firms may issue equity via ATMs in a "dribble-out" fashion where they sell the shares in (typically) smaller and variable quantities over three years. The shares are shelf-registered and may be sold without delay; as soon as the firm pulls them off the shelf. Since these issues are sold directly into the secondary market (using a placement agent strictly as a broker) at prevailing market prices, these transactions forego certification and marketing, and rely on the existing stock market demand for the firm's shares.

This paper empirically studies ATMs. We are the first comprehensive study of this equity issuance technique, and we offer several lines of inquiry. We begin with a basic description of the anatomy of the market, counter-balanced by a comparison with SEOs over the same period. We also explore firms' take-down behavior (when they actually issue shares in the secondary market) and the influence of stock market conditions on this. We investigate possible destinations of the proceeds raised via ATMs. Finally,

[1] Prior research has noted the use of best efforts offerings as an alternative to firm commitment. Our analysis of the ATM market indicates that they have replaced best efforts. Rights offerings do not involve firm commitment, and they are directed solely at existing shareholders instead of the broader market. Accelerated SEOs forego investment bank marketing but are still underwritten. We include these in our analysis of follow-on equity issuance method.

we examine the choice between ATM and SEO techniques for equity issuance. We test the theory of direct vs. underwritten equity issuance choice by Chemmanur and Fulghieri (1994), and we also compare returns surrounding the two issuance technique samples.

Our results in brief are as follows. ATMs are an important and increasingly viable equity issuance technique. They occur frequently with 974 announced between 2008 and 2015, and another 56 in the first quarter of 2016. They raise significant proceeds; over $140 billion during the period 2008-2015.[2] While this total is just over 14% of the amount raised using traditional SEOs over the same period, this proceeds ratio has steadily risen and was over 22% in 2015.

ATM actual issuance (a.k.a. takedown) is higher in quarters when the firm's contemporaneous stock return is higher. This suggests some element of market timing.[3] So too does the average issuance price in each quarter of takedown, which exceeds (each of) the average daily stock price during the contemporaneous quarter, and the end-of-quarter stock price. Also consistent with a timing influence is the change in various balance sheet and income statement accounts around the ATM's takedown. Specifically, when proceeds from issuance rise (i.e. when takedowns occur), only the changes in total assets and cash appear to consistently follow suit. Other likely destinations of the proceeds are unresponsive – changes in R&D, PP&E, intangibles, advertising, inventories, and leverage do not correlate well.

Our tests of issuance method choice follow the theory of Chemmanur and Fulghieri (1994). Their model predicts that when asymmetric information is high, outside investors rely on underwriter certification to distinguish high quality firms from low quality firms. Relatively opaque firms that use underwriters are revealed as high quality, while opaque firms forgoing underwriter services are revealed as low quality.[4] We use analysts' following to proxy for a firm's information environment, and S&P's

[2] With another $7.5 billion in 2016:1.
[3] However, this is difficult to confirm since actual issuance is only reported with quarterly frequency.
[4] See section II below for a more detailed discussion.

Primary Equity Ranking to proxy firm quality. The likelihood of a firm using an underwriter (SEO) as opposed to issuing directly (ATM), is increasing in the interactive between asymmetric information and firm quality. In other words, firms' choices between direct and underwritten equity offerings appear to depend on the costs and benefits of certification.

Our tests on the choice of equity issuance technique also recognize a middle ground. Gao and Ritter (2010) highlight two roles to underwriter services – certification *and* marketing. They document a temporal rise in accelerated SEO issuances, where marketing services are foregone. They argue that firms with ex-ante inelastic demand[5] will benefit more from underwriter marketing efforts, and they find that indeed these firms are more likely to choose fully marketed offers as opposed to accelerated offers. Our results are more nuanced. We also find that higher demand elasticity (greater institutional ownership) associates with more likely accelerated SEO than full marketed SEO. However, these results are in the context of the relative relations between institutional ownership and either ATM, or accelerated or full-marketed SEO. In particular, ATMs are most likely when institutional ownership is higher, i.e. when demand elasticity is higher.

Overall, our research makes several contributions. As noted above, our primary one is to be the first analysis of this new follow-on equity issuance technique. Given their temporal growth in both absolute and relative (to SEO market) use, it appears ATMs are likely a permanent fixture in the follow-on equity issuance landscape. This inference is also supported by our (loosely speaking) market timing evidence, given the popularity of this notion among corporate managers (Graham and Harvey (2001)), and in the repurchase arena (Dittmar, Field (2015), Bonaimé, Hankins, Jordan (2016), Ben-Rephael, Oded, Wohl (2014)).[6] A third contribution is to the literature on precautionary savings of corporate issuance

[5] And also larger SEOs.

[6] At some level, our analysis represents a natural counterpoint to the repurchase literature.

(McLean and Palazzo (2016)). ATMs appear to be an additional mechanism for precautionary savings, and so the received importance of such savings to firms, again suggests ATMs will maintain their popularity.

Our research generally speaks to the importance of regulatory policy for firm financing policies. The change in regulations in 2005 (SOR) which allowed for immediate issue of shares off the shelf, opened the door for firms to issue shares under favorable market conditions (a key motive behind dribbling out shares). The 2008 amendments to Form S-3 issuance likely had a hand in broadening the set of issuers using ATMs, also speaking to the importance of regulation for capital acquisition.

Finally, our work makes contributions in the context of Gao and Ritter (2010). Their empirical analysis covers 1996-2007, prior to the emergence of ATMs, and indicates that inelastic demand encourages marketing services. Our analysis suggests that ATMs offer a viable alternative in the face of more elastic demand.

The remainder of our paper is organized as follows. Section I describes the changes in regulation (in 2005 and 2008), and how they encouraged ATM issuance activity. Section II describes our data and illustrates the growth in ATM use over time. Section III presents information on the actual issuance patterns of ATMs and contemporaneous changes in spending accounts. In section IV we study the choice between ATM and SEO issuance techniques and the determinants of this choice. This section also briefly reviews the literature on asymmetric information and equity issuance, focusing on the implications developed by Chemmanur and Fulghieri (1994). And it includes description of event returns and run-ups surrounding both ATMs and SEOs. Section V concludes.

I. Regulatory Reform

The Securities Offering Reform (SOR) policy was promulgated by the SEC on December 1, 2005. There were several broad motives to the reform: to allow more disclosure prior to follow-on equity

offerings and to reduce asymmetric information problems that impede capital formation;[7] to define a new category of issuer – a "well-known seasoned issuer" (WKSI); and to provide more timely information to investors *without mandating delays in the offering process*. The latter opened the door to offering securities from the shelf very quickly after the firm made a decision to do so. In particular, SOR eliminated the prohibition against immediate takedowns off "delayed shelf registration statements".

However, SOR did not appear to catalyze ATM issuance activity. One possible explanation for this was that eligible firms perceived the value of dribbling out shares as less than the implicit and explicit costs of foregoing the (underwriter) benefits of firm commitment offerings. For large firms, this may be due to limitations on the size of issuance off the shelf, a concern the SEC specifically noted (Morrison and Foerster (2013)). For smaller firms, issuing shares off the shelf was still limited due to binding rules on issuer characteristics (Morrison and Foerster (2013)).

Both of these concerns were addressed in January 2008 with revisions to requirements governing issuance via forms S-3 and F-3. For our purposes, the key revisions encouraging ATM activity broadened the set of companies eligible to issue securities off the shelf, and increased the allowable size of issuances. Regarding the former, the SEC removed the "public float" restriction to defining WKSI ("well known seasoned issuer") companies, as long as the issuers met other eligibility conditions for the use of Form S-3. This had the net effect of allowing companies with less than $75 million in public float to issue via the shelf. Commenters on the SEC's proposed amendments (governing S-3 and F-3 policy) welcomed expansion of the eligibility, noting potential enhancement to smaller companies' access to capital.

The SEC further amended regulations that had previously restricted the value of securities that could be sold in an ATM to 10% of the issuer's aggregate market value of the outstanding voting stock held by non-affiliates. The new policy allows for fully one third of public float to be issued within any 12

[7] See Clinton, White and Woidtke (2014) and Shroff, Sun, White and Zhang (2013).

month period. This latter change opened the door to larger issues (or more total issuance activity over the course of an ATM program) by qualified firms (WKSIs).

In sum, the 2005 SOR removed wait times for securities issuance off the shelf. The lack of wait-time from decision to execution of issuance is likely important to realization of one of the purported benefits of ATMs – allowing firms to issue shares under "favorable" market conditions. The 2008 changes to forms S-3 and F-3 increased both the breadth of companies eligible to issue securities and the allowed issuance amount relative to the firm's public float. Given fixed costs to issuance, the increase in allowable issue size allowed firms to amortize that cost over larger (total over time) capital raises. It also likely made ATM issuance more attractive simply because the amount of capital able to be raised became significant. Combined with the wider set of eligible firms, total ATM activity would be expected to rise.

II. Data

A. ATM and SEO samples

Our study is built around two datasets of follow-on equity issuance: seasoned equity public offerings (SEOs) data and At-the-Market offerings (ATMs). The (main analysis) sample window spans the period of 1/1/2008 to 12/31/2014.[8] Our SEOs are drawn from the Securities Data Corporation (SDC) database (U.S. common stock issuances). Our sample of ATMs is primarily hand-collected, but also draws from DealFlow Media's (DFM) PrivateRaise database in 2011 through 2014 to cross-check our hand-collection.

For our hand-collection of ATM data, we use the Knowledge Mosaic platform to search all 8-K and 6-K filings, searching for the following keywords: "at-the-market", "at the market", "controlled equity

[8] All but the basic calendar-year data in Table 1 is based on this sample. For the 2015 ATM and SEO activity information in Table 1 (as well as the associated totals across 2008-2015), we collected only the number of events and quantities for the three samples. We will augment that data with I/B/E/S, Compustat and CRSP information, as well as take-down activity, for the next draft.

offering", "sales agency agreement", "distribution agreement". Also, we search for "ordinary brokers" information in 8-Ks and 6-Ks that are non-registration statements (in order to avoid getting all 424B2 through 424B5 filings). We account for any reinstitutions or amendments of earlier ATM programs (we find 12 of them in total).[9] Our initial ATMs sample includes 974 closed equity agreements

Our ATMs data includes the following fields: name of the issuer, the closing date, the placement status, the planned issuance amount (available for 629 of the total number of 763 ATMs), the closing and current trading symbol, the closing trading platform, SIC code, the issuer's country and state, the closing market capitalization, the market price at closing, the planned use of proceeds, the roster of placement agents together with the agent fees charged. Finally, we obtain the commitment period within which the issuing company commits itself to dribble-out some or all of the ATM shares.[10] All of these ATM specifics are available in Item 1.01 of the respective 8-K/6-K filing. Using factiva.com announcements, we gather the ATMs' announcement dates (we find that only 6 ATMs have announcement dates preceding the closing date).

Our SEOs sample is drawn from the SDC database and includes only common stock offerings in the U.S. Specifically, the filtering criteria we employ are the following (in parentheses we offer the available number of observations after imposing each criterion): a) all follow-on offerings with an issue date within 1/1/2008-12/31/2014 (7,542), b) that are of a firm commitment type (4,076), c) with no rights issues (4,073), d) with issuer SIC code not including regulated industries or the financial industry or REITs (2,369), e) where the issuer is traded on any of the main U.S. stock exchanges (NYSE, AMEX, NASDAQ, NASDAQ SmallCap) (2,109), f) with no unit issues (2,109), g) with no closed-end funds (2,109), h) with no LBO or RLBO firms (2,108), i) with no limited partnerships (1,992), j) with no simultaneous international

[9] An amendment is considered a revisiting of an initial equity sales agreement whereby the agreement's details change slightly. A reinstitution is a past agreement that is re-activated, usually due to the shelf-registration window expiring.

[10] The announcement of a commitment period does not place any legal obligation for the issuer.

offerings (1,973), and finally k) with an offering price exceeding $ 5 (1,578). These screens are broadly consistent with the extant literature studying SEO activity. [11]

Finally, to facilitate comparisons of ATMs with SEOs, we carve out a subsample of our 384 ATMs: those with no REITs issuers and no regulated and no (other) financial firms (1,410 observations). We do this to better understand the choice between ATM and SEO issuance, by these more commonly analyzed types of firms.[12]

B. Market Differences

Table 1 presents information differentiating ATMs from SEOs. Panel A highlights procedural differences. ATM offering shares are sold strictly into the secondary market. A placement agent is chosen by the firm and essentially acts as a broker of the shares in sales on the open secondary market. By contrast, SEO shares are sold in primary market transactions. The primary market sale of shares typically involves firm commitment. Finally, ATM issuance programs may be executed over time with only a fraction of shares sold during each visit (by the placement agent) to the secondary market. By contrast, (firm commitment) SEOs involve the issuance of shares in a single transaction. These three differences between ATM issuance and SEOs present new opportunities to companies seeking additional equity capital.

Evidence consistent with this is seen in Panel B of Table 1. Beginning with 2008 (the start of ATM market activity), we compare issuance activity for SEOs with ATMs. In both frequency and proceeds, ATM activity is clearly gaining rapidly in importance. From 2008 through 2015, announced ATM issuance programs grew from 26 programs to 211 programs. Moreover, total proceeds grew from a mere $2 billion to over $34 billion during the same period.

[11] Our analysis does not include PIPEs because our focus is on issues to public investors as they likely face different information problems than private ones. Our sample of SEOs includes accelerated SEOs. Bortolotti et al. (2008) and Gao and Ritter (2010) note that these share the key characteristic of underwriting that SEOs have.

[12] Our screens in the SEO data collection process contain the same industry restrictions. Table 1 Panel B also reports numbers of SEOs by year without such restrictions.

As noted above, regulated firms and especially REITs comprise significant portions of ATM activity. Nevertheless, focusing our attention on ATMs outside of these groups, we still see dramatic rises in activity. 2008 saw only eight ATMs, but this figure rose monotonically to 135 programs in 2015. Total proceeds too grew from one-half billion dollars in 2008 to $16 billion in 2015.

SEO activity shows a similar pattern over time, but it is less clear-cut. For the full sample of SEOs (no industry restrictions), total annual issuance proceeds between 2008 and 2015 varies between $90 billion and $150 billion, but with significant variation. Nevertheless, the peak year is indeed 2015 just like with ATMs. More obvious growth in equity issuance between the early part of our sample (2008-09) and the latter (2012-15 inclusive) is seen in the carve-out sample with industry restrictions.

Regardless of sampling, the relative importance of ATMs in equity issuance has risen. For the full sample, both relative count and relative proceeds (ATM/SEO) peak in 2015. We see the same for the carve-out sample with industry restrictions. Confirming evidence of this relative importance is seen in 2016 ATM issuance activity. Through the first quarter, total ATM programs announced equal 56. Moreover, total announced potential issuance from these programs is $7.5 billion. Overall, these numbers strongly suggest the viability of ATMs as a permanent fixture in the US equity issuance landscape.

C. Descriptive Statistics

In addition to differences between the ATM and SEO "markets", both in terms of structure and growth, there are important differences in the characteristics of ATM and SEO issuers and issues. Table 2 presents a number of issuer (panel A) and issue (panel B) characteristics for our two samples (ATMs and SEOs) and compares them.[13] The variables are listed and defined in Appendix A.

ATM firms are smaller than SEO firms both in terms of market cap and total assets. They also have lower leverage. Consistent with smaller size and leverage, ATM issuers expend more on R&D relative to

[13] At this time, Table II samples only on non-REIT, non-regulated firms. This is for two reasons. First, the carve-out samples are generally more homogeneous. Second, the variables in Table II are used to explain issuance technique choice, and motives for issuance are known to be different for REITs and regulated firms, than for other firms.

assets and show a higher Tobin's Q. ATM firms have lower sales relative to assets and lower EBITDA to assets (negative in fact for ATMs). Consistent with this, they carry more cash relative to assets and burn it more quickly. They have more volatile stock (panel B).

In line with SEOs raising all capital at once, ATM firms' major expenditures (CAPEX/TA and cash acquisition expenditures relative to assets) are significantly smaller than SEO firms' values. They also need more external funds (when EFN is negative, increases in CAPEX and net working capital are larger than EBITDA).

In section IV, the key variables explaining ATM/SEO issuance technique choice are the proxies for asymmetric information and firm quality. To measure asymmetric information between insiders and outsiders we use the quantity of analyst coverage. If a firm is not covered, we indicate so with a dummy variable "High AI" (equal to one). The fraction of ATM firms with "High AI" equal to one is less than the corresponding fraction for SEO firms, suggesting greater asymmetric information for SEO firms compared to ATM firms. On the other hand, we also form a continuous AI variable equal to one over (1 plus the number of analysts covering a firm), ex-ante.[14] Lower values of the continuous AI variable indicate greater coverage. We see a lower mean value of continuous AI for SEO firms compared to ATM firms. Therefore, conditional on any coverage, SEO firms have lower asymmetric information than ATM firms. But there is a larger fraction of SEO firms without coverage than the corresponding fraction of ATM firms.

Our proxy for firm quality is Standard and Poor's (S&P) common stock quality ranking. S&P first scores stocks based on growth and stability of both earnings and dividends. They then form rankings of these scores relative to a 'representative' sample of stocks. Del Guercio (1996) finds that banks (which in her sample are more likely subject to prudent man rules) significantly tilt their [delegated] investment portfolios towards high S&P rank (i.e. high quality) stocks.[15] Like prior work, we define ranks numerically

[14] If there is no analyst following, we set the continuous version of the AI variable equal to zero.
[15] Fernando, Gatchev and Spindt (2003), Badrinath et al. (1989) also use S&P's common stock quality ranking.

from a low of 2 (for a score of D) to a high of 9 (for a score of A+). Also following prior work, we set the S&P rank to 1 when missing.[16] Average S&P equity ranking scores are similar for ATMs and SEOs.

We also require institutional holdings data to examine the influence of (ex-ante) share demand elasticity on issuance method choice. We draw data from 13F quarterly filings submitted by institutions with more than $100 Million assets under management, available through Thomson Reuters. Our data are collected for the quarter prior to the initialization of the ATM program or the closing of the common stock SEO issuance, respectively. We show that both mean and median values of institutional holdings among ATM firms are significantly lower than among SEO firms.

In Panel B of Table II, we examine trading-related variables for ATM and SEO issues. These are characteristics around the event date.[17] Again, the variables are listed and defined in Appendix A. Percentage spreads (i.e. relative to stock price) are higher before ATMs than before SEOs. This suggests lower liquidity among ATM firms. Turnover is similar in the mean across the two samples, while median turnover is higher for SEOs, again suggesting worse liquidity for the ATM sample. Stock return volatility is higher before ATMs than SEOs, consistent with ATMs being used potentially to exploit market timing options.[18] Fees are apparently lower on ATMs than SEOs. ATM agent cash fees average 3.16% of planned proceeds (announced amount). The median is 3%. SEO fees are gross spreads and average 4.49% of proceeds. However as we show below, the average firm does not take down the entire filed/announced amount under an ATM. Thus the fee cost per unit share issued is actually closer for ATMs and SEOs.

[16] Given rankings are not done for non-S&P 500 stocks, this is equivalent to saying that non-S&P 500 firms are systematically of lower quality. We also conduct tests only within the S&P ranked firms to ensure our results are not driven by this convention. Our inferences are unaffected.

[17] It's important to emphasize here that the event date for ATMs is the announcement date of the program, whereas for SEOs it's the issue date of the shares. According to Clinton, White and Woidtke (2014) and Shroff, Sun, White and Zhang (2013), SOR changed SEO activity such that the "event" date is likely to be the issue date, after 2005.

[18] Although unreported results show no evidence of statistical links between economy-wide ATM relative (to SEO) use and stock market volatility.

Overall, basic firm and trading characteristics for ATM and SEO firms are what we might expect. Given that SEOs raise large amounts of capital all at once, it's unsurprising that they associate with more "large-investment-type" spending, that they are by bigger firms and that their liquidity is higher. ATMs associate with smaller firms and have the usual concomitant markings such as higher R&D and Tobin's Q, along with lower liquidity and greater stock volatility. Given the apparent selection into expected issuance technique groups, the simple availability of ATMs to firms with characteristics traditionally auguring difficulty in conducting SEOs, suggests ATMs are here to stay. Firms that naturally find ATMs to be viable equity issuance techniques will continue to use them.

III. Actual Issuance Behavior in ATM Programs

Given ATMs' flexibility to be executed in a dribble-out fashion, we investigate firms' actual issuance behavior under their ATM programs. We collect data on firms' issuance of equity under the ATM program from their 10-Q filings (or 10-k in the case of the fiscal year end filing). The 10-Q provides aggregated (across all of the firm's issues in the quarter) information on actual issuance activity. The sample is comprised of all ATMs that we are able to find price data for (from CRSP). We do not restrict our attention to non-regulated firm ATMs because there is no need (ability) to compare dribble-out activity of ATMs with a similar construct for SEOs (i.e. SEOs aren't dribbled-out).

A. Univariate Statistics

We focus on two firm-level measures of actual issuance activity. **Actual cumulative issuance** equals the total number of shares actually issued during the ATM program, divided by the announced number of shares that the firm planned to issue under the ATM program. **Actual issuance duration** equals the number of quarters it took the firm to complete the actual issuance of shares under the ATM (this variable is only calculated for the sub-sample of firms that complete the announced planned issuance

amount). For this variable, even if a firm did not issue shares during a particular quarter during its ATM program, we count that quarter as long as it occurs before the ATM is completed.

We also present two measures of "price efficiency" of the actual issuance. We scale the firm's reported "weighted average actual issuance price"[19] by two different measures of market price; the end-of-quarter price and the average (time-series) quarter's price (using daily closing prices). The former measure may be viewed as the benefit of doing an ATM relative to an SEO executed strictly on the last day of the quarter. While not all firms would choose to do an SEO at the end of the quarter, it is one possible view of the snapshot that would occur on any particular day of the quarter. The latter measure may be viewed as the benefit/cost of picking various days/times to dribble-out (perhaps on the basis of firm expectations that it's a favorable moment), relative to a rather uninformed approach of dribbling out an equal amount each day of the quarter.[20]

Table III presents means, medians and standard deviations of the above variables, across various samples. For the full sample of firms (in Panel A), average actual issuance is slightly less than a half of the announced plan size (47% in the mean), while the median firm issues just less than a third (32%). There is substantial variation in execution across firms (190% standard deviation). The typical firm is apparently unwilling to issue the full amount of announced ATM planned shares, and often takes down substantially less than even half the announced amount. Confirming evidence is seen in the fact that less than one third (143 out of 428) take down the full planned announced amount.

Also in Panel A we see that the average actual issuance price is above the average end-of-quarter price by 23% across all ATMs. Relative to one feasible issue price (that would occur on a single day in an SEO), the ATM issuance process yields more favorable pricing for the firm. This is apparently driven by a

[19] The average price issued at, across all dribble-outs that quarter, weighted by shares issued at each day's price.
[20] This latter methodology mirrors recent work in the stock repurchase literature. See Bonaimé, Hankins and Jordan (2016) and Dittmar and Field (2015) for details. Both papers compare reported average price paid during a buyback, with an average stock price smoothed over a time window.

few observations where placement timing choice significantly over-perform, since the median of issue price relative to end-of-quarter price equals 1.02. The final row of Panel A admits to other days within the quarter that the firm might issue. Compared to the average daily stock price during the quarter, the average issuance price obtained on ATM dribbling out is again superior, with a mean (across firms) of 1.35 and a median of 1.03. A simple splitting of issuance across each day in the quarter would yield worse pricing. This is in contrast to the prior literature on repurchases of stock, which suggests that managers lack timing ability.

Panels B and C report actual issuance statistics for (respectively) subsamples of firms that announced their ATM prior to or after the start of calendar year 2012. Given the increasing use of ATMs through time, we split at the beginning of 2012 to create two equal length windows of analysis that potentially differ by popularity of the issuance technique. The latter window may show more active dribbling out.

As it turns out, ATMs announced prior to 2012 show higher actual cumulative issuance in the mean and median. However, it is interesting to note the shorter duration to completion among the later window ATMs, with full actual issuance of the announced number of shares. In other words, conditional on completing the issuance of the announced number of planned shares, the more aggressive issuers are from the later sample rather than the earlier sample. On the other hand, there are more ATM users in the later part of the sample period that fail to "complete" the issuance program.

Panel D of Table 5 focuses further on time-series patterns of dribble-out. We report the actual cumulative issuance values by various quarter windows following the announcement. In other words, we investigate dribble-out "aggressiveness" over time. The first row of Panel D reports cross-sectional averages of actual cumulative issuance over various length windows following the ATM announcement [1, 2, 3, 4, 5, 8 and 12 quarters]. The means suggest an apparent preference to accomplish significant actual issuance in the first quarter (nearly 25% of the announced planned issuance amount), followed by

another sizable chunk (8%), and then markedly less activity over the second half of the year (about 5% of the announced). The second year continues to show less activity (8% of the announced), compared to the first year. This general downward trend presents in our regression results next.

By contrast, the (cross-sectional) medians suggest something of a hump-shape: more aggressive dribble-out in the second half of year one (16% of announced) compared to the first half of year one (1% of announced). Nevertheless, the decline in issuance activity during the second year continues to present. Overall, firms' issuance is more concentrated in the first year following announcement of the ATM program. Where these proceeds are allocated is an empirical question that we address in section C.

B. Censored quantile regressions

Numerous factors may influence firms' preferences to execute actual issuances in ATM programs. In Table IV we investigate the influence of time, stock volatility, and stock returns on dribble-out activity. Given that we treat each quarter of potential actual issuance by a firm as a separate observation, there are 957 firm/quarter observations in our regression, despite only 428 firms with actual issuance information.[21] Also, given the highly censored nature of actual issuance activity[22] we use a censored quantile regression (CQR).[23] In particular, OLS centers its analysis and minimization of the sum of squared errors, around the mean of the distribution of dependent variable outcomes. When there is significant mass of the distribution at one tail (zero in our case since many firm-quarters show zero take-down), this influences OLS coefficient estimates. Therefore, by using OLS we would learn less about factors that

[21] While this suggests a small average number of quarters per firm, recall that a large number of ATM programs were announced in 2013 and 2014. Given that we only collect dribble-out data through December 31, 2014, many of our observations will have limited data available. We also stop collecting dribble-out information upon completion of a firm's ATM program, and we require sufficient data to calculate our regressors.

[22] Fully 44% of our firm/quarters have zero dribble-out executed.

[23] A Tobit regression also handles censored data; however, our data on actual repurchases fails to satisfy the normality and homoscedasticity assumptions of the Tobit.

influence variation of takedown conditional on issuance, and more about the decision to takedown or not.[24]

We estimate the CQR centering our analysis on the 80th, 85th and 90th quantiles for two reasons. First varying the center-point around these higher percentiles provides similar numbers of observations on either side of the centering quantile. This allows us to explore factors that influence the conditional magnitude of influence of factors on takedown for those that actually engage in it. Second, it increases the efficiency of our estimates in the minimization of sum of squared errors.

We find several interesting results. Generally speaking, the following factors correlate significantly with firms' dribble-out behavior: how far along the firm is in the ATM program from a time standpoint; firm stock return during the quarter of dribble-out; and whether the firm committed publicly (in the announcement) to a time period for the ATM program. Most of these effects are intuitive. The farther along a firm is (time-wise) in the ATM program, the less it dribbles out in the current quarter, consistent with more aggressive issuance earlier in the program. We see higher dribble-out during quarters of higher (abnormal, i.e. market model based) stock returns, consistent with firms' attempts to time their issuance.[25] Finally, our lone counter-intuitive result is that public commitment associates with less takedown, but this is sensitive to the centering quantile.

Overall, our CQR results suggest that market characteristics are important determinants of firms' dribble-out decisions on a quarterly basis. The result suggesting market timing efforts by ATM firms in their takedown activities is consistent with the "price efficiency" results in Table III. Below, we explore another facet of potential market timing efforts by ATM issuers.

[24] Which we actually explore in a later section.
[25] But we must acknowledge the possibility that the returns were higher *after* the dribble-out, but during the same quarter.

C. Which financial ratios change contemporaneously with ATM takedown?

If firms are attempting to time the market with their takedown of ATM shares, not only should this cause positive correlation between their stock's performance and issuance magnitude, but it should also reduce correlation between issuance and spending activity. Put differently, market-timing motives behind ATM takedown behavior should associate with more cash savings (hoarding) of the proceeds.

Table V indirectly measures this by presenting changes in most potential uses of ATM issuance proceeds, along with the actual issuance amount. We do so on a quarterly basis, for the quarter of the ATM announcement as well as two years (eight quarters) after. We also take the "cumulative" perspective: each presented "change in" quarterly variable is the quarter "t" variable value minus the variable value from the quarter *preceding the ATM announcement*. Each variable (with exceptions noted) is also relative to total assets, so that the common scaling allows us to speak to the magnitude of the allocation of proceeds to various categories, in common size terms.

The potential destinations of proceeds we investigate (i.e. the ratios of the following dependent variables to total assets) are as follows: accounts receivable, cash, inventories, net PP&E, intangibles, R&D expenditures, advertising expenditures, leverage (short plus long-term debt all scaled by assets), and dividends. We also present cumulative (ATM) issuance proceeds relative to assets in the quarter preceding the ATM announcement. And we show a percentage growth in total assets variable, quarter by quarter.

The results in table V can be summarized easily. The only variables that reliably increase with issuance proceeds, are total assets and cash.[26] No other category shows any such consistent pattern. Firms appear to hoard the cash proceeds from ATM issuance, consistent with the precautionary motive for issuing equity (Maclean (2011)). Given this potential alternative equity issuance technique (to SEOs) that facilitates precautionary savings, we again conclude that ATMs are likely to remain popular.

[26] One might argue that leverage would fall if firms pay down debt with ATM issuance proceeds, but this is not the case. Moreover, apparent drops in leverage are caused by the increasing total assets that shrinks the ratio value.

IV. The Choice Between ATM and SEO

Given ATM firms' initial aggressiveness issuing shares off the shelf shortly after establishing the program, and given their apparent attempts at market timing – both of which are hallmarks of SEOs – the question arises of why ATM firms did not simply choose to conduct an SEO? This section explores potential answers to the question, particularly in the context of theory by Chemmanur and Fulghieri (1994).

A. Asymmetric Information, Certification and Equity Offerings

There is a long literature studying asymmetric information, certification and the acquisition of equity capital. Smith (1986) neatly summarizes the early studies and highlights the benefits of investment bank underwriting in the presence of uncertain quality firms, consistent with the theory of Myers and Majluf (1984). Other empirical work, particularly Beatty and Ritter (1986) and Carter and Manaster (1990), emphasizes the link between the value of underwriter services and the reputation of the investment bank.

In response to the set of empirical results linking investment bank reputation with the values of corporate securities issued, Chemmanur and Fulghieri (1994) propose a theory that endogenously determines investment bank effort, their reputation, their compensation, the values of securities issued and the choice of issuance method by firms (direct or underwritten). While many of the implications developed already have empirical support, direct tests of independent predictions are lacking. In particular, the implication that firms choose between direct equity offerings or purchase of an investment bank's underwriting services on the basis of the information environment they face and their own firm quality, remains untested with respect to seasoned equity issuance.

We test this implication that a firm's quality and the information environment it faces influence its choice between direct and underwritten equity offerings. Chemmanur and Fulghieri (1994) model investment bank reputation acquisition as a reflection of the dynamic tradeoff in choosing how strict a standard to set when evaluating issuers: It is more costly to set a stricter standard in the short run, but

may be more valuable in the long-run by reducing the probability that the bank underwrites a "lemon" and damages its reputation. In assessing this tradeoff banks pay attention to both the information environment and the issuer's quality. When asymmetric information is lower, investors can more easily discern firm quality and the value of an investment bank's certification (and fees earned) will be lower.[27] However, when asymmetric information is higher and investors have difficulty discerning firm quality, underwriter certification is more valuable. In this case, the bank's long-run incentive is to limit its underwriting to what it believes are high quality firms because certifying a "lemon" costs the bank its valuable reputation, depressing the fees it may charge in the future. Thus, Chemmanur and Fulghieri (1994) predict that the likelihood of an equity offering being underwritten, increases in the interaction between asymmetric information and issuer quality. This is the key implication we test below.

B. Test of Chemmanur and Fulghieri (1994)

We test the main implication that SEO likelihood is increasing in the interactive of asymmetric information and firm quality, with a logit.[28] We use analyst coverage to capture the firm's information environment. Specifically we define **High AI dummy** equal to one if there are no analysts covering the issuer in the month preceding the announcement/issue of the ATM/SEO and zero otherwise. As an alternative measure of asymmetric information we construct **Continuous AI** which equals 1/(1+number of unique analyst estimates) in the month preceding the announcement/issue. More analyst coverage proxies for lower information asymmetries. In addition, the evidence in Hong and Kacperczyk (2010) suggests that the information content of an additional analyst is decreasing in the number of pre-existing analysts covering the firm. Thus, the declining marginal impact of an additional estimate (built into our ratio) is appealing. To measure firm quality we use Standard and Poor's (S&P) common stock quality ranking, as discussed above.

[27] This is formalized in Chemmanur and Fulghieri's (1994) model as a reduced likelihood that high quality issuers will be pooled with low quality issuers.

[28] The sample is drawn from non-REIT non-regulated firms, since SEO papers typically exclude such firms.

We present our logit results in Table VI, Panel A. There are two columns of results, one for each asymmetric information proxy. The dependent variable equals one if the firm does an ATM and equals zero for an SEO. Our general specification follows:

$$y = \alpha + \delta\mathbf{X} + \beta_1 * AI + \beta_2 * Quality + \beta_3 * AI * Quality + \varepsilon$$

where **X** is the matrix of controls (in the appendix) and AI is the proxy for asymmetric information. The key coefficient is β_3. Recall that under Chemmanur and Fulghieri (1994), underwritten offers are more likely among opaque firms of higher quality. We proxy for asymmetric information with either the **High AI dummy** or **Continuous AI** so higher values will imply greater information asymmetry. We use **S&P equity ranking** to measure firm quality. Since the product is more positive among higher quality higher asymmetric information firms (who are expected to use an underwriter), we expect $\beta_3<0$.[29]

This is precisely what we find; the coefficient β_3 is significantly negative, whether we measure asymmetric information with the dummy variable or continuous variable.[30] These negative coefficients on the interaction of our proxies for asymmetric information and quality indicate that SEOs are more likely to be used by high quality/high asymmetric information firms. These firms presumably have the most to gain from certification, consistent with the costly certification hypothesis of Chemmanur and Fulghieri (1994).[31] Also, in un-tabulated results, the coefficient β_1 (on stand-alone **AI**) is notably larger when we include the interactive (β_3) than when we don't. The inclusion of β_3 causes β_1 to measure the effect of higher asymmetric information on ATM/SEO choice for the low quality firms. This is precisely the place where Chemmanur and Fulghieri (1994) predict firms will choose direct offerings because certification is too costly. The much more positive β_1 is consistent with this.

[29] All estimates are in terms of log-odds.

[30] Ai and Norton (2003) show that the coefficient on an interaction terms in logit models can be misleading. Following their proposed solution we confirm that marginal effects of the interaction of quality and AI are negative (see Appendix B for details).

[31] Given the large fraction of firms lacking an S&P ranking, we rerun the tests in Table 3 excluding firms with missing S&P ranks. This smaller sample still shows significant results. We find the coefficient on the interaction term is negative and significant at the 5% and 10% level respectively.

Several of the control variables are empirically important. We see a negative coefficient on firm size – larger firms are more likely to choose an SEO instead of ATM, consistent with the univariate evidence in Table II. There is also a negative coefficient on Tobin's Q, suggesting more growth opportunities encourage an SEO as opposed to ATM. Firms with more growth opportunities may need more capital in general. Indeed, the negative and significant coefficient on Proceeds confirms that greater proceeds associate with more likely use of an SEO. Third, SEOs are more likely to be chosen by firms with higher sales ratios. Fourth, SEOs are more likely to be chosen instead of ATMs when institutional ownership is ex-ante higher. This contradicts Gao and Ritter's (2010) inference that the marketing activities of underwriters in (book-built) SEOs is more valuable when institutional ownership is ex-ante *lower*. However, we further explore this relationship below by segmenting SEOs into accelerated ones and traditional ones.

Finally, larger run-up associates with greater likelihood of an SEO as opposed to ATM. While the SEO literature often interprets such evidence as market timing, Schultz (2003) questions this inference. Our earlier evidence on individual firm ATM takedown activity is consistent with market timing from a different perspective, not suffering from the same pseudo-market timing concerns raised by Schultz (2003).

Overall, the logit results are consistent with the costly certification hypothesis of Chemmanur and Fulghieri (1994). Higher quality firms in higher asymmetric information environments find the underwriting and certification of investment banks to be sufficiently valuable to encourage them over direct equity offerings (ATMs).

C. A middle ground: Accelerated SEOs

While Chemmanur and Fulghieri (1994) focus on certification choice, Gao and Ritter (2010) condition on certification (they study SEOs) and focus on whether underwritten offers are either fully marketed or accelerated. The choice of whether to accelerate the SEO is determined by ex-ante share

demand curve elasticity. Gao and Ritter (2010) offer four proxies for demand elasticity, but given they all yield similar inferences, we focus on their institutional ownership proxy.

When institutional ownership is ex-ante low, demand elasticity is hypothesized to also be low. This implies an opportunity to flatten the demand curve (in the short run) through marketing, encouraging a fully book-built SEO with road show. The alternative (i.e. accelerated offer) involves little marketing and consequently treats the short-run demand for shares as exogenous. While cheaper in terms of explicit underwriter fees (gross spreads), accelerated offers carry potentially greater implicit costs of steeper (than otherwise would be) demand elasticities.

Given these two versions of SEOs, along with ATMs, as possible follow-on equity offering techniques, we explore the choice between them using an ordered probit. The ordering is in terms of underwriter *activity* (not quite support, given the connotations of the term in the after-market). Specifically, the dependent variable is decreasing in underwriter efforts. Fully marketed SEOs are assigned a zero value, accelerated offers are assigned a one, and ATMs are assigned a two. We include the same explanatory variables that were in the logit. The new results are presented in Table VI, Panel B.

We present four columns of results, two each for the differing asymmetric information proxies. For each of those proxies, the two columns respectively present marginal effects of the regressors on the choice of i) ATM vs. fully marketed SEO and ii) ATM vs. accelerated SEO. Broadly speaking, the coefficients are significant when their counterparts were in the logit from Panel A. Crucially in support of Chemmanur and Fulghieri, the coefficient on the interactive of asymmetric information and firm quality, remains negative and significant for both types of SEO choice relative to ATM. Certification is chosen when it's most likely to be valuable.

One interesting result seen in Panel B is the varying coefficient magnitude on institutional holdings. Gao and Ritter (2010) predict higher holdings will associate with more likely accelerated SEOs than fully-marketed ones. We see indirect evidence of exactly this. The coefficient on institutional

holdings is more negative in the accelerated SEO vs. ATM choice column, than in the fully-marketed SEO vs. ATM choice column. Thus we find support for Gao and Ritter (2010) within the context of our experiment. Perhaps ATMs can be viewed as loose substitutes for accelerated SEOs. This is a potentially fruitful area of future research.

D. Event Returns and Run-up

Our final results section explores event returns as well as returns leading up to the event (run-ups). The events we study for ATMs are the announcements of the issue plan. Announcement dates for ATMs are the 8-K statement dates, which are required filings for ATMs. We cannot observe the exact "take-down" dates (i.e. issuance dates) as they are not reported (even ex-post). For SEOs the event is the actual issue date, rather than the announcement date (see Clinton, White and Woidtke (2014) and footnote 17 above).[32]

Table VII, panel A provides measures of event returns using both the market model and simple market-adjusted returns.[33] Both ATMs and SEOs show negative market-adjusted event returns (-2.4% and -3.6% respectively).[34] The average SEO event return is significantly different from that for the ATMs at the 5% level. However, given the above evidence that firms select the issuance method based on costly certification and marketing considerations (Table VI), the significant difference in event returns does not imply that the method of issuance is the reason for the difference.

Indeed, a key determinant in the selection of SEO over ATM is the magnitude of runup. Confirming evidence is found in Panel B. We calculate run-up as the cumulation of daily market-adjusted returns over two windows preceding the ATM and SEO events: [-252, -30] and [-30, -3], where zero is filing date. SEO

[32] Again the sample is drawn from non-REIT non-regulated firms, since SEO papers typically exclude such firms.
[33] We discuss only the market-adjusted returns for brevity, and also because the differences in run-up between ATMs and SEOs (see below) imply differences in market model intercept estimates that would affect measured abnormal returns.
[34] In un-tabulated results SEO *announcement* returns are significantly negative with average market-adjusted returns of -1.56%.

run-ups are respectively 17.6% and 6.7%. By comparison ATM run-ups are less than half as large, 5.5% and 3%. Both are significantly smaller than their SEO counterparts. Overall, SEOs show stronger performance prior to the event than ATMs.

We can interpret the difference in run-up in several ways. First, firms conducting ATMs have a timing option that SEO issuers do not. The ATM announcement does not require issuance immediately, so run-up need not be so large as to make it costly to eschew issuance now. An ATM firm may wait until the stock rises further to issue and take advantage of a higher price. Second, even if the firm issues under an ATM and then observes a further run-up in stock price, it still has the option to issue again and take advantage of that further rise in price. Overall, the timing option affords ATM firms the ability to announce and even execute issues after smaller run-ups than in the case of SEOs.

While the above assumes a market-timing element to the firm's decision, smaller run-up may associate with ATM issuance regardless of active timing. For example, an alternative interpretation is that run-up results from the market perceiving new investment opportunities for SEO firms to a greater degree than for ATM firms. Indeed, the negative relationship between Tobin's q and ATM (vs. SEO) incidence is consistent with this. Such a situation may arise if a shock to investment opportunity occurs that requires a large scale immediate investment. This would result in a large stock price response to the shock (run-up) and a likely SEO.

V. Conclusions

We study the anatomy of a new approach to offering equity. At-the-market (ATM) offerings came into fashion starting in 2008, driven by regulatory changes that made such offerings feasible. Since then, they have grown significantly to comprise a meaningful portion of the follow-on equity issuance market.

We explore firms' actual issuance behavior in their ATM programs. We find several interesting results. Firms appear to use the timing option to dribble-out shares when market conditions are favorable.

They also appear to hoard the proceeds in cash. Given that both of these results are consistent with market timing motives, and recognizing the focus of both managers and researchers on such motives, we anticipate that ATMs will remain popular.

We therefore explore determinants of the choice between ATMs and SEOs. To anchor our analysis, we test the costly certification hypothesis of Chemmanur and Fulghieri (1994). Under it, high asymmetric information firms that are also higher quality will choose an SEO because the benefits of certification outweigh the costs. Our empirical analysis supports this conclusion. The advent of a new direct-to-market follow-on equity offering approach allows us to empirically examine the theoretical influence of asymmetric information and firm quality on firm financial behavior.

We also study wealth effects associated with both ATMs and SEOs. ATMs appear to show less negative announcement returns when compared with event returns for SEOs, but this result is likely due to selection. Moreover, ATM firms show less run-up pre-event than SEOs. Under Ritter's (2003) observation of a negative correlation between run-up and announcement returns, this offers an alternative explanation for the differences in event returns.

Many avenues for future research remain. For example, given that underwritten offers are aimed at institutions, prior work on SEOs largely ignores retail investor considerations. To the extent that retail and institutional investors perceive and price risk differently, there is potential segmentation between the markets for ATMs and SEOs. While our analysis of the determinants of ATM dribble-out activity is a first step towards identifying market characteristics that may influence retail investors differently from institutional ones, much work remains. We view the ATM market as a viable setting to (in the future) explore segmentation within common equity claim markets.

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APPENDIX A

Acq/TA	Cash acquisition expenditures divided by total assets.
Actual cumulative issuance	Actual cumulative issuance equals the total number of shares actually issued up to this point in the ATM program, divided by the announced number of shares that the firm planned to issue under the ATM program.
Actual incremental issuance	Actual incremental issuance equals the number of shares issued (as part of the current ATM program) during this quarter, divided by the announced number of shares that the firm planned to issue under the ATM program.
Actual issuance duration	Actual issuance duration equals the number of quarters it took the firm to complete the actual issuance of shares under the ATM program. This variable is only calculated for the sub-sample of firms that complete the announced planned issuance amount.
(B-A Spread)/Price	Bid-ask spread divided by stock price, per day [averaged over -25, -3]
CAPEX/TA	Capital expenditures divided by total assets.
CARs (event CARs)	The stock's market model daily cumulative abnormal returns [-1,+1], where 0 is the event day. The market model parameter estimation window is trading days [-252,-16].
Cash Burn	Cash burn rate is the absolute value of operating income before depreciation divided by the sum of cash and cash equivalents. When the income number is positive, cash burn is set equal to zero. This follows Chaplinsky and Haushalter (2010).
Cash/TA	Cash and equivalents, all divided by total assets.
Change in advertising	Quarterly advertising expenses' change from previous quarter divided by quarterly, lagged total assets
Change in cash	Quarterly cash and cash equivalents' change from previous quarter divided by quarterly, lagged total assets
Change in dividends	Quarterly total dividends' change from previous quarter divided by quarterly, lagged total assets
Change in intangibles	Quarterly intangibles' change from previous quarter divided by quarterly, lagged total assets
Change in inventories	Quarterly inventories' change from previous quarter divided by quarterly, lagged total assets
Change in net PPE	Quarterly net property, plant and equipment change from previous quarter divided by quarterly, lagged total assets
Change in receivables	Quarterly accounts receivables' change from previous quarter divided by quarterly, lagged total assets
Change in R&D	Quarterly research and development expenditures' change from previous quarter divided by quarterly, lagged total assets

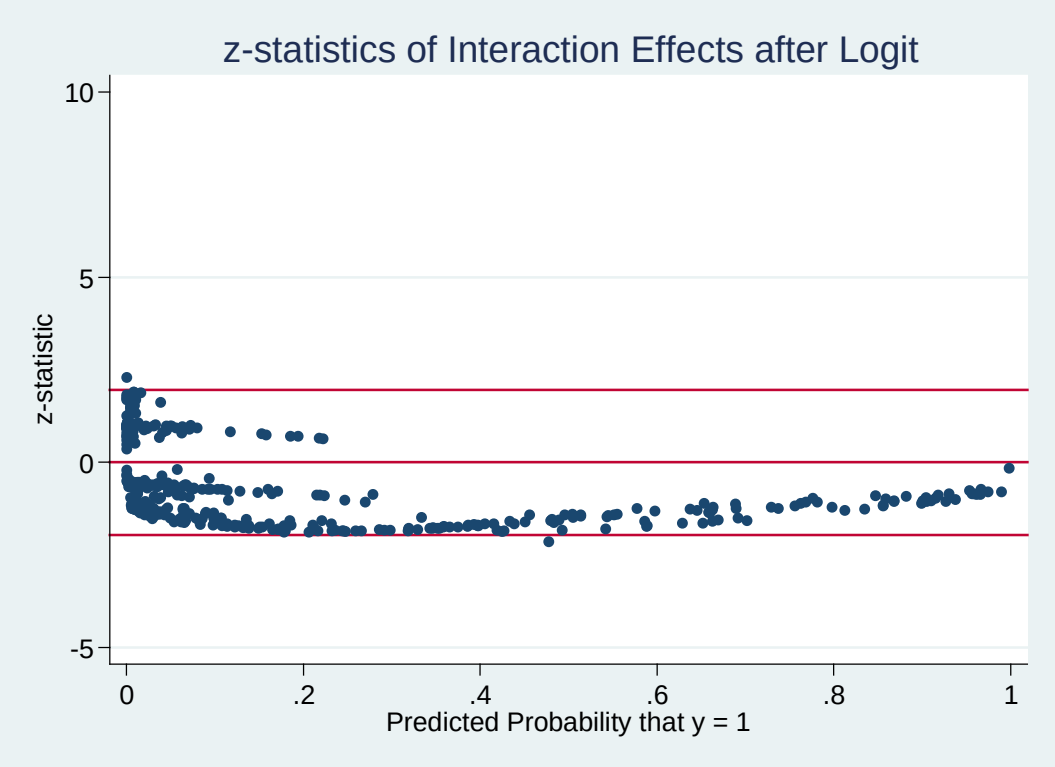
Change in total leverage	Quarterly short-term and long-term debt obligations' change from previous quarter divided by quarterly, lagged total assets
Commitment dummy	Commitment_dummy is equal to one if the firm announces a commitment period for issuance (rather than allowing it to expire at the end of the three-year shelf registration period), zero otherwise.
Continuous AI	1/(1+number of analyst estimates) in the month preceding ATM/SEO announcement/issuance. More analyst coverage proxies for lower information asymmetry.
Current quarter CARs	Current quarter CARs are the cumulative abnormal returns (market-model based) over the same quarter as the actual cumulative issuance quarter.
EBITDA/TA	EBITDA divided by total assets.
EFN/TA	External financing needs equals EBITDA minus change in CAPEX minus change in net working capital, all divided by total assets.
Fee	Gross spread over proceeds; for SEOs; agent cash fees over planned proceeds; for ATMs
Gross proceeds adjusted	Total gross proceeds amount divided by quarterly, lagged total assets
High AI dummy	Equals one if there is no analyst coverage in the month preceding ATM/SEO announcement/issuance. Equals zero otherwise.
Leverage	The sum of short-term and long-term debt, all divided by total assets.
MARs	The stock's market adjusted daily cumulative returns [-1,+1] where 0 is the event day. The CRSP equally-weighted index is the market proxy.
Market value of equity	Market value of equity equals the product of shares outstanding and closing price from two trading days prior to the initialization of the ATMs or closing of the common stock SEO transaction. Expressed in $millions.
Prior actual cum. issuance	Is the value of actual cumulative issuance, as of the previous quarter end.
Prior quarter CAR	Prior quarter CARs are the cumulative abnormal return (market-model based) over the quarter preceding the actual cumulative issuance measure's quarter.
Proceeds	Dollar proceeds planned for issue (ATM) or actually issued (SEO)
Proceeds/mveq	Proceeds (planned in case of ATM) divided by market value of equity, on event day
Quarter counter	Quarter counter is the number of quarters that have passed since the ATM announcement.
R&D/TA	R&D expenditures divided by total assets. If R&D is missing, we set it equal to zero.

σ_{ret}	Standard deviation of daily stock returns over prior trading year, specifically [-252,-2], where day 0 is the announcement date of ATM program or issuance date of SEO.
S&P primary equity ranking	Standard and Poor's (S&P) current quality ranking valuation on stock performance. The earnings quality variable ranks the firm's quality from 'A+' through 'D', with 'A+' being the highest. We re-code the equity ranking variable to be a numerically ordered variable from 9 to 2. Basic scores are computed separately for earnings and dividends and then each are adjusted by a set of predetermined modifiers for changes in the rate of growth, stability within long-term trends and cyclicality. Adjusted scores for earnings and dividends are then combined to yield a final ranking.
Sales/TA	Revenues divided by total assets.
Size	The natural log of total assets (in $millions).
Stock return volatility	Stock return volatility is the contemporaneous quarter's standard deviation of daily stock returns.
Tobin's Q	Book assets minus book equity plus market equity, all divided by book assets.
Total assets growth	Quarterly total assets' change from previous quarter divided by quarterly, lagged total assets
Total institutional holdings	Total institutional holdings as a percentage of total shares outstanding. Data are from 13F filings submitted to the SEC by institutions with more than $100 million assets under management. Institutional holdings are available from Thomson Reuters and are reported on a quarterly basis.
Turnover	Volume divided by shares outstanding, per day [averaged over -25, -3]

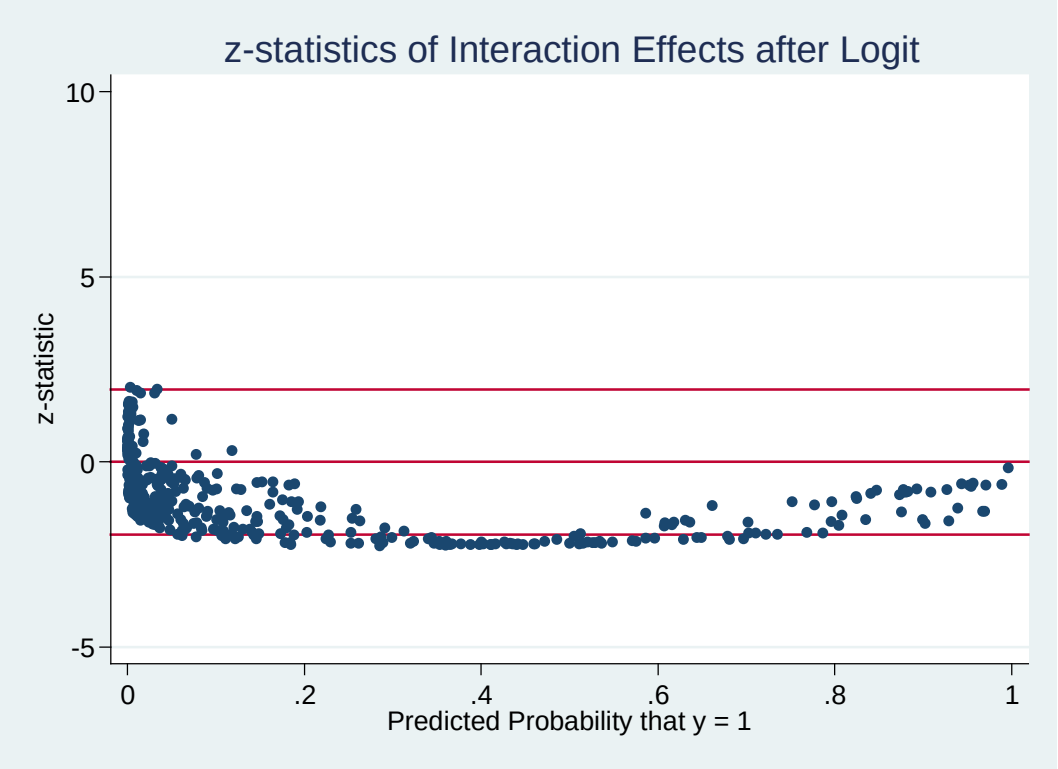
APPENDIX B

Appendix B presents the variation of the coefficient on the interaction of either the High AI dummy or the Continuous AI with the S&P primary equity ranking value. Figure 1 (2,3,4) refers to the information asymmetry and the firm quality interaction term drawn from regression model 2 (3,5,6). Each figure shows the interaction effect as a function of the predicted probability of the dependent latent variable. The presentation of the variation of the interaction effects across all predicted probability values is motivated by the Ai and Norton (2004) correction when interaction effects are present in non-linear estimation models.

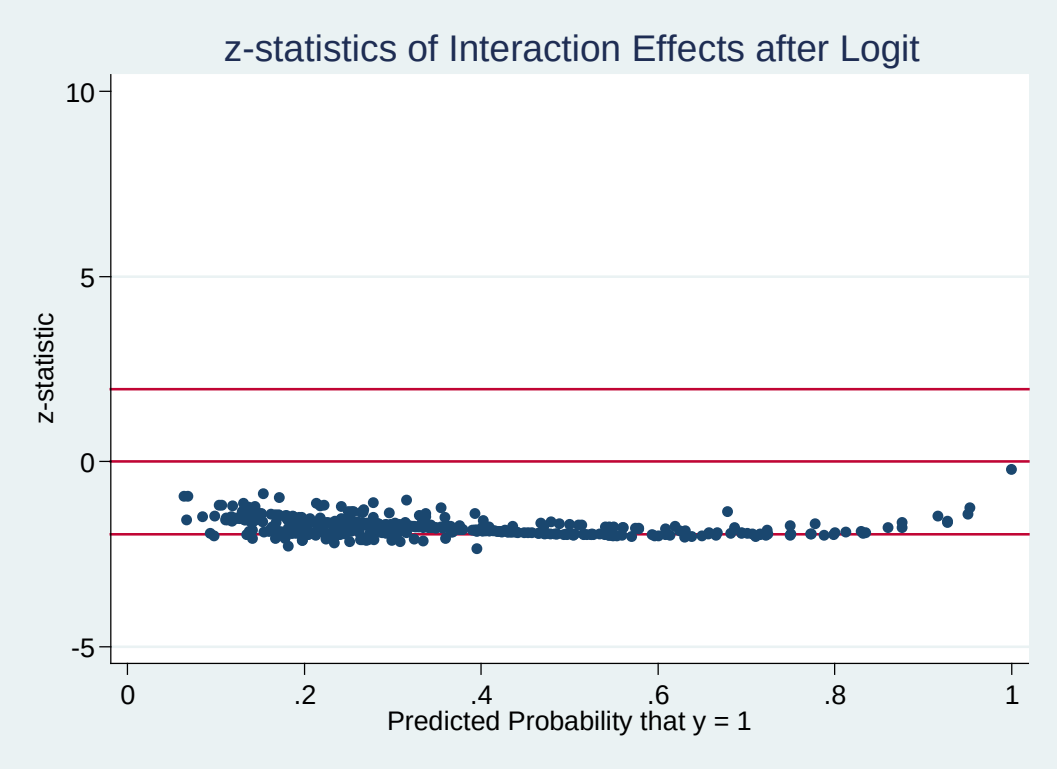
Interaction effect of High AI dummy with S&P primary equity ranking (Table 5, Panel A, regression model 1)



Interaction effect of continuous AI dummy with S&P primary equity ranking (Table 5, Panel A, regression model 2)



Interaction effect of High AI dummy with S&P primary equity ranking (Table 5, Panel B, regression model 1)



Interaction effect of Continuous AI with S&P primary equity ranking (Table 5, Panel B, regression model 2)

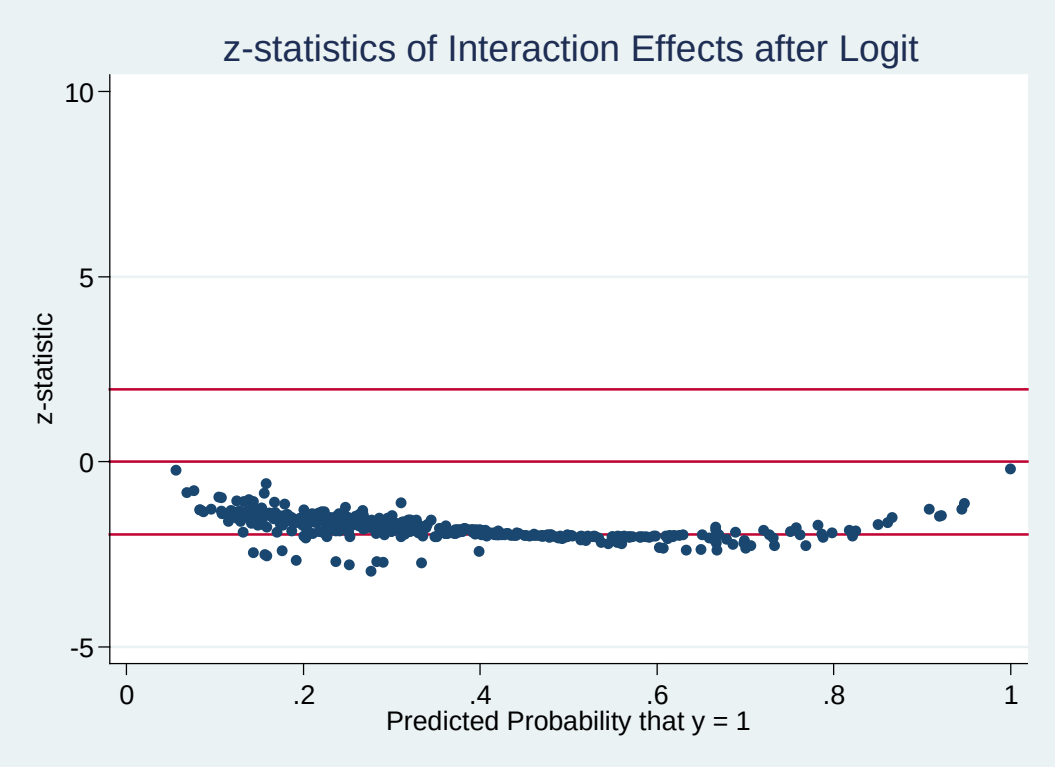


Table I
Comparison of ATMs and SEOs

Table I Panel A presents the main characteristics of two types of equity offerings: At-The-Market offerings (ATMs) and common stock Secondary Public offerings (SEOs). Panel B reports the distribution of completed transactions as well as the total gross proceeds amounts raised for all three sub-samples of ATMs (all ATMs, all ATMs with no REITs and all ATMs with no regulated industries). Information on the SEOs number of observations spans the same time period. The source for SEOs is the Securities Data Corporation (SDC) database, and for ATMs it is both DealFlow Media's PrivateRaise (for the years 2011, 2012, 2013, 2014, 2015) and our hand-collection (for the years 2008, 2009 and 2010). The information on ATMs' public announcements preceding the completion date of the offering type "Announced before completion" are hand-gathered from factiva.com as well as 8-K statements, and for SEOs are drawn from the Securities Data Corporation (SDC) database.

Panel A: Issuance Process

	Announced before completion	***Sold in the secondary market***	***Sold in increments***	***Underwritten***
ATMs	We find that 95.4% of ATMs programs are announced on (or after) the closing date of the commencement of the program. The dates of the securities' sale are not announced.	Through ATMs, newly-issued shares are sold to the secondary markets.	Yes	Through ATMs, newly-issued shares are dribbled out into the trading market through a designated broker-dealer at prevailing market prices. There is a placement agent used that acts on a best efforts basis. In the rare case that the placement agent commits to purchase the issuer's securities for its own account with a view to reselling securities, he does not conduct any roadshows or other solicitations. The placement agent is still liable with respect to material misstatements or omissions in the accompanying shelf registration statement.
SEOs	We find that 89.1% of SEO issuances have their filing date preceding the issue date.	Through SEOs, pure primary or combined primary and secondary shares (with the primary shares proportion being at least 50% of the entire offering) are sold to the secondary markets.	No	SEO issuers use underwriters that act on a firm commitment basis.

Panel B: Issuance Activity

		At-the-Market Offerings: ATMs		*Seasoned Equity Offerings: SEOs*			
	Year	# of issues	Proceeds (in $ billions)	# of issues	Proceeds (in $ billions)	ATMs as fraction of SEOs	ATMs as fraction of SEO proceeds
All	2008	26	1.92	163	119.66	15.95%	1.60%
	2009	74	26.14	387	138.72	19.12%	18.84%
	2010	92	7.42	389	90.54	23.65%	8.20%
	2011	115	9.85	304	101.56	37.83%	9.70%
	2012	131	13.11	411	143.95	31.87%	9.11%
	2013	168	23.16	514	141.73	32.68%	16.34%
	2014	157	27.08	498	126.76	31.53%	21.36%
	2015	211	34.10	504	152.81	41.87%	22.32%
	All years	*974*	*142.78*	*3,170*	*1,015.73*	*30.73%*	*14.06%*
Excluding REITs	2008	15	0.93	136	101.22	11.03%	0.92%
	2009	47	23.34	348	113.66	13.51%	20.53%
	2010	56	2.49	329	79.78	17.02%	3.12%
	2011	71	4.52	231	97.72	30.74%	4.63%
	2012	79	6.82	308	114.26	25.65%	5.97%
	2013	125	16.35	413	107.26	30.27%	15.24%
	2014	115	20.64	408	106.50	28.19%	19.38%
	2015	166	21.89	444	136.85	37.39%	16.00%
	All years	*674*	*96.98*	*2,617*	*857.25*	*25.75%*	*11.31%*
Excluding REITs and regulated firms	2008	8	0.49	76	30.74	10.53%	1.59%
	2009	27	3.30	218	39.07	12.39%	8.45%
	2010	47	1.50	234	34.76	20.09%	4.32%
	2011	56	2.30	176	46.50	31.82%	4.95%
	2012	62	5.25	212	43.76	29.25%	12.00%
	2013	87	4.03	333	98.31	26.13%	4.10%
	2014	97	10.06	329	84.02	29.48%	11.97%
	2015	135	15.96	372	111.35	36.29%	14.33%
	All years	*519*	*42.89*	*1,950*	*488.51*	*26.62%*	*8.78%*

Table II
Issuer Characteristics

Table II (Panel A) presents and compares the mean and the median values of annual financials of all ATMs and SEOs. Financials are drawn from Compustat (Fundamentals Annual) database as of the year before the two samples. All variable definitions are in Appendix A. Summary statistics of financial variables are for the full samples of ATMs and SEOs. Panel B presents and compares the mean and median values of annual trading-related variables of all ATMs and SEOs. Information is drawn from various sources: *Proceeds* and *fee*s (ATMs) from PrivateRaise, *(B-A Spread)/Price*, *turnover*, *Mvequ* and σ_{ret} from CRSP and *fees* (SEOs) from SDC. Panel C repeats the same financial and trading-related variables' comparison for the ATMs/SEOs that have (do not have) *S&P equity ranking* information available. Across all panels the last two columns compare mean and median values. The Satterthwaite two-sided t-statistic (Wilcoxon two-sided z-statistic) is presented in parentheses for the mean and the median difference tests, respectively. a,b,c denote statistical significance at the 10%, 5% and 1% level.

Panel A: Financial variables for all ATMs vs all SEOs

	ATMs				SEOs				Difference	
Variable	mean	median	Std.	Obs.	mean	median	Std.	Obs.	t-stat	z-stat
Market val. of eq. ($ M)	966.9	164.56	36.21	343	2275.7	608.08	135.45	1314	-3.16c	-14.19c
Size	4.88	4.27	2.16	384	6.48	6.48	1.77	1410	-12.55c	-13.59c
Leverage	0.42	0.37	0.32	325	0.49	0.46	0.33	1223	-3.59c	-4.98c
R&D/TA	0.47	0.31	0.80	332	0.17	0.05	0.31	1281	5.61c	12.12c
Cash/TA	0.45	0.46	0.35	332	0.27	0.11	0.31	1281	8.81c	7.55c
Sales/TA	0.38	0.16	0.96	332	0.76	0.56	0.77	1278	-10.63c	-11.46c
Cash Burn	0.94	0.46	2.58	329	0.43	0.00	2.55	1277	3.16c	14.75c
EBITDA/TA	-0.42	-0.28	0.85	331	-0.01	0.10	0.40	1273	-8.41c	-15.56c
Acq/TA	0.01	0.00	0.04	329	0.03	0.00	0.08	1235	-4.38c	-6.37c
Tobin's Q	3.48	2.28	5.01	328	2.73	1.77	2.66	1180	2.62c	3.08c
EFN/TA	-0.42	-0.23	0.63	322	-0.12	0.04	0.40	1011	-7.99c	-9.22c
CAPEX/TA	0.05	0.01	0.10	329	0.07	0.03	0.11	1275	-2.59c	-6.12c
High AI dummy	0.29	0.00	0.46	356	0.17	0.00	0.38	1372	4.70c	5.23c
Continuous AI	0.49	0.36	0.35	356	0.37	0.24	0.31	1372	5.98c	6.83c
Total institutional holdings	0.33	0.28	0.26	300	0.64	0.70	0.28	1031	-18.06c	-15.20c
S&P equity ranking (excluding missing)	3.36	3.00	0.92	181	4.03	4.00	1.26	551	-7.67c	-7.57c
S&P equity ranking (missing set to 1)	2.27	3.00	1.36	338	2.28	1.00	1.71	1309	0.11	1.16
Average daily order flow inverse demand elasticity	1.57	1.38	1.20	374	1.25	1.14	1.08	1394	4.66c	4.73c

Panel B: Trading-related variables for all ATMs vs all SEOs

	ATMs				SEOs				Difference	
Variable	mean	median	Std.	Obs.	mean	median	Std.	Obs.	t-stat	z-stat
(B-A Spread)/Price	0.007	0.005	0.008	373	0.002	0.001	0.005	1388	10.95c	16.88c
Turnover	0.02	0.007	0.03	373	0.01	0.008	0.02	1388	0.96	-2.19b
Proceeds/Mvequ	0.19	0.14	0.19	385	0.26	0.15	0.64	1228	-2.67c	-1.37
Fee	3.16	3.00	0.36	439	4.49	4.22	0.02	1078	-1.02	-18.60c
σ_{ret}	0.57	0.41	0.34	373	0.41	0.32	0.35	1387	5.18c	6.58c

Table III
Dribble-out of ATM Shares

Table III presents univariate statistics on firms' actual issuance behavior of ATM offerings. Data are collected from firms' 10-Q filings (for the ending quarter of each fiscal year we use the 10-K filing). All variable definitions are in Appendix A. We also report two *weighted average market prices* built on what ATM issuers quote for their actual issuance activity. The first is the average market price ATM issuers capture adjusted by the end-of-quarter closing price. The second is the average market price ATM issuers capture adjusted by the average contemporaneous quarter's closing price. For these measures, we only consider the ATM issuances for which we have the weighted average market price documented in the issuer's 10-Q or 10-K, respectively. We report statistics for three samples: (Panel A) all ATM programs, (Panel B) only the ATM programs with announcement date up to and including year 2011, (Panel C) only the ATM programs with announcement date within years 2012 and 2013 and 2014. In Panel D, we report the average and median values of *actual cumulative issuance* when we truncate the entire sample at the: first quarter, second quarter, third quarter, fourth quarter, fifth quarter, eighth quarter, all quarters together, respectively. We then report the average and median values of *actual incremental issuance* for each individual quarter. We also report the *difference between shares purchased and sold by institutions*, as well as the *difference between shares purchased and sold by institutions adjusted by the number of shares initially announced*. In the last row of Panel D, we present the Pearson correlation coefficient between actual incremental issuance percentage and the difference between shares purchased and sold by institutions adjusted by the number of shares initially announced.

Panel A: All Firms

	Mean	Median	StdDev	N
Actual cumulative. Issuance	0.47	0.32	1.90	428
Actual issuance duration (completed only)	5.75	6.00	3.22	143
Weighted average market price adjusted by the end-of-quarter price	1.23	1.02	3.21	673
Weighted average market price adjusted by the quarter's average closing price	1.35	1.03	3.87	673

Panel B: Pre-2012

	Mean	Median	StdDev	N
Actual cumulative Issuance	0.61	0.54	1.83	137
Actual issuance duration (completed only)	5.77	6.00	3.60	57

Panel C: Post-2012

	Mean	Median	StdDev	N
Actual cumulative Issuance	0.41	0.24	0.87	291
Actual issuance duration (completed only)	5.73	6.00	2.96	86

Panel D: Timing / Takedown and Institutional Activity

	Q1	Q1-Q2	Q1-Q3	Q1-Q4	Q1-Q5	Q1-Q8	Q1-Q12
Mean actual cumulative Issuance	0.24	0.32	0.35	0.37	0.37	0.43	0.45
Median actual cumulative issuance	0.00	0.01	0.07	0.17	0.20	0.27	0.31
Percentage of zero values for each quarter	*61.40%*	*46.94%*	*40.65%*	*34.42%*	*31.82%*	*27.42%*	*25.72%*

Table IV
Regressions Explaining Dribble-out Behavior

Table IV presents estimates from censored quantile regressions of the actual cumulative issuance (the total number of shares issued from start of program through this quarter, relative to the number of shares the firm announced it planned to issue in the original filing) on a set of explanatory variables for which the definitions are in Appendix A. The sample is all firm/quarters (957) with sufficient data to run the regression. In separate models, we focus on the following quantiles of the percentage actual issuance: 80th, 85th and 90th. p-values are reported underneath coefficients, in parentheses. For each ATM program, the actual issuance activity is computed up to 12/31/2014.

Parameters	Parameter Estimates (1)	Parameter Estimates (2)	Parameter Estimates (3)
	Q80	Q85	Q90
Intercept	0.12[b]	0.10	0.30[c]
	(0.067)	(0.254)	(0.009)
Quarter counter	-0.01[b]	-0.01[c]	-0.03[b]
	(0.012)	(0.003)	(0.047)
Stock return volatility	0.07	0.13[a]	0.15[a]
	(0.256)	(0.055)	(0.099)
Prior quarter CAR	-0.04	-0.04	-0.05
	(0.132)	(0.407)	(0.482)
Current quarter CAR	0.08[b]	0.08[b]	0.12[b]
	(0.014)	(0.011)	(0.021)
Commitment_dummy	-0.02[b]	-0.03[b]	0.05[b]
	(0.050)	(0.028)	(0.027)
CAR (Event Return)	0.16	0.18	0.21
	(0.113)	(0.189)	(0.296)
Predicted Mean Value of Dependent Variable	0.203	0.307	0.461
Number of observations	957		

Table V

Financial ratios across quarters – where does the money go?

Table V presents the mean values of changes in quarterly financial ratios for our sample of ATMs. Each variable listed (except total assets growth) is first scaled by total assets. This ratio is calculated in quarter -1 (the quarter preceding the event) and in quarter "t" (0, 1, … , 8). The "change variable" is the difference between the quarter "t" ratio and the quarter "-1" ratio. In other words, these are cumulative ratio changes. Total assets growth is the percentage difference between quarter "t" total assets and quarter "-1" total assets. Financials are drawn from Compustat (Fundamentals Quarterly) database. All variables' definitions are provided in Appendix A. The number of observations we count on for each of the quarters is as follows: Q0 draws from 235 obs, Q1 draws from 235 obs, Q2 draws from 234 obs, Q3 draws from 232 obs, Q4 draws from 219 obs, Q5 draws from 209 obs, Q6 draws from 195 obs, Q7 draws from 176 obs and Q8 draws from 160 obs. All mean values are winzorized at the 1% and the 99% level.

Parameters	Q0	Q1 (2)	Q2 (3)	Q3 (4)	Q4 (5)	Q5 (6)	Q6 (7)	Q7 (8)	Q8 (9)
Change in receivables	-0.002	-0.002	0.000	-0.001	-0.000	-0.001	-0.002	-0.003	0.005
Change in cash	0.019	0.085	0.094	0.120	0.152	0.190	0.190	0.210	0.207
Change in inventories	-0.000	0.002	0.005	0.010	0.008	0.012	0.015	0.008	0.009
Change in net PPE	0.002	0.008	0.013	0.022	-0.022	0.025	0.036	0.026	0.030
Change in intangibles	0.001	0.000	0.002	0.017	0.008	0.014	0.021	0.033	0.047
Change in R&D expenditures	-0.021	-0.028	-0.033	-0.031	-0.055	-0.042	-0.050	-0.052	-0.051
Change in advertising expenditures	-0.032	-0.040	-0.040	-0.054	-0.036	-0.035	-0.039	-0.042	-0.056
Gross proceeds adjusted	0.060	0.115	0.138	0.167	0.199	0.220	0.237	0.241	0.260
Change in total leverage	-0.049	-0.043	-0.031	-0.004	-0.020	-0.012	-0.036	-0.013	0.016
Change in dividends	0.000	-0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.002
Total assets growth	0.061	0.156	0.185	0.242	0.278	0.343	0.364	0.442	0.462

Table VI
Logistic Regression Explaining ATM vs. SEO Event

Table VI reports probability estimates from logistic regressions explaining incidence of ATM or SEO. All variable definitions are in Appendix A. All estimates are in terms of log odds. Panel A presents binomial logistic regression estimates with the dependent variable being equal to one if the observation is an ATM, zero if it's an SEO and Panel B presents ordered probit regression estimates with the dependent variable being equal to zero if the observation is a fully marketed SEO, 1 if it is an accelerated SEO and two if the observation is an ATM. On Panel B, each regression variable's estimates are split in two separate columns. The values in parentheses denote p-values for statistical significance levels and [a,b,c] denote levels of 10%, 5% and 1% respectively.

Panel A: Binomial logit regressions

	(1)	(2)
Intercept	8.26[c]	6.02[c]
	(0.000)	(0.002)
High AI dummy	7.22[b]	
	(0.049)	
S&P equity ranking	0.38[b]	0.41[b]
	(0.032)	(0.044)
High AI dummy*	-2.10[a]	
S&P equity ranking	(0.079)	
Continuous AI		10.91[b]
		(0.019)
Continuous AI*		-3.41[b]
S&P equity ranking		(0.028)
Size	-0.99[c]	-1.01[c]
	(0.000)	(0.028)
R&D/TA	0.18	0.07
	(0.823)	(0.927)
Acq/TA	-0.33	-0.40
	(0.010)	(0.907)
Tobin's Q	-0.23[c]	-0.23[c]
	(0.009)	(0.008)
Turnover	-8.51	-8.72
	(0.865)	(0.330)
σ_{ret}	0.14	0.14
	(0.066)	(0.795)
Proceeds/mveq	-2.07[b]	-1.90[b]
	(0.023)	(0.035)
Run-up	-0.21[c]	-0.24[c]
	(0.009)	(0.000)
EFN/TA	-0.34	-0.37
	(0.568)	(0.525)
Sales/TA	-1.05 [b]	-1.03[b]
	(0.019)	(0.025)

Cash/TA	-0.85 (0.972)	-0.91 (0.291)
Total institutional holdings	-2.31[c] (0.005)	-2.41[c] (0.005)
-2 Log Likelihood	223.5	223.4
Max-rescaled R-Square	0.59	0.59

Panel B: Ordered Probit regressions

Estimates	Predicting ATMs vs. fully marketed SEOs	Predicting ATMs vs. accelerated SEOs	Predicting ATMs fully marketed SEOs	Predicting ATMs vs. accelerated SEOs
	(1)	(2)	(3)	(4)
Intercept	7.94[c]	13.82[c]	5.65[c]	11.91[c]
	(0.000)	(0.000)	(0.005)	(0.000)
High AI dummy	7.31[b]	6.09[a]		
	(0.049)	(0.095)		
S&P equity ranking	0.35[a]	0.62[a]	0.44[b]	0.10[b]
	(0.032)	(0.032)	(0.036)	(0.050)
High AI dummy* S&P equity ranking	-2.10[a]	-1.89[a]		
	(0.079)	(0.051)		
Continuous AI			11.02[b]	9.50[b]
			(0.019)	(0.049)
Continuous AI* S&P equity ranking			-3.41[b]	-3.14[b]
			(0.028)	(0.046)
Size	-0.98 [c]	-1.08 [c]	-0.99[c]	-1.10[c]
	(0.000)	(0.000)	(0.000)	(0.000)
R&D/TA	0.12	0.70	0.01	0.61
	(0.886)	(0.609)	(0.989)	(0.654)
Acq/TA	-0.48	0.40	-0.54	-0.34
	(0.884)	(0.915)	(0.873)	(0.929)
Tobin's Q	-0.23[c]	-0.24[b]	-0.23[c]	-0.24[b]
	(0.010)	(0.042)	(0.009)	(0.040)
Turnover	-6.77	-18.90[a]	-6.97	-19.01[a]
	(0.472)	(0.073)	(0.449)	(0.330)
σ_{ret}	0.12	0.22	0.12	0.21
	(0.824)	(0.717)	(0.819)	(0.736)
Proceeds/mveq	-2.06[b]	-2.34[c]	-1.88[b]	-2.16[b]
	(0.024)	(0.001)	(0.037)	(0.021)
Run-up	-0.19[c]	-0.34[c]	-0.22[c]	-0.37[c]
	(0.001)	(0.003)	(0.000)	(0.006)
EFN/TA	-0.39	-0.08	-0.42	-0.12
	(0.508)	(0.924)	(0.469)	(0.877)
Sales/TA	-1.05 [b]	-1.16[b]	-1.03[b]	-1.13[b]
	(0.019)	(0.019)	(0.022)	(0.021)
Cash/TA	-0.64	-2.40[b]	-0.71	-2.45[b]
	(0.459)	(0.035)	(0.416)	(0.031)
Total institutional holdings	-1.99[b]	-4.36[c]	-2.08[b]	-4.48[c]
	(0.018)	(0.000)	(0.015)	(0.000)
-2 Log Likelihood	533.5	533.5	533.4	533.4
Max-rescaled R-Square	0.49	0.49	0.49	0.49

Table VII
Stock Returns Before, At, and After the Event (ATMs and SEOs)

Table VII, Panel A reports mean *market model abnormal returns* (CARs) and *market-adjusted returns* (MARs) to events by ATM firms and SEO firms, both without REITs and regulated industries. For the ATM sample we use the first public announcement date as our event date. For the SEOs we use the issue date as our event date. CARs are from the one-factor model. The CRSP equally-weighted index is our market proxy. Our event window is the three trading days surrounding t = 0 event day [-1,+1]. Panel B reports *run-ups* prior to both the ATM and SEO subsamples. Returns are computed over the [-252,-30] and [-30,-3] windows. [a,b,c] denote statistical significance at the 10%, 5% and 1% level.

Panel A: Event Returns	N	Market model abnormal returns	Market-adjusted returns
ATMs	371	-0.024c	-0.024c
SEOs	1,365	-0.036c	-0.032c
Panel B: Run-ups	ATMs (N = 359)	SEOs (N = 1,110)	
[-252,-30]	0.055c	0.176c	
[-30,-3]	0.030c	0.067c	