Seasoned Equity Offerings and the Cost of Market Timing

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Abstract

A robust finding in the literature is that seasoned equity offerings (SEOs) are followed by negative long-run abnormal returns, which can be seen as evidence of market timing. In this paper I document the cost of market timing, based on the idea that investors view companies with the most negative abnormal returns in the year following a SEO, as most likely to have timed the issue. I find that these companies compensate investors by offering a larger discount in subsequent SEOs. I also show that issuers anticipate the higher underpricing and are more likely to switch to debt if the returns following a previous SEO were more negative. A corollary of this finding is that firms' financial constraints increase if they time the market with previous issues. The effect of past market timing on underpricing is more pronounced if the CEO does not change in between issues. I also find that investors show a greater aversion to losses, in line with the predictions of Prospect Theory. I find no evidence that SEO underpricing is related to the returns following an Initial Public Offering (IPO), suggesting that investors view IPOs as being less indicative of the market timing motives of follow-on equity issuers.

December 1, 2011

JEL Classification: G14, G32
Keywords: Capital Structure, Equity Issue, Initial Public Offering, Market Timing, Underpricing

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I. Introduction

Seasoned equity offerings (SEOs) are on average followed by negative long-run abnormal returns (see, e.g., Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995). A popular explanation for this underperformance is that issuers are able to time the market and raise equity when the cost of capital is abnormally low. Loughran and Ritter (1995), and Baker and Wurgler (2000) view managers as being better informed than investors and are able to opportunistically issue equity when they anticipate that their share price is likely to decline. Graham and Harvey (2001) provide survey evidence in support of this view. Market timing can also be viewed in a rational framework, with firms choosing to issue equity in more favorable economic periods when asymmetric information is lower (e.g., Choe, Masulis, and Nanda, 1993; Lucas and McDonald, 1990). Another possible explanation for post-issue underperformance, suggested by Ritter (2003), is that both investors and managers are overoptimistic about the prospects of issuing firms.

While market timing of equity offerings is extensively documented in the literature, its effects on future equity offerings by repeat issuers are less known. Given that market timing represents a price risk for purchasers of the equity offering, I expect that offerings that are seen as more likely to be timed, to be issued at a greater discount to the pre-issue market price. Research has shown that seasoned equity offerings are underpriced on average, partly to compensate investors for the uncertainty regarding the value of the issuer. For instance, Corwin (2003) finds that seasoned offers were underpriced by an average of 2.2 percent between 1980 and 1998, while Altinkiliç and Hansen (2003) find an average discount of 3.2 percent over the 1990's.[1]

In this paper I examine the effects of past market timing on underpricing of subsequent equity offerings in the United States over the period 1980-2007. I capture possible market timing behavior by the abnormal returns following a previous issue, and find that underpricing of equity offerings is greater if firms are more likely to have timed the market previously. The additional discount by past market timers can be seen as

[1] Corwin (2003) finds that underpricing represents 21.7% of total direct and indirect issue costs and results in $1.95 million in lost proceeds, while Eckbo, Masulis, and Norli, (2007) consider underpricing as the most important indirect issuance cost of SEOs.

compensation for the perceived risk that these issuers will time the market again. I also find that the effect of past market timing is most pronounced for issuers that did not experience a change in their CEO in the period between issues. This finding is consistent with recent evidence by Baker and Xuan (2009) that the identity of the CEO matters in assessing past firm performance. I also find that underpricing is less sensitive to positive returns that follow a previous issue, than it is to negative returns. In line with prospect theory, this asymmetric effect could imply that investors are more concerned about potential losses compared with gains. An alternative interpretation of these results is that investors view a share price decline following a previous issue as market timing, but do not view a price increase as the ability of managers to successfully time profitable investment opportunities.

In robustness tests, I control for the possible influences of short selling constraints on my results. If SEOs made by short-sale constrained issuers (i.e., stocks that are difficult to short) are also underpriced more, then the market timing effect on underpricing may be spurious. I use several measures to capture the demand and supply influences on short-sale constraints, such as short interest outstanding, institutional ownership, and the Amihud (2002) measure of illiquidity. I also examine the influences of an exogenous event, the introduction of SEC Rule 10b-21 in August 1988, which prohibited short-selling around the issue of an SEO. I find that the market timing effect on underpricing remains significant after controlling for the influences of short-sale constraints. I also perform robustness tests that use the price reaction at the SEO announcement date to capture shareholder wealth effects, instead of using underpricing as the variable of interest. I find consistent results with respect to the cost of past market timing on shareholder wealth effects.

A corollary of the relationship between market timing and underpricing of subsequent equity offerings, is that the choice between debt and equity financing will also be influenced by past market timing. I find that, following an equity issue, firms are more likely to switch to debt if they had timed their previous equity offering. This suggests that past market timers anticipate the higher discounting and switch to debt in order to avoid

additional dilution of share value.[2] The higher cost of equity implies that firms' financial constraints increase if they time the market with previous issues, especially if they are unable to subsequently switch to debt.

Whereas SEOs are underpriced by more if returns following previous *SEOs* are more negative, they are not underpriced by more if returns following previous *IPOs* are more negative. This suggests that investors view IPOs as being less indicative of the market timing motives of follow-on equity issuers. Pagano, Panetta, and Zingales (1998) find other motives for IPOs besides market timing, while there may also be less opportunities to time IPOs because these take longer to set up (Geddes, 2003), and it is harder to establish what valuations investors are willing to pay, given that the shares are not trading yet (Chemmanur, He, and Hu, 2009; Geddes, 2003; Ritter, 2003). In addition, a company that overprices its IPO so much that it is withdrawn, will often not get another opportunity to go public (Dunbar, 1988).

The results in this paper provide several contributions to the literature. First, they suggest that investors take the past behavior of firms into account when evaluating their motives for market timing of subsequent equity offerings. This finding complements a growing literature that examines how investors form beliefs in financial market (see Hirschleifer and Teoh, 2003, for a review). Second, I show that there is a cost associated with timing equity issues, in the form of higher underpricing of subsequent issues. While the literature has hitherto recognized the motivations for market timing in equity offerings, the cost of such behavior has to the best of my knowledge, not yet been documented. I also show that managers that timed previous equity issues, to some extent anticipate the higher underpricing, and tend to switch to debt financing in order to avoid the cost of dilution or abandonment of profitable investment opportunities. This finding extends the literature on capital structure by shedding light on how past actions by firms affects the choice between equity and debt financing. A corollary is that firms' financial constraints increase if they time the market with previous issues, especially if they are unable to switch to debt. Finally, while my results provide evidence in line with the

[2] Eckbo, Masulis, and Norli (2007) note that underpricing in itself represents a wealth transfer to purchasers of the new securities, unless these are purchased entirely by current shareholders. This wealth transfer represents an indirect cost of raising equity, which decreases the marginal contribution of investment opportunities to overall shareholder wealth.

timing of seasoned equity offerings, I find no evidence that supports the market timing hypothesis in IPOs. On the other hand, my findings also support the view that IPOs and SEOs are different events, and investors do not consider the market timing of IPOs as providing a good indication of market timing intentions in subsequent equity offerings.

While studies on multiple issues of equity are relatively rare, two recent papers are most related to my study. D'Mello, Tawatnuntachai, and Taman (2003) look at repeat equity issuers and document that abnormal returns become less negative as more issues are made, with this being partly explained by a reduction in information asymmetry. I therefore control for the level of information asymmetry to ensure that the post-issue returns are not simply capturing general information asymmetry instead of market timing motives. Hovakiminan and Hutton (2010) find that the probability of seasoned equity issuers returning to the market to raise equity is positively linked to the one-year post issuance returns of the firm's previous equity issue. They attribute this to feedback from the market to the firm about the value of the firm's investment opportunities. My contribution differs in that I show a link between the returns following an SEO, which I consider as capturing market timing behavior, and underpricing of subsequent SEOs. Admittedly, it is difficult to distinguish whether returns following an issue reflect market timing by the issuer, as opposed to feedback from the market about the investment opportunities of the firm. In support of the market timing view, I find that underpricing is more sensitive to negative past returns than it is to positive past returns, a prediction in line with prospect theory. The second part of my analysis also provides support to the market timing hypothesis: I find that the returns following previous SEOs effect the choice between subsequent equity and debt financing. To some extent, conditioning on a seasoned offering being followed by either debt or equity controls for investment opportunities since funds will be raised in either case.

The remainder of the paper is structured as follows. The next section provides literature related to underpricing, while Section III develops the testable predictions. I describe the data in Section IV and present the results in Section V. Section VI concludes the paper.

II. Background on underpricing of equity offerings

Underpricing in seasoned equity offerings (SEOs) represents lost proceeds to the issuer and is considered the most important indirect cost of raising equity (Eckbo, Masulis, and Norli, 2003). It is generally measured as the difference between the closing price on the offer day, or one day prior to the offer day, and the price that the new shares are sold for. Whereas the possible rationales for underpricing have been well documented in the IPO literature (e.g., Ljungqvist, 2007) there is relatively less literature examining underpricing in SEOs. However, most of the explanations underlying underpricing for IPOs are applicable to the SEO literature. Eckbo and Masulis (1992) report mean underpricing of 0.44% for a sample of firms over the 1963-1981 period. Corwin (2003) and Mola and Loughran (2004) examine underpricing in SEOs over the 1980s and 1990s and document an average discount of 2.2% and 3% respectively. In more recent years the discount has risen and Altinkiliç and Hansen (2003) find an average discount of 3.2% over the 1990's.

There is a large empirical and theoretic literature suggesting explanations for underpricing, more prominently for IPOs. Most of these papers rely on asymmetric information models in which either the issuer, underwriter, or investor, has more information than the other parties. The main prediction of these models is that underpricing compensates the less informed party. In the framework of Rock (1985) some investors are less informed than others, giving rise to the winner's curse problem as the less informed investors end up subscribing to the worse issues. A prediction of this model is that underpricing increases with the uncertainty of the issuer's value. Parsons and Raviv (1985) examine the perspective of the investor who has the choice of either purchasing a share with certainty in the secondary market or to subscribe to an issue. Investors with high reservation prices who are uncertain about subscription demand and the allocation of shares, drive up secondary market prices, consequently increasing underpricing. In the models of Chemmanur (1993), and Benveniste and Spindt (1989), underwriters use underpricing to induce investors into revealing their private information

about their reservation price for an offering. Hanley (1993) finds evidence consistent with this hypothesis, while Bradley and Jordan (2002) find that underpricing is also related to the revelation of public information. Chemmanur (1993), Allen and Faulhaber (1989), Grinblatt and Hwang (1989), and Welch (1989), propose theoretical frameworks in which firms signal their quality through higher underpricing, which ensures that future equity offerings by these firms are better received by investors. There is limited evidence to support this hypothesis, however, as shown in Mola and Loughran (2004), Garfinkel (1993), and Jegadeesh, Weinstein, and Welch (1993).

A strand of papers focus specifically on seasoned offering, and emphasize the importance of placement costs on underpricing. Altinkiliç and Hansen (2003) show that underwriters attract capital suppliers by last minute adjustments to the offering price, based on the demand reflected in their order book. Corwin (2003) provides evidence that price pressure impacts underpricing and that this is greater for issuers with relatively more inelastic demand curves. This setting assumes that demand curves for stocks are not perfectly elastic, with demand for an offering increasing as the issue price falls.[3] Mola and Loughran (2004) and Corwin (2003) also find evidence that underwriter pricing practices, such as offer-price rounding, impact underpricing. A final strand of literature emphasizes the role of short-sellers and manipulative trading around seasoned offerings, although the evidence is mixed. Henry and Koski (2009) find that manipulative trading increases underpricing, whereas Chemmanur, He, and Hu (2009), provide evidence that institutional trading reflects an information production role rather than manipulative trading. Further studies (e.g., Singal and Xu, 2005; Kim and Shin, 2004; Safieddine and Wilhelm, 1996) examine the consequences of the adoption of SEC Rule 10b-21 in 1988, but find contrasting results with respect to its effect on underpricing.[4]

[3] Papers that find evidence of downward sloping demand curves include Duca, Dutordoir, Veld, and Verwijmeren (2010), Mitchell, Pulvino, and Stafford (2004), and Shleifer (1986).

[4] Rule 10b-21, adopted in August 1988, prohibited the use of shares purchased at the offering to cover short sales positions established between the initial filing and offer date. In April 1997, this rule was replaced by Rule 105 of Regulation M, which prohibited traders from covering short sales made within five days of the offering with shares obtained in the offering.

III. Testable Predictions

A. Post issue abnormal returns and current SEO underpricing

Both seasoned equity offerings (SEOs) and to a lesser degree, initial public offerings (IPOs), are on average followed by negative long-run abnormal returns (e.g., Ritter, 2003; Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995).[5] An extensive strand of literature suggests that the post-issue underperformance is evidence of issuers timing the market to raise equity when the cost of capital is abnormally low. One version of the market timing theory assumes that managers are better informed than investors and time equity issues to coincide with periods when their equity is overvalued (see, e.g., Huang and Ritter, 2009; Baker and Wurgler, 2000; Stein, 1996; Loughran and Ritter, 1995). Graham and Harvey (2001) provide survey evidence in support of this view. Firms may also time their issues to coincide with windows of opportunity during which asymmetric information is lower and investors have a more favorable view of issuers (see, e.g., Lowry, 2003; Bayless and Chaplisky, 1996; Choe, Masulis and Nanda, 1993). In the asymmetric information models of Korajczyk, Lucas, and McDonald (1992), and Lucas and McDonald (1990), firms postpone an issue until they release positive private information, which raises their stock price. Another possible explanation for post-issue underperformance, suggested by Ritter (2003), is that both investors and managers are overoptimistic about the prospects of issuing firms. In summary, the literature on market timing documents that SEOs and IPOs on average have a negative impact on the wealth of new investors, while issuers show signs of timing their offerings to coincide with higher stock prices.[6]

In the presence of information asymmetries, investors are limited in their ability to predict the market timing motives of issuers. However, investors can infer the intentions

[5] Eckbo, Masulis, and Norli (2007) review recent literature on equity offerings and document that 3-year buy-and-hold abnormal returns post-offering regularly exceed –10% for SEOs but are somewhat more muted for IPOs.

[6] Issuing overvalued equity to new investors results in a wealth transfer to current shareholders. As such, an overvalued issue has a positive effect on the wealth of current shareholders, unless the issuer overinvests the additional proceeds in negative net present value investments.

that issuers had by observing the consequence of their actions, as captured in the post-issuance returns. A corollary is that investors view companies with the most negative abnormal returns following IPOs or SEOs as more likely to time their future equity offerings. If this hypothesis holds I expect the level of underpricing in SEOs to be inversely related to the abnormal returns following previous equity issues. The risk of market timing constitutes another source of price uncertainty, complementing previous literature that relates underpricing to the uncertainty of the issuer and the demand as revealed in the underwriter's order book.

The risk of issuers timing their offering is the main price concern of potential subscribers. An equity issue is a mainly unpredictable event, and investors are assumed to update their expectations of the post-issue return distribution in a Bayesian manner, using information about returns following a similar event in the past (i.e. the previous equity issue).[7] Therefore, the magnitude of the effect that market timing risk has on underpricing depends on investors' perception on how representative the previous offering is of the current one, in terms of indicating market timing motives. It is not clear whether market timing is seen as a general trait of a company, as opposed to it being attributable to a specific CEO, assuming that decisions about security issues are authorized by the CEO. If the identity of the CEO is more important, the signal from past issues is less informative if the CEO changes between issues. I test this hypothesis by identifying firms that experience a change in their CEO in between issues. In support of the CEO view about corporate decisions, Baker and Xuan (2009) find that investors are more likely to supply capital to CEOs who perform well, holding constant the firm performance.

If market timing incentives are similar for both SEOs and IPOs, then the returns following either event should be equally informative for investors in updating their beliefs regarding market timing of subsequent SEOs. Both SEOs and IPOs raise additional capital, so that issuance can be motivated by needs to finance profitable investment opportunities or, in contrast, opportunities to raise capital when valuations are abnormally high. On the other hand, the IPO literature suggests that investors might view IPOs as being less indicative of the market timing motives of follow-on equity issuers.

[7] Hirschleifer (2001) identifies the role of Bayesian updating in asset pricing, while literature reviewed by Hirschleifer and Teoh (2003) documents how investors are influenced by observing the actions of other agents, although there is inconclusive evidence on whether such behavior is fully rational.

Apart from raising proceeds, a company might have other benefits from going public for the first time, while there may be less opportunities to time the market because of the time and costs of setting up the IPO, difficulty in valuation, and the risk of a failed offering. For instance, Pagano, Panetta, and Zingales (1998) find evidence of market timing of IPOs in the Italian market, but also find other benefits, such as cheaper access to bank credit. The authors also document an increased turnover in control following the IPO, which could lead to a change in market timing incentives. Geddes (2003) notes that the offering process for an IPO is more complex and lengthy than that of a secondary offering. IPOs require that documentation is set up for the first time, and involve more extensive marketing effort than subsequent SEOs.

Pricing of IPOs is also complex and usually depends on comparable firm multiples (Geddes, 2003; Ritter, 2003), whereas the price of listed securities provides a good indicator of what investors are willing to pay for seasoned offerings. As noted by Chemmanur, He, and Hu (2009), institutional investors' private information can also be partly inferred through trading volumes prior to an SEO offering, but this mechanism is not available in the case of IPOs. The importance of avoiding a failed IPO is emphasized in Dunbar (1998), who finds that only around 9% of companies with failed offerings are able to ever go public. A failed offering can be avoided if the issuer has a good indication of the demand curve for the company's shares. The uncertainty regarding the valuation of an IPO increases the risk of a failed offering, and to some extent explains why firms leave a substantial amount of money on the table by heavily discounting of the IPO.

B. Post issue abnormal returns and capital structure

In the presence of contracting costs, the choice between equity and debt financing is one that minimizes the cost of capital. For instance, the pecking order theory emphasizes the issuance costs arising from the varying degrees of information asymmetry associated with different financing instruments. To mitigate these costs, firms should use internally generated funds, and raise external funds only if these are insufficient. Their first choice of external funding should be straight debt, while equity should only be used as a last resort. In the tradeoff theory, firms compare the costs and the benefits of debt. The costs of debt include costs related to bankruptcy and agency costs resulting from the different

interests of bondholders and shareholders. The benefits of debt include the deductibility of interest expenses and the reduction of agency conflicts. This theory predicts that firms should issue equity when their leverage is above the desired target, and otherwise issue debt.

Underpricing represents an additional cost of issuing equity, since new securities are issued at below the market price. In the presence of profitable investment opportunities that can't be delayed, higher expected underpricing will cause a shift from equity to debt financing. Debt becomes a viable alternative if its issuance costs (for instance costs arising from the risk of asset substitution and bankruptcy) are lower than the investment's net present value. In severe cases of expected underpricing, or if investment opportunities are only marginally positive, the firm may abandon investment plans altogether if debt financing is not a viable substitute. Thus, past market timing may constitute a financing constraint prohibiting future fund-raising and investments. A manager can use the abnormal returns following past SEOs in the same way as investors to form expectations of underpricing of a subsequent equity offering. This behavior is consistent with the model of Noe, Rebello, and Wang (2003), where both managers and investors endogenously form expectations of prices based on past behavior, with debt emerging as the security of choice when the risk of issue failure increases. Hence, I hypothesize that firms are more likely to switch to debt if their abnormal returns following a previous SEO are more negative.

In addition, the risk of market mispricing is lower for a debt instrument than for common stock. Whereas the share price performance following past SEOs is likely to influence the perception that future SEO investors might have about the firm riskiness, this effect should be less important to investors in new debt issues. Eckbo, Masulis, and Norli, (2007) note that debt securities have a predictable contractual payment stream, while they are also protected by bankruptcy law. Debt purchasers are normally more sophisticated than equity investors and tend to scrutinize issuers more.[8] The commitment to pay interest also signals firm quality. Noe, Rebello, and Wang, (2003) provide a model in which underpricing is related to the difficulty of pricing a security, with debt emerging

[8] Debt issues have a minimal subscription amount that precludes smaller investors, while the illiquidity of the secondary market, and restricted availability of price data, also makes them unattractive to less sophisticated investors.

as the instrument that minimizes underpricing. In their model, rational agents learn from past experience how to price securities, providing further support to my hypothesis that firms switch to debt if past SEOs are followed by negative abnormal returns.

While some firms tend to switch to debt if they anticipate that an SEO will require larger underpricing, there are instances when an equity issue is still the preferable option. The most obvious case is if the share price is much higher than the issuer's underlying value, so that underpricing is not large enough to make debt an attractive alternative. In this case, the current shareholders will benefit from raising capital at a cost of equity below the true cost, while purchasers of the new issue will suffer a loss in wealth.[9] Relaxing the assumption that investments must have positive net present value, equity may be preferred to debt if managers have personal objectives and overinvest the proceeds from the issue (see, e.g., Stulz, 1990; Jensen 1986). In the presence of personal objectives, managers would prefer equity to debt since it is less restrictive and does not impose bankruptcy costs that would limit the use of the proceeds. Finally, if a firm has a multi-issue strategy, underpricing may be accepted as an immediate cost that is used to signal the quality of the issuer, which ensures that future equity offerings are better received by investors (e.g., Chemmanur, 1993; Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989).

IV. Data and summary statistics

In part (A) of this section I describe the sample of equity issues, and the construction of the variables directly related to the market timing hypothesis, underpricing and the returns following past SEOs and IPOs. In Part (B) I describe the other determinants of underpricing that I use as control variables in the underpricing regressions. In Part (C) I describe the variables that influence capital structure decisions, which I use as controls when I model the choice to issue equity.

[9] If the new issue is purchased completely by existing shareholders, there will be no wealth transfer, so that underpricing becomes irrelevant (Eckbo, Masulis, and Norli, 2007).

A. Equity issues, underpricing and post-issue returns

I obtain data for U.S. Initial public offerings and seasoned equity offerings issued between January 1st 1975 and December 31st 2007 from the Securities Data Company New Issues Database (henceforth SDC). I exclude units, secondary offerings, and those made by firms having a market capitalization under $10 million as well as utilities (SIC codes 4900-4949) and financials (SIC codes 6000-6999). I condition on a SEO being preceded by another SEO or an IPO. I allow for five years to elapse after 1975, before I start my sample of follow-on issues, with the first observation occurring in 1980.[10] I also require that firms have data available in both CRSP and Compustat. My final sample consists of 2,420 SEOs, 1,402 of which follow an SEO and 1,018 following an IPO. Figure 1 shows the annual distribution of the number of follow-on issues.

<< Please insert Figure 1 about here >>

I measure the dependent variable, underpricing, as in Altinkiliç and Hansen (2003), taking the logarithm of the ratio of the closing share price on the day prior to the offer, to the offer price. The offer price is obtained from SDC, while the closing price is obtained from CRSP. I plot the average underpricing per year in Figure 2. As previously documented by Mola and Loughran (2004), and Corwin (2003), underpricing exhibits an upward trend, and has averaged around 3% in recent years. The figure also shows that underpricing for equity issues that follow IPOs has become consistently above the underpricing of equity issues that follow previous SEOs. This might be because after 1990, newly listed firms became more likely to cease trading in the first 10 years after being listed, as documented by Fama and French (2004).

<< Please insert Figure 2 about here >>

[10] I allow for five years to pass so that I avoid a bias arising from having many of the issues in the first part of my sample occurring shortly after a previous issue.

I capture the performance following previous SEOs or IPOs as the buy-and-hold six month or one-year abnormal returns relative to a benchmark of non-issuers matched on size, as captured by the market value five days after an issue is made. I construct the benchmark portfolio based on the market value of all non issuers that have data available in CRSP, excluding financials and utilities. The benchmark return for each issuer making a SEO is the return on the equally weighted portfolio that is closest to that of the issuer. Ritter (2003) and Loughran and Ritter (1995) also use size benchmarks to calculate abnormal returns.

<< Please insert Figure 3 about here >>

Figure 3 shows a timeline for the event study employed in my approach. Since I need one year returns following a previous SEO or IPO, I impose the condition that at least one calendar year has passed between subsequent events, and also ensure that there is no overlap with the stock runup prior to the filing date. Underpricing is calculated at the issue date, which occurs on average(median) 42 (30) calendar days after the filing date.

B. Determinants of underpricing

I control for the following variables that have been used in other studies as determinants of underpricing:

Filing CARs: This captures the wealth effect of an SEO announcement, measured similarly to Altinkiliç and Hansen (2003), as the raw cumulative stock return over trading days -1 to +1 relative to the announcement date less the CRSP equally weighted market index return over the same period.

Abn. stock runup: The raw cumulative stock return over trading days -62 to -2 prior to the announcement date less the CRSP equally weighted market index return over the same period. As shown by Lucas and McDonald (1990), a pre-announcement stock runup can reflect lower equity-related adverse selection costs.

Residual volatility: Idiosyncratic risk, computed similarly to Hoberg and Prabhala (2009) as the annualized standard deviation of residuals from a regression of daily excess

stock returns on excess returns of the value-weighted CRSP market portfolio, estimated over trading days -62 to -2 before the announcement date.

Systematic volatility: Systematic risk, computed as the annualized standard deviation of the predicted value from a regression of daily excess stock returns on excess returns of the value-weighted CRSP market portfolio, estimated over trading days -62 to -2 before the announcement date.

Ln(MV): As in Corwin (2003) I proxy for firm size by the natural logarithm of the market value measured 5 days before the announcement of the issue. Firm size is generally interpreted as capturing asset diversification and the quality of publicly available information about the firm.

Tobin's Q: This has been shown to proxy for growth opportunities (see, for e.g., Graham, 2000; Polk and Sapienza, 2009), or overvaluation (Baker, Stein, and Wurgler, 2003). Tobin's Q is calculated as the market value of equity (Compustat # 25 x # 199) + total assets (# 6) – book value of equity (# 60)/total assets.

Relative proceeds: The relative offering size is calculated as the number of shares issued dived by the number of shares outstanding. Offering size is interpreted as capturing an adverse selection effect, or the liquidity effect of price pressure associated with new shares being issued (Altinkiliç and Hansen, 2003; Corwin, 2003), which require underpricing as a 'sweetener' to lure prospective investors.

Age: Firm age. DeAngelo et al. (2010) finds that firms in the earlier stage of their lifecycle are more likely to issue equity. Age is measured as the difference, in years, between the issue date and the date that the firm first appears in the CRSP database.

Years previous: The number of years that have elapsed since the previous issue.

Ln(price): The natural logarithm of the market price measured 5 days before issue is used to control for uncertainty about firm value as in Altinkiliç and Hansen (2003), with an inverse relationship hypothesized. In addition, Corwin (2003) finds that low-priced securities tend to be more underpriced than offers of high-priced securities, due to a common practice of rounding the offer price to even dollars.

Underwriter Prestige: As in Loughran and Ritter (2004), I take prestigious underwriters as those having a ranking of 8 or higher on the Carter and Manaster (1990)

9-point scale. SDC provides data on the underwriter of each SEO, which I match with the underwriter prestige rankings available from Jay Ritter's site.[11]

NYSE: I include a dummy variable equal to one for issuers on the New York Stock Exchange following Corwin (2003), who finds lower underpricing for these issues, which are characterized by less uncertainty.

Previous debt issue: I include a dummy variable equal to one for issuers that make a debt issue in between the current SEO and a previous equity offering.

Change CEO: A dummy variable equal to one if there was a change in the CEO since the previous issue was made, identified using Standard and Poor's Executive Compensation (ExecuComp) Database.

<< Please insert Table 1 about here >>

Panel A in Table 1 provides descriptive statistics for equity offerings, conditional on a firm having previously made an SEO. The sample consists of 1,402 follow-on equity offerings made by 732 firms that had a previous SEO. Around 95% of firms make no more than 4 further issues after their first SEO. Panel B presents statistics for 1,018 firms that issue equity following their IPO. The average underpricing for SEOs that follow a previous SEO is smaller than the underpricing for SEOs following an IPO. Overall, underpricing is similar to that documented by Corwin (2003), but slightly less than in Mola and Loughran (2004) and Altinkiliç and Hansen (2003), who examine a more recent period. The 6-month abnormal returns that follow a previous SEO are on average 2.6%, whereas the 12-month returns are 2.2%. Meanwhile, the 6-month abnormal returns following an IPO are -2.1%, and the 12-month returns are 21.7%.[12] The sharp increase in post-IPO returns after six months have elapsed might be due to the expiration of the

[11] Data for underwriter prestige between 1980 and 2007 are available on Jay Ritters's site at: http://bear.warrington.ufl.edu/ritter/ipodata.htm

[12] In the larger sample of 8,181 SEOs that are not conditioned on a previous SEO being made, the abnormal returns are -0.4% in the first 6 months, and -4.6% in the first 12 months after issue. The abnormal returns following 5,543 unconditioned IPOs are -0.1% in the first six months, and -3.1% in the first 12 months after the IPO. By comparison, Loughran and Ritter (1995) find that seasoned equity issuers underperform size-matched firms by 0.05% in the first 6 months after issue, and 6.3% in the first 12 months. They also find that IPO firms outperform the matched sample by 0.05% in the first 6 months, but underperform by 4.5% in the year after going public. Hovakimian and Hutton (2010) find that seasoned equity issuers underperform their book-to-market and size matched benchmark by 5.2% in the year after issue.

lockup period that commonly occurs after 6 months. Information released at the lock up date can have a large effect on share prices. Hence, the returns in the year after issue are considered more informative about market timing than those in the first 6 months after issue. Compared to firms issuing seasoned equity for the first time, Table 1 indicates that firms with a prior SEO have less firm-specific risk and growth opportunities, are larger and older, and raise less proceeds. These firms are also more likely to be listed on the NYSE and to adopt a prestigious underwriter to manage their issue. Thus, firms with a previous SEO are less prone to asymmetric information problems than those issuing equity after their IPO.

C. Determinants of capital structure

I include a number of standard firm-specific variables that capture costs associated with straight debt and equity financing (see, e.g., Frank and Goyal, 2009; Lewis, Rogalski, and Seward 1999). Firm characteristics are retrieved from Compustat and measured as at the end of the fiscal year prior to the offering, unless mentioned otherwise. The symbol "#" denotes a Compustat data item:

Abn. stock runup: The raw cumulative stock return over trading days -62 to -2 prior to the announcement date less the CRSP equally weighted market index return over the same period. As shown by Lucas and McDonald (1990), a pre-announcement stock runup can reflect lower equity-related adverse selection costs.

Stock volatility: Total risk, computed as the annualized standard deviation of daily stock returns over trading days -62 to -2 before the announcement date.

Slack: Cash and short-term investments (# 1) divided by total assets (# 6). Financial slack acts as a measure for adverse selection costs, as firms with higher slack could engage in wasteful use of resources.

Fixed assets: Calculated as plant, property and equipment (# 8) divided by total assets (# 6). Firms with more tangible assets are assumed to have lower financial distress costs. Asset tangibility could also be negatively associated with information asymmetry.

Ln(sales): Calculated as the natural logarithm of total sales (# 12). Larger firms are assumed to face smaller information asymmetries regarding their value and risk.

Taxes: This variable captures the tax liabilities benefit associated with issuing debt and is computed as income tax (# 16) divided by total assets.

Tobin's Q: This has been shown to proxy for growth opportunities (see, for e.g., Graham, 2000; Polk and Sapienza, 2009). Firms with higher growth opportunities face higher debt costs associated with risk shifting (Green, 1984) and underinvestment (Myers, 1977), making them more likely to issue equity instead of debt. Alternatively the Q-ratio might indicate overvaluation (Baker, Stein, and Wurgler, 2003). Tobin's Q is calculated as the market value of equity (# 25 x # 199) + total assets (# 6) – book value of equity (# 60)/total assets.

R&D expense: The expenditure on research and development (# 46) divided by total assets. Missing observations are assigned a value of 0. This variable proxies for growth opportunities.

Leverage-Target: the deviation of the market leverage from the target leverage.[13] I estimate a firm's target leverage using similar determinants of leverage as in previous research (see, for e.g., Hovakimian, Opler, and Titman, 2001; Huang and Ritter, 2009; Frank and Goyal, 2009). The firm's target leverage for firm *i* in year *t* is calculated as the fitted values from equation (1), while the deviation from the target leverage is the actual leverage for firm *i* in year *t* minus the target leverage (*t*-statistics, clustered by firm and year, are in brackets):

$$\begin{aligned}(1)\quad \text{Market Leverage}_{it} = {} & \underset{(18.2)}{0.16}\,\text{Fixed assets}_{it-1} + \underset{(9.27)}{0.01}\,\text{LnSales}_{it-1} - \underset{(-2.05)}{0.39}\,\text{Taxes}_{it-1} \\ & - \underset{(-9.66)}{0.01}\,\text{Tobin's Q}_{it-1} - \underset{(-19.62)}{0.28}\,\text{R \& D}_{it-1} - \underset{(-8.29)}{0.17}\,\text{Capex}_{it-1} - \underset{(-10.14)}{0.15}\,\text{Cash Flow}_{it-1} \\ & + \text{Industry} + \text{Year} + \upsilon_{it}\end{aligned}$$

Equation (1) is estimated using 129,422 firm-years over the period 1975-2007, and the adjusted R-squared is 30.9%. I retrieve firm characteristics from the Compustat Fundamentals Annual database, and omit financials (SIC codes 6000–6999), utilities

[13] I include the deviation from the target leverage as a determinant of the choice of financing instrument, but I also include other determinants for two reasons. First, as noted by Hovakimian et al. (2001), and Leary and Roberts (2005), target leverage is estimated with error, reducing its explanatory power. In addition, firms may adjust slowly to target leverage (see, e.g., Leary and Roberts, 2005) so that other factors may be more significant in explaining the choice between debt and equity at a particular instance in time.

(SIC codes 4900–4949), and firms with a market capitalization less than $10 million. market leverage is calculated as [book value of debt (# 9 + # 34)] divided by market value of assets [market value of equity (# 25 x # 199) + total assets (# 6) – book value of equity (# 60)]; Fixed assets [plant, property and equipment (# 8) divided by total assets]; LnSales [the natural logarithm of sales (# 12)]; Taxes [income tax (# 16) divided by total assets]; Tobin's Q [market value of equity (# 25 x # 199) + total assets (# 6) – book value of equity (# 60)]/[total assets]; R&D is the expenditure on research and development (# 46) divided by total assets][14]; Capex [capital expenditure (# 128) divided by total assets]; Cash flow [earnings before extraordinary items (# 18) + depreciation (item 14)]/[total assets]; Industry refers to 70 dummies based on the 2 digit SIC code, and Year are annual dummies.

The estimated regression coefficients are mostly in line with those found in previous research. In line with the tradeoff theory of capital structure, larger firms and those with more collateral, as measured by fixed assets, have higher target leverage, while the negative coefficient on Taxes is unexpected. Firms with a higher Tobin's Q ratio have a smaller target leverage, although this relationship can simply be mechanical (Huang and Ritter 2009; Baker and Wurgler, 2002). R&D and Capital expenditure are both negatively related to target leverage, supporting the tradeoff hypothesis that firms with more growth opportunities face higher costs associated with debt financing due to bankruptcy, risk-shifting, or underinvestment. Cash flow is negatively related to target debt, counter to the prediction that these firms would benefit from the tax savings and lower costs of free cash flow associated with debt.

KZ index: the Kaplan and Zingales index captures financial constraints (Graham 2000; Baker, Stein, and Wurgler, 2003), and firms with higher constraints face higher costs of issuing debt, which are to some extent mitigated by the disciplinary benefit that debt brings to firms with excess cash. I expect the probability of issuing equity should be increasing in the value of KZ index since more financially constrained firms are forced to issue equity. Following Baker, Stein, and Wurgler (2003), I exclude the Tobin's Q-ratio from the index, as a high Q-ratio might indicate overvaluation and thus contaminate the index as a measure of financial constraints. Hence, the KZ index is calculated as:

[14] Missing values of R&D are replaced by 0.

$$\text{(2)}\quad \text{KZ Index} = -1.002 \times \text{Cash flow} - 39.368 \times \text{Dividends} - 1.315 \times \text{Cash} + 3.139 \times \text{Book leverage}$$

Where: Cash flow [earnings before extraordinary items (# 18) + depreciation (item 14) divided by lagged total assets]; Dividends [cash dividends (# 21 + # 19) divided by lagged total assets]; cash [cash balances (# 1) divided by lagged total assets]; Book leverage [book value of debt (# 9 + # 34)] divided by book value of assets [book value of debt (# 9 + # 34) + stockholders' equity (# 216)].

The data for the *Aggregate Financing Costs Measures* are obtained from Datastream:

Interest rates: The real interest rate serves as a proxy for bankruptcy risk, as in Krishnaswami and Yaman (2008). This variable is calculated as the difference between yields on 10-year U.S. Treasury Bonds and the inflation rate, defined as the continuously-compounded annual change in the U.S. consumer price index.

Default premium: The default premium also captures bankruptcy risk (Korajczyk and Levy, 2003) and is defined as the difference between yields on Baa rated corporate Bonds and Aaa bonds. Both the real interest rate and the default premium are averaged over the 3 months prior to the issue date.

Market runup: Calculated as the return on the S&P 500 index over the quarter preceding the issue date, the stock market runup controls for general market conditions.

Confidence Index: I control for investor sentiment following several studies that highlight its importance in security issuance decisions (e.g., Lowry, 2003; Helwege and Liang, 2004). As a sentiment proxy I take the average level of the University of Michigan Consumer Sentiment Index over the three months prior to issuance.

V. Results

In part (A) of this section I examine the effects of past market timing on the underpricing of equity issues. I perform an analysis for equity issues occurring after previous SEOs and a separate analysis for firms issuing equity after their IPO, and contrast the results.

Part (B) presents a similar analysis, but I focus on the shareholder wealth effects at the SEO announcement date, instead of on underpricing. In Part (C) I model the influences of market timing on the capital structure, while in Part (D) I test my results for robustness to measures of short-sale constraints.

A. The impact of market timing on underpricing of subsequent SEOs

My main hypothesis proposes a relationship between returns following a past SEO or IPO and underpricing of a subsequent equity offering. Hence, my sample conditions on a firm returning to the market to raise further equity, but it is possible that the choice to do so is not random. For instance, a firm's choice on whether to issue further equity can depend on insider information about expected underpricing that is not observable to the market. An example of such a situation is one where a prospective issuer has lined up a convincing road show to market the equity issue after it is announced. Information released to selective investors during the road show might not even be impounded into prices until the issue is offered for sale, when the issue price is determined. Such a case would imply a correlation between the unobservable characteristics determining the decision to issue, and the unobservable influences in the underpricing regression, resulting in a selection bias. I address this concern by applying the Heckman (1979) 2-step procedure. where in the first step I estimate a probit regression to determine the decision to issue equity, from which I obtain the Inverse Mills' ratio. This captures unobservable characteristics influencing the decision to issue. I include the Inverse Mills' ratio in the second stage regression, where I regress underpricing on the market timing proxy and control variables. Some of the variables included in the first stage influence the decision to issue equity but not underpricing, helping the identification of the underpricing equation.

<< Please insert Table 2 about here >>

Table 2 shows the results of the first step of the Heckman procedure for equity issues that follow previous SEOs (Columns 1 and 2) and those following IPOs (Columns 2 and

3). The first step is performed using a panel regression consisting of all firms having at least one previous SEO, but not conditioning on them issuing again. The dependent variable takes a value of one if a firm issues equity again in a given firm-year, and a value of zero for every firm-year in which it does not. All explanatory variables are lagged by one year. The first two columns in Table 2 indicate that the probability of issuing equity following a previous SEO is positively related to both the 6-month and 12-month returns following the previous SEO. Havakimian and Hutton (2010) find similar results. The other explanatory variables are generally in line with the predictions of capital structure theory. For instance, the probability of an equity issue is also positively related to the stock run-up, Tobin's Q, and R&D expenditure, variables that have been used to capture growth opportunities. Firms are also more likely to issue equity if their leverage is above their target leverage. The results in Columns (3) and (4) refer to the sample of firms having done an IPO, but without conditioning on them issuing equity again. Both the 6-month and 12-month returns following the IPO have a positive influence on the likelihood of the firm issuing equity again, while most of the other determinants have a similar effect as in the SEO sample. IPO underpricing has an insignificant impact on the likelihood of issuing equity, in contrast to the predictions of models in which underpricing is used to signal better quality firms (e.g., Chemmanur, 1993; Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989).

<< Please insert Table 3 about here >>

Having shown that the probability of issuing further equity is positively influenced by the returns following a previous SEO or IPO, I next examine repeat issuers to test the hypothesis that past market timing impacts underpricing of subsequent equity issues. Table 3 presents the results of the second stage Heckman procedure, using the sample of firms that had a previous SEO. The dependent variable is underpricing, while I control for several determinants of underpricing previously documented in the literature (e.g., Altinkiliç and Hansen, 2003; Corwin, 2003), as well as the Inverse Mills' ratio calculated

from Table 2.[15] In addition, I control for the upward trend in underpricing documented in Figure (2) by including year dummies. The results in Column (1) suggest that past market timing has an impact on underpricing of subsequent equity issues. The significant negative coefficient for the six-month returns implies that underpricing is larger in the returns following a previous issue were more negative. In economic terms, if the returns are one standard deviation lower, underpricing increases by 0.29 percentage points. This represents 13% of the average underpricing across all SEOs. Column (2), indicates that the impact of the one-year returns on underpricing is similar, with one standard deviation lower returns resulting in higher underpricing of 0.22 percentage points (10% of the average). In the remaining analysis I report results for the one-year returns only, rather than the six-month variable.[16] I use the longer horizon for consistency with the results on issues following an IPO, for which the twelve-month period is more informative because it incorporates the expiration of the lock-up period. On the other hand, the longer horizon may be noisy due to developments after an issue that are not associated with market timing.

With regards to the other variables in the regression, the runup in stock prices prior to the announcement has a negative impact on underpricing. This is consistent with the runup capturing growth opportunities and positive sentiment about a company. In contrast volatility, particularly that attributable to firm-specific returns, increases underpricing, in line with the hypothesis that underpricing is higher when an issuer is exposed to more asymmetric information. The positive coefficient for firm age could be due to issuers late in their lifecycle, who raise funds due to cash shortfalls instead of investment opportunities, as documented in DeAngelo, DeAngelo, and Stulz (2010). A potential explanation for the negative coefficient on *Years previous*, is that firms signal their quality by waiting longer to issue as in the models of Lucas and MacDonald (1990), and Welch (1996). Underpricing is also lower for firms that are listed on the NYSE, in line with the findings or Corwin (2003), and consistent with Mola and Loughran (2004) and Altinkiliç and Hansen (2003), who use a dummy for Nasdaq issuers. The negative

[15] The specification in Column (1) of Table 3 uses the Inverse Mills' ratio from Column (1) of Table 2, while the remaining specifications in Table 3 use the Inverse Mills' ratio from Column (2) of Table 2. This is in accordance with whether 6-month, or 12-month returns are the variable of interest in Table 3.
[16] The results are similar if the six-month returns are used.

coefficient for *ln(price)*, and positive coefficient for *Tick<1/4* are both evidence of offer price rounding, consistent with the findings of Mola and Loughran (2004), and Corwin (2003).

In Column (3) I devise a further test of the hypothesis that past market timing impacts subsequent SEO underpricing. This hypothesis proposes that investors use the returns following previous issues to adjust their beliefs about the intentions of the issuer, and consequently the expected returns post-issuance. If this is the case, prospect theory (Kahneman and Tversky, 1979) would suggest that investor 'value' would be more sensitive to a drop in their wealth rather than an increase, assuming investors are loss-averse.[17] In order to test this proposition, I include an interaction term to allow for a differential effect of returns following a previous SEO on underpricing. The specification in Column (3) includes the interaction term, which has a positive and significant coefficient. Adding up the coefficient of *12 Mth. post-previous rets.* and the interaction term gives a total effect (0.06) on underpricing for the returns following a previous issue, when conditioning on these being positive. In contrast the coefficient for negative returns almost doubles, increasing the impact of past market timing on underpricing.

In Column (4) I interact the 12-month returns with a dummy variable that captures whether the issuer changed its CEO since the past issue was made.[18] If the identity of the CEO is more important, the signal from past issues is less informative if the CEO changes between issues. The interaction term has an estimated coefficient that is positive and significant, lending support to this hypothesis, since the influence of past returns has a smaller impact if a company changed its CEO. The coefficient of past returns remains negative for those companies that did not change their CEO. The coefficient for the dummy Change CEO (not interacted) is negative and significant, indicating that a change in CEO, by itself, reduces underpricing of future equity issues by 0.44 percentage points. This evidence suggests that a change in CEO signals a possible improvement in prospects for a company, and is consistent with the findings of Baker and Xuan (2009).

[17] In prospect theory the value function substitutes for a utility function, and value is derived from gains and losses around a reference point, rather than from levels (of wealth, in my case).
[18] Changes in the CEO are identified using Standard and Poor's Executive Compensation (ExecuComp) Database.

The final column of Table 3 includes two additional control variables, the abnormal returns for the window (-1, 1) around the filing date of the SEO, as well as the level of underpricing of the previous issue. The sample size is smaller since I omit observations for which the filing date is unavailable. The filing date return captures investor perceptions about the reasons for a firm issuing stock, including concerns about share price overvaluation, as in the Myers and Majluf (1984) framework. The estimated coefficient for *Filing CARs* is insignificant, indicating that information from the announcement date does not influence the final price that the shares are issued at. The coefficient of *Previous underpricing* is positive, so that past underpricing has some influence on underpricing of subsequent SEOs. This could reflect firm-specific effects, such as information asymmetry, that are not captured by the other control variables in the model. Even after including these two variables, the coefficient for the 12-month returns following past SEOs continues to have a negative and significant impact on underpricing.

<< Please insert Table 4 about here >>

Next I examine the hypothesis that past market timing impacts underpricing of SEOs that follow IPOs. Table 4 presents the results of the second stage Heckman procedure, using the sample of firms that had a previous IPO.[19] The dependent variable is underpricing, and I control for year effects in all specifications. Across all specifications, I find that returns following an IPO have no significant impact on underpricing of subsequent SEOs. These results are in contrast with those for multiple SEOs, documented in Table 3, and suggest that the post-IPO returns are not indicative of market timing motives in subsequent SEOs.

Turning to the other variables in Table 4, residual volatility has a marginally significant positive impact on underpricing, underlining the role of asymmetric information in underpricing. Tobin's Q is significantly positive across all specifications, suggests that this variable captures growth opportunities that are hard to value, or

[19] The specification in Column (1) of Table 4 uses the Inverse Mills' ratio from Column (3) of Table 2, while the remaining specifications in Table 4 use the Inverse Mills' ratio from Column (4) of Table 2. This is in accordance with whether 6-month, or 12-month returns are the variable of interest in Table 4.

overvaluation, both of which increase price uncertainty and lead to higher underpricing. The negative coefficient for *ln(price)*, is consistent with the practice of offer price rounding, while firms listed on the NYSE have larger underpricing, which is contrary to expectations. Column (5) indicates that the level of underpricing at the IPO does not influence subsequent SEO underpricing, which is inconsistent with the signaling models discussed earlier, and in line with the results in Table 2.

B. The impact of market timing on the announcement effects of SEOs

In the previous section, I use underpricing at the offering date to measure the cost of past market timing on subsequent equity issues, thus placing direct focus on the purchasers of the new issue. There are several reasons why underpricing is the appropriate measure to capture these costs. For instance, in the model of Benveniste and Spindt (1989) the demand for the new issue is partly reflected in the price discount, which compensates investors for revealing their private information. Hanley (1993) finds evidence for IPOs in line with the implications of this model, while Altinkiliç and Hansen (2003) show that underwriters adjust underpricing to incorporate private information of investors as reflected in the their order book.

While my primary focus is on underpricing at the offer date, theory suggests that the effects of past market timing should also to some extent be reflected in the announcement date returns, which capture shareholder walth effects. In the Myers and Majluf (1984) framework, adverse selection costs imply that companies have an incentive to issue shares when the market price is higher than the underlying value of the company.[20] An SEO announcement may signal overvaluation and is on average accompanied by a negative share price reaction. This signal should be stronger if the firm had timed its past equity issues to coincide with overvaluation.

However, the announcement day return also incorporates other information unrelated to market timing, such as signals about unanticipated financing requirements or

[20] Eckbo et al. (2007) note that unless all the new shares are sold to insiders, issuing undervalued equity dilutes the holding of current shareholders and results in a wealth transfer to purchasers of the new shares. Thus, issuers tend to wait till the market price is above the underlying value of the firm before issuing equity. Conversely, issuing overvalued equity to new investors results in a wealth transfer to current shareholders.

investment opportunities (see, e.g., Cooney and Kalay, 1993; Miller and Rock, 1985). This softer information embodies unobservable beliefs of investors, and is harder to control for. On the other hand, this information would be mostly incorporated into the share price by the time the issue is made. In addition, the announcement day reaction may be contaminated by uninformed or passive investors. Existing shareholders also have an incentive to keep the share price high, at least until after the issue is sold, so as to extract wealth from purchasers of the new shares. On the other hand, investors buying new shares have the option not to purchase the issue unless their updated beliefs about the expected return distribution, as well as the riskiness of these shares, is incorporated into the discount.

Whereas there may be some uninformed investors holding a company's stock, the purchasers of the new shares have a greater incentive to search for information, so that they should be more informed than the average existing shareholder. Market timing should also be more of a concern for the purchasers of the new equity than for current shareholders, since current shareholders benefit if additional stock is issued when valuations are high, thus raising more funds, before the share price drops to its true value.

<< Please insert Table 5 about here >>

I examine the effects of past market timing on announcement of equity issues in Table 5. The dependent variable is the cumulative abnormal returns (CARs) around the window (-1, 1), surrounding the announcement of an equity issue. The first two columns present estimates for the sub-sample of equity issues that are preceded by SEOs, whereas the other two columns pertain to the sub-sample of issues that follow an IPO. The explanatory variables are similar to those used in previous studies on equity issues (e.g. D'Mello, Tawatnuntachai, and Yaman, 2003; Bayless and Chaplinsky, 1996). I exclude year dummies in all regressions, since a χ^2 test does not reject the restriction that all the year dummy variable coefficients are jointly equal to zero (*p*-value of 0.33). The Inverse Mills' ratio used in each regression is calculated using the probit model in the corresponding Column of Table 2.

The results in the first two columns of Table 5 indicate that the announcement returns are positively influenced by the returns following previous SEOs. This is evidence that market timing motives, captured by the returns following previous issues, are also incorporated in the beliefs of investors at the announcement of an issue. With regards to the firm characteristics, announcement returns are lower for riskier firms, but higher for those with a larger stock runup and Tobin's Q, suggesting that these signal growth opportunities. Announcement returns are positively related to size, as proxied by *ln(sales)*, fixed assets of the issuer, and the dummy for having issued debt in the past. Issuers that have less tax benefits of issuing debt are also better received by the market. The Inverse Mills' ratio is positive and significant in Columns (1) and (2), indicating that there is 'soft' information that is not captured by observable variables in the selection model of Table 2, but which influences the decision to issue equity and also affects the stock price reaction positively. In contrast, almost all of the variables in Columns (3) and (4) are not significant in explaining the stock price reaction to equity announcements that follow IPOs. The insignificance of the firm characteristics could be because the stock price already incorporates information related to these characteristics, and the announcement of a stock issue does not alter the effect that these variables have on the stock price. The low R^2 is common in studies that examine the announcement effects of SEOs, and shows that the determinants of the market reaction are not well understood.

C. The impact of market timing on capital structure

The results in the previous section show that underpricing is larger for those firms with lower returns in the year following a previous issue. In this section I test whether firms take this into account when they decide whether to issue equity or debt. Underpricing represents an additional cost of issuing equity, since new securities are issued at below the market price. Hence I expect firms to prefer debt over equity financing if they expect larger underpricing, all else equal. I test this hypothesis by using a probit model to capture the marginal influence of returns following a previous issue, on the decision to issue equity or debt. I perform this analysis separately for SEOs and IPOs, and I condition that a firm returns to the market to issue either debt or equity. The

dependent variable takes a value of one if a firm switches to debt, and zero if it issues equity.

<< Please insert Table 6 about here >>

I control for other determinants of capital structure, similar to those used in Table 2.[21] Panel A of Table 6 shows descriptive statistics for firms that switch to debt and those that stick with another equity issue, having previously made an SEO. Out of a total of 1,732 equity issues, only 593 are followed by a debt issue, compared with 1,139 that are followed by an SEO.[22] Both the average 6-month and 12-month returns following a previous SEO are lower for those firms that switch to debt. These firms have a smaller stock price runup, are less risky, and have smaller growth opportunities (as measured by *Tobin's Q* and *R&D expense*), making debt issues less prone to risk shifting costs (e.g., Green, 1984). The lower slack and larger fixed assets mitigate costs related to overinvestment and bankruptcy. Firms that switch to debt are also larger (*sales*) and older, and would consequently find it easier to switch to debt since they are more established with market participants. In fact, their leverage is above the target, suggesting that the debt issue is not done to immediately re-balance their capital structure. The coefficients estimated by the probit regression in Panel B are largely in line with the univariate analysis. The coefficients for both *6-Mth. Post-previous Rets.* and *12-Mth. Post-previous Rets.* are negative, so that a firm is more likely to switch to debt if its previous SEO was followed by lower returns. In economic terms, when the 6-month (12-month) returns are one standard deviation lower, the probability of switching to debt rises by 2.21% (2.26%). These results support the hypothesis that firms take into account expected equity issue costs that arise from past market timing, thus influencing their capital structure. A corollary is that past market timing may constitute a financing constraint prohibiting future fund-raising and investments. The evidence presented here

[21] For the model I use in this section I know the precise issue date of equity or debt, which differs from that in Table 2, where firm-years are used in a panel setting. Thus, I can use more precise proxies for the stock runup and volatility, in line with the underpricing regressions in Tables 3 and 4.

[22] Firms switching to debt may subsequently raise equity, which is why the total number of equity issues in Panel A of Table 1 is larger than 1,732.

adds to that in Huang and Ritter (2009), and Baker and Wurgler (2002), who document that market timing has long-lasting influences on capital structure.

<< Please insert Table 7 about here >>

I perform a similar analysis for equity issues that follow IPOs, as shown in Table 7. Out of a total of 1,033 IPOs, only 94 are followed by a debt issue. Panel A shows that the average 6-month and 12-month returns following the IPO are lower for those firms that switch to debt, but not significant in the regression analysis in Panel B. For the firm characteristics, both the univariate analysis in Panel A and the regression estimates in Panel B indicate that firms switching to debt have lower debt-related costs than those sticking with equity, in line with the findings in Table 6. IPO underpricing is larger for firms that issue equity after their IPO, supporting the predictions of signaling models in which underpricing is used to signal firm quality (e.g., Chemmanur, 1993; Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989).

<< Please insert Table 8 about here >>

In Table 8 I test whether the impact of past market timing on underpricing is robust for the sub-samples of firms that stick with equity. In columns (1) and (2) I examine the same sample of firms that stick with equity as in Panel A of Table 6. The results indicate that the impact of *6-Mth. Post-previous Rets.* and *12-Mth. Post-previous Rets.* on underpricing remains significantly negative for SEOs following previous SEOs. The Inverse Mills' ratio used in columns (1) and (2) are those estimated using the probit model in the corresponding columns in Panel B of Table 6.[23] In columns (3) and (4) of Table 8 I examine the sample of firms that follow an IPO with an equity offering, taken from Table 7. In this case, the returns following IPOs have an insignificant impact on underpricing.

[23] To estimate the correct Inverse Mills' ratio I change the dependent variable in the probit regression to one if a firm sticks with equity.

D. Underpricing and short-sale constraints

Singal and Xu (2005) find that the negative returns following an SEO are largely due to short-sale constrained stocks (i.e., stocks that are difficult to short). If SEOs made by short-sale constrained issuers are also underpriced more, then the market timing effect that I document in the previous sections, may in fact be spurious. One reason why short-sale constrained stocks can have larger underpricing is that the pre-offer price does not reflect the market's valuation because investors cannot short the stocks and impound this information into prices (especially in the period between the announcement and issue dates). On the other hand, shares that are hard to short-sell offer less opportunities for manipulative traders to influence the offer price, so that underpricing is less. In this section I introduce proxies to capture stocks that are short-sale constrained, and re-run the underpricing regressions to test if the effects of market timing remain robust.

The first proxy for short-sale constraints is short interest, scaled by the total number of shares outstanding (both measured over the quarter prior to the SEO announcement date). This captures the demand for sales for shorting purposes. Short interest data are obtained from the Securities Monthly file of the CRSP-Compustat merged database, and are available from 2003 onwards. The mean (median) number of shares that are shorted, relative to shares outstanding, is 5.60% (3.74%) in my sample. However, Asquith, Pathak, and Ritter (2005) emphasize the importance of also controlling for the supply of shares that can potentially be borrowed for shorting purposes. I capture supply effects by using the number of shares held by 13F institutions (obtained from Thomson Reuters), divided by the number of shares outstanding (both measured over the quarter prior to the SEO announcement date). Institutional investors are a measure of supply since they are more likely to lend out their shares than individual investors. The mean (median) number of shares held by institutions, relative to shares outstanding, is 51.23% (50.60%).

My third proxy for constraints is the liquidity of the shares. High liquidity makes it easier for short-sellers to obtain shares, and open short positions can be covered without creating a large adverse price impact. I use the Amihud (2002) illiquidity measure, calculated as the ratio of the absolute value of daily stock returns divided by trading volumes averaged over the window $(-62, -2)$ relative to the SEO announcement date. As in Corwin (2003), I also control for the change in the stock price immediately prior to the

issue by taking the abnormal returns over days (-6, -2) relative to the issue date. Changes in the stock price can be due to short-sellers and manipulative trading, or the result of information production. Henry and Koski (2009) find that manipulative trading increases underpricing, whereas Chemmanur, He, and Hu (2009), provide evidence that institutional trading reflects an information production role rather than manipulative trading.

As a final robustness test, I introduce a dummy variable to capture the period after SEC Rule 10b-21 was introduced in August 1988.[24] Since this rule limits short-selling, the period after its introduction should be one where the effects of short-sale constraints on underpricing can be separated from the effects of past market timing. Hence, if my results are not spurious, they should remain significant in the period after Rule 10b-21 was introduced. This robustness test is especially appealing since it represents an exogenous event that directly captures a change in short sale constraints common to all issuers. Several studies (e.g., Singal and Xu, 2005; Kim and Shin, 2004; Safieddine and Wilhelm, 1996) examine the consequences of the adoption of Rule 10b-21 in 1988, but find contrasting results with respect to its effect on underpricing.

<< Please insert Table 9 about here >>

I present the results of the underpricing regression including the controls for short-sale constraints, in Table 9.[25] In column (1) I introduce *Instit. ownership* and *Short interest*, which enter the regression with the hypothesized sign, but are insignificant. The coefficient for the returns following a previous SEO remains significantly negative, indicating that short-selling effects have a separate influence from the market timing effects. In column (2) *Instit. ownership* becomes significant, when I omit *Short interest*, which allows the regression to be estimated from 1980 instead of 2003. In Column (3)

[24] Rule 10b-21 prohibited the use of shares purchased at the offering to cover short sales positions established between the initial filing and offer date. In April 1997, this rule was replaced by Rule 105 of Regulation M, which prohibited traders from covering short sales made within five days of the offering with shares obtained in the offering.

[25] In unreported results I split my sample based on the median value of several firm characteristics that D'Avolio (2002) finds to be related to short-sale constraints, such as size, market-to-book ratio, and cash flow. The effect of *12 Mth. post-previous rets.* remains significant in all sub-samples.

Amihud has a positive coefficient, indicating that more illiquid companies underprice their issues to a larger degree. When the 5-day abnormal returns prior to an issue are positive (*Positive 5-day CARs*), the estimated coefficient implies a positive influence on underpricing. This supports models in which private information revelation prior to an offer is rewarded with larger underpricing (e.g., Hanley, 1993; Benveniste and Spindt, 1989). The dummy variable for Rule 10b-21 shows a positive coefficient when interacted with *12 Mth. post-previous rets.* in Column (4). While the effects of past market timing on underpricing are weaker after this rule was introduced, the influence of *12 Mth. post-previous rets.* remains negative (adding up the coefficients results in a net effect of -0.38). In addition a χ^2 test rejects the restriction that the sum of the two coefficients is equal to zero (*p*-value of 0.00). In Column (5) I introduce all the controls that are available after 2003, with the only change being that the coefficient for *Negative 5-day CARs*, becomes positive. A potential reason is that short-sellers manipulate prices prior to an issue to obtain shares at lower prices, even though this practice is prohibited.

VI. Conclusions

Market timing is commonly cited as a determinant of equity issues, although the cost of timing equity offerings on future issues are not well known. In this paper I show that offerings are issued at a greater discount to the pre-issue market price if an issuer had exhibited market timing behavior with previous offerings. I capture market timing behavior by the abnormal returns in the year following a previous issue, and find that underpricing of equity offerings is greater if abnormal returns were more negative. The additional discount by past market timers can be seen as compensation for the perceived risk that these issuers will time the market again.

The effect of past market timing is most pronounced for issuers that did not experience a change in their CEO in the period between issues, suggesting that the identity of the CEO matters in assessing past firm performance. I also find that underpricing is less sensitive to positive returns that follow a previous issue, than it is to negative returns. This asymmetric effect could imply that investors are more concerned about potential losses compared with gains, in line with prospect theory. Whereas SEOs are underpriced by more if returns following previous *SEOs* are more negative, they are

not underpriced by more if returns following previous *IPOs* are more negative. This suggests that investors view IPOs as being less indicative of the market timing motives of follow-on equity issuers.

Past market timing also has an influence on capital structure decisions. I find that, following an equity issue, firms are more likely to switch to debt if they had timed their previous equity offering. This suggests that past market timers anticipate the higher discounting and switch to debt in order to avoid additional dilution of share value. A corollary of this finding is that firms' financial constraints increase if they time the market with previous issues, especially if they are unable to subsequently switch to debt. Thus, my results have implications for the objective function that managers should maximize when considering an equity issue. In particular, the cost of raising capital in the future should be considered in tandem with the cost of a present issue.

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Table 1: Summary statistics for follow-on seasoned equity offerings

Panel A provides descriptive statistics for equity issues that follow SEOs, while Panel B provides descriptive statistics for equity issues that follow IPOs. *SEO underpricing* is the logarithm of the ratio of the closing share price on the day prior to the offer, to the offer price. *6 Mth. post-previous rets.* (*12 Mth. post-previous rets.*) refers to the buy-and-hold returns over the 6-month (12-month) period after a previous SEO. *6 Mth. post-IPO rets.* (*12 Mth. post-IPO rets.*) refers to the buy-and-hold returns over the 6-month (12-month) period after a previous IPO. *Filing CARs* is measured as the raw cumulative stock return over trading days -1 to +1 relative to the announcement date less the CRSP equally weighted market index return over the same period. *Abn. stock runup* is the raw cumulative stock return over trading days -62 to -2 prior to the announcement date less the CRSP equally weighted market index return over the same period. *Residual volatility* is computed as the annualized standard deviation of residuals from a regression of daily excess stock returns on excess returns on the value-weighted CRSP market portfolio, estimated over trading days -62 to -2 before the announcement date. *Systematic volatility* is computed as the annualized standard deviation of the predicted value from a regression of daily excess stock returns on excess returns of the value-weighted CRSP market portfolio, estimated over trading days -62 to -2 before the announcement date. *MV* is the market value from CRSP measured 5 days before the announcement of the issue. *Tobin's Q* is calculated as the market value of equity (Compustat # 25 x # 199) + total assets (# 6) – book value of equity (# 60)/total assets. *Relative proceeds* is calculated as the number of shares issued dived by the number of shares outstanding. *Age* is measured as the difference, in years, between the issue date and the date that the firm first appears in the CRSP database. *Years previous*: is the number of years that have elapsed since the previous issue. *Price* is the market price measured 5 days before issue. *Underwriter Prestige is a* dummy equal to one for prestigious underwriters, defined as those having a ranking of 8 or higher on the Carter and Manaster (1990) 9-point scale. *NYSE* is a dummy variable for issuers on the New York Stock Exchange. *Previous debt issue* is a dummy variable for issuers that make a debt issue in between the current SEO and a previous equity offering. *Change CEO* is a dummy variable equal to one if there was a change in the CEO since the previous issue was made, identified using Standard and Poor's Executive Compensation (ExecuComp) Database. A *t*-test ($\chi 2$ test for the binomial dummy variables) is used to test for the equality of means across sub-samples. N denotes the number of observations.

	Panel A: SEOs following an SEO (N=1,476)			*Panel B:* SEOs following an IPO (N=1,018)			Difference in means
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	
SEO underpricing	0.022	0.012	0.033	0.028	0.018	0.040	-0.01***
6 Mth. post-previous rets.	0.026	0.026	0.328				
12 Mth. post-previous rets.	0.022	0.024	0.476				
6 Mth. post-IPO rets.				-0.021	-0.020	0.364	
12 Mth. post-IPO rets.				0.217	0.203	0.553	
Filing CARs	-0.020	-0.020	0.061	-0.026	-0.028	0.073	0.01**
Abn. stock runup	0.117	0.085	0.245	0.141	0.106	0.288	-0.02**
Residual volatility	0.457	0.405	0.225	0.543	0.497	0.237	-0.09***
Systematic volatility	0.147	0.128	0.104	0.142	0.120	0.107	0.01
MV	1161.2	353.6	3189.9	406.4	138.4	1418.9	754.82***
Tobin's Q	2.115	1.575	1.819	3.390	2.281	4.800	-1.27***
Relative proceeds	0.291	0.198	0.431	0.395	0.296	0.378	-0.11***
Age	15.102	10.290	14.361	3.490	2.138	3.425	11.61***
Years previous issue	3.465	2.754	2.205	3.129	2.370	2.059	0.34***
Price	27.496	23.690	18.998	21.495	18.960	15.730	6.01***
Tick<1/4 (%)	63.600			57.589			6.01**
Underwriter prestige (%)	58.059			40.357			17.71***
NYSE (%)	43.509			13.304			30.21***
Previous debt issue (%)	18.878			7.812			11.07***
Change CEO (%)	9.914			4.017			5.89***

Table 2: Returns following previous equity issues and the probability of a follow-on SEO

This Table presents the results of a panel probit regression that estimates the probability of issuing equity for firms that have a prior equity offering or IPO, over the period 1975-2007. The dependent variable is one if a firm makes an issue in a firm-year and zero otherwise. *6 Mth. post-previous rets.* (*12 Mth. post-previous rets.*) refers to the buy-and-hold returns over the 6-month (12-month) period after a previous SEO. *6 Mth. post-IPO rets*. (*12 Mth. post-IPO rets.*) refers to the buy-and-hold returns over the 6-month (12-month) period after a previous IPO. All other variables are calculated over the year preceding the issue date. *Abn. stock runup* is the raw cumulative monthly stock return less the CRSP equally weighted market index return. *Stock volatility* is computed as the annualized standard deviation of monthly stock returns. *Slack* is cash and short-term investments (# 1) divided by total assets (# 6). *Fixed assets* is calculated as plant, property and equipment (# 8) divided by total assets (# 6). *Ln(sales)* is the natural logarithm of total sales (# 12). *Taxes* is computed as income tax (# 16) divided by total assets. *Tobin's Q* is calculated as the market value of equity (# 25 x # 199) + total assets (# 6) – book value of equity (# 60)/total assets. *R&D expense* is the expenditure on research and development (# 46) divided by total assets. *Leverage-Target* refers to the deviation of the market leverage from the target leverage, as calculated in Section IV. *KZ index* is the Kaplan and Zingales index of financial constraints, as calculated in Section IV. *Age* is the firm age in years, calculated using the firm first instance when the firm appears in the CRSP database. *Years previous* is the number of years that have elapsed since the previous issue. *Interest rates* refers to the quarterly average real interest rate, measured as the difference between yields on 10-year Treasury Bonds and the inflation rate. *Default premium* is defined as the difference between yields on Baa rated corporate Bonds and Aaa bonds. *Market runup* captures the return on the S&P 500 Index. *Confidence index* is the quarterly average level of the Michigan Consumer Sentiment Index. *Z*-statistics, calculated using heteroskedasticity-robust standard errors, are in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Seasoned offerings		IPOs	
	(1)	(2)	(3)	(4)
Returns following previous issue				
6 Mth. post-previous rets.	0.29 ***			
	(7.92)			
12 Mth. post-previous rets.		0.27 ***		
		(9.67)		
6 Mth. post-IPO rets.			0.23 ***	
			(5.56)	
12 Mth. post-IPO rets.				0.23 ***
				(7.22)
Issuer characteristics				
Abn. stock runup	0.67 ***	0.65 ***	0.85 ***	0.85 ***
	(23.64)	(22.95)	(22.53)	(21.53)
Stock Volatility	-0.59 ***	-0.58 ***	-0.77 ***	-0.75 ***
	(-9.90)	(-9.69)	(-12.12)	(-11.49)
Slack	0.06	0.08	0.10	0.10
	(0.69)	(0.90)	(1.00)	(1.03)
Fixed assets	0.40 ***	0.41 ***	0.45 ***	0.48 ***
	(5.63)	(5.83)	(5.16)	(5.31)
Ln(Sales)	0.06 ***	0.06 ***	0.08 ***	0.08 ***
	(6.80)	(6.20)	(6.43)	(6.32)
Taxes	-0.80 **	-0.96 **	0.12	0.05
	(-2.08)	(-2.49)	(0.25)	(0.11)
Tobin's Q	0.01 *	0.01	0.03 ***	0.03 ***
	(1.93)	(1.16)	(3.88)	(3.87)
R&D expense	1.36 ***	1.37 ***	0.77 ***	0.73 ***
	(12.05)	(12.08)	(5.75)	(5.21)
Leverage-Target	0.70 ***	0.72 ***	1.07 ***	1.13 ***
	(4.94)	(5.03)	(4.85)	(5.09)
KZ index	0.02 **	0.02 **	-0.02 ***	-0.02 ***
	(2.41)	(2.38)	(-3.18)	(-2.91)
Age	0.00 ***	0.00 ***	-0.10 ***	-0.10 ***
	(-3.66)	(-3.48)	(-7.30)	(-7.36)
Years previous issue	-0.10 ***	-0.10 ***	-0.06 ***	-0.06 ***
	(-18.11)	(-17.91)	(-5.44)	(-5.16)
Previous underpricing	-0.39	-0.36		
	(-1.03)	(-0.96)		
IPO underpricing			-0.08	-0.07
			(-1.49)	(-1.28)
Aggregate Financing Costs Measures				
Interest rates	0.11	0.11	0.06	0.03
	(0.23)	(0.24)	(0.59)	(0.33)
Default premium	0.51 **	0.54 **	-0.84 **	-0.79 *
	(2.10)	(2.21)	(-2.10)	(-1.94)
Market runup	-5.99 ***	-6.11 ***	-0.20	-0.43
	(-3.83)	(-3.89)	(-0.15)	(-0.33)
Confidence Index	-0.08	-0.09	-0.04 **	-0.04 **
	(-1.25)	(-1.25)	(-2.27)	(-2.24)
Intercept	5.35	5.44	3.59 **	3.54 *
	(1.01)	(1.02)	(1.98)	(1.92)
Year dummies	Yes	Yes	Yes	Yes
Pseudo R-squared	14.98 %	15.36 %	20.72 %	21.58 %
No. of observations	23,834	23,834	13,302	13,302

Table 3: Returns following SEOs and underpricing of subsequent equity issues

This table presents the results of an OLS regression where the dependent variable is underpricing, using the sample of firms having made a previous SEO. The variables are explained in Table 1, with the exception of the following: $D_{Positive\ rets}$. is a dummy equal to one if the *12 Mth. post-previous rets* are positive. The specification in Column (1) uses the Inverse Mills' ratio from Column (1) of Table 2, while the remaining specifications in use the Inverse Mills' ratio from Column (2) of Table 2. This is in accordance with whether 6-month, or 12-month returns are the variable of interest in Table 3. *t*-statistics, calculated using heteroskedasticity-robust standard errors, are in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Returns following previous SEO					
6 Mth. post-previous rets.	-0.87 ***				
	(-6.33)				
12 Mth. post-previous rets.		-0.46 ***	-0.88 ***	-0.52 ***	-0.46 ***
		(-7.38)	(-3.81)	(-7.04)	(-7.81)
12 Mth. post-previous rets*$D_{Positive\ rets.}$			0.75 **		
			(2.23)		
12 Mth. post-previous rets*$D_{Change\ CEO.}$				0.80 *	
				(1.88)	
Issuer characteristics					
Change CEO				-0.44 *	
				(-1.79)	
Abn. stock runup	-1.28 ***	-1.24 ***	-1.24 ***	-1.26 ***	-1.35 ***
	(-10.88)	(-14.56)	(-13.61)	(-12.85)	(-4.39)
Residual volatility	3.66 ***	3.63 ***	3.52 ***	3.63 ***	2.93 ***
	(10.83)	(10.85)	(8.95)	(11.13)	(5.01)
Systematic volatility	1.66 ***	1.66 ***	1.53 ***	1.74 ***	1.12
	(2.93)	(3.09)	(2.95)	(3.08)	(1.25)
Ln(MV)	-0.13	-0.12	-0.12	-0.13	-0.09
	(-1.61)	(-1.57)	(-1.59)	(-1.62)	(-1.23)
Tobin's Q	0.10 *	0.10	0.10	0.10 *	0.12 ***
	(1.66)	(1.62)	(1.54)	(1.69)	(3.11)
Relative proceeds	0.00	-0.01	-0.02	-0.01	0.02 **
	(0.00)	(-0.06)	(-0.11)	(-0.09)	(2.30)
Age	0.03 ***	0.02 ***	0.02 ***	0.03 ***	-0.01
	(9.06)	(8.37)	(8.23)	(8.98)	(-0.39)
Years previous	-0.02 *	-0.02 *	-0.02 *	-0.01	0.09
	(-1.72)	(-1.92)	(-1.95)	(-0.80)	(0.43)
Ln(Price)	-0.76 ***	-0.75 ***	-0.75 ***	-0.72 ***	-1.08 ***
	(-3.95)	(-3.76)	(-3.82)	(-3.71)	(-9.02)
Tick<1/4	0.11 ***	0.10 ***	0.10 ***	0.10 ***	0.25 *
	(3.56)	(3.59)	(3.43)	(3.43)	(1.95)
Underwriter prestige	0.08	0.07	0.06	0.07	0.07
	(0.33)	(0.26)	(0.23)	(0.26)	(0.21)
NYSE	-0.28 **	-0.28 **	-0.27 **	-0.28 **	-0.27
	(-2.31)	(-2.17)	(-2.10)	(-2.14)	(-1.29)
Previous debt issue	-0.07	-0.07	-0.06	-0.04	0.06
	(-0.62)	(-0.59)	(-0.53)	(-0.33)	(0.24)
Inverse Mills' ratio	0.05	0.04	0.05	0.04	0.18
	(0.37)	(0.31)	(0.42)	(0.35)	(1.39)
Filing CARs					-0.36
					(-0.70)
Previous underpricing					0.08 ***
					(5.40)
Intercept	0.94 **	0.87 **	0.83 *	0.75 **	1.93 ***
	(2.52)	(2.24)	(1.89)	(2.14)	(3.63)
Year dummies	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	24.98 %	24.68 %	24.82 %	24.79 %	24.97 %
No. of observations	1,476	1,476	1,476	1,476	871

Table 4: Returns following IPOs and underpricing of subsequent equity issues

This table presents the results of an OLS regression where the dependent variable is underpricing, using the sample of firms having made a previous IPO. The variables are explained in Table 1, with the exception of the following: $D_{Positive\ rets}$. is a dummy equal to one if the *12 Mth. post-previous rets* are positive. The specification in Column (1) uses the Inverse Mills' ratio from Column (3) of Table 2, while the remaining specifications in use the Inverse Mills' ratio from Column (4) of Table 2. This is in accordance with whether 6-month, or 12-month returns are the variable of interest in Table 4. *t*-statistics, calculated using heteroskedasticity-robust standard errors, are in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Returns following previous SEO					
6 Mth. post-IPO rets.	-0.05				
	(-0.15)				
12 Mth. post-IPO rets.		0.28	0.84	0.31	0.42
		(1.22)	(1.42)	(1.28)	(1.58)
12 Mth. post-IPO rets*$D_{Positive\ rets.}$			-0.80		
			(-1.09)		
12 Mth. post-IPO rets*$D_{Change\ CEO.}$				-0.68	
				(-0.86)	
Issuer characteristics					
Change CEO				0.50	
				(0.74)	
Abn. stock runup	0.79	0.76	0.75	0.76	0.18
	(1.28)	(1.23)	(1.20)	(1.23)	(0.27)
Residual volatility	1.53 *	1.19	1.26	1.19	1.92 *
	(1.84)	(1.34)	(1.42)	(1.35)	(1.85)
Systematic volatility	-0.24	-0.30	-0.33	-0.30	-1.78
	(-0.18)	(-0.21)	(-0.23)	(-0.21)	(-1.06)
Ln(MV)	-0.11	-0.20	-0.20	-0.21	-0.49 **
	(-0.62)	(-1.09)	(-1.08)	(-1.12)	(-2.12)
Tobin's Q	0.15 ***	0.14 ***	0.14 ***	0.14 ***	0.15 ***
	(3.13)	(2.83)	(2.86)	(2.82)	(2.72)
Relative proceeds	0.58	0.54	0.54	0.54	-0.06
	(1.52)	(1.42)	(1.41)	(1.41)	(-1.33)
Age	0.06 *	0.05	0.05	0.05	0.16 ***
	(1.89)	(1.55)	(1.55)	(1.56)	(2.76)
Years previous	-0.02	0.01	0.01	0.00	0.00
	(-0.30)	(0.17)	(0.17)	(0.08)	(0.00)
Ln(Price)	-2.02 ***	-1.97 ***	-1.98 ***	-1.98 ***	-1.54 ***
	(-6.82)	(-6.57)	(-6.55)	(-6.58)	(-3.95)
Tick<1/4	-0.28	-0.28	-0.28	-0.29	-0.15
	(-1.22)	(-1.21)	(-1.22)	(-1.24)	(-0.55)
Underwriter prestige	-0.32	-0.22	-0.22	-0.21	-0.25
	(-1.34)	(-0.89)	(-0.90)	(-0.87)	(-0.85)
NYSE	0.77 **	0.77 *	0.77 *	0.77 *	0.90 *
	(1.97)	(1.91)	(1.90)	(1.88)	(1.81)
Previous debt issue	-0.49	-0.53	-0.53	-0.52	-0.39
	(-1.35)	(-1.38)	(-1.39)	(-1.37)	(-0.85)
Inverse Mills' ratio	0.09	0.12	0.12	0.12	-0.10
	(0.42)	(0.58)	(0.54)	(0.57)	(-0.38)
Filing CARs					0.07
					(0.03)
IPO underpricing					-0.00
					(-0.38)
Intercept	4.87 ***	5.03 ***	5.15 ***	5.11 ***	5.93 ***
	(4.13)	(4.14)	(4.17)	(4.14)	(4.27)
Year dummies	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	25.04 %	24.61 %	24.62 %	24.5 %	18.89 %
No. of observations	1,018	1,018	1,018	1,018	782

Table 5: SEO announcement effects and returns following previous issues

This table presents the results of an OLS regression where the dependent variable is *Filing CARs*, which captures the abnormal stock returns over the window (-1, 1) relative to the filing date. The firms in this sample have made a previous SEO (Columns 1 and 2) or IPO (Columns 3 and 4). The variables are explained in Table 1. The Inverse Mills' ratio used in each regression is calculated using the probit model in the corresponding Column of Table 2. *t*-statistics, calculated using heteroskedasticity-robust standard errors, are in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Seasoned offerings		IPOs	
	(1)	(2)	(3)	(4)
Returns following previous issue				
6 Mth. post-previous rets.	0.49 *			
	(1.78)			
12 Mth. post-previous rets.		0.52 **		
		(2.15)		
6 Mth. post-IPO rets.			0.99	
			(0.98)	
12 Mth. post-IPO rets.				0.17
				(0.22)
Issuer characteristics				
Abn. stock runup	2.35 ***	2.28 ***	1.85	1.73
	(3.35)	(3.59)	(0.88)	(0.80)
Residual volatility	-3.01 **	-2.95 **	0.39	-0.63
	(-2.22)	(-2.16)	(0.14)	(-0.27)
Systematic volatility	2.19	2.11	-5.25	-5.03
	(1.56)	(1.38)	(-1.32)	(-1.31)
Slack	-0.01	0.02	0.46	0.25
	(-0.01)	(0.03)	(0.22)	(0.12)
Fixed assets	1.62 ***	1.62 ***	0.28	-0.33
	(2.66)	(2.60)	(0.19)	(-0.21)
ln(Sales)	0.25 **	0.24 **	0.53 *	0.50 *
	(2.53)	(2.29)	(1.91)	-1.76
Taxes	-9.22 *	-9.44 **	-10.55	-13.19
	(-1.93)	(-1.97)	(-1.39)	(-1.77) *
Tobin's Q	0.43 ***	0.42 ***	0.07	0.05
	(7.36)	(6.97)	(1.27)	(0.93)
R&D expense	-0.27	-0.15	3.45	3.67
	(-0.28)	(-0.16)	(0.97)	(1.02)
Leverage-Target	-0.88	-0.83	2.01	-0.13
	(-0.97)	(-0.89)	(0.83)	(-0.05)
KZ index	-0.06	-0.05	0.01	0.02
	(-0.38)	(-0.37)	(0.10)	(0.17)
Age	0.02 ***	0.02 ***	-0.03	0.00
	(2.99)	(3.07)	(-0.33)	(-0.06)
Years previous issue	-0.09	-0.06	-0.04	0.09
	(-0.99)	(-0.70)	(-0.22)	(0.50)
Previous debt issue	0.81 **	0.81 **	0.99	0.85
	(2.14)	(2.09)	(0.94)	(0.78)
Previous underpricing	0.02	0.02		
	(0.22)	(0.23)		
IPO underpricing			0.00	0.00
			(0.21)	(-0.23)
Inverse Mills' ratio	0.52 ***	0.55 ***	-0.34	-0.59
	(4.73)	(4.53)	(-0.61)	(-0.98)
Intercept	-5.32 ***	-5.46 ***	-5.03 **	-4.10 ***
	(-5.40)	(-5.36)	(-2.05)	(-1.73)
Year dummies	No	No	No	No
Adjusted R-squared	3.11 %	3.00 %	0.09 %	0.04 %
No. of observations	871	871	782	782

Table 6: Impact of returns following previous SEO on capital structure

Panel A provides descriptive statistics for a sample of firms with a prior SEO, that subsequently issue further equity or switch to debt. Panel B shows a probit regression that estimates the probability of switching to debt for firms that have a prior equity offering, over the period 1975-2007. The dependent variable is one if a firm switches to debt and zero if it issues equity. The independent variables are explained in Table 2, with the exception of the following: *Abn. stock runup* is the raw cumulative stock return over trading days -62 to -2 prior to the announcement date less the CRSP equally weighted market index return over the same period. *Stock volatility* is computed as the annualized standard deviation of daily stock returns over trading days -62 to -2 before the announcement date. *Z*-statistics, calculated using heteroskedasticity-robust standard errors, are in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Panel A: Descriptive statistics							*Panel B: Probit regressions*	
	Switch to debt			Stick with equity			Difference		
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	in means	(1)	(2)
Returns following previous SEO									
6 Mth. Post-previous Rets.	-0.01	0.00	0.27	0.04	0.04	0.34	-0.05***	-0.31 **	
								(-2.21)	
12 Mth. Post-previous Rets.	-0.04	-0.02	0.37	0.05	0.05	0.50	-0.09***		-0.21 **
									(-2.14)
Issuer characteristics									
Abn. stock runup	0.01	0.00	0.19	0.13	0.10	0.25	-0.11***	-1.29 ***	-1.28 ***
								(-5.65)	(-5.61)
Stock Volatility	0.39	0.34	0.20	0.51	0.45	0.24	-0.12***	0.37	0.35
								(1.37)	(1.31)
Slack	0.06	0.03	0.08	0.17	0.08	0.22	-0.12***	-1.06 **	-1.05 **
								(-2.16)	(-2.14)
Fixed assets	0.44	0.42	0.24	0.33	0.27	0.24	0.10***	1.11 ***	1.12 ***
								(6.12)	(6.19)
Sales	3106.6	1287.8	4536.5	643.7	191.5	1662.2	2462.9***	0.37 ***	0.37 ***
								(10.12)	(10.14)
Taxes	0.03	0.03	0.03	0.03	0.02	0.04	0.00	1.10	1.23
								(0.70)	(0.78)
Tobin's Q	1.51	1.32	0.82	2.31	1.73	1.97	-0.79***	-0.14 **	-0.14 *
								(-1.98)	(-1.95)
R&D expense	0.01	0.00	0.02	0.07	0.00	0.14	-0.06***	-3.82 ***	-3.72 ***
								(-2.93)	(-2.86)
Leverage-Target	0.01	-0.02	0.14	-0.01	-0.03	0.13	0.02**	1.85 ***	1.84 ***
								(4.64)	(4.61)
KZ index	0.58	0.69	2.73	0.41	0.48	2.11	0.18***	-0.16 ***	-0.16 ***
								(-4.05)	(-4.00)
Age	23.18	16.12	19.65	11.63	8.15	11.42	11.54***	0.01 ***	0.01 ***
								(2.98)	(2.97)
Years previous issue	3.34	2.74	2.06	3.16	2.50	2.03	0.18*	0.02	0.02
								(1.22)	(0.99)
Previous underpricing	1.52	0.76	2.82	2.03	0.87	3.94	-0.51***	-0.34	-0.30
								(-0.26)	(-0.23)
Aggregate Financing Costs Measures									
Interest rates	3.68	3.68	2.14	3.79	3.58	2.12	-0.11	-0.17 *	-0.17 *
								(-1.90)	(-1.89)
Default premium	1.00	0.88	0.42	1.03	0.90	0.45	-0.03	0.74 *	0.71 *
								(1.82)	(1.75)
Market runup	0.04	0.04	0.07	0.04	0.04	0.06	0.00	-0.67	-0.60
								(-0.93)	(-0.84)
Confidence Index	91.69	92.33	10.98	90.03	91.77	10.96	1.66***	0.01	0.01
								(0.45)	(0.46)
Intercept								-3.98 ***	-3.97 ***
								(-3.10)	(-3.09)
Year dummies								Yes	Yes
Pseudo R-squared								35.45 %	35.57 %
No. of observations		593			1,139			1,732	1,732

Table 7: Impact of returns following previous IPO on capital structure

Panel A provides descriptive statistics for a sample of firms with a prior IPO, that subsequently issue further equity or switch to debt. Panel B shows a probit regression that estimates the probability of switching to debt for firms that have a prior IPO, over the period 1975-2007. The dependent variable is one if a firm switches to debt and zero if it issues equity. The independent variables are explained in Table 2, with the exception of the following: *Abn. stock runup* is the raw cumulative stock return over trading days -62 to -2 prior to the announcement date less the CRSP equally weighted market index return over the same period. *Stock volatility* is computed as the annualized standard deviation of daily stock returns over trading days -62 to -2 before the announcement date. *Z*-statistics, calculated using heteroskedasticity-robust standard errors, are in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively. N denotes the number of observations.

	Panel A: Descriptive statistics							*Panel B: Probit regressions*	
	Switch to debt			Stick with equity			Difference		
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	in means	(1)	(2)
Returns following previous IPO									
6 Mth. Post-IPO Rets.	-0.09	-0.09	0.27	-0.02	-0.023	0.37	-0.06**	-0.11	
								(-0.48)	
12 Mth. Post-IPO Rets.	0.09	0.10	0.41	0.21	0.2009	0.532	-0.13**		-0.11
									(-0.76)
Issuer characteristics									
Abn. stock runup	0.04	0.02	0.18	0.14	0.1045	0.2911	-0.11***	-1.08 ***	-1.01 ***
								(-3.23)	(-2.81)
Stock Volatility	0.43	0.41	0.21	0.57	0.5265	0.2475	-0.15***	-0.25	-0.37
								(-0.53)	(-0.74)
Slack	0.05	0.03	0.06	0.27	0.15	0.2816	-0.22***	-1.95 ***	-1.77 **
								(-2.60)	(-2.40)
Fixed assets	0.43	0.40	0.25	0.26	0.187	0.2243	0.18***	0.97 ***	1.06 ***
								(2.88)	(3.07)
Sales	708.5	278.4	1434.5	194.2	60.0	500.1	514.3***	0.31 ***	0.31 ***
								(4.01)	(3.81)
Taxes	0.03	0.02	0.04	0.03	0.02	0.0421	-0.01	-2.88	-2.67
								(-1.23)	(-1.16)
Tobin's Q	1.77	1.45	1.15	3.33	2.3182	3.8807	-1.57***	-0.08	-0.03
								(-1.01)	(-0.46)
R&D expense	0.01	0.00	0.05	0.10	0.0121	0.1865	-0.09***	0.52	0.47
								(0.47)	(0.48)
Leverage-Target	0.05	0.04	0.16	-0.02	-0.043	0.1167	0.07**	1.59 ***	2.06 ***
								(2.60)	(3.34)
KZ index	0.52	1.08	3.24	0.05	0.1077	1.821	0.47**	-0.05 **	-0.05 *
								(-2.09)	(-1.72)
Age	4.55	2.93	4.83	3.82	2.5616	3.3836	0.73	-0.08 **	-0.08 **
								(-1.98)	(-2.06)
Years previous issue	3.34	2.53	2.14	3.10	2.362	2.028	0.24	0.08 *	0.09 **
								(1.90)	(2.11)
IPO underpricing	4.75	2.10	9.18	14.02	5.56	31.802	-9.27***	-1.40 **	-1.41 **
								(-2.10)	(-2.01)
Aggregate Financing Costs Measures									
Interest rates	3.62	3.69	1.44	3.56	3.4916	1.7563	0.06	-0.35 ***	-0.37 ***
								(-2.81)	(-2.82)
Default premium	0.82	0.72	0.28	0.95	0.8767	0.3813	-0.14***	-1.62 **	-1.43 *
								(-2.21)	(-1.90)
Market runup	0.04	0.04	0.06	0.04	0.0438	0.0542	0.00	-0.97	-1.61
								(-0.62)	(-0.98)
Confidence Index	97.00	95.18	8.25	90.82	91.633	10.264	6.19***	0.05 **	0.05 **
								(2.21)	(2.22)
Intercept								-4.69 **	-5.16 **
								(-2.14)	(-2.21)
Year dummies								Yes	Yes
Pseudo R-squared								38.52 %	38.23 %
No. of observations		94			939			1,033	1,033

Table 8: Underpricing and returns following previous issue, after controlling for switchers
This table presents the results of an OLS regression where the dependent variable is underpricing, using the sample of firms having made a previous SEO and stick with equity (Columns 1 and 2), and those with a previous IPO that stick with equity (Columns 3 and 4). The independent variables are explained in Table 1. The Inverse Mills' ratio used in columns (1) and (2) are those estimated using the probit model in the corresponding columns in Panel B of Table 6, and the Inverse Mills' ratio used in columns (3) and (4) are those estimated using the probit model in the corresponding columns in Panel B of Table 7. To estimate the correct Inverse Mills' ratio I change the dependent variable in the probit regression to one if a firm sticks with equity, and zero if it switches to debt. *t*-statistics, calculated using heteroskedasticity-robust standard errors, are in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Seasoned offerings		IPOs	
	(1)	(2)	(3)	(4)
Returns following previous Issue				
6 Mth. post-previous rets.	-0.75 **			
	(-2.48)			
12 Mth. post-previous rets.		-0.43 **		
		(-2.00)		
6 Mth. Post-IPO Rets.			-0.06	
			(-0.15)	
12 Mth. Post-IPO Rets.				0.39
				(1.47)
Issuer characteristics				
Abn. stock runup	-0.72	-0.68	0.75	0.81
	(-1.03)	(-0.97)	(1.08)	(1.16)
Residual volatility	3.07 ***	3.04 ***	2.13 **	1.69
	(2.69)	(2.66)	(2.18)	(1.61)
Systematic volatility	1.64	1.68	-0.08	-0.16
	(1.48)	(1.53)	(-0.06)	(-0.11)
Ln(MV)	-0.07	-0.09	-0.22	-0.27
	(-0.49)	(-0.59)	(-1.10)	(-1.29)
Tobin's Q	0.06	0.06	0.13 ***	0.12 ***
	(0.61)	(0.66)	(4.10)	(3.91)
Relative proceeds	0.07	0.05	0.11	0.10
	(0.24)	(0.17)	(0.25)	(0.22)
Age	0.03 ***	0.03 ***	-0.05	-0.06
	(2.85)	(2.80)	(-1.27)	(-1.59)
Years previous issue	-0.02	-0.02	0.10 *	0.13 **
	(-0.55)	(-0.68)	(1.69)	(2.17)
Ln(Price)	-0.94 ***	-0.92 ***	-1.76 ***	-1.79 ***
	(-3.70)	(-3.62)	(-4.64)	(-4.59)
Tick<1/4	0.08	0.07	-0.20	-0.21
	(0.42)	(0.36)	(-0.79)	(-0.80)
Underwriter prestige	-0.01	-0.02	-0.38	-0.28
	(-0.08)	(-0.11)	(-1.39)	(-1.00)
NYSE	-0.19	-0.19	0.65	0.62
	(-0.82)	(-0.82)	(1.41)	(1.30)
Inverse Mills' ratio	-0.07	-0.01	0.80	0.61
	(-0.16)	(-0.02)	(0.95)	(0.63)
Intercept	1.64 *	1.57	4.38 ***	4.72 ***
	(1.72)	(1.64)	(3.23)	(3.35)
Year dummies	Yes	Yes	Yes	Yes
Adjusted R-squared	26.34 %	26.09 %	22.98 %	22.5 %
No. of observations	1,139	1,139	939	939

Table 9: Underpricing and short-sale constraints

This table presents the results of an OLS regression where the dependent variable is underpricing, using the sample of firms having made a previous SEO. The variables are explained in Table 1, with the exception of the following: *Short interest* refers to the number of shares shorted, scaled by the total number of shares outstanding (both measured over the quarter prior to the SEO announcement date).. Short interest data are obtained from the Securities Monthly file of the CRSP-Compustat merged database. *Instit. ownership* is the number of shares held by 13F institutions (obtained from Thomson Reuters), divided by the number of shares outstanding (both measured over the quarter prior to the SEO announcement date). *Amihud* is the Amihud (2002) illiquidity measure, calculated as the ratio of the absolute value of daily stock returns divided by trading volumes averaged over the window (−62, −2) relative to the SEO announcement date. *Negative 5-day CARs* is the abnormal returns over days (-6, -2) relative to the issue date, if these are negative, and 0 otherwise. *Positive 5-day CARs* is the abnormal returns over days (-6, -2) relative to the issue date, if these are positive, and 0 otherwise. *Rule 10B* is a dummy variable to capture the period after SEC Rule 10b-21 was introduced in August 1988. The Inverse Mills' ratio is obtained from Column (2) of Table 2. *t*-statistics, calculated using heteroskedasticity-robust standard errors, are in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Returns following previous SEO					
12 Mth. post-previous rets.	-0.45 ***	-0.39 ***	-0.44 ***	-1.04 ***	-0.41 **
	(-2.68)	(-6.68)	(-6.58)	(-5.15)	(-2.18)
Short selling controls					
Short interest	8.06				8.84
	(1.48)				(1.46)
Instit. ownership	-0.65	-1.34 **			-0.45
	(-1.36)	(-1.97)			(-0.99)
Amihud			3.70 ***		848.11 ***
			(2.73)		(23.54)
Negative 5-day CARs			-1.32		13.33 ***
			(-1.19)		(3.64)
Positive 5-day CARs			3.65 ***		0.15
			(2.62)		(0.04)
12 Mth. post-previous rets*Rule10B				0.66 ***	
				(2.55)	
Rule 10B				1.04	
				(1.18)	
Issuer characteristics					
Abn. stock runup	0.22	-1.27 ***	-1.29 ***	-1.24 ***	-0.20
	(0.38)	(-6.30)	(-10.36)	(-15.23)	(-0.35)
Residual volatility	0.57	3.14 ***	3.54 ***	3.62 ***	0.74
	(0.45)	(24.97)	(12.17)	(11.15)	(0.40)
Systematic volatility	2.92 *	2.04 ***	1.62 **	1.67 ***	4.11 **
	(1.72)	(5.00)	(2.26)	(3.21)	(2.53)
Ln(MV)	-0.25	-0.12	-0.13	-0.13	-0.18
	(-1.49)	(-1.27)	(-1.52)	(-1.62)	(-0.99)
Tobin's Q	-0.09 **	0.09	0.09	0.11 *	-0.09 ***
	(-2.25)	(1.51)	(1.48)	(1.74)	(-2.70)
Relative proceeds	-1.95 *	-0.12	-0.04	0.00	-1.71 *
	(-1.90)	(-0.41)	(-0.35)	(0.00)	(-1.87)
Age	-0.01	0.02 ***	0.02 ***	0.02 ***	-0.01
	(-0.94)	(5.17)	(7.43)	(8.34)	(-0.93)
Years previous	0.04 **	-0.02	-0.02 *	-0.02 *	0.03 ***
	(2.18)	(-1.51)	(-1.68)	(-1.78)	(2.61)
Ln(Price)	-0.85 ***	-0.62 ***	-0.74 ***	-0.75 ***	-1.02 ***
	(-2.63)	(-2.65)	(-3.46)	(-3.73)	(-2.75)
Tick<1/4	-0.33	0.16 **	0.09 ***	0.10 ***	-0.04
	(-0.76)	(2.37)	(3.62)	(3.77)	(-0.18)
Underwriter prestige	-0.11	0.05	0.04	0.07	0.08
	(-0.22)	(0.23)	(0.15)	(0.27)	(0.17)
NYSE	0.01	-0.16 **	-0.21 **	-0.29 **	0.07
	(0.07)	(-2.17)	(-2.36)	(-2.24)	(0.47)
Previous debt issue	-1.10 ***	-0.04	-0.07	-0.06	-1.02 ***
	(-3.58)	(-0.46)	(-0.70)	(-0.53)	(-4.66)
Inverse Mills' ratio	-0.04	-0.06	0.03	0.03	0.06
	(-0.21)	(-0.62)	(0.24)	(0.28)	(0.75)
Intercept	7.49 ***	1.89 ***	0.84 **	0.90 **	6.90 ***
	(4.78)	(3.92)	(2.07)	(2.40)	(4.61)
Year dummies	No	Yes	Yes	Yes	No
Adjusted R-squared	12.79 %	22.63 %	24.63 %	24.72 %	20.71 %
No. of observations	319	1,230	1,333	1,476	319

Figure 1: Annual number of follow-on issues
This figure shows the average annual number of SEOs for those firms having made a prior SEO or IPO. Data on the number of issues are obtained from the Securities Data Company New Issues Database (SDC). I exclude units, secondary offerings, and those made by firms having a market capitalization under $10 million as well as utilities (SIC codes 4900-4949) and financials (SIC codes 6000-6999).

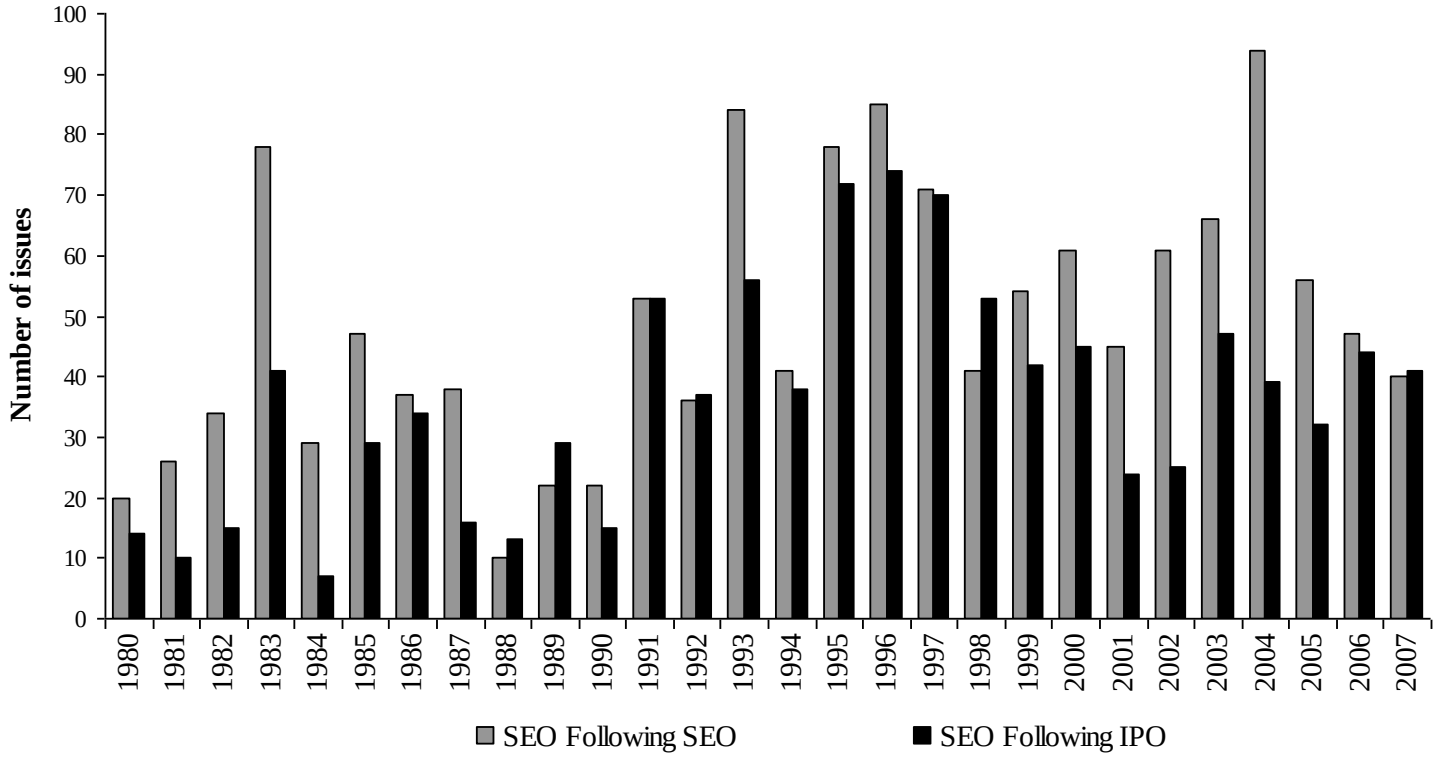

Figure 2: Average underpricing across issues
This figure shows the average annual underpricing for for those firms having made a prior SEO or IPO. Underpricing is calculated as the logarithm of the ratio of the closing share price on the day prior to the offer, to the offer price. The offer price is obtained from SDC, and the closing price is obtained from CRSP.

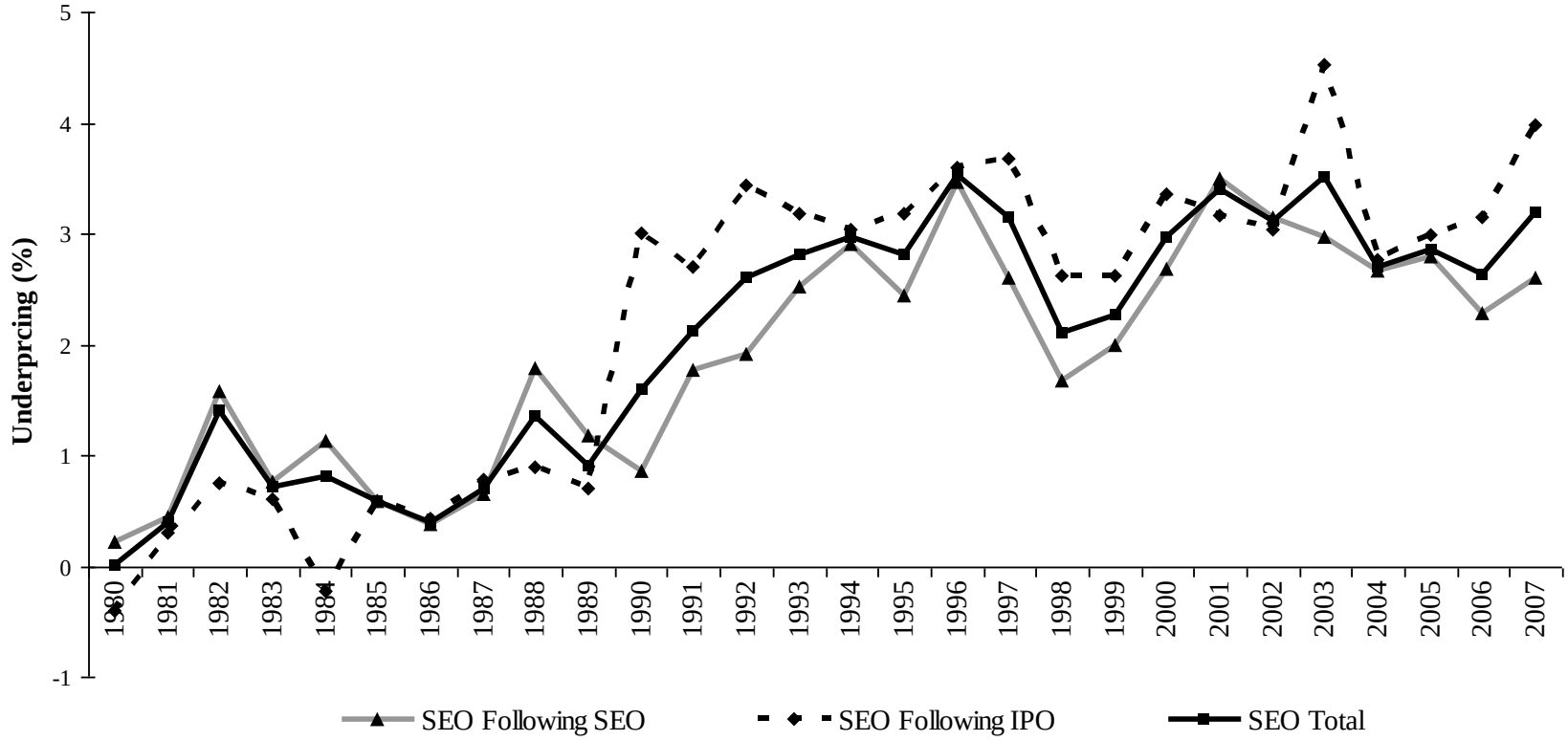

Figure 3: Timeline for the event study of follow-on issues
This figure shows the sequence of events for a typical firm in my sample. *6 Mth. post-previous rets.* (*12 Mth. post-previous rets.*) refers to the buy-and-hold returns over the 6-month (12-month) period after a previous SEO or IPO. *Abn. stock runup* is the raw cumulative stock return over trading days -62 to -2 prior to the announcement date less the CRSP equally weighted market index return over the same period.