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Pricing of Seasoned Equity Offers and Earnings Management

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Abstract

This study examines the relationship between earnings management by firms offering seasoned equity issues and the pricing of their offers. We hypothesize that seasoned equity offering (SEO) firms employing aggressive accounting decisions also more aggressively push up their offer prices, thereby leading to a decrease in the degree of underpricing. Consistent with our prediction (the issuer's greed hypothesis), evidence indicates that SEO firms making opportunistic accounting decisions issue new shares at inflated prices. Our findings remain robust after controlling for other determinants of SEO underpricing and the possible endogeneity of pricing and earnings management.

I. Introduction

Several recent studies examine discretion in financial reporting around the time of seasoned equity offerings (SEOs). They address whether managers "overstate" earnings during the periods surrounding equity offers. The findings indicate that firms issuing seasoned equity report positive (income-increasing) discretionary accruals (unexpected accruals or abnormal accruals) around SEOs and have lower post-issue, long-run abnormal stock returns and operating performance (e.g., Teoh, Welch, and Wong (1998b), Rangan (1998)). Researchers interpret this result as being consistent with investors naively extrapolating pre-issue earnings without fully adjusting for the potential manipulation of reported earnings. They also argue that the stock market temporarily overvalues issuing firms and is subsequently disappointed by predictable declines in earnings caused by earnings management.[1]

From a behavioral point of view, the above arguments are well grounded only when equity issuers benefit by manipulating their earnings. This can be achieved when the equity issuer's cost of capital is substantially lower than that implied by the equilibrium asset pricing models (Denis and Sarin, 2001). Examining the systematic relationship between equity pricing and earnings management provides an opportunity to address this issue directly. Equity issuers have an incentive to boost their earnings in order to increase their offering proceeds, which has a direct effect on the issuer's wealth. A higher offer price benefits an issuer partly because the issuer can receive more cash from the offerings. Additionally, the higher offer price leads to less dilution of ownership if the issuing firm raises the same amount of money from the offerings. If the shares offered are underpriced, the issuer must sell more shares, diluting the existing ownership.

In this paper, we examine the relationship between aggressive accounting decisions (e.g., earnings management) and the pricing of offers by firms conducting SEOs. Though underpricing of initial

[1] Consistent with this argument, Denis and Sarin (2001) show that, on average, post-SEO earnings announcements are met with a significantly negative stock price reaction, meaning that a portion of the issuing firm's poor, long-run performance is due to investors systematically overestimating its future earnings prospects at its offerings.

public offerings (IPOs) is well known, underpricing of SEOs hasn't received much attention. Recent research (Altınkılıç and Hansen (2002), Corwin (2003), Kim and Shin (2001), and Mola and Loughran (2004)) report that the underpricing of SEOs has become commonplace and that the magnitude of SEO underpricing has increased more dramatically in the 1990s than it did during earlier periods.[2] Consequently, in recent years, more attention has been paid to why SEOs are underpriced.

Given the fact that SEO underpricing is a relatively obscure phenomenon, it deserves more explanation. When a publicly traded firm goes to the market to issue equity securities, it typically has a number of choices regarding the offering methods, ranging from underwritten offerings to rights offerings.[3] The issuer must register the issue with the SEC whenever it makes a public offering. The offer price of an SEO is typically set after the stock market closes on the day prior to the offer date. Underpricing occurs if the offer price is lower than the market's valuation of the offering firm's shares. Unlike an IPO, a pre-offer stock price exists for an SEO. As a result, researchers have used two different measures of SEO underpricing: offer-to-close returns and close-to-offer returns. In this paper we use offer-to-close returns measured as the ratio of the closing price on the offer day to the offer price, minus one, to provide relevant evidence to compare the underpricing of SEOs and IPOs. We also employ the

[2] Corwin (2003) documents that SEOs were offered at a significant discount during the 1990s. For example, SEO underpricing increased to 2.92 percent for offers during the 1990–1998 period from 1.15 percent for offers in the 1980s. Kim and Shin (2001) also report that during the 1990s, approximately 80 percent of all firms' SEO offer prices were lower than pre-offer day closing prices (e.g., the median and mean underpricing were 2.02 and 2.99 percent, respectively).

[3] The two most frequently employed methods for seasoned equity issues are firm commitment underwritten offerings and rights offerings. Although rights offerings are much cheaper, over 90 percent of issues are underwritten offerings. Eckbo and Masulis (1992) document that issuers prefer the underwritten offers despite its significantly greater costs such as a discount. They report that direct costs for issuers average 6 (1) percent of the offering proceeds for firm commitment underwritten offerings (for right offerings).

alternative measure, close-to-offer returns measured as the ratio of offer price to the pre-offer close, minus one, in the sensitivity analyses.

Specific information about SEO allocations is not publicly available. Aggarwal, Prabhala, and Puri (2002) find that underwriters favor institutional investors by allocating more shares in IPOs with stronger premarket interest (e.g., high underpricing). According to their study, institutions dominate IPO allocations. Approximately three-quarters of shares offered in an issue are allocated to institutions, thereby enabling institutions to earn greater profits on their IPO investments compared to retail investors. Gibson, Safieddine, and Sonti (2003) report that between 1980 and 1994, the median of total institutional holdings in SEO firms increased by 8 percent in the offer quarter (e.g., from 27.65 percent in the quarter prior to the offerings to 35.65 percent in the offer quarter). Assuming all the increase in institutional ownership comes from the allocation of shares at the time of the offering, not from the post-offering acquisitions, using the median offer size in our sample (22.78 percent of shares outstanding prior to the offer), we estimate the proportion of seasoned equity issues allocated to the institutional investors as 71 percent, which is similar to the allocation pattern for IPOs.

Though previous literature implicitly assumes that equity issuers use earnings management in order to obtain high offering proceeds (Teoh, Welch, and Wong (1998a, 1998b), Rangan (1998), Shivakumar (2000)), none of the studies directly investigate this issue. DuCharme, Malatesta, and Sefcik (2001) find a positive correlation between pre-IPO earnings management and initial firm value, indicating that equity issuers manage earnings to affect the firm's stock prices. However, the overstated earnings may affect either the firm's closing price or the offer price on the day of issue, or both. DuCharme et al. (2001) do not specifically address which price is more influenced by the inflated earnings. Therefore no implication can be drawn as to the relationship between underpricing and earnings management.

In this study, we hypothesize that SEO firms that employ aggressive accounting decisions also push up their offer prices more aggressively to obtain higher proceeds from their offerings, and the offer day closing price does not increase as much as the offer price. Since the degree of underpricing is empirically measured as the difference between the offer price and the closing price on the offer date, we

expect a negative relationship between discretionary accruals and SEO underpricing. We argue that the offer price increase will exceed the increase in the closing price, as issuers would want to utilize favorable market valuation, induced by earnings management, as much as possible. Therefore, the degree of underpricing with earnings management is smaller than that without earnings management.

Our study differs from previous research in that: (1) we directly examine the relationship between pre-issue earnings management and the pricing of SEOs that should be the center of attention if issuers manage earnings to reduce the cost of capital; (2) by incorporating the degree of SEO underpricing into the earnings management story, our research improves the understanding of why SEO firms engage in earnings management prior to the offerings and how issuers' accounting decisions affect the pricing of SEOs; (3) in light of the information asymmetry hypothesis, we highlight how the relationship between earnings management and the pricing of SEOs is influenced by the degree of information asymmetry; (4) assuming the underpricing, earnings management, and stock returns are jointly determined around equity offerings, we address the endogenous nature of these variables by employing a simultaneous equation approach.

The empirical results are consistent with our prediction: the *issuer's greed hypothesis*. Our evidence indicates that firms opportunistically make accounting decisions also issue new shares at inflated prices. For a sample of SEOs from 1989 through 2000, we find a negative relationship between SEO underpricing and discretionary accruals. This finding suggests that seasoned equity issuers who adopt aggressive earnings management also push up their offer price in order to receive more proceeds from their offerings. We also find that the relationship between SEO underpricing and earnings management is more significant for issuers with high information asymmetry than for those with low information asymmetry. The three-stage least square (3SLS) estimation results support that our findings are robust, even after incorporating possible endogeneity. In addition, we show that the above evidence remains unchanged across controls for other determinants of SEO underpricing. Alternative measures for the underpricing and discretionary accruals do not change the results.

The remainder of the paper is organized as follows. Section II develops the hypothesis and empirical models examined in this study. Section III discusses the empirical results. Section IV concludes the paper.

II. Hypothesis and Empirical Models

A. Hypothesis Development: The Issuer's Greed Hypothesis

Teoh, Welch, and Wong (1998a) provide empirical evidence that IPO firms with unusually high discretionary current accruals (called "*aggressive*"earnings managers) experience poor stock return performance in the subsequent three years. They find that aggressive IPOs earn a cumulative abnormal return of approximately 20 to 30 percent less than *conservative* IPOs do. In another study, Teoh, Welch, and Wong (1998b) examine whether unusually aggressive earnings management through discretionary current accruals explains the long-term underperformance of seasoned equity issuers. They provide evidence that aggressive earnings management predict underperformance in post-issue stock returns for seasoned equity issuers.

DuCharme, Malatesta, and Sefcik (2001) also investigate the relationship between pre-IPO earnings management and subsequent stock performance. They assume that if issuers opportunistically manipulate earnings to increase IPO proceeds, then investors may be temporarily misled and form an expectation about the firm's value that is too optimistic. Thus, the firm value should decline when the truth becomes apparent later. This argument can be applied to SEOs as well. Accordingly, we expect that seasoned equity issuers tend to make more aggressive earnings management decisions to get higher proceeds from their offerings. When issuers have discretion over accrual adjustments, it becomes difficult for investors to assess whether reported earnings are misleading. Friedlan (1994) provides evidence that underwriters do not detect and adjust for all accounting choices made by the equity issuers. Teoh and Wong (2002) also report that analysts are misled by new equity issuers' opportunistic earnings management (in both IPOs and SEOs). If the market does not fully understand the extent to which SEO firms manage earnings, we argue that equity issuers have the incentive to push up offer prices to increase offering proceeds and that such an incentive may be more significant for aggressive earnings managers.

Prior studies suggest that discussion of underpricing issues must be based on the setting of the offer price and that, by overstating pre-issue earnings before an offering announcement, firms seek to issue their shares at higher prices (Ritter and Welch (2002), Shivakumar (2000)).[4] Thus, if issuers aggressively manage their pre-issue earnings it seems plausible to assume that they push up their offer prices more aggressively as well.

However, the relationship between earnings management and SEO underpricing may not be straightforward. First, though the temporal overvaluation induced by earnings management will enable SEO firms to increase the offer price, it also may increase the closing price on the offer date. In this case, we would observe no relationship between underpricing and earnings management when the percentage increase in the closing price on the offer date is as much as the percentage increase in the offer price. Second, since underwriters engage in the determination of the offer price (i.e., they may have discretion over the determination of the issue price) and are better informed, the offer price may be set based on unmanaged earnings. If the impact of earnings management on the offer-day closing price is larger than that on the offer price, we may observe a positive relationship between underpricing and discretionary accruals (e.g., higher underpricing for the issuers who manage earnings more).

We, however, argue that offer price increase will exceed the increase in closing price on the offer date, since issuers would want to utilize favorable market valuation as much as possible especially when they aggressively manage earnings. Prior literature concerns cognitive biases regarding how investors behave. Shefrin (2000, Ch.17) argues that investors are optimistic about future prospects of equity

[4] Shivakumar (2000) argues that it is rational for equity issuers to manage earnings before an equity offering announcement. He defines his hypothesis as the "managerial response hypothesis." Specifically, his view is that issuers' earnings management may actually be the rational response of issuers to anticipated market behavior at an offering announcement. However, his study primarily focuses on the effect of earnings management on the market response at offering announcements, and assumes that earnings management would be done before announcing equity offerings. Thus, the result cannot fully capture the effect of SEO firms' earnings management continually occurring after the offering announcements.

offerings, which result in post-issue underperformance, and that such investor optimism is a manifestation of heuristic-driven bias. Ritter (2003) also asserts that heuristics make decision-making easier but they can sometimes lead to biases, thereby leading to suboptimal investment decisions. Thus, it seems plausible to assume that some greedy issuers may attempt to exploit such a bias of investors. Hirshleifer (2001) notes that firms sometimes take actions to exploit the market misvaluation. In the survey assessing the theory and evidence regarding the importance of investor psychology as a determinant of asset prices, he argues that security prices are related to investor misvaluation and risk. Although issuers recently have become more complacent about underpricing,[5] we can argue that maximizing proceeds is still one of the primary goals of issuing firms. Firms issuing equity can temporarily reduce their cost of capital through aggressive earnings decisions and high offer price if the market overvalues the equity of the firm at the time of the offering. In this sense, although no widely accepted theory of explaining the link between SEO underpricing and the issuers' behavior on accounting decisions has been developed, we conjecture that the greedy equity issuers who adopt aggressive earnings decisions also have a strong desire to reduce the amount of underpricing in order to leave the least amount of money on the table for investors.

Therefore, we hypothesize that SEO firms employing aggressive accounting decisions also more aggressively push up their offer prices, thereby leading to a decrease in the degree of underpricing. We call this "*issuer's greed hypothesis*" and examine it in this study. Under this hypothesis, a negative relationship between discretionary accruals and SEO underpricing is expected.

B. Measures of Underpricing and Earnings Management

In this study, we define underpricing as the closing market price on the offer day minus the offer price, divided by the offer price. Figure 1 summarizes the definitions of variables used in this study. For

[5] Loughran and Ritter (2004) suggest two reasons: (1) the analyst has become a more important factor for issuers when choosing a lead underwriter (called the analyst lust hypothesis), (2) Venture capitalists and the executives of issuing firms have been co-opted through the setting up of personal brokerage account to which hot IPO shares are allocated (called the Corruption hypothesis).

the sensitivity analysis, we introduce another measure, discounting, as an alternative dependent variable. Similar to Altınkılıç and Hansen (2002), discounting is defined as the closing price on the day prior to the offer minus the offer price, divided by the closing price on the day prior to the offer.[6]

[Insert Figure 1 here.]

Following previous research, we employ discretionary accruals as a proxy for earnings management (Jones (1991), Dechow, Sloan, and Sweeney (1995), Subramanyam (1996), Teoh, Welch, and Wong (1998a, 1998b), Rangan (1998), Hribar and Collins (2002)). We define a firm's total accruals for a given quarter as the earnings before discontinued operations and extraordinary items less operating cash flows. Total accruals are then decomposed into discretionary and nondiscretionary accruals, with the latter estimated from the cross-sectional modified Jones model (Dechow, Sloan, and Sweeney (1995)):

(1) $NDA_{it} = a_0(1/A_{it-1}) + a_1(\Delta REV_{it} - \Delta REC_{it})/A_{it-1} + a_2 PPE_{it}/A_{it-1}$

where NDA_{it} is the fitted value of firm i's nondiscretionary accruals (NDAs), deflated by lagged total assets, in quarter t, ΔREV_{it} is the change in net revenues in quarter t from quarter t-1, ΔREC_{it} is the change in net receivables, PPE_{it} is gross property, plant, and equipment, and A_{it-1} is lagged total assets. For each quarter, the parameters a_0, a_1, and a_2 are estimated from the cross-sectional version of the original Jones model (1991), using all firms in each two-digit SIC code industry, excluding SEO firms:

(2) $TA_{it}/A_{it-1} = a_0 (1/A_{it-1}) + a_1(\Delta REV_{it}/A_{it-1}) + a_2 (PPE_{it}/A_{it-1}) + e_{it}$

where TA_{it} is total accruals for a firm i at the quarter t, A_{it-1}, ΔREV_{it} and PPE_{it} are the same as previously defined, and e_{it} is the residual error.

After estimating NDAs, the firm's DAs are computed as:

(3) $DA_{it} = TA_{it}/A_{it-1} - NDA_{it}$

where DA_{it} is firm i's discretionary accruals, deflated by lagged total assets, for quarter t, and other variables are the same as previously defined.

[6] We replicate the analyses using this alternative measure as a dependent variable. The results remain qualitatively unchanged (to be discussed in a later section).

Figure 2 illustrates our timing convention. Q(-1) is the last quarter for which a financial statement is available at the time of the offer. Though a quarterly financial statement has to be filed within 45 days from the end of the quarter, and an annual financial statement should be filed within 90 days from the fiscal year end, Easton and Zmijewski (1993) find that more than 25 percent of the firms violate the statutory filling date.[7] Therefore we use more generous time windows of 60 days for the quarterly financial statements and 120 days for the annual reports.

[Insert Figure 2 here.]

If the end date of the quarter immediately preceding the offer date is more than 60 days prior to the offer date and the quarter is not the 4th quarter, it is defined as Q(-1), and naturally the quarter in which the offering is announced will be Q(0). If the end date of the quarter immediately preceding the offer date is less than 60 days prior to the offer date or the quarter is the 4th quarter, it is defined as Q(0) and the preceding quarter is defined as Q(-1).[8] In this case, the quarter in which the offering is announced will be Q(+1). If the quarter immediately preceding the offer date is the 1st quarter and the end date of this quarter is less than 30 days from the offer date then it is defined as Q(+1), since the preceding quarter will be the 4th quarter and the offer date is less than 120 days after the end of the 4th quarter. The quarter before the 4th quarter is Q(-1). If the quarter immediately preceding the offer date is the 1st quarter and the end date of this quarter is more than 30 days but less than 60 days from the offer date then it is defined as Q(0).

If issuers have a greater incentive to manage earnings in the quarter when the financial statements are not available at the offer date, we would expect a greater amount of positive discretionary accruals in the quarter Q(0). Since we do not know in which quarter firms started to engage in earnings management,

[7] Easton and Zmijewski (1993), using a sample of 76,866 10K fillings and 193,283 10Q fillings, find that on average the 10K (10Q) is publicly available 97.2 (44.7) days after the fiscal year-end (quarter-end). The third quartile of the reporting lag is 97 days for the 10K and 46 days for the 10Q.

[8] If the quarter immediately preceding the offer date is the 4th quarter, then the quarter before will be the 3rd quarter. Since there is more than 90 days between the end of this 3rd quarter and the offer date, the financial statement of the 3rd quarter should be available at the offer date.

we define discretionary accruals as the sum of discretionary accruals over two periods, Q(-1) and Q(0). For the sensitivity analysis, discretionary accruals are disaggregated into two quarterly measures: discretionary accruals for the quarter Q(0) and for the quarter Q(-1).

C. Control Variables and Model Specification

To reduce the possible model misspecification problem due to missing variables, we control for other determinants of SEO underpricing. Loughran and Ritter (2002) argue that equity issuers are more tolerant of excessive underpricing if they simultaneously learn about a post-market valuation that is higher than what they expected. This suggests that the greater the recent increase in their price, the less bargaining effort that issuers expend in their negotiations over the offer price with underwriters.[9] Benveniste and Spindt (1989) model the process that lead banks in IPOs allocate more deeply underpriced shares to their better-informed investors to pay for information provided by them. Both of the two stories imply that pre-offer abnormal stock returns are positively related to the magnitude of SEO underpricing. In addition, other studies present evidence that when the overall stock market rallies during the road show period, underwriters do not fully adjust their pricing (Bradley and Jordan (2002), Loughran and Ritter (2002), Lowry and Schwert (2002)). To control for the effect of the pre-offer price move, we employ a variable, *PreCAR*, calculated as cumulative market-adjusted return over the period starting the day after the filing date and ending the day prior to the offer. Following prior studies, the sign of coefficient on *PreCAR* is predicted to be positive.

Several prior studies document that underpricing is a function of price uncertainty and information asymmetry (Rock (1986), Ritter and Welch (2002), Altınkılıç and Hansen (2002), Corwin (2003)). For example, Ritter and Welch (2002) argue that the underpricing of equity issues must be explained on the basis of whether asymmetric information between the issuers and investors is assumed.

[9] Based on the rent expropriation and share allocation story, Loughran and Ritter (2002) explain the conflict of interest between underwriters and issuers. They argue that if underwriters are given discretion in share allocation, they might intentionally leave more money on the table than necessary, then allocate these shares to favored buy-side clients.

Also, investors should receive more compensation in the form of underpricing, as valuing the firm becomes more difficult (Rock (1986)). Corwin (2003) reports that underpricing is generally higher for firms with high stock return volatility and a high bid-ask spread.[10] Collectively, these previous findings suggest that the more information asymmetry and price uncertainty, the more the SEOs are underpriced. In this study, we use two proxies for price uncertainty and asymmetric information. The first proxy for price uncertainty is *Volatility*, defined as the standard deviation of daily stock returns over the 30 trading days ending 11 days prior to the offer. The second proxy for information asymmetry is *AvgpSprd*, measured as the average of the percentage quoted bid-ask spreads over the 30 days ending two days prior to the offer. Based on the price uncertainty and asymmetric information stories, the relationship between underpricing and *Volatility* is expected to be positive. We also expect a positive relationship between underpricing and *AvgpSprd.*

Previous research finds that underpricing is related to the offer size and the price on the day prior to the offer (Altınkılıç and Hansen (2002), Corwin (2003), Gerard and Nanda (1993)). Altınkılıç and Hansen (2002) argue that, in the placement cost story, as the offering becomes more difficult to place, greater underpricing is needed in order to attract capital suppliers and compensate them for bearing the burden of greater illiquidity in their longer term investing. Based on the price pressure theory, Corwin (2003) argues that larger issues are more underpriced, and the effects of price pressure should be most pronounced for securities with relatively inelastic demand (securities with low stock price). In addition, Corwin (2003) provides empirical evidence of the negative relationship between underpricing and the pre-offer day price. We define the offer size as shares offered divided by the total number of shares outstanding prior to the offer. Following prior studies, we expect *offersize* (*ln(Price*)) to be positively (negatively) related to underpricing.

Mola and Loughran (2004) find that seasoned offer prices are clustered at integers and do not tend to fall on odd eighth fractions. Corwin (2003) argues that rounded prices may reflect the

[10] Corwin (2003), however, reports that asymmetric information has a weak effect on the underpricing of SEOs.

underwriter's desire to reduce the costs of negotiating the offer price and uncertainty about the underlying security value. In the presence of offer price rounding, he states that discounting (the closing price on the day prior to the offer minus the offer price, divided by the closing price) will be greater for low-priced stocks. He also holds that this effect will be most evident when the previous day's closing price does not fall on an even dollar or $0.25 price increment. Though we have no reason to believe that this is also the case for our measure of underpricing, we add both a price-increment dummy variable, *Tick*, and an interaction term, *ln(Price)*Tick,* to our regressions. Based on Corwin (2003), the sign of the coefficient on *Tick* (*ln(Price)*Tick*) is expected to be positive (negative). Also, we include an IPO underpricing variable (*IPOunder*) in the regressions. Prior research finds that SEO underpricing is positively affected by IPO underpricing (Corwin, 2003).[11] Thus we expect *IPOunder* to be positively associated with SEO underpricing.

It is well known that Nasdaq issues have different characteristics from those of the NYSE and other issues. Previous studies report that Nasdaq offers are more underpriced than NYSE offers (Ritter and Welch (2002), Altınkılıç and Hansen (2002), Corwin (2003)). Thus, the dummy variable for Nasdaq issues with the predicted positive sign is added to our models. Together, we include the above variables in our regressions to control other determinants of SEO underpricing.

To test our hypothesis, we establish the following empirical model, including the control variables discussed above:

$$(4) \quad Ud\_Prc = \alpha_0 + \alpha_1 DA + \alpha_2\, PreCAR + \alpha_3 Volatility + \alpha_4 OfferSize + \alpha_5\, ln(Price) + \alpha_6 Tick + \alpha_7\, ln(Price) * Tick + \alpha_8 IPOunder + \alpha_9 D_{NASDAQ}$$

[11] Loughran and Ritter (2004) show that during the 1990s, IPOs were offered at a significant discount. Such an IPO underpricing pattern is very similar to the pattern of SEO underpricing during the same time period. Corwin (2003) argues that if the relationship between underwriters and firms or the economies of the underwriting business changes over time, both the IPO and SEO would be affected.

where *Ud_Prc* is the closing price on the offer day minus the offer price, divided by the offer price; *DA* is the discretionary total accruals over two periods, Q(-1) and Q(0), divided by lagged total assets; *PreCAR* is the cumulative market-adjusted return over the period starting the day after the filing date and ending the day prior to the offer, where market return is defined as the return on the CRSP value-weighted index; *Volatility* is standard deviation of daily stock returns over the 30 trading days ending 11 days prior to the offer; *OfferSize* is the number of shares offered divided by the total number of shares outstanding prior to the offer; *ln(Price)* is the natural logarithm of the closing price on the day prior to the offer; *Tick* is an indicator variable that equals one if the closing price on the day prior to the offer does not fall on an even dollar or $0.25 price increment, and zero otherwise; *IPOunder* is an average IPO initial return during the same month as the SEO, where monthly IPO underpricing estimates are obtained from Jay Ritter's web page at http://bear.cba.ufl.edu/ritter/ipoall.htm; and D_{NASDAQ} is an indicator variable that equals one if the firm was listed on the Nasdaq at the time of the offer and zero otherwise.

D. Three-stage Least Square Estimation to Test Endogenous Determination

The relationship between underpricing and earnings management may not be unidirectional and these two are jointly determined. If SEO firms opt for a higher degree of underpricing due to informational concerns (Rock (1986), Loderer, Sheehan, and Kadlec (1991), Gerard and Nanda (1993), Korajczyk, Lucas, and McDonald (1991)) or information cost concerns (Altınkılıç and Hansen (2002)), they are unlikely to manage earnings to achieve a higher offer price. Under this scenario, greater underpricing will lead to a smaller degree of earnings management.

Among the control variables introduced to address other determinants of underpricing, pre-offer CAR deserves special attention. Though positive, pre-offer CAR would measure the positive news about share price by better-informed investors (according to the share allocation, information acquisition, and rent expropriation story),[12] it is also possible that over-optimism created by earnings management leads to

[12] Loughran and Ritter (2002) suggest that the greater the recent increase in their market price, the less is the bargaining effort of issuers in their negotiations over the offer price with underwriters.

positive market response during the pre-offer period. The reverse also can be true. Previous research shows that positive news about share price may encourage SEO firms to manage their earnings to meet the market expectation (Kasznik (1999), Matsumoto (2002), Degeorge, Patel, and Zeckhauser (1999), Das and Zhang (2003)).[13] Therefore, we address the possibility of endogeneity issues in the decision-making process for the pricing of equity offers. Assuming that underpricing, earnings management, and stock returns are jointly determined, we introduce a simultaneous equation approach with them as endogenous variables.

By estimating the following equations jointly, we test for the relationship between SEO underpricing and earnings management behavior, while incorporating endogenous determination.

(5) $$Ud\_Prc = \alpha_0 + \alpha_1 DA + \alpha_2\, PreCAR + \alpha_3 Volatility + \alpha_4 OfferSize + \alpha_5\, ln(Price) + \alpha_6 Tick + \alpha_7\, ln(Price) * Tick + \alpha_8 IPOunder + \alpha_9 D_{NASDAQ}$$

(6) $$DA = \beta_0 + \beta_1 Ud\_Prc + \beta_2\, PreCAR + \beta_3 Volatility + \beta_4\, ln(MKTCAP) + \beta_5 NONB6 + \beta_6 AbsTacc$$

(7) $$PreCAR = \delta_0 + \delta_1 Ud\_Prc + \delta_2 DA + \delta_3 OfferSize + \delta_4 D_{NASDAQ} + \delta_5\, ln(MKTCAP)$$

where *ln(MKTCAP*) is the natural logarithm of the market value of equity, where the market value of equity is defined on the day prior to the offer as the number of shares outstanding multiplied by price; *NONB6* is an indicator variable that equals one if the firm's auditor is not one of the six largest accounting firms, and 0 otherwise; and *AbsTacc* is the absolute value of total accruals. All other variables are defined as before.

Prior literature (Schipper (1989), Jo and Kim (2003)) suggests that asymmetric information makes it possible for managers to manage earnings. Based on these studies, the coefficient on *Volatility* is

[13] Kasznik (1999) shows that managers manage earnings toward their forecasts. Matsumoto (2002) reports that firms manage earnings to avoid missing expectations at the earnings announcement. Degeorge, Patel, and Zeckhauser (1999) find evidence of earnings management to exceed financial analysts' forecast, and Das and Zhang (2003) document that reported earnings per share are more likely to be rounded-up when managers ex-ante expect to round-up to meet analysts' forecast.

predicted to be positive. Under the size hypothesis, previous research suggests that large firms are more politically sensitive than small firms and that their earnings management is more likely to be detected (Zmijewski and Hagerman (1981), Watts and Zimmerman (1978)). This implies that the larger the firm, the more likely the manager is to choose income decreasing accounting procedures. Thus, in the *DA* equation, a negative coefficient on *ln(MKTCAP)* is expected.[14] Becker, DeFond, Jiambalvo, and Subramanyam (1998) provide empirical evidence that high quality auditors tend to deter earnings management, and vice versa. Based on this result, we expect the sign of *NONB6* in the *DA* model to be positive. Further, Becker et al. (1998) find that there is a negative relationship between discretionary accruals and the absolute value of total accruals.[15] Thus, a negative coefficient on *AbsTacc* is predicted. In the *PreCAR* equation, we control for offer size, firm size, and stock exchange.

III. Empirical Results

A. Sample Selection

The sample of SEOs was obtained from the Securities Data Company's (SDC) New Issues Database. We collected an initial sample of U.S. common stock offerings between 1989 and 2000, excluding IPOs. Of these, only 3,762 offers are available on the quarterly COMPUSTAT database and the Center for Research in Security Prices (CRSP) file. Offers without fiscal year-ends data in the COMPUSTAT file were excluded. This resulted in a sample of 3,099 offers. Additional restrictions were applied. To include an offer in a sample, we need: (1) sufficient data to compute discretionary accruals, and (2) data to calculate the SEO underpricing. These restrictions eliminated 1,994 offers. We also eliminated 65 offers due to other missing data included in regression analysis and offers trimmed at the 1st

[14] To further control the effect of firm size on *DA* and *PreCAR*, we also include a nonlinear firm size variable, *(Size-MedSize)*D*, where *Size* is *ln (MKTCAP)*, *MedSize* is the median *ln (MKTCAP)*, and *D* is a dummy variable that equals one if the firm size is larger than the median of all sample firms' sizes and zero otherwise. We find that including the nonlinear size variable does not alter the results reported later.

[15] They argue that non-discretionary accruals tend to be negative due to depreciation, and thus, negative (positive) discretionary accruals increase (decrease) the absolute value of total accruals.

and 99th percentiles based on *Ud_Prc, DA*, and *PreCAR*. The final sample consists of 1,040 offers: 705 offers by Nasdaq-listed firms and 335 offers by NYSE- and other exchange-listed firms. Table 1 presents the sample selection process.

[Insert table 1 here.]

Table 2 summarizes the characteristics of our sample SEOs. Panel A of this table presents the distribution of SEOs by industries. During the 1989-2000 period, the computer equipment, wholesales and retail sales, chemical products, and electronic equipment industries accounted for approximately 54 percent of the sample SEOs. Panel B of the table shows that two of the sample years (1996 and 1997) were relatively active in seasoned equity issues.

[Insert table 2 here.]

B. Offer Date Correction

Lease, Masulis, and Page (1991) note that stated offer dates are often inappropriate for analyzing effects due to the fact that some offers take place after the close of trading. After examining time stamps from the Dow Jones News Service (DJNS), they find that 25 percent of offers take place after the close. Safieddine and Wilhelm (1996) note that even time stamps from the DJNS may not identify the true time of the offer. Safieddine and Wilhelm (1996) and Corwin (2003) apply a volume-based offer date correction. Following these studies, we adjust the offer dates for our sample. If trading volume on the day following the SDC offer date is (i) more than twice the trading volume on the SDC offer date and (ii) more than twice the average daily volume over the previous 250 trading days, then the day following the SDC offer date is designated as the offer date.

C. Descriptive Statistics

Table 3 presents descriptive statistics for the selected variables. Panel A of table 3 provides the summary statistics for our full sample of SEOs. For the 1989-2000 period, the mean (median) *Ud_Prc* is 0.0345 (0.0135), which is significantly different from zero. This means that on average, underpricing consists of 3.45 percent of the offer price for the sample period. The magnitude of underpricing is similar to that reported by previous studies (Corwin (2003), Altınkılıç and Hansen (2002)). During the same

period, mean and median discretionary accruals scaled by beginning total assets are 0.0157 and 0.0089, respectively. These results indicate that, on average, firms offering equity boost their earnings by using discretionary accruals prior to the offerings. The magnitude of the *DA*s is statistically significant at less than the 1 percent level. Meanwhile, the mean (median) value of *PreCAR*, measured over the period starting the day after the filing date and ending the day prior to the offer, is –0.0187 (–0.0305), indicating that equity-offering firms experience significant price declines between the filing and offer dates. This is also consistent with prior research (Ritter and Welch (2002), Altınkılıç and Hansen (2002), Corwin (2003)).

The mean (median) value of the stock return volatility is 0.0388 (0.0346). The relative offer size, measured as offered shares divided by the number of pre-issue shares outstanding, is 28.72 percent. These statistics are also similar to those suggested by previous studies (Altınkılıç and Hansen (2002), Corwin (2003)), while the magnitude of IPOunder, defined as an average IPO initial return during the same month as the SEO, is 26.58 percent for our full sample. During the 1989-2000 period, the mean (median) value of absolute total accruals is 4.87 (2.82) percent of the lagged total assets, and the average spread is 3.30 percent of the bid price.

[Insert table 3 here.]

Panel B of table 3 reports the mean and median values for the subsamples of Nasdaq and NYSE and other exchange-listed offers. Columns 6-7 present the t-statistic and *p*-value for the test of the mean difference between Nasdaq issues and other issues, respectively. The last two columns of panel B present the Wilcoxon *Z*-statistic and corresponding *p*-value. As shown, several offer characteristics of Nasdaq offers are significantly different from those for other offers.

Consistent with prior studies, the degree of underpricing for Nasdaq offers is higher than that for NYSE and other offers. The mean underpricing from 1989 to 2000 is 4 percent for the Nasdaq subsample and 2.30 percent for the other subsample. The mean difference of underpricing across markets is statistically significant (t-value = -3.94, Wilcoxon Z-statistic = -4.79). This is also the case for discretionary accruals. During the same period, Nasdaq issues show a higher level of *DA*s than NYSE and

other issues. The mean (median) *DA*s for Nasdaq-listed offers are 0.0170 (0.0101), while the NYSE and other subsample has a mean (median) *DA*s of 0.0050 (0.0042). This indicates that Nasdaq-listed firms are more aggressive earnings managers. However, the difference between Nasdaq and other issues is not statistically significant (t-value = -1.05, Wilcoxon Z-statistic = -1.50). In addition, Panel B shows mixed evidence on the difference in the price decline between Nasdaq offers and other offers. The mean *PreCAR* for Nasdaq issues is –0.0141, while that for other issues is -0.0286.[16] However, this is not the case for the median values. The median *PreCAR* for Nasdaq offers is -0.0334 and -0.0292 for other offers.

The Nasdaq subsample is also related to a higher return volatility and higher spreads than other exchange-listed offers. For example, the standard deviation of daily stock returns averages 4.36 percent for Nasdaq issues and 2.89 percent for other issues. The mean difference of *Volatility* across markets is statistically significant (t-value = -10.90, Wilcoxon Z-statistic = -13.98). The relative offer size is 28.51 percent for Nasdaq offers and 29.16 percent for other offers. Meanwhile, the mean values of *ln(Price)* and *IPOunder* for Nasdaq issues are higher than those for other issues. Together, these statistics are consistent with prior findings (Ritter and Welch (2002), Altınkılıç and Hansen (2002), Corwin (2003)).

The information asymmetry hypothesis suggests that underpricing is a function of the degree of information asymmetry. Defining the bid-ask spread as a proxy for information asymmetry, we classify our sample into two groups (high versus low) based on the percentage of the bid-ask spread. Panel C of table 3 presents the mean and median values of selected variables, along with the mean difference t-test results and Wilcoxon Z-statistics. As predicted, the mean value of *Ud_Prc* for the high bid-ask spread subsample (0.0392) is higher than that for the low bid-ask spread subsample (0.0303). The t-statistic and Wilcoxon Z-statistic are -2.05 and -1.59, respectively. These are all statistically significant at

[16] This result is different from that of the previous study. Corwin (2003) reports that Nasdaq issues are associated with a larger price drop than NYSE issues. This may be due to the different time windows used to measure the pre-offer CAR. For example, Corwin measures the pre-offer CAR from day -5 to day -1, while we calculate the pre-offer CAR using a longer time period (e.g., from the filing date to the day prior to the offer).

conventional levels. The statistics indicate that on average, a higher degree of asymmetric information leads to greater SEO underpricing. More interestingly, the level of mean *DA*s for firms with high bid-ask spreads (0.0250) are much higher than that for firms with low bid-ask spreads (0.0072). The t-statistic supports the relationship (t-statistic = -1.92). The result suggests that firms with high information asymmetry tend to adjust their earnings more aggressively than those with low information asymmetry.

D. Univariate Analysis

To gain quick insight into the relationship between underpricing and earnings management, selected variables are sorted into quintiles based on the magnitude of underpricing (in Panel A) and discretionary accruals (in Panel B). Panel A of table 4 presents the mean values of variables for each quintile based on the magnitude of underpricing. The quintile values are obtained by averaging the variables across firms within each quintile. The table also includes a t-value for the mean difference of each variable across extreme quintiles. In panel A of table 4, the *DA*s for the most aggressive earnings management firms are associated with the lowest quintile of underpricing, and vice versa. Moreover, the mean *DA* decreases monotonically from the lowest quintile to the highest quintile of underpricing. The mean *DA* in the lowest (highest) underpricing quintile is 0.0273 (-0.0086). In addition, the difference in mean *DA*s between the extreme quintiles is statistically significant (t-value = -2.12). Collectively, these results indicate that there is a negative relationship between SEO underpricing and discretionary accruals.

[Insert table 4 here.]

Panel B of table 4 reports the mean values of selected variables for each quintile based on the magnitude of discretionary accruals. Looking at the mean underpricing for the quintiles, it becomes obvious that underpricing is negatively associated with *DA*s. Offerings by firms in quintile 1 (the most conservative *DA* portfolio) tend to be underpriced the most, and vice versa. The mean underpricing in the most conservative (aggressive) *DA*s quintile is 4.35 (2.93) percent of the offer price. Also, the difference in mean underpricing between the most conservative and aggressive *DA* portfolios is statistically significant (t-value = -2.17). The results support that issuers who aggressively adjust *DA*s also reduce the

magnitude of underpricing. Overall, table 4 shows that SEO underpricing is decreasing in the magnitude of *DA*s, suggesting that *DA*s may account for a portion of the observed underpricing.

Pearson correlation coefficients for the selected variables are reported in table 5. The correlation between *Ud_Prc* and *DA* is statistically significant with the predicted sign (negative). As expected, *PreCAR*, *Volatility*, *OfferSize*, *IPOunder*, and *Avgpsprd* are all significantly and positively related to underpricing.

[Insert table 5 here.]

E. Multiple Regression Results

Our hypothesis predicts that SEO underpricing would be negatively related to *DA*s. In this subsection, we examine the hypothesis after controlling for other determinants of underpricing. Table 6 presents the results of the OLS regressions with *Ud_Prc* as the dependent variable.

[Insert Table 6 here.]

In model 1, the coefficient on *DA* is significant with the predicted negative sign (-0.0341, t-value = -3.06). This supports our hypothesis that SEO firms employing aggressive earnings decisions push up the offer prices, thereby reducing the degree of underpricing. Other variables show results consistent with previous research (Rock (1986), Ritter and Welch (2002), Loughran and Ritter (2004), Altınkılıç and Hansen (2002), Corwin (2003), Gerard and Nanda (1993)). The coefficient on *PreCAR* is positive and significant (0.0466, t-value = 3.89), suggesting that the greater the recent increase in their price, the less effort issuers expend in bargaining over the offer price with underwriters. *Volatility* is also positively associated with *Ud_Prc*, indicating that the greater the price uncertainty, the more the SEO is underpriced. Consistent with the price pressure story that more underpricing would be given to larger offers and offers with a relatively low stock price, the coefficient on *OfferSize* is significantly positive, and the coefficient on *ln(Price)* is significantly negative. *IPOunder* also shows a significantly positive coefficient, implying that an SEO is underpriced more when there is a larger IPO underpricing. In addition, Nasdaq offers show the greater degree of underpricing.

Next, we expand our model to include the *Tick* variable. Corwin (2003) found a negative relationship between discounting and offer price rounding when price is interacted with the *Tick.* To control for this effect, we include both a price-increment dummy variable, *Tick*, and an interaction term, *ln(Price)*Tick*. Finally, our model incorporates a set of industry and year dummy variables to control the effect of any changes in underpricing across industries and time during the period, 1989-2000. Models 2-5 in table 6 report these results. Even after including the *Tick*, industry, and time dummy variables, coefficients on *DA*s are consistently negative and significant in these models (t-values = -3.03, -2.99, -3.05, -2.75 respectively). All other variables remain virtually unchanged with the predicted signs.

In models 2-5, coefficients on *Tick* are all positive and marginally significant. Coefficients on *Tick*ln(Price)* are negative but statistically insignificant except in models 2 and 3. Together, we find evidence consistent with the story that SEO firms managing pre-issue earnings by using discretionary accruals, push up their offer prices to obtain higher proceeds from their offerings, and this reduces the degree of underpricing.

F. Three-stage Least Square (3 SLS) Estimation Results

If there is any endogeneity in decision-making regarding the pricing of SEOs and earnings management, the results obtained from the OLS regressions will be biased. Assuming that the underpricing, earnings management, and stock returns are jointly determined, we estimate a 3SLS on the system of simultaneous equations.[17] In the first equation, we regress *Ud_Prc* on *DA* and *PreCAR*, as well as other control variables. In the second (third) equation, *DA (PreCAR*) is regressed on *Ud_Prc* and *PreCAR (Ud_Prc* and *DA*), and control variables.

As discussed earlier, if SEO firms deliberately increase their earnings to receive high proceeds, then the coefficient on *DA* in the first equation should be negative. If larger pre-offer, abnormal stock returns lead to more underpricing, then *PreCAR* should bear a positive coefficient. In the second equation,

[17] The 3SLS estimation provides consistent and efficient estimates in which several endogenous variables are determined simultaneously (Ramanathan, 1998).

if the SEO firm expecting a large underpricing due to the informational concerns has less incentive to manipulate earnings, then the coefficient on *Ud_Prc* should be negative. In addition, if the positive news in the market encourages earnings management, the coefficient on *PreCAR* in the second equation will be positive. If earnings management affects the market during the pre-offer period, then the coefficient on *DA* in the *PreCAR* equation should be positive.

[Insert Table 7 here.]

Table 7 reports the results. As predicted, the coefficient on *DA* is significantly negative in the first equation (-0.1698, t-value = -3.06). This result supports that even after incorporating endogeneity, earnings management by issuers is significantly related to the pricing of SEOs. We also find that the pre-offer abnormal stock returns play an important role in the pricing of SEOs. The coefficient on *PreCAR* is 0.8747 with a t-value of 4.26. In the *DA* equation, the coefficient on *Ud_Prc* is negative and statistically significant (t-value = -2.54). We interpret the result to mean that firms intending to underprice more tend not to manipulate earnings upward. We also find that SEO firms' earnings management is motivated by pre-offer stock returns. The *PreCAR* bears a significantly positive coefficient (0.9556, t-value = 7.51), implying that positive news about the share price prior to the offerings encourages SEO firms to manage their earnings to meet market expectations. Meanwhile, *DA* in the third equation is positively related to *PreCAR*. The coefficient on *DA* is 0.4457 with a t-value of 3.43, meaning that earnings management deters price declines in the period prior to the offer. In addition, we find evidence supporting the effect of (expected) pricing of SEOs on the pre-offer market returns. The coefficient on *Ud_Prc* in the *PreCAR* equation is positive and significant (t-value=2.22). Some variables (e.g., *Volatility, OfferSize*, and *IPOunder*) tend to lose their statistical significance when the 3 SLS equations are estimated.

To summarize, even after controlling for possible endogeneity, we find the evidence consistent with our hypothesis.

G. 3SLS Estimation with a Proxy for the Information Asymmetry

As discussed earlier, underpricing is a function of information asymmetry. The amount of underpricing reflects investor uncertainty. Therefore, the higher the information asymmetry, the more the

SEOs are underpriced (Rock (1986), Ritter and Welch (2002), Altınkılıç and Hansen (2002), Corwin (2003)).

At the same time, SEO firms' earnings management may be a function of information asymmetry as well. Schipper (1989) argues that the absence of full communication (or the existence of blocked communication) together with asymmetric information makes it possible for managers to manage earnings. In a recent study, Jo and Kim (2003) argue and find that earnings management of SEO firms are negatively associated with disclosure frequency since disclosure reduces information asymmetry. The statistics reported in panel C of table3 are consistent with their finding. Therefore, our next concern is with how the relationship between underpricing and earnings management would differ between subsamples with high and low degrees of information asymmetry. To test further, our sample is classified into two groups, high and low information asymmetry subsamples, based on the *AvgpSprd*, the average of percentage quoted bid ask spreads over the 30 days ending two days prior to the offer. By employing 3SLS estimation, we again examine the relationship between underpricing and *DA*s for high information asymmetry (high bid-ask spread) firms and low information asymmetry (low bid-ask spread) firms separately.

[Insert table 8 here.]

Table 8 summarizes the results. The columns 2-4 show the results for high bid-ask spread firms. In the *Ud_Prc* equation, the coefficient on *DA* is negative and significant (-0.2211, t-value =-2.65). The last three columns report the results for the low bid-ask spread subsample. The coefficient on *DA* in the *Ud_Prc* model is negative but insignificant, indicating that for the sample firms with low asymmetric information, earnings management does not explain the underpricing of SEOs. To summarize, table 8 suggests that the negative relationship between SEO underpricing and earnings management is more significant for issuers with high information asymmetry than for those with low information asymmetry.

H. Sensitivity Analysis

To check the robustness of the results and to gain more insight into the issues under investigation, we conduct a few additional tests. All tests are based on 3SLS estimations.

Test with the Closing Bid Difference

Corwin (2003) argues that the discounting of the seasoned offer is related to the underwriter practice of pricing at the bid quote.[18] He reports that the practice of pricing at the bid has a significant effect on SEO discounting for Nasdaq offers, but not for NYSE issues. Though we have no reason to believe this is also relevant to our measure of underpricing, to see the effect of this pricing practice on our investigation, we extend our 3SLS equations by including two more variables, *BidDiff* and $BidDiff*D_{NASDAQ}$. Panel A in table 9 presents the results.

[Insert table 9 here.]

The results with the closing bid quote suggest that the two proxies for the bid pricing have significant effects on underpricing. In the first equation, the coefficient on *BidDiff* is negative and significant (-0.1246 with a t-value = -3.15), while $BidDiff*D_{NASDAQ}$ bears a significantly positive coefficient (0.1173, t-value = 3.21).[19] Together, these results indicate that the close-bid price difference at least partly explains the underpricing.

The inference on *DA* in the *Ud_Prc* equation remains the same (t-value = -3.94), suggesting that the relationship between the two variables has not been impaired, even after controlling for the effect of bid pricing. Overall, the inclusion of a few more control variables does not alter our major conclusions, based on the test results reported earlier.

Tests with an offer discount as an alternative measure of underpricing

Prior studies employed other measures of SEO underpricing. In Corwin (2003), the dependent variable, underpricing, is measured as negative one times the return from the previous day's closing transaction price to the offer price. This measure is called the offer discount elsewhere in the literature

[18] Corwin (2003) assumes that Nasdaq issues are more likely to be priced at the previous day's closing bid quote, while NYSE offers are more likely to be priced at the closing price.

[19] This result is different from that suggested by Corwin (2003). He finds that the close-bid price difference has a significant effect on SEO pricing only for Nasdaq issues (not for NYSE issues).

(Altınkılıç and Hansen (2002), Kim and Shin (2001)). After substituting the offer discount, *Offer-Disc,* for the dependent variable, *Ud_Prc*, the 3 SLS is re-estimated. The results are reported in the columns 2-4 of Panel B of table 9. Consistent with the results reported earlier, the coefficient on *DA* in the offer-Disc equation is significantly negative (t-value =- 3.25), though *Volatility* and D_{NASDAQ} lose their statistical significance.

Tests with discretionary current accruals as an alternative measure of earnings management

Teoh, Welch, and Wong (1998a and 1998b) argue that managers have greater discretion over current accruals than over long-term accruals.[20] To check the robustness of our results reported earlier, we employ the current accruals model to estimate DAs and replicate the analyses (See Teoh, Welch, and Wong (1998a and 1998b), and Rangan (1998) for the estimation of discretionary current accruals).

The last three columns of Panel B present the results. The results are virtually the same as before. In the *Ud_Prc* equation, discretionary current accruals (*DCA*) shows a negative and significant coefficient (-0.9760, t-value=-3.16), indicating that using an alternative proxy for earnings management does not alter the results reported earlier. While, the coefficient on *Ud_Prc* in the *DCA* equation is significantly negative as previously reported (t-value=-3.53).[21] In summary, the additional tests in the above

[20] Prior studies (e.g., Teoh, Welch, and Wong (1998a and 1998b) and Rangan (1998)) consider current accruals and long-term accruals separately when investigating earnings management around equity offerings. The current accruals are adjustments involving short-term assets and liabilities. For example, managers can adjust current accruals by advancing (or delaying) recognition of revenues (expenses). While, the long-term accruals are adjustments involving long-terms net assets (e.g., depreciation, deferred taxes, and realizing unusual gains).

[21] We also conduct additional tests by employing two quarterly measures of DAs: DA_{Q0} , and DA_{Q-1}, where DA_{Q0} is the discretionary total accruals divided by the lagged total assets for the Q(0), and DA_{Q-1} is the discretionary total accruals divided by the lagged total assets for the Q(-1). Again, we find the evidence consistent with the results reported above. The results are available upon request.

subsections suggest that our main results remain robust and the sensitivity tests do not alter our conclusions based on the test results reported earlier.[22]

IV. Conclusion

This study examines the relationship between earnings management by firms offering seasoned equity issues and the pricing of SEOs. We argue that equity issuers have an incentive to boost their earnings before an offering as well as push up the offer prices in order to increase offering proceeds. This is because the offer price in an equity offering has a direct impact on the issuer's wealth. Ritter (1984) argues that earnings are a significant factor in determining the value of firms with initial public offerings (IPOs), indicating that the level of reported earnings may have an important implication for the pricing of equity offerings.

Evidence from recent studies suggests that seasoned equity offers tend to be significantly underpriced (Altınkılıç and Hansen (2002), Corwin (2003), Kim and Shin (2001), Mola and Loughran (2004)). At the same time, other studies document that firms manage earnings around SEOs, and there is a negative correlation between post-offer returns and pre-issue earnings management (Teoh, Welch, and Wong (1998a and 1998b), Rangan (1998), and Shivakumar (2000)). Though the above studies implicitly assume that issuers manage earnings to obtain higher offering proceeds, none of the studies directly

[22] Estimation of discretionary accruals (DA) may be subject to the measurement error. That is, a portion of nondiscretionary accruals (NDA) may be misclassified as DA. According to our hypothesis, there is no reason to believe that NDA bears any explanatory power in explaining the underpricing of SEOs. Therefore, any measurement error in estimating DAs will work against finding a significantly negative association between DA and SEO underpricing. However, if there is a mechanical relationship between total accruals and the underpricing of SEOs, regardless of the issuer's intention to manage earnings, observed negative relationship between DA and SEO underpricing may be due to such a mechanical relationship. To address this concern, we substitute DA with NDA and estimate the 3 SLS equations. The estimation results, not reported, show that the SEO underpricing is not associated with NDA (coefficient = 0.1455, t-value = 0.32).

examine the relationship between earnings management and the pricing of seasoned equity offers, which has a direct effect on the issuer's wealth.

In this study, we hypothesize that SEO firms employing aggressive accounting decisions also more aggressively push up their offer prices. Empirically, the degree of underpricing is defined as the offer price less the closing price on the offer date, scaled by the offer price. Therefore, a negative relationship between discretionary accruals and SEO underpricing is expected if the offer day closing price does not increase as much as the offer price.

Overall, the empirical results presented here are consistent with our prediction, the *issuer's greed hypothesis*. For a sample of SEOs from 1989 through 2000, we find that: (1) there is a negative relationship between SEO underpricing and discretionary accruals. This suggests that seasoned equity issuers actively engaging in earnings management also push up the offer price in order to receive more proceeds from their offerings; (2) the relationship between SEO underpricing and earnings management is more significant for issuers with high information asymmetry than for those with low information asymmetry; and (3) the 3SLS estimation results support that our results remain strong, even after incorporating possible endogeneity. In addition, we find that the above findings remain robust across controls for other determinants of SEO underpricing. Alternative measures for the underpricing and discretionary accruals do not change the results.

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Table 1

Sample Selection

	Number of SEOs
Total SEOs (between January 1989 and December 2000 from the Securities Data Corporation), which are available on the quarterly Compustat and CRSP database……	3,762
Less missing of fiscal year ends ……	(663)
Sample SEOs available …….	3,099
Less missing of accounting data to compute accruals ……..	(1,353)
Less missing of data to compute SEO underpricing …….	(641)
Less missing of other data including observations trimmed at the 1st and 99th percentiles based on Underpricing, DA, and CAR …..…	(65)
Final sample ……..….	1,040

Table 2
(N=1,040)
Characteristics of Sample Firms with Seasoned Equity Offerings from 1989 to 2000

Panel A: Number of SEOs by Industrial Classification

Industry	SIC codes	Number of offerings	%
Oil and Gas	13	56	5.38
Food Products	20	15	1.44
Clothing	23	8	0.77
Paper & Paper Products	24 – 27	33	3.17
Chemical Products	28	107	10.29
Manufacturing	30 – 34	61	5.86
Computer Equipment & Services	35, 73	218	20.96
Electronic Equipment	36	101	9.71
Transportation	37, 39-42, 44-45	49	4.71
Scientific Instruments	38	65	6.25
Communications	48	44	4.23
Whole Sales & Retails	50-59	133	12.79
Entertainment Services	70, 78-79	25	2.40
All others	10, 15-17,22, 29, 49, 61, 67, 72, 75, 80-87, 99	125	12.02
Total		1,040	100.00

Panel B: Number of SEOs by Calendar Year

Year	Number of sample SEOs	Cumulative Frequency	Cumulative % of sample
1989	23	23	2.21
1990	21	44	4.23
1991	72	116	11.15
1992	68	184	17.69
1993	94	278	26.73
1994	60	338	32.50
1995	79	417	40.10
1996	157	550	52.88
1997	169	707	67.98
1998	110	817	78.56
1999	107	924	88.85
2000	116	1,040	100.00

Table 3
Descriptive Statistics

Panel A: Full Sample (N=1,040)

Variables	Mean (*p*-value)	Median (*p*-value)	Std. Dev.	Percentile 75th	Percentile 25th
Ud_Prc	0.0345 (0.001)	0.0135 (0.001)	0.0654	0.0577	0.0000
DA	0.0157 (0.002)	0.0089 (0.002)	0.1636	0.0642	-0.0391
PreCAR	-0.0187 (0.001)	-0.0305 (0.001)	0.1669	0.0694	-0.1189
Volatility	0.0388 (0.001)	0.0346 (0.001)	0.0214	0.0479	0.0250
OfferSize	0.2872 (0.001)	0.2278 (0.001)	0.3345	0.3270	0.1421
LnPrice	2.9891 (0.001)	3.0534 (0.001)	0.8152	3.4812	2.6027
IPOunder	0.2658 (0.001)	0.1760 (0.001)	0.2597	0.2540	0.1153
Ln(MKTCAP)	5.5259 (0.001)	5.4244 (0.001)	1.5351	6.4690	4.6267
AbsTacc	0.0487 (0.001)	0.0282 (0.001)	0.0735	0.0564	0.0129
Avgpsprd	0.0330 (0.001)	0.0181 (0.001)	0.1210	0.0312	0.0111

Panel B: Mean and Median Values for Offer and Firm Characteristics across the Markets

	Nasdaq Offers (N=705)		NYSE & others (N=335)		t-test		Wilcoxon test	
Variables	Mean	Median	Mean	Median	t-statistic	*p*-value	*Z*-statistic	*p*-value
Ud_Prc	0.0400	0.0205	0.0230	0.0055	-3.94	0.0001	-4.79	0.0001
DA	0.0170	0.0101	0.0050	0.0042	-1.05	0.2936	-1.50	0.0668
PreCAR	-0.0141	-0.0334	-0.0286	-0.0292	-1.31	0.1902	-0.56	0.2862
Volatility	0.0436	0.0393	0.0289	0.0248	-10.90	0.0001	-13.98	0.0001
OfferSize	0.2851	0.2412	0.2916	0.1958	0.29	0.7713	-3.90	0.0001
LnPrice	3.0233	3.0325	2.9172	3.0796	-1.96	0.0498	-0.45	0.3281
IPOunder	0.2925	0.1830	0.2094	0.1524	-4.88	0.0001	-5.22	0.0001
Ln(MKTCAP)	5.3970	5.2836	5.7971	5.9264	3.96	0.0001	4.77	0.0001
AbsTacc	0.0552	0.0329	0.0351	0.0224	-4.15	0.0001	-5.25	0.0001
Avgpsprd	0.0342	0.0190	0.0300	0.0156	-0.44	0.6585	-1.04	0.1485

Panel C: Mean and Median Values for Offer and Firm Characteristics by Bid-Ask Spread

	High Bid-Ask Spread (N=413)		Low Bid-Ask Spread (N=412)		t-test		Wilcoxon test	
Variables	Mean	Median	Mean	Median	t-statistic	*p*-value	*Z*-statistic	*p*-value
Ud_Prc	0.0392	0.0185	0.0303	0.0117	-2.05	0.0408	-1.59	0.0555
DA	0.0250	0.0081	0.0072	0.0050	-1.92	0.0556	-0.01	0.4959
PreCAR	-0.0365	-0.0535	0.0084	-0.0107	3.79	0.0002	3.62	0.0001
Volatility	0.0397	0.0351	0.0410	0.0358	0.85	0.3970	0.17	0.4336
OfferSize	0.3547	0.2729	0.2098	0.1862	-6.41	0.0001	-10.14	0.0001
LnPrice	2.6807	2.7881	3.5000	3.4696	18.94	0.0001	16.91	0.0001
IPOunder	0.2077	0.1640	0.3846	0.2280	9.61	0.0001	8.30	0.0001
Ln(MKTCAP)	4.8166	4.8760	6.5248	6.3833	20.74	0.0001	18.01	0.0001
AbsTacc	0.0490	0.0300	0.0478	0.0280	-0.24	0.8133	-0.51	0.3043

Table 3 (Continued)

Ud_Prc = the closing market price on the offer day minus the offer price, divided by the offer price; *DA* = discretionary total accruals over two periods, Q(-1) and Q(0), divided by lagged total assets; *PreCAR* = cumulative market-adjusted return over the period starting the day after the filling date and ending the day prior to the offer, where market return is defined as the return on the CRSP value-weighted index; *Volatility* = standard deviation of daily stock returns over the 30 trading days ending 11 days prior to the offer; *OfferSize* = shares offered divided by total number of shares outstanding prior to the offer; *ln(Price)* = natural logarithm of the closing price on the day prior to the offer; *IPOunder* = average IPO initial return during the same month as the SEO, where monthly underpricing estimates for IPOs are obtained from Jay Ritter's web page at http://bear.cba.ufl.edu/ritter/ipoall.htm; *ln(MKTCAP)* = natural logarithm of market value of equity, where the market value of equity is defined on the day prior to the offer as the number of shares outstanding multiplied by price; *AbsTacc* = absolute value of total accruals; *Avgpsprd* = average of percentage quoted spreads over the 30 days ending two days prior to the offer,((ask – bid) /bid). The *t*-value for each variable is calculated as the mean value of the NYSE and other offers (low bid-ask spread in Panel C) less that of Nasdaq offers (high bid-ask spread in Panel C), deflated by the related standard error. The *p*-values are based on one-tailed tests. The statistics for *Avgpsprd* variable are based on 825 observations due to the missing value of bid-ask spread. In Panel C, sample is classified as a high (low) bid-ask spread firm if the firm's bid-ask spread is higher than (lower than or equal to) the median value of bid-ask spread for all sample firms.

Table 4

Mean Values of Selected Variables for Five Portfolios of Sample Firms by Assigning Firms to Quintiles Based on the SEO Underpricing or Discretionary Accruals

Panel A: Quintiles Based on the SEO Underpricing (*Ud_Prc*)

Portfolio Ranking	*DA*	*PreCAR*	*Volatility*	*OfferSize*	*IPO under*	*Avgpsprd*
Lowest	0.0273	-0.0317	0.0380	0.2517	0.3001	0.0231
2	0.0228	-0.0360	0.0359	0.2997	0.2340	0.0294
3	0.0149	-0.0141	0.0330	0.2516	0.1929	0.0204
4	0.0033	-0.0405	0.0397	0.2738	0.2746	0.0238
Highest	-0.0086	0.0227	0.0475	0.3591	0.3275	0.0529
t-value$_{H-L}$	-2.12**	3.14***	4.62***	3.71***	0.92	2.16**

Panel B: Quintiles Based on the Discretionary Accruals (*DA*)

Portfolio Ranking	*Ud_Prc*	*PreCAR*	*Volatility*	*OfferSize*	*IPO under*	*Avgpsprd*
Lowest	0.0435	-0.0241	0.0435	0.2951	0.3201	0.0328
2	0.0333	-0.0186	0.0359	0.3136	0.2565	0.0267
3	0.0283	-0.0266	0.0348	0.2664	0.2132	0.0277
4	0.0308	-0.0232	0.0382	0.2843	0.2373	0.0324
Highest	0.0293	-0.0146	0.0416	0.2784	0.2944	0.0258
t-value$_{H-L}$	-2.17**	0.60	-0.81	-0.68	-0.88	-0.59

The sample consists of 1,040 offers from 1989 through 2000. *Ud_Prc* = the closing market price on the offer day minus the offer price, divided by the offer price; *DA* = discretionary total accruals over two periods, Q(-1) and Q(0), divided by lagged total assets; *PreCAR* = cumulative market-adjusted return over the period starting the day after the filling date and ending the day prior to the offer, where market return is defined as the return on the CRSP value-weighted index; Volatility = standard deviation of daily stock returns over the 30 trading days ending 11 days prior to the offer; *OfferSize* = shares offered divided by total number of shares outstanding prior to the offer; *ln(Price)* = natural logarithm of the closing price on the day prior to the offer; *IPOunder* = average IPO initial return during the same month as the SEO, where monthly underpricing estimates for IPOs are obtained from Jay Ritter's web page at http://bear.cba.ufl.edu/ritter/ipoall.htm; *Avgpsprd* = average of percentage quoted spreads over the 30 days ending two days prior to the offer. The *t*-value for each variable is calculated as the mean value difference between the highest rank and the lowest rank based on SEO underpricing in Panel A (DA in Panel B), divided by the related standard error. Mean value of *Avgpsprd* is computed based on 825 observations. ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Table 5
Pearson Correlations Among the Dependent and Selected Independent Variables

	Ud_Prc	*DA*	*PreCAR*	*Volatility*	*OfferSize*	*Ln (Price)*	*Tick*	*IPOunder*	*Avgpsprd.*
Ud_Prc	1.0000								
DA	-0.0882***	1.0000							
PreCAR	0.0935***	0.0512*	1.0000						
Volatility	0.1679***	0.0337	0.0632**	1.0000					
OfferSize	0.1479***	-0.0755**	-0.0391	0.1166***	1.0000				
Ln (Price)	-0.0877***	0.0696**	0.2572***	-0.0516*	-0.3952***	1.0000			
Tick	0.0162	-0.0011	-0.0042	0.0923***	0.0086	-0.0293	1.0000		
IPOunder	0.0985***	0.0326	0.1281***	0.3183***	-0.0989***	0.3470***	0.1034***	1.0000	
Avgpsprd	0.1101***	0.0230	-0.0275	0.1605***	0.1161***	-0.2046***	-0.0155	-0.0723**	1.0000

The sample consists of 1,040 offers from 1989 through 2000. *Ud_Prc* = the closing price on the offer day minus the offer price, divided by the offer price; *DA* = discretionary total accruals divided by lagged total assets over two periods, Q(-1) and Q(0); *PreCAR* = cumulative market-adjusted return over the period starting the day after the filling date and ending the day prior to the offer, where market return is defined as the return on the CRSP value-weighted index; *Volatility* = standard deviation of daily stock returns over the 30 trading days ending 11 days prior to the offer; *OfferSize* = shares offered divided by total number of shares outstanding prior to the offer; *ln (Price)* = natural logarithm of the closing price on the day prior to the offer; Tick = an indicator variable that equals one if the closing price on the day prior to the offer doesn't fall on even dollar or $0.25 price increment, and zero otherwise; *IPOunder* = average IPO initial return during the same month as the SEO, where monthly underpricing estimates for IPOs are obtained from Jay Ritter's web page at http://bear.cba.ufl.edu/ritter/ipoall.htm; *Avgpsprd* = average of percentage quoted spreads over the 30 days ending two days prior to the offer. Correlation of *Avgpsprd* variable is based on the 825 observations. *, **, *** denote one-tailed significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Table 6

Regressions of SEO Underpricing on Proxy for Earnings Management (DA) and on Control Variables

Models	1	2	3	4	5
Intercept	0.0438	0.0189	0.0271	0.0356	0.0245
	(4.40)***	(1.42)	(2.00)**	(2.41)**	(1.34)
DA	-0.0341	-0.0339	-0.0333	-0.0344	-0.0315
	(-3.06)***	(-3.03)***	(-2.99)***	(-3.05)***	(-2.75)***
PreCAR	0.0466	0.0481	0.0470	0.0489	0.0482
	(3.89)***	(4.01)***	(3.93)***	(4.04)***	(3.90)***
Volatility	0.3541	0.4499	0.3481	0.3255	0.2782
	(3.46)***	(4.62)***	(3.39)***	(3.06)**	(2.53)**
OfferSize	0.0158	0.0163	0.0162	0.0160	0.0154
	(2.50)**	(2.57)**	(2.56)**	(2.49)**	(2.37)**
Ln(Price)	-0.0136	-0.0051	-0.0086	-0.0099	-0.0113
	(-4.79)***	(-1.30)	(-2.09)**	(-2.37)**	(-2.63)***
Tick		0.0315	0.0281	0.0253	0.0259
		(2.10)**	(1.88)*	(1.68)*	(1.71)*
*Ln(Price)*Tick*		-0.0088	-0.0081	-0.0072	-0.0077
		(-1.83)*	(-1.68)*	(-1.49)	(-1.56)
IPOunder	0.0276		0.0260	0.0264	0.0214
	(3.24)***		(3.05)***	(3.05)***	(1.67)*
D_{NASDAQ}	0.0109	0.0120	0.0115	0.0110	0.0098
	(2.51)**	(2.71)***	(2.61)***	(2.44)**	(2.13)**
Industry Dummies	No	No	No	Yes	Yes
Year Dummies	No	No	No	No	Yes
Adj. R^2	0.0960	0.0903	0.0975	0.0941	0.0955

The sample consists of 1,040 offers from 1989 through 2000. The following equation is estimated: $Ud\_Prc = \alpha_0 + \alpha_1 DA + \alpha_2 PreCAR + \alpha_3 Volatility + \alpha_4 OfferSize + \alpha_5 ln(Price) + \alpha_6 Tick + \alpha_7 ln(Price) * Tick + \alpha_8 IPOunder + \alpha_9 D_{NASDAQ}$, where *Ud_Prc* = the closing market price on the offer day minus the offer price, divided by the offer price; *DA* = discretionary total accruals over two periods, Q(-1) and Q(0), divided by lagged total assets; *PreCAR* = cumulative market-adjusted return over the period starting the day after the filling date and ending the day prior to the offer, where market return is defined as the return on the CRSP value-weighted index; *Volatility* = standard deviation of daily stock returns over the 30 trading days ending 11 days prior to the offer; *OfferSize* = shares offered divided by total number of shares outstanding prior to the offer; *ln (Price)* = natural logarithm of the closing price on the day prior to the offer; *Tick* = an indicator variable that equals one if the closing price on the day prior to the offer doesn't fall on even dollar or $0.25 price increment, and zero otherwise; *IPOunder* = average IPO initial return during the same month as the SEO, where monthly underpricing estimates for IPOs are obtained from Jay Ritter's web page at http://bear.cba.ufl.edu/ritter/ipoall.htm; D_{NASDAQ} = an indicator variable that equals one if the firm was listed on the NASDAQ at the time of offer and zero otherwise; and industry dummies are based on two-digit SIC codes. ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Table 7

Three-stage Least Squares Estimation: Relationship Between SEO Underpricing and Earnings Management

Dependent variable	*Ud_Prc*	*DA*	*PreCAR*
Intercept	0.1787	0.1999	-0.1885
	(3.84)***	(5.57)***	(-6.01)***
Ud_Prc		-1.2272	0.8323
		(-2.54)**	(2.22)**
DA	-0.1698		0.4457
	(-3.06)***		(3.43)***
PreCAR	0.8747	0.9556	
	(4.26)***	(7.51)***	
Volatility	-0.1298	0.3728	
	(-0.73)	(1.05)	
OfferSize	0.0012		0.0001
	(0.13)		(0.00)
Ln(Price)	-0.0441		
	(-3.80)***		
Tick	0.0291		
	(2.09)**		
*Ln(Price)*Tick*	-0.0090		
	(-2.01)**		
IPOunder	0.0043		
	(0.46)		
D_{NASDAQ}	0.0119		0.0108
	(2.63)***		(1.05)
ln(MKTCAP)		-0.0230	0.0231
		(-4.73)***	(5.53)***
NONB6		0.0289	
		(1.60)	
AbsTacc		-0.3223	
		(-4.22)***	
System Weighted R^2		0.0759	

The sample consists of 1,040 offers from 1989 through 2000. The following simultaneous equations are estimated: (1) $Ud\_Prc = \alpha_0 + \alpha_1 DA + \alpha_2 PreCAR + \alpha_3 Volatility + \alpha_4 OfferSize + \alpha_5 ln(Price) + \alpha_6 Tick + \alpha_7 ln(Price) * Tick + \alpha_8 IPOunder + \alpha_9 D_{NASDAQ}$, (2) $DA = \beta_0 + \beta_1 Ud\_Prc + \beta_2 PreCAR + \beta_3 Volatility + \beta_4 ln(MKTCAP) + \beta_5 NONB6 + \beta_6 AbsTacc$, and (3) $PreCAR = \delta_0 + \delta_1 Ud\_Prc + \delta_2 DA + \delta_3 OfferSize + \delta_4 D_{NASDAQ} + \delta_5 ln(MKTCAP)$, where Ud_Prc = the closing market price on the offer day minus the offer price, divided by the offer price; *DA* = discretionary total accruals over two periods, Q(-1) and Q(0), divided by lagged total assets; *PreCAR* = cumulative market-adjusted return over the period starting the day after the filling date and ending the day prior to the offer, where market return is defined as the return on the CRSP value-weighted index; *Volatility* = standard deviation of daily stock returns over the 30 trading days ending 11 days prior to the offer; *OfferSize* = shares offered divided by total number of shares outstanding prior to the offer*; ln (Price)* = natural logarithm of the closing price on the day prior to the offer; *Tick* = an indicator variable that equals one if the closing price on the day prior to the offer doesn't fall on even dollar or $0.25 price increment, and zero otherwise; *IPOunder* = average IPO initial return during the same month as the SEO, where monthly underpricing estimates for IPOs are obtained from Jay Ritter's web page at http://bear.cba.ufl.edu/ritter/ipoall.htm; D_{NASDAQ} = an indicator variable that equals one if the firm was listed on the NASDAQ at the time of offer and zero otherwise; *ln (MKTCAP)* = natural logarithm of the market value of equity, where the market value of equity is defined on the day prior to the offer as the number of shares outstanding multiplied by price; *NONB6* = an indicator variable that equals one if the firm's auditor is not one of big six accounting firms, and zero otherwise; *AbsTacc* = absolute value of total accruals. ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Table 8

Three-stage Least Squares Estimations: Relationship Between SEO Underpricing and Earnings Management for the different degrees of Information Asymmetry

	High Bid-Ask Spread			Low Bid-Ask Spread		
Dependent variable	*Ud_Prc*	*DA*	*PreCAR*	*Ud_Prc*	*DA*	*PreCAR*
Intercept	0.1467	0.2161	-0.1237	-0.0249	-0.0802	-0.2347
	(2.08)**	(3.34)**	(-2.37)**	(-0.18)	(-1.14)	(-3.59)***
Ud_Prc		-0.2126	0.2539		0.9811	0.1354
		(-0.21)	(0.56)		(1.35)	(0.19)
DA	-0.2211		0.3342	-0.1045		-0.2420
	(-2.65)***		(2.63)***	(-0.64)		(-0.78)
PreCAR	1.3724	1.6145		-0.1864	-0.5145	
	(2.65)***	(7.58)***		(-0.62)	(-2.94)***	
Volatility	0.4334	-0.0879		0.1439	0.2851	
	(1.51)	(-0.10)		(0.65)	(0.62)	
OfferSize	-0.0027		-0.0067	0.0811		0.1660
	(-0.24)		(-0.54)	(1.40)		(2.17)**
Ln (Price)	-0.0318			0.0038		
	(-1.95)*			(0.11)		
Tick	0.1475			-0.0202		
	(2.18)**			(-0.48)		
*Ln (Price)*Tick*	-0.0541			0.0045		
	(-2.10)**			(0.36)		
IPOunder	-0.0297			0.0366		
	(-1.00)			(2.94)***		
D_{NASDAQ}	0.0251		0.0005	0.0177		0.0313
	(2.04)**		(0.05)	(2.27)**		(1.33)
ln (MKTCAP)		-0.0228	0.0153		0.0107	0.0285
		(-2.17)**	(1.83)*		(1.15)	(3.47)***
NONB6		0.0236			0.0597	
		(1.12)			(1.13)	
AbsTacc		-0.4753			-0.3067	
		(-3.87)***			(-2.11)**	
System Weighted R^2		0.0917			0.0497	

The sample is reduced to 825 offers (413 for high bid-ask spread, and 412 for low bid-ask spread) due to the missing values of the bid-ask spread (*Avgpsprd)* variable. The following simultaneous equations are estimated: (1) $Ud\_Prc = \alpha_0 + \alpha_1 DA + \alpha_2 PreCAR + \alpha_3 Volatility + \alpha_4 OfferSize + \alpha_5 ln(Price) + \alpha_6 Tick + \alpha_7 ln(Price) * Tick + \alpha_8 IPOunder + \alpha_9 D_{NASDAQ}$, (2) $DA = \beta_0 + \beta_1 Ud\_Prc + \beta_2 PreCAR + \beta_3 Volatility + \beta_4 ln(MKTCAP) + \beta_5 NONB6 + \beta_6 AbsTacc$, and (3) $PreCAR = \delta_0 + \delta_1 Ud\_Prc + \delta_2 DA + \delta_3 OfferSize + \delta_4 D_{NASDAQ} + \delta_5 ln(MKTCAP)$, where *Ud_Prc* = the closing market price on the offer day minus the offer price, divided by the offer price; *DA* = discretionary total accruals over two periods, Q(-1) and Q(0), divided by lagged total assets; *PreCAR* = cumulative market-adjusted return over the period starting the day after the filling date and ending the day prior to the offer, where market return is defined as the return on the CRSP value-weighted index; *Volatility* = standard deviation of daily stock returns over the 30 trading days ending 11 days prior to the offer; *OfferSize* = shares offered divided by total number of shares outstanding prior to the offer; *ln (Price)* = natural logarithm of the closing price on the day prior to the offer; *Tick* = an indicator variable that equals one if the closing price on the day prior to the offer doesn't fall on even dollar or $0.25 price increment, and zero otherwise; *IPOunder* = average IPO initial return during the same month as the

Table 8 (continued)

SEO, where monthly underpricing estimates for IPOs are obtained from Jay Ritter's web page at http://bear.cba.ufl.edu/ritter/ipoall.htm; D_{NASDAQ} = an indicator variable that equals one if the firm was listed on the NASDAQ at the time of offer and zero otherwise; *ln (MKTCAP)* = natural logarithm of the market value of equity, where the market value of equity is defined on the day prior to the offer as the number of shares outstanding multiplied by price; *NONB6* = an indicator variable that equals one if the firm's auditor is not one of big six accounting firms, and zero otherwise; *AbsTacc* = absolute value of total accruals. The sample is classified as a high (low) bid-ask spread firm if the firm's bid-ask spread is higher than (lower than or equal to) the median value of bid-ask spread for all sample firms. ***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Table 9
Sensitivity Analysis: Three-stage Least Squares Estimations

Panel A: Relationship Between SEO Underpricing and Earnings Management After Controlling for the Closing Bid Quote

Dependent variable	*Ud_Prc*	*DA*	*PreCAR*
Intercept	0.3047	0.1402	-0.2004
	(5.27)***	(3.28)***	(-5.47)***
Ud_Prc		-0.7496	0.8769
		(-1.24)	(2.08)**
DA	-0.2995		0.3932
	(-3.94)***		(2.59)***
PreCAR	1.3881	0.6850	
	(6.18)***	(5.15)***	
Volatility	-0.2114	0.2989	
	(-1.48)	(0.75)	
OfferSize	-0.0238		0.0106
	(-1.95)		(0.55)
Ln (Price)	-0.0763		
	(-5.07)***		
Tick	0.0468		
	(2.85)***		
*Ln(Price)*Tick*	-0.0130		
	(-2.64)***		
IPOunder	-0.0140		
	(-1.48)		
D_{NASDAQ}	0.0151		0.0040
	(2.41)**		(0.29)
AvgpSprd	0.0018	0.0005	-0.0014
	(1.67)*	(0.24)	(-0.61)
BidDiff	-0.1246		
	(-3.15)***		
BidDiff$*D_{NASDAQ}$	0.1173		
	(3.21)***		
ln(MKTCAP)		-0.0151	0.0251
		(-2.59)***	(5.21)***
NONB6		0.0428	
		(1.84)*	
AbsTacc		-0.3783	
		(-4.43)***	
System Weighted R^2		0.0702	

Table 9 (continued)

Panel B: 3 SLS Estiamtion Using Alternative Proxies for SEO Underpricing and Earnings Management

	With Offer-Disc as Alternative Dep. Variable			With DCA as an Alternative Proxies for EM		
Dependent var.	*Off-Disc*	*DA*	*PreCAR*	*Ud-Prc*	*DCA*	*PreCAR*
Intercept	0.2914	0.2158	-0.1766	0.3890	0.2050	-0.1922
	(5.89)***	(3.73)***	(-3.93)***	(3.35)***	(7.16)***	(-7.57)***
Off-Disc		-2.4252	0.0994			
		(-2.44)**	(0.21)			
Ud_Prc					-1.3697	0.6597
					(-3.53)***	(1.39)
DA	-0.1962					
	(-3.25)***					
DCA				-0.9760		0.9424
				(-3.16)***		(4.63)***
PreCAR	1.2890	0.3609		1.9887	0.8562	
	(6.30)***	(1.65)*		(3.83)***	(12.02)***	
Volatility	-0.2535	1.3547		-0.0642	0.0263	
	(-1.26)	(2.07)**		(-0.52)	(0.23)	
OfferSize	-0.0178		0.0364	-0.0453		0.0125
	(-1.71)*		(1.81)*	(-1.56)		(0.82)
Ln(Price)	-0.0717			-0.0813		
	(-5.84)***			(-3.09)***		
Tick	0.0373			0.0273		
	(2.96)***			(2.37)**		
*Ln(Price)*Tick*	-0.0120			-0.0064		
	(-3.00)***			(-1.98)**		
IPOunder	-0.0300			-0.0535		
	(-3.61)***			(-1.77)*		
D_{NASDAQ}	0.0044		0.0174	0.0080		0.0121
	(0.86)		(1.53)*	(1.01)		(1.48)
ln(MKTCAP)		-0.0285	0.0231		-0.0187	0.0171
		(-3.28)***	(4.01)***		(-4.98)***	(4.91)***
NONB6		0.0421			0.0087	
		(1.80)*			(0.76)	
AbsTacc		-0.3685			0.0391	
		(-4.11)***			(1.00)	
System Weighted R^2		0.0646			0.0686	

In Panel A, the sample is reduced to 825 offers due to the missing values of the bid-ask spread (*Avgpsprd*) variable. The following simultaneous equations are estimated:

(1) $Ud\_Prc = \alpha_0 + \alpha_1 DA + \alpha_2 PreCAR + \alpha_3 Volatility + \alpha_4 OfferSize + \alpha_5 ln(Price) + \alpha_6 Tick + \alpha_7 ln(Price) * Tick + \alpha_8 IPOunder + \alpha_9 D_{NASDAQ} + \alpha_{10} AvgSprd + \alpha_{11} BidDiff + \alpha_{12} BidDiffNsdq$,

(2) $DA = \beta_0 + \beta_1 Ud\_Prc + \beta_2 PreCAR + \beta_3 Volatility + \beta_4 AvgSprd + \beta_5 ln(MKTCAP) + \beta_6 NONB6 + \beta_7 AbsTacc$, and

(3) $PreCAR = \delta_0 + \delta_1 Ud\_Prc + \delta_2 DA + \delta_3 OfferSize + \delta_4 D_{NASDAQ} + \delta_5 AvgSprd + \delta_6 ln(MKTCAP)$, where *Ud_Prc* = the closing market price on the offer day minus the offer price, divided by the offer price; *DA* = discretionary total accruals

Table 9 (continued)

over two periods, Q(-1) and Q(0), divided by lagged total assets; *PreCAR* = cumulative market-adjusted return over the period starting the day after the filling date and ending the day prior to the offer, where market return is defined as the return on the CRSP value-weighted index; *Volatility* = standard deviation of daily stock returns over the 30 trading days ending 11 days prior to the offer; *OfferSize* = shares offered divided by total number of shares outstanding prior to the offer; *ln (Price)* = natural logarithm of the closing price on the day prior to the offer; *Tick* = an indicator variable that equals one if the closing price on the day prior to the offer doesn't fall on even dollar or $0.25 price increment, and zero otherwise; *IPOunder* = average IPO initial return during the same month as the SEO, where monthly underpricing estimates for IPOs are obtained from Jay Ritter's web page at http://bear.cba.ufl.edu/ritter/ipoall.htm; D_{NASDAQ} = an indicator variable that equals one if the firm was listed on the NASDAQ at the time of offer and zero otherwise; *AvgpSprd* = average of percentage quoted spreads over the 30 days ending two days prior to the offer; *BidDiff* = difference between closing transaction pirce and closing bid quote on the day prior to the offer, divided by closing transaction price; *ln(MKTCAP)* = natural logarithm of the market value of equity, where the market value of equity is defined on the day prior to the offer as the number of shares outstanding multiplied by price; *AbsTacc* = absolute value of total accruals. Number of observations is reduced to 825 due to the missing values of the bid-ask spread (*AvgpSprd*) variable.

In Panel B, the following equations are estimated:

(1) $Ud\_Prc = \alpha_0 + \alpha_1 DA + \alpha_2 PreCAR + \alpha_3 Volatility + \alpha_4 OfferSize + \alpha_5 ln(Price) + \alpha_6 Tick + \alpha_7 ln(Price) * Tick + \alpha_8 IPOunder + \alpha_9 D_{NASDAQ}$

(2) $DA = \beta_0 + \beta_1 Ud\_Prc + \beta_2 PreCAR + \beta_3 Volatility + \beta_4 ln(MKTCAP) + \beta_5 NONB6 + \beta_6 AbsTacc$, and

(3) $PreCAR = \delta_0 + \delta_1 DA + \delta_2 Ud\_Prc + \delta_3 OfferSize + \delta_4 D_{NASDAQ} + \delta_5 ln(MKTCAP)$.

In the first three columns, *Ud_Prc* is substituted with the *Off-Disc* measured as the closing price on the day prior to the offer minus offer price, divided by the closing price on the day prior to the offer. In the last three columns, *DCA* is the discretionary current accruals that substitutes for *DA*. All other variables are the same as defined in panel A. For the estimation including the *DCA* variable, total sample is increased to 1,403 because more data are available when current accrual model is employed to estimate DAs than when Jones and modified Jones are used.

***, **, and * denote significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Figure 1
Variable Definitions

Name	Predicted sign	Definition
Ud_Prc		The closing market price on the offer day minus the offer price, divided by the offer price
Offer-Disc		The closing price on the day prior to the offer minus the offer price, divided by the closing price on the day prior to the offer
DA	-	Discretionary total accruals over two periods, Q(-1) and Q(0), divided by lagged total assets
DA_{Q0}	-	Discretionary total accruals divided by lagged total assets for the Q(0)
DA_{Q-1}	-	Discretionary total accruals divided by lagged total assets for the Q(–1)
PreCAR	+	Cumulative market-adjusted return over the period starting the day after the filling date and ending the day prior to the offer, where the market return is defined as the return on the CRSP value-weighted index
Volatility	+	Standard deviation of daily stock returns over the 30 trading days ending 11 days prior to the offer
OfferSize	+	Shares offered divided by number of shares outstanding prior to the offer
ln(Price)	-	Natural logarithm of the closing price on the day prior to the offer
Tick	+	An indicator variable that equals one if the closing price on the day prior to the offer doesn't fall on even dollar or $0.25 price increment, and zero otherwise
IPOunder	+	Average IPO initial return during the same month as the SEO, where monthly underpricing estimates for IPOs are obtained from Jay Ritter's web page at http://bear.cba.ufl.edu/ritter/ipoall.htm
D_{NASDAQ}	+	An indicator variable that equals one if the firm was listed on the NASDAQ at the time of offer and zero otherwise
AvgpSprd	+	Average of percentage quoted spreads over the 30 days ending two days prior to the offer, (ask – bid) /bid
BidDiff	-	Difference between closing transaction price and closing bid quote on the day prior to the offer, divided by closing transaction price
ln(MKTCAP)		Natural logarithm of market value of equity, where the market value of equity is defined on the day prior to the offer as the number of shares outstanding multiplied by price
AbsTacc		Absolute value of total accruals

Figure 2
Timing Convention