

# CEO Compensation and the Seasoned Equity Offering Decision

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**Empirical research on seasoned equity offerings indicates that the decision to make an SEO typically engenders a decline in firm value, as investors interpret this decision as a signal of poor financial health or that the stock is overpriced. Here, we add to the literature by analyzing the short-term market reaction to SEO announcements and the chief executive officer's link to firm performance (i.e. the proportion of CEO equity-based compensation). Results support the hypothesis that investors are more likely to view the announcement of an SEO as a last resort source of capital when the proportion of CEO equity-based compensation is high. In such cases of high equity-based compensation, our findings indicate that the SEO announcement provides an incremental signal of financial distress above that provided by financial statements. We also find this relationship (last resort signal) to be stronger when large information asymmetries exist between management and investors. Thus, managers should consider the ramifications of executive compensation structure when considering whether to make an SEO. Copyright © 2006 John Wiley & Sons, Ltd.**

## INTRODUCTION

In the wake of Wall Street scandals involving managerial misrepresentation of financial statements and investment opportunities, a signal from firm insiders that could indicate financial distress should be taken seriously by investors. In this paper, we test the hypothesis that the market's negative reaction to seasoned equity offering (SEO) announcements is more pronounced for firms where the chief executive officer (CEO) is paid with relatively more equity-based compensation. When equity-based compensation is high, we posit that investors are more likely to interpret the SEO as a 'last resort' source of capital. In addition,

we investigate whether an increased level of information asymmetry between management and shareholders strengthens this signal.

The notion of managerial signaling starts with the assumption that information about firm earnings and investment opportunities is asymmetrically distributed between managers and investors. Miller and Rock (1985) and Myers and Majluf (1984) explain how a firm's security issuance decisions can convey information to the market. In this way, managers can signal positive or negative information to investors who otherwise would not have this inside knowledge.

A signal is only credible if it is costly, so a signal with negative information content carries more credibility than one with positive information.<sup>1</sup> Mikkelson and Partch (1986) predict that SEOs convey unfavorable information to investors since managers issue common stock when shares are overvalued. Consistent with their hypothesis, this

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study finds a negative market reaction to SEO announcements. Along a similar line, if management's wealth is tied to that of the firm, investors may infer that the stock is overpriced to a larger degree following an SEO announcement. Datta *et al.* (2005) develop a model showing that managers with more stock options should issue equity when the difference between the offer price and the intrinsic stock value is large since this benefits existing shareholders (including the managers themselves).

We add to this stream of literature by providing an alternative explanation for why the market's negative reaction to SEO announcements increases as a CEO's equity-based compensation increases. That is, as the proportion of a CEO's compensation that is equity-based rises, investors are more likely to view an SEO announcement as a last resort source of capital. This 'last resort' signal causes investors to be more concerned about a firm's financial condition.

The decrease in stock value after SEO announcements is well-documented in the literature.<sup>2</sup> Here, we examine whether the CEO's compensation structure influences the market's reaction to the SEO announcement and we offer an explanation as to why this relationship exists. Having high proportions of equity-based compensation should encourage CEOs to use SEOs only as a last resort source of capital, since the event is typically associated with a decline in stock value and CEO personal wealth. Thus, when CEO compensation is closely tied to firm value, an SEO is likely to be a more credible, negative signal to the market, and therefore result in a more adverse market reaction.

This paper documents a negative relationship between the proportion of CEO equity-based compensation and the change in shareholder wealth after an SEO announcement. More specifically, firms compensating their CEOs with relatively more equity are observed to generally have a more pronounced negative price reaction to an SEO announcement than firms paying their CEOs relatively more cash. Because the 'last resort' signal is stronger in cases where CEO equity-based compensation is higher, an SEO announcement appears to give investors new information about the firm's worsening financial condition beyond information extracted from financial statements. Further, this relationship between compensation structure and SEO announcement returns is greater for firms with higher

levels of information asymmetry between managers and outside investors. Investors appear to be more sensitive to the 'last resort' signal when they are in need of information about the firm. In this study we use CEO compensation, as opposed to overall managerial compensation, due to the tremendous market scrutiny of CEO compensation packages by the press (e.g. Lublin, 2004; Mercer Human Resource Consulting, 2004; Chittum, 2004). The CEO is also the chief management decision maker (e.g. Bertrand and Schoar, 2003). We also include both equity- and option-based compensation (rather than focusing exclusively on stock options), and empirically examine how higher levels of equity-based compensation enhance the 'last resort' signal in SEO announcements.

The remainder of the paper is organized as follows. Next, several hypotheses concerning the relationship between equity-based compensation and SEO announcement effects are discussed. Further, the data and methodology are summarized. A description of the test results follows. The final section concludes.

## HYPOTHESES

### Seasoned Equity Offering Announcements

Mikkelson and Partch (1986) find that the announcement of a seasoned common stock offering leads to an approximate 4% decline in firm value.<sup>3</sup> This negative reaction is stronger than that for debt or preferred stock offerings combined. There are several interpretations of this negative reaction following equity offering announcements. Myers and Majluf (1984) propose that equity issues signal 'bad news' to the market. Shareholders infer that managers will tend to issue additional shares of stock when the firm is overvalued; that is, when the market price per share exceeds the managers' assessment of the stock price. In this way, a seasoned equity offering can be viewed as an application of Akerlof's (1970) lemons problem. Consistent with this theory, Clark *et al.* (2001) study insider trading activity around SEO issues and find that insiders issue overvalued equity and thus exploit these windows of opportunity. Myers and Majluf (1984) also suggest a pecking order theory for capital structure whereby firms prefer retained earnings as their

main source of funds. When this option is no longer available, the next preference is debt, with the last resort being external equity financing.

If CEOs have compensation closely tied to firm value, it may be more likely that an SEO will be perceived by investors as a 'last resort' choice since the decline in share price following the announcement causes a greater reduction in the CEO's personal wealth. Alternatively, shareholders may find SEOs less of a concern if managers are better aligned with their interests. However, if the managers' wealth is a direct function of equity market value, a rational manager would only knowingly decrease existing shareholder value as a last resort (e.g. Sanders, 2001; Graham *et al.*, 2004). Indeed, Yermack (1997) reports that CEOs time stock option awards to occur just prior to favorable firm news in order to reap greater benefits from their option holdings. CEOs also typically control firm policies and much of what the board knows and decides since they normally determine both meeting agendas and the information received by the board (e.g. Bebchuck and Fried, 2003; Bertrand and Schoar, 2003). Hence, CEOs should have substantial control over when SEOs are undertaken. As such, this negative signal of an SEO announcement combined with a high proportion of CEO equity-based compensation may raise investor pessimism regarding the financial condition of such firms.

Datta *et al.* (2005), find that the value of top manager stock options is negatively associated with changes in shareholder wealth following SEO announcements. According to these researchers, the market infers that the stock is overvalued when equity is issued by managers who are aligned with current shareholder interests. Here, we test whether investor perceptions of SEOs as a 'last resort' source of capital intensify as overall CEO equity-based compensation increases. In the next section, we analyze literature on equity-based compensation as a measure of the link between CEO wealth and firm performance.

### Compensation Structure

Equity-based compensation has traditionally been used to align interests between managers and shareholders. Theoretically, equity-based compensation mitigates the manager-shareholder or principal-agent problem. With these contracts, executives maximizing their personal welfare will

find it more financially rewarding to expend greater effort to maximize firm value, which can improve shareholder wealth. Traditionally, equity-based compensation consists of non-cash sources of compensation including stock options, restricted stock grants, and long-term incentive plans.

Core *et al.* (2003) show that equity-based compensation works to motivate executives to maximize firm value, and to mitigate agency costs. Using a combination of monitoring and incentive contracts, Hall and Liebman (1998) argue that this compensation structure can effectively align interests between executives and shareholders. In addition, they show that the growth in stock options and other sources of equity-based CEO compensation have increased dramatically in the 1980s and 1990s. About 70% of CEOs in 1994 were paid with stock options in addition to traditional cash-based compensation, up from 30% in 1980. More recently, according to AFL-CIO's Executive Paywatch, CEO compensation in 2003 consisted of an average of 33% cash-based (salary and bonus) and 67% equity-based compensation.<sup>4</sup>

Shleifer and Vishny (1988) contend that equity-based compensation should reduce the instance of managers engaging in 'non-value-maximizing behavior' since the manager's personal wealth is tied to that of the firm. Guay (1999) and Smith and Stulz (1985) suggest that equity-based compensation increases the relationship between executives' wealth and firm performance, thus providing more incentive for the executives to work to maximize shareholder wealth. In addition, Guay (1999) finds that executives with incentive contracts in their compensation structure will be more likely to invest in risky projects that increase firm value.

Previous studies have linked executive compensation structure to various corporate decisions. Datta *et al.* (2001) study the relationship between merger and acquisition decisions and equity-based compensation. They find a positive relation between acquiring managers' proportion of equity-based compensation and stock price performance around the acquisition announcement. This may indicate that shareholders perceive the merger to be a positive NPV investment since the CEO's personal wealth is tied to firm performance. Mehran *et al.* (1998) suggest that the probability of voluntary liquidation (which they find enhances shareholder value) is positively related to the

percent of the firm's outstanding shares owned by its CEO. In addition, Tehranian *et al.* (1987) find that in the case of divestitures, investors react more favorably when senior executives have equity-based compensation than when executives do not have such performance-based pay. The commonality in these studies is that investors appear to factor in executive compensation packages, especially more widely known CEO compensation structures, when interpreting management decisions as signals about firm value.<sup>5</sup>

Prior studies have shown that shareholder wealth declines following the announcement of an SEO (e.g. Asquith and Mullins, 1986). This is generally attributed to asymmetric information and management signals. If investors react negatively to this event, managers with equity stakes in the firm should be reluctant to undertake SEOs since their personal wealth is adversely affected. Since (a) the personal wealth of CEOs receiving high levels of equity-based pay are more closely aligned to their firms' stock prices, and (b) SEO announcements typically trigger a negative effect on firm value, these CEOs should only issue seasoned equity as a last resort. Shareholders should then interpret such an SEO announcement as a signal (incremental to that provided by financial statements) that the firm may be in financial distress since the CEO is forced to take an action which adversely affects his or her own personal wealth. Such a scenario may cause investors to carefully scrutinize the firm for indicators of financial distress and to place greater weights on any negative evidence in the financial statements. Our hypotheses thus far are the following:

*Hypothesis 1:* SEO announcements by CEOs with high (low) proportions of equity-based compensation should produce a more (less) adverse investor response.

*Hypothesis 2:* SEO announcements by CEOs with high (low) proportions of equity-based compensation should produce more (less) sensitivity among investors to financial distress factors.

### Information Asymmetry

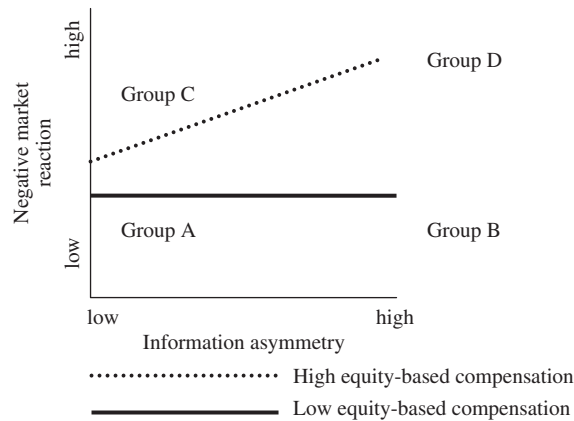
If higher proportions of CEO equity-based compensation reinforce the negative signal in SEO announcements, then this phenomenon should be more pronounced in firms with more agency

problems. Smith and Watts (1992) report that firms with more manager-shareholder agency problems have larger gaps between management and shareholder information about the firm, and consequently, greater information asymmetries. Information asymmetry exists when one party (management) has information that the other party (investors) does not. Higher levels of information asymmetry should lead investors to search for signals that provide some insight into the true conditions of the firm. Thus, in high information asymmetry settings, investors are expected to place a premium on information from firm insiders (e.g. Bolino, 1999). For example, Sanders and Carpenter (2004) find that announcements of stock repurchase announcements (a 'good news' signal) are more likely under high information asymmetry conditions. They infer from this relationship that management is aware that the release of a 'good news' signal to investors with little firm specific information is likely to cause a greater gain in firm value. CEOs, on the other hand, should be especially hesitant to supply a 'bad news' signal (e.g. an SEO announcement) to investors with little firm specific information.

As discussed previously, it is expected that the convergence of an SEO and high equity-based compensation provides incremental information to the market that the firm may be financially distressed (i.e. the SEO is a last resort). For firms in high information asymmetry environments, we expect this signal to be more influential. Therefore, in such settings we posit a significant difference between the SEO announcement returns of firms that pay their CEOs with high proportions of equity-based compensation versus low proportions of equity-based compensation. On the other hand, under conditions of low information asymmetry, firm performance is more transparent to investors and thus, they should be less sensitive to the 'last resort' signal from insiders. We postulate that the difference in market reactions for the two high and low equity compensation groups to be negligible under low information asymmetry. Specifically,

*Hypothesis 3:* In high (low) information asymmetry environments, the adverse effect of CEO equity-based compensation on the market's response to SEO announcements will be larger (smaller).

Figure 1 presents a graphical illustration of our expectations of market reactions to SEO



**Figure 1.** Predicted market reactions by level of information asymmetry. This figure shows the expected differences in market reactions to SEO announcements by level of asymmetric information. Group A consists of firms with EBC < 50% and low information asymmetries, Group B consists of firms with EBC < 50% and high information asymmetries, Group C consists of firms with EBC > 50% and low information asymmetries, Group D consists of firms with EBC > 50% and high information asymmetries. The figure shows that the difference in market reactions between groups with EBC > 50% and EBC < 50% is greater for firms with higher levels of information asymmetries than for firms with lower levels.

announcements under high and low information asymmetry environments. The next section describes the methodology used to test these hypotheses.

## DATA AND METHODOLOGY

### Univariate Tests

To test Hypothesis 1, that investors react more strongly to an SEO announcement when the CEO's equity-based compensation is high, we use a standard event study methodology, followed by a cross-sectional regression of cumulative abnormal returns. The initial data consists of all SEO announcements (as indicated by the initial filing date) made between 1993 and 2000 from the *SDC Platinum* database.<sup>6</sup> CEO compensation data is obtained from Standard & Poor's *ExecuComp* database. The *ExecuComp* database includes detailed compensation information on the top executives for firms in the S&P 500, the S&P Midcap 400, and the S&P Smallcap 600. Those

**Table 1.** SEO Announcements by Year

Year	SEO announcements
1993	34
1994	21
1995	16
1996	27
1997	31
1998	35
1999	37
2000	20
Total	221

This table shows the number of SEO announcements from 1993 to 2000 that are used in the sample. To be used in the sample, the firm announcing the SEO must also be listed in the *ExecuComp* database.

firms that announced a seasoned equity offering during the period and that are listed in the *ExecuComp* database are included in the sample. The initial sample consists of 221 firms. Firm characteristics and returns are obtained from the *CompuStat* and *CRSP* databases, respectively. For firms to remain in the sample, data from both *CompuStat* and *CRSP* must be available from one year prior to the SEO announcement (for market model parameter estimation and control variables) to ten days following the announcement (for abnormal return calculations in event period). Table 1 displays the sample size per year. The average number of SEOs announced per year in the sample is 27.6.

We use the following variables from *ExecuComp*: CEO salary, bonus, other annual compensation, restricted stock grants, stock options, long-term incentive plans, and other compensation types. Salary consists of the dollar value of the base salary, while bonus is the dollar value of the bonus earned by the CEO during the fiscal year. Other annual compensation includes annual compensation that is not categorized as salary or bonus. It includes items such as perquisites and other personal benefits, above-market earnings on restricted stock and options, tax reimbursements, and the dollar value difference between the price paid by the CEO for company stock and the actual market price of the stock under a stock purchase plan that is not generally available to shareholders or employees of the company. Restricted stock grants represent the value of restricted stock granted during the year, the resale of which is barred for about three to five years. If the employee terminates his or her employment before the stock vests, they forfeit the reward. Stock

options are valued using the Black-Scholes model and represent the total value of all options received during the year. Long term incentive plans represent the amount paid out to the CEO under the company's long-term incentive plan, which measures company stock performance over a period of more than one year (generally three years). All other compensation includes the following: severance payments, debt forgiveness, payment for unused vacation, signing bonuses, 401 K contributions and life insurance premiums.

A standard event study is employed using the daily returns market model methodology as described in Brown and Warner (1985). The event date is the filing date listed in *SDC Platinum*. The market model is estimated by ordinary least squares, using data from a 255 trading-day estimation period ending 46 trading days before the event date. The event period is defined as 10 days before through 10 days after the event date. Tests for market reactions around SEO announcements are undertaken for the full sample, SEOs with less than 50% CEO equity-based compensation (EBC), and SEOs with greater than 50% CEO EBC. Differences between the reactions are tested to assess the importance of the relationship between SEO market reactions and equity-based compensation.

### Multivariate Tests

To test the second hypothesis, the sample is divided into four sub-samples classified by the proportion of CEO EBC and leverage. We use leverage as a surrogate for financial distress (Dichev and Skinner, 2002). Further, to test the third hypothesis, the sample is divided into four additional sub-samples classified by EBC and growth opportunities. Here, growth opportunities are used to proxy for information asymmetry (Tsui *et al.*, 2001). Rather than focusing on one specific equity-based compensation item, we use a broader measure of equity-based compensation than many previous studies use.

In this study, equity-based compensation is defined as the sum of restricted stock grants, stock options, long-term incentive plans, and other compensation. The proportion of equity-based compensation is calculated by the total equity-based compensation divided by total compensation (which includes salary and bonus), consistent with Hall and Liebman (1998). The sample is first

divided into two sets of firms: firms where the CEO is compensated with less than 50% EBC, and those firms where the CEO is compensated with more than 50% EBC. We further sub-divide the two EBC samples into high (above-median) and low (below-median) financial distress firms (calculation described below). Additionally, we sub-divide the two EBC samples into high (above-median) and low (below-median) growth opportunity firms (calculation described below).<sup>7</sup>

Descriptive statistics for both groups of sub-samples are listed in Panels A and B of Table 2. Table 2 provides CEO compensation data along with a large number of the firm and SEO issue characteristics identified in the literature to affect SEO announcement returns (these control variables are described in the following section). In Panel A of Table 2 we divide the full sample into sub-samples by levels of financial distress. Here, we see that sales, pre-issue stock price runup, and market-to-book equity value vary significantly between sub-samples. When we divide the full sample into four sub-samples by equity-based compensation and growth in Panel B of Table 2, we also find significant variation between sub-samples in terms of sales, pre-issue runup, and market-to-book. Firm characteristic variables that are significantly different between sub-samples in Table 2 are controlled for in the multivariate regressions that follow.

Multiple regression analysis is used to assess the determinants of the abnormal returns found in the event studies and to test Hypotheses 2 and 3. The dependent variable in each regression is the cumulative abnormal return (CAR) surrounding the event date generated from the full sample event study. Consistent with other research examining SEO announcement effects (e.g. Datta *et al.*, 2005), we utilize the CAR from the three days surrounding the event date (-1, 1). Four models are calculated using the proportion of equity-based compensation, its interactions with surrogate measures of financial distress and information asymmetry, and other variables generally identified in the literature as affecting the market's reaction to SEO announcements (i.e. control variables).

We calculate a commonly used indicator of financial distress: industry-adjusted leverage ( $\text{adj\_lev}_{i,t-1} = (\text{TotalDebt}_{i,t-1} / \text{TotalAssets}_{i,t-1}) / \text{Industry\_Leverage}_{t-1}$ ), from the *CompuStat* database for each firm (e.g. Dichev and Skinner, 2002). Each firm in the sample is matched to an industry

**Table 2. Descriptive Statistics**

Panel A	EBC <50%, Low FD	EBC <50%, High FD	EBC >0.50, Low FD	EBC >0.50, High FD	Difference between samples
	Mean/(n)	Mean/(n)	Mean/(n)	Mean/(n)	F-statistic/ (p-value)
Salary (thousands \$)	659.90/(62)	657.65/(59)	687.58/(60)	749.18/(40)	0.58/(0.637)
Bonus (thousands \$)	630.50/(62)	1230.49/(59)	805.95/(60)	915.91/(40)	1.38/(0.251)
Other Annual (thousands \$)	90.18/(62)	80.43/(59)	16.68/(60)	17.97/(40)	1.63/(0.182)
Value of Restricted Stock (thousands \$)	85.80/(62)	328.94/(59)	315.28/(60)	653.42/(40)	2.31/(0.077)
Value of Stock Options (thousands \$)	455.57/(62)	507.90/(59)	9435.00/(60)	4755.67/(40)	8.720/( $<0.001$ )
Long-term incentive plans (thousands \$)	33.57/(62)	104.22/(59)	102.41/(60)	773.20/(40)	3.53/(0.016)
Other compensation (thousands \$)	78.81/(62)	233.26/(59)	111.72/(60)	74.51/(40)	1.64/(0.181)
Total compensation (thousands \$)	2034.32/(62)	3142.90/(59)	11474.60/(60)	7939.86/(40)	8.272/(0.001)
Percent of equity-based compensation	0.23/(62)	0.22/(59)	0.74/(60)	0.72/(40)	166.89/( $<0.001$ )
Shares issued as a percent of shares outstanding (%)	0.12/(54)	0.09/(57)	0.09/(51)	0.08/(37)	1.45/(0.229)
Sales (millions \$)	6.83/(54)	7.73/(59)	7.07/(52)	7.62/(40)	4.61/(0.004)
Pre-issue runup	0.03/(59)	0.03/(53)	0.06/(50)	0.03/(40)	5.58/(0.001)
Market-to-book	3.36/(53)	3.11/(58)	6.58/(49)	3.99/(40)	7.81/( $<0.001$ )
Growth	0.14/(51)	0.12/(56)	0.26/(51)	0.19/(35)	4.02/(0.008)
Leverage	0.14/(51)	0.41/(59)	0.13/(50)	0.31/(40)	37.13/( $<0.001$ )
Panel B	EBC <0.50, Low Growth	EBC <0.50, High Growth	EBC >0.50%, Low Growth	EBC >0.50%, High Growth	Difference between samples
	Mean/(n)	Mean/(n)	Mean/(n)	Mean/(n)	F-statistic/ (p-value)
Salary (thousands \$)	721.42/(76)	553.05/(45)	929.36/(48)	511.78/(52)	14.95/( $<0.000$ )
Bonus (thousands \$)	1211.61/(76)	435.72/(45)	1292.84/(48)	441.10/(52)	4.43/(0.005)
Other Annual (thousands \$)	126.80/(76)	15.55/(45)	29.25/(48)	6.07/(52)	4.05/(0.008)
Value of Restricted Stock (thousands \$)	288.91/(76)	61.54/(45)	729.57/(48)	192.97/(52)	3.58/(0.015)
Value of Stock Options (thousands \$)	589.02/(76)	298.80/(45)	6268.43/(48)	8758.48/(52)	7.63/( $<0.001$ )
Long-term incentive plans (thousands \$)	103.25/(76)	8.52/(45)	192.80/(48)	534.96/(52)	1.77/(0.154)
Other compensation (thousands \$)	207.74/(76)	63.57/(45)	175.26/(48)	24.45/(52)	2.37/(0.072)
Total compensation (thousands \$)	3248.74/(76)	1436.76/(45)	9617.50/(48)	10469.81/(52)	7.66/( $<0.001$ )
Percent of equity-based compensation	0.24/(76)	0.20/(45)	0.70/(48)	0.76/(52)	172.50/( $<0.001$ )
Shares issued as a percent of shares outstanding (%)	0.11/(68)	0.10/(43)	0.08/(38)	0.09/(50)	0.85/(0.46)
Sales (millions \$)	7.49/(71)	6.98/(42)	8.07/(40)	6.73/(52)	7.77/( $<0.001$ )
Pre-issue runup	0.03/(69)	0.02/(43)	0.03/(43)	0.06/(47)	5.94/( $<0.001$ )
Market-to-book	2.54/(69)	4.36/(42)	5.03/(40)	5.73/(49)	6.63/( $<0.001$ )
Growth	0.05/(62)	0.24/(45)	0.06/(34)	0.35/(52)	27.67/( $<0.001$ )
Leverage	0.32/(68)	0.23/(42)	0.21/(39)	0.21/(51)	4.56/(0.004)

Panel A displays the descriptive statistics for four sub-samples of EBC (equity-based compensation) and FD (financial distress as measured by leverage). Panel B displays the descriptive statistics for four sub-samples of EBC (equity-based compensation) and growth (capital expenditures divided by total assets). All compensation and firm characteristic data is in constant 2000 dollars using CPI. All compensation data is for firm CEOs. *Salary* and *bonus* are cash-based compensation, while *restricted stock grants*, *option grants* (calculated using the Black-Scholes model), *long-term incentive plans*, and *other compensation*, are equity-based compensation. We report *sales* in natural logarithms. *Pre-issue runup* is the average of monthly returns for the firm for the year prior to the SEO issue. *Market-to-book* is the market value of equity divided by book value of equity. *Growth* is measured as capital expenditures divided by total assets. *Leverage* is calculated as total debt divided by total assets.

using three-digit SIC codes. Industry leverage is then calculated for the year prior to the SEO announcement. To evaluate if higher levels of CEO equity-based compensation indicate that the SEO is a last resort source of financing for a distressed firm, we examine both the direct effect of equity-based compensation and the interaction between equity-based compensation and leverage in the aforementioned multiple regressions. The

nature of the interaction is further examined in a multivariate setting which includes all sub-samples of equity-based compensation and leverage.

Tsui *et al.* (2001) find that agency problems and information asymmetries between management and investors are more inherent in high growth firms. Likewise, McConnell and Servaes (1995) find that firms with greater growth are more difficult to monitor and governance mechanisms, such as

incentive-based compensation plans, should play a more significant role in firms with higher growth opportunities. We calculate the level of information asymmetry for the sample firms using Goyal *et al.*'s (2002) proxy of growth opportunities, where growth equals capital expenditures divided by total assets. We then test whether higher information asymmetry causes investors to be more sensitive to the 'last resort' signal provided by the convergence of an SEO and higher equity-based compensation. To do this, we evaluate the interactive effect of equity-based compensation and growth (i.e. information asymmetry) on cumulative abnormal returns in the multiple regressions. Further, the nature of the interaction is examined in a multivariate setting which includes all sub-samples of equity-based compensation and growth.

## RESULTS

### Univariate Tests for the Effect of CEO Equity-based Compensation on SEO Returns

Table 3 reports the market reaction to announcements of SEOs for the full sample, and the sample

split by equity-based compensation proportion. Consistent with prior literature, the reaction to an SEO on announcement day is significantly negative (0.92% decrease in shareholder wealth) for the full sample. A negative reaction is also reported for the day prior- and post-announcement ( $-0.20\%$  and  $-0.63\%$ , respectively).

The magnitude of the reaction changes when the sample is divided between firms where the CEO is compensated with less than 50% equity-based pay and more than 50% equity-based pay. Table 4 presents results of a comparison between the cumulative abnormal returns for the days surrounding the event date for both the EBC < 50% and EBC > 50% samples. When the cumulative abnormal returns for the three days ( $-1, 1$ ) around the event date are compared, there is a statistically significant difference between the two samples. Consistent with our expectation, the EBC > 50% sample experiences, on average, a 2.36% decline in firm value during the days surrounding the SEO announcement while the EBC < 50% sample experiences a 1.23% decrease. These returns are significantly different at the 5% level ( $t$ -statistic is 1.94).<sup>8</sup> The results so far suggest

**Table 3. Abnormal Returns Around SEO Announcement**

Day	Full Sample		EBC < 50%		EBC > 50%	
	Mean AR (%)	Z	Mean AR (%)	Z	Mean AR (%)	Z
-10	-0.18	-1.20*	-0.28	-1.19	-0.06	-0.47
-9	-0.03	0.49	0.10	1.28	-0.19	-0.67
-8	0.02	-0.12	0.01	-0.29	0.03	0.14
-7	-0.16	-1.42***	-0.26	-1.31***	-0.04	-0.67
-6	0.22	0.30	0.28	0.68	0.15	-0.30
-5	-0.14	-0.66	-0.59	-2.36*	0.40	1.60***
-4	0.22	0.95	-0.21	-1.50***	0.73	3.04*
-3	0.12	1.47***	0.30	1.78**	-0.10	-0.35
-2	0.07	0.49	0.07	-0.08	0.07	0.23
-1	-0.20	-1.41***	-0.09	-0.47	-0.54	-1.58***
0	-0.92	-5.60*	-0.87	-4.36*	-0.97	-3.54*
1	-0.63	-3.65*	-0.45	-2.61*	-0.85	-2.56*
2	0.09	0.24	-0.02	0.02	0.23	0.32
3	0.13	1.72**	0.10	1.22	0.17	1.21
4	0.35	1.95**	0.02	0.28	0.76	2.59*
5	0.41	1.46***	0.42	0.79	0.41	1.29***
6	0.13	0.39	0.04	-0.25	0.25	0.84
7	-0.12	-0.01	-0.08	0.28	-0.17	-0.32
8	-0.31	-1.15	-0.32	-0.85	-0.31	-0.77
9	-0.33	-1.44***	-0.13	-0.19	-0.57	-1.93*
10	0.33	1.47***	0.25	1.03	0.42	1.04
N		218		119		99

Day 0 is classified as the 'event date' (the announcement of the seasoned equity offering as listed in the WSJ). Mean AR indicates the mean abnormal return on the day in relation to the event date for each of the three samples (full, EBC < 50%, and EBC > 50%). \*, \*\*, \*\*\* indicates significance at the 0.10, 0.05, 0.01 levels, respectively.

**Table 4. Distribution of Cumulative Abnormal Returns Around Event Date by Sample**

	Full sample	EBC < 50%	EBC > 50%	Z/t statistic for difference
Minimum	-25.87	-16.70	-25.87	
Quartile 1	-4.31	-4.14	-4.48	
Median	-1.33*	-1.12*	-1.41*	1.23***
Quartile 3	0.66	1.43	0.27	
Maximum	20.49	20.49	10.48	
Mean	-1.75*	-1.23**	-2.36*	1.94**
Positive:Negative	69:149	41:78	28:71	
N	218	119	99	

Three-day CARs (%) around the date of SEO announcement. The *t*-statistic is for the difference in means between the CARs for the two samples and the Z-statistic is for the Wilcoxon rank-sum test for the difference between the two samples' distributions. The three-day window (-1, +1) includes the day prior to the announcement, the announcement date itself, and the day after the announcement. \*, \*\*, \*\*\* indicates significance at the 0.10, 0.05, 0.01 levels, respectively.

that shareholders react more adversely to SEO announcements when CEO compensation is linked to firm performance, thus lending support to Hypothesis 1.

In all groups, as shown in Table 3, the negative market response is significant on the day of the SEO announcement and on the following day. On the day prior to the announcement (day -1), the reaction is significantly negative for the EBC > 50% sample, yet not for the EBC < 50% sample. This difference is statistically significant at the 5% level between the two groups. Also, a more pronounced negative effect takes place in the EBC > 50% sample than the EBC < 50% sample on the announcement date (-0.97% compared to -0.87%, respectively) and the day after the announcement (-0.85% compared to -0.45%, respectively). These results provide further support for Hypothesis 1.<sup>9</sup>

#### Multivariate Tests for the Determinants of SEO Returns

Next, we examine the strength of this relationship in a multivariate setting to test Hypotheses 2 and 3. We analyze the determinants of the cumulative abnormal returns (CARs) for the full sample on the three days (-1, 1) surrounding the SEO announcement using the percentage of equity-based compensation and its interactions with proxies for financial distress (leverage) and information asymmetry (growth).

We include control variables consistent with Datta *et al.* (2005) and Denis (1994) among others. Friday *et al.* (2000) and Denis and Sarin (2001) use

the number of shares issued in the SEO as a percentage of shares outstanding to proxy for the size of the offer. We collect the number of shares issued from *SDC Platinum* and divide that by the number of shares of common stock outstanding before the SEO. In addition, Smith and Watts (1992) and Denis (1994) find that market-to-book equity is negatively related to abnormal returns following SEO announcements. Stock returns in the period before the SEO have also been found to be inversely related to the market's response to the SEO (e.g. Choe *et al.*, 1994).

Furthermore, we include the natural logarithm of total sales as a control variable, since Denis and Sarin (2001) suggest that firm size may affect the market's reaction to SEO announcements. We also include a dummy variable for the year that the SEO announcement took place and a dummy variable indicating the reason for the seasoned equity offering. Brennan and Kraus (1987) state that the reported reason for an SEO issuance may influence the market's reaction. Therefore, we compile reasons for the SEO from *Lexis Nexis Academic Universe* and divide them into five groups, which include the following: reduce bank debt (10.4%), general corporate purposes (9.1%), investments or expansion projects (15.8%), not for corporate purposes (14.9%), and no reason given/other reason given (47.9%).

We report the results of the multivariate regressions in Table 5. The ordinary least squares regression estimates are presented in Table 5 with *t*-statistics calculated using White's (1980) heteroskedasticity-consistent standard errors.<sup>10</sup> In Models 1 and 3, we test the direct and interactive effects

**Table 5. Determinants of Abnormal Returns Surrounding SEO Announcements**

	Dependant variable = CAR (-1, 1)			
	Model 1	Model 2	Model 3	Model 4
EBC	-0.037 (0.085)	0.017 (0.137)	-0.029 (0.176)	0.013 (0.224)
LEV	-0.018 (0.062)		-0.012 (0.169)	
EBC × LEV	0.042 (0.067)		0.026 (0.182)	
GROWTH		0.126 (0.002)		0.118 (0.001)
EBC × GROWTH		-0.182 (0.000)		-0.178 (0.000)
LSALES	0.005 (0.051)	0.004 (0.104)	0.005 (0.039)	0.004 (0.097)
MB	0.000 (0.344)	0.001 (0.258)	0.000 (0.472)	0.000 (0.489)
RUNUP	-0.247 (0.041)	-0.212 (0.063)	-0.234 (0.026)	-0.161 (0.126)
PCISSUE			-0.086 (0.082)	-0.120 (0.047)
YEARDDUM			0.000 (0.478)	0.000 (0.414)
REASONDDUM			0.004 (0.044)	0.005 (0.016)
INTERCEPT	-0.030 (0.110)	-0.059 (0.012)	-0.048 (0.049)	-0.070 (0.010)
<i>N</i>	180	170	171	160
<i>F</i> -statistic	3.29	4.28	2.83	4.04
( <i>p</i> -value)	(0.004)	(0.001)	(0.004)	(0.000)
Adj <i>R</i> -square (GMM)	0.071	0.104	0.088	0.146

This table shows the coefficients of ordinary least squares regressions and *p*-values (in parentheses) computed using White's (1980) heteroskedasticity-consistent standard errors. The standardized announcement window (-1, 1) cumulative abnormal returns is the dependent variable. EBC is the percent equity-based compensation, which is the sum of restricted stock grants, stock options, long-term incentive plans, other annual compensation, and other compensation divided by total compensation (which includes salary and bonus). LEV represents the industry-adjusted leverage calculated as firm leverage (total debt divided by total assets for the year prior to the SEO issue) divided by the industry average leverage in the year prior to SEO issue. Interaction variables are obtained by multiplying percent of equity-based compensation by the industry adjusted leverage (EBC × LEV) and by growth (EBC × GROWTH), where GROWTH is capital expenditures divided by total assets. LSALES is the natural logarithm of annual firm sales. MB (market-to-book) is the price-per-share divided by book-value per share of equity in the month prior to the SEO issue. Pre-issue RUNUP is the average of monthly returns for the firm for the year prior to the SEO issue. PCISSUE represents the number of shares issued in the SEO divided by the number of shares outstanding before the SEO. YEARDDUM is a number 1–8 corresponding to the SEO announcement years 1993–2000. REASONDDUM is a number 1–5 corresponding to the reason given for the SEO issuance.

of equity-based compensation and leverage (financial distress) in reduced (Model 1) and full (Model 3) models, respectively, as an initial test of Hypothesis 2. As a first-stage test of Hypothesis 3, we analyze the direct and interactive effects of equity-based compensation and growth (information asymmetry) in reduced (Model 2) and full (Model 4) models. Control variables in Models 1 and 2 (i.e. reduced models) include the natural logarithm of sales, the market-to-book value of

equity, and the pre-issue one-year stock price runup. Models 3 and 4 (i.e. full models) add the shares issued as a percent of shares outstanding, the issue year dummy, and the reason for issue dummy as control variables.

Two results are noted in Models 1 and 3. First, as suggested by Tables 3 and 4, there is a negative relationship between the percentage of equity-based compensation and CARs around the SEO announcement date. Our multivariate analysis

suggests that as the percentage of equity-based compensation increases, the negative SEO signal appears to become stronger. For instance, in Model 1 (3), when the percent of equity-based compensation increases by 1%, the cumulative abnormal returns following SEO announcements decrease by 3.7% (2.9%). However, the coefficient on EBC is not significant at traditional significance levels in Model 3. Second, Models 1 and 3 depict positive interactions between the percentage of equity-based compensation and industry-adjusted leverage. In Model 1 this interactive effect is significant at the 10% level (one-tailed test), while it becomes less significant at conventional significance levels as more control variables are added in Model 3. However, the positive coefficient may be economically significant as it implies that, holding all other relevant variables constant, the effect of leverage on SEO returns is dependent upon equity-based compensation. This form of this interaction, given the negative direct effects of compensation structure and leverage, indicates that the negative effect of leverage (or financial distress) increases as equity-based compensation increases.<sup>11</sup> Thus, we find preliminary support for Hypothesis 2. The nature of this interaction is examined through additional multivariate tests in the next subsection.

In Models 2 and 4 of Table 5, we present results for multivariate regressions that partition the sample by firm growth opportunities (information asymmetry) in order to test Hypothesis 3. In environments of greater growth/information asymmetry, the effects of the 'last resort' signal should be more pronounced. Models 2 and 4 of Table 5 document a statistically significant interaction ( $p$ -value  $< 0.01$ ) between the percentage of equity-based compensation and growth. In fact, the direct effect of equity-based compensation, which was negative and marginally significant in Model 1, becomes insignificant when a proxy for information asymmetry is evaluated in Models 2 and 4. This significant interaction suggests that the 'last resort' signal, produced by the convergence of high equity-based compensation and an SEO announcement, is more salient to investors when high levels of information asymmetry exist between themselves and management.<sup>12</sup> Hence, these results provide initial support for Hypothesis 3. We perform an additional test of this interaction's form via multivariate analyses in the next subsection.

### Analyses of Financial Distress and Information Asymmetry Effects on SEO Returns

We divide the full sample into sub-samples by leverage (financial distress) and growth (asymmetric information) to further investigate Hypotheses 2 and 3 in a multivariate setting. Prior to performing this procedure, we evaluate the potential for self-selection biases in our sample. Specifically, we analyze two sets of three-stage least squares (3SLS) regression models: first, with EBC and growth jointly estimated, and second, with EBC and industry-adjusted leverage jointly estimated (results not tabulated). In the first 3SLS regression, the coefficient of EBC is positive and significant ( $p$ -value  $< 0.01$ ) when used as a continuous independent variable explaining changes in growth. Further, the coefficient on growth is positive and significant ( $p$ -value = 0.049) when used to explain changes in EBC. However, EBC and leverage are not significantly related. Since this is the case, we might expect that high EBC firms and high growth firms 'choose' one another, thereby creating a sample bias were we to use one of these measures as a dependent variable in a regression analysis. However, since the dependent variable in our models is cumulative abnormal returns (CAR) around the SEO announcement, we can control for any relationship between these two variables (EBC and growth) by creating an exhaustive set of sub-samples using all combinations of high and low EBC and growth.

To further examine the interactive effect between equity-based compensation and leverage (Hypothesis 2) we divide our sample into four sub-samples (similar to Panel A of Table 2): high EBC/high leverage, high EBC/low leverage, low EBC/high leverage, and low EBC/low leverage. High (low) EBC indicates firms with greater than (less than) 50% equity-based compensation out of total compensation. A firm was classified as 'high leverage' if its leverage exceeded its industry median, and *vice versa* for the classification of 'low leverage' firms. The coefficients for these four groups using the CAR ( $-1, 1$ ) surrounding the SEO announcement as the dependent variable are presented in Panel A of Table 6. We also include the control variables used in Table 5 in the multivariate regression.

In Panel A of Table 6, we analyze the nature of the interaction between EBC and leverage illustrated in Models 1 and 3 of Table 5. First, under

**Table 6. Financial Distress and Growth Determinants of Abnormal Returns Surrounding SEO Announcements**

	LEVGRP1	LEVGRP2	LEVGRP3	LEVGRP4	LSALES	MB	RUNUP	PCISSUE	YEARDDUM	REASONDDUM
Panel A										
	-0.071	-0.069	-0.066	-0.053	0.005	-0.000	-0.269	-0.090	0.000	0.005
	(0.015)	(0.019)	(0.017)	(0.049)	(0.078)	(0.945)	(0.025)	(0.131)	(0.845)	(0.045)
<i>N</i>	175	175								
<i>F</i> -statistic	6.21									
( <i>p</i> -value)	(0.000)									
Adj <i>R</i> -square (GMM)	0.099									
Panel B										
	-0.064	-0.044	-0.036	-0.053	0.004	-0.000	-0.233	-0.091	-0.000	0.004
	(0.024)	(0.144)	(0.203)	(0.067)	(0.181)	(0.823)	(0.054)	(0.127)	(0.975)	(0.097)
<i>N</i>	175	175								
<i>F</i> -statistic	6.80									
( <i>p</i> -value)	(0.000)									
Adj <i>R</i> -square (GMM)	0.122									

This table shows the coefficients of ordinary least squares regressions and *p*-values (in parentheses) computed using White's (1980) heteroskedasticity-consistent standard errors. The standardized announcement window (-1, 1) cumulative abnormal returns is the dependent variable. Panel A presents EBC and industry-adjusted leverage interaction variables (groups); Panel B presents EBC and growth opportunity interaction variables. Groups are constructed as follows: GRP1 = EBC > 0.50 and LEV (GROWTH) > median, GRP2 = EBC > 0.50 and LEV (GROWTH) < median, GRP3 = EBC < 0.50 and LEV (GROWTH) > median, GRP4 = EBC < 0.50 and LEV (GROWTH) < median. LSALES is the natural logarithm of annual firm sales. MB is the price-per-share divided by book-value per share of equity in the month prior to the SEO issue. RUNUP is the average of monthly returns for the firm for the year prior to the SEO issue. PCISSUE represents the number of shares issued in the SEO divided by the number of shares outstanding before the SEO. YEARDDUM is a number 1-8 corresponding to the SEO announcement years 1993-2000. REASONDDUM is a number 1-5 corresponding to the reason given for the SEO issuance.

conditions of both high and low leverage, there is a significant negative effect on CAR ( $p$ -values  $< 0.05$ ) for firms that pay their CEOs with a high percentage of equity-based compensation (LEVGRP1 and 2). Second, when EBC is low and when leverage is high (LEVGRP3), we find a significant negative relationship ( $p$ -value = 0.017). When both EBC and leverage are low (LEVGRP4) the coefficient on the dummy variable is not as strong.<sup>13</sup> In sum, when equity-based compensation is high, it appears that a stronger SEO 'last resort' signal is created which causes investors to be more sensitive to leverage as an indicator of financial distress. These results lend further support for Hypothesis 2.

We also examine, in a multivariate setting, the nature of the interactive effects of equity-based compensation and growth (information asymmetry) documented in Models 2 and 4 of Table 5 (Hypothesis 3). We divide our sample into four subsamples (similar to Panel B of Table 2): high EBC/high growth, high EBC/low growth, low EBC/high growth, and low EBC/low growth. High (low) EBC indicates firms with greater than (less than) 50% equity-based compensation out of total compensation. A firm was classified as 'high growth' if its growth (capital expenditures divided by total assets) exceeded the median growth opportunity of the sample, and *vice versa* for the classification of 'low growth' firms. The coefficients for these four groups using CAR (-1, 1) as the dependent variable are presented in Panel B of Table 6.

Panel B of Table 6 illustrates that, for firms with high information asymmetry (high growth opportunities) and a high percentage of equity-based compensation (GRGRP1), there is a significant negative SEO effect measured by the 3 day CAR ( $p$ -value = 0.024). For firms with high information asymmetry and low EBC (GRGRP3), the relationship is not statistically significant. Lastly, in low information asymmetry settings when EBC is either high or low (GRGRP2 and 4), the effect on CAR is not significant. These results lend further support for Hypothesis 3, which states that investors react to the 'last resort' signal to a greater extent in high information asymmetry environments.

## CONCLUSION

In this study, we consider CEO compensation structure when analyzing the market response to

SEO announcements. Using an event study approach, results support the hypothesis that SEO firms paying higher equity-based compensation to their CEOs perform worse in the days surrounding the announcement than do firms with higher cash-based compensation structures. This may indicate that investors interpret the SEO issuance from CEOs whose wealth is tied to firm performance as a signal that a financially distressed firm is using the SEO as a 'last resort' means of raising capital. Univariate and multivariate results support the notion that (1) the percent of CEO equity-based compensation is directly related to the decline in firm value associated with an SEO announcement, and (2) the convergence of high equity-based compensation and an SEO causes investors to be more sensitive to a commonly used indicator of financial distress (leverage). Further, the equity-based compensation effect is exacerbated in firms that have high levels of information asymmetry between management and investors. In higher information asymmetry environments, investors appear to be more sensitive to a signal that the SEO is a 'last resort' form of financing.

These results have several important practical and academic implications. First, managers should consider the external ramifications of compensation structure decisions on shareholder value. Having high proportions of equity-based compensation may lead to indirect costs for shareholders following certain corporate decisions, such as the decision to issue seasoned equity as analyzed here. Second, the likely benefits of an SEO may outweigh the lower costs for a firm whose CEO is paid with low levels of equity-based compensation. Therefore, these firms should consider an SEO as a potentially cheaper way to raise capital, since the costs to them may be lower than traditionally reported. Third, this study shows that compensation structure impacts theories of capital structure. Future research that incorporates the form of management compensation into traditional capital structure theories may be worthwhile. Finally, our results support the theory that higher levels of information asymmetry increase the importance of management signals to investors.

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## NOTES

1. Miller and Rock (1985) propose that the information content in dividend reductions and omissions is stronger than that of a dividend increase since the former signals unfavorable information to investors and managers would reduce or omit dividends only by force, not by choice. In addition, studies from behavioral finance research, starting with Tversky and Kahneman (1986), show that investors' response to losses is more extreme than the response to gains. This effect is called loss aversion, and can explain why investors react more strongly to negative information ('bad news') signaled by managers as opposed to positive information ('good news').
2. See, for instance, Mikkelson and Partch (1986), Asquith and Mullins (1986), and Eberhart and Siddique (2002).
3. This result is in agreement with other empirical work documenting a negative stock price reaction on announcement of equity issuance including Noe (1988), Stulz (1990), Lucas and McDonald (1990), Harris and Raviv (1991), and Loughran and Ritter (1995).
4. This represented a 7% decrease in equity-based compensation from 2002; the same time when many firms began voluntarily expensing stock options. <http://www.afcio.org/corporateamerica/paywatch>
5. See Langley (2003) for a discussion of management concerns over investor reactions to executive compensation policies.
6. Websites developed by Ritter and Ljungqvist (<http://bear.cba.ufl.edu/ritter/SDCCOR.PDF> and <http://pages.stern.nyu.edu/~aljungqv/research.htm>, respectively) and Ellis *et al.* (2000) provide researchers with information related to known errors in the SDC data set. Errors identified by these resources include shares outstanding, venture backing, syndicate size, overallocation exercise data, unit offerings, and some accounting numbers for initial public offerings. We use the SDC data set only for SEO filing dates and number of shares issued. From a review of our sample of firms and the errors noted in the aforementioned resources, no corrections to our SDC data were required.
7. As per Heckman (1979), a bias can result from using non-randomly selected samples when estimating behavioral relationships. From our joint estimation of EBC and growth (see 'Analyses of Financial Distress and Information Asymmetry Effects on SEO Returns'), we note that the coefficient for EBC (growth) is positive and significant in a 3SLS regression using growth (EBC) as the dependent variable. However, since we use CARs as the

dependent variable rather than EBC or growth, we successfully control for this relationship by utilizing interaction variables in our multivariate tests and by dividing the sample into sub-samples using all combinations of high/low EBC and growth in our multivariate tests.

8. We also calculate the long-run performance of firms issuing SEOs following Barber and Lyon's (1997) methodology. We calculate holding period abnormal returns with the CRSP equally-weighted index as the benchmark portfolio. We find that for the three-year holding period, SEO firms with EBC > 50% significantly underperformed firms with EBC < 50% (both underperformed the benchmark portfolio). However, Eckbo *et al.* (2000), Mitchell and Stafford (2000), and Jegadeesh (2000) caution that results for long-run event studies for seasoned equity offerings can be erroneous and interpretations may be misleading.
9. We also divide the sample into quartiles based on the percentage of equity-based compensation and repeat the event study calculations. Results are similar to the split samples; higher equity-based compensation is associated with larger drops in shareholder wealth on the date of the SEO announcement. Since the sample sizes for the quartile samples are relatively small, we report only the split sample results here.
10. To control for possible heteroskedasticity in our cross-sectional sample, we report results using White's (1980) heteroskedasticity-consistent standard errors in Table 5. With the exception of the direct effect of equity-based compensation in Model 3, the results from this analysis are qualitatively similar to the results obtained from OLS standard errors.
11. We find qualitatively similar results using another commonly used indicator of financial distress: debt-to-equity for the year preceding the SEO announcement (e.g. Dichev and Skinner 2002).
12. We find qualitatively similar results using another commonly used indicator of growth: growth rate of sales over the year preceding the SEO announcement (e.g. Denis, 1994; Pilotte, 1992).
13. Additionally, a non-tabulated *t*-test for the difference between mean CARs confirms a significant difference (*p*-value < 0.01) in the expected direction between high (LEVGRP2) and low (LEVGRP4) EBC sub-samples under conditions of low leverage (mean CARs = -0.026 and -0.010, respectively).

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