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Why Do Investors React Negatively to Seasoned Equity Offerings?

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Abstract

The average investor reaction is neutral to primary offerings by firms with managerial incentives closely tied to the shareholder value. Investors react negatively (1) when there are insufficient managerial ownership stakes to deter misuse of SEO proceeds and (2) when there are negative signals transmitted through secondary offerings by insiders and block-holders. Consistent with an agency-based explanation, firms engaging in value-destroying corporate acquisitions suffer large negative returns at the announcement of SEOs. Agency problems seem to be of less concern to investors, however, when firms are subject to intense monitoring by institutional investors and the market for corporate control. Overall, our findings demonstrate that controlling agency problems, an important facet of corporate governance, has a significant effect on firm valuation and the cost of external equity capital.

JEL classification: G32, G34

Key words: Managerial Incentives, Seasoned Equity Offerings, Agency Costs, Adverse Selection, Asymmetric Information.

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It is well documented that investors react negatively to announcements of seasoned equity offerings (SEO).[2] There are three explanations offered for the negative reaction. One is the Leland and Pyle (1977) signaling effect: Sales of shares by better-informed investors signal that they believe shares are overpriced. Another, the Myers and Majluf (1984) adverse selection problem, goes beyond the pure signaling effect: It does not require insiders selling their personal shareholdings to transmit a negative signal. The mere act of issuing equity conveys a negative signal about the true value of the firm that leads to suboptimal investment decisions. The dead-weight loss due to suboptimal investments adds extra cost to equity financing and, hence, makes it the financing choice of last resort, providing a theoretical base for Myers' (1984) pecking order theory.

A third explanation, theoretically formalized by Jung, Kim, and Stulz (1996), is agency problems. When managerial self-interests are misaligned with shareholder value maximization, managers may pursue value-destroying growth strategies when there are no positive NPV investment opportunities, increasing their private benefits of control at the expense of shareholders. Investors' awareness of such potential misuse of funds raised in equity offerings causes the negative reaction.

All these explanations are plausible. But there is substantial variation in investor reaction across SEOs. How significant is each of the three effects--signaling, adverse selection, and agency—in explaining the variation? If they jointly influence investor reaction, can we disentangle them and assess their relative importance? These issues are important not only to better understand investor behavior but also to learn the key drivers affecting the cost of raising external equity capital and firm valuation.

[2] See Asquith and Mullins (1986); Masulis and Korwar (1986); Mikkelson and Partch (1986); Smith (1986); Korajczyk, Lucas, and McDonald (1991); Denis (1994); Jung, Kim, and Stulz (1996); and Chemmanur and Jiao (2005); among others.

This paper attempts an empirical assessment of the relative importance of the three theoretical explanations for the negative investor reaction. It also investigates the circumstances under which they affect and interact in pricing newly issued shares. We do so by providing a comprehensive treatment of agency considerations and by isolating price reaction to sales of personal shareholdings of insiders and block-holders through secondary offerings, which are often made as a part of SEOs.

Three variables are used to proxy agency problems; managerial incentives to enhance shareholder value, external pressures to contain agency costs, and managerial actions around SEOs indicative of the extent of agency problems. For managerial incentives, we estimate how closely top management's self-interests are tied to shareholder value by measuring the sensitivity of the value of top managers' equity stakes (stocks and stock options) to changes in stock price. This sensitivity, hereafter referred as "equity incentives", is measured by following Core and Guay (1999). The agency based explanation predicts a positive relation between equity incentives and investor reaction to SEOs.

Equity incentives may also be related to external pressures in place to contain agency costs. Principal-agent models suggest that when the agent's actions can be easily monitored, firms should rely less on costly incentive contracts (Prendergast (2002)).[3] Hence, equity incentives may play a less important role when there are more external pressures on management to make value-maximizing decisions. In a study of firm-level external pressures, Cremers and Nair (2005) investigate the interaction between monitoring by institutional investors and pressure from the market for corporate control. They find the two external pressures are complements. Therefore, we

[3] Incentive contracts in the form of equity grants are costly because managers are risk-averse and hence demand a risk-premium to compensate for insufficient diversification.

examine how equity incentives interact with external monitoring and with vulnerability to takeover threats in affecting investor reaction to SEOs.

Among the various managerial actions taking place around SEOs, we choose corporate acquisitions as an ex-post proxy for agency problems. In a recent study, Masulis, Wang, and Xie (2006) find that corporate governance and the profitability of acquisitions are positively related, implying that firms with undeterred agency problems are more likely to engage in acquisitions harmful to shareholders. Thus, when a firm engages in value-destroying acquisitions around its SEO, we expect investors to react more negatively to the SEO announcement.

We distinguish the Leland and Pyle type signaling effect from the Myers and Majluf adverse selection by using secondary offerings. Unlike primary offerings of newly issued shares that provide funds to the issuing firm, secondary offerings are shares sold by corporate insiders and block-holders. Because the proceeds do not go to the firm, secondary offerings *per se* cannot lead to suboptimal investment decisions associated with either the adverse selection or the agency problem. We isolate the pure signaling effect by controlling for the presence of secondary offerings in regressions. We then attempt to explain the remaining price reaction to SEOs with proxies for adverse selection and agency problems.

Our investigation identifies two main reasons for negative reactions to SEOs: (a) negative signals through secondary offerings and (b) the misalignment of managerial self-interests with those of shareholders. When managerial self-interests are closely aligned with shareholder value, the average investor reaction is positive, albeit insignificant, for a five-day window surrounding SEOs without secondary offerings. Apparently, the mere act of SEOs conveys *no* negative signal.

Our regression estimates suggest that one standard deviation increase in equity incentives leads to an increase of about 0.9% in SEO announcement returns. When secondary offerings are

present, the average price reaction drops by -2.3% relative to pure-primary issues. These results are robust to industry- and year fixed effects. Further, our analysis of long-term returns (over a five-year period) shows that the market's discriminating response to equity incentives is timely without any prolonged effect. Our long-term results are also consistent with the findings of Eckbo, Masulis, and Norli (2000) and Teoh, Welch, and Wong (1998).[4]

When we relate equity incentives to external pressures from institutional investors and the market for corporate control, equity incentives significantly explain SEO announcement returns only for firms not subject to intense external monitoring by public pension funds, block-holders, or the market for corporate control. This confirms the hypothesis that costly internal incentive contracts are substitutes for external monitoring.

Our results using value destroying acquisitions as an ex-post proxy for agency problems are also consistent with the agency based explanation. When SEO firms make acquisitions with announcement returns below -1%, they experience an investor reaction of about -3% at the time of SEO announcements relative to non-acquiring firms. The results are robust to alternative definitions of value-destroying acquisitions.

As for the information based explanations, the negative investor reaction to secondary offerings is consistent with the pure signaling hypothesis. This negative reaction cannot be attributed to the Myers and Majluf adverse selection, because the proceeds are not subject to managerial discretion. Agency problems, though, can explain partly the negative reaction because secondary offerings may reduce managerial equity stakes and block ownership concentration, making investors more concerned with misalignment of manager-shareholder interests and with the diminished monitoring by block-holders and institutional investors.

[4] Eckbo et al. demonstrate how the drop in leverage following equity issuance explains the long-run SEO underperformance. Teoh et al. document a long-run underperformance for firms with high accruals.

To identify the effect of the adverse selection problem, we control for secondary offerings to remove the pure signaling effect. We then relate the SEO announcement return to various proxies for the degree of information asymmetry surrounding the issuing firm based on previous studies, as well as to proxies for the variables that Myers and Majluf argue relax the adverse selection problem. We find none of the proxies is significantly related to the investor reaction.

There are two possible explanations for this negative finding. One is the Dybvig and Zender (1991) proposition that the Myers and Majluf adverse selection problem disappears when shareholders choose a managerial compensation policy that maximizes the ex-ante market value of the firm. This theoretical explanation gets a further boost from our finding of the neutral investor reaction to pure primary offerings by high equity incentive firms, which also is inconsistent with the prediction of the Myers and Majluf model that the mere act of issuing equity conveys a negative signal regardless of the level of equity incentives.[5]

The other explanation is the potential large firm bias in our sample. The necessary data to compute equity incentives are available only for S&P 1500 firms, which has more or less equal representation of large, mid, and small cap firms--S&P 500 (large cap), S&P 400 (mid cap) and

[5] Myers and Majluf assume that managers always act in the best interests of the old shareholders and, hence, provide no prediction on the relation between the market reaction and equity incentives. In a recent study, Datta, Iskandar-Datta, and Raman (2005) allow for divergent self-interests between managers and old shareholders in Myers and Majluf's framework and argue that the more aligned managerial incentive is to shareholder value, the more likely management is to issue overvalued equity to benefit old shareholders, exacerbating the adverse selection problem for other investors. Thus they predict that firms with better aligned shareholder-manager interests will receive more negative reaction to SEOs. As evidence in support of this rather counter-intuitive prediction, Datta et al. present a negative relation between the price reaction and stock options granted during the previous fiscal year. This use of stock options as a proxy for equity incentives is misleading and inappropriate for a number of reasons. First, Core and Guay (1999) demonstrate that the new grants represent partial adjustments toward the optimal level, and hence, new grants of stock options reflect deviations from the target incentive level and do not measure the alignment of manager-shareholder interests. Second, new grants of stock options represent only a fraction of total managerial equity incentives and ignore other equity incentives such as stock grants. Third, our analysis indicates that compared to stock grants, options are much less effective in aligning interests between managers and shareholders. In contrast to Datta et al., our measure of equity incentives is based on all managerial holdings of both stocks and stock options. Interestingly, our measure of equity incentives is negatively correlated with Datta et al.'s estimate of new option grants during their sample period. This negative correlation is consistent with Core and Guay's findings that firms with lower (higher) levels of equity incentives than optimal are more likely to increase (decrease) new grants of stock options in the following year.

S&P 600 (small cap) indices. Perhaps a sample of small firms with better proxies for the adverse selection may provide more supportive results.

The large firm bias may also affect our results concerning the agency hypothesis. The separation of ownership and control, which is the root cause of agency problems, is more prevalent among larger firms, making equity incentives more relevant. To the extent that smaller firms are more closely owned, however, our measure of equity incentive would be higher (had the data on equity incentives been available). We investigate this issue by using the Heckman (1979) two-step selection model in the robustness section. The results are robust to sample selection bias.

Our study also yields an interesting byproduct: Among the different components of the equity incentive, managerial stock ownership seems to matter most. Stock holdings have significant positive impact on investor reaction to SEOs, whereas the effect of stock options is negligible. Within stock ownership, the non-restricted portion has much greater impact than the restricted portion. Although providing an in-depth theoretical explanation is beyond the scope of this paper, one possible interpretation is that investors consider vested stocks most effective in aligning manager-shareholder interests because (1) they represent *current* managerial ownership of the firm and (2) vested stocks are the easiest for investors to value and understand.[6] We repeat our regression estimation only with the percentage of vested stocks owned by top managers. The results are similar to those with the equity incentive variable with all three components in it.

This paper is closely related to Jung et al. (1996), who are the first to formally demonstrate the role of agency problems in security issuance decisions. For lack of a better proxy, Jung et al.

[6] For restricted stocks, there are uncertainties over actual ownership of the shares because of the possible inability to clear the restrictions or of executives leaving the company prior to the expiration of the vesting period. Eventual conversion of options into stocks is also subject to uncertainty because of stock price volatility and the vesting requirements. In addition, the stock price of vested stocks is readily observable in the market, whereas valuation of executive stock options requires a number of assumptions of which investors may have difficulty understanding the ramifications.

use the market-to-book (MB) value ratio as the measure of agency problems. They reason that because low MB ratios imply low growth opportunities, investors are more concerned with misuse of the proceeds when low growth firms issue equity. Their data show a positive relation between MB ratios and investor reaction, i.e., more negative investor reaction when SEOs are made by low growth firms. As Jung et al. acknowledge, however, this relation can be explained by both the Myers and Majluf (1984) adverse selection problem and agency problems.[7]

Moreover, the extent of agency problems may not be inversely related to growth opportunities, as Jung et al. assume. For example, the "quiet life" hypothesis of Bertrand and Mullainathan (2003) suggests that firms with high-growth opportunities may suffer more agency problems than low-growth firms. Bertrand and Mullainathan present convincing evidence that managers' desire for a quiet life discourages corporate investments. Managers who prefer a quiet life to aggressively pursuing profitable investments will devote less effort to convert growth options into real assets. Because high-growth firms have more growth options, such managerial shirking may have more negative impact on high-growth firms than on low-growth firms. If investors believe the quiet life problem is prevalent, as Bertrand and Mullainathan's finding suggest, investors might be more concerned with improper use of SEO proceeds by high MB ratio firms than by low MB ratio firms.

[7]Jung et al. state, "As modified by Cooney and Kalay (1993), the Myers and Majluf model can explain that high-growth firms issuing equity would have a more positive stock price reaction than low-growth firms. Hence, relating the stock price reaction to investment opportunities is not sufficient to make the case for the agency model of security issues" (p. 165). Cooney and Kalay extend the Myers and Majluf model by allowing for negative NPV projects and demonstrate that the decision to issue equity could signal an exceptionally valuable project, leading to a positive market reaction. Thus, if issuing equity by high market-to-book firms signals good capital expenditure opportunities, SEO announcement day returns are likely to be positively related to market-to-book ratio. Indeed, McConnell and Muscarella (1985) document positive market reactions to announcements of various corporate capital expenditure decisions.

Unlike the MB ratio, our measure of equity incentives circumvents the quiet life issue to the extent that monetary incentives motivate managers. It also enables us to separate the effect of suboptimal investments due to agency problems from those due to the adverse selection problem.

The use of equity incentives as a proxy for (the inverse of) the agency problem is not free from endogeneity, however. Since equity incentives reflect the accumulation of stocks and options granted to managers as antidotes to agency problems, one may argue that firms have higher equity incentives because they are more prone to agency problems. We explicitly address this issue in the robustness section by using the Core and Guay model to estimate deviations from a customary level of incentives given firm characteristics. The deviations are used to analyze the relation between equity incentives and SEO announcement returns. The results are statistically and economically robust to this alternative specification.

We also address the omitted variables bias by modeling equity incentives and investor reaction as endogenous variables in a two-stage regression framework. The results are robust to using the predicted value of incentives. Finally, data on firm operating performance show that SEO firms with higher equity incentives utilize corporate resources more profitably and efficiently. This is comforting for our use of equity incentives because investors should be less worried about misuse of SEO proceeds when firms have more profitable and efficient operations.

The next section describes the data and the sample construction. Empirical results and a battery of robustness checks follow in Section II. Section III contains concluding remarks.

I. Data and sample construction

We obtain data from multiple sources. Data on SEOs are obtained from the Thompson Financial's SDC database; executive compensation data are obtained from the Executive Compensation Database of COMPUSTAT; and accounting and stock return data are obtained from

COMPUSTAT (both active and research) and CRSP, respectively. Because the Executive Compensation Database began compiling data for S&P 1500 firms in 1994, we start our sample of SEOs from that year.[8] We obtain corporate acquisitions data from SDC's M&A database; institutional and block-holdings from 13-F filings; and Gompers, Ishii and Metrick's (2003) governance measure from Wharton Research Data Services.

Our sample of SEOs covers the period 1994-2003. We classify SEOs into pure primary, pure secondary, and mixed issues.[9] We exclude REITs, ADRs, and Units. We also remove financial firms (SIC codes between 6000-6999) and utilities (SIC codes between 4910-4940) to conform to earlier studies.[10] Finally, we remove firms with less than $1 in offer price to prevent bid-ask bounce from dominating the results.

The remaining firms are intersected with the CRSP and COMPUSTAT Executive Compensation databases. We require that the Executive Compensation database reports sufficient compensation details of the CEO and other top four executives of the firm such that it is possible to compute the 'equity incentive' measure described in the Appendix. To ensure that our statistical inferences are not influenced by firms with multiple SEOs in the same year, we restrict to only one SEO per firm per year, which removes 10 observations from the sample. These filters produce a final sample of 597 firms over a period of 10 years. Of these, 361 are pure primary offerings, 140 pure secondary, and 96 mixed.

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[8] For a smaller sample of firms (S&P 500), COMPUSTAT also back-filled the information for 1992 and 1993. To ensure that we obtain compensation data as of the fiscal year prior to the SEO date and to avoid any data back-filling biases, we start our SEO sample in 1994. Our results are similar (with slightly stronger results for key variables of interest) when we include SEOs (16) from these earlier periods.

[9] Many SEOs in the SDC database have missing values for the primary shares offered. We take these SEOs as having zero primary shares. Our reading of over 20 10-Ks suggests that these missing codes should have been zero and they have been wrongly classified as missing by the SDC.

[10] These firms are removed because they often have specific reasons to issue SEOs. For example, banks often issue equity to meet regulatory capital requirements, while utilities may issue equity as a part of a gaming process with the regulators.

The SDC database provides only the filing-date of SEOs, which may not coincide with the announcement date. We start with the filing date as the base and search for any news item in the past month concerning the firm's plan to issue equity. We search all publications covered by Factiva, which includes the Wall Street Journal and Dow Jones News Retrieval. If we find any mention of a firm's plan to raise equity in an SEO, we consider that day as the announcement day; otherwise, we consider the filing date as the announcement day. [11] There are 28 cases where the announcement date differs from the filing date.

A. Summary Statistics

Table IA provides the yearly distribution of SEOs in our sample. Panel A provides statistics for all 597 firms, Panel B is restricted to pure primary and mixed offerings, Panel C to pure primary SEOs, and Panel D to pure secondary SEOs. The sample is fairly evenly spread over the ten-year period. For the total sample, the median (mean) offer price is $31 ($37) and the median (mean) firm raised about $130 million ($250 million). In the fiscal year ended just before the SEO, our sample firms have median (mean) sales of $634 million ($2,670 million). These numbers suggest that our sample indeed contains relatively large firms.

The proceeds raised in the offering represent about 13% (18%) of the equity value for the median (mean) firm based on the pre-issue market capitalization. This represents a significant portion of the firm value and therefore the SEOs represent important events for the sample firms. The corresponding numbers in Panels B and C indicate that these characteristics are roughly similar for all three samples. Panel D, however, shows that pure secondary issues involve larger firms with larger offerings, but proceeds as a percentage of market capitalization are smaller than our overall sample.

[11] Empirical studies on SEOs often use the filing date as the announcement day (e.g., Jegadeesh, Weinstein, and Welch (1993), Denis (1994), and Datta et al. (2005)).

Table IA also shows the yearly distribution of mean and median cumulative abnormal return (CAR) during (-2, +1) and (-2, +2) event windows surrounding the announcement date. The return on the value-weighted market index of CRSP is subtracted from the raw return of the issuing firm to obtain CARs. We include day +2 in the second window for two reasons. First, for some SEOs the filing information may not reach the market until day +1. Second, investors may disagree about the valuation implications of the SEO announcement. When investors' primary concern is about management's intended use of the proceeds, it may take longer for the market to reach consensus because additional information may be released subsequent to the SEO announcement. For example, there was considerable uncertainty about Google's intended use of the proceeds when it first announced an SEO on August 18, 2005.[12]

The CARs indicate that the average investor reactions to SEOs are -1.48% and -1.33% around the (-2, +1) and (-2, +2) windows, respectively. These numbers are statistically significantly different from zero. Datta et al. (2005) report a similar magnitude of stock price reaction around the filing date for SEOs during the period 1993-1999.

When we compare the announcement day returns in Panel D (pure secondary issues) with those in Panels A, B, and C, a clear pattern emerges. The market reacts more negatively when SEOs contain secondary offerings. For the pure primary subsample, the mean returns around (-2, +1) and (-2, +2) windows are -1.04% and -0.72%, respectively. These are higher than those for pure secondary issues, which are -1.55% and -1.76% for (-2, +1) and (-2, +2) windows, respectively. The difference is larger for median returns, which are more robust to outliers than the mean.

[12] According to an article in Forbes.com (2005), "…Google said on Thursday that it has submitted a U.S. Securities and Exchange Commission filing to issue 14.1 million common shares. The total offering is valued at approximately $4 billion…Merrill Lynch reiterated a 'neutral' rating on Google, saying the *stock will likely be range-bound until investors have more information regarding the use of the proceeds of the offering*." (Italics added for emphasis.)

B. Measure of Equity Incentive

To measure managers' equity incentives we follow Core and Guay (1999) and construct the 'Delta' of the firm's top managers (see the Appendix). Delta measures the sensitivity of the value of the managers' shareholdings and stock options to a 1% change in the firm's stock price. Thus, Delta captures the manager's incentive to increase the stock price and proxies for the alignment of interests between managers and shareholders. The Delta of stockholdings is simply given by 1% of the value of manager's stockholdings (i.e., number of stocks held by the manager multiplied by the stock price), while the Delta of stock options are computed using the Black-Scholes model as modified by Core and Guay.

We measure the managerial equity incentive *prior* to the equity issuance by using the most recent fiscal yearend data before the SEO announcement. The Executive Compensation database provides compensation details for the top five managers. Because SEO decisions may involve a team of top managers, we include the incentives of all five managers. In unreported results, we also experiment with an alternative specification where we use the incentives of only the CEOs and CFOs and obtain similar results.

Table IB shows the descriptive statistics for the compensation variable. Similar to earlier studies, we find considerable skewness in various compensation measures. To remove this skewness bias, we employ a log transform. Panel A shows that the median CEO of our overall sample earns total annual compensation of about $1.8 million, which includes salary, bonus, value of restricted stocks granted, Black-Scholes value of the options granted, and various miscellaneous items such as insurance and housing benefits. Total compensation does not include the gains executives realize from exercising existing options or proceeds from selling preexisting stocks. For the median firm, the top five managers' total annual compensation amounts to $5.3 million. These

numbers are fairly similar across the three samples, again with the exception of secondary offerings which show greater compensation because of larger firm size.

Delta is the key variable. The median CEO for the total sample has a Delta of $250,000, which is the amount the median CEO stands to lose if the stock price falls by 1%. For each firm, we compute the ratio of Delta to total compensation. The median Delta/Total ratio for CEO for the overall sample is 0.10. Thus if the stock price falls by 1%, the CEO loses about 10% of her yearly income. For the top five managers, we first sum their Deltas and then divide by the sum of their total compensation to obtain the Delta/Total ratio. Taken together, the top five managers of the median firm stand to lose $544,000 when the stock price falls by 1%, representing about 8% of their combined annual earnings. Most of our analysis uses the (log transform of) Delta/Total ratio of the top five managers as the key explanatory variable. In the robustness section we use alternative measures of the incentives such as (a) percentage ownership held by the top five managers and (b) log (Delta/Sum of Salary and Bonus Only). The key results are robust.

II. Empirical Results

A. Univariate Tests

We start with a univariate analysis of announcement day returns across various incentive groups. For each year, we break SEOs into four groups based on the log (Delta/Total) ratio of the top five managers, to ensure that our results are not biased by any time trend in the equity incentive grants.[13] Returns are computed for the event windows of (-2, +1) and (-2, +2) days around the announcement date. The mean CARs across the four groups are reported in Table II.

Panel A reports CARs for all SEOs. Firms with highest equity incentives outperform lowest incentive firms by an economically meaningful margin of 1.52% to 1.44%. This difference

[13] We also conduct an analysis by pooling all sample SEOs and then dividing firms into four groups. Our results are similar.

in returns is statistically significant at the 5% level; furthermore, the returns across the four groups are almost monotonic. While the CARs for the lowest incentive group are significantly negative (at the 2% level or better), the highest incentive group's CARs are statistically zero. The negative announcement day return is concentrated in sub samples of low incentive firms. The patterns for median return are similar (unreported).

In Panel B we exclude SEOs that are pure secondary issues, leaving only the pure primary and mixed offerings. Without pure secondary issues, the wedge between highest and lowest incentive groups increases to 1.98% and 2.02% for (-2, +1) and (-2, +2) day window, respectively. The concentration of negative reactions to firms with low equity incentives indicates that investors worry about SEOs when managerial self-interests are not closely aligned with shareholder value.

When we focus on only pure primary offerings in Panel C, the results are striking. There is no hint of negative market reactions for the high incentive group in this subsample. For the (-2, +2) day window, the high incentive group's CAR is actually positive, albeit insignificant. This result is inconsistent with Myers and Majluf's adverse selection, which predicts a negative market reaction regardless of the level of equity incentives.

Panel D shows the results for pure secondary issues. In contrast to other panels, there is no correlation between incentives and announcement day returns. Because no funds are raised that can be mismanaged, investors do not seem to pay attention to how well managerial interests are aligned with those of shareholders. Investors' main concern seems to be the negative signals transmitted from the actions of informed investors.

In sum, the evidence suggests that the two important factors affecting investor reactions to SEO announcements are agency costs and sale of shares by informed investors. The evidence concerning pure primary issues is inconsistent with adverse selection *ala* Myers and Majluf.

B. Multivariate Tests

1. Control variables

We first control for the pure signaling effect with a dummy variable that equals one if the issue contains secondary offerings, and zero otherwise.[14] We then relate SEO announcement returns to agency and adverse selection problems. The equity incentive of the top five managers is the proxy for (the inverse of) agency problems.

An ideal proxy for adverse selections is hard to find. Earlier studies have used the size of a firm as a proxy for asymmetric information with the presumption that larger firms are under greater scrutiny by the investors and are more actively followed by analysts. We include log (sales) of the firm as a proxy for a firm's size. We expect to see a positive coefficient on this variable. Another proxy used by previous researchers is the standard deviation of market-model regression residuals (Bhagat, Marr, and Thompson (1985)). Assuming that investors and managers are symmetrically informed about systematic factors affecting firm value, the residual volatility may be used as a proxy for information asymmetry about firm-specific information. To compute this measure, daily stock returns are regressed on the value-weighted market return for a one-year period ending 30 days before the SEO announcement and then we take the standard deviation of residual as an information asymmetry proxy. We also control for the number of analysts following the company's stock as yet another proxy for asymmetric information. We take log (1 + number of analysts) as the explanatory variable to remove the skewness and to ensure that firms with zero analysts are also included.

Myers and Majluf (1984) argue that the financial slack relaxes the adverse selection problem. We control for this effect by including a firm's cash and cash equivalents normalized by

[14] We also estimate our model with the fraction of secondary shares instead of a dummy variable, and obtain similar results. Further, we collect data on insider sales of shares from the firms' prospectus. Controlling for insider sales produces similar results.

its assets. This variable may also proxy for agency costs associated with free cash flows. Korajczyk et al. (1991) use a time-varying proxy for adverse selection costs based on whether firm issues equity before or after the earnings announcement. In unreported analysis, we also include a dummy variable in our regressions that takes a value of one if the firm issues equity immediately after its earnings release to the market, and zero otherwise. We do not report results of this specification because the results do not change.

Jung et al. (1996) argue that SEO announcement returns are positively related to growth opportunities, which they measure with the market-to-book ratio (Tobin's Q). We include it as a control variable. We also use analysts' consensus growth forecasts as the proxy for growth opportunities. Because MB ratios and analysts' consensus forecasts are highly correlated and because they produce similar results, we only report results with MB ratios.

Lucas and McDonald (1990) and Jung et al. (1996) use firms' past returns as a proxy for the availability of good projects. We control for this effect by including the firm's log (1 + buy and hold return) over the past twelve months before SEO filing. This variable also may stand as a proxy for overvaluation because the market timing literature suggests that firms issue shares when stocks are overvalued (see Loughran and Ritter (1995), Speiss and Affleck-Graves (1995), and Stein (1996)). To the extent managers are more likely to issue equity when stock prices are high, this variable controls for such timing behavior.

Financial leverage is also used as a control variable, where leverage is defined as the sum of long-term and short-term debt normalized by the book value of assets. High leverage may control the agency cost of free cash flows. Jensen (1986) and Stulz (1990) argue that leverage restricts management's discretion and reduces agency costs; hence, outside investors may be less concerned with the misuse of funds when firms are highly leveraged.

Teoh, Welch, and Wong (1998) find that equity issuing firms tend to raise reported earnings by increasing accruals in the pre-issue period. They also show that high-accrual issuers underperform low-accrual issuers in the long run. We control for the accrual, defined as the net income minus cash flow from operations scaled by the total assets. We expect to find a negative coefficient on this variable. Finally, we control for the amount raised in the SEO as a fraction of the pre-issue market value of the firm, because Masulis and Korwar (1986) find that this variable affects SEO announcement day returns.

For the remainder of this paper we use only the sample of pure primary and mixed offerings (457 SEOs). In unreported analysis, we include pure secondary issues and find our main results remain robust as long as we control for secondary offerings with a dummy variable.

Table III contains summary statistics for the control variables. All accounting variables are measured as of the end of the fiscal year prior to the equity issuance. The other variables are measured either one month or one quarter before the SEO filing. The variable of main interest, Delta, is significantly and positively correlated with market-to-book ratio, secondary issue dummy and growth, confirming the need to include them as control variables to avoid spurious correlation.

2. Results

The dependent variable in all regressions is the return during the (-2, +2) window for reasons discussed earlier. Regression analyses are repeated with other event windows and the results are not sensitive to the choice of this window. We estimate regressions with industry and year dummies, where industry dummies are based on two-digit SIC codes.[15] There are several reasons to control for industry- and year fixed effects. Equity incentives may vary across industries

[15] In our sample, there are eight two-digit industries with only one SEO each. We collapse these eight industries to a miscellaneous two-digit SIC code.

for reasons such as industry-specific growth characteristics and competitiveness in both the product and the labor market. The control variables such as market-to-book ratio and leverage also exhibit industry-specific variations (Bradley, Jarrell, and Kim (1983)). Furthermore, there is a well-documented time trend in equity incentive awards to the top executives (Murphy (1999)). Our goal is to understand the effect of equity incentives independent of such industry- and time-specific factors.

Table IV presents results for three different models based on various combinations of the explanatory variables. In Model 1, our base model, only two variables significantly explain the market reaction; equity incentives of the top managers and whether the SEO contains a secondary offering.[16] The market discriminates between firms with high- and low managerial equity incentives. At the same time, the market is concerned about the sale of securities by large shareholders and insiders, resulting in lower returns with secondary offerings. In economic terms, a standard deviation increase in the equity incentive leads to an increase of about 0.9% in announcement day returns. The presence of secondary offerings leads to about -2.3% relative to pure primary issues.

The coefficients on firm size (sales) and standard deviation of market model residual, our proxies for information asymmetry, are insignificant in all specifications. The coefficient on the number of analysts covering the firm (in Model 3) is also insignificant. In unreported analysis, we also use other proxies for information asymmetry such as the 'probability of information based trade' measure of Easley, Hvidkjaer, and O'Hara (2002) and divergence in analysts' earnings estimate. Neither of these proxies helps explain SEO announcement returns. The coefficient on

[16] The market-to-book ratio is insignificant in both Models 1 and 3. To check if the insignificance is due to the correlation with equity incentives, we drop the equity incentive variable in Model 2, where the ratio still remains insignificant. The MB ratio becomes positive and significant when we duplicate Jung et al.'s sample and model specifications--i.e., (-1, 0) window for only pure primary issues without SEO firm's past return as a control variable. Even under these specifications, the MB ratio becomes insignificant in we include equity incentives.

cash, our proxy for financial slack, which Myers and Majluf argue helps control the adverse selection problem, is not significant in any of the regressions.

In sum, our results provide strong support for the agency cost based explanation and the pure signaling effect. However, none of the six proxies that would have given credence to the adverse selection problem helps explain investor reaction.

3. Value-destroying corporate acquisitions as a proxy for agency problems

Equity incentives may be viewed as an ex-ante measure to control agency problems. In this section, we use an ex-post proxy for agency problems: incidences of misuse of corporate resources. We choose the most visible case of corporate investments – acquisitions of other firms. From the SDC US domestic M&A database, we obtain all acquisitions made by our SEO firms during the one year (+/- six months) and six-month (+/- three months) period surrounding the SEO announcement, as well as during the six month period following the announcement. The agency hypothesis suggests that investors should be wary of providing funds to firms with a history of bad acquisitions. Therefore, we look at the recent past to capture this effect. The market also can anticipate rationally the most likely use of these funds; hence, we include acquisitions made soon after the SEO announcement.

We follow the standard approach used in M&A literature to put filters on this sample. Our sample selection criteria for acquisitions are the same as Moeller, Schlingemann, and Stulz (2004). We require: (a) the deal is completed, (b) the target is a domestic US firm, (c) the acquiring firm has less than 50% of the target's outstanding shares before the deal and acquires the entire shares outstanding, and (d) the deal value is more than $1 million. We also require that the deal value is at least 5% of the acquirer size (measured by the book value of its assets).

In our sample, 149 (94) SEO firms acquired other firms during a +/- six-month (three-month) period surrounding their equity issuance. Panel A of Table V shows positive mean and median returns of 2.99% and 2.09 % for the +/- six-month period in a (-2, +2) day event-window surrounding the M&A announcement.[17] The magnitudes of these returns are comparable to Moeller et al. who report a mean abnormal return of 1.1% in the (-1, +1) day event window surrounding the acquisition announcement for over 12,000 acquisitions during 1980-2001. Our data also reveal a wide distribution of good and bad acquisitions. For the +/- six-month window, of 149 acquisitions, 46 had returns lower than -1% and 35 lower than -2%.

We create a dummy variable called 'M&A' that takes a value of one if an SEO firm engages in acquisitions, and zero otherwise. We re-estimate our regression model with this dummy variable and present result in Model 1 of Table V, Panels B, C, and D. The coefficient of the M&A dummy is insignificant in both Panels B and C and marginally significant in Panel D. However, these results hide important cross-sectional variations within the sample of acquirers.

We divide the acquirers into three groups based on the market's reaction to the announcement of acquisitions. We define three M&A dummy variables – good, neutral, and bad - that are equal to one (and zero otherwise) if an acquisition announcement return falls in top third, middle third, or bottom third of the sample distribution. Model 2 of Panel B shows that firms engaging in bad acquisitions experience an average market reaction of -3.17% to SEO announcements relative to firms with no acquisitions. In contrast, market reactions to firms with good and neutral acquisitions are insignificantly different from non-acquiring firms. Similar results hold for other panels as well.

As a robustness check, we use alternative definitions of good, neutral, and bad acquisitions. In Model 3, we use an absolute cut-off of +/-1% and classify an acquisition as good, neutral, and

[17] When there is more than one M&A deal in a given window, we take their average announcement day returns.

bad if the market reaction to acquisition announcement is above +1%, between -1% to +1% and below -1%, respectively. In Model 4, we use a cut-off of +/-2%. Irrespective of the cut-off and the window for the acquisition period, we find that SEO announcement day returns are negative and significant for firms with bad acquisitions. Investors seem to be concerned with potential misuse of funds and punish firms that engage in value destroying acquisitions around the time of SEO announcements.

4. Interaction between external monitoring and equity incentives

Managerial equity incentives are internal means to control agency problems. There is also external pressure to reduce agency costs stemming from monitoring the agent's actions by institutional investors and from the market for corporate control. We hypothesize that the effect of equity incentives is greater when managers are subject to less external monitoring.

To test this hypothesis, we use three distinct proxies for external monitoring and analyze how they interact with equity incentives. The first proxy is the shareholdings by public pension funds. Del Guercio and Hawkins (1999) and Gillan and Starks (2000) find that large pension funds stand out among institutional investors in successfully monitoring firms. Cremers and Nair (2005) find that public pension fund (PPF) ownership and takeover vulnerability interact in long-term abnormal returns. Davis and Kim (2006) show that among institutional investors, PPFs most proactively seek shareholder interests in proxy voting. We obtain the PPF holdings from the 13-F filings of institutional investors for the quarter ended just before and after the SEO announcement and take its average as a proxy for the PPF's shareholding at the time of SEO announcements. We define a dummy variable 'High Monitoring' equal to one for firms that fall in the top quartile in terms of the PPF's shareholding, and zero otherwise. A second dummy variable 'Low Monitoring' equals one minus 'High Monitoring'. These dummy variables are interacted with equity incentive.

We use the shareholdings of institutional block-holders as our second measure of external monitoring. Large concentrated shareholdings by institutional shareholders may limit the agency problems emanating from dispersed shareholding of public corporations (see Shleifer and Vishny (1986)). Like PPF holdings, we obtain data on institutional block-holders (defined as institutional shareholders with more than 5% holdings) from the 13-F filing a quarter before and after the SEO announcement and take the average. We also define two dummy variables, 'High' and 'Low' monitoring, taking a value of one (and zero otherwise) for firms in the top quartile and for the rest in terms of block-holder shareholdings, respectively.

Our third measure of external pressure is the anti-takeover index of Gompers, Ishii, and Metrick (2003). They construct the governance index from Investor Responsibility Research Center (IRRC) publications, which includes inputs from both firm-specific charter provisions as well as state corporate laws. A higher GIM-index corresponds to more anti-takeover provisions, insulating managers from the market for corporate control. We obtain the GIM index for the latest year before the SEO issuance and classify firms into high vs. low pressure depending on whether they fall into the bottom quartile (GIM index < 8) or not. Unlike other measures, GIM-index data is available for only 255 out of 457 sample firms.[18]

Results are provided in Table VI. Models 1 and 2 provide similar results. Whether the monitoring is done by public pension funds or block holders, the equity incentive does not have explanatory power for firms that are subject to a very high degree of outside monitoring. Only when firms are subject to less external monitoring do we find a positive and significant relation between equity incentive and investor reaction. Apparently, investors are less worried about agency problems when a firm is subject to a high degree of external monitoring. But when such

[18] For this estimation we drop industry fixed-effects because of the small sample size.

external force is not very strong, investors pay close attention to equity incentive as a controlling device against misuse of corporate funds.

Model 3 with the GIM index show results that point to the same direction as those with institutional investors; namely, equity incentives have explanatory power only when managements are somewhat protected against the threat from the market for corporate control. However, the model has a very poor fit even by the standard of cross-sectional studies that typically show quite low R squares. In an unreported regression, we also use the interaction of GIM index and the presence of block-holders as a proxy for high monitoring because Cremers and Nair (2005) find that they complement each other. The results are very similar to those reported in Table VI.

5. What type of incentives affects the market's response?

Our measure of equity incentives includes managers' holdings of restricted and unrestricted stocks and vested and unvested options. Does the market pay equal attention to all types of incentives or are there systematic differences across various components? To answer this question, we decompose Delta and announcement returns are regressed on separate components of equity incentives. The results are reported in Table VII. In Model 1, returns are regressed on stock Delta only, excluding the Delta of option holdings. In Model 2, we break stock Delta into Delta of restricted stocks and unrestricted stocks. Model 3 uses Delta of option holdings only. Model 4 includes all; restricted stock Delta, non-restricted stock Delta, and option Delta. Because a specific component of incentives may have zero value for some firms, in Models 2, 3, and 4 we construct our incentive measure as log ((1 + delta of the respective component)/total compensation)) in order to include observations with zero incentive in any given category.

A consistent pattern emerges from the results in Table VII. Stock based incentives, and not option based incentives, have significant positive impacts on announcement day returns. And

within stock-based incentives, it is the non-restricted part that provides the impact. Although these results warrant further theoretical investigation, we notice that investors seem to put more weight on those components of incentives that are closer to managers' direct equity ownership and easier to value.

Restricted stocks are often contingent upon achieving a predetermined goal, and may not be granted if managers fail to achieve the goal or leave the company before expiration of the vesting period. Because of this uncertainty, the market may consider vested stocks more effective in aligning manager-shareholder interests. In addition, stock prices also are readily observable from the stock market, whereas valuation of executive stock options requires a number of assumptions and investors may have difficulty understanding their ramifications.[19] Furthermore, when stock options fall underwater they are relatively ineffective in creating ownership incentive and raise the expectation of re-pricing, which further undermines incentives ex-ante (Hall and Knox (2004)).

6. Long-term effects

Are there any long-term implications of the equity incentive on the stock returns of issuing firms? Studies involving long-term returns are treacherous tasks due to various statistical biases and benchmarking issues surrounding them (see Barber and Lyon (1997) and Kothari and Warner (1997)). There is ongoing debate whether or not *controlling for risks* SEOs underperform in the long run.[20] We do not attempt to address that issue. Smaller sample sizes make the task of

[19] The valuation of executive options may differ from the value implied by the modified Black-Scholes formula for several reasons. Most executives are not able to trade their options or short-sell their company's stock to hedge the option risks. Further, the risk-neutral valuation formula may not be appropriate to executives because they hold undiversified portfolios with disproportionately high investment in their own company (see Murphy (1999)). For these reasons, executives may value their options lower than the value placed by an outside investor, although it also is possible for them to value options higher if they possess highly optimistic information unavailable to other market participants (see Yermack (1997)).

[20] See, for example, Loughran and Ritter (1995) for evidence in support of underperformance and Eckbo, Masulis, and Norli (2000) for flaws in the long-term performance measure.

detecting long term performance even harder. Our only goal is to understand whether cross-sectionally, high incentive SEO firms exhibit different long run performance from low incentive SEO firms on a risk-adjusted basis.

To conduct this test, we follow the method used in Brennan, Chordia, and Subrahmanyam (1998) which is similar in spirit to the Fama-McBeth approach. For each SEO, we obtain 60 monthly returns (or returns until delisting date, whichever is earlier) starting from the month after the announcement. We consider four factors; market, size, book-to-market, and momentum in Fama-French (1993) and Carhart (1997). We regress monthly returns of the SEO firms on one (market only), two (market and size), three (market, size, and B/M), and all four factors. The intercepts from these regressions are defined as risk-adjusted returns with respect to the given factors. We use these intercepts as the dependent variable for regressions on various firm and issue characteristics at the time of SEO. We consider five year returns. If a firm offers multiple issues in five years, we will obtain overlapping returns from the same firm making our statistical inferences biased. We repeat our analysis by considering only the first SEO by a firm in any overlapping five-year period and obtain similar (unreported) results.

In the cross-sectional regression, we control for firm size (log sales), market-to-book ratio, and secondary offering dummy. We also control for change in leverage after the equity issuance because Eckbo et al. (2000) illustrate the importance of adjusting for reductions in leverage in studying the SEO long run performance. To construct the leverage change, we start with the leverage (long-term debt plus short-term debt scaled by total assets) from the prior fiscal year. Then we compute the 'new leverage' by adding SEO proceeds to the total assets of the firm and assuming no debt has been issued concurrently. The difference between old and new leverage is

taken as a measure of decrease in leverage subsequent to equity issuance. Finally, Teoh et al. (1998) document that high accrual SEOs underperform in the long run, so we control for accruals.

Long-term return results are provided in Table VIII. The coefficient on the incentive variable is not significant regardless of the number of factors used in estimating risk-adjusted returns. Although the market discriminates SEOs based on the issuing firm's managerial equity incentives, its discriminatory response appears timely without any lingering effect.

Our long run results are also consistent with previous literature on leverage and accruals. The leverage change subsequent to the SEO issuance is negative and significant for all model specifications. The lower returns associated with a decrease in leverage are consistent with Eckbo et al.'s finding that much of the long run underperformance can be explained by lower expected returns associated with the lower leverage following SEOs. Accruals are also significantly negative for three and four factor models, consistent with Teoh et al.'s finding that high-accrual firms underperform in the long run.

7. Robustness checks

In this section we present a battery of checks on sample selection, endogeneity, alternative specifications, the relation between operating performance and equity incentives, alternative measures of equity incentives, and confounding events due to earnings releases around SEO announcements.

As stated earlier, our sample may contain large-firm bias because the compensation database covers only S&P 1500 firms. Because S&P 1500 also covers firms from mid-cap and small-cap indices, we do not expect severe bias. Nevertheless, we repeat our base regressions (corresponding to Model 1 of Table IV) using the Heckman (1979) two-step selection model. We

find virtually no change in the magnitude or the significance of the coefficients and therefore conclude that our main results are robust to the sample selection problem.[21]

In our estimation procedure, firm specific variables are regressed on the stock market response; hence, any reverse causality problem is unlikely. In addition, the market's response to SEOs is regressed on equity incentives measured from the end of the prior fiscal year, making the key independent variable known ahead of the dependent variable. This lag reduces the potential simultaneity bias.

The regression models may suffer, however, from an omitted variable that may lead to an endogeneity problem. For example, the decision to issue equity as well as its timing and the level of managerial incentives may be driven by some firm specific factors that are not controlled for in the regressions. In such a case, the OLS estimates will be inconsistent due to the well known omitted variable bias. We address this bias by using an instrumental variable regression following Coles et al. (2006). We model the market's reaction to SEO announcements and incentives as endogenous variables and estimate a two-stage regression model. In the first stage we regress equity incentive on its known determinants and all exogenous variables of the model. In the second stage, the predicted values of incentives are used as the key explanatory variable.

Another source of endogeneity is that our measure of equity incentives reflects the accumulation of past equity-based compensations designed to mitigate agency problems. As such, one may argue that firms with higher equity incentives may have more, not less, agency problems.

[21] In the selection-bias model, we first estimate a probit model for the likelihood of a firm's inclusion into the S&P 1500 index. To do this, we collect data on all SEOs by non-S&P 1500 firms during the sample period (1994-2003) and add them to the sample. We use firm size (log (sales)) and the number of analysts following the stock as explanatory variables in the probit model. We choose these variables for the selection model because larger firms and firms with more analyst coverage are more likely to be included in the S&P 1500 index. We obtain the inverse mill's ratio from this model and use it in the second stage OLS model (with market return as the dependent variable) to correct for the sample selection bias as suggested by Heckman (1979). We find a positive and significant coefficient (at 1%) on the equity incentive variable in the OLS model. All other results are qualitatively similar to the results for Model 1 in Table IV.

To address this issue, we estimate a target level of equity incentive for each firm and then take the deviation from the target level as the explanatory variable. Following Core and Guay (1999) and Coles et al., we model the target incentive level as a function of firm size (log sales); market-to-book ratio; a measure of dividend constraint that equals one if the firm's dividend payout is more than twice its retained earnings, and zero otherwise; cash flow normalized by total assets; the firm's stock return volatility (measured as the log of the standard deviation of daily stock return in the prior fiscal year); R&D to total asset ratio; leverage; and net operating loss carry-forwards scaled by total assets. We control for industry- and year fixed effects as well as the other control variables used in the earlier regressions.

In the instrumental variable regression, we use all the above variables. In addition, we use the lag incentive as of two fiscal years prior to the equity issuance date as the key instrument as advocated by Coles et al. (2006).[22] The two-stage instrumental variable regression results are reported in Table IX, Panel A. We provide results for both first stage and second stage regressions for two different model specifications – our base model in Model 1 and an all-inclusive one in Model 2. In the first stage we find that high market-to-book ratio firms provide higher equity incentives to their managers, consistent with our earlier assertion that high-growth firms could be more vulnerable to governance problems due to the pursuit of the quiet life. Firms more susceptible to damages from the quiet life problem may grant more equity incentives as antidotes to managerial shirking. The second stage results show that the predicted values of equity incentives are positive and significant for both specifications.

Panel B presents results for the deviation model. The key independent variable is the difference between actual equity incentives at the end of prior fiscal year and the predicted equity

[22] The instrument in IV regression is the equity incentives two fiscal years prior because we use equity incentive from the most recent fiscal year *prior* to the SEO announcement.

incentives based on the target model. Again the results are robust, suggesting more favorable market reaction when managerial self-interests are more closely aligned with shareholders' than customary given a firm's characteristics.

As a further robustness check on equity incentives, we examine whether firms with higher equity incentives indeed utilize financial resources more productively. If they do, rational investors will be less concerned with misuse of funds when the issuing firm has higher equity incentives. Three accounting measures are used as proxies for operating performance; return on assets (ROA), EBITDA/Sales margin, and asset turnover ratio (Sales/Assets). These measures are industry adjusted by subtracting industry median numbers for the same calendar year based on two-digit SIC codes.

Table X reports the median firm's industry-adjusted ROA, EBITDA/Sales, and Sales/Assets across four incentive groups from low to high. Panels A, B, and C contain the results for years -1, 0, and +1, respectively, relative to year for which equity incentive is measured. High incentive firms have higher profitability ratios in both ROA and EBITDA margin, for all three years compared to the low incentive firms. The differences are statistically significant at 1%.[23] Similarly, high incentive firms utilize their assets more, as shown by higher asset turnover ratios, compared to low incentive firms. One cannot infer any causation between incentives and operating performance based on these results. However, a positive correlation between the two measures is sufficient for our purpose. As long as investors believe that high incentive firms deploy their funds more profitably, they will be less worried about potential misuse of proceeds when top management has more equity incentives.

[23] This finding is consistent with those of Morck, Sheifer, and Vishny (1988) who find a positive relation between firm performance and stock ownership for firms where managers hold 0% to 5% of the outstanding stocks. The stock ownership for the top five managers of our median sample firm is 1.8%. See also McConnell and Servaes (1990) and Mehran (1995) for further evidence on effects of stock ownership and stock-based compensation on firm performance.

We also check robustness of our equity incentive measure to different estimation procedures. The results are reported in Table XI. In Model 1, we take the (log) average of Delta/Total Compensation of the top five managers, instead of their summed measures as in the base case. Intuitively, this measure assumes that each top executive has equal weight in the decision making process. In Model 2, we simply take the (log) of percentage shares held by the top five managers. This measure ignores the effect of option holdings.[24] Finally, in Model 3, we use a measure similar to our base case except for the sum of salary and bonus as the deflator (as opposed to the total compensation in the base case). Table XI shows that no matter which measure is used, investor reactions are more positive when equity incentives are higher returns and are strongly negative when secondary offerings are included.

Finally, we check for possible confounding effects caused by earnings announcements around SEOs. In our sample, 48 firms released earnings in the (-2, +2) window of SEO announcements. Our results do not change if these firms are excluded from the sample.

III. Conclusions

This paper attempts to assess the relevance of pure signaling effects, adverse selection problems, and agency problems in explaining investor reaction to SEOs and to disentangle their joint effects. Of the three possible explanations, pure signaling effects and agency problems exhibit significant explanatory power. Investors react to the negative signal conveyed when insiders and block-holders sell their shareholdings through secondary offerings. Investor reaction is positively related to managerial equity stakes, apparently because they help reduce agency problems. However, the mere act of issuing equity, such as primary offerings by high equity incentive firms, does not convey a negative signal, thereby casting doubt on the Myers and

[24] Jung et al. (1996) also document that firms with low managerial ownership experience the most negative stock price reaction with a smaller subsample; however, their high-ownership firms still show a mean abnormal return of -2.56% during SEO announcement periods.

Majluf's adverse selection problem as a primary explanation for the negative investor reaction to SEOs. The results are robust to various model specifications and control variables.

The lack of empirical support for the adverse selection problem in our study is subject to caveats, however. Because our sample is based on relatively large firms, we cannot exclude the possibility that one may find more supportive evidence with a sample of small firms. It is also possible better empirical proxies for adverse selection may alter the results. Therefore, all we can safely conclude is that adverse selection problems seem to be a second order of importance for relatively large firms.

Our results concerning equity incentives and secondary offerings have important implications for how frictions and their remedies affect firm valuation and the cost of capital. Because of agency problems, implementation of a sound managerial incentive system, an important facet of good corporate governance, enhances firm valuation and lowers the cost of newly issued equity. When insiders sell their personal shareholdings through secondary offerings, informational asymmetry seems to impose a substantial cost on the firm by lowering the firm value and raising the cost of external equity capital.

Appendix: Construction of Delta

We follow the methodology used in Core and Guay (1999) and Coles, Daniel, and Naveen (2006) to construct the Delta of managerial compensation. For the sake of completeness, we reproduce the methodology in this appendix. The Delta of a manager is the sum of the Deltas for the exercisable and unexercisable options plus the Delta of her shareholdings. Delta of shareholding is defined as shares owned (Execucomp variable SHROWN) * 0.01 * end of fiscal year price (Execucomp variable PRCCF). Thus,

Stock Delta = SHROWN*PRCCF*0.01.

We compute the Delta of the exercisable and unexercisable options separately. These estimates are based on the Black-Scholes (1973) formula for valuing European call options following the Core and Guay (1999) methodology. The option value of a call option is:

Option value = [S*exp(-d*T) *N(Z)-X*exp(-r*T)*N(Z-σ*sqrt(T))],

Where

Z = [ln(S/X)+T(r-d+σ2/2)]/(σ*sqrt(T))

N = cumulative probability function for the normal distribution

S = the closing price of the company's stock at most recent fiscal year end (Execucomp variable PRCCF)

X = exercise price of the option.

Following the papers cited above, we compute the average exercise price (X) in two steps. First, we divide the value the manager would have realized at year end if she had exercised all of her vested and unvested (exercisable and unexercisable) options that had an exercise price below the market price (Execucomp variables INMONEX and INMONUN, respectively) by the number of vested and unvested options the manager held at year end (Execucomp variables UEXNUMEX and UEXNUMUN, respectively). Second, we subtract the quotients from the end of fiscal year price (PRCCF) to get the average exercise price.

σ is the standard deviation stock return volatility calculated over 60 months as used in Execucomp's Black-Scholes valuation of options (Execucomp variable BS_VOLAT). *r* stands for the risk-free interest rate. Interest rate yields are the natural log of Treasury bond yields from CRSP as quoted at the firm's fiscal year end. If T = 1, *r* is the one-year bond yield; if T = 2 or 3, *r* is the two-year bond yield; if T = 4 or T = 5, *r* is the five-year bond yield; if 6 <= T <= 8, *r* is the seven-year bond yield; and if T = 9 or T = 10, *r* is the ten-year bond yield.

T stands for the time to maturity of the option in years. We compute time to maturity in years from Execucomp data for each grant during the year assuming that the grant was made at the end of the firm's fiscal year. First, we compute the average time to maturity of all grants during the year and round it to the nearest whole year. Then for exercisable options, we take *T* as (0.7 * average time to maturity)– 3. It is set to 1, if (0.7 * average time to maturity)– 3 <0. It is set to 6 if the data are missing. For unexercisable options, we take *T* as (0.7 * average time to maturity)– 1. It is set to 9 if the data are missing. It is set to 1 if this number is negative. The maximum value of *T* is set at 10.

d stands for the natural logarithm of expected dividend yield for fiscal year (Execucomp variable BS_YIELD), which is taken as the company's average dividend yield over the past three years.

The option Delta, which is the sensitivity with respect to a 1% change in stock price, is defined as:

Option Delta=[δ(option value)/ δ(price)]*(price/100) = exp(-d*T)*N(Z)*(price/100)

The total Delta of manager is given by the sum of stock Delta and option Delta.

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Table IA: Descriptive Statistics of SEOs and Announcement Returns

This table provides yearly distribution of seasoned equity offerings (SEOs) in our sample. Panel A provides mean and median statistics for all SEOs (pure primary, pure secondary, and mixed offerings); Panel B provides the statistics for the sample of pure primary and mixed offerings only; Panel C reproduces these statistics for pure primary offerings; Panel D has only pure secondary offerings. *'Nobs'* represents the number of SEOs in the sample period. *'OP'* is the offer price of SEO in $. *'Proceeds'* denotes the amount of money raised in the SEOs, in millions of dollars. *'Sale'* represents the prior fiscal year sales of the issuing firm measured in millions of dollars. *'PR/MV'* represents the proceeds raised in the SEO as a percentage of its pre-issue market capitalization. The market capitalization is measured as of the end of last fiscal year before the security issuance. CAR21 (CAR22) measures cumulative abnormal return (relative to value-weighted market index) over (-2, +1) ((-2, +2)) day window around the announcement date. The last row represents the pooled observation across the entire sample period.

Panel A: All SEOs (Pure Primary, Mixed, and Pure Secondary Issues)

		Mean						Median					
Year	**Nobs**	**OP**	**Proceeds**	**Sale**	**PR/MV**	**CAR21**	**CAR22**	**OP**	**Proceeds**	**Sale**	**PR/MV**	**CAR21**	**CAR22**
1994	39	30.87	186.87	4036.00	13.79	-2.25	-2.40	28.50	105.10	897.10	10.78	-1.02	-1.23
1995	69	33.26	149.20	3471.61	18.05	-0.85	-0.53	30.00	108.40	392.39	15.08	-0.63	-0.94
1996	75	29.96	160.97	1294.48	20.12	-1.56	-1.12	28.75	101.30	496.01	15.93	-1.49	-1.63
1997	65	33.48	167.87	1844.09	22.58	-3.40	-3.63	30.00	107.20	595.36	12.34	-2.82	-2.78
1998	58	40.05	247.74	2445.21	14.04	-0.59	-0.33	40.63	146.10	771.57	9.98	-1.73	-0.67
1999	71	49.93	418.34	3120.96	17.13	-0.12	-0.81	41.00	205.90	968.16	13.90	-0.82	-1.34
2000	66	56.29	384.22	1652.31	18.61	-2.36	-2.08	44.00	192.95	408.57	12.98	-1.39	-0.98
2001	56	32.84	255.47	3146.99	11.95	-1.11	0.19	25.25	136.15	817.38	11.12	-1.61	0.39
2002	54	28.96	283.31	4560.51	14.54	-1.64	-1.85	25.88	152.85	1915.78	10.16	-1.72	-2.11
2003	44	23.63	221.79	1939.38	22.91	-1.09	-0.86	19.38	110.45	645.82	16.16	-0.87	-0.33
Pool	**597**	**36.76**	**250.19**	**2670.34**	**17.56**	**-1.48**	**-1.33**	**30.50**	**130.10**	**634.29**	**13.27**	**-1.50**	**-1.12**

Panel B: Pure Primary and Mixed Issues Only

		Mean						Median					
Year	**Nobs**	**OP**	**Proceeds**	**Sale**	**PR/MV**	**CAR21**	**CAR22**	**OP**	**Proceeds**	**Sale**	**PR/MV**	**CAR21**	**CAR22**
1994	27	28.59	147.73	1736.51	15.03	-2.83	-2.95	26.88	97.50	595.74	13.33	-0.77	-1.23
1995	53	33.39	120.10	3434.63	21.07	-1.02	-0.58	30.00	95.80	284.65	18.16	-1.30	-0.94
1996	53	28.54	116.15	712.38	22.94	-1.53	-1.00	28.00	92.40	340.86	19.27	-0.81	-1.61
1997	44	33.50	145.55	1153.44	27.36	-3.75	-4.07	30.75	96.90	470.01	14.50	-2.84	-1.65
1998	45	37.84	226.84	2058.27	15.07	-0.19	0.05	39.88	130.10	546.01	11.83	-1.58	-0.50
1999	55	48.15	364.88	2152.90	19.50	-0.57	-0.98	40.50	166.10	604.58	15.04	-0.87	-1.34
2000	58	55.56	358.04	1598.46	19.41	-2.08	-1.72	46.50	187.60	337.38	13.22	-1.06	-0.42
2001	46	28.23	209.93	3022.27	12.25	-1.00	0.65	24.25	117.95	620.21	11.15	-1.61	0.16
2002	43	24.94	251.37	4465.20	15.34	-1.11	-1.23	23.16	142.50	1501.06	10.02	-1.47	-2.04
2003	33	24.36	187.58	1863.15	25.40	-0.78	-0.46	22.00	105.20	615.53	16.88	-0.72	0.39
Pool	**457**	**35.62**	**220.16**	**2218.12**	**19.43**	**-1.44**	**-1.16**	**30.00**	**116.70**	**513.15**	**14.66**	**-1.34**	**-0.86**

Table IA continued…….

Panel C: Pure Primary Issues Only

		Mean						Median					
Year	**Nobs**	**OP**	**Proceeds**	**Sale**	**PR/MV**	**CAR21**	**CAR22**	**OP**	**Proceeds**	**Sale**	**PR/MV**	**CAR21**	**CAR22**
1994	22	29.85	164.63	2048.70	15.16	-2.07	-1.98	27.25	99.00	626.99	13.98	-0.62	-0.59
1995	39	34.45	128.39	4580.80	19.35	-0.57	-0.02	34.25	95.80	394.29	15.66	-0.63	-0.53
1996	44	27.26	120.69	785.61	22.00	-1.58	-0.71	24.75	94.00	453.53	19.09	-0.54	-0.96
1997	31	34.17	150.96	1355.90	14.24	-3.15	-3.64	28.50	82.50	511.44	12.30	-2.69	-1.65
1998	35	39.18	240.91	2412.46	14.76	0.04	0.65	40.00	123.80	673.20	10.69	-1.04	-0.19
1999	42	44.78	357.57	2612.00	17.16	-0.66	-1.04	39.19	171.25	922.29	14.83	-0.84	-0.49
2000	43	56.46	325.83	1996.62	17.15	-0.89	-0.96	50.00	199.90	348.27	11.71	0.24	0.65
2001	36	27.77	216.69	3730.33	11.12	-0.82	0.72	21.50	116.35	721.22	10.32	-1.48	0.68
2002	40	24.88	262.91	4764.16	15.21	-0.78	-0.78	22.33	145.65	1744.96	9.90	-0.98	-1.21
2003	29	25.49	193.11	1993.54	26.29	-0.55	-0.16	23.08	105.20	615.53	16.65	-0.52	1.37
Pool	**361**	**35.11**	**221.60**	**2667.56**	**17.29**	**-1.04**	**-0.72**	**30.00**	**117.30**	**595.36**	**13.74**	**-0.81**	**-0.50**

Panel D: Pure Secondary Issues Only

		Mean						Median					
Year	**Nobs**	**OP**	**Proceeds**	**Sale**	**PR/MV**	**CAR21**	**CAR22**	**OP**	**Proceeds**	**Sale**	**PR/MV**	**CAR21**	**CAR22**
1994	12	35.99	274.94	9209.85	10.98	-0.94	-1.15	30.56	179.60	3407.56	7.80	-1.28	-1.02
1995	16	33.37	283.26	12334.00	7.73	-0.36	-0.18	32.05	258.10	1871.30	5.32	0.16	-0.64
1996	22	33.91	259.58	2587.77	14.05	-1.35	-1.03	33.13	116.30	1336.10	11.83	-2.59	-1.63
1997	21	35.64	225.18	3372.92	12.31	-2.67	-2.67	31.06	154.30	1958.85	10.33	-2.75	-2.82
1998	13	47.69	320.08	3784.60	10.47	-1.99	-1.64	43.19	277.40	3124.81	7.81	-2.12	-1.77
1999	16	55.64	562.62	6707.22	8.06	1.33	-0.15	55.00	268.60	3618.00	4.53	0.00	-2.04
2000	8	56.79	510.42	1963.54	11.40	-4.74	-5.56	40.00	186.00	1197.96	11.50	-5.79	-5.61
2001	10	54.06	464.97	3720.68	10.58	-1.64	-1.93	35.08	184.35	2157.99	11.12	-2.05	0.58
2002	11	43.53	377.68	4582.60	10.76	-3.42	-3.74	35.75	162.85	2346.99	10.60	-3.91	-3.88
2003	11	21.44	324.40	2168.08	15.43	-1.99	-2.03	18.75	142.00	1535.66	10.73	-3.42	-2.94
Pool	**140**	**40.88**	**346.18**	**5164.02**	**11.17**	**-1.55**	**-1.76**	**34.31**	**192.05**	**1950.26**	**9.40**	**-1.99**	**-2.03**

Table IB: Mean and Median Statistics of Executive Compensation

Panel A provides mean and median statistics for all SEOs, Panel B provides the statistics for the sample of pure primary and mixed offerings only, Panel C and D reproduce these statistics for pure primary and pure secondary offerings, respectively. We provide the compensation for CEO and the sum of top five executives of the firm (represented under the heading 'Top 5 Sum') for fiscal year prior to the equity issuance. All data come from the COMPUSTAT Executive Compensation Database. All compensation numbers are in thousands of dollars. *'Option-Grant'* measures the Black-Scholes value of option grants during the last fiscal year. *'Stock Grant'* measures the value of restricted stocks granted to the executives in the last fiscal year. *'Total'* denotes the total compensation of executives and includes salary, bonus, value of restricted stock grant during the year, the Black-Scholes value of total options granted during the year, long-term incentive payments, and other miscellaneous items. '*Delta'* represents the equity-based incentive of the manager. It represents the dollar (in '000) gain (loss) in manager's stock and stock option holdings for a one percent increase (decrease) in the stock price of the firm. To compute delta we take all stocks, including restricted stocks, held by the manager as of the end of prior fiscal year. Similarly, for this computation we consider all options held by the manager as of the end of the prior fiscal year. While stock's delta is simply given by 0.01*Stock Value, the option's delta is computed using the modified Black-Scholes formula for a dividend paying stock. Delta represents the sum of stock delta and option delta. *'Delta/Total'* measures the ratio of Delta to the total compensation of the manager. For CEO, we first compute the ratio for each firm and then report the mean across all firms. To compute the 'Top 5' manager's incentive, we add the compensation of all five managers and then divide the summed delta of top five managers with the summed total compensation of top five managers for each firm. We report the mean and median across all firms in the table below. *'% Ownership'* measures the percentage of firm's common stock held by the executives as of the last fiscal year end. Panel A is based on 597 observations, Panel B on 457, Panel C on 361 and Panel D on 140 observations.

	Salary	Bonus	Option-Gr	Stock-Gr	Total	Delta	Delta/Total	% Ownership
Panel A: ALL SEOs (Pure Primary, Mixed and Pure Secondary Issues)								
Mean Statistics								
CEO	545.61	582.88	2730.57	348.92	4447.88	987.69	0.54	3.62
Top 5 Sum	1671.62	1446.20	6641.07	876.51	11259.80	1762.33	0.23	5.88
Median Statistics								
CEO	475.00	300.00	687.23	0.00	1813.40	250.50	0.10	0.64
Top 5 Sum	1467.09	823.27	544.09	0.00	5297.94	544.09	0.08	1.59
Panel B: Pure Primary and Mixed Issues Only								
Mean Statistics								
CEO	496.70	516.76	2576.60	330.37	4148.66	893.43	0.54	3.53
Top 5 Sum	1515.68	1251.13	6031.56	828.99	10206.48	1636.33	0.21	5.96
Median Statistics								
CEO	420.00	256.96	672.31	0.00	1699.31	215.56	0.10	0.77
Top 5 Sum	1352.10	715.00	465.23	0.00	4906.99	465.23	0.08	1.80
Panel C: Pure Primary Issues Only								
Mean Statistics								
CEO	528.18	528.41	2271.25	381.41	3976.35	771.54	0.46	2.60
Top 5 Sum	1580.34	1286.31	5741.98	971.62	10253.59	1400.08	0.18	4.35
Median Statistics								
CEO	450.00	261.53	649.67	0.00	1704.45	201.71	0.09	0.59
Top 5 Sum	1410.00	775.00	421.47	0.00	4938.20	421.47	0.07	1.39
Panel D: Pure Secondary Issues Only								
Mean Statistics								
CEO	706.90	789.06	3105.01	407.82	5343.72	1271.75	0.61	3.85
Top 5 Sum	2168.19	2071.52	8310.69	1033.51	14429.58	2139.25	0.29	5.51
Median Statistics								
CEO	636.40	456.92	728.59	0.00	2396.12	375.80	0.09	0.47
Top 5 Sum	1923.42	1307.35	749.78	0.00	7246.83	749.78	0.08	1.02

Table II: Mean SEO Announcement Day Return by Equity Incentive Groups

This table provides the announcement day return across various equity incentive groups. Every year, we break all SEOs into four groups based on the equity incentive (i.e., delta/total compensation ratio) of the top five managers of the firm. Q1 represents the lowest quartile of equity-incentive, Q4 the highest. For each of these groups, we compute the return around (-2, +1) and (-2, +2) days of the announcement date. All returns are adjusted for the value-weighted return on CRSP index for the same days. We report mean return of all four quartiles and the difference between High (Q4) and Low (Q1) incentive groups. The 'p-value' test is for the null hypothesis that the return difference between high and low incentive firms is zero. Panel A is based on the aggregate sample of 597 SEOs including pure primary, pure secondary, and mixed offerings; Panel B is based on 457 SEOs that do not include pure secondary offerings (i.e, pure primary and mixed offerings); Panel C is based on 361 pure primary SEOs; Panel D is based on 140 pure secondary SEOs.

	Event Window		**Event Window**		**Event Window**		**Event Window**	
Group	**(-2,+1)**	**(-2,+2)**	**(-2,+1)**	**(-2,+2)**	**(-2,+1)**	**(-2,+2)**	**(-2,+1)**	**(-2,+2)**
	Panel A		**Panel B**		**Panel C**		**Panel D**	
	All SEOs		**Pure Primary & Mixed Offerings**		**Pure Primary Offerings**		**Pure Secondary Offerings**	
Q1 (Lowest)	-2.37	-1.95	-2.67	-2.02	-2.32	-1.68	-1.65	-1.71
Q2	-1.43	-1.34	-1.14	-1.09	-1.53	-1.21	-1.47	-1.18
Q3	-1.28	-1.52	-1.29	-1.54	-0.28	-0.28	-1.81	-2.03
Q4 (Highest)	-0.85	-0.5	-0.69	-0.01	-0.11	0.23	-1.26	-2.09
High-Low	1.52	1.44	1.98	2.02	2.21	1.91	0.39	-0.38
p-Value	0.04	0.05	0.02	0.03	0.03	0.08	0.77	0.76

Table III: Summary Statistics of Control Variables

This table provides the descriptive statistics for the control variables used in the regression analyses. All accounting numbers are measured as of the end of the fiscal year prior to the security issuance. *MCAP* represents the market capitalization, in millions of dollars, and is computed by multiplying COMPUSTAT item 25 (common shares outstanding) with 199 (fiscal year closing price). *Sales* (COMPUSTAT item number 12) represents the annual sales of the firm in millions of dollars. *MB* is the market-to-book ratio of the firm, which is measured by (market value of the firm's equity + book value of assets – book value of equity)/(book value of assets). Book value of assets and equity are from COMPUSTAT items 6 and 60 respectively. *Cash* measures the cash and marketable securities (item 1) as a percentage of the book value of assets. *Leverage* is computed by taking the ratio of long term and short term debt (item 9 + 34) divided by the total assets. *Past-Ret* is the return of issuing firm over the past one year, measured until the beginning of the issuing month. Return data is obtained from CRSP. *Accrual* is constructed by subtracting COMPUSTAT item 308 (net cash flow from operating activities) from 172 (net income) and dividing the difference with the total assets. *Growth* measures the percentage long term consensus growth forecast in the earnings of the firm by analysts. *Analyst* measures the number of analysts following a stock. *Growth* and *Analyst* data are measured a month before the SEO filing and both are obtained from the I\B\E\S. This table is based on 457 observations of pure primary and mixed offerings.

Variable	NOBS	Mean	Median	Minimum	Maximum	Std Dev
MCAP	457	3310.34	774.19	35.50	87255.34	8848.04
Sales	457	2218.12	513.15	1.05	152172.00	8337.86
MB	457	2.81	1.80	0.75	29.54	2.82
Cash	457	0.15	0.05	0.00	0.91	0.20
Leverage	457	0.27	0.26	0.00	1.25	0.20
Past-Ret	457	0.93	0.54	-0.98	9.72	1.30
Accrual	457	-0.06	-0.04	-3.04	0.26	0.17
Growth	329	22.23	20.33	3.00	75.00	10.03
Analyst	356	10.25	9.00	1.00	37.00	6.71

Table IV: Industry- and Year Fixed Effect Regression Results for the Market Reaction

This table provides regression results for industry (based on two-digit SIC code) and year fixed effects. The dependent variable is the market-adjusted return on SEO firms during (-2, +2) day window surrounding the announcement date. *Incentive* measures log (Delta/Total Compensation) of top five executives of the firm. *Sales* represents the log annual sales of the firm in millions of dollars. *MB* is the market-to-book ratio of the firm, which is measured by (market value of the firm's equity + book value of assets – book value of equity)/(book value of assets). Book value of assets and equity are from COMPUSTAT items 6 and 60 respectively. *Cash* measures the cash and marketable securities (item 1) as a percentage of the book value of assets. *Leverage* is computed by taking the ratio of long term and short term debt (item 9 + 34) divided by the total assets. *Secondary* is a dummy variable that equals one if the SEO includes some secondary shares in the offering, zero otherwise. *Past-Ret* measures log (1 + return of issuing firm over the past one year), measured until the beginning of the issuing month. Return data is obtained from the CRSP tapes. *'Residual Std Dev'* represents the log of standard deviation of residual from the market-model regression using one year's daily return observations (ending 30 days before the SEO announcement date) for each SEO. *Pr/MV* measures proceeds raised in SEO as a fraction of pre-issue market value of the firm. *Accrual* is constructed by subtracting COMPUSTAT item 308 (net cash flow from operating activities) from 172 (net income) and dividing the difference with the total assets. *Analyst* measures the number of analysts following a stock, log (1 + # of analysts. The table reports the coefficient estimates and heteroscedasticity-corrected p-values for four different models. Number of observations (NOBS) used in the estimation and the adjusted R-squared are provided at the bottom of the table.

	Model 1		**Model 2**		**Model 3**	
	Estimate	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***
Incentive	0.73	0.02			0.77	0.02
Sales	0.40	0.19	0.41	0.18	0.47	0.15
MB	0.03	0.84	0.11	0.44	0.06	0.70
Cash	0.96	0.73	0.59	0.83	1.38	0.62
Leverage	1.12	0.58	1.08	0.60	0.90	0.66
Secondary	-2.26	0.01	-1.88	0.04	-2.30	0.01
Past-Ret	0.55	0.42	0.70	0.30	0.72	0.34
Residual Std Dev	-1.23	0.33	-1.46	0.25	-1.82	0.17
Pr/MV					1.13	0.43
Accrual					-2.81	0.21
Analyst					-0.21	0.70
NOBS	457		457		457	
AdjR2	3.57%		2.52%		3.45%	

Table V: Regression Results using Acquisitions by SEO Firms as a Proxy for Agency Problems

This table provides regression results for the effect of acquisitions made by SEO firms on stock returns surrounding the SEO announcement date. Panel A provides summary statistics of the firms engaging in acquisitions in a +/-3, +/- 6, or +6 month window surrounding the SEO announcement date. CAR represents (-2,+2) event window market-adjusted returns around the acquisition announcement. Panels B, C, and D provide regression results. Panel B uses all M&A deals within +/- six-month window of SEO announcements, Panel C uses +/- three-month window, and Panel D includes only acquisitions made within six months after SEO announcement. All models in this table control for industry and year fixed effects. The dependent variable is the market-adjusted return during (-2,+2) day window surrounding the SEO announcement date. *M&A Dummy* equals one if a firm has made acquisitions in a given window surrounding the SEO announcement, zero otherwise. *Incentive* measures log (Delta/Total Compensation) of all top five executives of the firms. In Model 1, M&A Dummy takes a value of one if an SEO firm acquires other firms, and zero otherwise. In Model 2, *Good, Neutral, and Bad M&A* take values of one for those M&As that fall in top one-third, middle one-third, and bottom one-third of the distribution, respectively, based on M&A announcement day returns. In Model 3, *Good, Neutral, and Bad M&A* take values of one for those M&As that have M&A announcement day return of above +1%, between +1% and -1%, and below -1%, respectively. In Model 4, we classify firms into *Good, Neutral, and Bad M&As* based on whether the M&A announcement day return is above +2%, between +2% to -2%, and below -2%, respectively. *Sales* represents the log annual sales of the firm in millions of dollars. *MB* is the market-to-book ratio of the firm, which is measured by (market value of the firm's equity + book value of assets – book value of equity)/(book value of assets). Book value of assets and equity are from COMPUSTAT items 6 and 60, respectively. *Cash* measures the cash and marketable securities (item 1) as a percentage of the book value of assets. *Leverage* is computed by taking the ratio of long term and short term debt (item 9 + 34) divided by the total assets. *Secondary* is a dummy variable that equals one if the SEO includes some secondary shares in the offering, zero otherwise. *Past-Ret* measures log (1 + return of issuing firm over the past one year), measured until the beginning of the issuing month. *'Residual Std Dev'* represents the log of standard deviation of residual from the market-model regression using one year's daily return observations (ending 30 days before the SEO announcement date) for each SEO. Return data is obtained from CRSP. All p-values are heteroscedasticity corrected. Number of observations (NOBS) and adjusted R-squared are provided at the bottom of the table.

Panel A: ***Summary statistics for M&A sample***

Window	***+/- 3-months***	***+/- 6-months***	***+ 6-months***
# of firms with acquisitions	94	149	77
CAR (mean)	3.91%	2.99%	0.78%
CAR (median)	2.73%	2.09%	1.40%
# with CAR < -1%	27	46	29
# with CAR < -2%	18	35	20

Panel B: Regression Results: Within +/- six-months window

	Model 1		**Model 2**		**Model 3**		**Model 4**	
	Estimate	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***
Incentive	0.76	0.02	0.73	0.02	0.74	0.02	0.72	0.02
M&A Dummy	-0.62	0.42						
Good M&A			-0.27	0.81	-0.12	0.90	0.11	0.91
Neutral M&A			1.47	0.20	2.88	0.11	0.74	0.57
Bad M&A			-3.17	0.01	-3.08	0.01	-3.79	0.00
Sales	0.39	0.20	0.44	0.15	0.45	0.14	0.42	0.17
MB	0.03	0.82	0.07	0.66	0.07	0.67	0.08	0.62
Cash	0.89	0.74	1.37	0.61	1.21	0.65	0.85	0.75
Leverage	1.05	0.60	0.70	0.73	0.69	0.73	0.81	0.69
Secondary	-2.27	0.01	-2.30	0.01	-2.26	0.01	-2.28	0.01
Past-Ret	0.53	0.43	0.43	0.52	0.48	0.47	0.50	0.46
Residual Std Dev	-1.36	0.28	-1.45	0.25	-1.45	0.25	-1.37	0.28
NOBS	457		457		457		457	
AdjR2	3.49%		5.34%		5.21%		5.03%	

Panel C: Regression Results: Within +/- three-months window

	Model 1		Model 2		Model 3		Model 4	
	Estimate	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***
Incentive	0.72	0.02	0.70	0.03	0.64	0.05	0.61	0.05
M&A Dummy	0.42	0.63						
Good M&A			-0.42	0.76	1.86	0.08	1.97	0.08
Neutral M&A			4.16	0.00	0.72	0.79	-0.52	0.74
Bad M&A			-2.55	0.07	-2.80	0.06	-2.78	0.12
Sales	0.40	0.19	0.43	0.16	0.41	0.17	0.39	0.20
MB	0.03	0.87	0.04	0.79	0.07	0.64	0.07	0.65
Cash	0.94	0.73	1.34	0.62	1.08	0.69	1.15	0.67
Leverage	1.08	0.59	0.90	0.65	1.01	0.62	1.22	0.54
Secondary	-2.26	0.01	-2.35	0.01	-2.23	0.01	-2.19	0.02
Past-Ret	0.55	0.42	0.65	0.33	0.44	0.51	0.47	0.49
Residual Std Dev	-1.13	0.37	-1.06	0.40	-1.17	0.36	-1.25	0.33
NOBS	457		457		457		457	
AdjR2	3.39%		6.08%		4.64%		4.33%	

Panel D: Regression Results: Within next six-month window

	Model 1		Model 2		Model 3		Model 4	
	Estimate	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***
Incentive	0.80	0.01	0.81	0.01	0.80	0.01	0.79	0.01
M&A Dummy	-1.60	0.09						
Good M&A			-0.39	0.80	-1.00	0.42	-0.85	0.53
Neutral M&A			-1.72	0.26	-3.02	0.28	-0.28	0.86
Bad M&A			-2.78	0.07	-2.11	0.15	-4.49	0.01
Sales	0.39	0.20	0.38	0.21	0.39	0.20	0.40	0.18
MB	0.04	0.80	0.04	0.81	0.04	0.79	0.05	0.76
Cash	0.87	0.75	0.78	0.77	0.88	0.75	0.58	0.83
Leverage	0.99	0.62	0.83	0.68	0.92	0.65	0.68	0.74
Secondary	-2.18	0.02	-2.26	0.01	-2.25	0.01	-2.18	0.02
Past-Ret	0.53	0.43	0.55	0.42	0.52	0.44	0.58	0.39
Residual Std Dev	-1.30	0.30	-1.28	0.31	-1.29	0.30	-1.19	0.35
NOBS	457		457		457		457	
AdjR2	4.00%		3.85%		3.69%		4.51%	

Table VI: Interactions between Equity Incentives and External Monitoring

This table provides regression results analyzing the interactions between equity incentives and external monitoring and pressure on the investor reaction. The dependent variable is the market-adjusted return on SEOs during (-2, +2) day window surrounding the announcement date. Model 1 uses shareholdings by public pension funds, Model 2 uses block-holder's shareholdings, and Model 3 uses the Gompers, Ishii, and Metrick (2003) measure of anti-takeover provisions as proxies for external monitoring/ pressure. *High Monitoring* is a dummy variable that equals one for firms that fall in top quartile of respective monitoring dimension; and *Low Monitoring,* in the bottom three-fourth. *Incentive* measures log (Delta/Total Compensation) of all top five executives of the firms. *Sales* represents the log annual sales of the firm in millions of dollars. *MB* is the market-to-book ratio of the firm, which is measured by (market value of the firm's equity + book value of assets – book value of equity)/(book value of assets). Book value of assets and equity are from COMPUSTAT items 6 and 60 respectively. *Cash* measures the cash and marketable securities (item 1) as a percentage of the book value of assets. *Leverage* is computed by taking the ratio of long term and short term debt (item 9 + 34) divided by the total assets. *Secondary* is a dummy variable that equals one if the SEO includes some secondary shares in the offering, zero otherwise. *Past-Ret* measures log (1 + return of issuing firm over the past one year), measured until the beginning of the issuing month. *Residual Std Dev* represents the log of standard deviation of residual from the market-model regression using one year's daily return observations (ending 30 days before the SEO announcement date) for each SEO. Return data is obtained from CRSP. All p-values are heteroscedasticity corrected. Models 1 and 2 use industry and year fixed effects. Due to smaller number of firms covered in GIM index, Model 3 is estimated for 255 observations only. Model 3 uses year fixed effect in the estimation.

	Model 1		**Model 2**		**Model 3**	
	Public Pension Funds		**Block Holders**		**GIM-Index**	
	Estimate	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***
High Monitoring	0.18	0.93	-2.98	0.18	-1.51	0.45
Incentive x Low Monitoring	0.76	0.03	0.88	0.01	0.93	0.06
Incentive x High Monitoring	0.54	0.43	-0.07	0.92	0.09	0.87
Sales	0.37	0.23	0.37	0.23	0.57	0.08
MB	0.03	0.82	0.03	0.86	0.10	0.57
Cash	0.89	0.74	1.24	0.65	1.11	0.73
Leverage	1.15	0.57	1.13	0.58	2.36	0.30
Secondary	-2.23	0.01	-2.35	0.01	-1.74	0.15
Past-Ret	0.57	0.40	0.54	0.42	0.71	0.43
Residual Std Dev	-1.22	0.33	-1.36	0.28	0.28	0.84
NOBS	457		457		255	
AdjR2	3.30%		3.35%		0.43%	

Table VII: Regression Results using Different Components of Equity Incentives

This table presents the regression results for various components of equity incentives. The dependent variable is the market-adjusted return in (-2, +2) event window surrounding the SEO announcement day. In Model 1, *Incentive-Stock* measures log (Delta due to stockholdings/Total Compensation) of the top five managers of firms. In Model 2, *Restricted* and *Non-restricted* measure the log ((1+ Delta due to restricted stock holdings)/Total Compensation) and log ((1 + Delta due to non-restricted stock holdings)/Total Compensation), respectively. *Incentive-Option* measures log ((1 + Delta due to option holdings)/Total Compensation). *Sales* represents the log annual sales of the firm in millions of dollars. *MB* is the market-to-book ratio of the firm which is measured by (market value of the firm's equity + book value of assets – book value of equity)/(book value of assets). Book value of assets and equity are from COMPUSTAT items 6 and 60, respectively. *Cash* measures the cash and marketable securities (item 1) as a percentage of the book value of assets. *Leverage* is computed by taking the ratio of long term and short term debt (item 9 + 34) divided by the total assets. *Secondary* is a dummy variable that equals one if the SEO includes some secondary shares in the offering, zero otherwise. *Past-Ret* measures log (1 + return of issuing firm over the past one year), measured until the beginning of the issuing month. *Residual Std Dev* represents the log of standard deviation of residual from the market-model regression using one year's daily return observations (ending 30 days before the SEO announcement date) for each SEO. Return data is obtained from CRSP. The table reports the coefficient estimates and heteroscedasticity-corrected p-values. Number of observations (NOBS) used in the estimation and the adjusted R-squared are provided at the bottom of the table. All models use industry and year fixed effects.

	Model 1		**Model 2**		**Model 3**		**Model 4**	
	Estimate	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***
Incentive-Stock	0.53	0.01						
Restricted			0.23	0.30			0.21	0.35
Non-restricted			0.56	0.00			0.58	0.00
Incentive-Option					-0.13	0.70	-0.24	0.48
Sales	0.44	0.15	0.39	0.20	0.40	0.19	0.41	0.18
MB	0.05	0.73	0.07	0.62	0.12	0.42	0.10	0.53
Cash	1.64	0.55	1.42	0.60	0.81	0.77	1.70	0.54
Leverage	1.21	0.55	1.46	0.47	1.16	0.57	1.49	0.46
Secondary	-2.31	0.01	-2.19	0.01	-1.88	0.04	-2.24	0.01
Past-Ret	0.68	0.31	0.61	0.36	0.78	0.25	0.67	0.33
Residual Std Dev	-1.20	0.34	-1.24	0.33	-1.58	0.21	-1.33	0.30
NOBS	457		457		457		457	
AdjR2	4.17%		4.56%		2.40%		4.44%	

Table VIII: Cross-sectional Regression Results for Long Term Returns Following SEO Announcement

For each SEO, we compute the risk-adjusted return over the next five years starting from the month after the announcement date. We use four different benchmark models for the computation of risk-adjusted return. For Model 1, we regress the monthly return of each SEO firm on value weighted market return starting from the month just after the announcement date and continuing through the next 60 months (or delisting date, whichever is earlier). The *intercept* from that regression is the 'long term risk-adjusted return' with respect to the one-factor model. For Model 2, we regress SEO firm's monthly return on market and Fama-French *Size* factor. Model 3 accounts for Fama-French Market-to-Book factor as well. In Model 4, we add the momentum factor in the computation of risk-adjusted return. We regress these risk-adjusted returns on various explanatory variables representing the SEO characteristics. *Incentive* measures (log (Delta/Total Compensation)) of the top 5 managers of the firm. *Sales* represents the log annual sales of the firm in millions of dollars. *MB* is the market-to-book ratio of the firm, which is measured by (market value of the firm's equity + book value of assets – book value of equity)/(book value of assets). Book value of assets and equity are from COMPUSTAT items 6 and 60, respectively. *Leverage Change* is computed by taking difference in the ratio of long term and short term debt (item 9 + 34) divided by the total assets in the prior fiscal year and the same ratio computed after adding the SEO proceeds into total assets. *Secondary* is a dummy variable that equals one if the SEO includes some secondary shares in the offering, zero otherwise. *Accrual* is constructed by subtracting COMPUSTAT item 308 (net cash-flow from operating activities) from 172 (net income) and dividing the difference with the total assets. All p-values are heteroskedasticity corrected. Number of observations (NOBS) and adjusted R-squared are provided at the bottom of the table.

Dependent Variable: Long-Term Risk Adjusted Return								
	Model 1		**Model 2**		**Model 3**		**Model 4**	
	Estimate	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***
Intercept	0.241	0.76	0.277	0.72	0.166	0.84	0.722	0.39
Incentive	-0.006	0.95	-0.032	0.76	-0.094	0.40	-0.145	0.27
Sales	-0.003	0.97	-0.005	0.96	-0.081	0.39	-0.139	0.18
MB	0.067	0.41	0.022	0.77	0.127	0.09	0.103	0.13
Leverage Change	-5.826	0.04	-6.314	0.04	-6.005	0.06	-6.006	0.08
Secondary	0.189	0.58	0.131	0.70	-0.033	0.93	-0.046	0.90
Accrual	-0.665	0.20	-0.464	0.50	-1.367	0.02	-1.268	0.04
NOBS	457		457		457		457	
AdjR2	1.40%		1.10%		2.50%		2.00%	

Table IX: Alternative Econometric Specifications

In Panel A, we model the incentive (log (Delta/Total Compensation)) of the top five managers and the return around announcement date as endogenous variables in a two-stage regression framework. In the first stage regression, we regress *Incentive* on all exogenous variables and the instruments. In the second stage, we use the predicted value of incentive as the independent variable. The dependent variable in the second stage is the market-adjusted return around (-2, +2) event window surrounding the SEO announcement date. We report the results of both first and second stage estimations, with industry- and year-fixed effects for Model 1 and Model 2. *Sales* represents the log annual sales of the firm in millions of dollars. *MB* is the market-to-book ratio of the firm, which is measured by (market value of the firm's equity + book value of assets – book value of equity)/(book value of assets). Book value of assets and equity are from COMPUSTAT items 6 and 60, respectively. *Cash* measures the cash and marketable securities (item 1) as a percentage of the book value of assets. *Leverage* is computed by taking the ratio of long term and short term debt (item 9 + 34) divided by the total assets. *Secondary* is a dummy variable that equals one if the SEO includes some secondary shares in the offering, zero otherwise. *Past-Ret* measures log (1 + return of issuing firm over the past one year), measured until the beginning of the issuing month. Return data is obtained from CRSP. *'Residual Std Dev'* represents the log of standard deviation of residual from the market-model regression using one year's daily return observations (ending 30 days before the SEO announcement date) for each SEO. *Pr/MV* measures proceeds raised in SEO as a fraction of pre-issue market value of the firm. *Accrual* is constructed by subtracting COMPUSTAT item 308 (net cash flow from operating activities) from 172 (net income) and dividing the difference with the total assets. *Analyst* measures the number of analysts (log (1 + # of analysts)) following a stock. *Div-Const* measures dividend constraint of the issuing firm. It takes a value of one if the firm's dividend payout (item 21) is more than twice its retained earnings for the year (item 36). *R&D* represents research and developmental expenses (item 46) as a fraction of total assets. *NOL* is net-operating losses carry-forward (item 52) divided by total assets. *Cash flow* measures firms' cash flow from operations (item 308) scaled by the total assets. *Volatility* measures the (log of) stock return volatility of issuing firms over the past one year using daily return data from CRSP. *Lag-Incentive* is the lag of the incentive variable. All p-values have been corrected to account for the two-stage estimation biases. In Panel B, we estimate a deviation model. In the first stage regression, we regress *Incentive* on *Sale, MB, Cash flow, Leverage, Div-Const, R&D, NOL* and *Volatility* along with industry- and year fixed effects. We take the residual from this estimate and call the residual variable *Incentive-Deviation*. In the second stage we use *Incentive-Deviation* as our measure of managerial equity incentives. Both Models 1 and 2 use industry- and year fixed effects. In Panel A, regressions are estimated with fewer observations than the earlier tables because data required for *Lag-Incentive* from two fiscal years before the SEO are unavailable for a number of SEO firms. Number of observations (NOBS) used in the estimation and the adjusted R-squared are provided at the bottom of the table.

Panel A: Instrumental Variable Regression

	Model 1				**Model 2**			
	Estimate	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***
Incentive			1.07	0.06			1.07	0.05
Sales	-0.01	0.80	0.63	0.08	-0.01	0.86	0.58	0.14
MB	0.06	0.07	0.04	0.88	0.06	0.07	0.05	0.83
Cash	0.10	0.81	-1.48	0.70	0.09	0.83	-1.44	0.72
Leverage	-0.02	0.95	0.32	0.88	0.04	0.92	0.01	0.99
Secondary	0.15	0.17	-1.73	0.12	0.15	0.18	-1.94	0.09
Past-Ret	0.27	0.02	0.17	0.88	0.27	0.03	-0.14	0.91
Residual Std Dev	0.83	0.34	0.07	0.97	0.81	0.36	-0.08	0.97
Div-Const	-0.04	0.83			-0.02	0.91		
R&D	0.05	0.94			0.27	0.75		
NOL	-0.05	0.62			-0.06	0.59		
Cash-Flow	0.11	0.84			0.32	0.68		
Lag-Incentive	0.68	0.00			0.67	0.00		
Volatility	-1.25	0.17			-1.20	0.19		
Pr/MV					-0.07	0.55	1.72	0.07
Accrual					0.43	0.63	0.75	0.88
Analyst					-0.03	0.70	0.39	0.60
NOBS	345		345		345		345	
R2	69.57%		17.71%		68.83%		18.10%	

Table IX (Continued…)

Panel B: Deviation Model				
	Model 1		**Model 2**	
	Estimate	***p-Value***	***Estimate***	***p-Value***
Incentive-Dev	0.62	0.06	0.64	0.05
Sales	0.39	0.20	0.46	0.16
MB	0.12	0.41	0.15	0.31
Cash	0.44	0.87	0.80	0.77
Leverage	1.04	0.61	0.83	0.69
Secondary	-2.15	0.02	-2.20	0.02
Past-Ret	0.59	0.38	0.74	0.33
Residual Std Dev	-1.41	0.26	-1.98	0.13
Pr/MV			1.14	0.43
Accrual			-2.60	0.25
Analyst			-0.17	0.76
NOBS	457		457	
AdjR2	3.15%		2.97%	

Table X: Operating Performance Measures for Four Equity-Incentive Groups

This table presents the median operating performance measures for incentive group firms by quartile and for years -1, 0 and +1 relative to the fiscal year for which equity incentive is measured. ROA measures the return on assets and is computed by dividing the net income of the firm (without extraordinary incomes) by total assets. EBIDTA/Sales measures the operating profit margin. Sales/Asset measures the firm's asset turnover ratio. All numbers are adjusted (differenced) for the industry median based on 2-digit SIC codes.

	ROA	EBIDTA/Sales	Sales/Asset
Panel A: One Year Before Equity Incentive is Measured			
Q1 (Lowest Incentive)	0.0032	0.0192	-0.0939
Q2	0.0153	0.0456	0.0088
Q3	0.0287	0.0687	-0.0355
Q4 (Highest Incentive)	0.0501	0.0544	0.0616
High-Low	***0.0469******	***0.0352******	***0.1555******
Panel B: The Year Equity Incentive is Measured			
Q1 (Lowest Incentive)	0.0003	0.0288	-0.1157
Q2	0.0099	0.0383	-0.0060
Q3	0.0288	0.0790	-0.0304
Q4 (Highest Incentive)	0.0568	0.0743	0.0480
High-Low	***0.0565******	***0.0455******	***0.1637******
Panel C: One Year After Equity Incentive is Measured			
Q1 (Lowest Incentive)	0.0002	0.0243	-0.0871
Q2	0.0135	0.0517	-0.0035
Q3	0.0340	0.0882	-0.0358
Q4 (Highest Incentive)	0.0534	0.0873	-0.0096
High-Low	***0.0532******	***0.0630******	***0.0775****

***,**,* denote significance at 1%, 5% and 10% respectively

Table XI. Regression Results for Three Alternative Measures of Equity Incentives

The dependent variable is the market-adjusted return in (-2, +2) event window surrounding the SEO announcement day. In Model 1, *Incentive* measures log of average (Delta /Total Compensation) of the top five managers of firms; i.e., we compute this ratio for each executive, then take the log of its mean to compute the incentive. In Model 2, *Incentive* measures the log of percentage of shares held by the top five executives of the firm. In Model 3, we divide the summed delta of top five executives of the firms by the sum of their salaries and bonuses and take the log of this variable. *Sales* represents the log annual sales of the firm in millions of dollars. *MB* is the market-to-book ratio of the firm, which is measured by (market value of the firm's equity + book value of assets – book value of equity)/(book value of assets). Book value of assets and equity are from COMPUSTAT items 6 and 60, respectively. *Cash* measures the cash and marketable securities (item 1) as a percentage of the book value of assets. *Leverage* is computed by taking the ratio of long term and short term debt (item 9 + 34) divided by the total assets. *Secondary* is a dummy variable that equals one if the SEO includes some secondary shares in the offering, zero otherwise. *Past-Ret* measures log (1 + return of issuing firm over the past one year), measured until the beginning of the issuing month. Return data is obtained from CRSP. *Residual Std Dev* represents the log of standard deviation of residual from the market-model regression using one year's daily return observations (ending 30 days before the SEO announcement date) for each SEO. The table reports the coefficient estimates and heteroscedasticity-corrected p-values. Number of observations (NOBS) used in the estimation and the adjusted R-squared are provided at the bottom of the table. All models use industry- and year fixed effects.

	Model 1		**Model 2**		**Model 3**	
	Estimate	***p-Value***	***Estimate***	***p-Value***	***Estimate***	***p-Value***
Incentive	0.58	0.05	0.49	0.02	0.63	0.05
Sales	0.39	0.20	0.56	0.07	0.32	0.30
MB	0.04	0.78	0.11	0.46	0.00	0.99
Cash	0.94	0.73	1.89	0.50	0.70	0.80
Leverage	1.09	0.59	1.06	0.60	1.16	0.57
Secondary	-2.22	0.01	-2.33	0.01	-2.22	0.01
Past-Ret	0.66	0.33	0.76	0.26	0.72	0.28
Residual Std Dev	-1.35	0.28	-1.66	0.19	-1.53	0.23
NOBS	457		457		457	
AdjR2	3.24%		3.74%		3.22%	