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Managerial Incentives and Corporate Financing Decisions

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ABSTRACT

Using a CEO wealth decomposition method, I examine how each wealth component affects managerial incentives to raise external public funds. I find that the board compensation policy adjustment and CEO's own portfolio adjustment account for a larger proportion of total wealth change in issuance firms than in non-issuance firms; and larger in equity issuance firm than in bond issuance firm. I provide evidence that those adjustments serve to weaken the shareholder-manager interest alignment in that they are insignificantly or even negatively sensitive to shareholder returns. I also show these perceived wealth effects help explain a firm's ex ante financing choice.

JEL Classifications: G32, G34, J33

Keywords: executive compensation; public financing; SEO; bond issuance

I. INTRODUCTION

The security issuance is essentially a capital structure decision. Literature has put forward the trade-off theory, pecking-order model, and market timing theory, etc. to model firm's financing decisions (Modigliani and Miller, 1958; Myers and Majluf, 1984; Baker and Wurgler, 2002). Those capital structure theories basically focus on the cost and benefit of the financing choice to a firm or the financial market conditions to explain the firm's optimal policy choice. Very few of them look at the firm's financing decision from the perspective of managerial incentives. Since a CEO plays a prominent role in corporate financing decisions, his compensation structure has important influences on the financing choice of the firm.

The literature on the cross-sectional relationship between managerial incentives and financing decisions generally find mixed results. For example, Coles et al. (2006) find that higher risk-taking incentives (as measured by vega) from executive stock options encourage more aggressive debt policy. On the other hand, Lewellen (2006) incorporates the managerial risk aversion and undiversification and suggests that options discourage risk-taking and leverage. Datta et al. (2005) find that the market reacts more negatively to SEO announcements with high executive equity-based compensation. The result is interpreted as market perceives high manager-shareholder interest alignment as a clearer signal that the firm is issuing over-valued equity. Brzel and Webb (2006) support the same over-valuation story by documenting a negative relation between the proportion of CEO equity-based compensation and shareholder wealth changes following SEOs. Both papers use equity-based compensation grants prior to the issuance scaled by total compensation to measure interest alignment. However, it is well recognized that the alignment should be measured using the CEO's total portfolio holding. More importantly, given CEO's large portfolio holdings of stock and options, it is puzzling from these studies why a predictable decline in stock prices associated with an SEO would not deter a CEO from choosing an SEO. These contradictions in prior literature motivates me to conduct the event study on CEO wealth change upon a firm's public financing decision.

I first decompose the effects of a major firm policy on CEO wealth. Specifically, the effect of a corporate action on CEO wealth consists of a pure price effect, board compensation effect, and CEO's own portfolio adjustment effect. The pure price effect is the effect of stock price moment on CEO's prior unadjusted portfolio holdings. Board compensation effect consists of two parts: standard compensation grant that preserve the value of prior year's grant level; and incremental grant that represents abnormal grant a CEO receives upon the change of board compensation policy following an event. CEO's own portfolio adjustment includes CEO's ex-ante and ex-post options/stocks adjustment around the corporate event. I empirically calculate the contribution of each wealth component to CEO total wealth change around a firm's public financing event. I then examine how such wealth changes affect managerial incentives to raise external public funds, as well as test whether these incentives can help explain observed financing choices.

I study four groups of firms: issuance versus non-issuance firms; equity versus bond issuance firms; risk increase versus risk decrease firms; and return increase versus return decrease firms. I document striking differences in CEO wealth effect between issuance and non-issuance firms. The pure price effect accounts for -10.97%/-9.83%

(mean/median) and 17.13%/15.95% of total wealth change for issuance and non-issuance firms, respectively. The adjusted wealth component by board (board incremental compensation grant) accounts for 33.90%/31.87% and 17.18%/13.28% of total wealth change for issuance and non-issuance firms. The adjusted wealth component by CEO (CEO's own portfolio adjustment) accounts for 17.92%/17.91% and 4.56%/4.11% of total wealth change for issuance and non-issuance firms. It suggests that the wealth gain mainly comes from the adjusted part for issuers. This finding is intriguing since an issuance event is generally accompanied by a large price movement. Despite the larger price movement, adjustments from board and CEO himself seem to offset the negative side of price impact, and contribute more significantly to CEO's total wealth change of issuance than that of non-issuance firms.

I next compare the seasoned equity offering (SEO thereafter) versus public bond issuance choice considering their different after-market stock performance. For equity issuance firm CEOs, the pure price effect on their wealth is negative, given the negative stock market reaction to SEOs. However, equity issuance firm CEOs get larger incremental compensation grant following the issuance. In addition, equity issuance firm CEOs sell/exercise stocks/options more aggressively than bond issuance firm CEOs around the issuance. Those adjustments help offset the negative price effect and contribute to the overall wealth change for equity issuance CEOs. The sample firms are further grouped based on risk and return changes. I document that the adjustment components from both the board and CEO himself contribute more to CEO's total wealth change for the return decrease and risk increase group of firms, which is consistent with insider information, risk aversion and un-diversification of CEOs.

The above analysis raises the following research questions: How sensitive is each component of CEO wealth change to return and risk change? To address the issue, I estimate the wealth sensitivities by examining the relation between changes in CEO's wealth component and changes in shareholder wealth or changes in stock volatility (risk). I document that CEO's portfolio adjustment is positively sensitive to risk change for equity issuance firms, which suggest that CEOs exercise abnormal amount of stock options to diversify away the unsystematic risks if they anticipate risk increases. I find only the wealth of CEO's unadjusted portfolio holdings is sensitive to shareholder wealth. Both adjustments of board and CEO himself are insignificantly or even negatively related to shareholder wealth, especially in equity issuance firms. Therefore, I argue that those adjustments serve to weaken the shareholder-manager interest alignment.

One concern is that firms' public issuance decision and CEO incentives are likely simultaneously determined. I try to deal with this endogeneity issue by analyzing the feedback effect of CEO wealth on policy choice. I document that the perceived wealth changes essentially constitute incentives or decentives for a firm's ex ante financing choice. Controlling for firm characteristics, the anticipated wealth gains from incremental board compensation grant and CEO's stock/option selling/exercising, which offset negative price effect on existing portfolio holdings, increases the likelihood of public financing. Conditional on deciding on a public financing, the perceived wealth gain from incremental grant and CEO's own adjustment increase the probability of choosing equity issuance over bond issuance. I address the endogeneity of incentives and capital structure in that I document a wealth change around a financing event and analyze a feedback effect of the wealth change on financing decision.

The remainder of the paper is organized as follows. Section II reviews the method of decomposing CEO wealth following a firm's policy decision. The sample for empirical tests is described in Section III. Section IV reports the wealth change as well as risk and return analysis. Section V analyzes the feedback effect and Section VI concludes.

II. CEO'S WEALTH CHANGE DECOMPOSITION

I decompose CEO's total wealth change (Compustat Execucomp Data Item TDC1) into three components: pure price effect, board compensation effect and CEO's own portfolio adjustment effect. I define the pure price effect as the effect of stock price movement on CEO's prior unadjusted portfolio holdings. Board compensation effect consists of two parts: standard compensation grant that preserves the inflation-adjusted value of prior year's grant level; and incremental grant that represents abnormal grant CEO receive upon the change of board compensation policy following an event. CEO's own portfolio adjustment includes CEO's ex-ante and ex-post options/stocks adjustment around the corporate event.

Generally, the number of shares in CEO's current portfolio = the number of shares in previous year's portfolio + number of new grant – number of shares (options) sold (exercised) by CEO during the year. The second and third components represent board compensation policy and CEO's own portfolio adjustment, respectively. If there is no additional grant or CEO's action, the previous holdings are open positions whose values are subject to the market price change. The new grant is composed of two parts. One represents the standard part that preserves the inflation-adjusted value of standard compensation grant. The other one is an incremental part that may represent the board's policy change corresponding to an event.

Suppose the stock price movement is exogenous of the system (unaffected by board compensation policy and CEO's portfolio adjustment).[1] A firm's major financing decision would initiate a stock market price movement. CEO's portfolio holding value is directly linked to the stock price. Denote the price change as $\Delta P = P_1 - P_0$, where P_0 and P_1 represent the prevailing fiscal year-end price before and after the financing event.

Definition 1. I define the pure price effect using Black-Scholes values: Pure Price $effect_{B\text{-}S\ value} = N_S' \times \Delta P + N_O' \times [C(P_1) - C(P_0)]$, where C(.) is the Black-Scholes function of option values. N_S' and N_O' are unadjusted number of common stocks and option holdings. X is the option strike price.

As discussed above, the compensation grant is decomposed into two parts: the amount to preserve the value of previous grant and the incremental amount that represents any abnormal compensation grant after a major financing decision. I use the CPI-adjusted prior year's grant level to proxy for the first component, which I denote as standard grant. Note that the per-share value of at-the-money stock options is positively related to strike price.[2] Therefore if only to preserve the grant value of options, more or less shares would be granted depending on the change of price. The same holds for stock grant. High (low) market price means less (more) shares should be granted to preserve the grant value. I denote the second part as incremental grant, which is measured as any difference between the new grant and prior year's grant. Note incremental grant can be positive, negative or zero, which is determined by CEO negotiation power and/or the board's opinion on the implications of the policy decision.

Definition 2. The new grant value $W_G = W_{G-1} + WS$. W_{G-1} represents the grant value prior to the financing policy. WS is incremental grant value, which is determined by CEO negotiation power and/or the board's opinion on the implications of the policy decision. All values are measured in constant dollars.

Definition 2.1 The number of stock grant to preserve the value of stock grant (N_{GS1}) is determined by: $N_{GS1} = N_{GS-1}X / P_1$, where N_{GS-1} is the number of stocks granted in prior year.

Definition 2.2 The number of option grant to preserve the value of option grant (N_{GO1}) is determined by: $N_{GO1} = N_{GO-1}C(X) / C(P_1)$, where N_{GO-1} is the number of stock options granted in prior year, C(.) is the Black-Scholes function of option values.

Definition 2.3 The incremental grant value is defined as: $WS = \Delta Cash + \Delta Bonus + \Delta Other + (N_{GS} – N_{GS1})P_1 + (N_{GO} – N_{GO1})C(P_1)$, where N_{GS} and N_{GO} are the number of stocks and options granted in the current year; N_{GS1} and N_{GO1} are the number of stock and option granted to preserve the value of stock and option grant in the prior year.

The change of stock market condition and board compensation policy could affect CEO's portfolio risk and return. CEO can adjust his portfolio holdings to achieve his own return and risk objectives. I propose CEO will first sell his vested in-the-money option holdings, and then consider direct stock holdings. This is because direct stock holdings always have positive value while options could be worth zero if they are out-of-the-money.

In general, CEO's own adjustments can be decomposed into two parts: (1) Ex ante (or anticipated-event) adjustment: CEO, as an insider of the company, anticipates the change of stock price and risk following an event. Correspondingly, he estimates the impact of price and risk change on his portfolios and makes his own portfolio adjustment. The ex-ante adjustment enables CEO to capture the value of insider information. (2) Ex post adjustment: after a significant event, CEO reshuffles his portfolio in response to the market condition and board policy change. CEO's own adjustments reduce the possible value loss of the pure price effect.

Definition 3. CEO exercises his in-the-money vested options and sells stocks ex ante based on his anticipation of the future price movement and/or ex post in response to market condition and board policy. His portfolio adjustment leads to the wealth effect $W_C = –N_{EXS}\times\Delta P –N_{EXV}\times[C(P_1) –C(P_0)]$, N_{EXS} is the number of stocks sold, N_{EXV} is the number of exercised options.

Definition 4. CEO's total wealth change associated with the financing event, the total effect, is then the sum of the component effects: ΔW = pure price effect + board compensation grants + CEO's own portfolio adjustment.[3]

III. DATA AND DESCRIPTIVE STATISTICS

I use Thomson Financial's SDC Global New Issues database to obtain all the public financing data. Two major types of public financing are considered: seasoned equity offerings (SEOs) and public debt offers (including convertible bond, non-convertible bond, private convertible bond, and private non-convertible bond). I adopt the following screening rules to construct the event sample: (1) The stock return data, financial statement data, and executive compensation data are available from CRSP, COMPUSTAT, and ExecuComp. (2) To minimize the influence of outliers in the analysis, firms are excluded if they have a market value less than $10 million. (3) I exclude utility

(SIC=4900–4999) and financial (SIC=6000–6999) firms since these firms either operate in a regulated environment or have characteristics substantially different from other firms in the data. (4) I exclude unit offers, spinoffs, carve–outs, rights, and shelf offerings[4]. For SEOs, I include only issues that are more than 50% primary offering. (5) I require that there exists at least a three-year lag for a firm between equity and bond issues; and at least 1 year lag between subsequent equity (bond) issues. (6) I exclude the mixed group of firms that issue equity and bond within one fiscal year.

Each sample issuance firm is paired with a peer non-issuance firm that has not made any offerings during the previous 36 months. I identify same industry-year[5] non-issuance firms whose market value lies between 70% and 130% of the sample issuance firm value, and then select the firm that has the closest book–to–market value. Therefore, my matching controls for size, industry, and book–to–market. The resulting sample consists of 1,553 issuing events on 545 firms and 1,553 matching nonissuing events on 566 firms over the 1993 to 2010 period. I further divide event firms into 581 equity issuance events (on 391 firms) and 972 bond issuance events (on 428 firms).

Table 1 presents summary statistics for issuing and matching nonissuing firms (Panel A), as well as those for the subsample of equity issuance and bond issuance firms (Panel B). All variables are winsorized at 1% and 99%. All dollar values are in 2010 constant dollars. For each group, I report mean, median and standard deviation of main firm characteristics. I also test on the significance of difference in means and medians across groups.

Table 1
Descriptive statistics

The table reports descriptive statistics for public 1,553 financing issuance event years on 545 firms versus 3,447 non-issuance firm years (Panel A) and 581 equity issuance events on 391 firms and 972 bond issuance events on 428 firms (Panel B) over 1993-2010. Market value is price multiplied by the number of shares outstanding. ROA is return on assets. Market leverage is the book value of debt / (book value of debt + market value of equity). Market-to-book is defined as the ratio of market value of equity plus book value of debt to the book value of total assets. Internal free cash flow is (operating income – interest – dividend – tax) / Total assets. CAR is the announcement-period excess return calculated over the event days –1, 0 and +1, where day 0 is the filing date. Acquisition and Capital Expenditure are the dollar value of acquisition and capital expenditure scaled by total assets. Credit Rating reports S&P long-term domestic issuer credit rating[8]. Dividend payout is defined as the annual total amount of cash dividends declared on common divided by the number of common shares outstanding at fiscal year-end. Pre-event stock return is the annual percentage return to shareholders before the event year. Annual stock return is the event year annual percentage return to shareholders. Asterisks on means and medians in the non-issuance or equity issuance column indicate they are significantly different from the corresponding means and medians in the issuance or bond issuance column. The difference in means t-test assumes unequal variances across groups when a test of equal variances is rejected at the 10% level. The significance level of the difference in medians is based on a Wilcoxon sum-rank test. All variables are winsorized at the 1st and 99th percentiles. All dollar values are in 2010 constant dollars. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A
Issuance versus non-issuance events

	Issuance			Non-issuance		
Firm Characteristics	Mean	Median	Std.Dev.	Mean	Median	Std.Dev.
Total Assets($mil)	18,978	3,179	49,500	20,196	3,489	51,970
Mkt Valuation($mil)	7,072	2,297	12,882	7,511	2,569	12,685
Market-to-book	3.08	2.24	2.98	3.20	2.35	3.13
Credit Rating	10.40	10.00	2.87	10.66	10.30	3.53
Capital Expenditure	0.06	0.04	0.07	0.05	0.04	0.05
Acquisition	0.03	0.00	0.06	0.03	0.00	0.05
Internal cash flow	0.05	0.04	0.06	0.09***	0.07**	0.12
Dividend pay-out	0.33	0.19	0.63	0.26	0.10	0.41
Market leverage	0.22	0.20	0.15	0.11***	0.06***	0.14
ROA	0.12	0.12	0.07	0.13	0.12	0.08
Pre-event stock return (%)	24.70	16.38	52.69	17.49**	11.35***	63.34
Annual stock return (%)	10.37	7.36	41.82	16.68**	11.05*	58.57

Panel B
Bond issuance versus equity issuance events

	Bond Issuance			Equity Issuance		
Firm Characteristics	Mean	Media	Std.Dev.	Mean	Median	Std.De
Total Assets ($mil)	23,644	4,685	54,909	11,173***	1,764***	37,569
Mkt Valuation($mil)	8,271	3,116	13,652	5,065***	1,337***	11,204
Market-to-book	2.88	2.12	2.82	3.41***	2.43**	3.21
Credit Rating	9.90	10.00	2.66	11.47***	11.00***	3.01
Capital Expenditure	0.06	0.05	0.07	0.07	0.04	0.07
Acquisition	0.02	0.00	0.05	0.04***	0.01**	0.07
Internal cash flow	0.05	0.04	0.05	0.05	0.03	0.06
Dividend pay-out	0.51	0.31	0.64	0.18***	0.08***	0.58
Market leverage	0.22	0.20	0.15	0.21	0.19	0.15
ROA	0.12	0.12	0.07	0.12	0.12	0.08
Pre-event return (%)	16.88	11.64	38.06	33.89***	26.11**	47.40
Annual stock return (%)	15.04	10.59	41.03	4.33**	2.17**	64.78
CAR (%)	0.35	0.27	0.51	-2.97***	-2.56***	0.48

The differences between issuance and non-issuance firms are in line with the firm's financing needs, the costs and benefits of financing and the effects of financing on firms. Results presented in Table 1 show that univariately the issuance firms and matching non-issuance firms are not statistically different in size, market-to-book, market value of equity, credit ratings, ROA, capital expenditure, acquisition expenditure, and dividend payout ratio. Issuance firms do have lower internal cash flows and higher market leverage, which will be controlled in multivariate comparison. Though the pre-event annual stock return is higher for issuance firms, annual event-year stock return is lower, suggesting the issuance window timing and deteriorating post-issuance performance.

Next I compare bond issuance and equity issuance firms. Bond issuance firms are larger with lower growth rate and higher credit ratings, leading to a larger debt capacity. The two types of firms show same fixed investment needs (capital expenditure); but equity issuance firms have more acquisition expenditure, suggesting SEO is more likely to be pursued to support firm's M&A activities. They have the same level of ROA and internal cash flows on average but bond issuance firms have higher dividend payout ratio.

In addition, equity issuance firms have significantly higher returns before the event than bond issuance firms. During the event year, Equity firms experience larger decline in annual stock returns. This is consistent with the over-valuation hypothesis on equity issuance. It suggests that firms tend to issue overvalued stock, which triggers the market revaluation of the stock, leading to the poorer stock performance following SEOs. I document insignificant announcement excess returns for bond issuance firms and significantly negative excess returns for equity issuance firms, consistent with literature.

IV. DECOMPOSITION OF WEALTH CHANGE

A. Wealth Decomposition and Contribution Attribution

I apply the wealth decomposition method discussed in section 2 to the sample firms. CEO's total wealth change around the financing events is decomposed into three parts: wealth changes due to pure price effect, wealth changes due to board compensation policy, and wealth change due to CEO's own portfolio adjustment. Table 2 reports both the dollar value of each component and the percentage contribution of each component to the total wealth change.

Table 2
CEO wealth decomposition

The table reports the dollar value of wealth decomposition ($thou) and percentage attribution (%) for public 1,553 financing issuance event years versus 1,553 matching non-issuance firm years (Panel A) and 581 equity issuance events versus 972 bond issuance events (Panel B) over 1993-2010. Details of the variable construction are described in Appendix A. Asterisks on means and medians in the non-issuance or equity issuance column indicate they are significantly different from the corresponding means and medians in the issuance or bond issuance column. The difference in means t-test assumes unequal variances across groups when a test of equal variances is rejected at the 10% level. The significance level of the difference in medians is based on a Wilcoxon sum-rank test. All variables are winsorized at the 1st and 99th percentiles. All dollar values are in 2010 constant dollars. ***, **, * denote significance at the 1%, 5%, and 10% levels.

Panel A
Bond issuance versus equity issuance events

	Bond Issuance			Equity Issuance		
	Mean	Median	Std.Dev.	Mean	Median	Std.Dev.
A. Dollar value of wealth ($thou)						
Pure price effect	881	351	3,955	-1,661***	-817**	4,293
From direct stocks	270	100	2,816	-450*	-131*	6,680
From stock options	607	249	2,169	-1,318***	-692***	2,542
Compensation grant	4,017	2,753	6,695	3,942	2,544	3,691
Standard grant	2,846	1,990	4,726	2,015*	1,341***	4,407
Incremental grant	1,165	749	4,829	1,936**	1,224**	6,471
Cash	129	75	1,848	135	78	1,904
Restricted stock	30	0	2,207	140*	0	2,163
Stock options	986	652	4,030	1,535**	1,148**	5,755
CEO portfolio adj.	415	336	3,696	1,091***	831**	4,586
Stock adj.	94	79	3,110	244*	170*	6,259
Option adj.	312	241	1,648	853***	632**	2,603
Total wealth change	5,287	3,590	5,872	3,471*	2,567*	6,214
B. Percentage to total wealth change (%)						
Pure price effect	16.66	9.78	2.30	-47.85***	-	8.58
From direct stocks	5.11	2.79	1.11	-12.96***	-5.10*	1.78
From stock options	11.48	6.94	1.34	-37.97***	-	2.99
Compensation grant	75.98	76.69	1.35	113.57*	99.10*	2.49
Standard grant	53.83	55.43	0.93	58.05	52.24	2.10
Incremental grant	22.04	20.86	0.78	55.78**	47.68**	3.21
Cash	2.44	2.09	0.27	3.89	3.04	0.73
Restricted stock	0.57	0.00	0.17	4.03	0.00	3.40
Stock options	18.65	18.16	0.57	44.22**	44.72**	2.12
CEO portfolio adj.	7.85	9.36	1.52	31.43***	32.37***	4.33
Stock adj.	1.78	2.20	1.11	7.03**	6.62*	0.85
Option adj.	5.90	6.71	0.81	24.58***	24.62**	4.53

Panel B
Issuance versus non-issuance events

	Issuance			Non-issuance		
	Mean	Median	Std.Dev.	Mean	Median	Std.Dev.
A. Dollar value of wealth ($thou)						
Pure price effect	-470	-286	5,523	713**	442**	1,780
From direct stocks	-100	-54	4,987	228*	120*	1,663
From stock options	-363	-233	1,460	466**	317**	1,609
Compensation grant	3,988	2,675	1,928	3,260*	2,216	1,224
Standard grant	2,535	1,747	1,618	2,487	1,823	1,959
Incremental grant	1,453	927	1,036	715**	368**	2,399
Cash	131	76	1,869	86	34*	2,909
Restricted stock	71	0	2,191	44*	0	2,679
Stock options	1191	838	1,803	544**	330**	3,625
CEO portfolio adj.	768	521	2,310	190***	114***	1,993
Stock adj.	140	113	1,356	31***	5***	2,643
Option adj.	619	387	2,230	157***	108***	1,691
Total wealth change	4,286	2,909	3,666	4,163	2,772	3,339
B. Percentage to total wealth change (%)						
Pure price effect	-10.97	-9.83	2.30	17.13**	15.95**	2.29
From direct stocks	-2.33	-1.86	1.11	5.48*	4.33*	1.06
From stock options	-8.47	-8.01	1.33	11.19**	11.44**	1.48
Compensation grant	93.05	91.92	1.37	78.31	79.94	1.58
Standard grant	59.15	60.06	0.99	59.74	65.76	1.56
Incremental grant	33.90	31.87	0.76	17.18**	13.28**	0.54
Cash	3.06	2.61	0.28	2.07	1.23	0.36
Restricted stock	1.66	0.00	0.21	1.06	0.00	0.16
Stock options	27.79	28.81	0.55	13.07**	11.90**	0.14
CEO portfolio adj.	17.92	17.91	1.51	4.56***	4.11***	1.54
Stock ad.	3.27	3.88	1.15	0.74***	0.18***	0.91
Option adj.	14.44	13.30	0.78	3.77***	3.90***	0.95

The pure price effect assumes no new grant or CEO's own adjustment; thus, it evaluates the effect of price movement on CEO's prior (un-adjusted) portfolio holdings. Bond issuance firms have positive price effect while equity issuance firms have negative price effect on average. The evidence from price effect on CEO's un-adjusted portfolio is consistent with the significantly negative stock returns following SEOs.

The compensation grant is decomposed into the amount to preserve the previous grant level (denoted as standard grant) and incremental grant (including incremental cash compensation, incremental stock grant, and incremental option grant). Not surprisingly, the bond issuance CEOs get larger standard grant as bond issuance firms are larger. Interestingly, the incremental grant, especially the incremental option grant, is significantly higher in equity issuance firms. This evidence suggests that the board may treat the two types of financing policy differently. Despite the poorer post-issuance shareholder return on average, equity issuance firm CEOs get larger incremental compensation, which may partially compensate for the negative price effect.

Another adjustment is conducted by the CEO himself. The selling (exercising) of stocks and stock options may reduce the open portfolio position subject to the influence of price change. Moreover, it directly adds dollar value to CEO wealth. The results show CEOs of equity issuance firms adjust their portfolio more actively, which serves to offset the negative price effect. In sum, bond issuance firm CEOs earn marginal more overall wealth than equity issuance CEOs.

Next, I calculate the percentage contribution as the ratio of dollar value of each component to the total wealth change.[6] The three components show some interesting differences between equity and bond issuance firms. The pure price effect accounts for 16.66%/9.78% (mean/median) of wealth change for bond issuance firms and -47.85%/-31.83% for equity issuance firms. The difference is statistically significant. The compensation grants accounts for 75.98% /76.69% for bond firms and 113.57% /99.10% for equity firms. Note the contribution of standard grant is not significantly different in bond and equity firms while that of the incremental grant is higher in equity issuance firms; and the differences are statistically significant. The contribution of CEO's own portfolio adjustment effect is significantly higher for equity firms. CEO's own portfolio adjustment accounts for 7.85%/9.36% for bond firms and 31.43% /32.37% for equity firms, suggesting CEOs of equity issuance firms make more portfolio adjustment.

Table 2 panel B presents CEO wealth decomposition for issuance and nonissuance matching firms. In general, standard grant is not significantly different in issuance and industry, size, and book-to-marked matched nonissurance firms. Issuers, however, have much larger incremental grant adjustment as well as larger CEO's own portfolio adjustment. The percentage contribution result, which is scale free, reveals interesting results. The pure price effect accounts for -10.97%/-9.83% (mean/median) of total wealth change for issuers and 17.13%/15.95% (mean/median) for non-issuers. The standard grant accounts for 59.15%/60.06% for issuers and 59.74%/65.76% for non-issuers. These indicate that for non-issuers the wealth change mainly comes from the un-adjusted part. On the other hand, the adjustment components (both board and CEO's own adjustments) contribute more to CEO's total wealth change for issuance firms. For example, the incremental grant accounts for 33.90%/31.87% for issuers and 17.18%/13.30% for nonissuers; the CEO's own portfolio adjustment accounts for 17.92%/17.91% for issuers and 4.56%/4.11% for nonissuers.

B. Post-Issuance Return and Risk Change and Wealth Decomposition

The change of risk and return would trigger CEO's own portfolio adjustment and affect a firm's compensation policy. In this section I study subsamples of firms grouped based on the changes of returns and risks following the financing event. Table 3 reports the

wealth decomposition on subsamples based on return change for bond (panel A) and equity issuance firms (Panel B). For each group, I report both dollar values of wealth decomposition as well as the percentage of each component to total wealth change.

Table 3

Wealth decomposition on subsamples: return increase vs. return decrease

The table reports the wealth change decomposition on subsamples based on return change for bond (panel A) and equity issuance firms (Panel B). I define a firm as a return increase (decrease) firm if its event year's annual stock return is greater (lower) than the prior year's annual return. Asterisks on means and medians in the return decrease column indicate they are significantly different from the corresponding means and medians in the return increase column. The difference in means t-test assumes unequal variances across groups when a test of equal variances is rejected at the 10% level. The significance level of the difference in medians is based on a Wilcoxon sum-rank test. All variables are winsorized at the 1st and 99th percentiles. All dollar values are in 2010 constant dollars. ***, **, * denote significance at the 1%, 5%, and 10% levels.

Panel A

Bond issuance events

	Return Increase (N = 716)		Return Decrease (N = 256)	
	Mean	Median	Mean	Median
A. Dollar value of wealth ($thou)				
Pure price effect	1,310	683	-475***	-376***
From direct stocks	387	160	-126*	-49*
From stock options	939	511	-351***	-325***
Compensation grant	4,111	2,832	3,762	2,632
Standard grant	2,900	2,036	2,783	1,943
Incremental grant	1,211	794	979	689
Cash	137	80	98	68
Restricted stock	36	0	21	0
Stock options	1,040	690	862	620
CEO portfolio adj.	202	120	1,062***	888***
Stock adj.	46	31	253**	201**
Option adj.	154	90	818***	688***
Total wealth change	5,623	3,635	4,349*	3,144
B. Percentage to total wealth change (%)				
Pure price effect	23.30	18.80	-10.92**	-11.96**
From direct stocks	6.88	4.40	-2.90*	-1.56*
From stock options	16.70	14.07	-8.07**	-10.34**
Compensation grant	73.11	77.90	86.50	83.72
Standard grant	51.57	56.04	63.99	61.80
Incremental grant	21.54	21.86	22.51	21.91
Cash	2.44	2.20	2.25	2.16
Restricted stock	0.64	0.00	0.48	0.00
Stock options	18.50	18.99	19.82	19.72
CEO portfolio adj.	3.59	3.30	24.42***	28.24***
Stock adj.	0.82	0.85	5.82***	6.39***
Option adj.	2.74	2.48	18.81***	21.88***

Panel B
Equity issuance events

	Return Increase (N = 201)		Return Decrease (N = 380)	
	Mean	Median	Mean	Median
A. Dollar value of wealth ($thou)				
Pure price effect	402	277	-2,525***	-1,245***
From direct stocks	108	82	-597***	-240**
From stock options	390	179	-1,955***	-1,044***
Compensation grant	3,923	2,618	3,872	2,318
Standard grant	1,988	1,324	2,075	1,399
Incremental grant	2,049	1,296	1,870	1,186
Cash	154	90	119	69
Restricted stock	162	0	125	0
Stock options	1,615	1,205	1,493	1,109
CEO portfolio adj.	301	199	1,791***	1,119***
Stock adj.	66	30	407**	245**
Option adj.	233	172	1,388***	867***
Total wealth change	4,526	3,094	3,138**	2,192*
B. Percentage to total wealth change (%)				
Pure price effect	8.88	8.95	-80.47***	-56.80***
From direct stocks	2.39	2.65	-19.02***	-10.95***
From stock options	8.62	5.79	-62.30***	-47.63***
Compensation grant	86.68	84.62	123.39	105.75
Standard grant	43.92	42.79	66.12*	63.82*
Incremental grant	45.27	41.89	59.59*	54.11*
Cash	3.40	2.91	3.79	3.15
Restricted stock	3.58	0.00	3.98	0.00
Stock options	35.68	38.95	47.58*	50.59*
CEO portfolio adj.	6.65	6.43	57.07***	51.05***
Stock adj.	1.46	0.97	12.97***	11.18***
Option adj.	5.15	5.56	44.23***	39.55***

I define a firm as a return increase (decrease) firm if its event year's annual stock return is greater (lower) than the prior year's annual return. This partition allows us to address the relation between CEO wealth and shareholder wealth change; and at the same time analyze the compensation grant and CEO's own adjustment under different stock performance conditions.

The results show that a larger fraction of equity issuance firms experiences return decrease. By construction, the return increase group has positive pure price effect while the return decrease group has negative price effect in dollar value. The contribution of pure price effect to total wealth change is significantly higher for return increase group of firms. For compensation grant, we are more interested in the incremental grant as it represents the board policy adjustment with respect to the financing event. For both types of firms, the dollar value of incremental grant is not significantly different in the subsample of return increase and return decrease firms. However, the percentage contribution to wealth change is higher in the return decrease group, especially for equity issuance firms. Finally, I find that for both types of issuances, CEOs make more portfolio

adjustment in return decrease groups; and the CEO's own adjustment component contributes more to wealth change for return decrease subsamples. This is consistent with the hypothesis that CEOs tend to exercise/sell their stock options/stocks if they anticipate deteriorating performance after the financing event. In sum, the results suggest that for the return decrease group, the adjustment components from both the board compensation policy and CEO's own adjustment play a more important role in CEO's total wealth change. They help offset the negative price effect.

Next, the event firms are grouped into risk increase and risk decrease subsamples. A firm is defined as a risk increase (decrease) firm if its variance ratio of the event year's stock volatility to prior year's volatility is greater (less) than 1. Table 4 reports the wealth decomposition on subsamples based on the risk change for bond (panel A) and equity issuance firms (Panel B).

For both bond and equity issuance firms, pure price effect is significantly higher in the subsample of firms that have decreasing firm risks. The compensation policy is not significantly different for bond issuance firms. However, the risk increase equity issuance CEOs got more incremental compensation grant than the risk decrease equity issuance CEOs. The difference mainly comes from incremental cash and option compensation grant. The evidence is consistent with optimal compensation theory that says high risk firms should offer lower pay-for-performance, hence more cash grant in risk increase firms. However, with higher risk the option value is higher; therefore, it is relatively cheaper to grant options in risk increase firms. In terms of CEO's own portfolio adjustment, I find that CEOs adjust their portfolios more actively if there is an increase in risk, even more so for equity issuance firms. This adjustment behavior is consistent with the risk aversion and un-diversification of CEOs. In sum, I find that for both types of issuers, pure price effect contributes more significantly to total wealth change in the group of risk decrease firm. The contribution of adjustment component (incremental grant and CEO's own portfolio adjustment) to total wealth change is higher for risk increase group of firms, suggesting the wealth change mainly comes from the adjustment part for CEOs of risk increase firms.

Table 4

Wealth decomposition on subsamples: risk increase vs. risk decrease

The table reports the wealth decomposition for subsamples based on risk change for bond (panel A) and equity issuance firms (Panel B). A firm is defined as a risk increase (decrease) firm if its variance ratio of the event year's stock volatility to prior year's volatility is greater (less) than 1. Asterisks on means and medians in the total risk decrease column indicate they are significantly different from the corresponding means and medians in the total risk increase column. The difference in means t-test assumes unequal variances across groups when a test of equal variances is rejected at the 10% level. The significance level of the difference in medians is based on a Wilcoxon sum-rank test. All variables are winsorized at the 1st and 99th percentiles. All dollar values are in 2010 constant dollars. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A
Bond issuance events

	Total risk increase (N =456)		Total risk decrease (N =516)	
	Mean	Median	Mean	Median
A. Dollar value of wealth ($thou)				
Pure price effect	404	127	1,306**	551**
From direct stocks	110	25	427*	166**
From stock options	295	101	880**	387**
Compensation grant	4,140	2,827	3,821	2,687
Standard grant	2,899	2,072	2,715	1,943
Incremental grant	1,241	755	1,106	744
Cash	139	88	122	67
Restricted stock	35	0	28	0
Stock options	1,062	668	951	645
CEO portfolio adj.	849	663	38***	27***
Stock adj.	188	153	15***	9***
Option adj.	662	510	23***	18***
Total wealth change	5,393	3,617	5,165	3,265
B. Percentage to total wealth change (%)				
Pure price effect	7.49	3.51	25.29**	16.88**
From direct stocks	2.04	0.69	8.27**	5.08**
From stock options	5.47	2.79	17.04*	11.85**
Compensation grant	76.77	78.16	73.98	82.30
Standard grant	53.75	57.29	52.57	59.51
Incremental grant	23.01	20.87	21.41	22.79
Cash	2.58	2.43	2.36	2.05
Restricted stock	0.65	0.00	0.54	0.00
Stock options	19.69	18.47	18.41	19.75
CEO portfolio adj.	15.74	18.33	0.74***	0.83***
Stock adj.	3.49	4.23	0.29***	0.28***
Option adj.	12.28	14.10	0.45***	0.55***

Panel B
Equity issuance events

	Total risk increase (N =342)		Total risk decrease (N =239)	
	Mean	Median	Mean	Median
A. Dollar value of wealth ($thou)				
Pure price effect	-2249	-1076	-904**	-492*
From direct stocks	-628	-173	-234*	-81*
From stock options	-1815	-905	-760**	-411*
Compensation grant	4149	2662	3658*	2440
Standard grant	1976	1269	2083	1418
Incremental grant	2173	1393	1575*	1022
Cash	142	91	80*	52*
Restricted stock	154	0	181	0
Stock options	1877	1303	1270*	960*
CEO portfolio adj.	1842	1288	503***	259***
Stock adj.	414	219	118*	111*

Option adj.	1420	1070	376***	146***
Total wealth change	3742	2874	3257	2207
B. Percentage to total wealth change (%)				
Pure price effect	-60.10	-37.44	-27.76*	-22.29*
From direct stocks	-16.78	-6.02	-7.18*	-3.67*
From stock options	-48.50	-31.49	-23.33*	-18.62*
Compensation grant	110.88	92.62	112.31	110.56
Standard grant	52.81	44.15	63.95	64.25*
Incremental grant	58.07	48.47	48.36	46.31
Cash	3.79	3.17	2.44*	2.35*
Restricted stock	4.12	0.00	5.56	0.00
Stock options	50.16	45.34	38.99**	43.50
CEO portfolio adj.	49.23	44.82	15.44***	11.74***
Stock adj.	11.06	7.62	3.62**	5.03*
Option adj.	37.95	37.23	11.54***	6.62***

C. Sensitivity of Wealth to Return and Risk

The above analysis raises the question how sensitive each component of wealth change is to return and risk for issuance firms. In this section, I estimate the wealth sensitivities (see Guay (1999), Core and Guay (1999, 2002)) by examining the empirical relation between changes in a CEO's firm-specific wealth (and wealth components of interest) and changes in shareholder wealth or changes in stock volatility. The regressions are specified as:

$$\Delta W_{it} = a_0 + a_1 \times R + a_2 \times \log(VR_{it}) + a_3 \times R \times \log(VR_{it}) + \tau_t + \lambda_i + e_{it} \qquad (1)$$

Table 5 reports the median regression results on bond issuance firms (Panel A) and equity issuance firms (Panel B)[7]. The dependent variable is the change in CEO's firm-specific wealth in $ thousands. Columns (1) – (4) correspond to the total wealth change, the pure price effect, the incremental compensation grant, and CEO's own portfolio adjustment as the dependent variable. Consistent with the literature, I measure returns to shareholder, denoted as R, in $ millions. Dollar return equals a firm's event year stock return times the firm's beginning-of-year market value of equity. VR is the volatility ratio defined as the ratio of volatility of stock returns after the issuance to the volatility before the issuance. Log(VR) is the logarithm of VR. Log(VR) then measures the change of the volatility. The results are robust if I use a dummy variable which equals 1 if the volatility ratio is greater than 1 and 0 otherwise, or the empirical cumulative distribution function of variance as in Aggarwal and Samwick (1999). The parameters τ_t and λ_i represent year and industry effects.

Table 5
Sensitivity of wealth to return and risk

The table reports the median regressions of CEO wealth change and different wealth components on stock return and risk. Panel A reports the results for equity issuance firms. Panel B reports the results for bond issuance firms. The dependent variables are CEO's total wealth change, pure price effect, incremental grant, and CEO's own portfolio adjustment in thousands of 2010 dollars. Return is dollar return ($mil) which equals a firm's event year percentage stock return times the firm's beginning-of-year market value of equity. VR is the volatility ratio defined as the ratio of volatility of stock returns after the issuance to the volatility before the issuance. Log(VR) is the logarithm of the volatility ratio. All regressions include 2-digit SIC industry and year dummies (not reported). The t-statistics in parentheses are constructed using bootstrapped standard errors based on 100 replications. All variables are winsorized at the 1st and 99th percentiles. ***, **, * denote significance at the 1%, 5%, and 10% levels, respectively.

	Dependent variables			
	(1)	(2)	(3)	(4)
Independent variables	Total wealth	Price effect	Incremental Grant	Own portfolio adj.
Panel A. Equity issuance				
Return	81.22***	50.62***	1.17	-1.50*
	(3.05)	(3.51)	(0.65)	(-1.69)
Return×Log(VR)	-42.56	-18.41	-13.06	44.61
	(-0.52)	(-0.25)	(-0.85)	(0.40)
Log(VR)	444.41	188.05	-216.66	2654.45*
	(0.19)	(0.10)	(-0.24)	(1.77)
Pseudo R^2	0.16	0.15	0.11	0.13
Panel B. Bond issuance				
Return	12.41***	14.48***	2.71	-1.27
	(4.53)	(3.72)	(2.06) **	(-0.27)
Return×Log(VR)	-1.56	-4.01	-10.28	25.11**
	(-0.02)	(-0.11)	(-0.69)	(2.04)
Log(VR)	-203.85	606.55	-151.46	-536.96
	(-0.12)	(0.82)	(-0.19)	(-0.69)
Pseudo R^2	0.15	0.11	0.14	0.15

The sensitivity of wealth to return is estimated by $\partial \Delta W / \partial R = a_1 + a_3 \log(VR)$; and the sensitivity of wealth to risk is estimated by $\partial \Delta W / \partial \log(VR) = a_2 + a_3 R$. In the total wealth regression (column (1)), the sensitivity is the standard pay-for-performance sensitivity (PPS thereafter) in prior literature. Consistent with Aggarwal and Samwick (1999), the sensitivity of wealth to return reduces in risk increasing issuance firms, but the result is not significant. In addition, I document higher PPS for equity issuance firms than for bond issuance firms. The next question is, where is the higher PPS comes from?

The regressions of the wealth component show the pure price effect is positively significantly sensitive to shareholder returns, indicating the incentive alignment mainly comes from the un-adjusted portfolio holdings. In addition, this sensitivity is even higher in equity issuance firms. A larger (negative) price movement after equity issuance and a higher sensitivity suggest the portfolio wealth, if un-adjusted, would suffer a lot. The sensitivity of incremental compensation grants to return is only significant in bond issuance firms; and not significant at all for equity issuance firms. It suggests the shareholder-manager incentive alignment is severed by board compensation policy, which may account for the asymmetric pay sensitivity as documented in Harford and Li (2007). Interestingly, the portfolio adjustment is decreasing in returns, though not significant (bond firms) or only marginally significant (equity firms). This is consistent with the argument that CEOs of equity issuance firms sell/exercise in anticipation of negative returns or sell/exercise ex post to preserve wealth.

The total wealth change, pure price effect, and incremental grant do not show significant sensitivity to risk; and no difference is identified between two types of firms. I find portfolio adjustment is positively sensitive to risk change for equity issuance firms. This is consistent with the argument that if CEO anticipates risk increase, they exercise abnormal amount of stock options to diversify away the unsystematic risk associated with concentrating wealth in a single asset.

The documented sensitivities are economically meaningful. By specification, the wealth to return sensitivity is measured in dollars per thousand-dollar increase in the return to shareholders. The PPS coefficient in column (1) shows that for a firm with the same risk as the pre-event firm risk (Log(VR)=0), CEO's total wealth increases $81.22 for every $1,000 increase in the market value of equity issuance firm, while it is only $12.41 per $1,000 increase for bond issuance firm CEOs. Of the $81.22 wealth increase for equity issuance CEOs, $51.63 comes from the un-adjusted portfolio holdings; only $1.17 comes from incremental grant; and importantly, CEO's own portfolio adjustment tends to reduce the sensitivity by $1.49. Therefore, board compensation grants and CEO's own portfolio adjustment insensitivities have weakened the shareholder-manager incentive alignment for both types of firms.

V. FEEDBACK EFFECT

The above results show how CEO wealth changes in response to a firm's public financing decision and the resources and natures of the change. In this section I explore the endogeneity of CEO incentive and financing by examining a reversed causality – the feedback effect of CEO wealth on policy choice. That is, I test on to what extent the anticipated wealth change would motivate CEO's ex ante financing choice. Specifically,

I estimate the following Logit model to investigate the relationship between CEO incentives and the likelihood of firm's public financing choice:

$$P = a_0 + a_1 \times (\text{CEO wealth component}) + a_2 \times \text{Controls} + \tau_t + \lambda_i + e_{it} \qquad (2)$$

Table 6 reports the regression results. P is a dummy variable representing the likelihood of choosing bond issuance conditional on firms' choosing public financing (Panel A) and the unconditional likelihood of public financing choice (Panel B). To test the feedback effect, I use different components of CEO wealth as the independent variables, including pure price effect, standard compensation grant, incremental grant and CEO's own portfolio adjustment component. Pure price effect is further decomposed into stock price effect and option price effect; incremental compensation grant includes cash compensation, restricted stock and stock options; CEO's own portfolio adjustment contains stock selling, option exercise and dollar value generated from option exercise.

The choice of control variables follows standard capital structure theories. Literature has put forward the trade-off theory, pecking-order model, and market timing argument, etc. in explaining firm's financing choice. I expect firms with lower cost of debt (e.g. larger size, lower growth, better credit rating) are more likely to choose bond financing (trade-off theory). Whereas high profitable (ROA) firms with plenty internal cash flow and low dividend payout tend to use equity financing (pecking order theory). In addition, firms are more likely to choose equity financing when their equity is overvalued (high market-to-book) with respect to manager's private information (overvaluation/market timing hypothesis).

The coefficients on the control variables generally have signs in line with accepted theories. Therefore, I focus the analysis on the wealth variables. Controlling for firm characteristics, managerial incentives play an important role in firm's public financing choice. Different wealth components generate different motivations, a detailed decomposition is therefore important for us to understand the interaction of incentive and capital structure. I hence use specification (4) to illustrate my findings. The possible effect of price movement on unadjusted option holdings increases the likelihood of bond issuance. This is consistent with the post-issuance performance of bond and stock issuances. Standard compensation grants, which does not represent any change of compensation policy, is silent on the financing choice. The loading on incremental option grant, however, is significant negative, suggesting an anticipated more (abnormal) option grant, which may offset any negative price effect, tends to increase the probability of issuing equity. Moreover, the option exercise component, which adjusts CEO's open option positions, increases the likelihood of equity issuance. Though beyond the scope of this paper, it is interesting to note that all the effects come from the option variables. The evidence suggests that stock options are more sensitive to price movement and are more subject to board and CEO's own adjustments. The difference between direct stock and option holdings/grant merits further investigation.

To strengthen the analysis, I further run the unconditional logistic regressions of public financing versus non-public financing. The results show if CEO anticipates lower price effect (this is more related to the equity issuance firms), and higher adjustment from both the board and CEO themselves, he would be more likely to seek public financing. Again, all the effects come from the option-related variables.

Table 6
Feedback effect

The table reports the logit regressions of the likelihood of firms' public financing choice on ex post wealth change. Panel A reports the likelihood of choosing bond issuance conditional on firms' choosing public financing. Panel B reports the unconditional likelihood of public financing choice. All variables are winsorized at the 1st and 99th percentiles. All dollar values are in 2010 constant dollars. All regressions include 2-digit SIC industry and year dummies (not reported). The heteroscedasticity-robust z-statistics are reported in parentheses under the estimates. ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A
Likelihood of bond issuance

Independent variables	Dependent variable: likelihood of bond issuance			
	(1)	(2)	(3)	(4)
Pure price effect	0.027*	0.026*		
	(1.69)	(1.66)		
From direct stocks			-0.011	-0.012
			(-0.61)	(-0.65)
From stock options			0.098**	0.103**
			(2.32)	(2.43)
Compensation grant	0.015			
	(0.21)			
Standard grant		0.238	0.244	0.189
		(1.37)	(1.35)	(0.98)
Incremental grant		-0.512***	-0.460***	
		(-4.89)	(-4.17)	
Cash				-0.047
				(-0.13)
Restricted stock				-0.268
				(-0.86)
Stock options				-0.585***
				(-4.21)
CEO portfolio adj.	-0.023*	-0.023*		
	(-1.72)	(-1.76)		
Stock adj.			-0.005	0.007
			(-0.31)	(-0.44)
Option adj.			-0.156***	-0.141**
			(-2.80)	(-2.42)
Total Assets	0.425***	0.417***	0.430***	0.422***
	(6.32)	(6.01)	(6.14)	(5.98)
Credit ratings	-0.116***	-0.116***	-0.112***	-0.116***
	(-3.36)	(-3.36)	(-3.24)	(-3.35)
ROA	6.416***	6.280***	6.152***	6.251***
	(2.90)	(2.81)	(2.75)	(2.79)
Free cash flow	-3.284	-3.307	-3.136	-3.327
	(-1.34)	(-1.35)	(-1.27)	(-1.35)
Dividend payout	0.133	0.133	0.117	0.097
	(0.98)	(0.97)	(0.85)	(0.71)
Market-to-book	-0.076***	-0.076***	-0.065**	-0.063**
	(-2.88)	(-2.85)	(-2.42)	(-2.33)

Leverage	0.696	0.712	0.990	0.956
	(0.89)	(0.91)	(1.25)	(1.21)
Pseudo R^2	0.12	0.12	0.13	0.13

Panel B
Likelihood of public financing choice

Independent variables	Dependent variable: likelihood of public financing choice			
	(1)	(2)	(3)	(4)
Pure price effect	-0.021*	-0.030**		
	(-1.71)	(-1.99)		
From direct stocks			-0.037	-0.046*
			(-1.56)	(-1.76)
From stock options			-0.243***	-0.212***
			(-4.09)	(-3.47)
Compensation grant	0.790*			
	(1.79)			
Standard grant		0.164	0.025	0.064
		(1.09)	(0.16)	(0.40)
Incremental grant		1.412***	1.430***	
		(8.87)	(8.42)	
Cash				-0.380
				(-1.02)
Restricted stock				-0.506
				(-1.41)
Stock options				4.640***
				(11.75)
CEO portfolio adj.	0.027*	0.023*		
	(1.96)	(1.66)		
Stock adj.			-0.014	-0.007
			(-0.95)	(-0.41)
Option adj.			0.437***	0.452**
			(5.67)	(5.46)
Total Assets	0.330***	0.380***	0.348***	0.333***
	(6.41)	(7.04)	(6.34)	(5.80)
Credit ratings	0.025	0.031	0.035	0.056
	(1.08)	(1.34)	(1.48)	(1.26)
ROA	-2.454***	-2.185*	-2.283**	-3.220***
	(-2.24)	(-1.96)	(-2.02)	(-2.68)
Free cash flow	5.024***	5.104***	4.779***	5.991***
	(4.06)	(4.04)	(3.75)	(4.35)
Dividend payout	0.290***	0.292***	0.352***	0.410***
	(2.78)	(2.76)	(3.25)	(3.63)
Market-to-book	0.039**	0.037*	0.017	0.009
	(2.06)	(1.94)	(0.87)	(0.43)
Leverage	0.788	0.758	0.328	0.316
	(1.55)	(1.47)	(0.63)	(0.58)
Pseudo R^2	0.13	0.15	0.18	0.24

VI. CONCLUSION

I decompose CEO wealth changes into three components: pure price effect, board compensation effect, and CEO's own portfolio adjustment effect. I find that the components of CEO wealth change, from both board compensation policy and CEO's own portfolio adjustment, contribute more to the issuance firm CEO's wealth change than to the non-issuance firm CEO's. For equity issuance firm CEOs, the pure price effect is negative given a negative stock market reaction to SEOs. However, a larger incremental compensation grants and CEO's stock/option selling/exercising help offset the negative effect. Moreover, though the pay-for-performance sensitivity is high for equity issuance CEOs, the board adjustment is not sensitive to shareholder returns, which weakens the executive-shareholder alignment. CEO's own adjustment is even negatively related to stock returns – I show CEOs adjust their portfolio according to their return/risk target.

I document that the anticipated wealth changes essentially constitute incentives or decentives for a firm's public financing choice. Specifically, anticipated wealth gain (to offset negative price effect on existing portfolio holdings) increases the likelihood of public financing, especially equity issuance. I address the endogeneity of incentives and capital structure in that I document a wealth change around a financing event and analyze a feedback effect of the wealth change on financing decision. These findings have an important implication for policy makers and shareholders: it calls for policy maker's attention to the issue of shareholder-manager incentive alignment around corporate major financing decisions. Moreover, this decomposition methodology can be applied to effectively analyze CEO incentives and firm's other major policy decisions, such as investment, restructuring, CEO turnover or payout.

ENDNOTES

1. I acknowledge that insider trading (due to CEO's portfolio adjustment) can affect stock price to some extent. However, I ignore this influence from the derivation. I also argue that CEO will adjust his trading behavior to avoid triggering a large stock market reaction.
2. As firms usually grant at-the-money options, the grant value is based on at-the-money option value. The Black-Sholes equation for at-the-money option value is $C = SN(\frac{(r+\sigma^2/2)T}{\sigma\sqrt{T}}) - Xe^{-rT}N(\frac{(r-\sigma^2/2)T}{\sigma\sqrt{T}})$, where S is the current market price, X is the strike price. S=X when options are granted at-the-money. r is risk free rate. T is time to maturity. σ is the standard deviation of the stock return. $\frac{\partial C}{\partial S} = N(\frac{(r+\sigma^2/2)T}{\sigma\sqrt{T}}) - e^{-rT}N(\frac{(r-\sigma^2/2)T}{\sigma\sqrt{T}}) > 0$, suggesting a positive relationship between at-the-money Black-Scholes option value and stock price/strike price.
3. The sum of component effects ΔW matches the value of total wealth change in literature (as in Aggarwal and Samwick (1999) and Ortiz-Molina (2004), etc.). The wealth decomposition allows us to analyze the gains and losses of CEOs around a corporate event, while the total wealth change in literature simply adds up the relevant CEO wealth changes as reported in the Proxy (including the compensation

grant, change in the total value of stock and option holdings and dollar value of option exercise).

4. A shelf SEO is defined as an SEO whose issue date is at least 60 days after the filing date. Following Altinkilic and Hansen (2003) and Huang and Zhang (2011), I exclude shelf registered offers.
5. Industry is defined based on two-digit SIC code.
6. Note because of the winsorization of variables (the percentage values are also winsorized at the 1st and 99th percentiles), the weights may not sum up to 1.
7. The right skewness and large outliers of CEO's firm related wealth change motivate the use of median regressions. Results are robust to industry and year fixed effects regressions.
8. For the empirical analysis that follows, I transform the S&P ratings into conventional numerical scores. In particular, AAA takes on the value 1 and D takes on the value 22. Thus, a higher numerical score corresponds to a lower credit rating or higher credit risk. The entire spectrum of ratings is as follows. AAA=1, AA+=2, AA=3, AA−=4, A+=5, A=6, A−=7, BBB+=8, BBB=9, BBB−=10, BB+=11, BB=12, BB−=13, B+=14, B=15, B−=16, CCC+=17, CCC=18, CCC−=19, CC=20, C=21, D=22.

APPENDIX

CEO wealth decomposition

A: Definition of CEO wealth component

Variables	Definition
Pure price effect	Pure price movement on CEO's unadjusted portfolio holdings
From direct stocks	The effect of pure stock price movement on unadjusted stock holdings
From stock options	The effect of pure stock price movement on unadjusted option holdings
Compensation grant	Total board compensation=standard grant+incremental grant
Standard grant	Prior year's grant level=cash+restricted stocks+options+all other grants
Incremental grant	Difference between current and prior year's grant level
Cash	Difference between current and prior year's cash grant level
Restricted stock	Difference between current and prior year's restricted stock grant level
Stock options	Difference between current and prior year's options grant level
CEO's own portfolio adj.	CEO adjust his portfolio in response to market condition and board policy change
Stock adj.	Selling shares reduce the possible value loss of pure price effect
Option adj.	The sum of option exercise and cash income from option exercise
Total wealth change	The sum of pure price effect, compensation grant, and CEO's own portfolio adj.

B: Decomposition of CEO wealth component

Total Wealth Change
= Pure Price Effect+ Board Compensation Grant+ CEO's own portfolio adj.

Standard Grant Incremental Grant

Pure Price Effect = Price Effect from Direct Stocks + Price Effect from Options	(1)
Board Compensation Grant = Standard Grant + Incremental Grant	(2)
CEO's Own Portfolio Adj. = Stock Adjustment + Option Adjustment	(3)
Total Wealth Change =	(1)+(2)+(3)

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