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The impact of the sensitivity of earnings to bonuses on the performance target revision of U.S. listed firms.

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Abstract

This paper delves deeper into the question on whether the revision of targets is influenced by the sensitivity reported earnings to performance based compensation. In an attempt to answer this question I've researched whether the offset between the actual payout and the target payout is independent regardless of whether the target payout was beaten by the performance payout in prior period. I've found that the abnormal bonuses are serially correlated for both CEO's and non-CEO executives. After establishing this relation, I've researched the effect of the sensitivity of a firms' reported earnings on the adequacy of target revision and found that firms revise their targets more adequately for CEO's whose bonuses tends to react sensitive to reported earnings. However, this relation was not observed for non-CEO executives.

*The views stated in this paper are those of the author and not necessarily those of the supervisor,
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1 Introduction

In terms of corporate governance executive compensation has been widely debated. An important aspect of executive compensation is that it incentivizes the executive to maximize their performance within the firm. Moreover, it aligns the interests of the shareholders and the executives. To align these interests firms try to incentivize executives by issuing compensation based packages which are only awarded when certain firm performance measures have been met which in turn motivates executives to be more productive.

However, as performance based executive compensation initially results in alignment of the incentives of the shareholders and executives, this is not always the case. Within the confines of performance-based executive compensation, it can also happen that incentivizing the executive by issuing performance-based compensation packages can result in adverse behavior. For example, when executives try to cap revenue once their performance target has been met in order to prevent adequate target revision for future periods. When these actions negatively influence the profitability of a firm, this counterproductive behavior will lead to misalignment of the interests of the executives and the shareholders.

Weitzman (1980) states that for optimization of the performance based compensation targets more ambitious target setting in the future is required when awards are granted for performances in the current period. According to (Weitzman, 1980) this results in the problem that the employee can convince the company that the current period maximum performance that can be attained is smaller than it is in reality resulting in a future target that is more likely for the employee to be met as the current performance is often used as a benchmark to determine future targets.

Indjejikian & Nanda (2002) emphasized on this matter by examining the adequacy in which firms revise their targets. They stated that if firms revised their targets in such a manner that that it fully reflects the executives' past performance, then the chances of receiving a bonus which is above target should be independent of it the executives' past performance.

In addition to prior research, this paper delves deeper into the matter on the underlying factors which causes inadequate target revision to be greater. Whereas Indjejikian & Nanda (2002) merely explore whether performance targets are serially correlated, I also question whether the inadequacy to revise target to fully reflect the executives' performance target can be influenced by the sensitivity how bonuses react to reported earnings. Even though performance based compensation has been put into place in order to align the interests of the shareholders with that of the executive, this still might result in the adverse effects from the executive to indulge in earnings management in order to obstruct adequate target revision

for future periods in the future. I hypothesize that inadequate target revision will be more pronounced when performance based compensation for the executive tends to be sensitive to the reported earnings of that related year which translates to the following research question:

Do firms revise their targets less effectively when performance-based compensation is strongly influenced by reported earnings?

Prior literature has studied the concept of target ratcheting and the which exposes firms in which exposes firms to executives withholding effort to avoid revision of performance targets in the future (Indjejikian et al., 2014). This paper sheds a new light on this concept by not merely examining the concept of adequate target revision, but also to dive deeper into the underlying compensation characteristics of performance based compensation by scrutinizing the presence of inadequate revision of targets in an environment where the executive bonus reacts strongly to the reported earnings in the relating year. As a means to reduce information asymmetry between investors and shareholders, the SEC issued new legislation in 2006 which requires U.S. firms to give a more detailed disclosure regarding compensation paid to their executives (Espahbodi et al., 2016). The disclosure of the compensation structure of executives, grants me access to more detailed data than their was available before the legislation was passed.

In an attempt to answer the research question of this paper I've used data related to executives from firms within the Russell 3000 index. In our first hypothesis I research whether target revision is performed adequately by testing whether the likelihood of the bonus payout being higher than the target payout is greater when the target payout has been beaten by the actual payout in prior periods. Our research finds that that the likelihood for an executive to receive a bonus above the target payout to be higher when the executive received a bonus higher than the target bonus in prior period. This increased likelihood has been observed for both CEO executive and non-CEO executives which is in line with the results as presented by Indjejikian & Nanda (2002). Moreover, this increased probability can be observed for both equity and non-equity performance based bonuses. Furthermore, when examining the causality between past payouts and current payouts I found abnormal bonuses are serially correlated with one another for both CEO's and non-CEO executives which can be observed for both the equity and non-equity component of performance based compensation. In order to answer the research question on whether the inadequacy to revise targets is more pronounced for executives which performance based bonuses tend to react more sensitive on the firms' earnings I've constructed a proxy which simulates the sensitivity of earnings on bonuses. My findings show that for CEO's the serial correlation of performance targets

is less pronounced for CEO's whose bonus tends to react sensitively to a firms' earnings. However, note that for non-CEO's this relationship could not be observed.

This paper contributes to the extent that in prior research the effect of sensitivity of earnings on bonuses have not been accounted for. As the structure of performance based compensation can have an significant impact on the productivity of the executive, research on whether targets are revised in an adequate manner is viable as it allows firms to gravitates towards the answer of the question on how their executives should be compensated thereby creating a better alignment of the interests of shareholders and executives.

This paper is composed as follows: In chapter 2 the literature can be found, where I discuss prior research regarding the agency theory and target based executive compensation. After establishing the literature review, I elaborated on the hypothesis development. Then in Chapter 3, the research design is discussed. In chapter 4 the data collection process is discussed. In chapter 5, I elaborate on the results of the testing performed. Lastly, in chapter 6 the conclusions relating to the results can be found.

2 Literature Review

In this section I discuss the main objective of my paper in light of the current academic literature. The main objective of this research is to investigate whether the executives' chances of earning an above-target bonus is independent of the executives' past performance. The objective comprises an important empirical question, based on the notion of agency-theoretic arguments that a firm can better motivate its executives if it discounts executives' past performance in setting their future compensation. The latter notion is investigated in the paper by Indjejikian & Nanda (2002). I use this paper as a building block for my thesis. I extend their analysis by also investigating whether target achievements are more pronounced for firms with a high compensation earnings coefficient (CEC). I use the CEC as defined by Iwasaki et al. (2018). One could argue that for firms where the executive compensations' sensitivity with respect to the earnings is high, the effect of managers influencing their operational results is more pronounced.

2.1 Agency Theory related to executive compensation

The principal-agent problem is addressed in a wide range of academic papers. The conflict of interest between shareholders (principal) and agents (the executives) is primarily caused by information asymmetry and moral hazard. The information symmetry concretely indicates the executives possess more information than the shareholders. Hence, theory suggests that

executives within a firm can use this information to maximize their own wealth, instead of putting the firms' objectives first (see e.g. Jensen & Meckling, 2019; and Jensen & Meckling, 2019). According to Jensen (1994), agency theory postulates that because people are, in the end, self-interested they will have conflicts of interests over at least some issues any time they attempt to engage in cooperative endeavors.

Bonuses can be used to align the interests of both shareholders and executives (Aggarwal et al., 2012). Most executive pay packages contain five basic components: as base salary, annual bonuses, payouts from long-term incentive plans, restricted option grants, and restricted stock grants (Hermalin & Weisbach, 2017). Over the years, however, relative importance of these remuneration components developed considerably, since the composition of the packages influenced by a set of factors (Balsam, 2002). Introducing higher compensation packages for executives is deemed to increase their work effort and contribution towards firm performance (Duffhues & Kabir, 2009). Hence, the relationship between firm performances and executive bonuses is expected to be positive.

2.2 Prior research on executive performance targets and bonuses

Performance targets can cause incentive conflicts between firms and executives, as widely documented in existing academic literature (Holmström, 1979; 1992, Milgrom et al.; Raju & Srinivasan, 1996; Murphy, 2013). The aforementioned conflicts arise due to moral hazard, caused by the firms' struggles to accurately monitor managers' efforts because of adverse selection, as executive managers are better informed on the firms prospects than non-executives. A large range of multiperiod agency models predict that firm value is higher when a principal (firm) can commit in advance to adopt standards that do not incorporate information about an agent's past performance (Laffont & Tirole, 1993). Some of these models also indicate that a sequentially rational principal can benefit *ex post* if he doesn't obey the agreement but uses information on the agent's past performance in setting the agents' future compensation (e.g. Milgrom et al., 1992). Assuming a firm uses executives' superior past performance as a standard for evaluating future performance, executives might be inclined to reduce their productivity in early periods to avoid being held to higher performance targets in the future.

Based on considerations of Indjejikian & Nanda (2002), one can argue that "a rational firm benefits if it uses past performance information in revising the compensation arrangement." This argument hinges on the notion that information reflected in current performance should be fully incorporated into the next-period target. Hence the probability of an agent achieving their future target is independent on the current target achievement, and subsiding

abnormal bonuses should be serially uncorrelated. Milgrom et al. (1992), on the other hand, argue agents induce inferior performance, neglecting to operate at full performance level over successive accounting periods. By doing so, agents can produce a lower level of performance, not reflecting the true economic potential of their economic unit.

Indjejikian & Nanda (2002) provide evidence for the notion that firms do not adjust standards and compensation packages to fully reflect executives' past performance, as they document a serial correlation between consecutive target achievements. These findings hold for both CEOs and non-CEOs, suggesting firm-wide reluctance to fully adjust performance standards for executives' past performance. Hence, their results are in line with agency-theoretic arguments where a firm can better motivate its executives if it discounts executives' past performance in setting their future compensation.

2.3 Compensation Earnings Coefficient

Numerous articles have researched the degree of dependence between executive compensation and firm performance. Bushman et al. (2006), introduce a coefficient of earnings estimated from a model that regresses executive compensation on earnings and returns. Firms with a relatively high compensation earnings coefficient (CEC) may have more serious ex-post settling-up problem because their managers may be more incentivized to manage earnings because of its close relation with their compensation. The CEC has also been used by Iwasaki et al. (2018), to examine the relation between accounting conservatism and the degree of dependence on earnings-based compensation plans. They find that accounting conservatism is positively related to CEC.

2.4 Hypothesis Development

As noted, the main objective of this research is to investigate whether the executive's chances of earning an above-target bonus is independent of the executive past performance. I use a two-step approach based on the methods of Indjejikian & Nanda (2002), with an extension based on their empirical findings.

First, I want to determine whether subsequent abnormal bonuses are related to each other in terms of probability. Hence the first hypothesis is stated as:

Hypothesis 1a: The probability that an executive receives a bonus greater than or equal to his target bonus is independent of whether, in the prior period, the executive received a bonus that was greater than or less than his target bonus.

The null hypothesis here assumes that an executive's performance standard fully reflects

information about his past performance. In hypothesis 1a, I focus on the probability that the executive achieves the performance standard (target), given the fact he achieved or did not achieve the target performance in the prior performance. As here, I investigate the probability, the test doesn't incorporate the magnitude by which the executive's performance exceeds the performance standard, and how that is related to the magnitude in the prior period.

To determine whether receiving a bonus higher than the target and the magnitude of the relation, given that the previous bonus also trumped the target bonus, one can investigate the serial correlation between observations of a specific executive over time (as done in Indjejikian & Nanda (2002)). In line with the considerations of Indjejikian & Nanda (2002), if the executive's performance package fully reflects the information in his past performance, then we expect the abnormal bonus to be serially uncorrelated. Hence, if firms don't adequately update the performance targets of the executive, the abnormal bonuses will be serially correlated.

In hypothesis 1a, I explicitly investigate the *probability* of the subsequent abnormal bonuses being positive. To assess serial correlation between the abnormal bonuses and their magnitude, I state hypothesis 1b as:

Hypothesis 1b: Executives' abnormal bonuses are serially uncorrelated.

Both hypotheses together address the question whether performance standards are fully updated based on the relevant information about executives' past performance. Alternatively, if firms may incorporate information about executives' past performance using current performance data, but not to the full extent as is expected from the based under hypothesis 1a and b. There has been some literature also, suggesting firms may revise performance standards asymmetrically. The latter indicates, for example, that firms may increase standards following above-standard performance, but not reduce standards following below-standard performance Holthausen et al. (1995); Leone & Rock (2002); Weitzman (1980). It is worth mentioning that the tests provided in my thesis, explicitly allow for the possibility that firms revise executives' performance standards asymmetrically, and therefore doesn't provide an alternative hypothesis based on our baseline hypothesis.

Indjejikian & Nanda (2002) find that abnormal bonuses are serially correlated, indicating that firms fail to fully update the bonus structures based on relevant information about the executives' past performance. If firms fail to fully update the bonus structures, managers might be incentivized more to increase their performance, achieving higher abnormal bonuses. This effect might be particularly more pronounced for firms where the sensitivity of the bonus towards firm performance is high. I postulate the second hypothesis as:

Hypothesis 2: The relation between consecutive target achievements (abnormal bonuses) is more pronounced for executives (firms) with a high compensation earnings coefficient

Here, I use the compensation earnings coefficient as introduced by Bushman et al. (2006), and used by Iwasaki et al. (2018). If a firm has a high compensation earnings coefficient, the bonus of a firm is more sensitive to earnings. Hence, managers might be incentivized to increase their performance leading to even higher abnormal bonuses in future periods. To investigate hypothesis 2, the interaction between the abnormal bonus and CEC is of main interest, extending the regression framework from hypothesis 1b.

3 Methodology

3.1 Definition Abnormal Bonus Metrics

Before discussing the methods used to test the hypotheses, I describe some compensation variables used throughout this paper. I measure an executive's target bonus and his corresponding actual bonus relative to the executive's base salary. Below, the set of bonus variables are defined which will serve as a building block for all analysis throughout this paper. I define all variables for $t=2015, \dots, 2021$, with

$$A_t = \frac{\text{Actual bonus an executive earns for fiscal year } t \text{ performance}}{\text{Executive's base salary for fiscal year } t} \times 100 \quad (1)$$

$$T_t = \frac{\text{Target bonus an executive earns for fiscal year } t \text{ performance}}{\text{Executive's base salary for fiscal year } t} \times 100 \quad (2)$$

, providing the *abnormal bonus* of the executive as:

$$A_t - T_t = \frac{[\text{Actual bonus} - \text{Target bonus}] \text{ for fiscal year } t \text{ performance}}{\text{Executive's base salary for fiscal year } t} \times 100 \quad (3)$$

, from which I can construct the abnormal bonus percentage. The abnormal bonus percentage is defined as:

$$\frac{A_t - T_t}{T_t} = \frac{[\text{Actual bonus} - \text{Target bonus}] \text{ for fiscal year } t \text{ performance}}{\text{Target bonus an executive earns for fiscal year } t \text{ performance}} \times 100 \quad (4)$$

3.2 Hypothesis 1a

To test whether the probability that an executive receives at least his target bonus is independent of whether he received an above-target or below-target bonus in the prior year (Hypothesis 1a), I construct a probability matrix, in line with the methods of Indjejikian & Nanda (2002). Here I determine whether the probability of meeting the target in the current period, given that it is met in the previous period, is lower or higher than the probability of meeting the target in the current period, given that the target is not met in the previous period.

I also include non-parametric statistical test to determine whether

$$\Pr(A_t \geq T_t | A_{t-1} \geq T_{t-1}) = \Pr(A_t \geq T_t | A_{t-1} < T_{t-1}) \quad (5)$$

where I test whether the differences in proportions as defined in the equation are statistically significantly different from each other. I use the test statistic from a Z-test to assess the null hypothesis of equal proportions, indicating whether I can conclude if the proportions are statistically significantly different from each other.

3.3 Hypothesis 1b

In line with the considerations of Indjejikian & Nanda (2002), I examine whether the executives' abnormal bonuses are serially uncorrelated (hypothesis 1b). I do this by running the following regression model:

$$\frac{A_t - T_t}{T_t} = \beta_0 + \beta_1 \left(\frac{A_{t-1} - T_{t-1}}{T_{t-1}} \right) + \beta_2 \text{BELOW}_{t-1} + \beta_3 \text{BELOW}_{t-1} \left(\frac{A_{t-1} - T_{t-1}}{T_{t-1}} \right) \quad (6)$$

+ year dummies + industry effects + ε

, where A_t and T_t reflect the actual bonus and the target bonus for an executive for a fiscal year t , as defined in Equations (1)-(3). $\frac{A_t - T_t}{T_t}$ reflects the abnormal bonus as a percentage of the target bonus. BELOW_{t-1} denotes the dummy variable which equals 1 if $A_{t-1} < T_{t-1}$ and 0 otherwise. At last, I also include year dummies and industry effects to control for the heterogeneity in the magnitudes of the abnormal bonuses with respect to different years and industries when running the regression.

The interaction variable between BELOW and the abnormal bonus (as percentage), sheds light into the question whether firms revise future standards asymmetrically. That is, whether update target bonuses downwards in bad times, but not upwards in good times

using full information on past performances. Indjejikian & Nanda (2002) have found some evidence regarding the mechanisms explained above.

3.4 Hypothesis 2

To test whether the relation between consecutive target achievements is more pronounced for firms with a high compensation earnings coefficient (hypothesis 2), I extend regression model in Equation (6). I add the compensation earnings coefficient variable as a level and interaction variable with the abnormal bonus percentage as done in the following regression model:

$$\begin{aligned} \frac{A_t - T_t}{T_t} = & \beta_0 + \beta_1 \left(\frac{A_{t-1} - T_{t-1}}{T_{t-1}} \right) + \beta_2 \text{BELOW}_{t-1} + \beta_3 \text{BELOW}_{t-1} \left(\frac{A_{t-1} - T_{t-1}}{T_{t-1}} \right) \\ & + \beta_4 \text{CEC}_{t-1} + \beta_5 \text{CEC}_{t-1} \left(\frac{A_{t-1} - T_{t-1}}{T_{t-1}} \right) + \text{year dummies} + \text{industry effects} + \varepsilon \end{aligned} \quad (7)$$

, where CEC_{t-1} is the compensation earnings coefficient of a firm in the prior year ($t-1$). Here, the interaction variable between abnormal bonus and CEC is crucial for testing hypothesis 2. By examining the coefficient of the interaction variable in combination with the entire model, one can induce whether the relation between consecutive target achievements (abnormal bonuses) is more pronounced for executives with a high compensation earnings coefficient.

The CEC variable is constructed in line Iwasaki et al. (2018). The variable serves as a proxy for the executive-specific compensation earnings coefficient and is constructed by running the following regression model:

$$\Delta \text{BONUS}_{it} = \beta_0 + \beta_1 \Delta \text{E}_{it} + \beta_2 \text{RET}_{it} + \varepsilon_{it} \quad (8)$$

where ΔBONUS denotes the change in the natural logarithm of the executive's bonus at fiscal year end. ΔE is the change in net income deflated by the market value of equity at the beginning of the fiscal year. At last RET determines the cumulative stock returns over the entire firm's fiscal year.

The CEC is determined by estimating the time-series regression model in Equation (8) for each executive for the period $t-8$ to $t-1$. After running the time-series regression for each firm, I back out β_1 from Equation (8) as the final CEC for the specific firm i . Hence, the CEC coefficient indicates the sensitivity of a firm's executive bonus to its fiscal year earnings over the sample period.

3.5 Descriptive Statistics

Table 2 exhibits descriptive statistics on CEO and non-CEO executive salaries for the observation entries used for the equity and non-equity bonus analysis. Statistics for A_t , T_t , the abnormal bonus and abnormal bonus percentages are also shown in Table 2. The CEO and non-CEO salaries for the non-equity bonus sample is \$1,063,243 and \$577,183, respectively. Corresponding (non-equity) bonus payments are \$1,979,804 and \$657,312 respectively. One immediately finds salary for non-CEOs is substantially lower than compensation for CEOs.

The descriptives table also indicates CEOs target and actual bonuses are larger than non-CEO bonuses, both in absolute and relative terms, for non-equity and equity bonuses. One might suggest that the conclusions while testing the hypotheses might differ as the distributions of compensation variables differ from CEOs and non-CEOs. Hence, I conduct most of the tests separately for CEOs and non-CEO executives.

Furthermore, Table 3.5 indicates mean abnormal bonuses and percentages are positive for CEOs non-equity bonuses. However, the absolute mean abnormal bonus (scaled by base salary) for non-CEOs for non-equity bonuses is -0.36. For equity bonuses, I find mean abnormal bonus percentages to be relatively large: 73.23 percent for CEOs and 152.75 percent for non-CEOs. Note that for equity bonuses, the actual and target bonus figures are not given in dollars, nor are they scaled by salary. These figures merely provide the absolute number of equity shares connected to the relative bonus figure for the executives

Table 2: Descriptive Statistics for Executive Compensation Variables

A. Non-Equity Bonuses

	CEOs						non-CEOs					
	<i>n</i>	<i>Mean</i>	<i>Median</i>	<i>1st Quartile</i>	<i>3rd Quartile</i>	<i>Std. Dev</i>	<i>n</i>	<i>Mean</i>	<i>Median</i>	<i>1st Quartile</i>	<i>3rd Quartile</i>	<i>Std. Dev</i>
Base Salary (\$ thousands)	981	1063.24	1031.35	875.00	1250.00	313.25	6,783	577.18	540.26	433.73	676.67	215.33
Actual Bonus (\$ thousands)	981	1979.80	1567.50	925.76	2629.40	1675.73	6,783	657.31	493.36	260.04	842.43	738.95
Actual Bonus (A_t)	981	1.74	1.55	1.08	2.20	1.23	6,783	1.05	0.95	0.60	1.35	0.85
Target Bonus (T_t)	981	1.55	1.31	1.01	1.69	0.88	6,783	1.41	0.82	0.68	1.04	32.86
Abnormal Bonus ($A_t - T_t$)	981	0.19	0.20	-0.26	0.75	1.14	6,783	-0.36	0.10	-0.24	0.44	32.85
Abnormal Bonus (as %)	981	31.87	15.00	-19.62	60.00	268.48	6,783	31.19	12.03	-26.33	53.00	473.89

B. Equity Bonuses

	CEOs						non-CEOs					
	<i>n</i>	<i>Mean</i>	<i>Median</i>	<i>1st Quartile</i>	<i>3rd Quartile</i>	<i>Std. Dev</i>	<i>n</i>	<i>Mean</i>	<i>Median</i>	<i>1st Quartile</i>	<i>3rd Quartile</i>	<i>Std. Dev</i>
Base Salary (\$ thousands)	922	1073.40	1050	875.29	1250	306.40	5,827	590.90	554.47	447.29	695.71	695.71
Actual Bonus (Shares by thousands)	922	1974.77	1580	904.51	2624.35	1706.72	5,827	653.08	502.40	251.16	857.60	857.60
Target Bonus (Shares by thousands)	922	124.82	50.719	23.23	112.47	317.71	5,827	42.19	13.27	5.01	31.37	31.37
Abnormal Bonus (as %)	922	73.23	26.01	9.71	68.29	165.34	5,287	152.75	34.14	9.14	97.66	3601.08

Note. This table provides descriptive statistics for CEOs and non-CEOs with equity and non-equity bonuses, separately. A dataset is used from 2014 to 2021, with 981 and 922 distinct CEOs used for non-equity and equity bonuses, respectively. The non-CEOs comprise 6,783 and 5,287 distinct executives, for non-equity and equity bonuses respectively. A_t is the executive’s actual bonus for fiscal year t performance, scaled by the executive’s year t base salary. T_t is the executive’s target bonus for fiscal year t performance, scaled by the executive’s year t base salary. Note that for equity bonuses (B), the actual and target bonus figures are not given in dollars, nor are they scaled by salary. These figures merely provide the absolute number of equity shares connected to the relative bonus figure for the executives

4 Data

4.1 Hypothesis 1

For the first hypothesis I've retrieved the data from several databases of the Wharton Research Data Services (WRDS) databases where I've included the companies from the Russell 3000 index for the period from 2015 to 2021. For my first hypothesis I needed to collect data relating to compensation of executives. In order to do so, I've retrieved data from the ISS incentive Lab database. The datasets I've used for my first hypothesis are the ISS Summary Compensation table (SumComp table), the ISS Grants of Plan-Based Awards table (GbpGrant table) and the Option Exercises and Stock Vested table (ExerVest).

The SumComp table displays the Stock Awards, the option Awards and the Non-Equity compensation on executive year level. The ExerVest table displays the Options and Stock that have vested for every executive in every year. the GbpGrant table shows the grants that have been given for every executive in every year. Every grant shows the target bonus for either equity compensation or non-equity compensation where equity compensation is displayed units of equity and non-equity compensation is given in currency.

The data from the SumComp table and the ExerVest table are given per executive year. However, the GbpGrant table is displayed per grant. Note that one executive can have multiple grants for one year. Furthermore, the vesting structure of each grant is structured in such a manner, that is does not necessarily vest in the year the bonus relates to. Each grant vests either after the performance period or on a monthly, quarterly, semiannually or yearly basis. Based on the vesting schedule for each grant I've calculated in which year the reward will vest resulting in a dataset on executive year level where every observation displays the number of stocks and the number and the amount of non-equity compensation that vests in that year if target performances were to be met. Before doing so, I've removed the following grants that relate to option rewards, as these primarily are time related, whereas we want to explore the performance based compensation rather than rewards based on time. Then I've removed all the observations without vesting information as it is unclear when these target bonuses will vest. Further, I delete all grants of which the grant date is missing, as this makes calculating when the target bonuses vest becomes inaccurate as I only know the year in which the grant is given. However, as the majority of the non-equity bonuses lacks a grant date, I've kept those included. Note that most of these grants that relate to cash bonuses are limited to one payout after the performance period of a year enabling me to allocate the vesting of these grants to the correct executive year. Then I've removed all the grants of which the frequency of vesting did not align the vesting schedule. For example, when the vesting schedule denotes that the length of the vesting period is 19

months but payment happens semi-annually. Then I removed the grants that vest once the executive retires, as it is uncertain when these awards vest. Furthermore, I've removed all observations where the vesting schedule is other than Cliff (after performance period) or Ratable (monthly, quarterly, semi-annually or yearly) as it is not known when these awards will vest.

Next, I derive the actual non-equity awards and equity awards from the Sumcomp table and the Exervest table respectively. Note that these tables are displayed for every executive year. For the completeness of our test, I've only kept executive years of which all grants can be included into our dataset to prevent our test from biased due to missing data.

Note that for equity compensation, the data is given in units of shares rather than currency. This is due to the fact that the stock value when the share vests differs from the stock value when the grant is given. Using the value of vested shares as achieved target payout and the fair value of shares at grant date as target payout would result in unreliable results. Therefore I've performed regression related to equity bonuses and non-equity bonuses separately.

4.2 Hypothesis 2

For my second hypothesis I need to construct the Compensation Earnings Coefficient (CEC hereafter) which is a proxy for the sensitivity of earnings on bonuses. In order to do so I've extracted the data from the ISS Summary Compensation table that denotes the bonuses given per participant year for the executive years and kept the observations of which the executive years reconcile with the executive years which are used to test our first hypothesis. I've calculated the bonuses by subtracting salary and other compensation from the total compensation per executive year. Then I've extracted the earnings deflated by market value from the Compustat database. The firm-years of which either earnings or market value had missing values or a value of 0 were removed. Then, I've extracted the monthly stock return from the CRSP database and recalculated the yearly return. The firm-years of which one or more monthly returns are missing are removed as a whole. Lastly I've merged the CRSP and Compustat dataset with the ISS summary Compensation table based on company and year.

Note that in order to construct the compensation earnings coefficient for every executive year which is based on a regression from $t-8$ to $t-1$ it is necessary for the yearly stock return to be present for the 8 years prior. Moreover, as the earnings, market value and bonus variables are used to calculate the change compared to prior year in order to calculate the proxy, the data from 9 years prior is required to be present for every executive year. Therefore all the

executive years which has a missing yearly return value for the 8 years prior, or a missing bonus, earnings or market value or missing earnings value have been removed.

Table 1: Sample Selection Procedure

	Executive years
Grant Plan Based awards table	104,544
Less:	
Missing data to calculate variables	(40,480)
Merging with Summary Compensation table & Executive Vesting table	(53,544)
Observations available for hypothesis 1	10,520
Less:	
Merging with Compensation earnings coefficient table	(9,983)
Observations available for hypothesis 2	537

5 Results

5.1 Probability Matrix abnormal bonuses

I present the results of the tests of hypothesis 1a in Table 2. Here, I exhibit two tables regarding non-equity and equity bonuses. As noted in the hypothesis development, if performance standards fully reflect the executive's past performance, the probability that an executives receives a bonus higher than its target bonus should be independent of whether he received a positive (or negative) abnormal bonus in the previous year. In Table 2, Panel A, I document a 67 percent chance of a CEO receiving at least the target bonus, given it received at least the target bonus in the prior year, when considering non-equity like bonuses. The percentage for equity-like bonuses is 65 percent, and therefore fairly similar. On the other hand, if the CEO's bonus was lower than the target bonus in the prior year, he only has a 59 percent chance of receiving a bonus higher than the target for non-equity bonuses (Panel A), and 55 percent for equity bonuses. In line with Indjejikian & Nanda (2002), I perform a non-parametric test of differences in proportions for bonuses with positive and negative abnormal bonuses in the previous years. Considering both cases of non-equity and equity bonuses, the z-stat is statistically significant at the 1% level.

Results on non-CEO executive abnormal bonuses can also be found in Table 2, Panel A (non-equity bonuses) and Panel B (equity bonuses). The results indicate a non-CEO has a 67% percent chance of yielding an abnormal bonus for non-equity bonuses (Panel A), and

65 percent for equity bonuses (Panel B), given a positive abnormal bonus in the prior year. Given the target bonus in the prior year was larger than the actual bonus, the probability of receiving a positive abnormal bonus for non-CEOs is 49 and 47 percent for non-equity and equity-like bonuses, respectively. As for the CEO bonuses, all tests with the null hypothesis of equal probabilities for positive and negative abnormal bonuses in the prior years, are rejected at the 1% significance level.

Overall, the evidence in Table 2 is in line with the findings of Indjejikian & Nanda (2002), rejecting the null hypothesis that the probability that an executive will achieve his performance standard independent of past performance, suggesting firms don't fully adjust standards to reflect executives' past performance. These hypotheses are rejected for CEOs, non-CEOs, non-equity and equity bonuses.

5.2 Serial Correlation Abnormal Bonuses

The results for hypothesis 1b are presented in Table 3. Column (1) and (3) exhibit results regarding non-equity bonuses, while Column (2) and (4) describe the results for equity bonuses. I use the framework as denoted in Equation 6. In all columns, I regress CEO and non-CEO executives' abnormal bonus percentage on its lagged value. In line with considerations of Indjejikian & Nanda (2002) I also allow for the possibility that firms revise standards asymmetrically depending on whether executives' past performance was above or below standard. I include a dummy variable which equals 1 if the abnormal bonus was negative in the prior year, and interaction variable that measures the incremental response. Year fixed effects are included to control for the variation in average bonuses across years. Industry-wide factors that may induce persistent abnormal bonuses over time are accounted for by including industry fixed effects across the regression models. In line with Indjejikian & Nanda (2002), to help control for performance exceeding the performance maximum and to mitigate effects of extreme values, I exclude extreme abnormal bonuses where an executive's bonus is more than three times his target bonus.

All regressions denoted in Table 3 are statistically significant (see F-stats), with an adjusted R^2 from 10 to 17%. Furthermore, all coefficient estimates on the executives' abnormal bonuses are statistically significant at the 10% significance level. Hence, hypothesis 1b stating there is no serial correlation between abnormal bonuses of executives can be rejected.

The intercepts across all models in Table 3 are insignificant, indicating we can't find evidence where after controlling for year and industry effects, abnormal bonuses are significantly larger than 0. If we use the model from column (1), however, we find that if the abnormal bonus in the prior year increases by 10 percent, the current bonus exceeds the

Table 2: Frequency distribution of Executives' Actual vs. Target bonuses in consecutive periods

Panel A. Non-equity bonus

		CEO (n=726)		Non-CEO (n=3,770)	
		$A_t < T_t$	$A_t \geq T_t$	$A_t < T_t$	$A_t \geq T_t$
$A_{t-1} < T_{t-1}$	% Total Observations	15.29	21.90	18.49	17.67
	% Row Observations	41.11	58.89	51.14	48.86
$A_{t-1} \geq T_{t-1}$	% Total Observations	20.80	42.01	20.95	42.89
	% Row Observations	33.11	66.89	32.82	67.18

Tests: Test for differences in proportions (indicated in bold), for CEOs and non-CEOs separately. For CEOs, the z-stat is 38.78, and for non-CEOs, the z-stat is 121.46. Hence, both are significant at the 1% level, rejecting the null of equal proportions.

Panel B. Equity Bonus

		CEO (n=778)		Non-CEO (n=4,049)	
		$A_t < T_t$	$A_t \geq T_t$	$A_t < T_t$	$A_t \geq T_t$
$A_{t-1} < T_{t-1}$	% Total Observations	17.99	22.11	20.57	17.93
	% Row Observations	44.87	55.13	53.43	46.57
$A_{t-1} \geq T_{t-1}$	% Total Observations	21.21	38.69	21.41	40.08
	% Row Observations	35.41	64.59	34.82	65.18

Tests: Test for differences in proportions (indicated in bold), for CEOs and non-CEOs separately. For CEOs, the z-stat is 24.41, and for non-CEOs, the z-stat is 135.59. Hence, both are significant at the 1% level, rejecting the null of equal proportions.

Note. The table presents tests for hypothesis 1a for equity (Panel A) and non-equity bonuses (Panel B). A_t is the executive's actual bonus for fiscal year-t performance. T_t is the executive's target bonus for fiscal year-t performance. The rows in the table correspond to outcomes for which the executive's actual bonus was less than, or greater than or equal to his target bonus in the previous year. The columns correspond to the same outcomes for the current year, t. For CEOs and non-CEOs separately, the upper number in each cell is the percentage of the total CEO or non-CEO observations that are classified in that cell. The lower number in each cell is the conditional percentage—the percentage of row observations corresponding to that cell.

target bonus by 3.4 percent on average.

Across all regression models the results show a negative coefficient for the interaction term with the BELOW dummy and abnormal bonus percentage, which is statistically significant at the 1% level across all models. These findings are qualitatively similar to the findings of Indjejikian & Nanda (2002) regarding the interaction term. The negative term of the interaction term indicates executive increases in abnormal bonuses in prior years have a larger absolute effect on the abnormal bonuses in this year, if abnormal bonuses have been positive in prior years. Hence, this provides evidence of an asymmetric standard-setting process where firms revise future standards downward to reflect the bad times more aggressively than they revise them upward to reflect the good times.

For instance, in the case of non-equity bonuses for CEOs as shown in column (1), if in the prior year the actual bonus exceeded the target bonus by 10 per cent, the current bonus on average exceeds the target bonus by 3.4 per cent. However, if the CEO missed the target bonus by 10 percent, the current bonus will be 2.1 per cent on average. Hence, here we see that the bonuses are revised downwards such that in the next period the CEO can even attain a positive abnormal bonus. Results for CEOs with equity bonuses are qualitatively similar.

The implications of the interaction term for non-CEOs are somewhat less severe. Instead of flipping the abnormal bonus percentage from negative in the prior year to a positive abnormal bonus, on average, here one can see that the discrepancy between missing the target is reduced. For instance, in Column (4), the results indicate if the actual bonus trumped the target bonus by 10 per cent in the prior year, the actual bonus surpasses the target bonus by 3.4 per cent. However, if the actual bonus was 10 percent lower than the target bonus in the prior year, the executive (non-CEO) will on miss the target in this year 0.7 per cent, on average.

Overall, the results of Table 3 are largely in line with the findings of Indjejikian & Nanda (2002). These results suggest firms do not fully update their beliefs on performance standards based on prior executives' past performance, especially not when the performance has surpassed the target performances of the company in the prior year. I find evidence for the notion of an asymmetric standard-setting process, where firms revise future standards downward reflecting bad times more aggressively than they revise them upward to reflect the good times.

Table 3: OLS Regressions of persistence in abnormal bonus percentages

Independent Variables	CEOs		Non-CEOs	
	(1) Non-Eq	(2) Equity	(3) Non-Eq	(4) Equity
Intercept	0.093 (0.46)	0.093 (0.46)	0.401 (1.05)	0.276 (0.74)
$\frac{A_{t-1}-T_{t-1}}{T_{t-1}}$	0.338*** (5.21)	0.315*** (4.71)	0.334*** (12.32)	0.336*** (12.08)
BELOW _{t-1}	-0.007 (-0.10)	-0.043 (-0.64)	-0.002 (-0.07)	-0.002 (0.96)
BELOW _{t-1} $\frac{A_{t-1}-T_{t-1}}{T_{t-1}}$	-0.543*** (-4.16)	-0.517*** (4.02)	-0.319*** (-6.02)	-0.272*** (-5.18)
Adjusted R^2	17.46%	10.69%	13.26%	14.06%
F-stat	2.63	2.59	10.43	10.89
n	646	629	3,271	3,203

Note. Table 3 exhibits OLS regressions as defined in Equation (XX) of the Methodology section. Column (1)-(2), run regression models for CEO compensation packages, while columns (3)-(4) run regression models for non-CEO executives. Column (1) and (3) denote regression models for non-Equity compensation, while column (2) and (4) show regression results for equity bonuses. $\frac{A_t-T_t}{T_t}$ denotes the bonus an executive receives subtracted by the target bonus, and scaled by the target bonus at time t . $BELOW_{t-1}$ denotes the dummy variable equaling 1 if an executive's actual bonus was less than his target bonus in year $t-1$. Industry and year dummies are included in all regressions, though coefficients are suppressed here. The results only include executive years where $A_t < 3T_t$, and $A_{t-1} < 3T_{t-1}$. In addition, the results only consider years where an executive earned a bonus in year t ($A_t > 0$). ***, **, and * denote statistically significant coefficients at the 1%, 5% and 10% significance level, respectively

5.3 Compensation Earnings Coefficient

To test hypothesis 2, I first determine the year-specific CEC for each participant from which I obtain data over the sample period. The relevant CEC (coefficient) can be obtained by extracting the unique firm and participant coefficient from the regression related to ΔE . The results are summarized with the mean of all coefficients for all regression output in Table 4. The mean coefficient for ΔE for CEOs is 2.38. For CEOs the mean of all CECs obtained that are larger than 0 is 14.38, while for CECs lower than 0 the mean of the CECs for CEOs is -18.53. For non-CEOs the mean CEC is somewhat larger, with an average of 5.37. For non-CEOs the mean for CECs larger than 0 is 12.82, while for CECs lower than 0 the mean is -5.36.

Table 4: Regression results for compensation earnings (to extract CEC)

	CEO			non-CEO		
	<i>Full sample</i>	<i>CEC > 0</i> <i>Coefficient</i>	<i>CEC < 0</i>	<i>Full sample</i>	<i>CEC > 0</i> <i>Coefficient</i>	<i>CEC < 0</i>
Constant	0.13	0.11	0.16	-0.02	-0.07	0.05
ΔE	2.38	14.83	-18.53	5.37	12.82	-5.64
RET	0.19	0.05	0.44	0.51	0.56	0.43
Adjusted R^2	0.04	0.07	-0.01	0.07	0.14	-0.02
R^2	0.31	0.34	0.28	0.34	0.38	0.27

Note. This table exhibits estimated parameters of the regression as defined in Equation (8). $\Delta BONUS$ is the change in natural log of a CEO or non-CEO's bonus at fiscal year end. ΔE is the change in net income deflated by market value of equity at the beginning of fiscal year. RET is the cumulative stock market return of the firm's fiscal year over the last 12 months. Regressions are estimated for every participant-year. The table reports mean coefficients across all participant IDs (unique executive identifiers). The table also reports the mean adjusted R^2 (across participant-years) for all regressions.

5.4 Serial Correlation Abnormal Bonuses with earnings sensitivity of bonus

The results for hypothesis 2 are presented in Table 5. Again, Column (1) and (3) exhibit results regarding non-equity bonuses, while Column (2) and (4) describe the results for equity bonuses. In all columns, I regress CEO and non-CEO executive's abnormal bonus percentage on its lagged variable and a set of variables and interaction variables. The regression models are specified in Equation (7). In essence, I extend the regression from Table 3 by adding the CEC coefficient to incorporate the sensitivity of an executives' earning and bonus. The interaction term between CEC and the abnormal bonus percentage allows us to examine whether the relation between consecutive target achievements (abnormal bonuses) is more

pronounced for executives with a high compensation earnings coefficient. Again, year fixed effects are included to control for the variation in average bonuses across years, while industry dummies are included to control for industry-wide factors that may induce persistence in industry-wide abnormal bonuses over time.

The regression models for non-CEO executives in Column (3) and (4) are statistically significant, with an adjusted R^2 of 15 and 20, respectively. However, the models for CEO executives are not statistically significant, though yielding a relatively high R^2 of 18 and 27 percent, respectively. Reasons for not yielding a significant joint F-test for all regression coefficient could be that the number of observations are relatively low with respect to the model in Table 3, due to the data collection process for the CEC coefficient.

The coefficient output in Column (1) and (2) are qualitatively similar as the results found in Table 6. The coefficients for the lagged abnormal bonus percentage and interaction term between the BELOW dummy and abnormal bonus come in at the same sign. However, here we only find a statistically significant coefficient for the lagged abnormal bonus percentage in Column (2). The interaction term between BELOW and abnormal bonus are statistically significant at the 10% significance level in Column (1) and (2). These results corroborate our earlier results finding positive serial correlation between abnormal bonuses, where firms seem to more aggressively update target bonuses downwards in bad times than they update target bonuses upwards, giving rise to the asymmetric standard setting of firms.

The level variable of CEC is not statistically significantly different from 0 across all models in Table 5. However, interesting insights can be derived from the interaction term between the CEC and abnormal bonus percentage in Column (1) and (2), for CEO executives. Here, the interaction term comes in at a negative sign of -0.030 and 0.028 respectively, and are both statistically significant at the 5% significance level. An increase of the CEC by 10 reduces the abnormal bonus percentage by 0.3 percent, *ceteris paribus*. This result contradicts hypothesis 2, as the results indicates the relation between consecutive target achievements is less pronounced for executives with a high compensation earnings coefficient.

The outcome of the regression output indicates that for executives where the dependence of their bonus is more strongly correlated with the earnings of their company, the serial correlation between abnormal bonuses weakens. This could be explained that if firms are tend to provide higher bonuses for CEOs dependent on the firms performance, they engage and update their bonus award system more adequately. Therefore, a high CEC can be seen as an indicator for a firm adequately adjusting their bonus awards, taking on an anticipative role, and therefore indirectly also anticipate on their bonus schemes. Hence, an increase in CEC variable signals a firms pro-active role in awarding and updating bonus schemes, ultimately updating their beliefs and performances based on prior executives' past performances more

adequately than firms with a low CEC.

Unfortunately, the results for non-CEOs provide less insightful results in Column (3) and (4). No statistically significant coefficients are found there. One reason for somewhat less strong results in the table including the CEC variables is the low number of observation per regression model we obtain due to the matching process. However, some indicative results are found for CEO-models, while none are found for non-CEO models. An explanation could be that CEO-bonuses are more strongly correlated with earnings (net income) than bonuses for non-CEO executives. Hence, the CEC coefficients for non-CEOs are much more noisy, as this coefficient captures the relation between bonus of an executive and firm earnings (net income). As the CEC for non-CEOs is more noisy, they will add noise to the regression models in Column (3) and (4), and yield weaker results with regards to the regression models obtained for CEOs in Column (1) and (2).

Overall, the results in Table 7, provide no evidence for the notion that consecutive target achievements (abnormal bonuses) is more pronounced for executives with a high compensation earnings coefficient (hypothesis 2). Alternatively, results for CEOs indicate that increases in the CEC signals the pro-activeness of a firm towards updating previous firm-specific information accurately, which also reduces serial correlation between abnormal bonuses for CEO executives. This effect couldn't be found for non-CEO executives, which may be linked to the more noisy proxy of the CEC, as non-CEO bonus awards are less directly linked to the earnings of a specific firm.

Table 5: OLS Regressions of persistence in persistence abnormal bonus in relation earnings/bonus sensitivity

Independent Variables	CEOs		Non-CEOs	
	(1) Non-Eq	(2) Equity	(3) Non-Eq	(4) Equity
Intercept	0.217 (0.68)	0.108 (0.34)	0.220 (1.00)	0.476*** (2.07)
$\frac{A_{t-1}-T_{t-1}}{T_{t-1}}$	0.386 (1.44)	0.539* (1.83)	0.270 (1.53)	0.006 (0.03)
BELOW _{t-1}	0.028 (0.20)	0.109 (-0.74)	-0.420 (-0.26)	-0.012 (-0.07)
BELOW _{t-1} $\frac{A_{t-1}-T_{t-1}}{T_{t-1}}$	-0.774* (-1.85)	-0.830* (-1.90)	-0.123 (-0.35)	-0.272 (1.05)
CEC _t	0.002 (0.42)	0.002 (0.40)	0.001 (0.82)	0.002 (0.66)
$\frac{A_{t-1}-T_{t-1}}{T_{t-1}} * CEC_t$	-0.030** (-2.43)	-0.028** (-2.18)	-0.000 (0.12)	-0.003 (-0.42)
Adjusted R2	17.78%	27.31%	14.72%	20.48%
F-stat	1.57	1.43	2.45***	1.85***
F-test: Beta1 + Beta3				
n	84	79	152	129

Note. Table 5 exhibits OLS regressions as defined in Equation (XX) of the Methodology section. Column (1)-(2), run regression models for CEO compensation packages, while columns (3)-(4) run regression models for non-CEO executives. Column (1) and (3) denote regression models for non-Equity compensation, while column (2) and (4) show regression results for equity bonuses. $\frac{A_t-T_t}{T_t}$ denotes the bonus an executive receives subtracted by the target bonus, and scaled by the target bonus at time t . $BELOW_{t-1}$ denotes the dummy variable equaling 1 if an executive's actual bonus was less than his target bonus in year $t-1$. I include the CEC_t coefficient and an interaction term, by using the proxy for CEC as defined in Equation (8). Industry and year dummies are included in all regressions, though coefficients are suppressed here. The results only include executive years where $A_t < 3T_t$, and $A_{t-1} < 3T_{t-1}$. In addition, the results only consider years where an executive earned a bonus in year t ($A_t > 0$). ***, **, and * denote statistically significant coefficients at the 1%, 5% and 10% significance level, respectively.

6 Conclusion

In this paper I aim to examine whether fully revise their targets less effectively when performance-based compensation is strongly influenced by reported earnings. I use a two-step approach to answer the research question as mentioned above. First, I examine the relationship between abnormal bonuses for CEOs and non-CEOs over time. Here, I'm par-

ticularly interested in the notion whether firms do, or do not fully adjust their bonus targets with all prior information executives achieving their target performances. Second, I delve deeper into the relationships between consecutive abnormal bonuses, by also investigating the relationship between the correlation of abnormal bonuses and how they are linked to the compensation earnings coefficient. Concretely, I examine whether the relation between consecutive target achievements (abnormal bonuses) is more pronounced for executives with a high compensation earnings coefficient.

To examine whether firms fully update the performance targets of the CEOs and non-CEOs, I first analyzed whether the probability of having a positive abnormal bonus for executives was larger if in the prior period an abnormal bonus was achieved, relatively to if in the prior period no positive abnormal bonus was achieved. I followed the research framework of Indjejikian & Nanda (2002). The results provide strong evidence for the notion that the probability of achieving a positive abnormal bonus is higher when a positive abnormal bonus was achieved in the prior period, for CEOs, non-CEOs, non-equity and equity bonuses. Furthermore, I also find strong evidence for the notion that abnormal bonuses are positively serially correlated. The results suggest firms do not fully update their beliefs on performance standards based on prior executives' past performance, especially not when the performance has surpassed the target performances of the company in the prior year. Additionally, I find evidence for the notion that firms asymmetrically update their target performance metrics, where firms revise future standards downward reflecting bad times more aggressively than they revise them upward to reflect the good times.

To test whether the relation between consecutive target achievements is more pronounced for executives with a high compensation earnings coefficient, I extended the framework for the first hypothesis by adding a level and interaction variable of CEC with the abnormal bonus. The results provide no evidence for the notion that consecutive target achievements are more pronounced for executives with a CEC. Alternatively, I do find some evidence for the notion that a high CEC signals the pro-activeness of a firm towards updating previous firm-specific information accurately, which may reduce the serial correlation between abnormal bonuses for CEO executives.

Overall, I find strong evidence for the notion that firms do not fully revise their performance standards for bonus packages based on prior performance information, for CEOs, non-CEOs, non-equity and equity bonuses. Furthermore, the notion that bonus packages are more sensitive to earnings, seems to be a strong indicator for whether firms take a pro-active role in adjusting the bonuses based on year and person-specific performance. All results corroborate earlier findings of Indjejikian & Nanda (2002), where firms fail to fully update their performance standards based on prior information, giving rise to mismatches in the goal

of bonus packages, which are ultimately used to reduce principal-agent problems. These principal-agent problems can negatively influence executive performances, and make sure the interests of the shareholders and executives are less well-aligned, which may negatively affect firm performance in the long run.

6.1 Limitations and recommendations for future research

Even though I did attempt to answer the research question to the best of my ability, there are still some limitations that I ran into while writing this paper. In order to make a good comparison between target payout and the actual payout I had to include all the grants that relate to an executive year. Note that some grants relate to the executives' tenure rather than its performance. Not being able to isolate the grants that merely relate to performance may have resulted in less pronounced results than they would have been if time related awards would not have been included. Furthermore, I noted that merging the datasets for the second hypothesis resulted in a significant decrease in observations. As the compensation earnings coefficient for one executive year was reliant on the available data of the 9 preceding years, many observations were lost due to missing data. The tests that relate to the second hypothesis would have been more reliable if the amount of observations were larger. For future research It would also be interesting to employ a research design where the performance related grants were to be isolated. Furthermore, it would be interesting as well to design a different measure of the sensitivity of earnings to bonuses which is less reliant on the data of multiple preceding years.

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