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THE STRUCTURE AND INCENTIVE PROPERTIES OF CEO  
BONUSES: DO ANNUAL CEO BONUS PLANS SPUR EARNINGS  
MANAGEMENT?

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**The Structure and Incentive Properties of CEO Bonuses: Do Annual  
CEO Bonus Plans Spur Earnings Management?**

David Pecha

A thesis submitted in partial fulfilment of the requirements for the degree  
of Doctor of Philosophy

March 2018

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## ABSTRACT

I investigate whether and when do annual bonus plans incite CEOs to manage short-term performance. I employ a large hand-collected dataset of detailed CEO bonus plan features that allows me to link ex-ante bonus schemes with their actual pay-outs. I show that CEOs manage earnings downwards whenever bonuses become insensitive to marginal performance (i.e. below minimum and above maximum payout thresholds) and upwards otherwise. This pattern is particularly pronounced for larger bonus plans and when corporate governance is weak. In additional tests, I rule out the possibility that this behavior is driven by CEOs' incentives to smooth earnings. The novel dataset also allows me construct measures of the ex-ante strength and relative importance of bonus driven incentives and to investigate the factors influencing the ex-ante structure of the bonus plan as well as the determinants and consequences of voluntary bonus disclosures. Finally, I also leverage my dataset to re-investigate prior findings on the pay-for-performance sensitivity of cash pay and find evidence suggesting that results documented in prior literature are mechanically driven by ex-ante bonus plan structure. The investigation of the incentive consequences of bonus plans is particularly timely given that recent regulatory changes render bonus pay relatively more favourable to companies at the expense of equity pay and bonus pay is expected to proliferate.

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## 1 Introduction

Cash pay historically accounted for a commanding fraction of CEO pay packages and still remains the dominant form of executive pay in most countries around the world<sup>1</sup>. The same had been true in the United States, where S&P500 CEOs received nearly 70% of their compensation in the form of cash salaries and cash bonuses in 1992. The situation changed dramatically after 1993, when, in an attempt to constrain ‘excessive’ CEO compensation, Bill Clinton signed into law a new tax code provision<sup>2</sup> limiting the tax-deductibility of CEO pay, exempting only compensation that could be classified as purely performance-based, a criterion most easily satisfied by stock and option pay<sup>3</sup>.

Consequently, equity compensation experienced meteoric rise which stimulated a large body of academic literature on the incentive properties of CEO equity pay and the relationship of equity pay and misreporting (e.g. Armstrong et al., 2013). Nevertheless, cash compensation remained an important driver of CEO incentives (annual bonuses currently account for one quarter of S&P500 CEO pay). CEO bonus plans have been frequently criticized by the business press and others for allegedly instilling short-termism and inciting CEOs to manage earnings. Bonus awards have also been blamed for contributing to the financial meltdown of 2008, and were targeted by the Dodd-Frank Act as well as by the Troubled Asset Relief Program. Nevertheless, CEO bonus plans received little attention in the academic literature over this time period.

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<sup>1</sup> E.g. in China equity compensation was legalized and encouraged by the local regulatory bodies since 2007. However, a decade later, less than 1% of listed companies provide stock or equity rewards to their CEOs (Conyon & He, 2012). See Abowd & Bognanno (2007) for an international comparison of CEO pay differences.

<sup>2</sup> Section 162(m) of the Internal Revenue Code.

<sup>3</sup> While restricted stock and stock options granted at the money automatically satisfy the criterion, CEO bonus plans must meet a number of requirements with respect to the difficulty of attainment of the bonus payout as well as the magnitude of potential discretionary adjustments by the board.



In a surprise move, the United States congress repealed the 1993 compensation deduction exemption while passing the Tax Cuts and Jobs Act in December 2017. Consequently, cash compensation suddenly becomes significantly more favorable at the expense of equity pay, and corporate governance experts speculate equity compensation might largely concede its place back to cash-based bonuses as the main form of incentive pay. However, little is known about the potential adverse incentive consequences of bonus plans or about the ways in which these incentives can be mitigated. While the business press suggests that bonus plans can indeed lead to earnings management, the most recent academic study on the topic (Gaver et al., 1995) documents that CEO bonuses do not lead to earnings management, and argues that the semblance of such a relationship is driven by unrelated financial reporting incentives, such as managers' desire to smooth earnings.

Therefore, I investigate whether and under what circumstances do annual CEO bonus plans lead to earnings management. To do so, I hand-collect a large novel dataset of CEO bonus details. One of the contributing factors for the scarcity of recent studies on CEO cash bonuses has been the lack of machine readable bonus data. In fact, prior studies typically rely on small datasets based on infrequent voluntary disclosures<sup>4</sup>. I exploit the 2006 SEC disclosure requirement changes, enabling me to hand-collect both ex-ante (i.e. how much the CEO knew he would get paid under what circumstances) and ex-post (i.e. how much got actually paid) information<sup>5</sup>, therefore allowing me to accurately identify the nature of the

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<sup>4</sup> E.g. Gaver et al. (1995) collect data for 102 firms that voluntarily disclosed their bonus plan details between 1980 and 1990.

<sup>5</sup> Prior to 2006, the only machine-readable information was the actual ex-post bonus payout. Following the 2006 SEC disclosure regulation this amount is not available either, as it became confounded with other non-equity incentive compensation components (such as long-term incentive plans) in traditional compensation databases.

incentives the CEO had been facing. Additionally, the data also allows me to establish several new ex-ante measures of the strength of incentives derived from the CEO's bonus plans and to directly investigate the pay-for-performance sensitivity of the bonus plan.

First, I investigate whether bonus plans in general incite earnings management. Typical bonus plans have non-linear payoffs – zero payout for performance below lower performance threshold, capped maximum payout for performance exceeding upper performance threshold and formulaic payout between the two bounds. Since I can determine how the CEO ended relative to his ex-ante bonus bounds, I can ex-post identify whether the bonus plan provided the CEO with incentives to manage earnings upward or downward - if the actual bonus did not meet the threshold bonus, the CEO had incentives to depress performance by *downward* earnings management (and thus 'save' performance for an eventual future bonus); if the actual bonus fell within the incentive zone<sup>6</sup> the CEO had incentives to select *positive* discretionary accruals (to increase current bonus); and if the actual bonus was at the maximum, the CEO likely had incentives to manage earnings *downward* (again, to 'save' performance for a future period), but he also could have arrived at the maximum by *positive* accruals from within the incentive zone.

In fact, I find that CEOs report relatively more negative discretionary accruals when their actual bonuses are either at their maximum or minimum, and relatively more positive discretionary accruals when actual bonuses are within the incentive zone, i.e. between the minimum and maximum amount. This evidence is consistent with CEOs' efforts to maximize their bonus payouts by the means of earnings management.

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<sup>6</sup> Perhaps with the exception of the uppermost part of the incentive zone, where the CEO might have had incentives to depress performance from above the threshold actual performance.

The initial results implicate bonus plans from spurring earnings management. If this assertion is true, the relationship should be particularly pronounced when bonus plans are more material and thus provide stronger incentives. I test and find that this earnings management pattern is indeed especially strong for firms with larger bonus plans and I do not find significant results for companies with smaller bonus plans.

Next, I investigate how does the strength of bonus-driven earnings management incentives vary with the quality of the firm's corporate governance environment. If corporate governance is strong, the board of directors should be able to design and administer the bonus plan in a manner that minimizes its adverse impacts (such as incentives to manage earnings). Yet, firms with poor corporate governance might devise and implement plans poorly, leading to powerful CEO incentives to misreport performance. I find that bonuses lead to earnings management only when corporate governance is weak, but not so when corporate governance is strong. This finding stresses the utmost importance of the board of directors in the compensation process and suggests that bonuses need not have adverse consequences if they are properly administered.

Finally, I investigate whether the documented results can be explained by the CEO's desire to smooth earnings. It is conceivable that the CEO attempts to lead reported performance towards a targeted performance via earnings management and takes a 'big bath' when actual performance falls too short of this target. Thus, earnings smoothing would result in the same prediction of the earnings management pattern below the bonus minimum and above its maximum as the attempt to maximize bonus payout. To rule out that my findings are driven by earnings smoothing, I test whether the CEO attempts to lead performance towards his ex-ante

performance target when the bonus is within the incentive zone, i.e. manage earnings upwards when the actual performance is short of the target and vice versa. However, the findings are inconsistent with this explanation and provide further support for the bonus maximization hypothesis.

Additionally, I investigate the relationship between voluntary bonus disclosure and bonus-driven earnings management incentives. Gaver et al. (1995) find no evidence that bonuses lead to earnings management on a sample of firms voluntarily disclosing their bonus plan details. It is possible that only firms with high-quality bonus plans which do not provide strong earnings management incentives select to voluntarily disclose their plans and therefore the relationship disappears for this subgroup. Hence, I additionally hand-collect information on S&P500 firms disclosing bonus data voluntarily between 2003 and 2005 (30 firms in total). Interestingly, I find no evidence of earnings management for these firms on my main sample from 2006 to 2012, suggesting there might be a systematic difference in bonus plan structure for these firms. When studying the determinants of voluntary bonus disclosure, I find no evidence that corporate governance quality or the characteristics of the bonus plan influence the likelihood of voluntary disclosure; instead, I find that a key determinant of voluntary disclosure is the presence of an externally-hired CEO.<sup>7</sup>

To sum up, I find evidence that CEOs manage earnings in order to maximize their bonuses and the results are distinct from and not driven by the CEO's desire to smooth earnings. The likelihood and magnitude of earnings management is

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<sup>7</sup> Furthermore, I also study the pay performance sensitivity of the bonus plan, to alleviate the possibility that my results are driven by systematic non-linearities of the payout function over the incentive zone of the bonus plan. E.g. Leone et al. (2006) suggest that the incentive zone might be more sensitive to below target performance to stimulate accounting conservatism. However, I do not find any non-linearities of the bonus plan incentive zone. In fact, I find evidence suggesting that prior studies' findings are driven by not controlling for the ex-ante structure of the bonus plan.

proportional to the size of the incentives provided by the bonus plan. However, firms with strong corporate governance are able to mitigate the adverse earnings management consequences of their bonus plans, thus leading to both more efficient compensation contracting and more informative financial reporting.

The study proceeds as follows: Chapter 2 provides a comprehensive literature review of related CEO compensation literature, and chapter 3 covers institutional background and describes the structure of a typical bonus plan. Chapter 4 develops the hypotheses. Chapter 5 discusses the employed data and sample construction, describes the hand-collection procedure of annual bonus plan details and further describes the employed research methodology. Chapter 6 presents the results. Chapter 7 concludes.

## **2 Literature Review**

This chapter provides a review of related CEO compensation literature. Specifically, section 2.1 explores the three main theories of CEO pay, namely the managerial power theory, optimal contracting theory and institutional pressure theory. Section 2.2 scrutinizes studies on the determinants of executive pay and section 2.3 explores research dealing with the relationship of CEO compensation and misreporting. Finally, section 2.4 reviews studies on the pay-for-performance sensitivity of CEO cash pay

Overall, chapter 2 focuses primarily on the findings of prior academic studies and does not explore in depth related institutional details (e.g. the historical trends of CEO pay and the changes in the underlying regulatory and tax frameworks) and details of CEO compensation arrangements (e.g. the specifics of the structure of bonus and equity compensation plans and the related board-level compensation setting processes), except where these are critical components of the reviewed studies. Instead, these institutional and structural elements are explored in more detail in chapter 3.

### **2.1 Executive Compensation Theories**

Prior CEO compensation studies typically fall into either one of the two main ‘camps’, or theories, namely the managerial power and optimal contracting theory (Murphy, 2013). The managerial power view asserts that CEOs are largely able to capture the compensation-setting process via subordinating the board of directors to their own wishes, and therefore CEOs effectively set their own pay without regard for what is best for shareholders (Bebchuk & Fried, 2003). Therefore, according to the managerial power view, the observed pay levels of top executives as well as the

meteoric rise of CEO compensation levels over the last two decades are simply a manifestation of ever more powerful CEOs and deteriorating corporate governance quality.

In contrast, the competing optimal contracting theory posits that observed pay levels and compensation arrangements are the outcome of an efficient compensation setting process, during which boards of directors make the best use of information available to them in order to establish an optimal contract which aims to align the CEO's interest with those of the shareholders. To accomplish this goal, the board heavily relies on pay-for-performance schemes, where the CEO's pay becomes strongly tied to firm performance in order to achieve the desired incentive alignment between shareholders and the top executive (Jensen & Murphy, 1990b).

While not as clearly defined, a number of studies argue that a key determinant of observed CEO pay structure is not necessarily CEO power or optimal incentives, but rather an outcome of regulatory<sup>8</sup> distortions and institutional<sup>9</sup> pressures. In this study, I label this and closely related hypotheses as the institutional pressure theory.

While the three aforementioned theories are sometimes perceived as mutually exclusive by their staunch supporters (e.g. Bebchuk & Fried, 2006, argue that CEO pay is driven entirely by managerial power and that any semblance of efficiency, such as observed pay-for-performance linkage, is simply driven by an attempt to camouflage CEO's excess pay, and to attenuate shareholder outrage that would otherwise ensue should shareholders become aware of the full extent of the CEO's rent extraction), a common view is that all three theories are in play in most CEO compensation situations, but their relative importance differs (Murphy, 2013). For

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<sup>8</sup> E.g. changes in disclosure rules and the tax code (Perry & Zenner, 2001), legal environment (Bereskin & Cicero, 2013), or accounting rules (Skant, 2012).

<sup>9</sup> E.g. the influence of institutional investors (Hartzell & Starks, 2003) and compensation consultants (Murphy & Sandino, 2010) as well as the role of public opinion (Kuhnen & Niessen, 2012) and media scrutiny (Core et al., 2008).

example, the structure of the compensation package of a particular firm could be largely driven by the tax code which makes some forms of pay prohibitively expensive and other forms of pay relatively favorable. At the same time, the details of the pay plan (such as performance targets, vesting periods, grant dates) could be structured by the board with an optimal contract in mind, subject to the strict limitations imposed by the tax code. Finally, the CEO could also use his superior understanding of the business to convince the board that the firm's situation is in fact more dire than it actually is, which would lead the board to institute performance targets which are easier to achieve and thus would effectively lead to excess CEO pay unjustified by an efficient contract. This study also takes the position that the three theories are not mutually exclusive.

### **2.1.1 Managerial Power Theory**

The managerial power theory posits that self-interested CEOs leverage their influence over the board of directors to extract rents from the company in the form of excessive compensation packages that are detached from firm performance and lavish shareholder-funded perquisites such as private jets. Since the CEOs are essentially able to determine their own pay packages, they set their compensation as high as possible while trying to avoid shareholder outrage. To mitigate concerns of shareholder outrage, CEOs devise ex-post arguments to justify their pay levels. For example, CEOs could opportunistically select high paying companies as their compensation peers, to show that CEO pay is in fact in line with industry standards. The following paragraphs briefly explore how CEOs acquire power over the pay setting process, and what are the manifestations of CEO rent-extraction efforts. Then, I review the seminal studies on managerial power in more detail.



The CEO could acquire power over the board of directors in a number of ways. First, it is possible that the company suffers from overall weak corporate governance and the board of directors might not have the ability, time, or incentive to effectively monitor the CEO (e.g. Yermack, 1996). It is also possible that the board of directors is personally deferential to the CEO because they were appointed during his or her tenure and are therefore unlikely to challenge the CEO in an essential quid-pro-quo for their earlier appointment (Carcello et al., 2011). It is also possible that board members are socially connected with the CEO through board interlocks, memberships in common clubs, etc., again giving them incentive to be friendly and deferential to the CEO. It is also possible that the CEO extracts his power from his political connections, reputation and industry recognition, ownership stake, or relationships with the firm's controlling shareholders (Anderson et al., 2009).

The CEO can utilize his or her power over the board of directors to extract rents from the firm in a number of ways. First of all, the CEO can demand excessively large compensation package with weak per-for-performance linkage (Core et al., 1999). They might also ex-post influence the remuneration process so as to skew the pay-for-performance relationship in their favor: specifically, when performance is poor, they convince the board to shield them from the negative consequences of firm performance arguing that poor performance is driven by systemic factors beyond the CEO's control. When performance is good, however, they can demand additional pay arguing they are chiefly responsible for the firm's results (Bertrand & Mullainathan, 2001). CEOs might also demand unreasonable perquisites (e.g. private jets or lavish offices) and benefits (e.g. outsize golden handshakes and golden parachutes<sup>10</sup>, excessive pensions). Furthermore, the CEO might ask the board to opportunistically

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<sup>10</sup> Golden handshake is a term commonly used for large sign-on bonuses externally hired CEOs sometimes receive when starting their new job, while golden parachutes are payments made to CEOs when they leave the firm.

set or alter the terms of his or her compensation contract (Bebchuk et al., 2010; Morse et al., 2011) so as to reap higher pay (e.g. option backdating<sup>11</sup>). The CEO might also use his power over the financial reporting process to manipulate company performance in a way that maximizes the CEO's pay (Goldman & Slezak, 2006), without having to fear the backlash from the board of directors due to his influence over the board members. Finally, the CEO might take advantage of board complacency in order to entrench his or her position in the company (e.g. by the adoption of poison pills, staggered boards and other anti-takeover provisions) and avoid concerns of potential future CEO turnover.

The seminal paper of Core et al. (1999) documents that firms with weaker corporate governance suffer from greater agency problems which in turn result in greater CEO pay levels and weaker firm performance. Hallock (1997) finds that CEOs who lead interlocked firms earn significantly higher compensation. Board interlocks refer to the situation where the current CEO of firm A serves on the board of firm B and vice versa. The managerial power view implies that in such situations the interlocked CEOs have diminished incentives to monitor each other but might rather support each other's efforts to extract rents from their respective companies in the form of inefficient and excessive pay.

The study of Bebchuk et al. (2011) constructs a new measure of CEO power, the CEO pay slice. The CEO pay slice is measured as the fraction of the top five executives' total pay that is reaped by the chief executive. The authors find that CEO pay slice is negatively associated with both firm value and firm performance. They also document that a higher CEO pay slice leads to a higher likelihood of receiving an

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<sup>11</sup> Option backdating refers to the past practice of changing the award date of an executive option grant to a prior date on which the company stock price was low, as to effectively grant the CEO above the money options (which would otherwise be subject to unfavorable tax treatment); this practice is illegal and its discovery by the public led to a wave of shareholder outrage (Heron & Lie, 2007).

opportunistic option grant<sup>12</sup>, lower sensitivity of CEO turnover to firm performance, and lower stock returns around proxy statement filings that disclose the CEO pay slice increases.

Murphy & Sandino (2010) find that CEO pay is higher in companies that hire compensation consultants. The managerial power explanation argues that CEOs with the most excessive pay are also most likely to hire consultants and use the consultant's justification to shield themselves from shareholder outrage that could otherwise be triggered by excessive pay levels.

Bertrand & Mullainathan (2001) study whether and when are CEOs rewarded for luck, i.e. for positive shocks to firm performance beyond the CEOs' control. Analyzing three sets of scenarios – oil price shocks, exchange rate shocks and industry booms, the authors find that CEOs are indeed rewarded for performance beyond their control and that this effect is particularly pronounced for companies with weaker corporate governance (i.e. with relatively more powerful CEOs) and conclude their findings suggest CEOs are able to capture the pay setting process.

Malmendier & Tate (2009) study the impact of a CEO's achievement of superstar status (i.e. industry awards) on their compensation and firm performance. The authors document that after winning an award, CEOs receive higher pay and consume more perquisites. However, they tend to underperform relative to comparable CEOs who did not receive awards. Both of these effects are strongest for firms with weaker corporate governance, in line with the managerial power explanation that CEOs are able to leverage their status to influence the pay-setting process in their favor, reaping higher pay that shows a weaker pay-for-performance linkage.

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<sup>12</sup> I.e. a grant awarded on the day with the lowest stock price over the past month (option backdating).

The opportunistic timing of stock option grants is explored by Bebchuk et al. (2010). The authors find that CEO power leads to higher likelihood of opportunistic option grants (i.e. grants awarded at the day with the lowest stock price over the past month). They also document that CEOs receiving opportunistic option grants received higher than average non-option compensation. Finally, they show that opportunistic option grants to CEOs were more likely when the firm's independent directors also previously or concurrently received an opportunistic grant, suggesting pay capture and quid-pro-quo pay dynamics. Furthermore, the study of Aboody & Kasznik (2000) documents that CEOs opportunistically time corporate voluntary disclosures so as to maximize the value of their option compensation. I.e. CEOs tend to release bad news prior to option grants, to effectively reduce the options' strike price, and good news before option exercises, to boost the value of the stock they acquire through the exercise.

Morse et al. (2011) investigate whether powerful CEOs rig their incentive contracts ex-post. Specifically, they find that powerful CEOs are able to shift the ex-post weight towards the performance measures that will result in the higher compensation and away from other measures. This phenomenon can be illustrated on the following example: Suppose that ex-ante the CEO's bonus is based 50% on an accounting performance measure (e.g. ROA) and 50% on a market-based measure (e.g. stock returns). If accounting performance turns out to be poor but the company stock price surges, a powerful CEO will ex-post rig the said contract to be more heavily weighted towards the market-based measure. If, however, accounting performance ends up being outstanding, the CEO will use his power to skew the weighting more heavily towards the accounting measure.

The study of Dechow & Sloan (1991) investigates the CEO's behavior in the years preceding retirement from the helm. Specifically, the authors empirically inquire whether the CEO manages discretionary accruals so as to opportunistically increase his or her pay, as well as the value of pensions and to bolster his or her post-retirement job opportunities<sup>13</sup>. The authors also investigate whether CEOs adjust the firm's investment strategy to achieve the aforementioned goals. The authors' main findings suggest that most CEOs cut R&D spending in their pre-retirement years, but that this effect is attenuated for CEOs who have a large stock ownership in the company<sup>14</sup>. These findings are in line with the theoretical study of Bizjak et al. (1993) who argue that stock-based incentive compensation can be used to mitigate CEOs' incentives to manipulate market perception of firm performance by the means of altering the firm's investment policy in high information asymmetry settings. The issue of CEOs' pre-retirement career concerns is also studied by Brickley et al. (1999) who document that the vast majority of CEOs (more than 80%) serve on at least one corporate board after they retire from the CEO position and the authors find that the likelihood of obtaining a post-retirement job as a board member of an outside company is significantly positively associated with the accounting performance of the firm that the CEO retired from, while the likelihood of staying on the board of the original company is primarily contingent on the firm's stock returns, further elucidating the pattern documented by Dechow & Sloan (1991).

Hartzell & Starks (2003) study the relationship between institutional ownership levels and CEO compensation. The authors find a strong positive

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<sup>13</sup> CEOs frequently serve as board members after they retire. They also commonly take up consultancy positions. Some CEOs use their acquired fame to attain celebrity status, writing books and giving speeches (e.g. Jack Welch, the former CEO of General Electric).

<sup>14</sup> Arguably, for CEOs with large stock ownership, the potential negative impacts of a sub-optimal investment policy on their stock portfolio would out-weight the benefits they could acquire by boosting the last few years' firm performance via myopic means.

association between institutional ownership and pay for performance sensitivity and a negative association between ownership and the level of CEO pay. The findings suggest that the additional monitoring derived from institutional ownership constrains the CEO's power and influence over the pay setting process.

The consumption of perquisites by CEOs is scrutinized by Yermack (2006), who finds that companies whose CEOs extensively use perks such as corporate jets and lavish office furnishings tend to underperform other companies. These findings suggests perks are either a sign or a manifestation of agency problems and rent-extraction on the part of the CEO, rather than an efficient mechanism.

### **2.1.2 Optimal Contracting Theory**

In contrast to the managerial power theory, the optimal contracting theory suggests that the goal of the board of directors is to maximize shareholder value. Recognizing that CEOs' incentives inherently diverge from the incentives of shareholders, as CEOs tend to be professional managers with only fractional ownership, rather than owner-managers, the board structures the compensation package in such a way so as to align the CEO's incentives with those of shareholders.

Since shareholders are primarily concerned with achieving good firm performance, boards heavily rely on pay-for-performance compensation schemes, whereby the CEO is paid based on the achievement of pre-established firm performance measures. Given that performance measures are imperfect and could provide adverse incentives (such as incentives to simply manipulate firm performance to achieve performance targets and attain high pay), boards utilize a very large toolbox of compensation components (e.g. salary, annual bonus, pension) and fine-tune their structure and details (e.g. performance measures and thresholds, the payout function,

timing) so as to align CEO and shareholder incentives as closely as possible, while taking into account the monetary cost to the firm of providing these incentives.

The managerial power view attributes the perceived high levels of CEO pay to the capture of the pay-setting process by CEOs. On the other hand, the optimal contracting view argues that CEO pay constitutes only a small fraction of the firm's overall expenses and given that the CEO's action have direct impact on the firm's performance, even a relatively modest improvement in CEO incentives (achieved by increasing or adjusting the CEO's compensation package) can potentially result in large scale improvements in shareholder welfare, well above the marginal cost of the firm associated with providing these incentives<sup>15</sup>.

The optimal contracting view also argues that labor market forces play a key role in determining CEO pay. Due to improvements in information technology and continuous increases in firm size of the largest firms, CEOs decisions are having an increasingly larger aggregate impact on the firms' nominal performance, and therefore the relative importance of having the right CEO who is well motivated also increased over time, justifying higher pay levels. Similar trends have been documented for other figures in the public domain, such as for top athletes and actors (Kaplan & Rauh, 2010).

Accordingly, many of the perceived excesses of CEO compensation implicated in the managerial power literature have an optimal contracting explanation. For example, in the case of perquisite consumption, which Yermack (2006) argues to

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<sup>15</sup> A common popular critique of CEO pay levels is that CEO pay is 'unfairly' high, especially when compared to compensation of lower level employees. However, the optimal contracting theory is not implicitly concerned with fairness, but simply with an optimization of incentives given the board's information set (i.e. the marginal improvement in shareholder welfare simply has to be higher than the marginal cost to shareholders). There are also a few studies which attempt to introduce the concept of fairness into the optimal contracting framework, either through the behavioral effects on the CEO and employees (Dittmann et al., 2010) or via the effects on external forces such as on politicians, the media, and the public opinion (Kuhnen & Niessen, 2012).

be a sign of rent-extraction and agency problems, the study of Rajan & Wulf (2006) finds that perk consumption is not associated with common proxies of agency problems (high free cash flow and weaker corporate governance) and the authors also document that perks tend to be offered in situations where they can enhance managerial productivity. For example, time-saving perks such as private jets or personal chauffeur service are provided to CEOs for whom they will save the most time, rather than simply to CEOs who are the most powerful. The major determinants of CEO pay, as indicated by the optimal contracting theory are further discussed in more detail in section 2.2.

### **2.1.3 Institutional Pressure Theory**

In this section, I review studies suggesting that CEO pay levels and structure are significantly impacted by the changing regulatory, legal, political, and tax landscape or influenced by external influences (e.g. the business press, public opinion, compensation consultant, proxy advisors). Many specifics of the institutional background are also described in more depth in chapter 3.

The early paper of Hite & Long (1982) finds that the 1969 Tax Reform gave a strong impetus to the adoption of non-qualified stock option plans which the reform rendered more advantageous. This milestone can be seen as the first impulse for the wide proliferation of option-based pay (stock options constituted a small fraction of CEO compensation packages before 1969, and bonus plans accounted for the vast majority of CEOs' performance-based pay).

Choudhary et al. (2009) find that firms significantly alter the terms of their equity compensation plans in the anticipation of an incoming regulatory change. More specifically, the FAS 123R that was ultimately issued in 2006 requires firms to



expense the stock options. In response, a large subset of firms accelerated the vesting of their outstanding employee stock options. Firms with weaker corporate governance were more likely to accelerate vesting and the announcements of vesting acceleration were met with negative stock market reaction.

Hayes et al. (2012) investigate the impacts of FAS 123R on CEO compensation structure and risk-taking incentives. The authors find that in response to increased accounting cost of executive options driven by FAS 123R, firms substitute them with other performance-based compensation, resulting in a significant decrease of pay convexity<sup>16</sup> and moderate decline in pay-for-performance sensitivity.

Lo (2003) studies the economic consequences of regulated changes in disclosure of CEO compensation. Following the 1992 adoption of mandatory disclosure requirement for top executive pay, companies experienced positive abnormal stock returns and this phenomenon was particularly pronounced for firms that lobbied against this regulation<sup>17</sup>.

Additional results on the effect of compensation disclosure are provided by the study of Wei & Yermack (2011) who study the impact of the 2006 SEC disclosure reform which significantly extended the disclosure requirements stipulated by the earlier 1992 policy. In particular, the authors find that companies whose CEOs have sizeable defined benefit pension plans or deferred compensation<sup>18</sup> suffer from negative market reaction.

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<sup>16</sup> Pay convexity is commonly assumed to provide strong risk-taking incentives. Pay convexity is commonly achieved with option compensation, but not with standard grants of stock.

<sup>17</sup> Potentially the decision to lobby was associated with the magnitude of agency problem within the firms and these firms therefore benefitted the most from the mandate.

<sup>18</sup> These pay arrangements did not have to be disclosed in detail prior to the 2006 reform.

Perry & Zenner (2001) study the effects of the 1993 tax code changes<sup>19</sup> on CEO compensation. The 1993 tax code changes, specifically the introduction of Section 162(m) of the Internal Revenue Code, renders all top executive pay above \$1 mil. non-tax deductible to the company; however, all compensation deemed as performance-based is excluded from this cap. The authors find that both salary levels and growth have declined following the regulation, especially so for firms with large compensation packages (i.e. firms for which the cap is more likely to be binding). At the same time, however, total CEO compensation as well as the rate of growth of CEO pay increased substantially.

Bereskin & Cicero (2013) study the changes in CEO compensation practices in response to a shift in the legal environment. In particular, the authors zoom in onto the introduction of Delaware case law<sup>20</sup> protecting firms against takeovers. The study finds that following the change, CEOs of Delaware companies with staggered boards and without large institutional shareholders experienced significant increase in their pay levels. In response, firms that were not directly affected by the law but were competing in the same industries with affected firms also ultimately increased their CEO pay levels, but did so with a time lag<sup>21</sup>.

Core et al. (2008) investigate the role of the press in influencing the CEO compensation environment. The authors find evidence suggesting that the press works as an efficient monitor of CEO pay practices. Specifically, the press is more likely to

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<sup>19</sup> In fact, the 1993 tax code changes followed shortly after the 1992 SEC compensation disclosure reform and the effects of these two major regulatory interventions are therefore studied in unison.

<sup>20</sup> This law came into effect in the mid-1990s.

<sup>21</sup> The natural explanation appears to be that newly entrenched CEOs were able to reap additional pay from their now fortified position, and other firms had to adjust to the new labor market realities by also increasing their pay, but did so only after observing the pay increases in affected companies. Furthermore, the authors find that the pay increases are persistent, not transitory, in both types of firms.

focus on firms with large excess<sup>22</sup> CEO pay, rather than just firms with large pay packages. Coverage is also more likely for CEOs with large option exercises. However, the authors find no evidence that companies respond by curtailing excess CEO pay. Their findings have interesting implications for the later study of Kuhnen & Niessen (2012) who investigate the impact of public opinion on CEO pay. The latter study finds that while companies do not change the aggregate *levels* of pay in response to negative public opinion, firms alter the compensation *mix* by substituting compensation instruments that are perceived negatively by the public (e.g. as was the case for stock options following the public outrage over option backdating).<sup>23</sup>

Finally, I review studies on the Say-on-Pay voting mandate and the role of compensation consultants. As part of the Troubled Assets Relief Program (TARP) in 2009, companies who were recipients of TARP funds were mandated to hold a non-binding shareholder vote to approve the pay packages of their top executives, and this requirement was extended to cover all listed companies shortly thereafter. Ertimur (2011) finds that while shareholders overwhelmingly approve executive pay package in Say-on-Pay voting, the votes are also able to curb excessive CEO pay in companies that overpay their CEOs.

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<sup>22</sup> Here, excess (or abnormal) pay stands for CEO pay that is not explained by standard economic determinant of CEO pay levels, such as firm size, industry, etc. It is therefore viewed as a proxy of agency problem and the rents that the CEO is able to extract from the company.

<sup>23</sup> To illustrate the difficulty of interpreting findings of CEO compensation studies with respect to testing the underlying theory, I list two explanations of the Kuhnen & Niessen (2012) finding, one consistent with managerial contracting theory and the other following optimal contracting theory. Managerial power: CEOs leverage their power over the pay setting process to reap excess pay. In order to avoid shareholder outrage, they obfuscate their pay packages in such a way that will generate the least scrutiny and shareholder outrage. Optimal contracting: It is in the best interest of shareholders to provide the CEO with powerful incentives and the board would actually like to pay the CEO more than it currently does as that would generate significantly more shareholder welfare than would the marginal cost of CEO pay be, but the board cannot do that as it would generate public opinion or regulatory blowbacks. Therefore, the board is looking for creative ways how to compensate the CEO more without generating too much attention. (Interestingly, according to this explanation, option backdating can be perceived as the optimal compensation strategy if the risk of discovery is sufficiently low, as it allows the board to convey higher pay to the CEO without having to disclose this increase for the public and the regulators to see.

In response, it became very common for companies to hire compensation consultants to aid the board with the compensation-setting process and to vouch for the quality of CEO pay arrangements ahead of upcoming Say-on-Pay votes. The study of Murphy & Sandino (2010) investigate the effects of compensation consultants on CEO pay and find that CEO pay tends to be higher in firms that employ compensation consultants<sup>24</sup>.

## **2.2 Determinants of CEO Pay**

This section describes the main determinants of CEO compensation levels and structure that were identified in prior studies. I begin by reviewing studies concerned with the role of accounting-based and market-based performance measures in affecting CEO pay (section 2.2.1). Next, I turn my attention to corporate governance and CEO characteristics (section 2.2.2). Finally, I summarize major studies on the role of firm characteristics (section 2.2.3).

### **2.2.1 Accounting and Market Based Performance Measures**

The role of cash-flow from operations in CEO cash compensation is explored by Nwaeze et al. (2006). They find that cash flow from operations exhibits significant explanatory power with respect to cash compensation levels and the relative importance of cash flow from operations increases when its quality relative to that of earnings is higher. The importance of cash flow from operations in determining CEO

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<sup>24</sup> A common consequence of regulatory interventions aimed at curbing CEO pay levels that are deemed as excessive appears to be an increase, not a decline, in CEO pay levels. The optimal contracting explanation would be that if the original pay arrangement was optimal, then by forcing the company to switch to a different compensation structure, the firm was have to incur higher cost (i.e. pay more) to achieve a comparable level of incentives. The managerial power explanation could be that regulatory interventions present CEOs with new tools that they can use to further expand their power (e.g. by having CEOs realize they can use compensation consultants to justify their excessive pay, which they either had not been aware of, or could not effectively implement in prior years during which compensation consultant usage was rare).

cash pay is also higher for firms that rely more strongly on internally generated cash flow.

Baber et al. (1999) investigate how earnings persistence determines whether earnings levels or earnings changes are the better earnings specification for executive compensation contracts. They find that the sensitivity of compensation to earnings changes is an increasing convex function of the persistence of earnings innovations. To the contrary, the sensitivity of compensation to earnings levels is a concave function of persistence. The weights of earnings levels first increase and then drop as innovations become more persistent. A closely related study of Baber et al. (1998) explores whether compensation committees adjust executive pay for earnings persistence and find that the strength of pay for performance relations between CEO non-equity compensation and accounting performance increases with measures of earnings persistence and that the relative weights assigned to persistence are greater for CEOs who are approaching retirement.

The differential roles of different earnings components in executive compensation contracts are studied by Natarajan (1996), who finds that earnings and working capital from operations have a better association with cash compensation than earnings alone. The author also documents that shareholders attach more importance to current accruals and cash flow from operations than to non-current accruals. The study also shows that there is a systematic relationship between the weights attached to earnings and working capital from operations, and their stewardship values.

Clinch & Maglione (1993) study the differences in the effects of different earnings components on executive compensation in bank holding companies. They find that both operating earnings and cash flow related non-operating earnings are

associated with cash compensation while noncash discretionary earnings are not. The strength of the relationship varies with the anticipated capital position. They also show that the length of CEO tenure is negatively associated with the magnitude of the relationship.

Ittner et al. (1997) study what are the factors influencing the relative weights of financial and non-financial performance measures in CEO bonus contracts. The authors find that non-financial measures are more important for innovation oriented and quality oriented firms. They further document that regulated firms also emphasize non-financial measures. However, they find no evidence that the level of financial distress or the size of the CEO's equity holdings affect the relative weights. There is also no evidence that CEO with larger influence over the board are more likely to be compensated based on non-financial measures.

This issue is also examined by Lambert et al. (1991) who investigate what determines the relative weight of accounting and market measures in compensation contracts and whether the relative weights are related to the amount of noise in each measure and the measures' sensitivity to managerial actions. They find that cash compensation has a strong relation with accounting performance, but only a modest relation to market performance and the degree to which pay is tied to a performance measure is negatively related to the amount of noise the measure exhibits. They also find that high growth firms emphasize market performance in compensation contracts. Furthermore, they document that high correlation between stock and accounting performance typically leads to a larger weight on stock performance in executive pay.

The theory paper of Goldman & Slezak (2006) inquires how does the potential for manipulation affect the characteristics of the equilibrium stock-based incentive contract and the equilibrium pay for performance sensitivity. They show that when the

agent can misrepresent performance (harmful to firm value), the equilibrium pay for performance sensitivity will be lower. Furthermore, monitoring environment also affects the equilibrium incentive contract; specifically, the equilibrium pay for performance sensitivity increases with detection probability and decreases with the penalty for performance manipulation.

### **2.2.2 Corporate Governance and CEO Characteristics**

Core et al. (1999) study the impact of corporate governance quality on CEO pay and find that firms with weaker corporate governance pay more to their CEOs. Gaver & Gaver (1993) investigate whether compensation plans vary with the investment opportunity set and show that growth firms pay significantly higher levels of cash compensation and have a higher incidence of stock option plans. However, after controlling for firm size, the differences in performance-based compensation disappear.

The study of Kole (1997) finds that the structure of the CEO's compensation package is largely influenced by the flexibility of the board in negotiating with the CEO, which in turn systematically varies with the characteristics of the firm's assets. Specifically, larger and more diverse firm have more flexibility in contracting, research-intensive firms are constrained to grant more restrictive award (e.g. usage of longer vesting periods) and innovative firms are more likely to rely on a wider variety of equity-based instruments.

A number of studies investigate the role of CEO ability in impacting CEO compensation arrangements. Milbourn (2003) finds that firms are more likely to use stock-based pay to compensate executives with higher ability and documents that the effectiveness of stock-based pay is contingent on the informativeness of CEO's

contribution to firm performance, which is in turn affected by his perceived ability and reputation. Therefore, as CEO ability increases, the pay contract is made more sensitive to firm performance and vice versa.

Albuquerque et al. (2013) investigate whether the choice to select firms with high CEO pay as peer firms for compensation purposes represent a reward for unobserved CEO talent and find that CEO talent is strongly and positively associated with CEO compensation. They find that CEO power is also related to higher compensation, but only in specific cases. Furthermore, they estimate that the impact of talent on CEO pay is from two to ten times larger than that of CEO power. This is consistent with the notion that peer pay effect reflects mainly the need to reward CEOs for their intangible talent.

An earlier analysis by Faulkender & Yang (2010) also shows that the median compensation of peer firms provides significant incremental explanatory power above the standard economic factors in understanding the cross-sectional variation in CEO compensation and that firms prefer to select highly paid compensation peers. This effect is stronger in firms where the compensation peer group is smaller, the CEO is the chairman of the board, has a longer tenure are where directors are more busy.

The relation between institutional ownership and the characteristics of executive compensation is studied by Hartzell & Starks (2003) who find that there is a strong positive association between institutional ownership and pay for performance sensitivity and a negative association between ownership and the level of pay. These results are consistent with the monitoring role of the institutions and there is also a clientele effect and institutions pick firms with certain compensation structures.



### **2.2.3 Firm Characteristics**

Rose & Shepard (1997) investigate the relationship between the scope of the firm and the compensation of its CEO and inquire whether the pay premia for CEOs of diversified firms can be better explained by managerial ability or managerial power. The study finds that CEOs of diversified firms earn significantly more than the executives of similar, but undiversified companies. It also documents that the pay premium is invariant of CEO tenure and chief executives of incumbent firms who diversify their firms earn less than newly hired CEOs at already diversified firms. This evidence suggests diversification is not driven by managerial entrenchment.

The study of Jin (2002) explores the relation between CEOs' incentive levels and firm risk characteristics and finds that the optimal CEO incentive level decreases with firm nonsystematic risk. Only nonsystematic risk drives the negative relation between risk and incentive levels. Furthermore, when CEOs can trade the market portfolio, their optimal incentives are unaffected by systematic risk. When they cannot, the relationship is ambiguous. The author also shows that incentives for CEOs who are likely facing short-selling constraints decrease with both types of risk.

The role of stock liquidity is studied by Jayaraman & Milbourn (2012). The authors investigate how liquidity influences the composition of annual CEO pay and the sensitivity of managerial wealth to stock prices. They document that the proportion of cash-based pay as part of total compensation is lower in firms with greater stock liquidity, consistent with equity pay being more efficient in firms with higher liquidity. They also find that in firms with higher liquidity, pay becomes more sensitive to stock prices, but not to earnings or cash-flows.

## **2.3 CEO Compensation and Misreporting**

A large body of literature tackles the issue of potential compensation driven misreporting incentives. The majority of these studies are focused on the impact of equity pay and their findings are summarized in section 2.3.1. Studies on bonus-driven misreporting incentives are relatively rare and are discussed in section 2.3.2.

### **2.3.1 Equity Compensation and Misreporting**

Prior studies investigating whether CEO equity pay leads to misreporting often offer conflicting findings. I begin by reviewing studies suggestive of equity pay leading to CEO misreporting, and later summarize studies that offer contrasting evidence. Due to the large volume of literature in this area, I focus on a subset of representative studies.

Efendi et al. (2007) study whether the boom in option compensation in the 1990s led to an increase in CEO misreporting incentives and find that the likelihood of misstating financial statement numbers is significantly higher for CEOs with large holdings of in-the-money stock options. Similarly, Burns & Kedia (2006) also document that the sensitivity of the CEO's option portfolio to stock price is significantly positively related to the propensity to misreport.

Bergstresser & Philippon (2006) investigate the relation of high-powered incentives and earnings management and find that firms with more strongly incentivized CEOs have higher levels of earnings management, largely through discretionary accruals manipulation. They also show that CEOs tend to exercise unusually large amounts of options and sell unusually large quantities of their stock during periods of high accruals.

Armstrong et al. (2010) also study whether CEO equity based holdings and equity compensation provide incentives to manipulate accounting reports. Utilizing propensity score matching, they find no evidence of a positive association between CEO equity incentives and accounting irregularities. Moreover, the documented evidence indicates that accounting irregularities occur less frequently at firms where CEOs have relatively higher levels of equity incentives.

However, Erickson et al. (2006) find no evidence that executive equity incentives lead to an increased likelihood of accounting fraud. On the issue of CEO stock option incentives, Grant et al. (2009) find that risk-related option incentives lead to a larger extent of income smoothing. This suggests a potential alternative explanation for some of the findings indicative of opportunistic misreporting incentives – in fact, misreporting can be driven by the desire to smooth the earnings process for the benefit of shareholders, rather than the CEO’s benefit.

### **2.3.2 Cash Pay and Misreporting**

In contrast to the voluminous literature on equity pay and misreporting, that dominated the body of literature on the relationship of CEO pay and misreporting roughly since the implementation of Section 162(m)<sup>25</sup> of the Internal Revenue Code, the literature on the role of cash pay in relatively small and largely features pre-Section 162(m) analyses.

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<sup>25</sup> This issue is described in detail in section 3.2 of this study. While in the pre-Section 162(m) period, CEO performance pay was dominated by bonus plans, Section 162(m) gave an impetus to the proliferation of equity pay. Academic interest was also largely steered to equity plans, for which historical data were more easily available (bonus plans details were not mandatorily disclosed until 2006). Nevertheless, bonuses remained a sizeable component of CEO pay packages and are thought to be likely to regain their prominent position after the recent amendments to Section 162(m) in the Tax Cuts and Jobs Act passed in December 2017 and that largely eliminates the advantages of equity pay introduced during the original passage of Section 162(m) in 1993.

The first study to investigate bonus driven incentives was that of Healy (1985). Using a sample of 93 companies from 1930 to 1980 and employing total accruals as a proxy for earnings management, the study finds evidence consistent with bonuses driving earnings management. There are two follow-up studies, Holthausen et al. (1995) and Gaver et al. (1995), both using samples collected over the 1980s and finding results diverging from Healy (1985). In particular, Gaver et al. (1995) argues the earlier findings of Healy (1985) are driven by the usage of total, rather than discretionary, accruals as earnings management measure, introducing endogeneity problems which they argue drive the results. Consequently, after using discretionary accruals, Gaver et al. (1995) find no evidence of bonus-driven earnings management. I review these studies in more detail below.

The pivotal study of Healy (1985) relies on the proxy statement disclosures of company-wide bonus plans that were put for shareholder approval by and of the 250 largest industrial corporations as listed on the 1980 Fortune Directory. Relying on bonus information disclosed over the period from 1930 to 1980, the author is able to obtain sufficient information for 93 firms. A potential challenge associated with relying on disclosed bonus-plan ratification data is threefold: First, the details these plans tend to be amended over time without additional disclosures or shareholder approval. Second, given that these are company-wide plans, it is hard to determine whether the CEO is included in the plan, and if so, whether the CEO's plan structure follows the same format as that of a typical covered employee, and how large is the CEO's share of the plan (and the consequent magnitude of bonus-driven incentives). Finally, the potential incentives to misreport firm performance to boost the payout of a company-wide plan are likely to differ from those derived by the desire of boosting the

payout of modern, individualized<sup>26</sup>, bonus contracts. Using total accruals as a proxy for earnings management, the author finds evidence consistent with earnings management driven by bonus-plan incentives.

However, this conclusion is challenged by the follow-up study of Gaver et al. (1995). To arrive at their sample of 102 firms covering the sample period between 1980 and 1990, the authors investigate the proxy statements of a total of 1588 companies. However, given that disclosure of bonus information is not mandatory, they find sufficient information for only 126 firms, some of which later have to be excluded due to missing Compustat data. Due to their reliance of rare voluntary disclosures, there are potential concerns of endogeneity. For example, if only firms with high-quality bonus plans which do not lead to misreporting decide to disclose their plans, finding no incidence of bonus-driven misreporting on a sample of voluntarily disclosing firms could paint a misleading picture of the bonus-driven incentives in non-disclosing firms.

The main critique of the Healy (1985) study by Gaver et al. (1995) is that total accruals are an inappropriate measure of earnings management in this setting due to their relation with firm performance, which is in turn linked to bonus payouts. The authors first replicate the results of Healy (1985) on their sample and show consistent results. However, after using discretionary accruals (rather than total accruals) as

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<sup>26</sup> Company-wide bonus plans were predominant for a large part of the 20<sup>th</sup> century. Personalized individual bonus plans started to proliferate in the 1980s and became the standard form of bonus compensation throughout the 1990s. Over my sample period from 2006 to 2012, I find that a small number of companies still include the CEO in their broad company-wide plans, however these payouts constitute only a negligible fraction of the CEO's bonus payouts and the vast majority is derived from a second, individualized, bonus plan. Therefore, the monetary incentives currently derived by CEOs from company-wide plans appear to be borderline insignificant. It can be conjectured that firms still include the CEO in these plans either to boost employee morale and instill a feeling of camaraderie (both the common employee and the CEO share a similar reward for firm performance) or for institutional reasons (that is, the company prefers to renew old company-wide bonus plans rather than replace them with new ones; major alteration, such as adjusting the definition of covered employees to exclude the CEO would require a plan replacement; to avoid this concern, firms diminish the CEO's bonus opportunity to the lowest possible level at par with common employees rather than exclude the top executive from the plan altogether).

earnings management proxy, they no longer find results suggestive of bonus-driven misreporting. Specifically, they find that while CEOs manage earnings downward when performance is strong (and the maximum bonus threshold is likely binding), CEOs manage earnings upward when performance is weak. Gaver et al. (1995) argue that this evidence is more consistent with income smoothing, rather than with the pursuit of maximizing bonus payouts.

This issue is also investigated by the concurrent study of Holthausen et al. (1995). Unlike Gaver et al. (1995) who rely on voluntary disclosures, the authors utilize confidential compensation databases provided by two different consultancy companies to establish their sample of 443 firm-year observations for the years from 1982 to 1984 and from 1987 to 1991. Similar to Gaver et al. (1995), they also employ discretionary accruals as their measure of earnings management and find results that differ from those of Healy (1985).

## **2.4 Pay-for-Performance Sensitivity of CEO Cash Pay**

In this section, I review studies on the pay-for-performance sensitivity of CEO cash pay. First, I analyze studies investigating whether cash pay is shielded from particular components of performance (section 2.4.1). Afterwards, I summarize analyses of the differential sensitivity of cash pay to good and bad firm performance (section 2.4.2).

### **2.4.1 Is Cash Pay Shielded from Certain Elements of Performance?**

The study of Dechow & Huson (1994) investigates whether compensation committees actively adjust earnings-based cash compensation. Specifically, the authors inquire whether executive compensation gets shielded from the adverse

effects of restructuring charges. They find that while restructuring charges are not contractually excluded from executive compensation arrangements, a large part of executive cash compensation is actually shielded from such charges. They also document that restructuring charges are more likely to be shielded when they are nonrecurring in nature and when the CEO has a shorter expected horizon with the firm.

Healy et al. (1987) study whether accounting procedure changes (in inventory valuation and depreciation) are followed by adjustments in CEO compensation arrangements to account for the resulting differences. They show that subsequent to the accounting changes, cash salary and bonus awards are based on reported earnings rather than earnings under the original method. However, the authors also document that the overall impact on compensation arrangements is relatively small and is not likely to significantly influence the CEO's decision about implementing the accounting changes. A similar research question was also tackled by Abdel-Khalik (1985) who investigates whether the bonuses of executives who switched from FIFO to LIFO are adversely affected by the switch. The paper shows that, on average, the switch to LIFO did not affect the income-based performance bonus awards of the switching firms' executives. However, executives of firms retaining FIFO exhibit higher income-based bonuses than other firms' executives.

Matsunaga & Park (2001) inquire whether CEO bonuses are negatively affected by missing quarterly earnings benchmarks. They document that there is a significant adverse effect on CEO bonuses when the firm's earnings miss either the consensus analyst forecast or the earnings of the same quarter of the prior year. They also show that the penalty increases substantially if the firm misses the benchmark more than once a year.

#### **2.4.2 The Differential Sensitivity of Cash Pay to Good and Bad Performance**

The seminal study on the asymmetric sensitivity of CEO cash compensation to stock returns is that of Leone et al. (2006). They hypothesize that CEO cash pay should be less sensitive to positive stock returns than to negative stock returns, essentially to encourage a conservative accounting policy and to avoid the problem of ex-post setting up (that is, if positive market performance does not ultimately translate to superior accounting numbers, the board would not be able to recover cash pay that had already been paid in expectation of this performance that was based on the positive stock performance results). As the basis for their empirical analysis they regress changes in cash CEO pay on changes in stock returns. Specifically, they rely on a dummy variable equal to one whenever stock returns are negative as their key interaction and independent variable. Consistent with their predictions, the authors find that CEO cash pay is significantly more sensitive to negative stock return performance than to positive stock return performance.

A number of alternative explanations are suggested in the discussion paper of Dechow (2006). The main alternative explanation suggested in this study was that the results documented in Leone et al. (2006) are not the outcome of complex pay schemes designed to avoid the ex-post setting up problem and to encourage conservative policies, but rather the mechanical results stemming from the typical design features of a standard bonus plan. That is, since most bonus plans have a pre-determined minimum and maximum payout, if CEOs are more likely to reach the maximum payout than the minimum payout then the differences in likelihood of being in a performance insensitive region of the bonus plan is likely to be systematically



different for the negative and positive performance subgroups<sup>27</sup>, potentially driving the observed relationship. Dechow (2006) also deliberates about the potential effects of Section 162(m)<sup>28</sup> and also provides an explanation based on pay camouflage<sup>29</sup> by powerful CEOs.

The bonus design hypothesis of Dechow (2006) is later build upon by the study of Shaw & Zhang (2010), who re-investigate the questions tackled by Leone et al. (2006). First, Shaw & Zhang (2010) are able to obtain broadly consistent results when replicating the exact methodology of Leone et al. (2006). However, they argue that the two-way performance partition based on having negative stock returns is potentially driving the observed results. Specifically, given that CEOs are able to reach target performance in the majority of cases<sup>30</sup>, the positive stock performance partition is likely to comprise firms with strong performance, whose bonus plans are likely to reach to maximum bonus threshold, rendering them insensitive to marginal performance. However, the negative stock performance partition is likely to combine poor performers, who are also likely to be below the minimum bonus threshold and therefore exhibit no sensitivity to marginal performance, with a large subset of decent, above-target performers, whose bonus ends up within the incentive zone. Therefore, they argue that the Leone et al. (2006) results are effectively induced by the two-way performance partitioning resulting is significant differences in the likelihood of the

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<sup>27</sup> This appears to be the case. In this study, I find that CEOs are more than twice as likely to reach the maximum bonus boundary as they are to miss the minimum bonus threshold.

<sup>28</sup> To satisfy the performance-based criterion of Section 162(m) in order to be tax-deductible to the firm, boards of directors are prohibited from exercising upward discretionary adjustment to the ex-post bonus payouts. However, negative discretion (ex-post lowering of the bonus payout) does not compromise tax-deductibility.

<sup>29</sup> Similar to the theory expounded by the later study of Kuhnen & Niessen (2012), if very large cash payouts to the CEO are likely to generate shareholder outrage, than firms that want to provide CEOs with large compensation for stock return performance might be induced to partially substitute bonus plan payout with other forms of reward (e.g. perquisites or extraordinary equity grant). Since there is no outrage cost associated with small payouts, firms need not substitute bonus payout when stock performance is lackluster.

<sup>30</sup> Using my sample, I find that CEOs are able to meet or beat their bonus targets 64% of the time, supporting the conjecture of Shaw & Zhang (2010).

bonus ending within the incentive zone<sup>31</sup>, rather than above the maximum or below the minimum thresholds.

Therefore, Shaw & Zhang (2010) implement a three-way performance partition to alleviate this concern and subsequently find no differences in the sensitivity of cash pay to poor stock return performance and good stock return performance. However, since the authors do not have access to the ex-ante structure of the bonus plan and cannot compare the CEO's payout to the actual payout thresholds, they are unable to test the bonus design hypothesis directly.

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<sup>31</sup> I.e. negative stock return subgroup has higher likelihood of being in the incentive zone.

### **3 Institutional Background**

The chapter aims to introduce and describe the relevant institutional features and determinants of CEO pay. First, I will briefly elaborate on the historical trends and changes in how CEOs are compensated (section 3.1). Then, I will cover in detail the issues related to the structure and implementation of CEO annual bonus plans (section 3.2), such as the role of the board of directors in bonus plan design, the main design features and considerations of typical bonus plans, and the incentives thus derived. Finally, I will review the key regulatory interventions and institutional changes affecting my study (section 3.3).

#### **3.1 Trends in CEO Compensation**

In this section, I review the major developments in CEO pay over the last century. Major regulatory interventions (e.g. the passage of Section 162(m) of the Internal Revenue Code) are described only briefly with an emphasis on their effects on CEO pay trends; the details of these regulatory events are covered in more detail in section 3.3. While this study is primarily concerned with the compensation of US CEOs, I also briefly compare US CEOs' pay with that of CEOs from other countries.

Sophisticated performance-based CEO compensation schemes started to emerge around the 1920s. The emergence of performance-based CEO pay was aided by the increasingly common professional-manager CEOs, who were slowly replacing owner-managers (Berle & Means, 1932). Owner-managers, commonly company founders who maintain large ownership stakes in their businesses, do not require complex compensation schemes in order to have their incentives aligned with shareholders' interests, since owner-managers *are* the shareholders. However,

improvements in technology and automation<sup>32</sup> led to a gradual increase in firm size as well as in growing complexity of the CEO job, driving the need for professional CEOs to take the helm. However, since professional managers typically join the firms with little to no ownership stakes, their incentives are likely to diverge from those of shareholders. Thereby shareholders rely on the board of directors to utilize the compensation tools at the board's disposal to align CEO and shareholder interests (this issue is described in depth in section 2.1.2).

The structure of CEO pay has been relatively stable for the majority of the 20<sup>th</sup> century. Until the early 1990s, CEOs were receiving primarily cash compensation, composed of salaries and large annual bonus plans. For example, in 1980, around 85% of CEO pay in large US corporations was paid in cash, with equity pay accounting for the remaining 15% (Murphy, 2013). Similarly, the total CEO pay levels, relative to average worker wages, were growing at relatively low rates (compared to the rates of CEO pay growth observed since the 1990s) that were largely explained by steady increases in firm size and complexity.

The dynamics of CEO compensation were significantly altered via regulatory interventions in the early 1990s. Driven in part by public outrage over perceived excessive pay levels, the SEC in 1992 introduced a major reform of CEO pay disclosure requirements. Until that point in time, CEO compensation disclosures were largely voluntary<sup>33</sup>. In the following year, the newly elected US president Bill Clinton

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<sup>32</sup> In the early years of the 20<sup>th</sup> century, Ford Motor Company famously builds its assembly line of Model T, marking a significant improvement in the efficiency of vehicle manufacturing. Concurrently, modern management accounting methods (e.g. standard costing) are developed and gradually adopted.

<sup>33</sup> Limited access to CEO compensation information has a number of interesting consequences. First, the public had limited access to the actual figures, but that does not seem to have prevented public outrage; arguably the media are able to instill outrage about CEO pay regardless of firm disclosure policies. Second, CEOs did not know each other's salaries, potentially diminishing their bargaining power during pay negotiations with the board of directors. Finally, limited data availability meant that very few academic studies on CEO pay had been written and published. The number of CEO pay studies skyrocketed following the 1992 SEC disclosure regulation.

further drew on the public outrage, now further reinforced by disclosed pay figure in company filings, and decided to curb what was deemed as excessive CEO pay.

However, given that CEO compensation is stipulated in private contracts between the shareholders (represented by the board of directors) and the CEO, the US government has no direct legal authority to interfere in such contractual relationships. Nevertheless, private contracting can be influenced indirectly via regulatory action, most notably via disclosure requirements (e.g. the 1992 SEC pay disclosure reform) or the tax code.

Historically, companies have been able to deduct CEO compensation expenses from their taxes, as the tax code provides for the deduction of remuneration paid for *reasonable* services rendered to the company. Therefore, the US congress decided to re-classify excessive CEO compensation as *unreasonable*, and therefore non-tax deductible. When determining the definition of unreasonable pay, the Congress initially decided to classify as unreasonable any pay above \$1 mil. However, after stiff resistance from listed companies, an exemption was introduced for any compensation that could classify as performance-based. This change was put into effect as Section 162(m) of the Internal Revenue Code and effectively rendered non-tax deductible any pay above \$1 mil. that does not satisfy a strict performance-based test.

While the intent of Section 162(m) was to curb excessive CEO pay, CEO pay levels in fact skyrocketed following its adoption. Although a standard pay package of large company CEO<sup>34</sup> was less than \$3 mil. in 1992, it surged to over \$10 mil. over the course of the next decade (Murphy, 2013). The structure of CEO pay also changed significantly. While the majority of pay was delivered in the form of cash in 1992, equity compensation experienced meteoric rise and accounted for nearly two thirds of

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<sup>34</sup> Specifically, these numbers reflect the median total pay of S&P 500 CEOs. All dollar amounts are inflation adjusted to current dollars.

total CEO pay a decade later. At the same time, CEO salary levels largely remained flat. CEO bonus plans were steadily growing over the same period, however at slower rates than equity pay. Unexpectedly, Section 162(m) was amended in December 2017 as part of the Tax Cuts and Job Act, removing the deductibility exception provision that rendered equity pay particularly tax advantageous. It remains to be seen whether the structure of CEO compensation begins to gravitate back to that common in the pre-Section 162(m) period.

Equity pay was delivered largely in the form of stock options until 2006. However, stock option pay ultimately drew public and regulatory ire (the Enron accounting scandal as well as the outrage over option backdating are commonly seen as contributing factors). In addition, FAS 123R was passed in 2006, reversing the favorable accounting treatment of stock option pay<sup>35</sup>. Since then, stock options have been largely replaced by restricted stock and, more recently, by performance-based shares (Ellig, 2013).

There are a number of differences between compensation packages of US and international CEOs. First, compensation of CEOs outside the United States is still predominantly reliant on cash pay instruments (Fernandes et al., 2013), as used to be the case in the US prior to the adoption of Section 162(m). Second, even after controlling for firm and CEO characteristics and for the riskiness of pay, US CEOs appear to receive significantly higher pay than their international counterparts (Canyon et al., 2011). Finally, while many governance features of US firms have been ultimately adopted by many other countries (e.g. board independence requirements<sup>36</sup>),

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<sup>35</sup> Prior to the passage of FAS 123R, companies had the choice not to expense their stock option. This favorable treatment further diminished the perceived cost of granting options (i.e. no accounting charge upon grant and no cash outlay).

<sup>36</sup> For example, China adopted nearly identical board independence requirements as those in the US effective 2005 (Canyon & He, 2011).

their CEO pay disclosure standards are significantly weaker than those mandated by the SEC<sup>37</sup>.

### **3.2 Design and Implementation of Bonus Plans**

This section elaborates on the role of annual bonuses in the CEO compensation package, describes the design, timing, and implementation of a typical bonus plan, explores the structure of a typical bonus plan, and elaborates on potential bonus-driven misreporting incentives.

The board of directors will typically set up an annual bonus plan shortly after the beginning of a new fiscal year. This process contains several integral parts: The board first selects appropriate performance measures based on which to evaluate the executive in the current period. Financial measures, such as accounting earnings and cash flows single-handedly dominate the portfolio of performance measures, but non-financial and often subjective measures, such as the board's own assessment of the executive's individual performance are becoming increasingly common.

Next, the board forms ex-ante expectations of the chosen measures and decides how they will be linked to actual bonus payout. Typically, the board will establish an ex-ante formula which is to determine the ex-post amount. The board not only has discretion in establishing the formula, but oftentimes can also alter parts of the formula over the course of the fiscal year and/or ex-post adjust the formula-determined amount.<sup>38</sup>

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<sup>37</sup> At the same time, however, the compensation packages of non-US CEOs tend to be much more complex. It can be conjectured that the complexity of pay arrangements of US CEOs is in part driven by the need to constantly adjust the changing regulatory environment (Kuhnen & Niessen, 2012). Put simply, US firms might develop new complex pay designs to avoid recently introduced regulatory hurdles. In turn, however, the regulators will move to raise new regulatory hurdles for the new pay schemes (with a time lag), which will in turn lead companies to invent a new set of ever more complex pay arrangements.

<sup>38</sup> However, these discretionary adjustments must satisfy the criteria of Section 162(m) for performance based pay or will otherwise render bonus pay not exempt from the \$1 mil. deductibility

Bonuses are typically paid-out in the following months after the end of the corresponding fiscal year. This is usually done after an internal performance assessment subsequent to having publicly reported company performance for the year. However, the board must always pay out bonuses no later than 75 days after the end of the fiscal year for which the bonus is paid or the bonus payout becomes non-tax deductible (Ellig, 2013).

Annual bonuses typically exhibit a highly non-linear payout function. This is largely due to the common implementation of minimum and maximum bonus caps which effectively render the payout function flat when performance is below its lower threshold or above its upper threshold.

When the board is establishing the payout formula, it typically comes up with three distinct performance thresholds. The performance target constitutes the board's expectation for the firm's (and the CEO's) performance and just meeting it will result in the payout of the pre-established target bonus. Target bonuses are set-up ex-ante and usually expressed as a percentage of the CEO's base salary. Actual performance exceeding target performance results in above-target bonus payouts (computed according to the payout formula) and vice versa.

Apart from target performance, the board will also usually establish lower and upper performance thresholds. Performance just at the lower performance threshold results in a minimum bonus payout (hurdle bonus). If the lower threshold is missed, performance is considered unsatisfactory and no bonus is paid out. Similarly, any performance exceeding the pre-established upper performance threshold receives the capped maximum bonus. Performance between the lower and upper performance thresholds results in a payout computed by the ex-ante formula.

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cap. The SEC issued repeated guidance on what uses of discretion do and do not satisfy the Section 162(m) test.



Due to the aforementioned non-linearities, bonuses are thought to be prone to providing misreporting incentives. When the actual performance falls short of the lower performance threshold, the CEO can cash in the whole threshold bonus if he or she is able to manage reported performance to exceed the lower bound. On the other hand, if the executive does not meet the lower threshold, the current bonus will be zero irrespective of by how much does actual performance fall short of the threshold. In such cases, the CEO has incentives to further depress performance (i.e. take a big bath) to ‘save’ performance for future bonuses. Similarly, if the actual performance exceeds the upper performance threshold, the CEO will receive the capped maximum bonus irrespective of by how much does he beat the threshold. Consequently, the CEO faces strong incentives to manage earnings downward to save performance to maximize his bonus in future periods. Within the incentive zone, the executive has incentives to manage earnings upwards to increase his current bonus payout, but the strength of the incentives varies with the design of the pay-performance relation of the established formula, e.g. with its concavity/convexity.

Bonus plan payouts currently constitute approximately 25% of actual compensation to top executives of listed companies. While bonuses do not match equity compensation in their size, they are unique in their structure which explicitly rewards short-term (usually annual) performance; equity compensation usually aims to reward long-term performance. Due to their shorter-term nature, bonus rewards are likely to provide more salient incentives (dollar to dollar), especially to liquidity-constrained CEOs.

Furthermore, while the dollar amounts of CEO equity grants often exceed the dollar amount of their bonus payouts, these amounts refer to the *firm's* cost of

providing these incentives, rather than to the value the executive ascribes to them. Prior research suggests that standard equity pricing methods significantly overestimate the value of equity instruments to executives (Hall & Murphy, 2002). Therefore, it is possible for CEO bonus plans to provide more powerful incentives than equity grants even in situations where they account for a relatively smaller fraction of the compensation package (as measured by the estimated compensation cost to the firm).

Moreover, bonuses typically emphasize accounting performance (earnings are the dominant performance measure in bonus plans), balancing the focus on stock-market performance of equity grants. Another distinct feature of executive bonuses is the importance of the input of the firm's board of directors. Boards have an exceptionally large influence on both the ex-ante setup of bonus plans and on determining the actual ex-post payout based on the assessment of the executive's performance relative to the plan. Conversely, the board usually does not provide any input for equity compensation once it is granted<sup>39</sup>.

### **3.3 Regulatory and Institutional Interventions in CEO Pay**

This section first describes the key relevant reforms of CEO pay disclosure rules that allow me to construct my data sample (section 3.3.1) and then proceeds to review the main related regulatory interventions impacting the CEO pay environment, in particular those affecting the preferential favorability of different forms of performance-based pay (section 3.3.2).

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<sup>39</sup> Complex performance-based share awards are a possible exception.

### 3.3.1 SEC Compensation Disclosure Rules

Formal disclosure rules of top executive pay were first substantially strengthened in 1992, when the SEC mandated listed firms to include detailed pay information for their top executives<sup>40</sup> in a structured format in the firms' proxy filings. These requirements were further strengthened during the 2006 SEC disclosure mandate that I rely upon in this study in order to collect bonus information for my sample.

Prior to 2006, companies only had to disclose the actual amount of bonuses paid to their CEOs and any further information about the administration of their annual bonus plans had been disclosed on a voluntary basis. Academic research utilizing bonus details generally relied on the scarce voluntarily disclosed information or had to turn to confidential datasets compiled by compensation consultancy companies.

In 2006, the SEC decided to significantly extend the requirements for disclosure of listed firms' executive compensation arrangements. Because, unlike equity compensation, bonus plans typically have a detailed ex-ante structure, the new rules particularly significantly affected bonus disclosure. Companies now have to systematically disclose all material details of their bonus plans. This includes the expected payouts of these plans and their relationship with performance – the bonus payout formula. Apart from quantitative disclosures, boards are also required to provide qualitative descriptions in the Compensation Discussion and Analysis section of the proxy statement about their ex-ante bonus plan design and describe how they ultimately arrived at the ex-post payoffs.

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<sup>40</sup> Typically the CEO and the other four highest paid executives; this definition was subject to minor alterations over time.

Effectively, companies now disclose the targeted ex-ante thresholds – bonus target, which is to be paid if the CEO performs just according to expectations; minimum threshold bonus which will be paid if the CEO just meets the minimum performance requirements, and nothing will be paid if these requirements are missed; and the maximum threshold which is the maximum amount a CEO can receive for the year. While some firms do not implement minimum or maximum bonuses, all firms, with rare exceptions, have a bonus target in place as required by the SEC.

Accordingly, firms also disclose the performance measures underlying the payout bounds and their relation with the payouts, i.e. the payout formula. Firms have a certain leeway not to disclose the payout formula in detail for competitive reasons. However, the key details of the formula, such as how many and what type of performance measures are used and whether and how can the board utilize discretion during bonus determination, are disclosed consistently.

### **3.3.2 Regulatory Interventions**

In this section, I primarily focus on the details of Section 162(m) of the Internal Revenue Code. Section 162(m) was initially introduced as part of the Revenue Reconciliation Act of 1993 (also known as the Omnibus Budget Reconciliation Act or OBRA). However, the Section was also recently amended as part of the Tax Cuts and Jobs Act signed into law in December 2017. The amended version is effective for fiscal years starting on or after 31 December 2017<sup>41</sup>.

The key feature of the original Section 162(m) is that it limits the tax-deductibility of top executive compensation that exceeds \$1 mil. (such compensation is defined as unreasonable, and therefore cannot be deducted along

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<sup>41</sup> 2017 amendment effectively repeals the performance-based exemption, subject to a number of conditions.

reasonable compensation paid for services rendered to the firm). However, the Section provides an exemption for pay that is classified as performance-based.

The determination of what pay components can be classified as performance-based is decidedly complex. For example, stock options are would satisfy this criterion, but only if they are qualified<sup>42</sup> and granted at or above current stock price. Non-qualified options and options with strike prices lower than grant-date market price would not pass the Section 162(m) test. The recent proliferation of so-called performance-based stock is commonly seen to be in large part due to performance-based shares' features, which both allow the board significant flexibility in determining the structure and design of the plans but at the same time are able to relatively easily pass the Section 162(m) tax-deductibility tests<sup>43</sup>.

Annual bonus plans must satisfy a large number of criteria to pass the tax-deductibility test. They cannot contain features of guaranteed payout (e.g. guaranteed minimum payouts), cannot contain favorable adjustments not justified by ex-ante formulas (e.g. discretionary increases for performance not captured by the ex-ante formula), have to be paid out no later than 75 days after the end of the fiscal year for which performance is rewarded and also satisfy a host of other requirement. These criteria might be particularly hard to satisfy after the passage of the expanded executive compensation disclosure regulation by the SEC in 2006. The disclosure requirements mandate detailed disclosures of both the ex-ante and ex-post structure of the bonus plans (the impact of the 2006 SEC reform, as measured by the extent of newly mandated disclosures was relatively less significant on equity-based pay),

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<sup>42</sup> The multifaceted criteria for the distinction between qualified and non-qualified options are summarized in Ellig (2013)

<sup>43</sup> A cynical view of performance-based shares is that they are the outcome of financial engineering which essentially allows firms to replicate the majority of features of their favored cash-based or option-based performance schemes but at the same time not risk losing tax-deductibility.

inviting scrutiny by regulators and shareholders alike into potential tax-deductibility criteria violations.

## 4 Hypothesis Development

In this chapter, I build on the literature and regulatory reforms that are reviewed in the preceding two chapters to develop my main hypotheses<sup>44</sup>. The main questions of interest in this study revolve around whether and when do annual bonus plans lead CEOs to manage firm performance. Answering these questions is particularly important after the recent amendment to Section 162(m) of the Internal Revenue Code during the passage of the Tax Cuts and Jobs Act 2017. The amendment makes bonus compensation relatively more advantageous as compared to equity pay and governance experts speculate that compensation packages are likely to begin to gravitate towards higher proportions of bonus-based pay.

Prior to the initial introduction of Section 162(m) in 1993, cash pay and bonuses in particular used to serve as staples of US CEOs' pay packages and equity pay was relatively modest. The favorable treatment of equity pay at the expense of cash compensation by the Section led to a proliferation of equity pay in the US (this trend has not been mirrored by non-US companies that were not affected by Section 162(m) and that still rely primarily on cash pay). Combined with improved SEC disclosure rules implemented in 1992 that provided insight into the details of equity compensation (the 1992 rules did not mandate any systematic bonus-level disclosure other than the actual bonus payout), equity compensation became a popular topic of academic studies and a large body of literature studies the relationship of equity pay and misreporting<sup>45</sup>.

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<sup>44</sup> While I am interested in a number of factors not captured by my main hypotheses, for example the determinants of the strength of ex-ante bonus driven incentives, or the propensities of different types of firms to rely on certain bonus plan features, I restrict the discussion in chapter four only to the main hypotheses. The remaining questions and relationships of interests are discussed directly in the text in chapters 5 and 6.

<sup>45</sup> Despite the large volume of published studies, there is still no apparent consensus on whether equity pay in fact leads to earnings management or not. These studies are summarized in section 2.3.1.

That is despite the fact that bonus compensation remained a significant component of CEO pay packages (around 25% of total pay) and despite the relatively stronger incentive effect of one dollar of bonus incentives relative to a dollar of equity compensation. Bonuses are also more salient and provide liquidity advantages to the CEO. While the academic literature stayed largely silent on the issue of bonus-driven misreporting incentives after the passage of Section 162(m), bonus plans were frequently implicated by the business press and regulators alike. A factor contributing to the relative absence of academic studies is likely the difficulty of observing the structure of CEO bonus plans, as firms have not been mandated to disclose such information until 2006. Prior studies on CEO bonuses and misreporting (all using dataset pre-dating the Section's passage) rely on small samples of voluntary disclosures or confidentially obtained from consultancy companies.

While the 1992 SEC disclosure reform did not result in significant improvements in bonus disclosures, the opposite is the case for the SEC's follow-up 2006 enhanced disclosure rules, which mandate detailed disclosure of both ex-ante and ex-post bonus plan information (the 2006 reform led to relatively fewer new disclosures for equity pay, relative to bonus compensation). After the reform's passage, it is therefore possible to study the effects of bonus plan design on misreporting in all listed firms. A potential challenge, however, is that this information is not available in standard compensation databases (e.g. Execucomp) and even the scarce bonus-level information available before 2006, that is the actual bonus payout, is no longer available in usable machine-readable form due to the new complexities of firms' disclosures of bonus amounts. Therefore, such investigation requires the hand-collection of bonus information directly from company filings.



The newly available data are particularly promising given that the most recent study on the linkage of CEO bonuses and earnings management (Gaver et al., 1995) relies on a small sample of firms that disclosed their CEO bonus plans voluntarily (less than 10% of firms elect to do so), introducing potential endogeneity concerns. Furthermore, the authors document evidence suggesting that bonus plans do not lead to earnings management, a conclusion which is in apparent conflict with the views of the regulatory bodies and the business press (it is possible that only firms with pristine bonus plans that do not instill misreporting decide to disclose their plans voluntarily, driving the documented findings).

Therefore, to investigate *whether* CEO bonus plans in fact spur earnings management, I state my main hypothesis (in null form) as follows:

*H1: CEO annual bonus plans do not lead to earnings management*

Next, I turn my attention to the cross-sectional determinants of the relationship between CEO bonus plans and earnings management (assuming there is any). In other words, I want to investigate *when* bonus plans lead to earnings management. First, I want to investigate how the relationship varies with the quality of the firm's corporate governance. Studies document that weak corporate governance tends to result in larger CEO pay (e.g. Core et al., 1999). It can be expected that CEOs of firms with weaker governance might be better able to exploit weak board oversight and to reap higher pay by misreporting firm performance. In contrast, firms with strong corporate governance might be able to prevent bonus-driven misreporting incentives, e.g. by strong monitoring mechanisms, or by the willingness and capacity of the board of directors to discretionarily cut pay whenever it appears that the CEO managed

performance to enrich him or herself, therefore diminishing the CEO's incentives to misreport in the first place.

My second hypothesis (in null form) is worded as follows:

*H2: Strong corporate governance does not attenuate the relationship between CEO bonuses and earnings management.*

I am also interested in whether the strength of the bonus – earnings management relationship is affected by the structure of the bonus plans. First, I scrutinize the role of the size of the bonus plan (i.e. the relative importance of bonus incentives in the context of the compensation packages). If I observe that bonuses in fact lead to earnings management when testing H1, it should be expected that this relationship should be stronger for firms relying on bonus compensation more heavily and vice versa. Therefore, hypothesis three (null form), is stated in the following manner:

*H3: Larger bonus plans are not associated with a stronger relationship between CEO bonuses and earnings management.*

After testing for the effects of the overall size of bonus-driven incentives, I also investigate individual design features of the plan. Specifically, I would like to test whether the relationship of bonus plans and earnings management is stronger for plans that incorporate an individual performance evaluation component into the bonus plan formula versus those that do not. I frame my fourth hypothesis in the following way:

*H4: Bonus plans that include individual performance evaluation metrics are not associated with an attenuated relationship between CEO bonuses and earnings management.*

After testing my main hypotheses, I also conduct a number of additional analyses and extensions for which I do not establish formal hypotheses. First, I am interested in ruling out alternative explanations. Therefore, I want to test for whether any potential findings that suggest that CEO bonus plans might lead to earnings management might in fact be driven by income smoothing. The prior paper of Gaver et al. (1995) finds evidence suggesting that the documented earnings management patterns are in fact the outcome of income smoothing, rather than bonus-driven earnings management. However, since the authors rely on a small number of firms that decided to disclose bonus information voluntarily, it is possible that misreporting incentives are attenuated in these firms (e.g. only firms with highest quality bonus plans decide to disclose bonus details), and any remaining earnings management efforts are therefore driven by other considerations, such as income smoothing. It is conceivable that earnings management in firms that decide not to disclose their bonus arrangements is in fact driven by bonus-derived incentives. Therefore, I also want to investigate whether bonus plans lead to earnings management even in companies which have been disclosing their bonus plans voluntarily.

Furthermore, I also want to leverage my unique bonus dataset to conduct several preliminary analyses which are not directly tied to the issue of earnings management. First, I want to study the determinants of the strength of bonus-based incentives, i.e. the factors that lead boards of directors to decide how important should bonus plans be in the context of the CEO's entire compensation package. Then, after

investigating what makes firms employ either relatively small or relatively large bonus plans, I also want to study the determinants of the main design features of these plans (e.g. when do firms incorporate or omit explicit maximum and minimum bonus thresholds and what leads firms to incorporate individual performance measures into the CEO's bonus plan).

Finally, I want to investigate the pay-for-performance sensitivity of bonus plans to good and bad firm performance, a contentious and unresolved question in the literature. While the seminal study of Leone et al. (2006) finds that CEO cash pay is less sensitive to good than to bad performance, the subsequent study of Shaw & Zhang (2010) finds no such asymmetry and argues that the earlier results might be mechanically driven by bonus plan discontinuities. Since I can utilize and match both ex-ante and ex-post bonus payout information, I can directly test whether any asymmetry in bonus plans' pay-for-performance sensitivities exists and if it does, whether it is driven by bonus payout thresholds (as conjectured by Shaw & Zhang, 2010) or rather by the differential slopes of the bonus payout function within the plan's incentive zone (i.e. in line with Leone et al., 2006).

## 5 Research Methodology

In this chapter, I first describe my sample selection criteria and data collection procedures (section 5.1) and subsequently turn my attention to the design of the empirical specifications (section 5.2), where I first describe the construction of the variables employed in the empirical analysis and subsequently elaborate on the construction of the regression models used to test my hypotheses, as well as additional analyses and extensions.

### 5.1 Sample and Data Collection

To compile my sample, I hand-collect annual bonus plan details from firms' proxy statements. I start with the entire S&P500 universe beginning 2006 when the new regulation became effective, spanning seven years until 2012. I exclude banks and financials<sup>46</sup> as these firms have unique business models and compensation arrangements and furthermore were also heavily regulated during my sample period.

I then attempt to download proxy statements for all remaining companies from the SEC EDGAR web database. I fail to locate proxies for 86 firm years, and I am left with 2978 downloaded annual proxy statements. I manually read the statements and note down annual bonus plan details. First, I collect the actual annual bonus payout.

While collecting the annual bonus payout amount might seem redundant, this information is not provided in any compensation database. Although many researchers still use the 'BONUS' variable provided in the Execucomp database (e.g. Gopalan et al., 2014<sup>47</sup>), this endeavor is erroneous as the definition of the Execucomp

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<sup>46</sup> Firms classified as 44 & 47 by Fama-French (48) industry classification.

<sup>47</sup> Many authors are unaware of the changes in reporting bonus amounts and their translation to the changes in Execucomp coverage. In order to determine whether a study adjusted their bonus amounts accordingly, a few quick methods can be used: First, if a significant proportion of their sample covers period after 2006, the sample median bonus payout can be checked. Since \$0 bonuses are very rare (my results in Table 2 – Panel B show this occurs in less than 10% of firm-years), the sample median

‘BONUS’ variable changed following the 2006 SEC compensation disclosure regulation and now captures only discretionary and irregular (e.g. signing or retirement) bonuses which are generally non tax-deductible. Tax deductible bonuses are now aggregated with other non-equity incentive compensation prior to disclosure and need to be manually disaggregated and potentially merged with appropriate non-tax deductible bonus components.

Next, I collect the ex-ante target bonus, i.e. the projected expected dollar payout to the CEO if he just meets the board’s performance expectations. It is usually disclosed as a percentage of the CEO’s base salary. Among else, the target bonus will later enable me to proxy for the size of the bonus plans and for the ex-ante strength of incentives. Many prior bonus studies use ex-post bonuses as a proxy for bonus size and incentives and run into obvious trouble due to firm and bonus plan heterogeneity – say, a relatively large bonus payout can be both the result of poor CEO performance under an outsized plan or an indication of superior performance under a modest plan. I also collect information whether the annual bonus plan has a stipulated minimum and/or maximum and if so, I collect the dollar amounts for these thresholds, too. Finally, I collect information on whether the CEO’s individual performance, as assessed ex-post by the board of directors, matters for the determination of bonus plan payouts.

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should never be \$0. However, since the Execucomp bonus amount only captures non-tax deductible bonus payouts that are infrequent, a \$0 median bonus is a clear indicator of using unadjusted post-2006 Execucomp bonus numbers. If a large proportion of the sample falls before 2006, median can no longer be used in such a straightforward manner. However, comparing the average (or median) bonus payout to the average (or median) salary can be helpful. As very few firms provide bonus opportunities lower than the CEO’s base salary (as shown in Table 2 – Panel A, the average target bonus is approximated 150% of salary and the average realized bonus is nearly 200% of average salary; very few firms have a target bonus opportunity for the CEO below 100% of salary). Therefore, average bonus payout that are below the average salary levels are a good indicator of a study having used unadjusted Execucomp bonus numbers. Both of these tools can be successfully applied on the descriptive statistics in Gopalan et al. (2014).

During the data-collection exercise, I encounter several difficulties which result in the reduction of the sample size, as documented in Table 1: First, for 30 firm-years, the CEO does not work for a sufficient fraction of the fiscal year for the bonus plan to be efficiently implemented – e.g. joins for only the final month of the fiscal year, yet becomes eligible to participate in the plan. I also drop 21 firm-years for which I am unable to identify the target bonus amount despite it being clear that a target is in place. Additional 33 observations are dropped due to a CEO mismatch in Execucomp and the proxy filing. For 106 firm-years, there is no annual CEO bonus plan in place and the executive is incentivized predominantly through equity. This type of compensation arrangement is relatively common for high technology firms<sup>48</sup>.

I remove additional 120 firm-years during which the CEO's bonus plan is purely discretionary. In these cases, the plan does not have any disclosed ex-ante thresholds and expectations and the actual payout is fully under the discretion of the board of directors. This type of plan does not qualify as performance-based and the payouts are therefore not tax-deductible.

Finally, I drop 123 firm-years with bonus plans which I classify as shadow plans. While the bonus details are disclosed ex-ante, it is directly obvious for this type of plans that the actual payouts are not determined by the disclosed scheme, but the disclosure serves mainly to satisfy the criteria for tax-deductibility. A common strategy for forming shadow plans is to establish an outsized performance-based bonus maximum – such as 1% of total firm sales – and then give the board the discretion to reduce the actual payout to any amount it deems appropriate. This strategy provides the advantages of discretionary bonus plans while maintaining the tax-deductibility status.

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<sup>48</sup> Such compensation structure is found for e.g. the CEOs of Apple or Google (Alphabet).

Thus, after hand-collecting the data on actual bonus, target bonus, minimum bonus, maximum bonus, and the use of individual performance measures, I am left with a sample of 2545 firm-year observations usable for further analysis. Non-bonus CEO-related variables are taken from Execucomp and IncentiveLab. Firm characteristics are from Compustat and stock returns come from CRSP. Additional corporate governance information is extracted from the Riskmetrics database and supplemented by data from Lucian Bebchuk's website for 2006 data. After merging these databases, I arrive at a final sample of 1839 firm-years which I utilize for the main analyses.

## **5.2 Research Methodology**

In this section, I first discuss the construction of my variables (section 5.2.1), followed by introducing the models for my main analyses designed to test the hypotheses developed in chapter 4 (section 5.2.2). Additionally, I elaborate on the empirical models and strategy for my additional analyses (section 5.2.3) and extensions (section 5.2.4).

### **5.2.1 Variable Construction**

First, I construct two novel measures of annual bonus plan size and strength of bonus-driven incentives. The first, Bonus Size 1, is defined as the ex-ante target bonus as a percentage of the CEO's base salary and the other, Bonus Size 2, is the bonus target as a fraction of the CEO compensation package. I also establish several dummy variables indicating the presence or absence of important bonus plan features. Individual Performance dummy is a dummy variable indicating the presence of an individual performance measure in the CEO's bonus payout function. No Minimum



Bonus dummy is a dummy variable indicating the absence of a stipulated minimum bonus threshold. I also use No Maximum Bonus dummy, a dummy variable indicating the absence of a stipulated maximum bonus payout threshold.

I utilize several non-bonus CEO compensation variables which are taken from Execucomp and IncentiveLab. Specifically, I extract the CEO's base salary, his total compensation and variables required to construct my measure of the strength of CEO equity incentives. Total compensation is defined as the sum of salary, bonuses, long-term incentive plans, restricted stock, options, and other compensation. CEO equity incentives are proxied by Equity Incentives, an adjusted measure proposed by Bergstresser & Philippon (2006).

This measure captures the change in the value of the CEO's equity portfolio as a fraction of his total compensation that results from a percentage change in the firm's stock price. More specifically:

$$EQUITY\ INCENTIVES_{i,t} = \frac{ONEPCT_{i,t}}{(ONEPCT_{i,t} + SALARY_{i,t} + TARGET\ BONUS_{i,t})} \quad (1)$$

Where:  $ONEPCT_{i,t} = 0.01 * PRICE_{i,t} * (SHARES_{i,t} + OPTIONS_{i,t})$

Salary is the CEO's cash salary, Shares is the number of shares held by the CEO, Options is number of options held by the CEO. Price is the company share price.

I also construct CEO Power, a measure of CEO influence that is based on how many roles does the CEO play in the top management of the company. CEO Power equals 1 if the top executive serves only as the firm's CEO, but not as its president nor as chairman of the firm's board. CEO Power equals 2 if he or she takes on one of these

functions in addition to being the chief executive and it equals 3 if he or she takes on all three roles at once.

I also establish the CEO Hired Outside dummy, a dummy variable capturing whether the CEO was promoted internally or hired from outside of the company. It equals one if the CEO served at the company for less than twelve months prior to taking the helm. CEO Age and CEO Tenure capture the CEO's age and tenure at the beginning of the fiscal year, respectively.

I employ the E Index as my main measure of the strength of corporate governance. E Index is the Entrenchment Index constructed according to Bebchuk et al. (2009). It takes the value of 1 for each of the following six provisions that is implemented: staggered boards, limits to shareholder bylaws, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments. Lower values of E Index signal strong corporate governance and vice versa. I compute E Index values from the Riskmetrics database for years 2007 to 2012 and I employ the dataset available at Lucian Bebchuk's website for 2006 data.

For firm characteristics, Total Assets are defined as the average of the firm's beginning and end year total assets. Leverage is constructed as the ratio of debt to total assets. Book-to-Market Ratio is the ratio of the firm's book value to assets to the market value of its equity. Stock Return is the firm's annualized stock return with dividend re-investment whereas ROA is defined as the firm's earnings before interest and taxed (EBIT) scaled by total assets. Return & ROA volatilities are estimated as the standard deviations of last five years' respective values.

My main earnings management measure is discretionary accruals estimated using the modified Jones model with operating cash flows, as suggested by Cheng et

al. (2012). I estimate the model by year and Fama-French (48) industry<sup>49</sup> for all firms in the Compustat universe with total assets larger than \$1 bil. and employ the acquired residuals as my earnings management proxy.

More specifically, I estimate the following regression by year and industry:

$$\frac{TACC_{i,t}}{TA_{i,t}} = \alpha + \beta_0 \frac{1}{TA_{i,t}} + \beta_1 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{TA_{i,t}} + \beta_2 \frac{PPE_{i,t}}{TA_{i,t}} + \beta_3 \frac{OCF_{i,t}}{TA_{i,t}} + \varepsilon_{i,t} \quad (2)$$

Where TACC is total accruals, TA is average total assets,  $\Delta REV$  is change in revenues,  $\Delta REC$  is the change in receivables, PPE is the gross property, plant, and equipment, and OCF is the firm's cash flow from operations.

I also establish several measures of bonus-driven misreporting incentives. Above Max dummy is a dummy variable indicating that the CEO reached the maximum bonus threshold, meaning that the bonus plan became insensitive to marginal performance (specifically, this dummy equals to one when payout is higher than 95% of maximum bonus threshold, to deal with rounding issues, vacation adjustments etc.<sup>50</sup>). Under such circumstances, the CEO had incentives to manage earnings downward to 'save' performance for a future bonus payout. However, it is also possible that in some cases the CEO could arrive in this scenario by upward earnings management, where the CEO overestimated the amount of performance management necessary to attain the highest payout.

Next, I construct Under Min dummy, a dummy variable indicating that the CEO was unable to attain the minimum stipulated bonus threshold. Under this

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<sup>49</sup> Alternatively, I also estimate an alternative firm-level metric, as also suggested by Cheng et al. (2012). Specifically, I estimate the regression separately for each firm using firm-level data from 1990 to 2012 (I require at least ten firm-year observations for each firm). Results remain virtually unchanged when using this alternative measure.

<sup>50</sup> Results remain unchanged when using 100% of maximum alternative definition.

scenario, the CEO could derive the most advantage from relying on downward earnings management (e.g. taking a big bath) to further depress performance (without consequent drop in bonus pay) and use performance thus saved to boost his bonus payout in future periods. I also establish Outside IZ dummy, a combined dummy variable equal to one whenever the bonus payout is either under the minimum threshold or at or above the maximum threshold.

Finally, I also establish a dummy specification for bonus payout relative to the bonus target to be used in later tests of the income smoothing hypothesis. Above Target is a dummy equal to one when the CEO's actual bonus payout meets or exceeds the ex-ante target bonus.

### 5.2.2 Main Analyses

In my main analysis, I scrutinize how do the CEO's discretionary accrual choices vary with the outcomes of his or her bonus program. I estimate earnings management determinant regressions with both firm and year fixed effects and dummies indicating where the CEO's bonus ended relative to the plan. Using firm fixed effects enables me to investigate whether a firm's CEO's accrual behavior changes in years when his or her bonus falls outside of the thresholds as compared to years when it falls within the incentive zone.

$$\text{Earnings Management}_t = \beta_0 + \beta_1 \text{Bonus Incentive}_t + \text{Firm} + \text{Year} + \varepsilon_{it} \quad (3)$$

To test H1, I first estimate specification (3) on the entire sample while employing Outside IZ as the right hand side bonus incentive variable of interest. Outside IZ is an indicator variable equal to one whenever the actual bonus payout falls

outside of the bonus plan's incentive zone<sup>51</sup>. Subsequently, I replace Outsize IZ by its two subcomponents, Above Max and Under Min, dummies indicating whether the bonus payout is at or above its ex-ante stipulated maximum or at or below its ex-ante minimum, respectively. To test H2, I estimate (3) on subsamples with strong and weak corporate governance, where corporate governance quality is proxied by E Index. To test H3, subsample my data based on the relative size of bonus driven incentives, as proxied by Bonus Size 1 and Bonus Size 2. To test H4, I subsample my dataset based on whether the bonus plan in question contains an individual performance measure.

### 5.2.3 Additional Analyses

After testing my main hypotheses, I additionally explore and try to rule out several alternative explanations to the observed findings. First, I investigate whether the documented earnings management behavior is consistent with income smoothing. To accomplish this task, I rely on a subsample of observations with actual bonus

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<sup>51</sup> My methodological design relies on combining ex-ante bonus plan data with ex-post bonus payouts to accurately determine what were the CEO's bonus driven earnings management incentives. A major advantage of bonus *payout* data post-2006 is that nearly all firms disclose this information and do so in a reasonably standardized manner. Alternatively, it would also be possible to infer this information by comparing the ex-ante *performance* (as opposed to payout) thresholds with ex-post performance realizations, if such information was available in comparable quality. However, the downside of relying on performance data to infer incentives is that many companies do not disclose these measures, arguing that doing so would reveal the companies' proprietary information to their competitors. Furthermore, the minority of companies that do disclose these measures frequently do not follow consistent definitions and/or fail to define their performance measures in sufficient detail necessary to allow the researcher to accurately determine and compare both ex-ante and realized performance. Additionally, relying on a small subsample of firms which, unlike their peers and competitors, decided to disclose their bonus plans performance measures in granular detail, could introduce to any potential findings a concern similar to that of the study of Gaver et al. (1995), which relies on a sample of firms disclosing bonus plans voluntarily (less than 10% of all firms), specifically that the results might not be generalizable as firms with exceptionally high-quality disclosures are likely to systematically differ from other firms across multiple dimensions, such as in corporate governance quality, that are in turn critical in affecting any bonus-earnings management relationship. However, using performance data could also bring methodological advantages – for example, it would allow for employing regression discontinuity design which could be used to distinguish earnings management incentives of managers with realized performance which just met or just missed a performance threshold. This technique cannot be employed within a payout-based methodology as this methodology does not allow me to accurately distinguish how far 'outside' of the incentive zone a CEO ended. However, payout-based measures enable me to employ censored regressions (used in additional analyses and extensions).

payouts falling *within* the incentive zone and inquire whether performance appears to be managed towards a pre-determined target. To do so, I employ Above Target as the right hand side variable. Specifically, if the observed relationship between earnings management and CEO bonus plans is in fact due to the CEO's desire to smooth the earnings process, we would expect *downward* earnings management when performance exceeds target performance and upwards earnings management when performance falls below (note that extreme performance, that is performance either above or under the incentive zone, is excluded from this estimation, therefore mitigating concerns of alternative explanations that are present when the entire performance spectrum is studied, such as the potential incentives for taking a 'big path' when performance is particularly weak). However, if the CEO is actually driven by the incentives to maximize his or her bonus compensation, the CEO always has incentives to manage earnings *upwards* within the boundaries of the incentive zone<sup>52</sup>. Bonus driven incentives should also be particularly pronounced for firms with larger bonus plans and therefore I also run a subsample analysis within the incentive zone on firms with large and small bonus plans, respectively.

Additionally, I also study the determinants and consequences of voluntary bonus disclosures. To do so, I investigate the proxy filings of my sample firms in the years preceding the 2006 SEC disclosure mandate, in order to identify which firms disclosed their bonus information before doing so became mandatory. It is conceivable that bonus plan structure or corporate governance quality are systematically different in these firms, potentially leading to an altered bonus plan –

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<sup>52</sup> The relative propensity to do so could be affected by the shape of the pay for performance function within the incentive zone. This topic is described in detail in section 2.4.2. Preliminary results on my sample suggest the absence of major non-linearities of the payout function within the incentive zone. It appears that the semblance of such asymmetries documented by some prior studies (e.g Leone et al., 2006) is mechanically driven by not accounting for above maximum or below minimum performance in this or prior year (when studying changes).

earnings management relationships for this subsample. Such a phenomenon could explain the conclusions of Gaver et al. (1995) who do not find evidence of earnings management (they rely on a sample of voluntarily disclosing firms).

Specifically, I search the proxy filings of my sample firms for bonus information disclosures throughout the years from 2003 to 2005<sup>53</sup>. Then, I estimate a determinant model of firms' decision to voluntarily disclose bonus information in 2005 (one year ahead of the 2006 SEC mandate; the SEC mandate is thought to not have been anticipated by firms and therefore the year 2005 should be reflective of pre-2006 bonus disclosure decisions). I largely follow model specification (5). However, the dependent variable becomes an indicator equal to one if the firms discloses voluntarily. I also include an additional explanatory variable, lead target bonus (i.e. the 2006 target bonus) as a fraction of the compensation package to proxy for the size of the bonus plan. I rely on lead data since bonus plans tend to be relatively stable across time and ex-ante bonus targets are not available for non-disclosing firms. I also employ the ex-post 2005 bonus payout as an alternative measure, but using the ex-post payout introduced endogeneity problems (i.e. firms could decide not to disclose when ex-post payouts are large). Since industry practice is potentially a key driver of disclosure choices, I estimate the model separately both with and without industry fixed effects.

#### **5.2.4 Extensions**

Finally, I turn my attention to extensions of my analysis and explore multiple CEO bonus related questions which my unique hand-collected dataset of bonus details

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<sup>53</sup> I focus on a three-year period, rather than a single year to alleviate the concern that firms disclose their bonus plan structure for several years to come (e.g. the payout benchmarks and performance criteria for not only the current but also the following two years, since bonus plan structure tends to be relatively stable over time) and do not disclose again in the following year unless they decide to fundamentally alter the bonus scheme.

might be able to elucidate but are not directly tied to the issue of earnings management. First, I am interested in investigating what determines the relative importance of bonus pay within the CEO's compensation package and the magnitude of bonus-driven incentives.

Therefore, I establish novel measures of bonus size and importance and subsequently construct determinant models for these variables. Specifically, I first estimate fixed effect regression models of the determinants of bonus plan size. I include numerous CEO and firm characteristics described in the previous section as explanatory variables and also utilize industry (Industry) and year (Year) fixed effects.

$$\begin{aligned}
 \text{Bonus Size}_{t+1} = & \beta_0 + \beta_1 \text{E Index}_t + \beta_2 \text{CEO POWER}_t + \beta_3 \text{CEO Hired Outside}_t \quad (4) \\
 & + \beta_4 \log \text{CEO Age}_t + \beta_5 \log \text{CEO Tenure}_t + \beta_6 \text{Equity Incentives}_t \\
 & + \beta_7 \log \text{Total Assets}_t + \beta_8 \text{Return Volatility}_t + \beta_9 \text{ROA Volatility}_t \\
 & + \beta_{10} \text{Book-to-Market Ratio}_t + \beta_{11} \log \text{Salary}_t + \text{Industry} \\
 & + \text{Year} + \varepsilon_{it}
 \end{aligned}$$

To estimate the determinants of ex-ante bonus plan size, I first estimate specification (4) while using Bonus Size 1 as the dependent variable (Bonus Size 1 is defined as the ex-ante target bonus as a percentage of the CEO's base salary). Subsequently, I also employ an additional bonus importance measure Bonus Size 2 (this variable is defined as the bonus target as a fraction of the CEO compensation package).

Next, I investigate the factors influencing the likelihood that bonus plans exhibit several main design features. Specifically, I am interested in the determinants of the inclusion of individual performance measures and the stipulation of explicit



bonus payout minima and maxima. Accordingly, I estimate the following logistic regression model:

$$\begin{aligned}
 \text{Bonus} & \quad \beta_0 + \beta_1 \text{E Index}_t + \beta_2 \text{CEO POWER}_t + \beta_3 \text{CEO Hired Outside}_t \quad (5) \\
 \text{Feature}_{t+1} = & \quad + \beta_4 \log \text{CEO Age}_t + \beta_5 \log \text{CEO Tenure}_t + \beta_6 \text{Equity Incentives}_t \\
 & \quad + \beta_7 \log \text{Total Assets}_t + \beta_8 \text{Return Volatility}_t + \beta_9 \text{ROA Volatility}_t \\
 & \quad + \beta_{10} \text{Book-to-Market Ratio}_t + \beta_{11} \log \text{Salary}_t + \text{Industry} \\
 & \quad + \text{Year} + \varepsilon_{it}
 \end{aligned}$$

In model (5), I first use as the dependent variable the Individual Performance dummy, a dummy variable indicating the presence of an individual performance measure in the CEO's bonus payout function. Next, I employ No Minimum Bonus dummy, a dummy variable indicating the absence of a stipulated minimum bonus threshold, as the dependent variable. Finally, I employ No Maximum Bonus dummy, a dummy variable indicating the absence of a stipulated maximum bonus payout threshold, as the dependent variable.

Finally, I also investigate whether the design features of bonus plans help explain the findings for differential sensitivity of cash pay to good and bad firm performance documented in prior studies. Specifically, Leone et al. (2006) show evidence suggesting that CEO cash pay is more sensitive to poor market performance (stock returns) than it is to good market performance. The authors argue that this relationship is the outcome of boards devising asymmetrical bonus incentives in order to deal with the ex-post setting up problem. However, this conclusion is challenged in the discussion paper of Dechow (2006) who argues that the observed relationship

could simply be mechanically driven by bonus plans design, rather than constitute a deliberate board decision<sup>54</sup>.

Specifically, it is possible that the attenuated pay-for-performance sensitivity in good performance periods is driven by the higher likelihood of the executive arriving at a performance insensitive region of the bonus plan (e.g. the maximum payout threshold). If the likelihood of either missing or exceeding the boundaries of the bonus incentive zone is in fact associated with the likelihood of negative stock return performance, bonus bounds, rather than the board's decision making, could drive the results (this could ensue, for example, if the likelihood of reaching the maximum bonus threshold is significantly greater than the likelihood of missing the minimum bonus hurdle, as appears to be the case).

Therefore, I replicate the study of Leone et al. (2006) on my sample. Since I am able to identify whether the CEO ended either within or outside the incentive zone, I subsequently re-estimate the model on a subsample of within the incentive zone years.

In terms of the model specification, I follow the methodology and nomenclature of Leone et al. (2006). The dependent variable is the change in (logarithmic) CEO cash compensation<sup>55</sup>. The right hand side variables include the firm's sales (Sales) and the squared value of sales (SalesSquared), the firm's age (Firmage), leverage (Leverage), the change in the return on the firm's assets (chROA), annual stock returns (RET), and book to market ratio (BM). The main variable of interest, NegAdjRET, is an indicator variable equal to one when the firm's market-adjusted stock returns are negative. The specification also features industry

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<sup>54</sup> Dechow (2006) suggests several alternative explanations for the Leone et al. (2006) findings. The mechanical bonus outcome hypothesis is one of them.

<sup>55</sup> Defined as the change in the sum of the CEO's salary and annual bonus, annual bonus amounts are hand-collected from company filings.

and year fixed effects. The model includes numerous interaction variables, specifically, NegAdjRET is interacted with both performance measures (chROA and RET) and RET is interacted with firm characteristics (Firmage, Leverage, BM).

## 6 Results

This chapter presents the results of the tests of my hypotheses developed in chapter 4, as well as descriptive evidence and results of additional analyses and extensions described in chapter 5<sup>56</sup>. This chapter consists of several sections. Specifically, I first present descriptive statistics, including a correlation matrix (section 6.1), followed by the presentation of regression results (section 6.2).

### 6.1 Descriptive Statistics

To gain an insight into the sample distribution of the variables employed in my empirical specification as well as to provide descriptive evidence about the proliferation of varied bonus plan design features, I first turn my attention to the summary statistics. Specifically, Table 2 presents the descriptive statistics for my main sample of 1839 firm-year observations. Additional details on the construction of my sample can be found in Table 1 and are discussed in section 5.1.

Panel A of Table 2 shows summary values for quantitative compensation variables. The mean<sup>57</sup> target bonus in my sample is almost \$1.7 mil., while the average actual bonus exceeds \$2 mil., indicating CEOs are capable of beating the board's ex-ante expectations during the sample period. There is also a substantial variation both between the ex-ante sizes of the bonus plans (moving from first to third quartile of plan size nearly doubles target bonus). At the same time, however, there is relatively little variation in the sizes of CEO's salaries. Moving from the first to the third quartile of salary distribution, cash salaries increase modestly from \$0.92 mil. to \$1.26 mil. This dynamic seems to correspond to the tax-deductibility limitation

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<sup>56</sup> The sample selection criteria, collection of sample data, variable construction and establishing of empirical model specification are also described in chapter 5.

<sup>57</sup> This dynamic can also be seen by comparing median bonus payouts with median targets.

imposed by Section 162(m) of the Internal Revenue Code that disallows firms to deduct non-performance based pay above \$1 mil. (CEO salaries are always classified as non-performance based<sup>58</sup>).

Minimum bonuses are relatively modest, and are less than a quarter of target bonuses on average. Maximum bonuses are set at approximately double the bonus target on average. CEO salaries do not seem to deviate significantly from the \$1 mil. deductibility cap. The median target bonus stands at exactly 125% of base salary. Average total compensation is approaching \$10 mil. and the average bonus payout constitutes about one fifth of the CEO's compensation package.

Panel B presents qualitative bonus features. Over one third of annual plans explicitly reward the CEO's individual contribution to firm performance based on the board's subjective assessment. Nearly half of the analyzed bonus plans either do not stipulate a lower performance threshold or set it to zero. However, only about 6% of firms do not administer an explicit upper bound.

I observe that nearly 20% of the time the CEO reaps the maximal, or near maximal bonus award. CEOs miss their minimum annual bonus payout less than 10% of the time. In other cases, the actual bonus is determined by the payout formula within the incentive zone. Interestingly, in line with the information from panel A, CEOs are able to beat the board's ex-ante performance expectations in almost 2/3 of the cases.

Panel C shows descriptive statistics for governance quality and CEO characteristics. Median E Index and CEO power scores both take the value of 2. This translates to the median company having had implemented two of the six major

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<sup>58</sup> Theoretically, it could be argued that salary increases are in fact a form of performance based compensation. Salary increases can have significant multiplier effects throughout the compensation packages as many pay components (e.g. target bonuses, severance pay) are contractually defined as multiples of the CEO's salary. However, from a regulatory standpoint, neither salaries per se nor salary increases enjoy performance-based status.

provisions<sup>59</sup> that help entrench the CEO's position. Similarly, the median CEO has one additional top position within the firm, either as the company's president or as the chairman of its board. One quarter of the CEOs were hired from outside (CEO Hired Outside dummy) while the rest were internally promoted. Most CEOs are in their fifties (CEO Age) and their average tenure (CEO Tenure) is over six years. A one percent increase in firm stock price will result in a value change in the average CEO's equity holdings equal to nearly one fifth of his or her annual pay (CEO Equity Incentives).

Finally, panel D exhibits the summary statistics for company characteristics. As expected, the sample companies are large and profitable, with median assets above \$10 bil. and median ROA of 6%. The firms exhibit modest leverage with a median of 23% and a significant dispersion in both stock returns (first quartile reflects stock returns of negative 8% while third quartile corresponds to positive returns of 28%; therefore, moving from the lower to the upper quartile of stock returns results in an annual stock return difference of over 35 percentage points) and book-to-market ratios. As expected, discretionary accruals are centered on zero.

Table 3 presents the correlation table. Univariate correlations exhibit several interesting observations. First, firms with weaker corporate governance (high E Index) are associated with *smaller* bonus plans (i.e. negative correlation of -0.21 with Target). At the same time, however older CEOs (Age) and CEOs with longer tenure (Tenure) have larger annual plans. Firm size (Assets) is a major determinant of the CEO's pay package. That is, larger firms provide both larger ex-ante pay opportunities (Target) as well as large ex-post compensation payouts (Bonus). Univariate analysis also shows a weak positive correlation between the magnitude of equity incentives

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<sup>59</sup> These six provisions are staggered boards, limits to shareholder bylaws, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments.

(Eq. Inc.) and bonus incentives (Target). This relationship is likely driven by firm size, as larger firms tend to have both larger equity and bonus plans. However, in a multivariate setting it might be expected that equity plans and bonus incentives could be used as substitutes.

## **6.2 Regression Results**

This section is concerned with presenting the regression results of this study. I begin with a presentation of my main results related to the links between bonus incentives and earnings management (section 6.2.1), followed by additional analyses (section 6.2.2) aimed chiefly at further exploring other aspects of the CEO bonus-earnings management relationship and ruling out alternative explanations, and ultimately present several extensions including a discussion of the results of determinant models of bonus plans design features and importance and the findings on the symmetry of the sensitivity of CEO bonus pay to good and poor firm performance (section 6.2.3), and I also discuss possible future bonus-related research questions.

### **6.2.1 Annual Bonus Plans and Accrual Management**

In this section, I focus on my main results on the relationship between bonus incentives and earnings management. To do so, I rely on firm fixed effects<sup>60</sup> regression specifications developed in section 5.2.2. Using firm fixed effects allows me to effectively compare the differential incentives stemming from the same bonus plans in different years, and alleviates the concerns of endogeneity stemming from firm invariant characteristics such as cross-company differences in corporate governance quality. I also include year fixed effects to account for market-wide

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<sup>60</sup> Using CEO fixed effects in place of firm fixed effects yields similar results.

intertemporal changes (e.g. broad changes in the corporate governance environment or regulatory landscape).

Table 4, Panel A presents the paper's main results. The dependent variable is discretionary accruals computed as the residual of the modified Jones model with operating cash flows estimated by year and Fama-French (48) industry for all firms in the Compustat universe with total assets larger than \$1 bil. Panel A uses the whole estimation sample for specifications (1) and (2) and further splits the sample into subsamples according to predetermined criteria for specifications (3) to (10). Each specification shows a distinct fixed effects regression's results. As discussed in the preceding paragraph, all regressions are endowed with both firm and year fixed effects, controlling for observable and unobservable firm and time specific characteristics. Importantly, firm fixed effects in combination with the employed dummy explanatory variables enable for powerful and meaningful interpretation of the results as 'within firm' results – i.e. it answers the question of how does the accrual management behavior change when a firm's bonus plan moves from within the incentive zone to outside of the zone.

The main independent variable in specification (1) is Outside IZ which equals one if the bonus plan finished outside of the incentive zone, i.e. either below minimum threshold (or at 0) or above 95% of maximum threshold. In specification (2), this variable is decomposed into two separate dummies, Above Max which equals one if the actual bonus exceeds 95% of maximum threshold and Under Min which is equal to 1 if the bonus is short of minimum threshold or zero. Specifications (3) and (4) split the sample into observations with large and small bonus plans, defined respectively as those at or above and those below median target bonus as a percentage of base salary. Specifications (5) and (6) split the sample by the median target bonus as a fraction of



total compensation. Specifications (7) and (8) separate the sample by median entrenchment index value. Specifications (9) and (10) split the sample based on the inclusion of individual performance measures in the bonus formula.

The results of specification (1) indicate that CEOs select relatively more negative discretionary accruals when their actual bonus falls outside of the incentive zone than when it falls within. This pattern is suggestive of bonus-driven earnings management incentives. Specifically, the CEO has incentives to manage earnings upwards within the incentive zone to reap an increase in bonus payout. However, when performance is beyond the maximum bonus threshold, the CEO has incentives to depress performance by accrual management as he or she can thereby ‘store’ performance that can be used to bolster future bonus payouts, but a consequent drop in firm performance stemming from the accrual management will not affect the CEO’s current bonus payout, as bonus becomes insensitive to marginal performance outside of the incentive zone.

To obtain a deeper insight into this relationship, I investigate the results in specification (2) which separately analyzes the earnings management incentives derived from being either above (Above Max) or below (Below Min) the incentive zone boundaries. Specification (2) indicates the earnings management phenomenon documented in specification (1) is particularly strong at the lower bounds (coefficient -7.38, t-statistic -2.79), but not as strong at the upper bound (coefficient -1.99, t-statistic -0.94). This finding is consistent with the interpretation that suggests the upper bound subsample is likely to be partially confounded by bonuses which were *arrived at* through positive discretionary accruals from within the incentive zone<sup>61</sup>.

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<sup>61</sup> That is, the CEO might have ‘overshot’ the accrual management.

Next, I study the results concerned with the role of bonus plan size on the magnitude of earnings management incentives. To investigate these effects, specifications (3) and (4) separate the sample into companies with larger and smaller ex-ante bonus plans, respectively. Specification (3) shows earnings management incentives are particularly potent when the bonus plans are large, but specification (4) suggests they are negligible when bonus plans are smaller. Regressions (5) and (6) mirror the results of the previous two regressions while employing an alternative way to separate the sample – median target bonus as a percentage of base salary is replaced by median target bonus as a percentage of total compensation. These findings reinforce the idea that the earnings management results shown in specifications (1) and (2) are indeed the outcome of bonus plan derived incentives, rather than outcome of some third factor which jointly determines both earnings management and bonus payouts.

The role of corporate governance quality is studied in specifications (7) and (8). In particular, if the observed patterns are in fact driven by bonus incentives, it can be expected that firms with superior corporate governance, where boards are capable of superior monitoring of CEO efforts and also most likely to implement high quality incentive contracts, might be able to mitigate and constrain potential bonus-driven misreporting, while CEOs of weak governance companies might be most likely to exploit weak board oversight to attain higher compensation.

Therefore, subsamples of strong corporate governance and weak corporate governance firms are studied in specification (7) and (8), respectively. Regression results from specification (7) suggest that companies with strong corporate governance are capable of mitigating bonus-driven earnings management incentives (negative but statistically insignificant coefficient); yet companies with weak internal

controls - specification (8) – suffer from particularly severe earnings management in response to annual bonus plans (coefficient of -7.09, t-statistic -2.61). Finally, specifications (9) and (10) investigate whether the inclusion of individual CEO performance in the bonus formula alters the strength of incentives to manage earnings in order to maximize bonus payout. However, I do not identify any material difference between the two sub-samples.

### **6.2.2 Additional Analyses**

Next, I turn my attention to test investigating possible alternative explanations for the findings documented in section 6.2.1. These tests primarily deal with the issues of income smoothing as an alternative explanation to the earnings management – CEO bonus plan relationship and also with the determinants and consequences of pre-2006 voluntary bonus disclosure, with a particular emphasis on the generalizability of findings obtained through infrequent voluntary disclosures.

The prior study of Gaver et al. (1995) suggests that the relationship between bonuses and earnings management could in fact reflect the outcome of the CEO's desire to smooth the firm's earnings process. Under such a scenario, the firm would be expected to manage earnings downwards when performance is unexpectedly strong. When performance is below expectation, the firm would be predicted to typically manage earnings upwards, unless performance is so poor that upwards earnings management is unlikely to lead to a reasonably high level of reported performance. In such a case, the firm could be expected to take a 'big bath'.

It is hard to distinguish between the earnings management and income smoothing based on ex-post bonus data alone, due to the differential predictions described in the antecedent paragraph. To conduct my analysis, I therefore focus only

on a subsample of firm years during which the CEO's bonus was *within* the incentive zone and therefore sensitive to marginal performance. Consequently, I also alleviate the need to account for taking a big bath under the income smoothing hypothesis, as big baths are likely to be taken in years in which the bonus payout ends under the minimum threshold (put differently, big bath is very likely to result in performance levels that do not warrant the minimum bonus payout; therefore, big bath years are unlikely to be found in my within the incentive zone subsample).

Within the incentive zone, the bonus-driven earnings management and income smoothing explanations provide conflicting predictions, therefore allowing me to test which of these hypotheses is better supported by the data. The expectations are aligned for years of below-target bonuses (within the incentive zone) when both income smoothing and bonus maximization motivates the CEO to manage performance upwards. However, in the case of above target performance and payout<sup>62</sup>, income smoothing predicts *downwards* earnings management in order to smooth out the earnings process while the bonus plan motivates the CEO to manage earnings *upwards* to attain a higher bonus payout.

In particular, the results shown in Table 4, Panel B reflect adjusted methodology compared to that used in panel A, in order to distinguish whether or not the incentives to manage earnings are due to annual bonus plans or are driven by the CEO's desire to smooth earnings. This is critical, since earnings smoothing would likely result in the same predicted pattern as earnings management behavior on a sample combining both within and outside of the incentive zone payouts. Thus, panel B uses a smaller sample of firm-years with actual bonuses within the incentive zone only (1354 observations) and tests whether performance is being managed towards a

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<sup>62</sup> The target bonus level reflects the board's ex-ante expectation of firm performance. Therefore, above target payouts are the outcome of better than expected performance and below target payout reflect missing the board's expectations.

targeted number. The independent dummy variable Above Target equals one if the actual bonus exceeds target bonus and zero otherwise. The results in specification (11) indicate that within the incentive zone, CEOs select more *positive* discretionary accruals when they finish above the ex-ante target bonus than when they miss the target. This finding is consistent with the attempt to maximize bonus payout but inconsistent with the desire to smooth earnings. Specifications (12) and (13) further document that this pattern is especially strong for large annual bonus plans (incentives to smooth earnings should be independent of bonus plan design).

Additionally, I briefly discuss the results of other supplementary analyses related to the bonus-earnings management relationship<sup>63</sup>. First, I study the determinants and consequences of voluntary bonus disclosure. The prior study of Gaver et al. (1995) relies on infrequent voluntary bonus disclosures to construct their sample. The authors find that less than 8% of the firms they attempted to obtain bonus information for actually disclose this data<sup>64</sup>. Gaver et al. (1995) find no evidence of earnings management that is driven by bonus plans on the sample of firms that voluntarily disclose bonus information; the authors do not investigate the determinants of the decision to disclose.

To investigate this issue, I additionally hand-collect bonus information for the firms in my sample with respect to their bonus disclosures preceding the SEC disclosure mandate in 2006. Therefore, I check proxy filings to identify sample firms that disclosed the CEO bonus plan information in at least one of the three years preceding the mandate, i.e. over the period from 2003 to 2005. I find that only 30 firms in my sample provided bonus information voluntarily.

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<sup>63</sup> Not all results have been tabulated.

<sup>64</sup> They investigate the filings of 1588 firms out of which only 126 disclose CEO bonus plan structure.

Table 5 presents the results for the determinants of the decision to voluntarily disclose (I follow model (5) and employ a dummy indicating voluntary disclosure as the dependent variable; additionally I also include Bonus Size 2 as an independent variable; the right hand side variables are measured in year 2005). However, the right hand side variables generally exhibit limited explanatory power and are mostly insignificant. I find no effects on measures of corporate governance quality. Interestingly, I find a positive and strongly significant relationship between the presence of an externally hired CEO and the decision to disclose bonus plan information before 2006.

Using my main sample period, I also try to study the differences in bonus-induced earnings management incentives in firms that used to disclose their plans voluntarily and firms that disclosed only after the SEC mandate. Employing subsample analysis and following model specification (3), I find no evidence of bonus driven earnings management when studying the earnings management decisions between 2006 and 2012 of firms that disclosed their plans voluntarily ahead of 2006. However, the size of this subsample is small and I am therefore very cautious in interpreting the results. I also find evidence suggesting that bonus-driven misreporting incentives are attenuated for externally-hired CEOs<sup>65</sup>.

### **6.2.3 Extensions**

This section elaborates on extensions and preliminary findings for several non-earnings management research questions related to CEO bonus plans. I focus on two main sets of questions, the first concerned with the determinants of the structure and incentive features of annual CEO bonus plans (Tables 6 and 7) and the other

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<sup>65</sup> Earnings management results not tabulated due to concerns of small sample size.

focusing on the symmetry of pay-for-performance sensitivities of CEO cash pay to good and bad stock return performance (Table 8), a contested research area with conflicting findings. Furthermore, a number of other potential future extensions are also discussed.

Having constructed two novel measures of the overall strength of bonus-driven incentives which reflect the ex-ante strength of the CEO's bonus opportunity, I first discuss their determinants as reflected in the specifications underlying Table 6. Specifically, Table 6 presents the results of fixed effects regressions of two distinct novel measures of the size of bonus plans on a set of explanatory variables. Regression specification (1) employs the ex-ante target bonus as a percentage of the CEO's base salary as the dependent variable (Bonus Size 1), and regression model (2) utilizes an alternative measure computed as the target bonus size relative to the size of the aggregate CEO compensation package (Bonus Size 2).

The results for E Index, the measure of corporate governance quality, are strikingly similar across both specifications. Firms with high E Index (poor corporate governance) rely less on annual CEO bonus plans. For example, the coefficient on E Index in specification (1) is negative and strongly significant (coefficient -3.4, t-statistic -3.53). This finding is consistent with the seemingly puzzling findings of Gopalan et al. (2014) who, despite arguing that short-term compensation is troublesome, empirically document that firms with stronger governance do in fact set shorter-term contracts than do firms with relatively worse governance systems.

Specification (1) further indicates that larger firms (log Total Assets) and firms with experienced CEOs (log CEO Tenure) provide stronger bonus incentives. Specification (2) however indicates that large firms and firms in which CEOs have sizeable equity stakes prefer to deliver CEO incentives through other means. The

seemingly inconsistent results for large firms might be explained by large firms' inclination to provide strong incentives in general, yet primarily so through the grants of equity.

Following the discussion of the determinants of the relative importance of bonus-driven incentives, I turn my attention to the determinants of specific features of bonus contracts. In particular, Table 7 shows the results of logistic regressions estimating the determinants of the propensity to implement 3 distinct features in annual bonus plans. Specification (1) examines the propensity to employ measures of the CEO's individual performance (Individual Performance dummy) and regressions (2) and (3) document the determinants of avoiding the stipulation of lower and upper bonus bounds, respectively (No Minimum Bonus or 0 dummy, No Maximum Bonus dummy).

The results of specification (1) show that externally-hired CEOs (CEO Hired Outside) are much more likely to have their individual performance assessed as an input for their annual bonus determination. This might be caused by their higher ability, which renders mitigating noise in observable performance measures more optimal for the board; another possibility is that the board pays particular efforts to learn about the ability of the new CEO and thus can utilize this information in its compensation decisions; alternatively such CEOs might attempt to signal their ability to potential outside employers through this mode of evaluation.

CEOs with longer tenure (log CEO Tenure) are less likely to be compensated based on their individual contribution; the same holds true for powerful CEOs (CEO Power). Larger firms and firms with better growth opportunities are more likely to assess individual performance. This could be driven by the fact that firm performance



in larger and more complex firms is the result of a larger number of factors, relative to smaller firms, thus making the accurate capturing of the CEO's contribution harder.

Specifications (2) and (3) reveal that firms with poor governance (E Index) are *less* likely to institute explicit upper and lower thresholds in their annual bonus plans. Interestingly, CEOs hired from outside (CEO Hired Outside) are more prone to having a minimum threshold bonus in place. Companies with good growth prospects (Book-to-Market Ratio) and companies delivering strong equity incentives (Equity Incentives) are less likely to stipulate lower bonus thresholds. Finally, large firms are less likely to set up ex-ante bonus bounds.

Having discussed results scrutinizing the determinants of bonus plan size and features, I now turn my attention to findings related to the differential sensitivity of CEO cash and bonus pay to good and bad performance, before concluding this section by discussing multiple potential future research questions and ideas. I attempt to leverage my data to inform on prior studies of the pay for performance sensitivity of cash pay and present my results in Table 8. I first replicate the results of Leone et al. (2006) using my data sample and I find comparable results, as shown in specification (1). In particular, it appears that CEO cash pay is more sensitive to negative stock return performance than it is to good stock return performance (i.e. the interaction of  $RET * NegAdjRET$  is positive and strongly significant). However, this relationship could simply be driven by bonus plan design (performance insensitive bonus payouts outside the incentive zone). That is,  $NegAdjRET$  could be related to the likelihood of being outside of the bonus incentive zone. To address this concern, I reinvestigate the relationship on a subsample of within the incentive zone firm years and I show the results in specification (2). Interestingly, the apparent non-linearities disappear (other coefficients remain largely unchanged), suggesting the prior results of Leone et al.

(2006) are likely mechanically driven by the design features of the bonus plans (explicit minima and maxima), rather than by asymmetries within the bonus incentive zone. To account for and distinguish these differing dynamics however requires the knowledge of the ex-ante structure of the bonus plan. Ex-ante bonus plan details only became publicly available following the 2006 SEC disclosure reform and couldn't therefore be incorporated by Leone et al. (2006).

Next, I discuss several additional potential future research extensions of this study. While I focus almost exclusively on incentives driven by annual bonuses, it could also be insightful to investigate the 'tug of war' or the interplay between CEO equity and bonus driven incentives, e.g. when and under what circumstances are earnings management decisions likely to be driven by either of the two types of compensation. That would entail disentangling situations in which the incentives stemming from these two compensation instruments diverge (or are aligned) and/or are of different levels of magnitude. With the new CEO pay regulations stipulated by the Tax Cuts and Jobs Act of 2017 coming into effect, it will also be particularly interesting to study the changes in the ratio of equity and bonus compensation and the consequent alterations in CEOs' earnings management behaviour.

The Tax Cuts and Jobs Act also gives rise to other potential questions. For example, its 'grandfathering' clause, which effectively allows companies to temporarily avoid increasing the tax burden of their bonus plans and maintain CEO bonus pay tax deductibility for as long as the firms do not materially alter the bonus plan in place prior to the Act's passage, could be exploited in order to study companies' choice between adjusting bonus plan features to maintain optimal incentives on the one hand and maintaining advantageous tax treatment on the other. Furthermore, it is possible the Act might significantly affect bonus plan disclosures

and structure (e.g. a potential switch to discretionary plans to bypass the 2006 SEC disclosure rules), allowing for a study of firms' preferences among different types of bonus plans in conjunction with firms' disclosure choices.

Furthermore, this study was focused on CEOs' annual bonus plans. In recent years, the corporate world experienced a proliferation of other types of CEO compensation that exhibit many of the same characteristics and features as annual bonus plans (such as the predominant reliance on accounting-based performance measures and the ex-ante stipulation of future performance targets), in particular long term non-equity incentive plans (LTIPs) and performance shares. A natural extension would be to study what determines a firms' choice between the relative importance of these 'bonus-like' compensation instruments, whether they provide comparable earnings management incentives to annual bonus plans, and how do these earnings management incentives arising from different segments of the pay package interact.

Additionally, while this study is centred on CEOs, the analysis could also be extended to include the CFO, the entire top management team, and in some cases all employees covered by company-wide plans – followed by an investigation of the relative incentives and behaviors of these different actors. Furthermore, additional empirical techniques could be considered, such as regression discontinuity design (requiring data on ex-ante performance thresholds).

## 7 Conclusion

I exploit the 2006 SEC compensation disclosure regulation and manually hand-collect detailed bonus information from company filings. I subsequently inquire whether and when do annual CEO bonuses lead to performance misreporting, an issue which ignited a fierce debate following the financial crisis and gained new steam following the December 2017 amendment of Section 162(m) of the Internal Revenue Code that is likely to stimulate a proliferation of cash-based pay.

I document earnings management behavior strongly suggestive of CEO attempts to manage firm performance for the purpose of maximizing their annual bonus payouts. Specifically, managers select relatively more negative discretionary accruals when the actual bonuses finish outside of the incentive zone, i.e. in situations when a decrease in performance does not lead to a drop in bonus but allows to ‘save’ performance for bonus determination in future periods. As expected, this pattern is particularly pronounced when the bonus plans are larger and provide stronger incentives.

I subsequently inquire whether the bonus driven misreporting incentives vary with the quality of the firm’s corporate governance environment and document that only CEOs of firms with weak corporate governance manage earnings to boost their bonuses; firms with strong corporate governance are capable of mitigating these incentives. Finally, I rule out the possibility that the documented earnings management behavior is driven by the CEO’s desire to smooth earnings.

Taken together, the results suggest that while bonuses can lead to adverse misreporting incentives, companies with quality corporate governance are able to alleviate their negative consequences and structure bonus plans efficiently, leading to improvements in both compensation contracting and financial reporting quality.

## Reference List

- Abdel-Khalik, A. R. 1985. The effect of LIFO-switching and firm ownership on executives' pay. *Journal of Accounting Research* 23 (2):427-447.
- Aboody, D., M. E. Barth, and K. Ron. 2004. Firms' voluntary recognition of stock-based compensation expense. *Journal of Accounting Research* 42 (2):123-150.
- Aboody, D., and R. Kasznik. 2000. CEO stock option awards and the timing of corporate voluntary disclosures. *Journal of Accounting and Economics* 29 (1):73-100.
- Adithiyankul, P., I. Alon, and T. Y. Zhang. 2011. Executive perks: Compensation and corporate performance in China. *Asia Pacific Journal of Management* 28 (2):401-425.
- Adut, D., W. H. Cready, and T. J. Lopez. 2003. Restructuring charges and CEO cash compensation: A reexamination. *Accounting Review* 78 (1):169-192.
- Aggarwal, R. K., and A. A. Samwick. 1999. Executive compensation, strategic competition, and relative performance evaluation: Theory and evidence. *Journal of Finance* LIV (6).
- Aggarwal, R. K., and A. a. Samwick. 1999. The other side of the trade-off: The impact of risk on executive compensation. *Journal of Political Economy* 107 (1):65-65.
- Aggarwal, R. K., and A. A. Samwick. 2003. Performance incentives within firms: The effect of managerial responsibility. *Journal of Finance* 58 (4):1613-1650.

- Agrawal, A., and G. N. Mandelker. 1987. Managerial incentives and corporate investment and financing decisions. *Journal of Finance* 42 (4):823-837.
- Albuquerque, A. M., G. De Franco, and R. S. Verdi. 2013. Peer choice in CEO compensation. *Journal of Financial Economics* 108 (1):160-181.
- Ali, A., and W. Zhang. 2015. CEO tenure and earnings management. *Journal of Accounting and Economics* 59 (1):60-79.
- Almazan, A., and J. Suarez. 2003. Entrenchment and severance pay in optimal governance structures. *Journal of Finance* 58 (2):519-547.
- Anderson, R. C., and J. M. Bizjak. 2003. An empirical examination of the role of the CEO and the compensation committee in structuring executive pay. *Journal of Banking & Finance* 27 (7):1323-1348.
- Anderson, R. C., A. Duru, and D. M. Reeb. 2009. Founders, heirs, and corporate opacity in the United States. *Journal of Financial Economics* 92 (2):205-222.
- Antia, M., C. Pantzalis, and J. C. Park. 2010. CEO decision horizon and firm performance: An empirical investigation. *Journal of Corporate Finance* 16 (3):288-301.
- Antle, R., and A. Smith. 1986. An empirical investigation of the relative performance evaluation of corporate executives. *Journal of Accounting Research* 24 (1):1-39.
- Armstrong, C., C. Ittner, and D. Larcker. 2012. Corporate governance, compensation consultants, and CEO pay levels. *Review of Accounting Studies* 17 (2):322-351.

- Armstrong, C. S., W. R. Guay, and J. P. Weber. 2010. The role of information and financial reporting in corporate governance and debt contracting. *Journal of Accounting and Economics* 50 (2-3):179-234.
- Armstrong, C. S., A. D. Jagolinzer, and D. F. Larcker. 2010. Chief executive officer equity incentives and accounting irregularities. *Journal of Accounting Research* 48 (2):225-271.
- Armstrong, C. S., D. F. Larcker, G. Ormazabal, and D. J. Taylor. 2013. The relation between equity incentives and misreporting: The role of risk-taking incentives. *Journal of Financial Economics* 109 (2):327-350.
- Babenko, I., M. Lemmon, and Y. Tserlukevich. 2011. Employee stock options and investment. *Journal of Finance* 66 (3):981-1009.
- Baber, W. R., S. H. Kang, and K. R. Kumar. 1999. The explanatory power of earnings levels vs. earnings changes in the context of executive compensation. *Accounting Review* 74 (4):459-472.
- Baber, W. R., S.-H. Kang, and K. R. Kumar. 1998. Accounting earnings and executive compensation: The role of earnings persistence. *Journal of Accounting and Economics* 25 (2):169-193.
- Baker, G., R. Gibbons, and K. J. Murphy. 1994. Subjective performance measures in optimal incentive contracts. *Quarterly Journal of Economics* 109 (4):1125-1156.
- Baker, G., M. Gibbs, and B. Holmstrom. 1994. The wage policy of a firm. *Quarterly Journal of Economics* 109 (4):921-955.
- Baker, G. P. 1992. Incentive contracts and performance measurement. *Journal of Political Economy* 100 (3):598.

- Baker, G. P., and B. J. Hall. 2004. CEO incentives and firm size. *Journal of Labor Economics* 22 (4):767-798.
- Baker, G. P., M. C. Jensen, and K. J. Murphy. 1988. Compensation and incentives: Practice vs. theory. *Journal of Finance* 43 (3):593-616.
- Banker, R. D., M. N. Darrrough, R. Huang, and J. M. Plehn-Dujowich. 2013. The relation between CEO compensation and past performance. *Accounting Review* 88 (1):1-30.
- Barro, J. R., and R. J. Barro. 1990. Pay, performance, and turnover of bank CEOs. *Journal of Labor Economics* 8 (4):448.
- Bartov, E. 1993. The timing of asset sales and earnings manipulation. *Accounting Review* 68 (4):840-855.
- Bartov, E., D. Givoly, and C. Hayn. 2002. The rewards to meeting or beating earnings expectations. *Journal of Accounting and Economics* 33 (2):173-204.
- Bartov, E., and P. Mohanram. 2004. Private information, earnings manipulations, and executive stock-option exercises. *Accounting Review* 79 (4):889-920.
- Bebchuk, L.A., A. Cohen, and A. Ferrell. 2009. What matters in corporate governance? *Review of Financial Studies* 22 (2):783-827.
- Bebchuk, L.A., and Y. Grinstein. 2005. The growth of executive pay. *Oxford Review of Economic Policy* 21 (2):283-303.
- Bebchuk, L. A., K. J. M. Cremers, and U. C. Peyer. 2011. The CEO pay slice. *Journal of Financial Economics* 102 (1):199-221.
- Bebchuk, L. A., and J. M. Fried. 2003. Executive compensation as an agency problem. *Journal of Economic Perspectives* 17 (3):71-92.



- . 2006. Pay without performance: Overview of the issues. *Academy of Management Perspectives* 20 (1):5-24.
- . 2010. Paying for long-term performance. *University of Pennsylvania Law Review* 158 (7):1915-1959.
- Bebchuk, L. A., J. M. Fried, and D. I. Walker. 2002. Managerial power and rent extraction in the design of executive compensation. *The University of Chicago Law Review* 69 (3):751-846.
- Bebchuk, L. A., Y. Grinstein, and U. R. S. Peyer. 2010. Lucky CEOs and lucky directors. *Journal of Finance* 65 (6):2363-2401.
- Bens, D. A., and R. Johnston. 2009. Accounting discretion: Use or abuse? An analysis of restructuring charges surrounding regulator action. *Contemporary Accounting Research* 26 (3):673-+.
- Bereskin, F. L., and D. C. Cicero. 2013. CEO compensation contagion: Evidence from an exogenous shock. *Journal of Financial Economics* 107 (2):477-493.
- Berger, A. N., T. Kick, M. Koetter, and K. Schaeck. 2013. Does it pay to have friends? Social ties and executive appointments in banking. *Journal of Banking & Finance* 37 (6):2087-2105.
- Bergman, N. K., and D. Jenter. 2007. Employee sentiment and stock option compensation. *Journal of Financial Economics* 84 (3):667-712.
- Bergstresser, D., and T. Philippon. 2006. CEO incentives and earnings management. *Journal of Financial Economics* 80 (3):511-529.
- Berle, A. A., and G. C. Means. *The Modern Corporation and Private Property*. Macmillan Publishing Co., New York, 1932.

- Bernard, V. L., and D. J. Skinner. 1996. What motivates managers' choice of discretionary accruals? *Journal of Accounting and Economics* 22 (1-3):313-325.
- Bertrand, M., and S. Mullainathan. 2001. Are CEOs rewarded for luck? The ones without principals are. *Quarterly Journal of Economics* 116 (3):901-932.
- Bettis, C., J. Bizjak, J. Coles, and S. Kalpathy. 2010. Stock and option grants with performance-based vesting provisions. *The Review of Financial Studies* 23 (10):3849-3888.
- Biddle, G. C., G. Hilary, and R. S. Verdi. 2009. How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics* 48 (2-3):112-131.
- Bizjak, J., M. Lemmon, and T. Nguyen. 2011. Are all CEOs above average? An empirical analysis of compensation peer groups and pay design. *Journal of Financial Economics* 100 (3):538-555.
- Bizjak, J. M., J. A. Brickley, and J. L. Coles. 1993. Stock-based incentive compensation and investment behavior. *Journal of Accounting and Economics* 16 (1-3):349-372.
- Bizjak, J. M., M. L. Lemmon, and L. Naveen. 2008. Does the use of peer groups contribute to higher pay and less efficient compensation? *Journal of Financial Economics* 90 (2):152-168.
- Bol, J. C., and S. D. Smith. 2011. Spillover effects in subjective performance evaluation: Bias and the asymmetric influence of controllability. *Accounting Review* 86 (4):1213-1230.

- Boschen, J. F., A. Duru, L. A. Gordon, and K. J. Smith. 2003. Accounting and stock price performance in dynamic CEO compensation arrangements. *Accounting Review* 78 (1):143-168.
- Bouwens, J., and P. Kroos. 2011. Target ratcheting and effort reduction. *Journal of Accounting and Economics* 51 (1-2):171-185.
- Brenner, M., R. K. Sundaram, and D. Yermack. 2000. Altering the terms of executive stock options. *Journal of Financial Economics* 57 (1):103-128.
- Brickley, J. A., S. Bhagat, and R. C. Lease. 1985. The impact of long-range managerial compensation plans on shareholder wealth. *Journal of Accounting and Economics* 7 (1-3):115-129.
- Brickley, J. A., J. S. Linck, and J. L. Coles. 1999. What happens to CEOs after they retire? New evidence on career concerns, horizon problems, and CEO incentives. *Journal of Financial Economics* 52 (3):341-377.
- Brisley, N. 2006. Executive Stock Options: Early exercise provisions and risk-taking incentives. *Journal of Finance* 61 (5):2487-2509.
- Brown, A. B., P. Y. Davis-Friday, L. Guler, and C. Marquardt. 2015. M&A decisions and US firms' voluntary adoption of clawback provisions in executive compensation contracts. *Journal of Business Finance & Accounting* 42 (1-2):237-271.
- Brown, K., R. Jha, and P. Pacharn. 2015. Ex ante CEO severance pay and risk-taking in the financial services sector. *Journal of Banking & Finance* 59:111-126.
- Brown, K. E. 2015. Ex ante severance agreements and earnings management. *Contemporary Accounting Research* 32 (3):897-940.

- Burgstahler, D., and I. Dichev. 1997. Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics* 24 (1):99-126.
- Burgstahler, D., and M. Eames. 2006. Management of earnings and analysts' forecasts to achieve zero and small positive earnings surprises. *Journal of Business Finance & Accounting* 33 (5-6):633-652.
- Burkart, M., D. Gromb, and F. Panunzi. 1997. Large shareholders, monitoring, and the value of the firm. *Quarterly Journal of Economics* 112 (3):693-728.
- Burns, N., and S. Kedia. 2006. The impact of performance-based compensation on misreporting. *Journal of Financial Economics* 79 (1):35-67.
- Burns, N., S. Kedia, and M. Lipson. 2010. Institutional ownership and monitoring: Evidence from financial misreporting. *Journal of Corporate Finance* 16 (4):443-455.
- Bushman, R. M., R. J. Indjejikian, and A. Smith. 1996. CEO compensation: The role of individual performance evaluation. *Journal of Accounting and Economics* 21 (2):161-193.
- Bushman, R. M., and A. J. Smith. 2001. Financial accounting information and corporate governance. *Journal of Accounting and Economics* 32 (1-3):237-333.
- Cadman, B., M. E. Carter, and S. Hillegeist. 2010. The incentives of compensation consultants and CEO pay. *Journal of Accounting and Economics* 49 (3):263-280.
- Cadman, B., S. Klasa, and S. Matsunaga. 2010. Determinants of CEO pay: A comparison of ExecuComp and non-ExecuComp firms. *Accounting Review* 85 (5):1511-1543.

- Carcello, J. V., T. L. Neal, Z. V. Palmrose, and S. Scholz. 2011. CEO involvement in selecting board members, audit committee effectiveness, and restatements. *Contemporary Accounting Research* 28 (2):396-+.
- Carpenter, J. N. 1998. The exercise and valuation of executive stock options. *Journal of Financial Economics* 48 (2):127-158.
- . 2000. Does option compensation increase in managerial risk appetite? *Journal of Finance* 55 (5):2311-2331.
- Carter, M. E., and L. J. Lynch. 2003. The consequences of the FASB's 1998 proposal on accounting for stock option repricing. *Journal of Accounting and Economics* 35 (1):51-72.
- Carter, M. E., L. J. Lynch, and I. Tuna. 2007. The role of accounting in the design of CEO equity compensation. *Accounting Review* 82 (2):327-357.
- Carter, M. E., L. J. Lynch, and S. L. C. Zechman. 2009. Changes in bonus contracts in the post-Sarbanes-Oxley era. *Review of Accounting Studies* 14 (4):480-506.
- Chan, L. H., K. C. W. Chen, T. Y. Chen, and Y. X. Yu. 2012. The effects of firm-initiated clawback provisions on earnings quality and auditor behavior. *Journal of Accounting and Economics* 54 (2-3):180-196.
- Chan, L. L. H., K. C. W. Chen, T. Y. Chen, and Y. X. Yu. 2015. Substitution between real and accruals-based earnings management after voluntary adoption of compensation clawback provisions. *Accounting Review* 90 (1):147-174.
- Chance, D. M., R. Kumar, and R. B. Todd. 2000. The 'repricing' of executive stock options. *Journal of Financial Economics* 57 (1):129-154.

- Chang, Y. Y., S. Dasgupta, and G. Hilary. 2010. CEO ability, pay, and firm performance. *Management Science* 56 (10):1633-1652.
- Chen, J., M. Ezzamel, and Z. M. Cai. 2011. Managerial power theory, tournament theory, and executive pay in China. *Journal of Corporate Finance* 17 (4):1176-1199.
- Cheng, C. S. A., C. Z. Liu, and W. Thomas. 2012. Abnormal accrual estimates and evidence of mispricing. *Journal of Business Finance & Accounting* 39 (1-2):1-34.
- Cheng, Q., and D. B. Farber. 2008. Earnings restatements, changes in CEO compensation, and firm performance. *Accounting Review* 83 (5):1217-1250.
- Cheng, Q., and T. A. Warfield. 2005. Equity incentives and earnings management. *Accounting Review* 80 (2):441-476.
- Choudhary, P., S. Rajgopal, and M. Venkatachalam. 2009. Accelerated vesting of employee stock options in anticipation of FAS 123-R. *Journal of Accounting Research* 47 (1):105-146.
- Chung, R., M. Firth, and J. B. Kim. 2002. Institutional monitoring and opportunistic earnings management. *Journal of Corporate Finance* 8 (1):29-48.
- Clifford W. Smith, Jr., and R. L. Watts. 1992. The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics*.
- Clinch, G., and J. Magliolo. 1993. CEO compensation and components of earnings in bank holding companies. *Journal of Accounting and Economics* 16 (1-3):241-272.

- Cohen, D. A., A. Dey, and T. Z. Lys. 2008. Real and accrual-based earnings management in the pre- and post-Sarbanes-Oxley periods. *Accounting Review* 83 (3):757-787.
- Comprix, J., and K. A. Muller. 2006. Asymmetric treatment of reported pension expense and income amounts in CEO cash compensation calculations. *Journal of Accounting and Economics* 42 (3):385-416.
- Conyon, M. J., J. E. Core, and W. R. Guay. 2011. Are U.S. CEOs paid more than U.K. CEOs? Inferences from risk-adjusted pay. *Review of Financial Studies* 24 (2):402-438.
- Conyon, M. J., and L. He. 2011. Executive compensation and corporate governance in China. *Journal of Corporate Finance* 17 (4):1158-1175.
- Core, J., and W. Guay. 1999. The use of equity grants to manage optimal equity incentive levels. *Journal of Accounting and Economics* 28 (2):151-184.
- . 2002. Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. *Journal of Accounting Research* 40 (3):613-630.
- Core, J. E. 2010. Discussion of Chief executive officer equity incentives and accounting irregularities. *Journal of Accounting Research* 48 (2):273-287.
- Core, J. E., W. Guay, and D. F. Larcker. 2008. The power of the pen and executive compensation. *Journal of Financial Economics* 88 (1):1-25.
- Core, J. E., W. R. Guay, and R. E. Verrecchia. 2003. Price versus non-price performance measures in optimal CEO compensation contracts. *Accounting Review* 78 (4):957-981.

- Core, J. E., R. W. Holthausen, and D. F. Larcker. 1999. Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics* 51 (3):371-406.
- Cornett, M. M., A. J. Marcus, and H. Tehranian. 2008. Corporate governance and pay-for-performance: The impact of earnings management. *Journal of Financial Economics* 87 (2):357-373.
- Coughlan, A. T., and R. M. Schmidt. 1985. Executive compensation, management turnover, and firm performance. *Journal of Accounting and Economics* 7:43-66.
- Cremers, K. J. M., and Y. Grinstein. 2014. Does the market for CEO talent explain controversial CEO pay practices? *Review of Finance* 18 (3):921-960.
- Cyert, R. M., K. Sok-Hyon, and P. Kumar. 2002. Corporate governance, takeovers, and top-management compensation: Theory and evidence. *Management Science* 48 (4):453-469.
- Daniels, K. N., F. D. Hurtado, and G. G. Ramirez. 2013. An empirical investigation of corporate bond clawbacks (IPOCs): Debt renegotiation versus exercising the clawback option. *Journal of Corporate Finance* 20:14-21.
- Darrough, M. N. 1987. Managerial incentives for short-term results - a comment. *Journal of Finance* 42 (4):1097-1102.
- Das, S., K. Kim, and S. Patro. 2011. An analysis of managerial use and market consequences of earnings management and expectation management. *Accounting Review* 86 (6):1935-1967.



- Dechow, P. M. 2006. Asymmetric sensitivity of CEO cash compensation to stock returns: A discussion. *Journal of Accounting and Economics* 42 (1-2):193-202.
- Dechow, P. M., W. L. Ge, C. R. Larson, and R. G. Sloan. 2011. Predicting material accounting misstatements. *Contemporary Accounting Research* 28 (1):17-82.
- Dechow, P. M., and M. R. Huson. 1994. The effect of restructuring charges on executives' cash compensation. *Accounting Review* 69 (1):138-156.
- Dechow, P. M., A. P. Hutton, and R. G. Sloan. 1996. Economic consequences of accounting for stock-based compensation. *Journal of Accounting Research* 34 (3):1-20.
- Dechow, P. M., and R. G. Sloan. 1991. Executive incentives and the horizon problem: An empirical investigation. *Journal of Accounting and Economics* 14 (1):51-89.
- DeFeo, V. J., R. A. Lambert, and D. F. Larcker. 1989. The executive compensation effects of equity-for-debt swaps. *Accounting Review* 64 (2):201.
- DeFusco, R. A., R. R. Johnson, and T. S. Zorn. 1990. The effect of executive stock option plans on stockholders and bondholders. *Journal of Finance* 45 (2):617-627.
- Dehaan, E., F. Hodge, and T. Shevlin. 2013. Does voluntary adoption of a clawback provision improve financial reporting quality? *Contemporary Accounting Research* 30 (3):1027-1062.
- Denis, D. K. 2012. Mandatory clawback provisions, information disclosure, and the regulation of securities markets. *Journal of Accounting and Economics* 54 (2-3):197-200.

- Dittmann, I., and E. Maug. 2007. Lower salaries and no options? On the optimal structure of executive pay. *Journal of Finance* 62 (1):303-343.
- Dittmann, I., E. Maug, and O. Spalt. 2010. Sticks or carrots? Optimal CEO compensation when managers are loss averse. *Journal of Finance* 65 (6):2015-2050.
- Djankov, S., R. La Porta, F. Lopez-de-Silanes, and A. Shleifer. 2008. The law and economics of self-dealing. *Journal of Financial Economics* 88 (3):430-465.
- Doyle, J. T., J. N. Jennings, and M. T. Soliman. 2013. Do managers define non-GAAP earnings to meet or beat analyst forecasts? *Journal of Accounting and Economics* 56 (1):40-56.
- Drymiotes, G., and K. Sivaramakrishnan. 2012. Board monitoring, consulting, and reward structures. *Contemporary Accounting Research* 29 (2):453-+.
- Eaton, J., and H. S. Rosen. 1983. Agency, delayed compensation, and the structure of executive remuneration. *Journal of Finance* XXXVIII (6).
- Ecker, F., J. Francis, P. Olsson, and K. Schipper. 2013. Estimation sample selection for discretionary accruals models. *Journal of Accounting and Economics* 56 (2-3):190-211.
- Ederhof, M. 2010. Discretion in bonus plans. *Accounting Review* 85 (6):1921-1949.
- Edmans, A., and X. Gabaix. 2011. The effect of risk on the CEO market. *Review of Financial Studies* 24 (8):2822-2863.
- . 2011. Tractability in incentive contracting. *Review of Financial Studies* 24 (9):2865-2894.

- Edmans, A., X. Gabaix, and A. Landier. 2009. A multiplicative model of optimal CEO incentives in market equilibrium. *Review of Financial Studies* 22 (12):4881-4917.
- Edmans, A., X. Gabaix, T. Sadzik, and Y. Sannikov. 2012. Dynamic CEO compensation. *Journal of Finance* 67 (5):1603-1647.
- Efendi, J., A. Srivastava, and E. P. Swanson. 2007. Why do corporate managers misstate financial statements? The role of option compensation and other factors. *Journal of Financial Economics* 85 (3):667-708.
- Ellig, B. R. 2014. *The Complete Guide to Executive Compensation*. Revised and expanded third edition. New York : McGraw-Hill Education.
- Engel, E., R. M. Hayes, and X. Wang. 2007. The Sarbanes-Oxley act and firms' going-private decisions. *Journal of Accounting and Economics* 44 (1-2):116-145.
- . 2010. Audit committee compensation and the demand for monitoring of the financial reporting process. *Journal of Accounting and Economics* 49 (1-2):136-154.
- Eric Noreen, M. W. 1981. Equilibrium warrant pricing models and accounting for executive stock options. *Journal of Accounting Research*.
- Erickson, M., M. Hanlon, and E. L. Maydew. 2006. Is there a link between executive equity incentives and accounting fraud? *Journal of Accounting Research* 44 (1):113-143.
- Ertimur, Y., F. Ferri, and V. Muslu. 2011. Shareholder activism and CEO pay. *Review of Financial Studies* 24 (2):535-592.

- Espahbodi, H., E. Strock, and H. Tehranian. 1991. Impact on equity prices of pronouncements related to nonpension postretirement benefits. *Journal of Accounting and Economics* 14 (4):323-346.
- Fahlenbrach, R. 2009. Shareholder rights, boards, and CEO compensation. *Review of Finance* 13 (1):81-113.
- Fahlenbrach, R., and R. M. Stulz. 2011. Bank CEO incentives and the credit crisis. *Journal of Financial Economics* 99 (1):11-26.
- Faleye, O., R. Hoitash, and U. Hoitash. 2011. The costs of intense board monitoring. *Journal of Financial Economics* 101 (1):160-181.
- Fama, E. F., and M. C. Jensen. 1983. Separation of ownership and control. *Journal of Law & Economics* 26 (2):301-325.
- Feltham, G. A., and M. G. H. Wu. 2001. Incentive efficiency of stock versus options. *Review of Accounting Studies* 6 (1):7-28.
- Fernandes, N., M. A. Ferreira, P. Matos, and K. J. Murphy. 2013. Are U.S. CEOs paid more? New international evidence. *Review of Financial Studies* 26 (2):323-367.
- Firth, M., P. M. Y. Fung, and O. M. Rui. 2006. Corporate performance and CEO compensation in China. *Journal of Corporate Finance* 12 (4):693-714.
- Frydman, C., and R. E. Saks. 2010. Executive compensation: A new view from a long-term perspective, 1936–2005. *Review of Financial Studies* 23 (5):2099-2138.
- Gabaix, X., and A. Landier. 2008. Why has CEO pay increased so much? *Quarterly Journal of Economics* 123 (1):49-100.

- Garen, J. E. 1994. Executive compensation and principal-agent theory. *Journal of Political Economy* 102 (6):1175-1199.
- Garvey, G., and T. Milbourn. 2003. Incentive compensation when executives can hedge the market: Evidence of relative performance evaluation in the cross section. *Journal of Finance* 58 (4):1557-1582.
- . 2006. Asymmetric benchmarking in compensation: Executives are rewarded for good luck but not penalized for bad. *Journal of Financial Economics* 82 (1):197-225.
- Gaver, J. J., and K. M. Gaver. 1998. The relation between nonrecurring accounting transactions and CEO cash compensation. *Accounting Review* 73 (2):235-253.
- Gaver, J. J., K. M. Gaver, and J. R. Austin. 1995. Additional evidence on bonus plans and income management. *Journal of Accounting and Economics* 19 (1):3-28.
- Ghosh, A., A. Marra, and D. Moon. 2010. Corporate boards, audit committees, and earnings management: Pre- and post-SOX evidence. *Journal of Business Finance & Accounting* 37 (9-10):1145-1176.
- Gibbons, R., and K. J. Murphy. 1992. Optimal incentive contracts in the presence of career concerns - theory and evidence. *Journal of Political Economy* 100 (3):468-505.
- Gillan, S. L. 2006. Recent developments in corporate governance: An overview. *Journal of Corporate Finance* 12 (3):381-402.
- Goldman, E., and S. L. Slezak. 2006. An equilibrium model of incentive contracts in the presence of information manipulation. *Journal of Financial Economics* 80 (3):603-626.

- Gopalan, R., T. Milbourn, F. H. Song, and A. V. Thakor. 2014. Duration of executive compensation. *Journal of Finance* 69 (6):2777-2817.
- Grant, J., G. Markarian, and A. Parbonetti. 2009. CEO risk-related incentives and income smoothing. *Contemporary Accounting Research* 26 (4):1029-+.
- Guay, W. R. 1999. The sensitivity of CEO wealth to equity risk: an analysis of the magnitude and determinants. *Journal of Financial Economics* 53 (1):43-71.
- Guidry, F., A. J. Leone, and S. Rock. 1999. Earnings-based bonus plans and earnings management by business-unit managers. *Journal of Accounting and Economics* 26 (1-3):113-142.
- Hall, B. J., and K. J. Murphy. 2002. Stock options for undiversified executives. *Journal of Accounting and Economics* 33 (1):3-42.
- . 2003. The trouble with stock options. *Journal of Economic Perspectives* 17 (3):49-70.
- Hanlon, M., S. Rajgopal, and T. Shevlin. 2003. Are executive stock options associated with future earnings? *Journal of Accounting and Economics* 36 (1-3):3-43.
- Hartzell, J. C., and L. T. Starks. 2003. Institutional investors and executive compensation. *Journal of Finance* 58 (6):2351-2374.
- Haw, I. M., S. S. M. Ho, and A. Y. Li. 2011. Corporate governance and earnings management by classification shifting. *Contemporary Accounting Research* 28 (2):517-+.
- Hayes, R. M. 2004. Discussion of underwater options and the dynamics of executive pay-to-performance sensitivities. *Journal of Accounting Research* 42 (2):413-421.

- Hayes, R. M., M. Lemmon, and M. M. Qiu. 2012. Stock options and managerial incentives for risk taking: Evidence from FAS 123R. *Journal of Financial Economics* 105 (1):174-190.
- Hayes, R. M., and S. Schaefer. 2000. Implicit contracts and the explanatory power of top executive compensation for future performance. *Rand Journal of Economics* 31 (2):273-293.
- . 2005. Bonuses and non-public information in publicly traded firms. *Review of Accounting Studies* 10 (4):431-464.
- . 2009. CEO pay and the Lake Wobegon effect. *Journal of Financial Economics* 94 (2):280-290.
- Hazarika, S., J. M. Karpoff, and R. Nahata. 2012. Internal corporate governance, CEO turnover, and earnings management. *Journal of Financial Economics* 104 (1):44-69.
- Healy, P. M. 1985. The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics* 7 (1-3):85-107.
- Healy, P. M., S.-H. Kang, and K. G. Palepu. 1987. The effect of accounting procedure changes on CEOs' cash salary and bonus compensation. *Journal of Accounting and Economics* 9 (1):7-34.
- Hemmer, T., O. Kim, and R. E. Verrecchia. 1999. Introducing convexity into optimal compensation contracts. *Journal of Accounting and Economics* 28 (3):307-327.
- Hennes, K. M., A. J. Leone, and B. P. Miller. 2008. The importance of distinguishing errors from irregularities in restatement research: The case of restatements and CEO/CFO. *Accounting Review* 83 (6):1487-1519.

- Heron, R. A., and E. Lie. 2007. Does backdating explain the stock price pattern around executive stock option grants? *Journal of Financial Economics* 83 (2):271-295.
- Hite, G. L., and M. S. Long. 1982. Taxes and executive stock options. *Journal of Accounting and Economics* 4 (1):3-14.
- Hodge, F. D., S. Rajgopal, and T. Shevlin. 2009. Do managers value stock options and restricted stock consistent with economic theory? *Contemporary Accounting Research* 26 (3):899-932.
- Holthausen, R. W., D. F. Larcker, and R. G. Sloan. 1995. Annual bonus schemes and the manipulation of earnings. *Journal of Accounting and Economics* 19 (1):29-74.
- Hoppe, F., and F. Moers. 2011. The choice of different types of subjectivity in CEO annual bonus contracts. *Accounting Review* 86 (6):2023-2046.
- Hribar, P., and D. C. Nichols. 2007. The use of unsigned earnings quality measures in tests of earnings management. *Journal of Accounting Research* 45 (5):1017-1053.
- Indjejikian, R. J., M. Matejka, K. A. Merchant, and W. A. Van der Stede. 2014. Earnings targets and annual bonus incentives. *Accounting Review* 89 (4):1227-1258.
- Indjejikian, R. J., M. Matejka, and J. D. Schloetzer. 2014. Target ratcheting and incentives: Theory, evidence, and new opportunities. *Accounting Review* 89 (4):1259-1267.
- Indjejikian, R. J., and D. Nanda. 2002. Executive target bonuses and what they imply about performance standards. *Accounting Review* 77 (4):793-819.



- Ittner, C. D., D. F. Larcker, and M. V. Rajan. 1997. The choice of performance measures in annual bonus contracts. *Accounting Review* 72 (2):231-255.
- Jackson, S. B., T. J. Lopez, and A. L. Reitenga. 2008. Accounting fundamentals and CEO bonus compensation. *Journal of Accounting and Public Policy* 27 (5):374-393.
- Jayaraman, S., and T. T. Milbourn. 2012. The role of stock liquidity in executive compensation. *Accounting Review* 87 (2):537-563.
- Jeffrey Coles, N. D., Lalitha Naveen. 2006. Managerial incentives and risk-taking. *Journal of Financial Economics*.
- Jensen, M. C., and K. J. Murphy. 1990a. CEO Incentives -- it's not how much you pay, but how. *Harvard Business Review* 68 (3):138-149.
- . 1990b. Performance pay and top-management incentives. *Journal of Political Economy* 98 (2):225-264.
- Johnson, S. A., H. E. Ryan, and Y. S. Tian. 2009. Managerial incentives and corporate fraud: The sources of incentives matter. *Review of Finance* 13 (1):115-145.
- Johnson, S. A., and Y. S. Tian. 2000. Indexed executive stock options. *Journal of Financial Economics* 57 (1):35-64.
- Kaplan, R. S. 1985. Evidence on the effect of bonus schemes on accounting procedure and accrual decisions - Comment. *Journal of Accounting and Economics* 7 (1-3):109-113.
- Kaplan, S. N., and J. Rauh. 2010. Wall Street and Main Street: What contributes to the rise in the highest incomes? *Review of Financial Studies* 23 (3):1004-1050.

- Ke, B., K. Petroni, and A. Safieddine. 1999. Ownership concentration and sensitivity of executive pay to accounting performance measures: Evidence from publicly and privately-held insurance companies. *Journal of Accounting and Economics* 28 (2):185-209.
- Kole, S. R. 1997. The complexity of compensation contracts. *Journal of Financial Economics* 43 (1):79-104.
- Kuhnen, C. M., and A. Niessen. 2012. Public opinion and executive compensation. *Management Science* 58 (7):1249-1272.
- Lambert, R. A., and D. F. Larcker. 1987. An analysis of the use of accounting and market measures of performance in executive-compensation contracts. *Journal of Accounting Research* 25:85-129.
- Leone, A. J., J. S. Wu, and J. L. Zimmerman. 2006. Asymmetric sensitivity of CEO cash compensation to stock returns. *Journal of Accounting and Economics* 42 (1-2):167-192.
- Lowry, M., and K. J. Murphy. 2007. Executive stock options and IPO underpricing. *Journal of Financial Economics* 85 (1):39-65.
- Malmendier, U., and G. Tate. 2009. Superstar CEOs. *Quarterly Journal of Economics* 124 (4):1593-1638.
- Matejka, M., K. A. Merchant, and W. A. Van der Stede. 2009. Employment horizon and the choice of performance measures: Empirical evidence from annual bonus plans of loss-making entities. *Management Science* 55 (6):890-905.
- Matsumoto, D. A. 2002. Management's incentives to avoid negative earnings surprises. *Accounting Review* 77 (3):483-514.

- Matsunaga, S. R., and C. W. Park. 2001. The effect of missing a quarterly earnings benchmark on the CEO's annual bonus. *Accounting Review* 76 (3):313.
- Milbourn, T. T. 2003. CEO reputation and stock-based compensation. *Journal of Financial Economics* 68 (2):233-262.
- Murphy, K. J. 2000. Performance standards in incentive contracts. *Journal of Accounting and Economics* 30 (3):245-278.
- . 2002. Explaining executive compensation: Managerial power versus the perceived cost of stock options. *The University of Chicago Law Review* 69 (3):847-869.
- . 2003. Stock-based pay in new economy firms. *Journal of Accounting and Economics* 34 (1–3):129-147.
- Murphy, K. J., and Paul Oyer. 2004. Discretion in executive incentive contracts. *Working Paper*.
- Murphy, K. J., and Michael C. Jensen. 2011. CEO bonus plans and how to fix them. *Working Paper*.
- Murphy, K. J. 2013. Chapter 4 - Executive compensation: Where we are, and how we got there. In *Handbook of the Economics of Finance*, edited by M. H. George M. Constantinides and M. S. Rene: Elsevier, 211-356.
- Murphy, K. J., and T. Sandino. 2010. Executive pay and “independent” compensation consultants. *Journal of Accounting and Economics* 49 (3):247-262.
- Murphy, K. J., and J. Zábajník. 2004. CEO pay and appointments: A market-based explanation for recent trends. *American Economic Review* 94 (2):192-196.

- Narayanan, M. P. 1985. Managerial incentives for short-term results. *Journal of Finance* 40 (5):1469-1484.
- Nwaeze, E. T., S. S. M. Yang, and J. Yin. 2006. Accounting information and CEO compensation: The role of cash flow from operations in the presence of earnings. *Contemporary Accounting Research* 23 (1):227-265.
- Ofek, E. L. I., and D. Yermack. 2000. Taking stock: Equity-based compensation and the evolution of managerial ownership. *Journal of Finance* LV (3):1367-1384.
- Perry, T., and M. Zenner. 2001. Pay for performance? Government regulation and the structure of compensation contracts. *Journal of Financial Economics* 62 (3):453-488.
- Rajan, M. V., and S. Reichelstein. 2009. Objective versus subjective indicators of managerial performance. *Accounting Review* 84 (1):209-237.
- Rajan, R. G., and J. Wulf. 2006. Are perks purely managerial excess? *Journal of Financial Economics* 79 (1):1-33.
- Rajgopal, S., D. Taylor, and M. Venkatachalam. 2012. Frictions in the CEO labor market: The role of talent agents in CEO compensation. *Contemporary Accounting Research* 29 (1):119-+.
- Rose, Nancy L., and C. Wolfram. 2002. Regulating executive pay: Using the tax code to influence chief executive officer compensation. *Journal of Labor Economics* 20 (S2):S138-S175.
- Saly, P. J. 1994. Repricing executive stock option in a down market. *Journal of Accounting and Economics* 18 (3):325-356.

- Shaw, K. W., and M. H. Zhang. 2010. Is CEO cash compensation punished for poor firm performance? *Accounting Review* 85 (3):1065-1093.
- Skant, T. R. 2012. CEO pay, managerial power, and SFAS 123(R). *Accounting Review* 87 (6):2151-2179.
- Sloan, R. G. 1993. Accounting earnings and top executive compensation. *Journal of Accounting and Economics* 16 (1-3):55-100.
- Sunyoung, K., and J. Ng. 2018. Executive bonus contract characteristics and share repurchases. *Accounting Review* 93 (1):289-316.
- Tucker, J. W., and P. A. Zarowin. 2006. Does income smoothing improve earnings informativeness? *Accounting Review* 81 (1):251-270.
- Van Der Stede, W. A. 2013. Discretion in managerial bonus pools. *Accounting Review* 88 (1):351-354.
- Wibur Lewellen, C. L. K. M. 1987. Executive compensation and executive incentive problems. *Journal of Accounting and Economics* 9.
- Xie, B., W. N. Davidson, and P. J. DaDalt. 2003. Earnings management and corporate governance: the role of the board and the audit committee. *Journal of Corporate Finance* 9 (3):295-316.
- Yermack, D. 1995. Do corporations award CEO stock options effectively? *Journal of Financial Economics* 39 (2-3):237-269.
- . D. 1996. Higher market valuation of companies with a small board of directors. *Journal of Financial Economics* 40 (2):185-211.
- . 2006. Flights of fancy: Corporate jets, CEO perquisites, and inferior shareholder returns. *Journal of Financial Economics* 80 (1):211-242.

- . 2006. Golden handshakes: Separation pay for retired and dismissed CEOs. *Journal of Accounting and Economics* 41 (3):237-256.
- . 2009. Deductio' ad absurdum: CEOs donating their own stock to their own family foundations. *Journal of Financial Economics* 94 (1):107-123.

**Table 1**  
**Sample Construction**

Table 1 presents the construction of the regression sample. The sample starts with all S&P500 firm-year observations from 2006 to 2012, i.e. 3500 observations. Banks and financials – defined as firms with Fama-French (48) codes of 44 and 47, respectively - are dropped from the sample. Next, observations without matching proxy filings (form DEF 14A) on the SEC EDGAR online portal are dropped. Further, observations for which the person identified as the chief executive in Execucomp is different from that in the proxy filings are removed. Subsequently, I also drop observations for which the CEO serves only a small fraction of the year which bars efficient implementation of the bonus plans. I also drop 21 observations for which disclosure quality does not allow for the collection of information. I also drop observations without a standard annual bonus plans – firms which do not pay bonuses at all and firms which utilize either completely discretionary or shadow bonus plans. Finally, the sample is reduced by missing archival data necessary for subsequent analyses, resulting in a final sample of 1839 firm-year observations.

<b>Full Sample</b>	<b>3500</b>	<b>Obs.</b>
S&P500 firms from 2006 to 2012		
<u>minus Banks &amp; Financials</u>	<u>(-436)</u>	
<i>Fama-French (48) classification 44 &amp; 47</i>	3064	Obs.
<u>minus No Proxy Available</u>	<u>(-86)</u>	
<i>Proxy statement not available on SEC website</i>	2978	Obs.
<u>minus Technical Problems</u>	<u>(-84)</u>	
<i>Execucomp and proxy CEOs differ (33) OR the CEO served a small fraction of the year (30) OR poor disclosure (21)</i>	2894	Obs.
<u>minus No Bonus Plans</u>	<u>(-106)</u>	
<i>Annual bonus is not a part of CEO's pay package</i>	2788	Obs.
<u>minus Discretionary Bonus Plans</u>	<u>(-120)</u>	
<i>Plan is informal and fully in the discretion of the board. Not tax-deductible.</i>	2668	Obs.
<u>minus Shadow Bonus Plans</u>	<u>(-123)</u>	
<i>Disclosed details of the plan are not meaningful for analysis and aim at tax-deductibility</i>	2545	Obs.
<u>minus Missing Archival Data</u>	<u>(-706)</u>	
<i>Missing data to be merged from either Compustat, Execucomp, Incentive Lab, CRSP, or Riskmetrics</i>	1839	Obs.
<b>Final Sample</b>	<b>1839</b>	<b>Obs.</b>
Used in subsequent analyses		

**Table 2**  
**Summary Statistics**

Table 2 presents the descriptive statistics for the regression sample. The sample is comprised of 1839 firm-year observations of S&P500 firms and spans from 2006 to 2012. Table 1 presents the details of the sample construction. Panel A of Table 2 presents descriptive statistics for quantitative CEO compensation variables. All amounts are presented in thousands of USD. Bonus amounts are hand-collected from company filings and the remaining variables are from Execucomp & Incentive Lab. Minimum, target, and maximum bonus are ex-ante bonus amounts established to be paid out if the minimum (target, maximum) performance is met. Bonuses generally cannot exceed maximum and no bonuses are usually paid if minimum bonuses are not earned. Actual bonus is the CEO's actual bonus earned pursuant to the annual bonus plan. Salary is the CEO's base salary for the given year and Total Compensation is the sum of the CEO's salary, bonuses, long-term incentive plans, restricted stock, options, and other compensation.

Panel A - CEO Compensation

Variable	Mean	St.D.	Q1	Median	Q3
Minimum Bonus	353	598	0	158	540
Target bonus	1687	1482	1005	1320	1875
Maximum Bonus	3593	4263	2000	2684	3971
Actual Bonus	2019	2053	950	1600	2484
Salary	1112	322	918	1054	1255
Total Compensation	9767	6056	5712	8186	12061

Panel B presents descriptive statistics for qualitative bonus details. Individual Performance dummy is equal to 1 if the CEO's individual performance, as subjectively assessed by the board of directors, enters the bonus determination formula. No Minimum/Maximum Bonus dummies indicate situation when the plan does not explicitly stipulate minimum/maximum bonus or when the stipulated minimum bonus is zero. The remaining dummy variables capture how the CEO ex-post finished relative to the ex-ante bonus thresholds. Bonus Below Minimum or 0 dummy equals one if the bonus falls short of minimum bonus or equals zero. Bonus at Maximum dummy equals 1 if the actual bonus is larger than 95% of maximum bonus. Bonus in Incentive Zone dummy is equal to 1 if the two preceding dummies equal zero. Bonus Above Target Bonus dummy equals 1 if the actual bonus exceeds target bonus.

Panel B - Bonus Characteristics

Variable	Mean	St.D.
Individual Performance dummy	0.36	0.48
No Minimum Bonus or MB=0 dummy	0.44	0.50
No Maximum Bonus dummy	0.06	0.24
Bonus at Maximum dummy	0.18	0.39
Bonus In Incentive Zone dummy	0.74	0.44
Bonus Below Minimum or 0 dummy	0.08	0.27
Bonus Above Target Bonus dummy	0.64	0.48



Panel C presents descriptive information for CEO characteristics and governance variables. E Index is the Entrenchment Index constructed according to Bebchuk et al. (2009). It takes the value of 1 for each of the following six provisions that is implemented: staggered boards, limits to shareholder bylaws, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments. Lower values of E Index signal strong corporate governance and vice versa. CEO Power is equal to 1, if the executive does not serve as the chairman of the board and as the president, plus 1 for each of the aforementioned positions the CEO captures. CEO Hired Outside dummy is equal to 1 if the CEO worked for the company for less than a year before becoming the chief executive. CEO Age and CEO Tenure capture the CEO's age and tenure at the beginning of the fiscal year, respectively. CEO Equity Incentives measure the strengths of the incentives from the CEO's equity holdings as proposed by Bergstresser & Philippon (2006).

Panel C - CEO Characteristics & Governance

Variable	Mean	St.D.	Q1	Median	Q3
E Index	2.25	1.38	1	2	3
CEO Power	2.21	0.56	2	2	3
CEO Hired Outside dummy	0.25	0.43			
CEO Age	56.18	5.75	53	56	60
CEO Tenure	6.96	5.66	3.09	5.60	9.00
CEO Equity Incentives	0.19	0.13	0.10	0.17	0.26

Panel D presents company characteristics. Total Assets are the average of the firm's beginning and end year total assets in \$bil. Leverage is the ratio of debt to total assets. Book-to-Market Ratio is the ratio of the firm's book value to assets to the market value of its equity. Discretionary Accruals are the residual of the modified Jones model with operating cash flows estimated by year and Fama-French (48) industry for all firms in the Compustat universe with total assets larger than \$1 bil. Return & ROA Volatility are estimated as the standard deviations of last five years' respective values.

Panel D - Company Characteristics

Variable	Mean	St.D.	Q1	Median	Q3
Total Assets	22.78	32.80	5.08	10.59	26.54
Leverage	0.24	0.15	0.13	0.23	0.34
Book-to-Market Ratio	0.46	0.31	0.25	0.40	0.62
Stock Return	0.12	0.33	-0.08	0.11	0.28
ROA	0.07	0.06	0.03	0.06	0.10
Discretionary Accruals	0.01	0.03	-0.01	0.00	0.02
Sales Growth	0.07	0.15	0.00	0.06	0.13
Return Volatility	0.32	0.19	0.19	0.27	0.41
ROA Volatility	0.03	0.03	0.01	0.02	0.04

**Table 3**  
**Correlation Matrix**

This table presents Pearson (above diagonal) and Spearman (below diagonal) correlations for the main sample variables. Some variable names are shortened or simplified to fit the structure of the correlation table. Minimum, Target, and Maximum Bonus are ex-ante bonus amounts established to be paid out if the minimum (target, maximum) performance is met. Actual bonus is the CEO's actual bonus earned pursuant to the annual bonus plan. Individual Perf. is equal to 1 if the CEO's individual performance, as subjectively assessed by the board of directors, enters the bonus determination formula. E Index is the Entrenchment Index constructed according to Bebchuk et al. (2009). CEO Power is equal to 1, if the executive does not serve as the chairman of the board and as the president, plus 1 for each of the aforementioned positions the CEO captures. Outside CEO is a dummy equal to 1 if the CEO worked for the company for less than a year before becoming the chief executive. CEO Age and CEO Tenure capture the CEO's age and tenure at the beginning of the fiscal year, respectively. All remaining variables are defined in Table 2.

Variable	MIN.	TARGET	MAX.	BONUS	IND.	E	POWER	OUTSIDE	AGE	TENURE	E.INC	ASSETS	LEVER.	BM	RET	ROA
Minimum Bonus	1.00	0.56	0.31	0.50	-0.02	-0.04	0.00	0.03	0.11	0.11	-0.08	0.12	-0.02	0.08	0.02	-0.05
Target Bonus	0.10	1.00	0.60	0.86	0.05	-0.19	0.00	0.05	0.20	0.15	-0.03	0.39	0.01	0.09	0.03	-0.03
Maximum Bonus	0.03	0.85	1.00	0.54	0.03	-0.14	0.01	0.05	0.12	0.09	-0.01	0.25	0.06	0.03	0.01	-0.03
Actual Bonus	0.07	0.64	0.61	1.00	0.08	-0.15	0.02	0.05	0.20	0.10	-0.01	0.32	0.00	-0.02	0.18	0.07
Individual Perf.	-0.03	0.09	0.08	0.10	1.00	-0.04	-0.06	0.04	-0.02	-0.07	0.02	0.05	-0.02	-0.02	0.01	-0.01
E Index	0.05	-0.21	-0.20	-0.12	-0.04	1.00	0.02	0.00	0.03	0.04	-0.01	-0.28	0.01	-0.06	0.07	0.03
CEO Power	0.00	0.02	0.03	0.05	-0.06	0.02	1.00	0.00	0.05	-0.04	0.06	0.10	0.10	0.02	0.02	-0.01
Outside CEO	-0.04	0.06	0.09	0.03	0.04	0.00	0.00	1.00	0.08	0.10	-0.03	-0.06	0.05	-0.02	-0.01	-0.08
CEO Age	0.00	0.14	0.14	0.12	-0.03	0.03	0.06	0.06	1.00	0.37	-0.02	0.08	0.04	0.05	0.03	-0.03
CEO Tenure	0.05	0.11	0.10	0.05	-0.07	0.04	-0.01	0.05	0.31	1.00	0.24	-0.03	-0.01	0.03	0.03	-0.01
Equity Inc.	-0.07	0.10	0.10	0.07	0.02	-0.01	0.06	-0.06	-0.04	0.31	1.00	0.07	-0.21	-0.17	-0.15	0.18
Total Assets	0.04	0.58	0.51	0.42	0.06	-0.27	0.11	-0.06	0.10	-0.04	0.03	1.00	-0.03	0.35	-0.04	-0.24
Leverage	0.02	0.01	0.04	0.00	-0.03	0.02	0.11	0.04	0.04	-0.03	-0.19	0.10	1.00	-0.10	-0.03	-0.20
Book-to-Market	0.12	0.07	0.05	-0.07	-0.04	-0.03	0.02	-0.02	0.07	0.03	-0.21	0.40	-0.04	1.00	-0.28	-0.48
Stock Return	0.02	0.01	0.01	0.29	0.01	0.06	0.02	-0.02	0.03	0.02	-0.12	-0.04	-0.02	-0.27	1.00	0.12
ROA	-0.07	-0.05	-0.04	0.10	0.02	0.03	-0.03	-0.08	-0.05	-0.03	0.22	-0.39	-0.27	-0.58	0.11	1.00

**Table 4**  
**Earnings Management Choices in Response to Bonus Thresholds**

Table 4 presents earnings management outcomes in response to annual bonus threshold. Each regression is estimated with firm and year fixed effects and with dummies indicating how did the CEO bonus plan finish relative to a given ex-ante benchmark. The dependent variable is discretionary accruals defined as the residual of the modified Jones model with operating cash flows estimated by year and Fama-French (48) industry for all firms in the Compustat universe with total assets larger than \$1 bil. T-statistics are in parentheses.

Panel A: The independent variables are OUTSIDE IZ which is a dummy variable equal to one if the bonus plan finished outside of the incentive zone, i.e. either below minimum threshold (or at 0) or above 95% of maximum threshold. In specification (2) this variable is decomposed into two separate dummies. ABOVE MAX equals one if the actual bonus exceeds 95% of maximum threshold. UNDER MIN. is equal to 1 if the bonus is short of minimum threshold or zero. Specifications (3) and (4) split the sample into observations with large and small bonus plans as those at or above and those below median target bonus as a percentage of base salary. Specifications (5) and (6) split the sample by the median target bonus as a fraction of total compensation. Specifications (7) and (8) separate the sample by median entrenchment index value. Specifications (9) and (10) split the sample based on the inclusion of individual performance measures in the bonus formula.

Panel A			
	(1)		(2)
	<u>Whole Sample; n=1839</u>		<u>Whole Sample; n=1839</u>
OUTSIDE IZ	-4.29*** (-2.43)	ABOVE MAX.	-1.99 (-0.94)
		UNDER MIN	-7.38*** (-2.79)
	(3)		(4)
	<u>Large Plans; n=962</u>		<u>Small Plans; n=877</u>
OUTSIDE IZ	-6.94*** (-2.83)	OUTSIDE IZ	-3.05 (-1.19)
	(5)		(6)
	<u>Large Plans (alt); n=914</u>		<u>Small Plans (alt); n=925</u>
OUTSIDE IZ	-4.65* (-1.92)	OUTSIDE IZ	-1.36 (-0.52)
	(7)		(8)
	<u>Strong Governance; n=1027</u>		<u>Weak Governance; n=812</u>
OUTSIDE IZ	-2.17 (-0.88)	OUTSIDE IZ	-7.09*** (-2.61)

	(9)		(10)	
	<u>Individual Contribution; n=655</u>		<u>No Individual Contribution; n=1184</u>	
OUTSIDE IZ	-6.08**		OUTSIDE IZ	-5.19***
	(-2.01)			(-2.29)

Panel B: This panel utilizes a smaller sample of observations for which the bonus plan ended within the incentive zone. The independent variable ABOVE TARGET equals one if the actual bonus exceeds target bonus and zero otherwise. Specification (11) presents results for the whole sample while specifications (12) and (13) present results separated into subgroups with large and small bonus plans based on the median target bonus as a percentage of base salary, as in specifications (3) and (4).

Panel B

	(11)		(12)		(13)	
	<u>Whole Sample; n=1354</u>		<u>Large Plans; n=735</u>		<u>Small Plans; n=619</u>	
ABOVE TARGET	3.28**		ABOVE TARGET	5.82***	ABOVE TARGET	0.17
	(2.01)			(2.89)		(0.06)

**Table 5****The Determinants and Consequences of Voluntary Bonus Disclosures**

This table presents logistic regression results of the propensity to voluntarily disclose bonus details. The sample is for the year 2005 and covers all firms that are members of the main sample with adequate data. P-values are in parentheses. The dependent variable equals to 1 if the firm disclosed bonus plan details at least once over the period of past three years (i.e. from 2003 to 2005). Bonus Size is the proportion of bonus pay in the compensation package, where bonus pay is measured by the ex-ante target bonus size for 2006. E Index is the Entrenchment Index constructed according to Bebchuk et al. (2009). CEO Power is equal to 1, if the executive does not serve as the chairman of the board and as the president, plus 1 for each of the aforementioned positions the CEO captures. CEO Hired Outside dummy is equal to 1 if the CEO worked for the company for less than a year before becoming the chief executive. CEO Age and CEO Tenure capture the CEO's age and tenure at the beginning of the fiscal year, respectively. CEO Equity Incentives measure the strengths of the incentives from the CEO's equity holdings as proposed by Bergstresser & Philippon (2006). Total Assets are the average of the firm's beginning and end year total assets. Return and ROA Volatility are estimated as the standard deviations of last five years' respective values. Book-to-Market Ratio is the ratio of the firm's book value to assets to the market value of its equity. Salary is the CEO's base salary.

	(1)	(2)
Intercept	-10.38 (0.33)	-7.91 (0.85)
Bonus Size	0.01 (1.00)	0.16 (0.94)
E Index	0.00 (1.00)	0.07 (0.75)
CEO Power	0.26 (0.55)	0.22 (0.64)
CEO Hired Outside	1.82*** (0.01)	2.21*** (0.00)
log CEO Age	0.66 (0.78)	-1.18 (0.68)
log CEO Tenure	0.48 (0.32)	0.83 (0.13)
Equity Incentives	1.27 (0.51)	2.07 (0.33)
log Total Assets	-0.04 (0.89)	0.08 (0.83)
Return Volatility	2.37* (0.05)	2.16 (0.11)
ROA Volatility	-12.12 (0.19)	-9.50 (0.32)
Book-to-Market Ratio	0.87 (0.51)	1.19 (0.42)
log Salary	0.48 (0.66)	0.47 (0.72)
Industry FE	No	Yes
Observations	194	194
Dep. Variable =1	26	26
Dep. Variable =0	168	168
Pseudo R-Squared	0.109	0.18

**Table 6**  
**The Determinants of Annual Bonus Plan Incentives**

This table presents fixed-effects regression results of the determinants of the size of annual bonus plans. White's t-statistics are in parentheses. The dependent variable in column (1) is the ex-ante target bonus as a percentage of base salary. Column (2) features the target bonus as a fraction of total CEO compensation. E Index is the Entrenchment Index constructed according to Bebchuk et al. (2009). CEO Power is equal to 1, if the executive does not serve as the chairman of the board and as the president, plus 1 for each of the aforementioned positions the CEO captures. CEO Hired Outside dummy is equal to 1 if the CEO worked for the company for less than a year before becoming the chief executive. CEO Age and CEO Tenure capture the CEO's age and tenure at the beginning of the fiscal year, respectively. CEO Equity Incentives measure the strengths of the incentives from the CEO's equity holdings as proposed by Bergstresser & Phillipon (2006). Total Assets are the average of the firm's beginning and end year total assets. Return and ROA Volatility are estimated as the standard deviations of last five years' respective values. Book-to-Market Ratio is the ratio of the firm's book value to assets to the market value of its equity. Salary is the CEO's base salary.

	(1)	(2)
Intercept	-242.54* (-1.69)	9.53 (0.67)
E Index	-3.40*** (-3.53)	-0.55*** (-3.11)
CEO Power	-3.47 (-1.57)	-0.31 (-0.72)
CEO Hired Outside	-0.10 (-0.02)	-0.57 (-0.91)
log CEO Age	71.51*** (2.45)	2.85 (0.89)
log CEO Tenure	8.53*** (2.58)	0.85 (1.55)
Equity Incentives	-16.66 (-0.77)	-13.85*** (-5.49)
log Total Assets	25.11*** (7.2)	-1.10*** (-3.05)
Return Volatility	20.45 (1.61)	1.27 (0.98)
ROA Volatility	-43.18 (-0.97)	-18.28*** (-2.82)
Book-to-Market Ratio	-7.63 (-1.04)	2.05* (1.96)
log Salary	-22.82 (-1.33)	1.72 (1.27)
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	1839	1839
R-Squared	0.25	0.11
Ad. R-Squared	0.24	0.09

**Table 7**  
**The Determinants of Bonus Features**

This table presents logistic regression results of the determinants of certain bonus features. Specification (1) presents the determinants for the inclusion of individual performance measures in the bonus payout formula. Specification (2) shows the determinants of not stipulating any lower performance threshold and specification (3) shows the determinants of not stipulating an upper performance threshold. P-values are in parentheses. E Index is the Entrenchment Index constructed according to Bebchuk et al. (2009). CEO Power is equal to 1, if the executive does not serve as the chairman of the board and as the president, plus 1 for each of the aforementioned positions the CEO captures. CEO Hired Outside dummy is equal to 1 if the CEO worked for the company for less than a year before becoming the chief executive. CEO Age and CEO Tenure capture the CEO's age and tenure at the beginning of the fiscal year, respectively. CEO Equity Incentives measure the strengths of the incentives from the CEO's equity holdings as proposed by Bergstresser & Philippon (2006). Total Assets are the average of the firm's beginning and end year total assets. Return and ROA Volatility are estimated as the standard deviations of last five years' respective values. Book-to-Market Ratio is the ratio of the firm's book value to assets to the market value of its equity. Salary is the CEO's base salary.

	(1)	(2)	(3)
Intercept	-1.30 (0.62)	-1.87 (0.47)	8.87* (0.05)
E Index	0.00 (0.91)	-0.10** (0.02)	-0.14* (0.09)
CEO Power	-0.36*** (<.01)	-0.03 (0.76)	-0.19 (0.31)
CEO Hired Outside	0.41** (0.01)	0.48*** (<.01)	0.15 (0.61)
log CEO Age	0.57 (0.34)	0.65 (0.27)	-1.45 (0.19)
log CEO Tenure	-0.26** (0.02)	-0.24** (0.02)	0.38* (0.06)
Equity Incentives	0.57 (0.27)	2.61*** (<.01)	-1.59 (0.10)
log Total Assets	0.18** (0.02)	0.17** (0.03)	0.34** (0.02)
Return Volatility	0.30 (0.36)	-0.86** (0.01)	-0.72 (0.28)
ROA Volatility	-1.83 (0.29)	2.84 (0.10)	-2.48 (0.50)
Book-to-Market Ratio	-0.47* (0.05)	-0.67*** (<.01)	-1.03** (0.03)
log Salary	-0.32 (0.22)	-0.36 (0.17)	-1.11** (0.01)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	1839	1839	1839
Dep. Variable =1	662	805	111
Dep. Variable =0	1177	1034	1728
Pseudo R-Squared	0.028	0.036	0.065

**Table 8****The Role of Bonus Plan Design in Pay-for-Performance Sensitivity of Cash Pay**

This table presents fixed-effects regression results of the determinants changes in (logarithmic) CEO cash compensation (defined as the change in the sum of the CEO's salary and annual bonus; annual bonus amounts are hand-collected from company filings). White's t-statistics are in parentheses. Column (1) shows results for the entire sample while column (2) excludes observations where the CEO's bonus was either under the minimum or at/above the maximum thresholds. The empirical specifications follow the model devised by Leone et al. (2006). The right hand side variable include the firm's sales (Sales) and the squared value of sales (SalesSquared), the firm's age (Firmage), leverage (Leverage), the change in the return on the firm's assets (chROA), annual stock returns (RET), and book to market ratio (BM). Finally, NegAdjRET is an indicator variable equal to one when the firm's market-adjusted stock returns are negative. The specification includes numerous interacted variables and also features industry and year fixed effects.

	(1)	(2)
Intercept	-0.15*** (-2.64)	-0.14*** (-2.40)
chROA	1.59*** (5.18)	1.24*** (4.23)
RET	0.04 (0.55)	-0.02 (-0.24)
NegAdjRET	-0.02 (-0.85)	-0.02 (-0.58)
chROA*NegAdjRET	0.27 (0.51)	0.01 (0.03)
RET*NegAdjRET	0.23*** (2.71)	0.02 (0.29)
Sales	0.00 (1.57)	0.00*** (2.21)
SalesSquared	0.00 (-0.68)	0.00 (-0.93)
Firmage	0.00* (-1.79)	0.00*** (-2.41)
Firmage*RET	0.00*** (3.41)	0.01*** (3.84)
Leverage	0.03 (0.40)	0.11 (1.62)
Leverage*RET	0.19 (1.27)	0.03 (0.20)
BM	0.08*** (2.36)	0.08*** (2.45)
BM*RET	0.17*** (3.44)	0.13*** (2.81)
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	1839	1361
R-Squared	0.14	0.11
Ad. R-Squared	0.13	0.09