EXECUTIVE PAY DISPARITY AND INTERNAL CONTROL MATERIAL WEAKNESSES

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Certificate of Originality

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ABSTRACT

Prior literature on executive pay disparity provides two perspectives. The tournament perspective considers the large pay gap between the CEO and other senior executives as an effective tournament incentive that can reduce the entrenchment of the CEO (Kale, Reis, and Venkateswaran (2009)). The other perspective named as the managerial power perspective suggests that large pay gap can make the CEO more entrenched by increasing the bargaining power of the CEO (Bebchuk, Cremers and Peyer (2011)). Therefore, this line of research provides inconclusive evidence. In this study, I try to extend and complement previous studies by investigating the role of executive pay disparity in affecting firms' internal control quality. Using 8,547 U.S. firm-year observations over 2004-2012, I document that firms with large executive pay disparity tend to be associated with a lower likelihood of having internal control material weaknesses. This relation is insensitive to different categories of internal control material weaknesses based on two classification schemes. In addition, I also find that a larger pay disparity between the CEO and non-CEO executives will lead to a higher degree of accounting conservatism and a lower probability of having financial restatements. Taken together, the evidence is supportive of the tournament incentive perspective.

I further examine factors that may affect the extent of the association between CEO pay disparity and internal control material weaknesses. Based on the results of the baseline model, I find that the negative relation between CEO pay disparity and internal control material weaknesses is more stronger for firms with the most severe agency problems. This suggests that a large CEO pay disparity can be substitutive of other corporate governance mechanisms. Consistent with the tournament incentives perspective, I also find evidence showing that the negative relation between executive pay disparity and the probability of having internal control material weaknesses is less pronounced when the probability of promotion perceived by other senior executives is high. Specifically, I find that the relationship between executive pay disparity and material weaknesses is weakened when the CEO is new, and weakened further if the new CEO is an outsider.

Finally, I perform several partitioning analyses. In particular, the evidence show that the pay disparity between the CEO and lower-level executives has a stronger impact on internal control weaknesses for firms with lower CEO ownership, a younger CEO, lower institutional ownership, less analyst coverage, lower degree of board independence, and no female board presence. As a whole, the results provided by partitioning analyses are supportive of the tournament incentives perspective as well. Most importantly, the evidence also suggests that executive pay disparity seem to serve as a substitute, as far as accounting practice is concerned, of other mechanisms for corporate governance that would otherwise be weak.

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CHAPTER ONE

OVERVIEW

1.1 Introduction

This thesis examines the link between executive pay disparity and the probability of reporting internal control material weaknesses. In this chapter, I mainly discuss the motivations, research questions, research design and major findings for this study to provide an overview of my thesis.

In chapter three, I examine the role of pay disparity between the CEO and non-CEO executives, which is measured as chief executive officer (CEO) pay slice (CPS), in affecting the effectiveness of internal controls. Based on the results of chapter three, I go a step further in chapter four to explore factors that may affect the degree of the association between executive pay disparity and internal control material weaknesses based on the results of chapter three.

1.2 Motivations and research questions

The literature on CEO compensation is vast. However, previous studies mainly focus on the absolute level and the main components of CEO pay. Recently, executive pay disparity has begun to spark an intense debate about how a large compensation difference between the CEO and senior executives affects the performance and behavior of firms. My thesis is mainly motivated by this development in the studies on executive pay disparity: First, Kale, Reis, and Venkateswaran (2009) document a positive association between CEO pay disparity and firm performance. Their results imply that the large compensation differential between the CEO and senior executives is viewed as the tournament incentive that can motivate non-CEO executives to work harder in order to compete for the CEO position. I call this "tournament incentive perspective". However, the tournament

incentive perspective may also suggest that a large pay disparity can result in more risk taking, which may increase the chance of non-CEO executives being promoted to the CEO position. Second, Bebchuk, Cremers and Peyer (2011) provide evidence that large pay disparity between the CEO and senior executives is associated with lower future firm value. Their results suggest that a large pay differential between the CEO and non-CEO executives increases the bargaining power of CEO, and hence make the CEO more entrenched. I call this "managerial power perspective". In addition, Chen, Huang, and Wei (2013) find that there is a significant and positive relation between executive pay disparity and the cost of equity, which is consistent with Bebchuk, Cremers, and Peyer (2011)'s managerial power explanation. Apparently, the evidence provided so far is mixed, and how executive pay disparity affects other firm behavior and decision making remains unclear. Since prior research mainly focuses on the association between executive pay disparity and firm performance, I intend to find more evidence for this line of research by focusing on how executive pay disparity affects firms' financial reporting quality. In particular, I examine whether the pay disparity between the CEO and lower-level executives has an impact on the likelihood of having internal control material weaknesses, since good internal control is perceived as an important factor in providing higher financial reporting quality (Committee of Sponsoring Organizations [COSO] (1987); Kinney, Maher, and Wright (2000); Kinney (2000)).

In addition, many academics investigate the relation between management compensation and firms' accounting practice (Bergstresser and Philippon (2006); LaFond and Roychowdhury (2008); Jiang, Petroni and Wang (2010); Hoitash, Hoitash and Johnstone (2012)). Balsam, Jiang and Lu (2014) document that high equity incentives is associated with a lower likelihood of reporting internal control material weaknesses. Yet other compensation dimensions may also have impacts on firms' internal control system or other accounting practice. This thesis adds to the extant literature on a potential compensation dimension: executive pay disparity.

My study starts in chapter three to mainly address the research question of whether the pay differential between the CEO and other senior executives has an

impact on firms' financial reporting quality, particularly the relationship between the pay disparity and the effectiveness of internal controls over financial reporting? To provide additional evidence related to firms' financial reporting quality, I also examine whether executive pay disparity affects the degree of accounting conservatism and the likelihood of having financial restatement.

Such investigations naturally lead to further research questions on factors affecting the degree of the association between executive pay disparity and internal control material weaknesses, which are dealt with in chapter four. The factors I am specifically interested in are as follows.

The first factor relates to the question: Does the severity of agency problem affect the relationship between executive pay disparity and internal control material weaknesses? A series of studies in tournament incentive (Lazear and Rosen (1981); Kale, Reis, and Venkateswaran (2009)) suggest that the large executive pay disparity between the CEO and lower level executives encourages non-CEO senior executives to develop firm-specific skills in order to replace the current CEO, and this in turn makes more subordinate managers to be skillful and competitive. The large pool of skilled internal candidates further reduces the entrenchment of the current CEOs by increasing the bargaining power of the board. Therefore, their results indicate that the pay gap between the CEO and subordinate managers is positively related with corporate governance. In contract, Bebchuk, Cremers, and Peyer (2011) document that a large differencial between the CEO and non-CEO managers leads to more CEO opportunistic behavior. It implies that a large pay disparity is correlated with more severe agency problem. In addition, Chen, Huang, and Wei (2013) show that the positive association between executive pay differencial and the cost of equity is stronger when agency problems are more severe. Thus, executive pay disparity's role in firms' corporate governance structure is not clear based the above findings. Hence, I intend to investigate whether the severity of agency problem has an impact on the relationship between executive pay disparity and internal control material weaknesses.

The second factor relates to the question: Does the probability of promotion perceived by non-CEO executives affect the association between executive pay disparity and internal control material weaknesses? The probability of promotion perceived by other senior executives is found to be related with tournament incentives (Kale, Reis, and Venkateswaran (2009)). If my findings are consistent with Kale, Reis, and Venkateswaran (2009)'s tournament incentive perspective, then the association between executive pay disparity and internal control material weaknesses should be weak when the probability of promotion is lower.

1.3 Research design and major findings

The three main research questions stated above will be operationalized into three testing hypotheses. The managerial power perspective proposed by Bebchuk, Cremers, and Peyer (2011) and Chen, Huang, and Wei (2013) leads to my 1st hypothesis (Hypothesis 1): Executive pay disparity is positively related with the probability of having internal control material weaknesses. The rejection of the hypothesis will lend support to the tournament incentive perspective proposed by Kale, Reis, and Venkateswaran (2009). On the basis of the testing result of Hypothesis 1, the second hypothesis (Hyppthesis 2) is: the negative association between executive pay disparity and internal control material weaknesses is more pronounced when the agency problems are more severe. It tests the impact of agency problem on the relation between executive pay disparity and the probability of having internal control material weaknesses. The third (Hypothesis 3) hypothesis is: the negative association between executive pay disparity and internal control material weaknesses is weakened when the firm has a new CEO, and is weakened further when the new CEO is an outsider. It tests the effect of the probability of promotion perceived by non-CEO executives on the relation between executive pay disparity and internal control material weaknesses.

Following prior literature (Bebchuk, Cremers, and Peyer (2011); Chen, Huang, and Wei (2013)), I define CPS as the percentage of the total CEO compensation to

the total pay of the top five executives to proxy for executive pay disparity. The dependent variable is ICMW, which is dummy variable equal to 1 for firms that report at least one internal control material weakness and 0 otherwise. To test Hypothesis 1, I run a logistic regression of ICMW against CPS to see how the probability of disclosing a material weakness in internal control over financial reporting is related to executive pay disparity. To test Hypothesis 2, I follow Chen, Chen, and Wei (2011) to use free cash flow to proxy for the severity of agency problem and then interact it with CPS. To test Hypothesis 3, I interact CPS measure with several variables that may affect the probability of promotion perceived by non-CEO executives such as new CEO indicator, insider CEO indicator and industry homogeneity. Following Kale, Reis, and Venkateswaran (2009), new CEO indicator is equal to one in the CEO's first year of service as CEO and zero otherwise. Following Parrino (1997), insider CEO indicator is equal to one if that executive has worked for the firm for at least one year before becoming the CEO, and industry homogeneity is measured as the mean partial correlation between firm returns and industry returns for each industry year, controlling for the market returns.

Major findings can be summarized as follows. First, CPS is negatively related to the probability of having internal control material weaknesses. Further analysis shows that larger executive pay disparity leads to more conservative accounting and less financial restatements. Second, I find that the negative association between CPS and the probability of having internal control material weaknesses is more pronounced when the agency problem is more severe. Furthermore, the relation weakens when the probability of promotion perceived by non-CEO executives is lower. In particular, the negative relation is less pronounced when the CEO is new, and weakens further when the new CEO is an outsider. Taken together, all evidence provided by this study supports the tournament incentive perspective proposed by Kale, Reis, and Venkateswaran (2009).

1.4 Contributions

This study contributes to the emerging literature on executive pay disparity in the following important ways. First, my study is among the first to provide evidence on the association between executive pay disparity and the effectiveness of internal controls over financial reporting. My results are consistent with Kale, Reis, and Venkateswaran (2009), but inconsistent with Bebchuk, Cremers, and Peyer (2011) and Chen, Huang, and Wei (2013). I complement Kale, Reis, and Venkateswaran (2009)'s study by showing that executive pay disparity also affects firms' accounting practice. Second, this study improves our understanding of pay disparity's role in corporate governance structure. My findings in chapter four show that the negative association between executive pay disparity and the probability of having internal control material weaknesses is more stronger for firms having more severe agency problems or weak corporate governance suggesting that executive pay disparity is substitutive of other corporate governance mechanism.

Third, my study contributes to the literature on the determinants of internal control deficiencies by showing that executive pay disparity lead to a lower probability of having internal control material weaknesses. This suggests that executive pay disparity plays a role in affecting the effectiveness of internal controls over financial reporting.

Finally, there is a growing literature on how executive compensation affects financial reporting quality (Reitenga, Buchheit, Yin and Baker(2002); Bergstresser and Philippon (2006); Cheng and Farber (2008); Laux and Laux (2009); Jiang, Petroni and Wang (2010)). This study sheds light on the importance for financial reporting quality of another dimension concerning the executive compensation: executive pay disparity.

1.5 Thesis Structure

The remainder of the thesis is organized as follows. Chapter two provides literature review on issues examined in this study. Chapter three examines the role of executive pay disparity in affecting the probability of having internal control material weaknesses. Chapter four looks at the factors that may affect the extent of the association between executive pay disparity and the likelihood of having internal control material weaknesses. Chapter five provides concluding remarks, limitations and future research opportunities.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews some key studies related to the Sarbanes-Oxley Act(SOX), internal control, accounting conservatism, financial restatement, executive pay disparity, executive compensation and accounting practice, and top management characteristics and accounting practice. Section 2.2 reviews literature of internal control. Section 2.3 reviews previous studies on accounting conservatism. Section 2.4 presents evidence regarding the causes and consequences of financial restatement. Section 2.5 provides an overview of the emerging studies of executive pay disparity. Section 2.6 summarizes literature of the association between executive compensation and accounting practice. Section 2.7 reviews studies on the relation between top management characteristics and accounting practice.

2.2 Internal control over financial reporting

2.2.1 Sarbanes-Oxley Act and internal control over financial reporting

The majority of literature on internal controls is conducted in the post-SOX regime. Before the implementation of SOX, companies were only required to disclose significant internal control deficiencies[1] in firm's 8-K when there was a change in auditor (SEC, 1988).

After a series of financial fraud (e.g., Enron and Worldcom), the U.S. Congress finally passed SOX in 2002. The act consists of 11 sections, ranging from corporate

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[1] The PCAOB defines an internal control deficiency as: A deficiency in internal control over financial reporting exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent or detect misstatements on a timely basis. In discuss internal control deficiencies in more detail in section 2.2.2.

governance, auditor independence, to internal control assessment. The most studied sections are Section 302 and Section 404, which were effective on August 29, 2002 and November 15, 2004, respectively. Under Section 302, SEC registrants' executives, i.e. CEOs and CFOs, must certify that they have evaluated the effectiveness of their internal controls over financial reporting in the periodic reports (e.g., the 10-Qs and 10-Ks). Section 404, requires both company executives and independent auditors to evaluate the internal control quality annually over financial reporting. Not only managers, but also the independent auditors, are responsible for reporting material weaknesses[2] in internal control under this section. In addition, the auditor has to issue an adverse opinion on the effectiveness of internal controls if one or more internal control material weakness exists.

After the passage of SOX, much research has been conducted to document the improvement in corporate governance and firm performance. In addition, Johnstone, Li and Rupley (2011) document that the top management possesses more financial and accounting expertise ever since the passage of SOX. However, many studies also argue that the costs of SOX such as SOX compliance costs imposed on the firms are excessive.

Zhang (2007) investigates the economic consequences of the Sarbanes-Oxley Act by studying the market reactions to the legislative events in the pre- and post-SOX period. He uses the stock prices to proxy for the economic consequences of SOX events by assuming the stock prices incorporate all the relevant information of the costs and benefits of SOX. The evidence shows that the market reacts negatively to key SOX legislative events, implying that the implementation of SOX imposes net costs on firms. In addition, he examines the cross-sectional implications of major provisions of SOX. He finds that market reacts more negatively for firms with more non-audited services. Moreover, he documents that firms with more foreign

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[2] Material weakness is the most severe type of internal control deficiency. I will discuss material weakness in more detail in section 2.2.2.

transactions, more complex operations, and weak corporate governance are associated with more costs under SOX regime.

Engel, Hayes and Wang (2007) examine firms' going –private decisions caused by the heavy SOX-related costs after the passage of SOX. Using sample firms that file Schedule 13E-3 with SEC to deregister from public from January 1998 to May 2005, they find that more firms decide to go private in the post-SOX period relative to the pre-SOX period. In addition, they find that the going-private decisions are more common among small firms, which suggest that SOX-related costs are heavier for small firms than for large firms. Further analyses show that the market reactions to going-private announcements are more positive for smaller firms with high inside ownership in the post-SOX period relative to the pre-SOX period. This suggests that firms with high inside ownership tend to maintain their effectiveness of corporate governance system by deregistering from public stock market in order to avoid the SOX-related costs. Taken together, their study indicates that firms may avoid SOX-induced disclosure requirements by undertaking going-private transactions.

Prakash (2008) compares the costs and benefits of SOX 404 for small public companies by focusing on non-accelerated filters[3] rather than accelerated filters. They document that the SOX-related costs are quite heavy for these small firms. However, the implementation of SOX also improves the financial reporting quality of these small firms, which correspondingly decreases the cost of equity capital.

2.2.2 Determinants of internal control deficiencies

Empirical evidence on the determinants of internal control deficiencies is limited before the passage of SOX. Krishnan (2005) focuses on internal control deficiencies

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[3] Public companies with a market capitalization of at least $75 million are considered as accelerated filters, which are required to provide a management assessment of the internal control system associated with an auditor's opinion from November 2004. Non-accelerated filters are required to follow all the requirements under SOX 404 on or after December 15, 2007.

reported from 1994 to 2000 in the 8-Ks of firms that changed auditors and investigates the association between audit committee quality and internal control quality. His findings show that higher audit committee quality leads to higher internal control quality. In particular, more independent audit committee and audit committee members with more financial expertise are associated with higher internal control quality. However, one of the limitations of their study is that the sample of reported internal control problems only contains the companies that have auditor changes, which may lead to a sample bias.

Ever since the passage of SOX, a number of studies provide evidence on the determinants of internal control material weaknesses. Using data of internal control disclosures prior to audits mandated by Section 404, Ashbaugh-Skaife, Collins and Kinney (2007) focus on disclosures under Section 302 to investigate the broad factors that may affect firms' internal control quality. They find that firms reporting internal control deficiencies have more complex operations, greater accounting measurement application risk, more audit resignations, more changes in firms' organizational structure, and fewer resources for internal controls. Regarding the incentives to detect and disclose internal control deficiencies, they find that companies that have more financial restatements and SEC Accounting and Auditing Enforcement Releases (AAERs) have more incentives to discover and report internal control deficiencies. In addition, firms reporting SOX-302 warnings of internal control deficiencies are more likely to be audited by dominant auditors and have more concentrated institutional owners. Their results suggest that firms tend to report internal control deficiencies when they are exposed to higher internal control risk and have more incentives to disclose internal control deficiencies between the effective date of Section 302 and Section 404.

Doyle, Ge and McVay (2007a) find similar determinants of internal control quality as compared to Ashbaugh-Skaife, Collins and Kinney (2007)'s study. Using a sample of companies that report internal control material weaknesses under both Section 302 and Section 404, they find that smaller, younger, financially weaker, more complex, growing rapidly, and undergoing restructuring firms are more likely

to report internal control material weaknesses. They find that the factors affecting internal control material weaknesses depends on the categories of material weaknesses reported. By decomposing material weaknesses into transaction- or account-level and firm-level weaknesses, they provide evidence that companies disclosing transaction- or account-level weaknesses tend to have more diversified and complex operations and more changes in organizational structure. The other group, firm-level weaknesses, is more common in younger and financially weaker firms. Alternatively, they divide material weaknesses into complexity group, staffing group, and general group. Firms with more severe complexity-related issues tend to have more diversified and complex operations and to be undergoing rapid organizational structural changes, while firms with staffing-related internal control problems tend to be smaller and financially weaker.

While both Section 302 and Section 404 require disclosures of internal control material weaknesses, Section 404 is more stringent in that both management and independent auditors are responsible for evaluating the effectiveness of internal control system. To provide a better understanding of these two different regimes, Hoitash, Hoitash and Bedard (2009) examine how associations between governance characteristics and internal control quality differ under Section 302 and Section404. They find that firms with internal control material weaknesses are associated with weak corporate governance under Section 404, while this relationship is not observed under Section 302. In particular, their study presents that firms with audit committee having higher financial qualification and board having higher quality are less likely to have material weaknesses. This implies that companies with weak corporate governance are not likely to detect or report their material weaknesses under Section 302.

Li, Sun and Ettredge (2010) provide evidence relating to the interrelationships among CFOs' professional qualifications, internal control material weaknesses under Section 404, CFOs' turnover, CFOs' improvement in professional qualification, and improvement in internal control quality. First, they find that there is a negative association between a CFO's professional qualification and an adverse

SOX 404 opinion. This implies that CFO qualification is a crucial determinant of internal control weaknesses. Furthermore, they document that an adverse SOX 404 opinion leads to a higher probability of CFO turnover in the following year. After firing these unqualified CFOs, firms are more likely to hire CFOs with better professional qualification. Finally, their results show that hiring a more qualified new CFO improves internal control quality subsequently. Overall, their results suggest that CFO qualifications serves as an important determinant of internal control quality.

Focusing on nonprofit organizations, Petrovits, Shakespeare and Shih (2011) find that firms that are financially weaker, smaller, growing rapidly, and more complex are more likely to have internal control weaknesses. Additional results show that companies with internal control problems receive less public support subsequently. This indicates that the internal control quality influences donors, government agencies, and other capital resources' funding decision.

2.2.3 Classification of internal control weaknesses

Prior research provides evidence that factors affecting internal control weaknesses depend on different categories of internal control material weaknesses (Doyle, Ge and McVay (2007a)). There is another line of research examining how various classifications of internal control material weaknesses lead to different reporting effects (Doyle, Ge and McVay (2007b); Feng, Li and McVay (2009); Goh and Li (2011)). This section summarizes literature related to internal control material weaknesses classification.

Doyle, Ge and McVay (2007b) examine the relation between accrual quality and internal control quality. They find that firms that disclose at least on material weakness under Section 302 and Section 404 are more likely to have lower accrual quality. By decomposing material weaknesses intro transaction- or account-level and company-level, they find that the negative association between material weaknesses

and accrual quality only exists in firms with company-level weaknesses but not exists in firms with transaction- or account-level weaknesses. This is because company-level weaknesses are more severe and less auditable than transaction-account-level weaknesses. Moreover, internal control material weaknesses under Section 404 do not lead to poor accrual quality while company-level weaknesses under Section 404 do lead to poor accrual quality.

Ge and McVay (2005) present a classification scheme of internal control material weaknesses. By doing descriptive statistics, they find that inadequate accounting resources, such as the lack of qualified accounting personnel, deficient revenue-recognition policies, deficient reporting process and accounting policies, inappropriate account reconciliation and improper segregation of duties, is the major cause of the majority of internal control material weaknesses. In subsequent analysis, they also investigate firm characteristic that may affect the effectiveness of internal control system. More specifically, their evidence present that business complexity and dominance of auditor firms are negatively related to internal control quality while firm size and profitability are positively associated with internal control quality.

Feng, Li and McVay (2009) investigate whether internal control quality affects the accuracy of management guidance using material weaknesses disclosure under Section 404. They measure the accuracy of management guidance as the absolute value of the difference between reported earnings and management forecast of earnings scaled by asset per share at the beginning of the fiscal year. Using 2,994 firm-years, they document that higher internal control quality leads to more accurate management projections of firm performance. They also compare the associations among various categories of material weaknesses. The evidence shows that the association is strongest when material weaknesses are relevant to revenue and cost of goods sold. This result is consistent with their prediction that manager forecast accuracy is affected by revenue and cost of goods sold inputs most.

Goh and Li (2011) study the association between internal control material weaknesses and conditional conservatism. Using different measures of accounting conservatism, they find that there is a positive relation between internal control quality and conservatism. Further, they show that firms that report internal control material weaknesses and remediate these material weaknesses subsequently tend to have a higher degree of accounting conservatism compared to material weaknesses firms that fail to do so. In additional analyses, they examine how the association between internal control quality and accounting conservatism differs among various groups of internal control material weaknesses. The results show that company-level material weaknesses lead to even lower conservatism since this kind of material weaknesses tend to be the most severe and pervasive material weaknesses.

Hammersley, Myers and Shakespeare (2008) examine different groups of internal control weaknesses based on weaknesses characteristics under Section 302. Their main research question is how market reacts to internal control weaknesses disclosure under Section 302. They point out that market reacts negatively to internal control weaknesses disclosure. Furthermore, they decompose internal material weaknesses into different groups based on material weaknesses characteristics to investigate if the association between market reactions and internal control material weaknesses depends on material weaknesses classifications. The findings show that stock returns on the day that the weaknesses are reported are more negative when material weaknesses are more severe, less auditable or the material weaknesses disclosure is vague. In addition, returns are less negative if management's conclusion regarding internal control system is effective even though there is an internal control weakness or if the firm is audited by a Big-4 auditor. As a whole, their findings suggest that the information content of internal control material weaknesses perceived by investors depend on the characteristics of material weaknesses disclosed. Krishnan (2005) also considers the severity of internal control problems despite internal control disclosures examined in his study is before the effective date of Section 302. By decomposing the internal control problems into

less severe and more sever, he finds that the association between audit committee quality and internal control quality holds in both groups of internal control problems.

2.2.4 Consequences of internal control weaknesses

A stream of literature documents the effects of internal control material weaknesses on earnings quality. Bedard (2006) investigate whether earnings quality improves after the passage of Section 302 and Section 404 by using unexpected accrual as a proxy for earnings quality. They find that the absolute value of unexpected accrual is higher before the year of internal control material weaknesses disclosure. This suggests that manages reverse prior year's accrual that was extremely large. Furthermore, the absolute value of unexpected accrual is even higher under Section 302 than under Section 404, which implies that material weaknesses disclosed under Section 302 are more severe than those disclosed under Section 404. Finally, they find that there is a decline of the level of unexpected accrual for firms not having internal control material weaknesses under Section 404 following the year of material weaknesses disclosure. Overall, their study suggests that there is an increase in earnings quality after the passage of SOX. Chan, Farrell and Lee (2008) examine the association between internal control material weaknesses under Section 404 and firms' earnings management activities. Consistent with prior studies suggesting that managers are more likely to manipulate earnings if internal control quality is low, they find that firms with internal control material weaknesses under Section 404 tend to manage earnings. Consistent with Chan, Farrell and Lee (2008)'s study, Ashbaugh-Skaife, Collins and Kinney (2008) also document that firms having internal control deficiencies under both Section 302 and Section 404 have lower accrual quality. However, they find that firms that remediate their previous reported internal control problems experience an increase in accrual quality compared to firms that do not.

Another line of research related to consequences of internal control material weaknesses examine the effect on firms' cost of capital. Beneish, Billings and

Hodder (2008) find that the cost of equity capital increases following the disclosure of internal control weaknesses under Section 302. However, they do not find an impact of internal control material weaknesses on firms' cost of equity under Section 404. Ogneva, Subramanyam and Raghunandan (2007) also find similar results that disclosure of internal control material weaknesses do not have an impact on the cost of equity under Section 404 after controlling for basic firm characteristics and analyst forecast bias. In contract, Ashbaugh-Skaife, Collins, Kinney and LaFond (2009) document a significant increase in the cost of equity after disclosure of material weaknesses under Section 404. They further point out that the reason why Ogneva, Subramanyam and Raghunandan (2007) find no significant association between cost of equity capital and internal control weaknesses under Section 404 is due to look-ahead bias in the classification of internal control quality.

Johnstone, Li and Rupley (2010) examine the corporate governance changes following the disclosure of internal control material weaknesses. Using 733 firm reporting internal control material weaknesses from 2004 to 2006, they find that disclosure of internal control material weaknesses lead to turnover of members of board, audit committee and top managers. Additional analyses show that the remediation of internal control material weaknesses is positively associated with audit committee members turnover and changes in the characteristics of board members and top management, such as board independence, financial expertise of audit committee members, accounting expertise and CFO-specific job experience of CFOs, and CEO reputation. Overall, their results suggest that remediation of internal control weaknesses lead to an improvement in corporate governance.

Some studies focus on the changes of audit status and audit fees after the disclosure of internal control material weaknesses. Prior research find that firms reporting internal control material weaknesses tend to pay higher audit fees (Raghunandan and Rama (2006); Hogan and Wikins (2008); Krishnan, Rama, and Zhang (2008)). Munsif, Raghunandan, Rama and Singhvi (2011) examine audit fees for remediating firms that previously disclosing internal control material weaknesses. They find that firms that remediate reported internal control material weaknesses

tend to have lower audit fees than firms that do not. However, these remediating firms continue to pay an audit fee premium in the following four year, which suggesting that audit fees for firms disclosing internal control material weaknesses tend to be consistently higher. Ettredge, Heintz, Li and Scholz (2011) investigate the impact of auditors' opinion under Section404 on auditor status. Using a sample of internal control material weaknesses under Section 404, from November 2004 to December 2007, they find that firms with adverse auditors' opinion on internal control over financial reporting are more likely to dismiss their auditors during the following year. Furthermore, they document that firms that dismiss their auditors after receiving adverse auditors' opinion have a higher tendency to hire Big 4 and industry specialist auditors relative to control companies. Finally, their results show that companies that hire an auditor specializes in the firm's industry are more likely to receive a remediation of adverse reports on the effectiveness of internal control system.

Hammersley, Myers and Shakespeare (2008) examine market reaction to disclosure of internal control material weaknesses under Section 302. Their evidence show that market react negatively to material weaknesses on the day that internal control material weaknesses are reported.

2.3 Conservatism

2.3.1 Definition of conservatism

The Financial Accounting Standards Board (FASB) defines conservatism as "a prudent reaction to uncertainty to try to ensure that uncertainty and risks inherent in business situations are adequately considered" (FASB 1980).

Researchers have also introduced a variety of views of conservatism. Bliss (1924)'s interpretation of conservatism is that "anticipate no profits but anticipate all losses". Basu (1997) interprets conservatism as "resulting in earnings reflecting 'bad news' more quickly than 'good news'. Watts (2003) define conservatism as "the

differential verifiability required for recognition of profits versus losses". He also states that Bliss (1924)'s definition of conservatism is an extreme form of accounting conservatism. Beaver and Ryan (2005) define accounting conservatism as "on average understatement of the book value of net assets relative to their market value".

2.3.2 Conditional conservatism versus unconditional conservatism

Some literature related to conservatism classifies accounting conservatism into two categories (Ball and Shivakumar (2005); Beaver and Ryan (2005)): conditional and unconditional conservatism.

Unconditional conservatism refers to "aspects of the accounting process determined at the inception of assets and liabilities yield expected unrecorded goodwill" (Beaver and Ryan (2005)). Example of unconditional conservatism include the immediate expensing of the costs of intangibles developed in-house, accelerated depreciation of property, plant equipment, etc (Beaver and Ryan(2005); Cheng, Huang, and Li(2010)).

Conditional conservatism refers to "book values are written down under sufficiently adverse circumstances but not written up under favorable circumstances, with the latter being the conservative behavior" (Beaver and Ryan (2005)). Examples of conditional conservatism include the lower of cost or market accounting for inventory, the recognition of contingency losses, asset write down, etc (Beaver and Ryan(2005); Cheng, Huang, and Li(2010)). In contract to unconditional conservatism, conditional conservatism requires stronger verification for the recognition of economic gains than for the recognition of economic losses. In addition, earnings generated under conditional conservatism reflect a timelier fashion of bad news than good news. Ball and Shivakumar (2005) document that conditional conservatism is efficient in enhancing contracting, while unconditional conservatism is inefficient or at best neutral in contracting. Thus, I focus on

conditional conservatism in additional analysis of chapter three to investigate if executive pay disparity affects conditional conservatism.

2.3.2 Demand for accounting conservatism

Prior studies provide a number of explanations regarding the demand for accounting conservatism. One line of studies documents that conservatism is effective in reducing the contracting cost between the firms' shareholders and other contracting parties (Ahmed, Billings, Morton, and Standford-Harris (2002); Ball and Shivakumar (2005); Zhang (2008)). Accounting conservatism can also reduce litigation risk, since overstating (understating) net assets or earnings is more (less) likely to generate litigation costs. Some relevant studies show that overstating earning or net assets may lead to lawsuits against public accountants (Kellog (1984); St. Pierre and Anderson (1984)). Other than that, taxation also induces managers to adopt conservative accounting (Shackelford and Shevlin (2001). Firms could create value if managers attempt to reduce firms' current tax expenses by deferring the recognition of gains and accelerating the recognition of losses in time (Watts (2003)). In addition, accounting regulation also encourages managers to adopt conservative accounting (Watts (2003)).

Moreover, there are other factors affecting the demand for accounting conservatism. One of these factors is information asymmetry. LaFond and Watts (2008) examine the information role of conservatism. Their findings show that information asymmetry leads to more conservative accounting. This suggests that accounting conservatism acts as a governance mechanism to mitigate agency conflicts between shareholders and managers. Hui, Matsunaga and Morse (2009) document that conservatism leads to lower management forecast frequency, suggesting that accounting conservatism serves as a substitute for management earnings forecast. In addition, their results show that aggregate measures of conservatism are negatively associated with management forecast specificity and forecast time horizon. Kim, Li, Pan and Zuo (2013) examine the information role of

accounting conservatism in equity market. Using seasoned equity offerings (SEOs) from 1989 to 2008, they find that issuers with more conservative accounting experience less negative stock returns when they make SEO announcements. They also find that accounting conservatism can moderate the negative association between information asymmetry and market reaction to SEO announcements, which suggesting that investors view accounting conservatism as a means to mitigate the negative impact of information asymmetry.

The second important factor that may affect the demand of accounting conservatism is corporate governance. Lafond and Roychowdhury (2008) examine how managerial ownership affects accounting conservatism, finding that firms with greater managerial ownership are associated with a lower degree of accounting conservatism. This suggests that investors perceive accounting conservatism as a governance mechanism to mitigate the impact of agency problems. Moreover, their results indicate that managerial ownership and accounting conservatism act as substitutes in addressing agency problems arising from separation between ownership and control. In contract, some papers document that firms with good corporate governance enforce the use of accounting conservatism, indicating that accounting conservatism and other corporate governance mechanism act as complements. For example, Garcia Lara, Osma and Penalva (2009) find that companies with better corporate governance have a higher degree of accounting conservatism. Ramalingegowda and Yu (2012) document that higher institutional ownership is associated with more conservative accounting.

Some studies have also conducted to investigate how management characteristics affect accounting conservatism. Using measures of both conditional and unconditional conservatism, Ahmed and Duellman (2013) argue that overconfident managers are less likely to adopt accounting conservatism. Further analysis show that external monitoring does not moderate the negative effects of managerial overconfidence on accounting conservatism.

2.4 Financial restatement

2.4.1Introdcution

Firms need to restate their financial statements when their original financial reporting is not in accordance with Generally Accepted Accounting Principles (GAAP). Auditing Standard No.2 issued by PCAOB interprets a financial restatement as a strong indicator of an internal control material weakness over financial reporting. Moreover, both internal control weaknesses and restatements can been used as external indicators for earnings quality (Dechow, Ge and Schrand (2010). Therefore, I predict that executive pay disparity may also have an impact on the likelihood of financial restatements if there is a significant relation between executive pay disparity and internal control material weaknesses. In this subsection, I summarize literature related to causes and consequences of financial restatements.

2.4.2 Causes of financial restatement

Research on the causes of financial restatements has grown significantly in recent years. Kinney and McDaniel (1988)'s study is among the early studies on the determinants of financial restatements. Using a sample of error corrections from the NAARS file for the ten years following the SEC's issuance of ASR No. 117, they document that firms correcting previously reported quarterly earnings tend to be smaller, less profitable, have higher debt levels, growing slowly, and have more uncertainties.

Many studies have examined whether audit effort has an impact on financial restatements. However, the evidence on this research question is inconclusive. Hribar, Kravet and Wilson (2010) find that audit effort, measured as audit fees, is positively related to the likelihood of financial restatements. In contrast, Lobo and Zhao (2013) find that there is a negative association between audit effort and the probability of misreporting by using audit fees to proxy for audit effort as well. On

the other hand, many researchers argue that non-audit fees that have a probability to affect auditor independence may also affect the occurrence of financial restatements. Kinney, Palmrose and Scholz (2004) find no significant relation between fees for financial information systems design and implementation or internal audit services and financial restatements, while they do find some relation between fees for unspecified non-audit services and financial restatements. In addition, they find that financial restatements are associated with lower tax services fees, which is consistent with the notion that acquiring tax services from a registrant's audit firm is beneficial to the registrant. Using a sample of UK firms from 1996 to 1998, Ferguson, Seow and Young (2004) find evidence that non-audit services fees are significantly positively related with the likelihood of financial restatements. In contrast, Agrawal and Chadha (2005) argue that non-audit fees do not have any impacts on financial restatements on average.

Some studies examine board characteristics as a determinant of financial restatement. Beasley (1996) find a negative association between the percentage of independent board members and the probability of firms accused of fraudulent financial reporting. Abbott, Parker and Presley (2012) investigate the impact of female board presence on the probability of financial restatements based on a premise that gender diversity can enhance the effectiveness of group decision-making (Lee and Farth (2004); Pelled, Eisenhardt and Xin (1999); Eisenhardt, Kahwayj and Bourgeois (1997)). Their results show that the presence of at least one female director in board reduces the likelihood of financial restatements. Beasley (1996) find a negative association between the percentage of independent board members and the probability of firms accused of fraudulent financial reporting. Larcker, Richardson and Tuna (2007) examine the effects of various dimensions of corporate governance on the likelihood of financial restatements. However, they find that only two out of fourteen dimensions of governance are associated with financial restatements. One is managerial power such the degree of board independence. The other one is leverage.

On the other hand, many of the studies focus on the association between audit committee quality and financial restatements. Abbott, Parker and Peters (2004) examine audit committee characteristics and find that audit committee independence and diligence are significantly negatively associated with the occurrence of financial restatements. In contrast, Agrawal and Chadha (2005) find no evidence for audit committee independence as a stand-alone measure. However, they do find that if the board or audit committee includes an independent director with financial expertise, the probability of financial restatement is lower. Carcello, Neal, Palmrose and Scholz (2010) investigate how CEO involvement in the director selection process affects the monitoring benefits of audit committee independence and expertise. In particular, they test this conjecture by examining how CEO involvement in the director selection process affects the relation between financial statement restatement and audit committee independence and expertise. The evidence shows that the negative association between audit committee independence and expertise and financial restatement holds when CEO is not formally involved in the director selection process.

In terms of other possible causes of financial restatement, many of the prior studies have examined whether top management characteristics affect financial restatements. Schrand and Zechman (2012) examine whether firms with overconfident executives are more likely to engage in the misstatements. They find that misreporting executives tend to be more overconfident, which is consistent with Ahmed and Duellman (2013)'s concern that managerial overconfidence can affect firms' financial reporting. Demerjian, Lev, Lewis and McVay (2013) examine the association between managerial ability and earnings quality. Based on prior literature, they adopt four proxies for earnings quality: the occurrence of financial restatement (Anderson and Yohn (2002)), the persistence of earnings (Richardson, Sloan, Soliman and Tuna (2005)), errors in the bad debt provision (McNichols and Wilson (1988)), and accruals quality (Dechow and Dichev (2002)). As a whole, they find that managers with higher ability are associated with higher earnings quality, which indicating that managerial ability has an impact on the accuracy of accruals.

Huang, Rose-Green and Lee (2012) examine the association between CEO age and financial reporting quality. Specifically, they adopt two proxies for financial reporting quality: firms meeting or beating analyst earnings forecasts and financial statement restatements. Extant research studies suggest that older managers are more ethical and risk-averse in contrast to younger ones (Vroom and Pahl (1971); Hambrick and Mason (1984); Loe, Ferrell and Mansfield (2000); Sundaram and Yermack (2007)). On the basis of this suggestion, their findings show that firms with older CEOs are less likely to meet or beat analyst earnings forecasts and also less likely to experience financial restatements. In the subsample analysis of chapter four, I also examine how the association between executive pay disparity and internal control material weaknesses changes conditional on CEO age.

Managerial compensation is another possible factor that may affect the likelihood of financial restatements. Efendi, Srivastava and Swanson (2007) investigate the impact of CEOs' incentive to maintain or increase the value of his/ her in-the-money stock option holdings on financial restatements. Their results show that the holdings of in-the-money stock options are significantly positively related to the probability of misreporting. Furthermore, they find that an interest-coverage debt covenant, new raised capital and chairman-CEO duality also increase the likelihood of financial misstatements. This is consistent with Burns and Kedia (2006), who find that the sensitivity of the CEO's option portfolio to stock price is significantly positively associated with the tendency of financial misstatements. In contract, Armstrong, Jagolinzer and Larcker (2010) do not find a significant relation between CEO equity incentives and financial restatements. In chapter three, I investigate whether executive compensations have an impact on the likelihood of having financial restatements through another incentive mechanism-executive pay disparity.

2.4.3 Consequences of financial restatements

Using an accrual-based measure based on Dechow and Dichev (2002)'s model and earnings restatements as two proxies for financial reporting quality,

Ramalingegowda, Wang and Yu (2013) find that higher financial reporting quality can moderate the negative effect of dividends on investments. Specifically, this association is more pronounced for firms with more R&D investments or more growth options. This is consistent with the premise that higher financial reporting quality can reduce the cost of external capital and therefore less positive NPV investment projects is forgone in order to pay dividends.

Desai, Hogan and Wilkins (2006) examine consequences of earnings restatements by focusing on management turnover and subsequent employment of displaced managers in managerial labor market. They find that the rate of management turnover is higher for firms experience earnings restatement than for control firms. In addition, it is more difficult for the displaced managers of restating firm to find a new job in external labor market relative to displaced managers of control firms. Their results suggest that such a reputational penalty may constrain managers from manipulating earnings and act as a substitute for public enforcement of GAAP violations. Moreover, the quality of the new position of managers left from restating firms is lower compared to either their previous job position or the new employment of the control firm managers. Hennes, Leone and Miller (2008) also examine the management turnover following restatements by classifying restatements into irregularities and errors. First, they find that market reacts more negatively for the irregularities than for errors, and most of the irregularities lead to class action lawsuits while only one restatement classified as errors result in a class action lawsuit in their sample. Second, they find that the rate of CEO/CFO turnover is much higher for irregularities than for errors. Using 788 Securities and Exchange Commission (SEC) and Department of Justice (DOJ) enforcement actions for financial misreporting from 1978 to 2006, Karpoff, Lee and Martin (2008) find that 93.6% of all employees identified as responsible parities for financial misreporting are fired. In addition, culpable managers lose substantial values on their shares.

Using a sample of 409 firms that experience earnings restatements from 1997 to 2001, Srinivasan (2005) examine career and litigation consequences of financial restatements for outside directors, particularly audit committee member. His study

shows that the rate of director turnover is higher for firms with financial restatements that are more severe and for audit committee directors.

Many of the prior restatement literature establish that shareholders lose substantial value when firms engage in financial restatements. Palmrose, Richardson and Scholz (2004) find an average market-adjusted return of approximately -9% over a 2-day announcement window. Specifically, they document that the market reaction is more negative if restatements involve fraud, affect more accounts, decrease reported earnings and attributed to auditors or management. Finally, they find that there is a significant increase in the analyst forecast dispersion when companies make restatement announcement. Similarly, Anderson and Yohn (2002) also find a significant negative market reaction for financial restatements announcement. In addition, this relation is more pronounced for firms with revenue recognition problems. Lev, Ryan and Wu (2008) document that companies announcing restatements that eliminate or shorten histories of earnings growth or positive earnings tend to receive more negative market reaction than other restatements.

Hribar and Jenkins (2004) investigate the impact of financial restatements on firms' cost of equity capital. Their findings show that accounting restatements lead to a percentage increase in the cost of capital, ranging from 7% to 20% depending on the estimation model used. In particular, this increase in the cost of capital is even larger if the accounting restatements are initiated by auditors or firms have higher leverage.

In addition, a large number of studies examine legal consequences of financial restatements. Using a sample of 492 U.S. public companies announcing non-GAAP restatements from 1995 to 1999, Palmrose and Scholz (2010) document that 38% of restatements lead to litigation, including litigation action against the companies, officers, directors, and auditors. Additional analyses reveal that companies with restatement related to earnings and fraud are more likely to involve in litigations. Lev, Ryan and Wu (2008) show that companies announcing restatements that

eliminate or shorten histories of earnings growth or positive earnings have higher probability of class action lawsuits relative to other control restatements.

2.5 Executive pay disparity

Executive pay disparity refers to the fraction of the total compensation of the firm's top five executives captured by the CEO (Bebchuk, Cremers and Peyer (2011); Chen, Huang and Wei (2013)).

A growing literature is studying the pay disparity between CEO and senior managers. In general, two perspectives on the executive pay disparity have been developed. The first perspective perceives the executive pay disparity as a feature of tournament incentives (Lazear and Rosen (1981); Bognanno (2001)). Specifically, the pay gap between CEO and non-CEO executives is viewed as a tournament incentive in which non-CEO executives are motivated to put more effort on developing firm-specific skills for competing for the CEO position. This increases the number of skilled internal CEO candidates. Consequently, an increased number of qualified internal CEO candidates further increases the bargaining power of the board to make the CEO less entrenched (Masulis and Mobbs (2011)). Moreover, Raheja (2005) document that insiders are motivated to disclose their private information by tournament incentives, which in turn help the board to monitor the CEO more effectively. All the evidence implies that pay disparity between the CEO and subordinate managers is an effective incentive mechanism to enhance firms' corporate governance. Regarding the executive pay disparity as a proxy for tournament incentives, Kale, Reis and Venkateswaran (2009) examine the impact of pay disfferencial between CEO and VPs on firm performance. Using total compensation pay gap between CEO and other VPs as their primary measure of executive pay disparity, they find that a large pay disparity is significantly positively related with firm performance. Specifically, the total pay differencial between CEO and other VPs affect firm q and ROA positively, suggesting that tournament incentives have a positive impact on firm performance. They further examine the

conditional association between the pay gap and firm performance. They show that the relation between CEO-VPs pay gap and firm performance is less positive when the promotion probability perceived by other VPs is lower. In particular, they show that the relation between CEO-VPs pay gap and firm performance is less positive if the firm has a new CEO, and especially the new CEO is an outsider. In addition, the tournaments are more stronger when the CEO is close to retirement. As a whole, their study indicates that the pay gap between CEO and other VPs provides promotion incentives to non-CEO executives and is an important incentive mechanism for improving corporate governance. In contrast, Kini and Williams (2012) suggest that a large pay gap between the CEO and senior managers serves as tournament incentives that can increase firm risk.

The second perspective views a large pay gap between CEO and non-CEO executives as a symptom of entrenched CEOs. This perspective suggests that a large pay disparity reflects higher bargaining power of CEOs. Therefore, a large pay disparity also indicates a more entrenched CEO, which leads to more severe agency problems. Under this perspective, Bebchuk, Cremers and Peyer (2011) investigate the relation between executive pay disparity and firm performance by measuring the pay disparity as CPS-the fraction of the total compensation of the top five executive team captured by the CEO. In contrast to Kale, Reis and Venkateswaran (2009)'s study finding a significantly positive contemporaneous relation between executive pay disparity and firm performance, Bebchuk, Cremers and Peyer (2011) find that a large pay gap between CEO and non-CEO executives experience lower future firm value and accounting performance. In addition, they also examine the impact of executive pay disparity on several firms' behavior. First, they find that a larger executive pay disparity is associated with a more negative market reaction to acquisition announcements, suggesting high-CPS firms are more likely to engage in worse acquisition activities. Second, high-CPS increases the probability of CEOs receiving opportunistically timed option grants. Third, they find that firms with a larger executive pay disparity have a lower probability of a CEO turnover after experiencing bad performance. Finally, their findings show that stock market returns

accompanying the filing of proxy statements is lower for periods when executive pay disparity increases. Overall, their findings are consistent with the notion that larger executive pay disparity is associated with severe agency problems. Another recent study by Chen, Huang and Wei (2013) investigates the relation between executive pay disparity and the cost of equity capital. Using CPS as the main proxy for executive pay disparity, they find a significantly positive association between CPS and the cost of equity capital. In addition, they document that the positive association is more pronounced when agency problems of cash flow are more severe and when firms with a higher probability of CEO turnover operate in industries that are more heterogeneous. All these results indicate that a larger executive pay disparity leads to an entrenched CEO and more severe agency problems.

2.6 Other executive incentive mechanisms and financial reporting quality

Despite the concerns over executive pay disparity, prior research has focused on other incentive mechanism such as equity incentives. For example, extant research has examined the effect of executive equity incentives on financial reporting quality.

Beneish (1999) investigates the incentives of managers to overstate earnings. He documents that managers in firms reporting overstated earnings tend to sell their shares and cash-in their equity-contingent compensation in the period when earnings are overstated. This suggests that managers' motivation to overstate earnings is to sell their shares at higher price. In contrast, Dechow, Sloan and Sweeney (1995) find no significant association between managers' incentives to sell shares at higher price and earnings management activities, proxied by firms subject to AAERs.

Using earnings that meet or just beat analyst' forecasts as a proxy for earnings management activities, Cheng and Warfield (2005) find that managers with higher equity incentives defined as stock-based compensation and stock ownership tend to report earnings that meet or just beat analysts' forecasts. They further show that managers with high equity incentives are more likely to sell more shares after

earnings management activities by examining the extent to which managers report earnings that meet or just beat analysts' forecasts. In addition, they find that managers with consistently high equity incentives are more likely to report persistent earnings. As a whole, their study indicates that stock-based compensation and stock ownership provide higher incentives for managers to manipulate earnings.

Using a sample of 224 firms restating their financial statements from 1997 to 2002, Burns and Kedia (2006) examine the relation between the sensitivity of the CEO's option portfolio to stock price and the likelihood of financial restatements. They document that options and other CEO compensation components lead to different consequences of financial restatements. Specifically, they find that there is a significantly positive association between CEO option holdings and the occurrence of financial restatements, while there is no significant relation between other CEO compensation components and the probability of financial restatements.

Bergstresser and Philippon (2006) investigate the relation between CEO equity incentives and firms' level of earnings management. Using the dollar change in the value of a CEO's stock and options holdings that would come from a one percentage point increase in the company stock price as the measure of CEO equity-based incentives, they find that higher CEO equity-based incentives lead to more earnings management activities. Further analyses show that unusually large number of options is exercised by CEOs and substantial quantities of shares are sold by other insiders during periods of high accruals.

Based on Bergstresser and Philippon (2006)'s study, Jiang, Petroni and Wang (2010) investigate the association between CFO equity incentives and the level of earnings management activities. They find that higher CFO equity incentives lead to more earnings management activities. Moreover, the impact of CFO equity incentives dominates the impact of CEO equity incentives, which suggests that CFOs exhibit independent influence on firms' earnings quality. These findings are inconsistent with the findings of Feng et al.,(2011), which document that the reason why CFOs engage in material accounting manipulations is because they give in to

pressure from CEOs, but not because they seek private benefits from equity incentives.

2.7 Top management characteristics and financial reporting quality

The passage of SOX has generated a line of research to investigate the relation between top management characteristics and financial reporting quality. Many studies focus on the gender of top management. Barua et al., (2010) investigate the relation between CFO gender and the quality of accruals. They document that companies with female CFOs tend to report lower absolute abnormal accruals and lower accrual estimation errors. Overall, their results are consistent with prior literature suggesting that females are less aggressive and more risk-averse in business and financial decision making contexts, which in turn ensures a higher financial reporting quality. Using the gender diversity data of Fortune 500 firms from 1996 to 2000, Krishnan and Parsons (2008) examine how gender diversity in senior management teams affect the accounting conservatism, earnings smoothness, loss avoidance tendencies and earnings persistence. Comparing the first and fourth quartiles of gender diversity rankings, they find that earnings quality if higher in the high gender diversity sample group relative to the low gender diversity sample group. This suggests that increasing the gender diversity in senior management teams leads to higher earnings quality. Frances, Hasan, Park and Wu (2009) analyses the effect of gender differences on accounting reporting from the perspective of accounting conservatism. They focus on firms that replace their male CFO with a female CFO and compare the degree of accounting conservatism between pre- and post-transition periods. Using 92 cases of replacement of male CFOs with female CFOs, they find that firms with female CFOs tend to adopt more conservative accounting, suggesting that female CFOs tend to be more cautious in recognizing good news than bad news. In contrast, firms experience a significant decrease in the degree of accounting conservatism when they replace their female CFOs with male CFOs. Further analyses show that the stock market returns are less negative around the date of bad

earnings news announcement for firms with female CFOs. Overall, they find evidence supporting the notion that female CFOs tend to be more cautious and less aggressive.

Francis et al., (2008) examine the association between CEO reputation and earnings quality. Using the number of articles mentioning the CEO as a proxy for CEO reputation, they find a significantly negative relation between the number of news articles pertaining to the CEO and earnings quality. Contrary to this finding, Demerjian et al., (2013) document a significant positive association between managerial ability and earnings quality measured as financial restatement, earnings persistence, errors in the bad debt provision, and the mapping of accruals into cash flows.

DeJong and Ling (2009) examine the CEOs and CFOs fixed effects on firms' accounting accruals. They find that both CEOs and CFOs have a significant impact on accounting accruals, while the magnitude of the accruals is smaller for CFOs than for CEOs. Specifically, controlling the manager fixed effects to the models of accruals increases the adjusted R-square. In addition, the F-tests reject the null hypothesis that there are no significant joint effects of managers. Overall, they find evidence that both CEOs and CFOs have manager-specific effects on firms' accounting accruals, but CFOs are more likely to report "solid" earnings relative to CEOs. Ge, Matsumoto and Zhang (2011) also investigate the managers specific effects on accounting practices by focusing on individual CFOs. Using a sample of 359 CFOs across different firms over time, they document that individual CFOs explain the heterogeneity in accounting practice significantly. They further find that the individual CFOs effects are much stronger when CFOs' job discretion and job demands are high. In addition, they examine the impact of CFO characteristics their styles such as CFO gender, age, and education levels. However, their evidence related to the impact of CFO characteristics is quite limited, which suggests that these CFO characteristics only capture a small portion of CFOs' individual styles.

Huang, Rose-Green and Lee (2012) investigate the association between CEO age and financial reporting quality proxied as the meeting or beating of analyst earnings forecasts and financial restatements. Based on the results of prior literature (Peterson, Rhoads, and Vaught (2001); Sundaram and Yermack (2007)) that older individuals are more ethical and conservative, they conjecture that CEO age has a positive impact on firms' financial reporting quality. Using a sample of 3,413 firms from 2005 to 2008, they find that the CEO age is negatively related with firms meeting or beating analyst earnings forecasts and the likelihood of financial restatements. Further analyses show that CFO age has no significant impact on firms' financial reporting quality, which is consistent with the findings of Feng, Ge, Luo and Shevlin (2011).

Prior literature also suggests more earnings management activities when CEOs are near retirement. Using a sample of firms that have significant consistent R & D activities, Dechow and Sloan (1991) document that CEOs tend to manage R & D expenditures to enhance short-term earnings performance surrounding their departure. This suggests that the horizon problem contributes to the earnings management activities. David et al., (2007) also find that firms with CEOs approaching retirement tend to have large and positive discretionary accruals in the year before the retirement.

CHAPTER THREE

EXECUTIVE PAY DISPARITY AND INTERNAL CONTROL MATERIAL WEAKNESSES

3.1 Introduction

This chapter investigates the association between executive pay disparity and the likelihood of having internal control material weaknesses. In additional tests, I also examine whether executive pay disparity affects the degree of accounting conservatism and the likelihood of financial restatements to provide more evidence regarding the association between executive pay disparity and financial reporting quality.

As prior literature related to executive pay disparity provides inconclusive evidence, I intend to fill this gap by investigating the impact of executive pay disparity on the effectiveness of internal controls. Based on the existing literature, it is not clear whether large executive pay disparity leads to a higher or lower internal control quality. If the findings are consistent with Kale, Reis and Venkateswaran (2009)'s study, the tournament incentive perspective may predict a positive association between executive pay disparity and the effectiveness of internal controls over financial reporting. However, the tournament incentive perspective may not necessarily predict a positive relation between executive pay disparity and firms' internal control quality. Kini and Williams (2012) suggest that a large pay gap between the CEO and other executives can lead to greater risk taking as this may increase the chance of other top executives to be promoted to the CEO positions. Based on their argument, large executive pay disparity may result in more internal control material weaknesses. On the other hand, a large executive pay disparity should lead to a poor internal control system if the findings are consistent with Bebchuk, Cremers and Peyer (2011) and Chen, Huang and Wei (2013). Thus, existing theories provide competing and alternative predictions about the impacts of executive pay disparity on firms' internal control quality. In light of the previous

studies, the main research question for this chapter is whether executive pay disparity has an impact on the likelihood of having internal control material weaknesses.

I further examine whether the association between executive pay disparity and the occurrence of internal control material weaknesses are sensitive to various classifications of weaknesses by adopting two classification schemes based on prior literature. First, the weaknesses are classified into firm-level and account- or transaction-level weaknesses (Doyle, Ge, and McVay (2007a)). Firm-level material weaknesses tend to be more pervasive and have firm-wide influence on firms' internal control system. Account- or transaction-level material weaknesses tend to be more auditable. Thus, this kind of material weaknesses in internal controls is more likely to be adjusted than firm-level material weaknesses. Second, the weaknesses are classified into staffing, complexity and general (Doyle, Ge, and McVay (2007a)). The first group, staffing, includes firms that are lack of qualified financial and accounting staff, inadequate training for accounting personnel, and poor segregation of duties. Complexity related weaknesses consist of the deficiencies in applying consistent corporate policies among different business units and weaknesses in interpreting and applying accounting standards. General weaknesses refer to weaknesses in accounting for transaction. Appendix 2 summarizes these two classification schemes and provides detailed examples.

Third, I examine whether executive pay disparity also has an impact on the degree of accounting conservatism and the likelihood of financial restatements. Prior literature related to accounting conservatism document that better corporate governance lead to a higher degree of accounting conservatism (Garcia Lara and Osma (2009); Ramalingegowda and Yu (2012)). In addition, Goh and Li (2011) document that firms with material weaknesses tend to be less accounting conservative. Thus, I expect to see a positive relation between executive pay disparity and accounting conservatism if the findings are consistent with Kale, Reis and Venkateswaran (2009)'s tournament incentives perspective. Otherwise, the relation between executive pay disparity and accounting conservatism is negative if

the findings are consistent with Bebchuk, Cremers and Peyer (2011) and Chen, Huang and Wei (2013)'s managerial power perspective. On the other hand, a substantial stream of literature related to the causes of financial restatements are motivated by agency theory (Agrawal and Chadha (2005); Abbott, Parker, and Peters (2004); Beasley (1996)), indicating that board monitoring is an important attribute in achieving a higher financial reporting quality. Thus, I posit that executive pay disparity is associated with a lower likelihood of having financial restatements if executive pay disparity serves as a tournament incentive to increase the bargaining power of the board (Kale, Reis and Venkateswaran (2009)). In contrast, executive pay disparity leads to a higher likelihood of restating if executive pay disparity entrench the CEO (Bebchuk, Cremers and Peyer (2011) and Chen, Huang and Wei (2013)).

3.2 Hypotheses development

Internal controls have long been recognized as important in achieving high financial reporting quality (Committee of Sponsoring Organizations [COSO] (1987); Kinney, Maher, and Wright (2000); Kinney (2000)). The deficiencies in internal control system may generate incorrect financial information that may mislead the shareholders. Among the top management team, CEO is the key personnel that has direct supervision on the effectiveness of internal controls over financial reporting. However, the internal control system may also be damaged by the CEO for self-interests. A number of accounting scandals such as Enron and Worldcom before the passage of SOX are the typical examples of CEOs behaving opportunistically at the cost of shareholders' benefits. Although the passage of SOX improves the effectiveness of internal controls, the opportunistic behavior of CEOs still exists as long as the ownership and control are separated in a company (Jensen and Meckling (1976)).

Hoitash, Hoitash and Bedard (2009) document that the firms with better corporate governance are associated with a lower likelihood of internal control

material weaknesses disclosures by investigating the effects of audit committee quality on the probability of having material weaknesses. However, agency problems may also contribute to the internal control material weaknesses through the channel of other corporate governance mechanisms such as executive pay disparity.

Bebchuk and Fried (2003)'s study indicates that higher compensation of executives reflects higher bargaining power. Therefore, large executive pay disparity increases the bargaining power of the CEO under the managerial power perspective (Bebchuk, Cremers and Peyer (2011) and Chen, Huang and Wei (2013)). This, in turn, increases the entrenchment of the CEO. Entrenched CEOs may increase the severity of agency problems by engaging in the manipulation of financial reporting and disclosures in order to hide their opportunistic behavior such as overinvestment and inefficient merger and acquisition decisions (Bowen, Rajgopal and Venkatachalam (2008)). In addition, CEOs with higher managerial power have much discretion in managing and operating the firm. Thus, the CEO may take advantage of their power to manipulate the controls to favor his self-interests.

Yet, under the tournament incentives perspective (Kale, Reis and Venkateswaran (2009)), large executive pay disparity encourages VPs to put much more effort in developing firm-specific skills (Lazear and Rosen (1981)). Thus, the large executive pay disparity increases the number of skilled internal CEO candidates. Consequently, the availability of qualified internal CEO candidates makes the CEO less entrenched by increasing the bargaining power of the board. This leads to stronger corporate governance. Stronger corporate governance in turn results in greater effectiveness of internal controls. However, Kini and Williams (2012) argue that tournament incentives may encourage non-CEO executives to take greater risk in order to compete for the CEO position. This may therefore lead to more internal control material weaknesses.

Based on the above analyses, it becomes an empirical question as to which effect dominates. Thus, I develop our main hypothesis in the null form:

Hypothesis 1: **There is no association between executive pay disparity and internal control material weaknesses.**

3.3 Methodology and research design

3.3.1 Sample

The sample consists of U.S. firms that filed Section 404 reports with fiscal years between 2004 and 2012. Internal control material weaknesses and executive compensation data are collected from AuditAnalytics SOX 404 database and ExecuComp database, respectively. The accounting variables data are obtained from Compustat. Since I also examine the impacts of executive pay disparity on accounting conservatism and the likelihood of financial restatements, I collect stock returns from CRSP for calculating the proxy for accounting conservatism and financial restatements data from AuditAnalytics. This study is focusing on disclosures of internal control material weaknesses under SOX 404, firms with fiscal year ends before November 2004 are excluded from this sample. The firms with insufficient data for executive compensation and control variables are also excluded. In addition, firms in the financial or utility industries are deleted from this sample. The final sample of internal control material weaknesses includes 8,547 firm-year observations. To run all the regressions, variables are winsorized at 1st and the 99th percentiles to reduce the impact of outliers.

3.3.2 Model specification

To test the relation in Hypothesis 1 between executive pay disparity and the probability of having internal control material weaknesses, I adopt the following logistic regression model:

$$ICMW_t = a_0 + a_1 CPS_{t-1} + a_2 Size_t + a_3 Age_t + a_4 Aggr\_loss_t + a_5 Foreign\_transaction_t$$
$$+ a_6 Sale\_growth_t + a_7 Z\_score_t + a_8 Segments_t + a_9 Restrcuture_t + \varepsilon$$

（1）

where *ICMW* is internal control material weaknesses. It is a dummy variable with a value equal to 1 for firms that report at least one internal control material weaknesses, otherwise it is equal to 0. In addition, the auditor's opinion on the effectiveness of internal controls is used.

CPS is the CEO pay slice. It is calculated as the total compensation of CEO divided by the sum of the total compensation of the top-five executives. I identify CEOs based on ExecuComp's classification (ExecuComp item CEOANN). The CEO is required to be in the company for at least a whole fiscal year. Following Chen, Huang and Wei (2013), I also require the companies to have complete total compensation data in ExecuComp for at least 5 top executives. If there are more than 5 top executives with complete total compensation reported, I only use the 5 executives with the highest total compensation.

The rests are control variables considered as the determinants of internal control material weaknesses:

a) *Firm size (Size)*, measured as the natural log of total assets. Previous literature find that firm size is negatively associated with the probability of having internal control material weaknesses (Deyle, Ge and McVay (2007a)), since large firms can take advantage of economies of scale to improve their internal control systems.

b) *Firm age (Age)*, measured as the natural log of the number of years that firms are existing in CRSP. It is expected to observe a negative relationship between firm age and internal control weaknesses. Older firms are more mature in many aspects. And the internal control systems of older firms tend to be more developed.

c) *Aggregate loss (Aggr_loss)*, measured as a dummy variable that is equal to 1 for firms that have a sum of earnings before extraordinary items for year t-1 and year t is negative and 0 otherwise. It indicates the financial health of a firm. Defond and Jiambalvo (1991) document that firms with financial reporting errors are more likely to have worse firm performance. Deyle, Ge and McVay (2007a) find that financial health is negatively related with the probability of having internal control weaknesses. Thus, all the evidence provided by existing literature lead to my expectation that aggregate loss is positively associated with internal control material weaknesses.

d) *Foreign transactions (Foreign_transaction)*, measured as a dummy that is equal to 1 for firms have foreign currency transactions and 0 otherwise. Multinational companies are more likely to engage in complex transactions, which may lower the efficiency of the internal control system. For example, the legal environments may differ across different countries, which in turn may affect the effectiveness of internal control. Deyle, Ge and McVay (2007a) show that internal control material weaknesses are more likely for firms that are more complex. Thus, firms with foreign currency transactions are expected to have negative impact on firms' internal control system.

e) *Sale growth (Sale_growth)*, measured as the percentage change of sales from year t-1 to year t. Deyle, Ge and McVay (2007a) document that firms with internal control material weaknesses tend to be growing rapidly. A quickly growing firm may have inadequate financial resources for the internal control system. Therefore, I expect to observe a positive relation between sale growth and the probability of having internal control material weaknesses.

f) *Segments (Segments)*, measured as the natural log of the number of operating and geographic segments. Firms with a number of operating and geographic segments tend to have more complex operating environment. This complexity may then increase the probability of having internal control deficiency.

g) *Restructure (Restructure)*, measured as the sum of the restructuring charges of year t-1 and year t, scaled by the book asset value of prior year. Firms undertaking restructuring may have difficulties in estimating and adjusting accruals (Dechow and Ge (2006)). Moreover, departmental and personnel adjustments associated with firm restructuring may affect internal control system as well. For example, insufficient staff may lower the internal control quality. Taken together, firms undergoing restructuring tend to report more internal control material weaknesses.

h) *Z-score (Z_score)*, measured by the following equation (Altman (1968)):

(3.3*Pretax income+Sale+1.4*Retained earnings+1.2*(Current assets-Current

Liabilities))/Total assets

Altman Z-score measures the distress risk of the firm. The internal control systems of financial distressed companies are lack of financial resources, thus the degree of distress risk is expected to be positively related with internal control weaknesses. [4]

Using the above logistic regression model, I predict that the coefficient a_1 for CPS is significantly positive if Hypothesis 1 is true.

3.4 Descriptive statistics

Univariate statistics for CPS and the main variables used in this paper are shown in Table1. The statistics are estimated based on a panel data set of 8,547 firm-year observations for the sample years from 2004 to 2012. Only firms with fiscal year ends on or after the effective date of SOX 404 are included in the sample. As shown in this table, there are only around 4.9% observations reporting internal control material weaknesses during the sample period. The mean and median of CPS are

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[4] Variable definitions are provided in Appendix 1.

0.385 and 0.390. respectively, which are comparable to those reported by Bebchuk, Cremers, and Peyer (2011) and Chen, Huang and Wei (2013).

(INSERT TABLE 1 HERE)

Table 2 reports the results of t-tests for mean comparison between firms that have internal control material weaknesses and firm that do not report internal control material weaknesses. As shown in this table, ICMW firms tend to have lower CPS. This implies that large compensation gap between the CEO and executives are associated with a lower likelihood of having internal control material weaknesses. In addition, the results indicate that firms with ICMW tend to be smaller, and have more aggregate losses, foreign transactions, and restructuring charges. The mean difference of Z_score between these two groups suggests that less distress risk is associated with lower probability of disclosing internal control material weaknesses.

(INSERT TABLE 2 HERE)

Table 3 presents the Pearson correlations matrix. It illustrates the following facts. First, CPS is significantly negatively associated with ICMW, suggesting that large executive pay disparity is related with a lower likelihood of having internal control material weaknesses.. Second, firm size (Size) is significantly negatively related to internal control material weaknesses. Third, there is a significantly negative association between Z-score (Z_score) and internal control material weaknesses (ICMW). Fourth, aggregate loss (Aggr_loss), foreign transactions (Foreign_transaction), and restructuring charges (Restructure) are significantly positively associated with internal control material weaknesses. This implies that firms with bad financial condition and a higher degree of complexity are more likely

to have internal control material weaknesses. Fifth, Sale_growth, Age and Segments have no significant relations with ICMW. Sixth, CPS is positively correlated with firm size, firm age, and the number of segments with significance lever lower than 0.01, and is negatively correlated with aggregate loss and sale growth with significance lever lower than 0.01.

(INSERT TABLE 3 HERE)

3.5 Main results

Table 4 provides the logistic regression results for Model (1) which tests the association between executive pay disparity (CPS) and internal control material weaknesses (ICMW) in Hypothesis 1.

As shown in Table 4, the coefficient estimate for CPS is -0.955, significant at lower than 0.01 level. This suggests that large executive pay disparity leads to a lower likelihood of having internal control material weaknesses. The result is insupportive of Hypothesis 1. The coefficient on Size is significant ($P<0.01$) and negative, consistent with the findings of Doyle, Ge, and McVay (2007a) that larger firms tend to have less internal control material weaknesses. In contrast to Doyle, Ge, and McVay (2007a), I do not find a significantly negative relation between firm age and internal control material weaknesses. The coefficient estimate for Age is significantly positive, suggesting that older firms are more likely to report internal control material weaknesses. The coefficient estimated for Aggr_loss and Foreign_transaction are 0.338 and 0.290, both significant at lower than 0.01 level. This implies that firms with worse financial condition and a higher level of complexity tend to report more internal control material weaknesses. In addition, the coefficient for Z_score is -0.129, significant at a level lower than 0.01. This indicates that firms with more distress risk are more likely to have internal control

material weaknesses. The coefficient estimates for Sale_growth, Segments, and Restructure are 0.116, 0.031, and 0.072, but not significant.

(INSERT TABLE 4 HERE)

I then adopt two classification schemes for internal control material weaknesses to examine whether the association between executive pay disparity and material weaknesses differs across different groups of internal control material weaknesses[5]. I first divide internal control material weaknesses into staffing, complexity and general weaknesses by operating characteristics. Staffing related material weaknesses include inadequate qualified financial and accounting staff and resources, the lack of training for financial staff, and poor segregation of duties. This type of weaknesses is more severe than the other two weaknesses. Complexity related weaknesses are more likely to be caused by complex accounting issues. This kind of material weaknesses includes inconsistent application of company policies among different business units and segments, and material weaknesses resulting from applying complex accounting standards. General control weaknesses include contracting practices related weaknesses, deficiencies in the reporting process, and deficiencies in the design of accounting-related policies and the execution of accounting-related processes. This category of material weaknesses include weaknesses in accounting for transactions

To do the tests, I repeat logistic regression of Model (1) and replace the dependent variable ICMW with Staffing_ICMW, Complexity_ICMW, and General_ICMW. Staffing_ICMW is equal to 1 for firms with at least one staffing related internal control material weaknesses and 0 for firms do not have any material weaknesses. Complexity_ICMW is equal to 1 for firms with at least one complexity related internal control material weaknesses and 0 for firms do not have any material

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[5] Refer to Appendix 2 for examples of the two internal control material weaknesses classification schemes.

weaknesses. General_ICMW is equal to 1 for firms with at least one general internal control material weaknesses and 0 for firms do not have any material weaknesses.

Table 5 provides the results of the above classification scheme. As shown, the coefficient estimates for CPS in all three models are -1.213, -1.122 and -1.316 respectively and the p-values are all below 0.01. This suggests that large executive pay disparity is associated with lower likelihood of all three types of internal control material weaknesses.

(INSERT TABLE 5 HERE)

Second, the internal control material weaknesses are classified into firm-level and account/transaction level weaknesses. Examples of firm-level weaknesses include senior management competency, ineffective audit committee, etc. This kind of weaknesses has a more pervasive nature and has firm-wide influence on the internal control system. Account/transaction level weaknesses include inadequate account reconciliations, deficiencies in information technology systems, etc. This kind of weaknesses is more auditable. Therefore, Account/transaction level material weaknesses tend to have small impacts on the internal control system.

Again, I do the tests using back the logistic regression Model (1) but replacing the dependent variable ICMW with Firm_ICMW and Account_ICMW. Firm_ICMW is equal to 1 for firms with at least one firm-level material weakness and 0 for firms without any material weaknesses. Account_ICMW is equal to 1 for firms with at least one account/transaction-level material weaknesses and 0 for firms without any material weaknesses.

Table 6 reports the results of the second classification scheme. The coefficient a_1 on CPS are both significantly negative, suggesting that the larger the pay gap

between the CEO and other executives, the lower the probability of having firm-level or account/transaction-level internal control material weaknesses.

(INSERT TABLE 6 HERE)

Overall, the main results shown in this section are all insupportive of Hypothesis 1. This is consistent with the tournament incentives perspective that the large executive pay disparity is viewed as tournament incentives that encourage non-CEO executives to exert greater effort and hence increase the bargaining power of the board to reduce the entrenchment of the CEO.

3.6 Additional results

3.6.1 The endogeneity of CPS

The endogeneity issue in executive compensation studies has been explored a lot. The negative association between executive pay disparity and internal control material weaknesses could be driven by reverse causality. In this section, I address the endogeneity issue in two different ways.

First, I follow Chen, Chen and Wei (2011) and Chen, Huang and Wei (2013) to include the lagged dependent variable in Model (1). If the main results are driven by reverse causality, then the coefficient for CPS should turn to be insignificant after controlling the lagged ICMW. The results are presented in Column (1) of Table 7. Due to the inclusion of lagged ICMW, the primary sample size is reduce to 7, 640 firm-year observations. As shown, the coefficient on CPS is -1.252, significant at the 0.01 level. This evidence indicates that it is unlikely that a lower likelihood of having internal control material weaknesses in the previous period lead to a large executive pay disparity.

Second, I estimated a 2-stage least squares (2SLS) regression by treating CPS as endogenous. Sepcifically, I adopt four instruments for the endogenous variable including: CPS lagged by 2 years, the industry median value of CPS, number of VPs and the mean age of the top management team. Murphy (1999) finds that the level and structure of executive compensation varies with firm size and industry. Further, Bebchuk, Cremers, and Peyer (2011) find evidence showing that the industry median CPS is a significant determinant of firm-level CPS. Thus, industry median value of CPS provides good exogenous variation, which makes it a valid instrument. Similarly, CPS lagged by 2 years is not likely to be determined by internal control material weaknesses 3 years later. Following Kini and Williams (2012), I adopt the number of VPs as the third instrument. Kale, Reis and Venkateswaran (2009) argue that the tournament incentive is lower when the number of VPs is higher. Thus, I include the number of VPs as one additional determinant of the pay gap between the CEO and other senior executives. In addition, the number of VPs is not likely to have a direct effect on firms' internal controls. Finally, I follow Lee, Lev and Yeo (2008) to use the mean age of the top management team as another instrument. Lazear and Rosen (1981) suggest that a large pay gap is designed to attract young employees to actively participate in the managerial tournament. Thus, the existence of younger employees may results in a higher pay gap. At the same time, it is unlikely that the age of the top management team will have an impact on the effectiveness of internal controls. As a whole, the above four variables all meet the criteria for valid instruments. Due to the additional data requirements, the sample size is reduced to 7,077 for this test. The second-stage results on the relation between CPS and ICMW is presented in the second column of Table 7. As shown, the coefficient on CPS is -0.110 with a P-value lower than 0.05. This suggests that the significantly negative association between executive pay disparity and internal control material weaknesses is not driven by endogeneity bias.

Overall, the evidence provided by the above two analyses suggest that reverse causality is not likely to drive the negative relation between executive pay disparity and internal control material weaknesses.

(INSERT TABLE 7 HERE)

3.6.2 CFO effects

Based on the fact that SOX requires both the CEO and the CFO to certify the financial statements, CFOs also have some effects on the effectiveness of internal controls over financial reporting (Li, Sun and Ettredge (2010)). On the other hand, many studies document that CEOs have the power to replace CFOs (Fee and Hadlock (2004)), thus CFOs could be influenced by CEOs to engage in accounting manipulations (Feng, Ge, Luo and Shevlin (2011)). Therefore, CFOs may have some impacts on the association between executive pay disparity and internal control material weaknesses. In this section, I attempt to address this issue in two different ways.

First, I examine the CFO effects on firms' internal control quality through the perspective of CFO equity incentives. Jiang, Petroni and Wang (2010) document that CFO equity incentives are positively associated with earnings management and the effects of CFO equity incentives on earnings management are even stronger compared to those of the CEOs. Thus, I consider CFO equity incentives as a potential factor attributed to internal control material weaknesses.

To measure CFO equity incentives, I follow Bergstresser and Philippon (2006) and Jiang, Petroni and Wang (2010) to calculate the variable Incentive_ratio to capture the power of CFO equity incentives from holding stocks and options. First, I calculate ONEPCT, which is measured as the dollar change in the value of the CFO's stock and options holding resulting from a one percentage point increase in the firm's stock price. The specific equation to calculate ONEPCT is as follows:

$$ONEPCT = 0.01 * Price * (Shares + Options) \tag{2}$$

where *Price* is the company share price, *Shares* is the number of shares held by the CFO, and *Options* is the number of options held by the CFO including newly granted options, unexercised exercisable options, and unexercised unexercisable options. I then use *ONEPCT* to calculate Incentive_ratio as follows:

$$Incentives\_ratio = ONEPCT /(ONEPCT + Cash\_pay) \tag{3}$$

where *Cash_pay* is the sum of salary and bonus. This incentives ratio captures the fraction of the CFO's total compensation that would come from a one percentage point increase in the company's stock price.

Following Jiang, Petroni and Wang (2010), I identify CFOs based on managers' titles in ExecuComp (ExecuComp item TITLEANN) that contain any of the following phrases: CFO, chief financial officer, treasurer, controller, finance, and vice president-finance. I then rerun logistic regression Model (1) but include additional control variables of both CEO Incentives_ratio and CFO Incentives_ratio.

Table 8 reports the regression results. In Column (1), I only control for the CEO_incentives_ratio. As shown, the coefficient on CEO_incentives_ratio is positive but insignificant, suggesting that CEOs' equity incentives have no significant impacts on internal control material weaknesses. However, the coefficient on CPS remains significantly negative. In Column (2), I only include the CFO_incentives_ratio as an additional control variable. The coefficient on CFO_incentives_ratio is -0.209, but insignificant. Again, the effect of CPS on internal control material weaknesses remains significantly negative in Column (2). In the last column, I control for both CEO_incentives_ratio and CFO_incentives_ratio. The results show the significant association between CPS and ICMW remains unchanged after controlling for CEO_incentives_ratio and CFO_incentives_ratio. Both CEO_incentives_ratio and CFO_incentives_ratio have no significant impacts on ICMW. The coefficient for CFO_incentives_ratio is even

negative in the last two columns though it is insignificant. These insignificant results are consistent with the Feng, Ge, Luo and Shevlin (2011)'s findings that the reason why CFOs engage in earnings management is because they give in to pressure from CEOs.

(INSERT TABLE 8 HERE)

Second, I consider the CFO effects on internal control material weaknesses by replacing the measure of executive pay disparity with the pay gap between the CEO and the CFO. Since SOX requires only the CEO and the CFO to certify the financial statements and higher compensation indicates higher bargaining power of executives (Bebchuk and Fried (2003)), therefore large pay disparity between the CEO and the CFO may increase entrenchment of the CEO. This in turn may lead to internal control material weaknesses. I hence revise the logistic regression Model (1) by replacing the independent variable CPS with the pay gap between the CEO and the CFO (CEO_CFO_PAYGAP). CEO_CFO_PAYGAP is defined as the logarithm of the total pay difference between the CEO and the CFO. Again, I identify CFOs based on managers' titles in ExecuComp (ExecuComp item TITLEANN) that contain any of the following phrases: CFO, chief financial officer, treasurer, controller, finance, and vice president-finance.

Table 9 presents the regression results. The coefficient on CEO_CFO_PAYGAP is -0.091 with a *P*-value lower than the level of 0.01. This suggests that large pay gap between the CEO and the CFO is associated with a lower likelihood of internal control material weaknesses. In addition, this evidence is supportive of the tournament incentives perspective not the managerial power perspective[6].

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[6] I also measure the pay gap between the CEO and CFO as the CEO total compensation divided by the sum of the total compensation of CEO and CFO. The results are qualitatively the same.

(INSERT TABLE 9 HERE)

To summarize, the evidence provided in this section as a whole suggests that the negative association between executive pay disparity and internal control material weaknesses is robust after considering the CFO effects.

3.6.3 Accounting conservatism and financial restatements

As additional tests to investigate the impact of executive pay disparity on accounting practice, I examine whether executive pay disparity affects firms' degree of accounting conservatism and probability of having financial restatements in this section.

First, I investigate the association between executive pay disparity and accounting conservatism. Garcia Lara, Osma and Penalva(2009) document that stronger corporate governance is associated with a higher degree of accounting conservatism. Since the evidence provided by Model (1) suggests that executive pay disparity enhances firms' corporate governance structure, large executive pay disparity should then lead to more conservative accounting. Furthermore, both accounting conservatism and internal control weaknesses have been used as indications of "earning quality" in prior literature (Dechow, Ge and Schrand (2010)). Thus, executive pay disparity may positively relate with accounting conservatism if both higher degree of conservatism and less internal control material weaknesses indicate higher earnings quality. Taken together, I expect that there is a significantly positive association between executive pay disparity and the degree of accounting conservatism.

I follow Basu (1997) to define accounting conservatism as requiring higher degree of verification to recognize good news as gains relative to recognize bad news as losses, which means earnings reflecting bad news in a timelier fashion than

good news. The prior research refers to this as conditional conservatism (Beaver and Ryan (2005); Ball and Shivakumar (2005)). Following Khan and Watts (2009), I use C_score as the measure of conditional conservatism in this section. The C_score is based on Basu (1997) model to allow for the variation in coefficients across firms and over time. Khan and Watts (2009) develop a firm-specific measure of the timeliness of good news (G_score) and bad news (C_score) and find evidence that conservatism is increasing in the C_score. The G_score and C_score are estimated based on the following three equations:

$$NI_t = \beta_1 + \beta_2 D_t + \beta_3 RET_t + \beta_4 D_t * RET_t + \varepsilon \tag{4}$$

$$G\_score_t = \beta_3 = \mu_1 + \mu_2 MV_t + \mu_3 MTB_t + \mu_4 LEV_t + \varepsilon \tag{5}$$

$$C\_score_t = \beta_4 = \lambda_1 + \lambda_2 MV_t + \lambda_3 MTB_t + \lambda_4 LEV_t + \varepsilon \tag{6}$$

where *NI* is net income before extraordinary items scaled by the market value of equity at the beginning of the fiscal year; *D* is a dummy variable that is equal to 1 if *RET* is negative; *RET* is the buy and hold stock return in the prior fiscal year; *MV* is the natural log of the market value of equity; *MTB* is market value of equity divided by the book value of equity; and *LEV* is total debt divided by total assets.

To calculate C_score, I follow Khan and Watts (2009) to replace β_3 and β_4 from equation (5) and (6) into equation (4), including additional items in the last parenthesis, and yields equation (7) as follows:

$$NI_t = \beta_1 + \beta_2 D_t + RET_t * (\mu_1 + \mu_2 MV_t + \mu_3 MTB_t + \mu_4 LEV_t) + D_t * RET_t (\lambda_1 + \lambda_2 MV_t + \lambda_3 MTB_t + \lambda_4 LEV_t) + (\delta_1 MV_t + \delta_2 MTB_t + \delta_3 LEV_t + \delta_4 D_t * MV_t + \delta_5 D_t * MTB_t + \delta_6 D_t * LEV_t) + \varepsilon \tag{7}$$

53

I then estimate equation (7) by running annual cross-sectional regressions. Lastly, the coefficient estimates of λ_1 to λ_4 from equation (7) are applied to equation (6) to obtain C_score, the firm-specific accounting conservatism measures.

To test the relation between executive pay disparity and conservatism, I use the following regression model:

$$C\_score_t = a_0 + a_1 CPS_{t-1} + a_2 Own_{n-1} + a_3 Size_t + a_4 MTB_t + a_5 Leverage_t$$
$$+ a_6 Sale\_growth_t + a_7 R\&D_t + a_8 CFO_t + a_9 Revt + a_{10} Lit_t + \varepsilon \qquad (8)$$

Table 10 reports the regression results for testing the relation between C_score and CPS. As shown, I find a positive and significant ($p<0.01$) coefficient on CPS. This suggests that firms with large executive pay disparity are associated with a higher degree of accounting conservatism. The coefficients on the control variables are generally consistent with prior literature. Consistent with LaFond and Roychowdhury (2008), I find that CEO ownership (Own) is negatively related with accounting conservatism, indicating that accounting conservatism acts as a role in mitigating severe agency problems. The coefficient on Leverage is positive and significant, consistent with firms having greater bondholder-shareholder conflict tend to adopt more conservative accounting. The coefficient on MTB is -0.014, significant at a level of 0.01. This suggests that firms with less growth opportunities tend to use more conservative accounting. Sales growth (Sale_growth) is negatively associated with conservatism, suggesting that firms growing rapidly use less conservative accounting. I also find a significant and positive relation between cash flows from operations (CFO) and conditional conservatism. However, the coefficient on firm size (Size) is positive and significant, which is inconsistent with the findings in LaFond and Watts (2008). I find no significant relation between litigation risk (Lit), research and development (R&D), and operating uncertainty (Revt) and conditional conservatism. Overall, the significantly positive association

between executive pay disparity and accounting conservatism is consistent with the idea that large executive pay disparity is associated with higher financial reporting quality.

(INSERT TABLE 10 HERE)

Second, I examine whether executive pay disparity affects the likelihood of having financial restatements. Prior research has identified both internal control material weaknesses and financial restatements as external indicators of earnings misstatements (Dechow, Ge and Schrand (2010)). In addition, financial restatement is viewed as a strong indicator of internal control material weakness (PCAOB, 2007). Based on my findings that large executive pay disparity is associated with lower likelihood of reporting internal control material weaknesses, executive pay disparity may also has an negative impact on the probability of having financial restatements if executive pay disparity is an important factor contributing to the effectiveness of earnings reporting. Moreover, Agrawal and Chadha (2005) document that weak corporate governance leads to higher probability of financial restatements. Regarding executive pay disparity as an incentive mechanism in mitigating severe agency problems, I also expect there is a negative association between executive pay disparity and the likelihood of financial restatements.

To test the relation between executive pay disparity and the likelihood of financial restatements, I follow Lobo and Zhao (2013)'s regression pattern to develop the regression model as follows:

$$
\begin{aligned}
Res_t =\ & a_0 + a_1 CPS_{t-1} + a_2 Size_{t-1} + a_3 Age_{t-1} + a_4 Merger_{t-1} + a_5 Financing_{t-1} + a_6 Loss_{t-1} \\
& + a_7 Current\_accrual_{t-1} + a_8 Leverage_{t-1} + a_9 INV\_INT\_COV_{t-1} + a_{10} Sale\_growth_{t-1} \\
& + a_{11} BM_{t-1} + a_{12} Fin\_demand_{t-1} + a_{13} Audit\_fees_{t-1} + a_{14} Big\_4_{t-1} + \varepsilon
\end{aligned}
$$

where Res is the dependent variable that is equal to 1 for firms that have at least one financial restatement in that fiscal year and 0 otherwise. CPS is defined the same as in prior regressions.

Table 11 provides the logistic regression results of the above model. As expected, the coefficient on CPS is significant and negative, suggesting that large pay gap between the CEO and other executives are associated with lower likelihood of having financial restatements. This is also consistent with the idea that large executive pay disparity leads to higher financial reporting quality. Consistent with the findings of Lobo and Zhao (2013), I also find a negative relation between firm size (Size) and financial restatements. In addition, the evidence shows that Fin, Loss, and BM are all positively related with the likelihood of having financial restatements. Financial position, as indicated by Leverage, is also positively related with financial restatements, which is consistent with Abbott, Parker and Presley (2012) but inconsistent with Lobo and Zhao (2013). Contrary to the findings of Lobo and Zhao (2013), I do not find a significantly negative relation between audit effort proxied by Audit_fees and Big_4 and financial restatements.

(INSERT TABLE 11 HERE)

As a whole, the evidence provided in this section show that large executive pay disparity is associated with both a higher degree of accounting conservatism and a lower likelihood of having financial restatements. This suggests that executive pay disparity is an effective managerial incentive mechanism in providing high financial reporting quality, consistent with my finding that large pay gap between the CEO and other executives lead to a lower likelihood of having internal control material weaknesses.

3.7 Robustness checks

In this section, I test whether the main results presented so far are sensitive to alternative measures of executive pay disparity. Specifically, I use industry-adjusted CPS and PAYGAP as two alternative measures of CPS.

3.7.1 Industry-adjusted CPS

Bebchuk, Cremers and Peyer (2011) find that industry median CPS is a major determinant of firm-level CPS. Therefore, I first use industry-adjusted CPS as an alternative measure of CPS to test the relation between executive pay disparity and internal control material weaknesses again. The industry adjusted CPS is defined as the difference between firm-level CPS and industry median CPS.

Table 12 presents the results of testing the association between industry-adjusted CPS and internal control material weaknesses by replacing CPS with industry-adjusted CPS in Model (1). As shown, the coefficient on industry-adjusted CPS is significant and negative after deducting industry median CPS (CPS_adjusted) from firm-level CPS. Therefore, the negative association between executive pay disparity and internal control material weaknesses is not sensitive to the measure of industry-adjusted CPS.

(INSERT TABLE 12)

I then test whether the relation between executive pay disparity and accounting conservatism is sensitive to the measure of industry-adjusted CPS by replacing CPS with industry-adjusted CPS in Model (8). The results are reported in Table 13. The coefficient on CPS_adjusted becomes insignificant after I replace CPS with industry-adjusted CPS, which suggests that the positive relation between executive

pay disparity and the degree of accounting conservatism is mainly driven by the industry effects.

(INSERT TABLE 13)

Lastly, I repeat the logistic regression of financial restatements on CPS by deducting the industry median CPS from the firm-level CPS. The results are shown in Table 14. The coefficient on CPS is -0.723 with a *p*-value lower than the level of 0.05. Thus, the relation between executive pay disparity and the likelihood of having financial restatements is not sensitive to the measure of industry-adjusted CPS.

(INSERT TABLE 14)

3.7.2 PAYGAP

I then follow Kale, Reis, and Venkateswaran (2009) to use PAYGAP as another alternative measure of CPS to repeat the baseline models. PAYGAP is defined as the natural log of the difference between the total pay of the CEO and the median value of the total pay of the other 4 top executives[7]. The results on internal control material weaknesses are reported in Table 15. The coefficient on PAYGAP is significant and negative, consistent with my findings that executive pay disparity is negatively associated with internal control material weaknesses. Therefore, the association between executive pay gap and material weaknesses is robust by using PAYGAP instead of CPS.

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[7] I also define PAYGAP as the CEO total pay divided by the sum of the CEO and CFO total compensation.

(INSERT TABLE 15 HERE)

The regression of accounting conservatism on CPS is also repeated by replacing CPS with PAYGAP. As shown in Table 16, PAYGAP shows a positive association with the degree of accounting conservatism and is significant at the 0.01 level. Thus, the positive relation between executive pay disparity and accounting conservatism is not sensitive by using PAYGAP as a proxy for executive pay disparity.

(INSERT TABLE 16 HERE)

Table 17 presents the logistic regression results of financial restatements on PAYGAP. The coefficient on PAYGAP is -0.041, significant at lower than 0.01 level. This suggests that the negative association between executive pay disparity and the probability of having financial restatements is robust by using PAYGAP as an alternative measure of executive pay disparity.

(INSERT TABLE 17 HERE)

3.8 Conclusion

This chapter examines whether executive pay disparity influences the likelihood of having internal control material weaknesses. Using a sample of 8,547 U.S. firm-year observations that report filed Section 404 reports with fiscal years between 2004 and 2010, I find that large pay gap between the CEO and other executives is associated with a lower likelihood of having internal control material weaknesses. This result suggests that executive pay disparity is an effective incentive mechanism

that constrains managers' opportunistic behavior and mitigates agency problems. Moreover, the evidence provided in this chapter is supportive of Kale, Reis, and Venkateswaran (2009)'s tournament incentives perspective, but insupportive of Bebchuk, Cremers, and Peyer (2011) and Chen, Huang and Wei (2013)'s managerial power perspective.

Further analyses show that executive pay disparity is related with different types of internal control material weaknesses based on two classification schemes: staffing, complexity and general weaknesses; firm-level and account/ transaction-level weaknesses. Additional tests also provide evidence showing that large executive pay disparity leads to a higher degree of accounting conservatism and a lower likelihood of having financial restatements. The positive association between executive pay disparity and accounting conservatism suggests that large pay gap between the CEO and other executives is an effective corporate governance mechanism that have a role in the implementation of conservatism, which is consistent with the findings of Garcia Lara, Osma and Penalva (2009) that stronger corporate governance leads to more conservative accounting. In addition, the negative association between executive pay disparity and the likelihood of having financial restatements also suggests that executive pay disparity could be used as a corporate governance mechanism to reduce the probability of a company restating its earnings. This complements Agrawal and Chadha (2005)'s study by showing executive pay disparity as another effective corporate governance mechanism in reducing the incidence of financial restatement by a firm. Lastly, the baseline analysis is robust to corrections for endogeneity of executive pay disparity and to alternative measures of executive pay disparity.

CHAPTER FOUR

THE SENSITIVITY OF INTERNAL CONTROL MATERIAL WEAKNESSES TO EXECUTIVE PAY DISPARITY

4.1 Introduction

The evidence provided in the previous chapter is consistent with Kale, Reis, and Venkateswaran (2009)'s tournament incentives perspective. This suggests that large pay gap between the CEO and other executives can motivate non-CEO executives to work hard and invest in firm-specific human capital in order to compete for the CEO position. This in turn leads to an increased number of qualified internal candidates for the CEO position. Consequently, the large pool of skilled internal candidates for the CEO position increases the bargaining power of the board, and in hence decreases the entrenchment of the CEO. In this chapter, I extend the previous chapter by investigating factors that may affect the extent of the negative association between executive pay disparity and internal control material weaknesses.

First, I examine whether the severity of agency problems has an impact on the relation between executive pay disparity and material weaknesses. The separation of ownership and control leads to agency problems between managers and shareholders (Jensen and Meckling (1976)). As shown in the previous chapter, the findings indicate that the pay gap between the CEO and other executives serves as a corporate governance mechanism that constrains managers' opportunistic behavior and mitigates agency problems. However, how executive pay disparity interact with other corporate governance mechanisms to affect firms' internal control system is not clear so far. Prior studies document that various governance mechanisms could act as substitutes in reducing the agency conflicts of firms (LaFond and Watts (2008); LaFond and Roychowdhury (2008)). In contrast, some argue that different governance mechanisms could also act as complements in mitigating the agency problems (Garcia Lara, Osma and Penalva (2009); Ramalingegowda and Yu (2012)). Specifically, executive pay disparity and other corporate governance mechanisms

may serve as complements or substitutes in reducing the agency conflicts. Chen, Huang and Wei (2013) document that the positive association between executive pay disparity and the cost of equity capital they find is stronger when the agency problems of free cash flow are more severe. In this chapter, I follow Chen, Huang and Wei (2013) to allow executive pay disparity to interact with the measure of free cash flow to investigate how executive pay disparity contribute to firms' corporate governance structure. If executive pay disparity acts as a complement of other corporate governance mechanism, the association between executive pay disparity and internal control material weaknesses is expected to be more negative in firms with less severe agency problems. On the other hand, the relation between executive pay disparity and material weaknesses is expected to be more negative in firms with more severe agency problems if executive pay disparity serves as a substitute of other corporate governance mechanisms. Therefore, the first research question in this chapter is whether the negative association between executive pay disparity and internal control material weaknesses varies with the severity of agency problems.

Second, I investigate whether the probability of promotion perceived by non-CEO executives affects the negative association between executive pay disparity and internal control material weaknesses. Since tournament incentives perspective supports the idea that large executive pay disparity can motivate lower-level executives to work hard in order to compete for the CEO position. Therefore, the probability of promotion perceived by these lower-level executives may have some impacts on the tournament incentives. If the perceived probability of promotion is relatively lower, then the non-CEO executives should be less motivated to work hard and compete for the CEO position. In other words, lower probability of promotion is associated with less incentive effects of tournaments. This in turn may moderate the association between executive pay disparity and internal control material weaknesses. In contrast, the non-CEO executives should be highly motivated to compete for the CEO position if the probability of promotion is higher. In this case, the relation between executive pay disparity and internal control material weaknesses should be much stronger. Kale, Reis and Venkateswaran (2009)

document that when the CEO is newly hired, the probability of promotion perceived by other executives is lower. Furthermore, they show that the probability of promotion is even lower when the new CEO is an outsider at the meantime. This is because the tournament for the CEO's position is in its infancy when the firm just hires a new CEO. As a result, the probability of promotion for non-CEO executives is lower in the near future. Moreover, the probability of promotion perceived by other executives is even lower when the new CEO is an outsider because non-CEO executives may recognize that there is a high possibility that future CEOs may also be outsiders. Based on their findings, I attempt to examine whether the probability of promotion perceived by other executives has any effects on the association between executive pay disparity and internal control material weaknesses from the perspective of whether the firm has a new CEO and whether the new CEO is an outsider. Therefore, the second research question in this chapter is whether the relation between executive pay disparity and internal control material weaknesses varies when the firm has a new CEO or the new CEO is an outsider.

Finally, I conduct several subsample analyses to provide supplementary evidence on whether the association between executive pay disparity and material weaknesses varies with management characteristics and corporate governance mechanisms. First, I examine the impact of CEO ownership on the relation between executive pay disparity and internal control material weaknesses by partitioning the whole sample into above- and below-median CEO ownership. Under the separation of ownership and control of the firms, the CEO has the advantages to facilitate the extraction of self-interest because of the prime knowledge related to firm business he has. However, greater managerial ownership leads to greater alignment of the interests of shareholders and managers, which in turn mitigate the agency problems arising from the separation of ownership and control (Jensen and Meckling (1976)). This suggests that managerial ownership plays a role in mitigating agency conflicts between shareholders and managers. Therefore, I aim to examine whether the association between executive pay disparity and internal control material weaknesses varies with CEO ownership in order to have a better understanding of the role of executive pay

disparity in corporate governance structure. Second, I examine whether CEO age has an impact on the relation between executive pay disparity and internal control material weaknesses. This is motivated by a recent study showing that firms with older CEO are associated with higher financial reporting quality (Huang, Rose-Green and Lee (2012)). Finally, I examine whether the association between executive pay disparity and internal control material weaknesses varies with different corporate governance mechanism by adopting four governance mechanisms: analyst coverage, institutional ownership, board independence and female board presence. These subsample analyses can provide supplementary evidence for the first research question in this chapter.

4.2 Hypotheses development

Kale, Reis and Venkateswaran (2009) find evidence that the pay gap between the CEO and other executives is related with better firm performance. This indicates that executive pay disparity is positively correlated with corporate governance. On the contrary, Bebchuk, Cremers, and Peyer (2011) and Chen, Huang and Wei (2013) suggest that shareholders view large executive pay disparity as a symptom of CEO entrenchment, which means the pay gap between the CEO and other executives is negatively correlated with corporate governance. My findings in chapter three complement Kale, Reis and Venkateswaran (2009)'s study by showing that large executive pay disparity leads to a lower likelihood of internal control material weaknesses, which is consistent with the premise that large pay disparity acts as an effective corporate governance mechanism. In this chapter, I attempt to extend the previous chapter by exploring whether the negative association between executive pay disparity and internal control material weaknesses varies with the severity of agency problems. If executive pay disparity serves as a substitute of other corporate governance mechanisms, the relation between the pay disparity and material weaknesses should be stronger for firms with more severe agency problems. On the other hand, the association between executive pay disparity and internal control

material weaknesses should be weaker for firms with more severe agency problems if executive pay disparity serves as a complement of other governance mechanisms. Therefore, the second hypothesis is developed as follows:

Hypothesis 2: The negative association between executive pay disparity and internal control material weaknesses is more pronounced when the agency problems are more severe.

I further examine whether the probability of promotion perceived by other executives has an impact on the negative association between executive pay disparity and internal control material weaknesses. The evidence provided in chapter three is consistent with Kale, Reis and Venkateswaran (2009)'s tournament incentives perspective. This implies that large executive pay disparity can motivate non-CEO executives to work hard in order to compete for the CEO position. Consequently, the number of skilled internal candidates for the CEO position increases, which in turn reduce the entrenchment of the CEO by increasing the bargaining power of the board. Therefore, the probability of promotion perceived by other executives should have some impacts on tournament effects induced by large pay gap between the CEO and other senior executives (Kale, Reis and Venkateswaran (2009)). Specifically, the negative association between executive pay disparity and internal control material weaknesses may vary with the probability of promotion perceived by other executives. Since the tournament for the CEO's position is in its infancy when the firm just hires a new CEO, the probability of promotion perceived by non-CEO executives is lower in the near future. Furthermore, the probability of promotion perceived by other executives is even lower when the new CEO is an outsider because non-CEO executives may recognize that there is a high possibility that future CEOs may also be hired from outside. Based on these notions, Kale, Reis and Venkateswaran (2009) find that the relation between executive pay disparity and firm performance is less pronounced when the

firm has a new CEO, and weakens further when the new CEO is an outsider. As a result, I develop Hypothesis 3 as follows:

Hypothesis 3: The negative association between executive pay disparity and internal control material weaknesses is weakened when the firm has a new CEO, and is weakened further when the new CEO is an outsider.

4.3 Methodology and research design

To test the above two hypotheses, I continue to use the sample of U.S. firms that filed Section 404 reports with fiscal years between 2004 and 2010. The sample size is 8,547 firm-year observations as in the previous chapter.

Apart from the variables of the baseline models in chapter three, I also employ several additional variables for testing the two hypotheses in this chapter. To test Hypothesis 2, I follow Chen, Huang and Wei (2013) to measure the agency problems of free cash flow using operating cash flow (OCF) and investment opportunities. Operating cash flow is measured as net cash flow from operating activities scaled by lagged assets. Investment opportunities is defined as Tobin's Q. Tobin's Q is measured as the market value of equity minus the book value of equity plus the book value of total assets, scaled by the book value of total assets. Also like them, I divide the sample into 2 equal-sized groups with above and below within-year median value of operating cash flow (OCF), and another 2 equal-sized groups with above and below within-year median value of Tobin's Q. Firms classified as having high OCF and low Tobin's Q are more likely to have the most severe agency problems of free cash flow. On the other hand, firms classified as having low OCF and high Tobin's Q are more likely to have the least serious agency problems. I then define High_FCF as a dummy variable, which is equal to 1 for firms with above within-year median operating cash flow and below within-year median Tobin's Q and 0 otherwise. I also define Low_FCF as a dummy variable, which is equal to 1

for firms with below within-year median operating cash flow and above within-year median Tobin's Q and 0 otherwise. I then build on the basic logistic regression Model (1) to have the following regression model to test Hypothesis 2:

$$
\begin{aligned}
ICMW_t = {} & a_0 + a_1 CPS_{t-1} + a_2 High\_FCF_{t-1} + a_3 Low\_FCF_{t-1} \\
& + a_4 CPS_{t-1} * High\_FCF_{t-1} + a_5 CPS_{t-1} * Low\_FCF_{t-1} + a_6 Size_t + a_7 Age_t \\
& + a_8 Aggr\_loss_t + a_9 Foreign\_transaction_t + a_{10} Sale\_growth_t + a_{11} Z\_score_t \\
& + a_{12} Segments_t + a_{13} Restrcuture_t + \varepsilon
\end{aligned}
\tag{10}
$$

where High_FCF and Low_FCF are just defined above and all other variables are defined as before.

Using the above model, I predict that the coefficient on the interaction term between CPS and High_FCF is significant and negative if the association between executive pay disparity and internal control material weaknesses is more pronounced for firms with the most severe agency problems. In contrast, the coefficient on the interaction term between CPS and Low_FCF is expected to be significant and negative if the relation between executive pay disparity and internal control material weaknesses is more pronounced for firms with the least serious agency problems.

Due to the potential endogenous relation between CPS and the free cash problem, I also regress Tobin's Q or OCF on CPS to use the residuals of Tobin's Q and OCF instead of Tobin's Q and OCF to partition the sample. Therefore, I define High_FCF_Residual as a dummy variable, which is equal to 1 for firms with above within-year median residual OCF and below within-year median residual Tobin's Q. In addition, I define Low_FCF_Residual as a dummy variable, which is equal to 1 for firms with below within-year median residual OCF and above within-year median residual Tobin's Q. I then estimate the following logistic regression to test Hypothesis 2 again:

$$ICMW_t = a_0 + a_1 CPS_{t-1} + a_2 High\_FCF\_Residual_{t-1} + a_3 Low\_FCF\_Residual_{t-1}$$
$$+ a_4 CPS_{t-1} * High\_FCF\_Residual_{t-1} + a_5 CPS_{t-1} * Low\_FCF\_Residual_{t-1}$$
$$+ a_6 Size_t + a_7 Age_t + a_8 Aggr\_loss_t + a_9 Foreign\_transaction_t + a_{10} Sale\_growth_t$$
$$+ a_{11} Z\_score_t + a_{12} Segments_t + a_{13} Restrcuture_t + \varepsilon$$

(11)

To test Hypothesis 3, I follow Kale, Reis and Venkateswaran (2009) to construct New_CEO as a dummy variable, which is equal to 1 when the CEO is in the first year of service as a CEO and 0 otherwise. I also construct another dummy variable, Insider, which is equal to 1 when the CEO has worked in the firm for at least 1 year before becoming the CEO and 0 otherwise (Parrino (1997)).

I then interact CPS with New_CEO and Insider to test whether the association between executive pay disparity and internal control material weaknesses is less pronounced when the firm just hires a new CEO, and weakens further when the new CEO is an outsider. In addition, I follow Parrino (1997) to include a measure of the relative cost of hiring an outsider CEO using industry homogeneity. The industry homogeneity is constructed to measure the similarity between firms within an industry. Based on the assumption that firms operating in a heterogeneous industry have a higher cost of hiring an outsider CEO, the firms operating in a heterogeneous industry should be more likely to promote internal candidates to the CEO position. This in turn increases the tournament incentives of the firms operating in a more heterogeneous industry. On the other hand, the probability of hiring an outside CEO as well as improved outside employment opportunities for non-CEO executives is higher for firms operating in a more homogeneous industry. Taken together, the tournament incentives for firms operating in heterogeneous industry should be higher. Therefore, I expect the association between executive pay disparity and internal control material weaknesses is stronger for firms operating in a heterogeneous industry. To calculate industry homogeneity (Homo), I follow Parrino (1997) to first calculate the partial correlation between monthly firm returns and monthly industry returns after controlling for the monthly market returns in the past

5 years. Industry returns are defined as the equal-weighted average monthly returns of all firms operating in the same industry defined by Fama and French (1997). The industry homogeneity is then defined as the mean partial correlation coefficient of all firms operating in the same industry. Firms with less than 36 monthly returns within any 5-year period are excluded from this test. In addition, firms operating in industries with less than 35 firms are also excluded from this analysis. The regression model looks as follows:

$$
\begin{aligned}
ICMW_t = {} & a_0 + a_1 CPS_{t-1} + a_2 New\_CEO_{t-1} + a_3 Insider_{t-1} + a_4 Homo_{t-1} \\
& + a_5 CPS_{t-1} * New\_CEO_{t-1} + a_6 CPS_{t-1} * Insider_{t-1} + a_7 CPS_{t-1} * Homo_{t-1} \\
& + a_8 CPS_{t-1} * New\_CEO_{t-1} * Insider_{t-1} + a_6 Size_t + a_7 Age_t + a_8 Aggr\_loss_t \\
& + a_9 Foreign\_transaction_t + a_{10} Sale\_growth_t + a_{11} Z\_score_t + a_{12} Segments_t \\
& + a_{13} Restrcuture_t + \varepsilon
\end{aligned} \tag{12}
$$

Based on the above logistic regression model, I predict that the coefficient on the interaction term between CPS and New_CEO is positive meaning that the association between executive pay disparity and internal control material weaknesses is less pronounced when the firm has a new CEO. Furthermore, the coefficient a_8 is expected to be negative, suggesting that the relation between executive pay disparity and material weaknesses weakens further when the new CEO is an outsider.

4.4 Main results

Table 18 reports the logistic regression results of Model (10) and Model (11) for testing whether the association between executive pay disparity and internal control material weaknesses varies with the severity of agency problems. Column (1) provides the results for Model (10). As shown, the coefficient on CPS is still

significant and negative, which suggests that executive pay disparity has a positive impact on firm's internal control quality after controlling for the agency problems of free cash flow. The coefficient on High_FCF is 0.770, significant at lower than 0.05 level. This indicates that firms with most severe agency problems are more likely to have internal control material weaknesses. In contrast, the coefficient on Low_FCF is not significant. The coefficient on the interaction term between CPS and High_FCF is significant and negative, suggesting that the negative association between executive pay disparity and internal control material weaknesses is more pronounced for firms with the most severe agency problems of free cash flow. Column (2) reports the results for Model (11). The reported results are generally qualitatively similar to those reported in Column (1). As a whole, the evidence is supportive of Hypothesis 2, which implies that the relation between executive pay disparity and internal control material weaknesses is stronger for firms with the most severe agency problems. This in turn indicates that executive pay disparity is substitutive to other corporate governance mechanisms.

(INSERT TABLE 18 HERE)

Table 19 reports the logistic regression results of Model (12) for testing whether the association between executive pay disparity and internal control material weaknesses varies with the probability of promotion perceived by non-CEO executives. As shown, the coefficient on CPS is still significant and negative after controlling for the factors that can affect the probability of promotion perceived by lower-level executives. Most importantly, the coefficient on the interaction term between CPS and New_CEO is 3.358, significant at lower than 0.01. This suggests that the negative relation between CPS and ICMW is less pronounced when the firm has a new CEO. In addition, the coefficient on CPS*New_CEO*Insider is -1.896, significant at lower than 0.05. This means that the negative association between CPS and ICMW weakens further when the new CEO is hired from outside. The

coefficient on the interaction term between CPS and Homo is positive and marginally significant, suggesting that tournament incentives have less effects in more homogeneous industries. Overall, the results shown in Table 19 are consistent with Hypothesis 3. This suggests that the incentive effects of tournaments are weak when the firm has a new CEO, and weakens further when the new CEO is an outsider. The evidence is consistent with the findings of Kale, Reis, and Venkateswaran (2009).

(INSERT TABLE 19 HERE)

4.5 Subsample analyses

In this section, I conduct several subsample analyses to investigate whether the relation between executive pay disparity and internal control material weaknesses varies with management characteristics and corporate governance mechanisms.

First, I examine whether the CEO ownership has an impact on the association between executive pay disparity and material weaknesses. Therefore, I partition the sample into above- and below-median CEO ownership. Since greater managerial ownership can mitigate the agency problems between shareholders and managers by aligning the interests of managers with those of shareholders, the agency problems should be more severe for firms with lower CEO ownership. Based on the results from testing Hypothesis 2, I expect the association between executive pay disparity and internal control material weaknesses is stronger for firms with lower CEO ownership. Following LaFond and Roychowdhury (2008), I measure the CEO ownership as the percentage of the firm's outstanding shares owned by the CEO excluding shares granted in options. Table 20 reports the results of partitioning the sample into above- and below-median CEO ownership. Column (1) contains the firm-year observations that have above-median CEO ownership. As shown, the coefficient on CPS is insignificant, suggesting that the pay gap between the CEO

and other executives has no impact on internal control material weaknesses for firms with greater CEO ownership. In contrast, the results from Column (2) show that the association between executive pay disparity and material weaknesses is significant and negative for firms with below-median CEO ownership. As a whole, this partitioning analysis suggests that the negative relation between executive pay gap and internal control material weaknesses is more pronounced for firms with lower CEO ownership and is supportive of Hypothesis 2.

(INSERT TABLE 20 HERE)

Second, I examine the impact of CEO age on the relation between executive pay disparity and internal control material weaknesses. Huang, Rose-Green and Lee (2012) document that firms with older CEO tend to have higher financial reporting quality. This indicates that CEO age serves as an effective corporate governance mechanism in enhancing firms' financial reporting quality. Prior research also document that CEOs tend to be more opportunistic when they approach retirement in order to boost their final year's pay (Cheng (2004)). Taken together, the association between executive pay disparity and material weaknesses may vary with CEO age. On the basis of Huang, Rose-Green and Lee (2012), I divide the sample into two groups with CEO age above and below 62[8]. Table 21 presents the results for this subsample analysis. Column (1) shows the logistic regression results for firms with CEO age above 62. The coefficient on CPS is insignificant, suggesting that the pay gap between the CEO and other executives has no impact on internal control material weaknesses for firms with older CEO. In Column (2), the results show that CPS is significantly negatively related with internal control material weaknesses for firms with CEO at an age below 62. Overall, the results shown in this partitioning

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[8] I also use cutoffs of 60 and 65 and the results are qualitatively similar.

analysis suggest that executive pay disparity serves as a substitute of CEO age in improving firms' financial reporting quality.

(INSERT TABLE 21 HERE)

Next, I partitioning the sample based on several corporate governance mechanisms to provide further evidence of whether executive pay disparity serves as a substitute or complement of other corporate governance mechanisms in improving firms' financial reporting quality. First, I divide the sample into two groups with above- and below-median institutional ownership. I obtain institutional ownership data from Thomson-Reuters Institutional Holdings (13F) database. The institutional ownership is defined as the sum of the number of shares held by all institutions in a firm's stock divided by the total number of shares outstanding at the end of prior fiscal year. The observations with total institutional ownership larger than 100% are excluded from the sample. Any firm-year observations with no institutional ownership recorded in the database are also excluded from this sample. Table 22 presents the results of this partitioning analysis. Column (1) reports the results of firms with above median institutional ownership. As shown, the coefficient on CPS is negative but insignificant. This suggests that the pay gap between the CEO and other executives has no significant impact on internal control material weaknesses for firms with greater institutional ownership. In column (2), the evidence shows that CPS is significantly and negatively associated with ICMW for firms with lower institutional ownership. This suggests that executive pay disparity is substitutive to institutional ownership as a corporate governance mechanism in improving firms' financial reporting quality.

(INSERT TABLE 22 HERE)

Second, I partition the sample into two groups using a cutoff of median analyst coverage. Prior research suggests that analysts serve as external monitors to managers (Yu (2008)). Therefore, analyst coverage is an effective external corporate governance mechanism. I then partition the whole sample into two groups with above- and below-median analyst coverage. I obtain the analyst information from I/B/E/S database. The analyst coverage is defined as the number of financial analysts following the firm at the end of prior fiscal year. Following prior literature (Chang, Dasgupta and Hilary (2009)), I set the number of analysts to 0 for firms that not covered by IBES. Table 23 reports the results of this partitioning analysis. Column (1) includes the firm-year observations with above median analyst coverage. As shown in this column, the coefficient on CPS is insignificant. This suggests that the pay gap between the CEO and other executives has no significant impact on internal control material weaknesses for firm with above median analyst coverage. In contrast, the coefficient on CPS is significantly negative in Column (2), which suggests that executive pay disparity has significant impacts on internal control material weaknesses for firms with below median analyst coverage. Overall, the evidence shown in this table implies that the negative association between executive pay disparity and material weaknesses is more pronounced for firms with less analyst coverage. Regarding analyst coverage as an effective external corporate governance mechanism, this evidence also suggests that executive pay disparity is substitutive to analyst coverage in enhancing the effectiveness of firms' corporate governance structure.

(INSERT TABLE 23 HERE)

Third, I partition the sample into two groups with above- and below-median percentage of independent members on the board. Board independence has long been recognized as an effective internal governance mechanism (Fama and Jensen (1983)), thus it is worth examining whether board independence affects the negative

relation between executive pay disparity and internal control material weaknesses. The board data is collected from RiskMetrics database, which has the data that is only available from the year of 2007. Therefore, the whole sample size of this subsample analysis is much smaller relative to prior analyses. I then follow Ferreira and Laux (2009) to define a director as independent if she or he is not an employee, a former executive, a relative of a current executive of the firm, or having any other business relations with the firm. Table 24 reports the results of this subsample analysis. Column (1) shows the logistic regression results for firms with above-median percentage of independent directors on the board. The coefficient on CPS is insignificant, suggesting that executive pay disparity has no significant impact on internal control material weaknesses for firms with a higher percentage of independent directors. In Column (2), the coefficient on CPS is -1.829, significant at a level lower than 0.05. This suggests that executive pay disparity has a significant impact on internal control material weaknesses for firms with a lower percentage of independent directors. As a whole, the results indicate that the negative relation between executive pay disparity and material weaknesses is stronger for firms with a lower degree of board independence. This also suggests that executive pay disparity could act as a substitute mechanism for corporate governance that would be otherwise weak.

(INSERT TABLE 24 HERE)

Lastly, I partition the sample into two groups based on whether the firm has female board presence or not. Extant research documents that board gender diversity is associated with higher board discussion quality and higher board effectiveness (Clarke (2005); Gul, Srinidhi and Ng (2011); Abbott, Parker and Presley (2012)). Therefore, Female board presence could be viewed as an effective mechanism for corporate governance. Table 25 reports the logistic regression results for this subsample analysis. Column (1) shows the results of firms with at least one woman

director on board. As shown, there is no significant relation between CPS and ICMW, which suggests that the pay gap between the CEO and other executives has no significant impact on internal control material weaknesses for firms with female board presence. Column (2) reports the results of firms with no female director on the board. The coefficient on CPS is -1.262, significant at a level lower than 0.1. Therefore, the relation between CPS and ICMW is marginally stronger for firms with no female director on board. This is supportive of my hypothesis that executive pay disparity is substitutive to other corporate governance mechanisms in affecting firms' accounting practice[9].

(INSERT TABLE 25 HERE)

4.6 Conclusion

In this chapter, I examine the factors that may have an impact on the association between executive pay disparity and internal control material weaknesses. Based on the findings of chapter three, the results of this chapter is summarized as follows. First, I find that the relation between executive pay disparity and internal control material weaknesses is stronger for firms with the most severe agency problems of free cash flow. This indirectly suggests that the pay gap between the CEO and other executives could act as a substitute of other effective mechanisms for corporate governance.

Second, I investigate the effectiveness of tournament incentives in special cases. Specifically, I find that the association between executive pay disparity and material weaknesses is less pronounced when the firm has a new CEO, and is weakened further when the CEO is an outsider. This is consistent with Kale, Reis, and

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[9] I also control for analyst following, institutional ownership, board independence and board size as four corporate governance mechanisms in the baseline model to see if CPS conveys some incremental effects on internal controls. The results are qualitatively similar.

Venkateswaran (2009)'s tournament incentives perspective and suggests that the tournament incentives are less effective when the probability of promotion perceived by other senior executives is lower.

Third, I repeat the baseline model by conducting several partitioning analyses. The findings show that the relation between executive pay disparity and internal control material weaknesses is more pronounced when the firms have lower CEO ownership, younger CEO, lower institutional ownership, less analyst coverage, lower degree of board independence, and no female board presence. The evidence provided by these subsample analyses indicate that executive pay disparity could substitute for a corporate governance mechanism in influencing firms' financial reporting quality.

Taken together, the evidence shown in this chapter is still consistent with Kale, Reis, and Venkateswaran (2009). One of the most important indications provided by this chapter is that executive pay disparity could act as a substitute of other effective corporate governance mechanisms for monitoring corporate managers.

CHAPTER FIVE

SUMMARY

5.1 Concluding remarks

Existing literature has two different views on executive pay disparity: the tournament incentives perspective (Lazear and Rosen (1981); Kale, Reis, and Venkateswaran (2009)) and the managerial power perspective (Bebchuk, Cremers, and Peyer (2011); Chen, Huang and Wei (2013)). The tournament incentives perspective views executive pay disparity as a tournament prize that can motivate non-CEO executives to work hard, invest in firm-specific human capital and in hence compete for the CEO position. This in turn increases the number of qualified internal candidates for the CEO position. Consequently, the increased number of skilled internal candidates for the CEO position decreases the entrenchment of the CEO by increasing the bargaining power of the board. On the other hand, the managerial power perspective suggests that the large pay gap between the CEO and other executives could increase the entrenchment of the CEO. This may lead to more severe agency problems. As a whole, the evidence on executive pay disparity is still inconclusive. This thesis attempts to provide more evidence on executive pay disparity by investigating the association between executive pay disparity and internal control material weaknesses. The main findings are summarized as follows.

In chapter three, I mainly find that large executive pay disparity leads to a lower likelihood of having internal control material weaknesses. The empirical evidence is consistent with the tournament incentives perspective of Kale, Reis, and Venkateswaran (2009), suggesting that the pay gap between the CEO and other executives can act as an effective incentives mechanism for corporate governance. Further analyses show that the pay gap between the CEO and other executives is associated with different kinds of internal control material weaknesses based on two classification schemes: staffing, complexity and general weaknesses; firm-level and account/ transaction-level weaknesses. In additional tests, I also find that large

executive pay disparity leads to a higher degree of accounting conservatism and a lower likelihood of having financial restatements.

In chapter four, my findings are concluded as follows. First, I document that the negative association between executive pay disparity and internal control material weaknesses is more pronounced for firms with the most severe agency problems. Second, I find that the negative relation between executive pay disparity and internal control material weaknesses is less pronounced when the firm has a new CEO, and weakens further when the new CEO is an outsider. This suggests that the tournament incentive is less effective when the firm just hires a new CEO, especially when the new CEO is an outsider. Finally, I find that the relation between executive pay disparity and internal control material weaknesses is more pronounced for firms with lower CEO ownership, younger CEO, lower institutional ownership, lower analyst coverage, lower degree of board independence, or no female board presence.

Overall, this thesis is supportive of Kale, Reis, and Venkateswaran (2009)'s tournament incentives perspective and suggests that executive pay disparity could act as an effective incentive mechanism in improving firms' financial reporting quality. Furthermore, the evidence shown in chapter four suggests that executive pay disparity serves as a substitute of other mechanism for corporate governance that could otherwise be weak.

5.2 Limitations

This study is subject to several limitations. Most importantly, I still do not know how the pay gap between the CEO and other executives is formed. To better assess the effect of CPS on firm's behavior, I may need to find out who is "behind the scene" that make this to happen. Specifically, who design the pay gap between the CEO and other executives? What is the mechanism through which the pay gap could have an impact on firms' accounting practice?

Second, using data from ExecuComp may lead to biased results. This is because ExecuComp mainly contains larger firms in the S&P 1500 index. Third, I do not consider the impact of managerial accounting expertise on my results due to the data limitation.

5.3 Future research opportunities

Future research could be carried out in the following areas. First, more studies can be conducted to investigate whether other incentive mechanisms have impacts on internal control material weaknesses. Since CFOs also have the responsibility of certifying the financial statements, the pay gap between the CFO and other financial officers may also have a tournament incentive effect, which in turn may have an impact on financial reporting quality as well.

Second, the effects of the pay gap between the CEO and other executives on other managerial decisions can be investigated. For example, executive pay disparity may have an impact on the decision of voluntary corporate financial disclosure. If the story is consistent with Kale, Reis, and Venkateswaran (2009)'s tournament incentives perspective, I expect that large executive pay disparity may lead to more voluntary corporate financial disclosure.

Appendix 1 Notation and definitions of variables

ICMW. Internal control material weaknesses, which is a dummy variable that is equal to 1 for firms that report at least one material weakness in year t, and 0 otherwise.

CPS. The CEO pay slice, measured as the total compensation of the CEO divided by the sum of the total compensation of the top-five executives.

Size. The natural log of total assets.

Age. The natural log of the number of years that firms are existing in CRSP.

Aggr_loss. A dummy variable that is equal to 1 for firms that have a sum of earnings before extraordinary items for year t-1 and year t is negative and 0 otherwise.

Foreign_transaction. A dummy that is equal to 1 for firms have foreign currency transactions and 0 otherwise.

Sale_growth. The percentage change of sales from year t-1 to year t.

Segments. The natural log of the number of operating and geographic segments.

Restructure. The sum of the restructuring charges of year t-1 and year t, scaled by the book asset value of prior year.

Z_score. Z-score, estimated as follows:

(3.3*Pretax income+Sale+1.4*Retained earnings+1.2*(Current assets-Current

Liabilities))/Total assets

Staffing_ICMW. Staffing related internal control material weaknesses, which is a dummy variable that is equal to 1 for firms with at least one staffing related internal control material weakness, and 0 for firms with no material weakness.

Complexity_ICMW. Complexity related internal control material weaknesses, which is a dummy variable that is equal to 1 for firms with at least one complexity related internal control material weakness, and 0 for firms with no material weakness.

General_ICMW. General internal control material weaknesses, which is a dummy variable that is equal to 1 for firms with at least one general internal control material weakness, and 0 for firms with no material weakness.

Firm_ICMW. Firm-level internal control material weaknesses, which is a dummy variable that is equal to 1 for firms with at least one firm-level internal control material weakness, and 0 for firms with no material weakness.

Account_ICMW. Account/Transaction-level internal control material weaknesses, which is a dummy variable that is equal to 1 for firms with at least one Account/Transaction-level internal control material weakness, and 0 for firms with no material weakness.

ONEPCT. The effect of a one percentage point increase in a firm's stock price on the value of the firm's shares held by a manager, which is estimated as

$$ONEPCT = 0.01 * Price * (Shares + Options):$$

where *Price* is the company share price, *Shares* is the number of shares held by the the manager, and *Options* is the number of options held by the manager including newly granted options, unexercised exercisable options, and unexercised unexercisable options.

CEO_incentives_ratio. The fraction of the CEO's total compensation that would come from a one percentage point increase in the company's stock price. It is estimated as ONEPCT normalized by ONEPCT plus cash pay, where cash pay is the sum of salary and bonus.

CFO_incentives_ratio. The fraction of the CFO's total compensation that would come from a one percentage point increase in the company's stock price. It is

estimated as ONEPCT normalized by ONEPCT plus cash pay, where cash pay is the sum of salary and bonus.

CEO_CFO_PAYGAP. The natural log of the total pay difference between the CEO and the CFO.

C_score. The firm-level measure of conditional conservatism following Khan and Watts (2009). Specifically, a firm-specific measure of the timeliness of good news (G_score) and bad news (C_score) is developed as follows:

$$NI_t = \beta_1 + \beta_2 D_t + \beta_3 RET_t + \beta_4 D_t * RET_t + \varepsilon \qquad \text{(A-1)}$$

$$G\_score_t = \beta_3 = \mu_1 + \mu_2 MV_t + \mu_3 MTB_t + \mu_4 LEV_t + \varepsilon \qquad \text{(A-2)}$$

$$C\_score_t = \beta_4 = \lambda_1 + \lambda_2 MV_t + \lambda_3 MTB_t + \lambda_4 LEV_t + \varepsilon \qquad \text{(A-3)}$$

where *NI* is net income before extraordinary items scaled by the market value of equity at the beginning of the fiscal year; *D* is a dummy variable that is equal to 1 if *RET* is negative; *RET* is the buy and hold stock return in the prior fiscal year; *MV* is the natural log of the market value of equity; *MTB* is market value of equity divided by the book value of equity; and *LEV* is total debt divided by total assets.

To calculate C_score, the coefficients β_3 and β_4 from equation (A-2) and (A-3) are replaced into equation (A-1), including additional items in the last parenthesis, and yields equation (A-4) as follows:

$$NI_t = \beta_1 + \beta_2 D_t + RET_t * (\mu_1 + \mu_2 MV_t + \mu_3 MTB_t + \mu_4 LEV_t) + D_t * RET_t (\lambda_1 + \lambda_2 MV_t + \lambda_3 MTB_t + \lambda_4 LEV_t) + (\delta_1 MV_t + \delta_2 MTB_t + \delta_3 LEV_t + \delta_4 D_t * MV_t + \delta_5 D_t * MTB_t + \delta_6 D_t * LEV_t) + \varepsilon$$

$$\text{(A-4)}$$

I then estimate equation (A-4) by running annual cross-sectional regressions. The coefficient estimates of γ_1 to γ_4 from equation (A-4) are applied to

equation (A-3) to obtain C_score, the firm-specific accounting conservatism measures.

Own. The percentage of the firm's outstanding shares held by the CEO.

MTB. Market-to-Book ratio, which is measured as market value of equity divided by the book value of equity.

Leverage. The measure of leverage ratio, estimated as total liabilities divided by total assets.

Lit. Litigation risk, which is a dummy variable that is equal to 1 for firms in a litigious industry-SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370- and 0 otherwise.

R&D. Research and development expenses, which is estimated as the total research and development expenses deflated by lagged assets.

CFO. Cash flows from operations, which is estimated as the cash flows from operations deflated by lagged assets.

Revt. The standard deviation of the natural log of revenues measured from t-5 to t-1.

Res. Financial restatements, which is a dummy variable that is equal to 1 for firms that have at least one financial restatement in year t and 0 otherwise.

Merger. A dummy variable that is equal to 1 for firms that have an acquisition that contributed to sales (AQS>0) and 0 otherwise.

Financing. A dummy variable that is equal to 1 if the sum of new long-term debt plus new equity execeeds 2 percent of lagged total assets and 0 otherwise.

Loss. A dummy variable that is equal to 1 if net income is negative and 0 otherwise.

Current_accrual. A change in noncash current assets from year t-1 to t scaled by average assets. (($\triangle$Current assets-$\triangle$Cash and short-term investments)-($\triangle$Current liabilities-$\triangle$Debt in current liabilities-$\triangle$Taxes payable))/Average total assets.

INV_INT_COV. Inverse interest expense coverage, which is equal to interest expense divided by operating income before depreciation.

BM. Book-to-market ratio, which is measured as book value of equity divided by market value of equity.

Fin_demand. Financing demand, which is a dummy variable if Free_cash<-0.5 and 0 otherwise. Free_cash is cash flows from operations minus average capital expenditure scaled by lagged current assets.

Audit_fees. The natural log of total audit fees.

Big_4. A dummy variable that is equal to 1 if the client is audited by one of the Big 4 accounting firms and 0 otherwise.

CPS_adjusted. Industry-adjusted CPS, which is estimated as the firm-level CPS minus industry median CPS.

PAYGAP. The natural log of the difference between the total pay of the CEO and the median value of the total pay of the other 4 top executives.

OCF. Operating cash flows, which is measured as net cash flow from operating activities scaled by lagged assets.

Tobin's Q. The market value of equity minus the book value of equity plus the book value of total assets, scaled by the book value of total assets.

High_FCF. A dummy variable, which is equal to 1 for firms with above within-year median operating cash flow and below within-year median Tobin's Q and 0 otherwise.

Low_FCF. A dummy variable, which is equal to 1 for firms with below within-year median operating cash flow and above within-year median Tobin's Q and 0 otherwise.

High_FCF_Residual. A dummy variable, which is equal to 1 for firms with above within-year median residual OCF and below within-year median Tobin's Q and 0 otherwise by regressing OCF and Tobin's Q on CPS respecitively.

Low_FCF_Residual. A dummy variable, which is equal to 1 for firms with below within-year median residual OCF and above within-year median Tobin's Q and 0 otherwise by regressing OCF and Tobin's Q on CPS respecitively.

New_CEO. A dummy variable, which is equal to 1 when the CEO is in the first year of service as a CEO and 0 otherwise.

Insider. a dummy variable, which is equal to 1 when the CEO has been worked in the firm for at least 1 year before becoming the CEO and 0 otherwise.

Homo. Industry homogeneity, which is measured as the mean partial correlation between a firm's monthly returns and the industry monthly returns controlling for the market returns.

Appendix 2 Examples of internal control material weakness classification schemes

By operating nature of control weakness

Staffing

Staffing internal control material weaknesses are related with staffing concerns, such as the lack of qualified financial and accounting staffs. Detailed examples are listed below:

1) Inadequate qualified staffing and resources

2) Ineffective, non-existent or understaffed audit committee

3) Segregation of duties/ design of controls

Complexity

Complexity internal control material weaknesses are associated with complex accounting issues. Detailed examples are described as follows:

1) Accounting documentation, policy and/ or procedures

2) Ineffective regulatory compliance issues

3) Journal entry control issues

General

General internal control material weaknesses refer to weaknesses in accounting for transactions. Detailed examples are as follows:

1) Information technology, software, security and access issue

2) Untimely or inadequate account reconciliation

3) Treasury control issues

By firm-level or account/transaction-level material weaknesses

Firm-level

Firm-level internal control weaknesses tend to be more pervasive and are difficult to be corrected by additional auditor testing. Detailed examples are as follows:

1) Ineffective control environment

2) Segregations of duties

3) Ethical or compliance issues with personnel

Account/transaction-level

Account/transaction-level internal control material weaknesses tend to be more easily corrected through adjusting entries than firm-level weaknesses. Detailed examples are concluded as follows:

1) Information technology, software, security and access issue

2) Treasury control issues

3) Journal entry control issues

REFERENCES

Abbott, L.J., Parker, S., Peters, G., 2004. Audit committee characteristics and restatements. Auditing: A Journal of Practice & Theory 23, 69-87.

Abbott, L.J., Parker, S., Presley, T.J., 2012. Female board presence and the likelihood of financial restatement. Accounting Horizons 26, 607-629.

Agrawal, A., Chadha, S., 2005. Corporate governance and accounting scandals. Journal of Law and Economics 48, 371-406.

Ahmed, A.S., Billings, B.K., Morton, R.M., Standford-Harris, M., 2002. The role of accounting conservstism in mitigating bondholder-shareholder conflicts over dividend policy and in reducing debt costs. The Accounting Review 77, 867-890.

Ahmed, A.S., Duellman, S., 2013. Managerial overconfidence and accounting conservatism. Journal of Accounting Research 51, 1-30.

Altman, E.I., 1968. Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. Journal of Finance 23, 589-609.

Anderson, K., Yohn, T., 2002. The effect of 10-K restatements on firm value, information asymmetries, and investors' reliance on earnings. Working paper. Georgetown University.

Armstrong, C., Jagolinzer, A., Larcker, D., 2010. Chief executive officer equity incentives and accounting irregularities. Journal of Accounting Research 48, 225-271.

Ashbaugh-Skaife, H., Collins, D., Kinney, W., 2007. The discovery and reporting of internal control deficiencies prior to SOX-mandated audits. Journal of Accounting and Economics 44, 166-192.

Ashbaugh-Skaife, H., Collins, D., Kinney, W., 2008. The effect of SOX internal control deficiencies and their remediation on accruals quality. The Accounting Review 83, 217-250.

Ashbaugh-Skaife, H., Collins, D., Kinney, W., LaFond, R., 2009. The effect of SOX internal control deficiencies on firm risk and cost of equity. Journal of Accounting Research 47, 1-43.

Basu, S., 1997. The conservatism principle and the asymmetric timeliness of earnings. Journal of accounting and economics 24, 3-37.

Ball, R., Shivakumar, L., 2005. Earnings quality in UK private firms: Comparative loss recognition timeliness. Journal of Accounting and Economics 39, 83-128.

Barua, A., Davidson, L.F., Rama, D.V., Thiruvadi, S., 2010. CFO gender and accruals quality. Accounting Horizons 24, 25-40.

Beasley, M., 1996. An empirical analysis of the relation between the board of director composition and financial statement fraud. The Accounting Review 71, 443-465.

Beaver, W., 1993. Conservatism. Working paper. Standford University.

Beaver, W.H., Ryan, S.G., 2005. Conditional and unconditional conservatism: concepts and modeling. Review of Accounting Studies 10, 269-309.

Bebchuk, L.A., Fried, J.M., 2003. Executive compensation as an agency problem. Journal of Economic Perspectives 17, 71-92.

Bebchuk, L.A., Cremers, M., Peyer, U., 2011. The CEO pay slice. Journal of Financial Economics 102, 199-221.

Bedard, J., 2006. Sarbanes-Oxley internal control requirements and earnings quality. Working paper, Universit¨| Lava.

Beneish, M.D., 1999. Incentives and penalties related to earnings overstatements that violate GAAP. The Accounting Review 74, 425-457.

Beneish, M.D., Billings, M.B., Hodder L.D., 2008. Internal control weaknesses and information uncertainty. The Accounting Review 83, 665-703.

Bergstresser, D., Philippon, T., 2006. CEO incentives and earnings management. Journal of Financial Economics 80, 511-529.

Bliss, J.H., 1924. Management through accounts. New York, NY: The Ronald Press Co.

Bognanno, M.L., 2001. Corporate tournaments. Journal of Labor Economics 19, 290-315.

Bowen, R.M., Rajgopal, S., Venkatachalam, M., 2008. Accounting discretion, corporate governance, and firm performance. Contemporary Accounting Research 25, 351-405.

Burns, N., Kedia, S., 2006. The impact of performance-based compensation on misreporting. Journal of Financial Economics 79, 35-67.

Carcello, J.V., Neal, T.L., Palmrose, Z., Scholz, S., 2011. CEO involvement in selecting board members, audit committee effectiveness, and restatements. Contemporary Accounting Research 28, 396-430.

Chan, K.C., Farrell B., Lee, P., 2008. Earnings management of firms reporting material internal control weaknesses under Section 404 of the Sarbanes-Oxley Act. Auditing: A Journal of Practice & Theory 27, 161-179.

Chang, X., Dasgupta, S., Hilary, G., 2009. The effect of auditor quality on financing decisions. The Accounting Review 84, 1085-1117.

Chen, K.C.W., Chen, Z., Wei, K.C.J., 2011. Agency costs of free cash flow and the effect of shareholder rights on the implied cost of equity capital. Journal of Financial and Quantitative Analysis 46, 171-207.

Chen, Z., Huang Y., Wei, K.C.J., 2013. Executive pay disparity and the cost of equity capital. Journal of Financial and Quantitative Analysis 48, 849-885.

Cheng, C.S.A., Huang, H.H., Li, Y., 2010. Hedge fund intervention and accounting conservatism. Working paper, Louisiana State University.

Cheng, Q., Farber, D. B., 2008. Earnings restatements, changes in CEO compensation, and firm performance. The Accounting Review 83, 1271-1251.

Cheng, Q., Warfield, T.D., 2005. Equity incentives and earnings management. The Accounting Review 80, 441-476.

Cheng, S., 2004. R&D expenditure and CEO compensation. The Accounting Review 79, 305-328.

Clarke, C.J., 2005. The XX factor in the boardroom: why women make better directors. Director Monthly (August), 12-14.

Committee of Sponsoring Organizations, 1987. Report of the National Commission on Fraudulent Financial Reporting. New York: American Institute of Certified Public Accountants.

Davidson III, W.N., Xie, B., Xu, W., Ning, Y., 2007. The influence of executive age, career horizon and incentives on pre-turnover earnings management. Journal of Management & Governance 11, 45-61.

Dechow, P., Dichev, I., 2002. The quality of accruals and earnings: The role of accrual estimation errors. The Accounting Review 77, 35-59.

Dechow, P., Ge, W., 2006. The persistence of earnings and cash flows and the role of special items: implications for the accrual anomaly. Review of Accounting Studies 11, 253-296.

Dechow, P., Ge, W., Schrand, C., 2010. Understanding earnings quality: A review of the proxies, their determinants and their consequences. Journal of Accounting and Economics 50, 344-401.

Dechow, P., Sloan, R., 1991. Executive incentives and the horizon problem. Journal of Accounting and Economics 14, 51-89.

Dechow, P., Sloan, R., Sweeney, A., 1995. Detecting earnings management. The Accounting Review 70, 193-225.

Defond, M., Jiambalvo, J., 1991. Incidence and circumstances of accounting errors. The Accounting Review 66, 643-655.

DeJong, D., Ling, Z., 2010. Managers: Their effects on accruals and firm policies. Working paper. The University of Iowa.

Demerjian, P.R., Lev, B., Lewis, M.F., McVay, S.E., 2013. Managerial ability and earnings quality. The Accounting Review 88, 463-498.

Desai, H., Hogan, C.E., Wilkins, M.S., 2006. The reputational penalty for aggressive accounting: Earnings restatements and management turnover. The Accounting Review 81, 83-112.

Doyle, J., Ge, W., McVay, S., 2007a. Determinants of weaknesses in internal control over financial reporting. Journal of Accounting and Economics 44, 193-223.

Doyle, J., Ge, W., McVay, S., 2007b. Accruals quality and internal control over financial reporting. The Accounting Review 82, 1141-1170.

Efendi, J., Srivastava, A., Swanson, E.P., 2007. Why do corporate managers misstate financial statements? The role of option compensation and other factors. Journal of Financial Economics 85, 667-708.

Eisenhardt, K., Kahwayj, J., Bourgeois, L., 1997. How management teams can have a good fight. Harvard Business Review 75, 77-85.

Engel, E., Hayes, R.M., Wang, X., 2007. The Sarbanes-Oxley Act and firms' going-private decisions. Journal of Accounting and Economics 44, 116-145.

Ettredge, M., Heintz, J., Li, C., Scholz, S., 2011. Auditor realignments accompanying implementation of SOX 404 ICFR reporting requirements. Accounting Horizons 25, 17-39.

Fama, E.F., French, K.R., 1997. Industry costs of equity. Journal of Financial Economics 43, 153-193.

Fama, E., Jensen, M., 1983. Seperation of ownership and control. Journal of Law and Economics 26, 301-325.

Fee, C., Hadlock, C., 2004. Management turnover across the corporate hierarchy. Journal of Accounting and Economics 37, 3-38.

Feng, M., Ge, W., Luo, S., Shevlin, T., 2011. Why do CFOs become involved in material accounting manipulations? Journal of Accounting and Economics 51, 21-36.

Feng, M., Li C., McVay, S., 2009. Internal control and management guidance. Journal of Accounting and Economics 48, 190-209.

Ferguson, M., Seow, G., Young, D., 2004. Nonaudit services and earnings management: UK evidence. Contemporary Accounting Research 21, 813-841.

Ferreira, M., Laux, P., 2009. Corporate boards and SEOs: the effects of certification and monitoring. Working paper. University of Delaware.

Frances, B., Hasan, I., Park, J.C., Wu, Q., 2009. Gender differences in financial reporting decision-making: Evidence from accounting conservatism. Working paper. Rensselaer Polytechnic Institute.

Francis, J., Huang, A., Rajgopal, S., Zang, A., 2008. CEO reputation and earnings quality. Contemporary Accounting Research 25, 109-147.

Ge, W., Matsumoto, D., Zhang, J.L., 2011. Do CFOs have style? An empirical investigation of the effect of individual CFOs on accounting practices. Contemporary Accounting Research 28, 1141-1179.

Ge, W., McVay, S., 2005. The disclosure of material weaknesses in internal control after the Sarbanes-Oxley Act. Accounting Horizons 19, 137-158.

Goh, B.W., Li, D., 2011. Internal controls and conditional conservatism. The Accounting Review 86, 975-1005.

Gul, F., Srinidhi, B., Ng, A., 2011. Does board gener diversity improve the informativeness of stock prices? Journal of Accounting and Economics 51, 314-338.

Hambrick, D.C., Mason, P.A., 1984. Upper echelons: The organization as a reflection of its top managers. The Academy of Management Review 9, 193-206.

Hammersley, J.S., Myers, L.A., Shakespeare, C., 2008. Market reactions to the disclosure of internal control weaknesses and to the characteristics of those weaknesses under Section 302 of the Sarbanes-Oxley Act of 2002. Review of Accounting Studies 13, 141-165.

Healy, P., 1985. The effect of bonus schemes on accounting policies. Journal of Accounting and Economics 7, 85-107.

Hennes, K.M., Leone, A.J., Miller, B.P, 2008. The importance of distinguishing errors from irregularities in restatement research: The case of restatements and CEO/CFO turnover. The Accounting Review 83, 1487-1519.

Hogan, C., Wilkins, W.S., 2008. Evidence on the audit risk model: Do auditors increase audit fees in the presence of internal control deficiencies? Contemporary Accounting Research 25, 219-242.

Hoitash, U., Hoitash, R., Bedard, J.C., 2009. Corporate governance and internal control over financial reporting: a comparison of regulatory regimes. The Accounting Review 84, 839-867.

Hoitash, R., Hoitash, U., Johnstone, K.M., 2012. Intenral control material weaknesses and CFO compensation. Contemporary Accounting Research 29, 768-803.

Hribar, P., Jenkins, N.T., 2004. The effect of accounting restatements on earnings revisions and the estimated cost of capital. Review of Accounting Studies 9, 337-356.

Hribar, P., Kravet, T., Wilson, R., 2010. A new measure of accounting quality. Working paper. The University of Iowa and The University of Texas at Dallas.

Huang, H., Rose-Green, E., Lee, C., 2012. CEO age and financial reporting quality. Accounting Horizons 26, 725-740.

Hui, K.W., Matsunaga, S., Morse, D., 2009. The impact of conservatism on management earnings forecasts. Journal of Accounting and Economics 47, 192-207.

Jensen, M., 1986. Agency costs of free cash flow, corporate finance, and takeovers. American Economic Review 76, 323-329.

Jensen, M., Meckling, W., 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics 3, 305-360.

Jiang, J. X., Petroni, K. R., Wang, I. Y., 2010. CFOs and CEOs: who have the most influence on earnings management? Journal of Financial Economics 96, 513-526.

Johnstone, K., Li, C., Rupley, K.H., 2011. Changes in corporate governance associated with the revelation of internal control material weaknesses and their subsequent remediation. Contemporary Accounting Research 28, 331-383.

Kale, J., Reis, E., Venkateswaran, A., 2009. Rank order tournament and incentive alignment: the effect on firm performance. Journal of Finance 64, 1479-1512.

Kellogg, R.L., 1984. Accounting activities, security prices, and class action lawsuits. Journal of Accounting and Economics 6, 185-204.

Khan, M., Watts, R.L., 2009. Estimation and empirical properties of a firm-year measure of accounting conservatism. Journal of Accounting and Economics 48, 132-150.

Kim, Y., Li, S., Pan, C., Zuo, L., 2013. The role of accounting conservatism in the equity market: Evidence from seasoned equity offerings. The Accounting Review 88, 1327-1356.

Kini, O., Williams, R., 2012. Tournament incentives, firm risk, and corporate policies. Journal of Financial Economics 103, 350-376.

Kinney, W., 2000. Assertions-based standards for integrated internal control. Accounting Horizons 4, 1-8.

Kinney, W., Maher, M., Wright, D., 2000. Research opportunities in internal control quality and quality assurance. Auditing: A Journal of Practice and Theory 19, 83-90.

Kinney, W., McDaniel, L.S., 1989. Characteristic of firms correcting previously reported quarterly earnings. Journal of Accounting and Economics 11, 71-93.

Kinney, W., Palmrose, Z., Scholz, S., 2004. Auditor independence, non-audit services, and restatements: was the U.S. government right? Journal of Accounting Research 42, 561-588.

Krishnan, G.V., Parsons, L.M., 2008. Getting to the bottom line: An exploration of gender and earnings quality. Journal of Business Ethics 78, 65-76.

Krishnan J., 2005. Audit committee quality and internal control: and empirical analysis. The Accounting Review 80, 649-675.

Krishnan, J., Rama, D., Zhang, Y., 2008. Cost to comply with SOX Section 404. Auditing: A Journal of Practice & Theory 27, 169-186.

LaFond, R., Roychowdhury, S., 2008. Managerial ownership and accounting conservatism. Journal of Accounting Research 46, 101-135.

LaFond, R., Watts, R.L., 2008. The information role of conservatism. The Accounting Review 83, 447-478.

Larcker, D., Richardson, S., Tuna, I., 2007. Corporate governance, accounting outcomes, and organizational performance. The Accounting Review 82, 963-1008.

Laux, C., Laux, V., 2009. Board committees, CEO compensation, and earnings management. The Accounting Review 84, 869-892.

Lara, J.M.G., Osma, B.G., Penalva, F., 2009. Accounting conservatism and corporate governance. Review of Accounting Studies 14, 161-201.

Lazear, E.P., Rosen, S., 1981. Rank-order tournament as optimum labor contracts. Journal of Political Economy 89, 841-864.

Lee, C., Farth, J., 2004. Joint effects of group efficacy and gender diversity on group cohesion and performance. Applied Psychology: An International Review 53, 136-154.

Lee, K.W., Lev, B., Yeo, G.H.H., 2008. Executive pay dispersion, corporate governance, and firm performance. Review of Quantitative Finance and Accounting 30, 315-338.

Lev, B., Ryan, S.G., Wu, M., 2008. Rewriting earnings history. Review of Accounting Studies 13, 419-451.

Li, C., Sun, L., Ettredge, M., 2010. Financial executive qualifications, financial executive turnover, and adverse SOX 404 opinions. Journal of Accounting and Economics 50, 93-110.

Lobo, G.J., Zhao, Y., 2013. Relation between audit effort and financial report misstatements: Evidence from quarterly and annual restatements. The Accounting Review 88, 1385-1412.

Loe, T.W., Ferrell, L., Mansfield, P., 2000. A review of empirical studies assessing ethical decision making in business. Journal of Business Ethics 25, 185-204.

Masulis, R.M., Mobbs, S., 2011. Are inside directors the same? Evidence from the external directorship market. Journal of Finance 66, 823-872.

McNichols, M., Wilson, P., 1988. Evidence of earnings management from the provision for bad debts. Journal of Accounting Research 26 (Supplement), 1-31.

Mian, S., 2001. On the choice and replacement of chief financial officers. Journal of Financial Economics 60, 143-175.

Munsif, V., Raghunandan, K., Rama, D.V., Singhvi M., 2011. Audit fees after remediation of internal control weaknesses. Accounting Horizons 25, 87-105.

Murphy, K.J., 1999. Executive compensation, in Ashenfelter, Orley and David Card, eds.: Handbook of Labor Economics.

Ogneva, M., Subramanyam, K.R., Raghunandan, K., 2007. Internal control weakness and cost of equity: Evidence from SOX Section 404 disclosure.

Palmrose, Z., Richardson, V., Scholz, S., 2004. Determinants of market reactions to restatement announcements. Journal of Accounting and Economics 37, 59-89.

Palmrose, Z., Scholz, S., 2004. The circumstances and legal consequences of non-GAAP reporting: evidence from restatements. Contemporary Accounting Research 21, 139-180.

Parrino, R., 1997. CEO turnover and outside succession: A cross-sectional analysis. Journal of Financial Economics 46, 165-197.

Pelled, L., Eisenhardt, K., Xin, K., 1999. Exploring the black box: An analysis of work group diversity, conflict, and performance. Administrative Science Quarterly 44, 1-28.

Peterson, D., Rhoads, A., Vaught, B.C., 2001. Ethical beliefs of business professionals: A study of gender, age and external factors. Journal of Business Ethics 31, 225-233.

Petrovits, C., Shakespeare, C., Shih, A., 2011. The causes and consequences of internal control problems in nonprofit organizations. The Accounting Review 86, 325-357.

Public Company Accounting Oversight Board (PCAOB), 2007. Auditing Standard No.5: An audit of internal control over financial reporting that is integrated with an audit of financial statements.

Prakash, S., 2008. The Sarbanes-Oxley Act and small public companies. Working paper. Standard graduate School of Business.

Raghunandan, K., Rama, D., 2006. SOX Section 404 material weakness disclosures and audit fees. Auditing: A Journal of Practice & Theory 25, 99-114.

Raheja, C.G., 2005. Determinants of board size and composition: A theory of corporate boards. Journal of Financial and Quantitative Analysis 40, 283-306.

Ramalingegowda, S., Wang, C., Yu, Y., 2013. The role of financial reporting quality in mitigating the constraining effect of dividend policy on investment decisions. The Accounting Review 88, 1007-1039.

Ramalingegowda, S., Yu, Y., 2012. Institutional ownership and conservatism. Journal of Accounting and Economics 53, 98-114.

Reitenga, a., Buchheit, S., Yin, Q. J., Baker, T., 2002. CEO bonus pay, tax policy, and earnings management. The Journal of the American Taxation Association 24, 1-23.

Richardson, S., Sloan, R., Soliman, M., Tuna, I., 2005. Accrual reliability, earnings persistence and stock prices. Journal of Accounting and Economics 39, 437-485.

Sarbanes-Oxley Act (SOX), 2002. Public Law No. 107-204. Washington, DC: GPO.

Schrand, C.M., Zechman, S.L.C., 2012. Executive overconfidence and the slippery slope to financial misreporting. Journal of Accounting and Economics 53, 311-329.

Shackelford, D.A., Shevlin, T., 2001. Empirical tax research in accounting. Journal of Accounting and Economics 31, 321-387.

Srinivasan, S., 2005. Consequences of financial reporting failure for outside directors: Evidence from accounting restatements and audit committee members. Journal of Accounting Research 43, 291-334.

St. Pierre, K., Anderson, J.A., 1984. An analysis of the factors associated with lawsuits against public accountants. The Accounting Review 59, 242-263.

Sundaram, R.K., Yermack, D., 2007. Pay me later: Insider debt and its role in managerial compensation. The Journal of Finance 62, 1551-1587.

Vroom, V.H., Pahl, B., 1971. Relationship between age and risk taking among managers. Journal of Applied Psychology 55, 399-405.

Wang, X., 2010. Increase disclosure requirements and corporate governance decisions: evidence from chief financial officers in the pre- and post-Sarbanes-Oxley periods. Journal of Accounting Research 48, 885-920.

Watts, R., 1993. A proposal for research on conservatism. Working paper. University of Rochester.

Watts, R.L., 2003. Conservatism in accounting part I: explanations and implications. Accounting Horizons 17, 207-221.

Yu, F., 2008. Analyst coverage and earnings management. Journal of Financial Economics 88, 245-271.

Zhang, I.X., 2007. Economic consequences of the Sarbanes-Oxley Act of 2002. Journal of Accounting and Economics 44, 74-115.

Zhang, J., 2008. The contracting benefits of accounting conservatism to lenders and borrowers. Journal of Accounting and Economics 45, 27-54.

Table 1 Descriptive statistics					
	Mean	Std. Dev	Q1	Median	Q3
ICMW	0.049	0.216	0	0	0
CPS	0.385	0.107	0.319	0.390	0.454
Size	7.472	1.459	6.426	7.387	8.444
Age	2.964	0.754	2.485	2.944	3.584
Aggr_loss	0.160	0.366	0	0	0
Foreign_transaction	0.411	0.492	0	0	1
Sale_growth	0.094	0.176	0.002	0.081	0.169
Z_score	1.920	1.327	1.246	1.963	2.718
Segments	2.060	0.768	1.386	2.197	2.708
Restructure	0.005	0.009	0.000	0.000	0.006

Table 1 reports the descriptive statistics for the sample containing 8,547 firm-years from 2004 to 2012. All variables are defined in Appendix 1.

Table2 Descriptive statistics of firms categorized by ICMW

	ICMW=1 N=419	ICMW=0 N=8128	
		Mean	Mean diff
CPS	0.357	0.387	-0.029***
Size	6.935	7.499	-0.564***
Age	2.907	2.967	-0.060
Aggr_loss	0.341	0.151	0.191***
Foreign_transaction	0.506	0.406	0.100***
Sale_growth	0.102	0.094	0.008
Z_score	1.368	1.948	0.580***
Segments	2.084	2.058	0.025
Restructure	0.007	0.005	0.002***

Table 2 reports the means of variables categorized into ICMW and Non-ICMW firms. *, **, and *** indicate significant difference at the 0.1, 0.05, and 0.01 level, respectively, under a *t*-test for mean comparison. All variables are defined in Appendix 1.

	A	B	C	D	E	F	G	H	I	J
Table 3: Spearman correlations										
ICMW (A)	**1**	**-0.060**	**-0.083**	-0.017	**0.112**	**0.044**	0.010	**-0.094**	0.007	**0.038**
CPS(B)	**-0.060**	**1**	**0.190**	**0.133**	**-0.077**	0.014	**-0.028**	0.014	**0.070**	-0.000
Size(C)	**-0.083**	**0.190**	**1**	**0.290**	**-0.166**	*0.028*	0.002	0.003	**0.190**	-0.029
Age(D)	-0.017	**0.133**	**0.290**	**1**	**-0.052**	-0.014	**-0.123**	**0.138**	**0.153**	**0.064**
Aggr_loss(E)	**0.112**	**-0.077**	**-0.166**	**-0.052**	**1**	**0.059**	**-0.169**	**-0.438**	-0.006	**0.299**
Foreign_transaction(F)	**0.044**	0.014	*0.028*	-0.014	**0.059**	**1**	-0.018	**-0.095**	**0.314**	**0.136**
Sale_growth(G)	0.010	**-0.028**	0.002	**-0.123**	**-0.169**	-0.018	**1**	**0.060**	-0.012	**-0.193**
Z_score(H)	**-0.094**	0.014	0.003	**0.138**	**-0.438**	**-0.095**	**0.060**	**1**	-0.031	**-0.199**
Segments(I)	0.007	**0.070**	**0.190**	**0.153**	-0.006	**0.314**	-0.012	**-0.031**	**1**	**0.126**
Restructure(J)	**0.038**	-0.000	**-0.029**	**0.064**	**0.299**	**0.136**	**-0.193**	**-0.199**	**0.126**	**1**

Table 3 reports the spearman correlations of ICMW, CPS and control variables. Bold typeface indicates significance at the 1% level. Italic typeface indicates significance at the 5% level. All variables are defined in Appendix 1.

Table 4 Logistic regression of internal control material weaknesses on executive pay disparity

Dependent variable: internal control material weaknesses

Variables	Predicted sign	Coefficient estimate	P-value
Intercept	-	-1.708	0.00
CPS	**?**	**-0.955***	**0.00**
Size	-	-0.119***	0.00
Age	-	0.151***	0.00
Aggr_loss	+	0.338***	0.00
Foreign_transaction	+	0.290***	0.00
Sale_growth	+	0.116	0.50
Z_score	-	-0.129***	0.00
Segments	+	0.031	0.54
Restructure	+	0.072	0.98
Year dummies		Yes	
Industry dummies		Yes	
Observations		8547	
R-square		0.096	

Table 4 reports logistic results of internal control material weaknesses on CPS from 2004 to 2012. The dependent variable, internal control material weaknesses, is equal to 1 for firms that report at least one material weakness under auditor's opinion in that fiscal year and 0 for firms without any material weaknesses. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 5 Logistic regression of internal control material weaknesses categorized by operating nature on executive pay disparity

Dependent variable		(1)		(2)		(3)	
		Staffing		Complexity		General	
Variables	Predicted sign	Coefficient estimate	*P*-value	Coefficient estimate	*P*-value	Coefficient estimate	*P*-value
Intercept	-	-2.480	1.00	-0.482	0.41	-3.860	0.93
CPS	**?**	**-1.213*****	**0.00**	**-1.122*****	**0.00**	**-1.316*****	**0.00**
Size	-	-0.109***	0.00	-0.126***	0.00	-0.144***	0.00
Age	-	0.240***	0.00	0.133**	0.01	0.250***	0.00
Aggr_loss	+	0.324***	0.00	0.332***	0.00	0.358***	0.00
Foreign_transaction	+	0.420***	0.00	0.304***	0.00	0.376***	0.00
Sale_growth	+	0.073	0.76	0.150	0.41	0.117	0.63
Z_score	-	-0.163***	0.00	-0.125***	0.00	-0.157***	0.00
Segments	+	0.013	0.85	0.014	0.80	0.013	0.85
Restructure	+	-3.214	0.49	4.239	0.21	-7.552	0.13
Year dummies		Yes		Yes		Yes	
Industry dummies		Yes		Yes		Yes	
Observations		7752		7942		7746	

	(1)	(2)	(3)
R-square	0.070	0.098	0.068

Table 5 reports logistic results of internal control material weaknesses categorized by operating nature on CPS from 2004 to 2012. Column (1) shows the regression results of staffing material weaknesses, a dummy variable that equal to 1 for firms with at least one staffing material weaknesses and 0 for firms without any material weaknesses, as the dependent variable. Column (2) shows the regression results of complexity material weaknesses, a dummy variable that equal to 1 for firms with at least one complexity material weaknesses and 0 for firms without any material weaknesses, as the dependent variable. Column (3) shows the regression results of general material weaknesses, a dummy variable that equal to 1 for firms with at least one general material weaknesses and 0 for firms without any material weaknesses, as the dependent variable. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 6 Logistic regression of firm-level and account/transaction-level internal control material weaknesses on executive pay disparity

Dependent variable		(1) Account/Transaction-level material weaknesses		(2) Firm-level material weaknesses	
Variables	Predicted sign	Coefficient estimate	*P*-value	Coefficient estimate	*P*-value
Intercept	-	-3.881	0.94	-1.564***	0.01
CPS	**?**	**-1.420***	**0.00**	**-1.128***	**0.00**
Size	-	-0.149***	0.00	-0.124***	0.00
Age	-	0.261***	0.00	0.133***	0.00
Aggr_loss	+	0.372***	0.00	0.315***	0.00
Foreign_transaction	+	0.361***	0.00	0.302***	0.00
Sale_growth	+	0.191	0.42	0.141	0.44
Z-score	-	-0.153***	0.00	-0.136***	0.00
Segments	+	0.0018	0.80	0.018	0.74
Restructure	+	-7.02	4.84	3.951	0.24
Year dummies		Yes		Yes	
Industry dummies		Yes		Yes	
Observations		7595		7947	
R-square		0.032		0.099	

Table 6 reports logistic results of account/transaction-level and firm-level internal control material weaknesses on CPS from 2004 to 2012. Column (1) shows the regression results of account/transaction-level material weaknesses, a dummy variable that equal to 1 for firms with at least one account/transaction-level material weaknesses and 0 for firms without any material weaknesses, as the dependent variable. Column (2) shows the regression results of firm-level material weaknesses, a dummy variable that equal to 1 for firms with at least one firm-level material weaknesses and 0 for firms without any material weaknesses, as the dependent variable. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All

other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 7 Logistic regression of internal control material weaknesses on CPS for the endogeneity of CPS

Dependent Variable: Internal control material weaknesses

Variables	Predicted sign	(1) Controlling for the lagged internal control material weaknesses		(2) 2SLS regression	
		Coefficient estimate	*P*-value	Coefficient estimate	*P*-value
Intercept	-	-3.720	0.95	0.141	0.00
CPS	**?**	**-1.252***	**0.00**	**-0.110****	**0.02**
ICMW_lag	+	0.846***	0.00		
Size	-	-0.076***	0.01	-0.011	0.00
Age	-	0.118**	0.04	0.008	0.06
Aggr_loss	+	0.285***	0.00	0.050***	0.00
Foreign_transaction	+	0.278***	0.00	0.012**	0.02
Sale_growth	+	0.282	0.15	0.031**	0.04
Z-score	-	-0.091***	0.00	-0.008***	0.00
Segments	+	-0.011	0.84	0.005	0.11
Restructure	+	1.244	0.74	-0.257	0.36
Year dummies		Yes		Yes	
Industry dummies		Yes		Yes	
Observations		7640		7077	
R-square		0.105		0.022	

Table 7 reports logistic results of internal control material weaknesses on CPS from 2004 to 2012 for the endogeneity of CPS. The logistic regression in Column (1) addresses the endogeneity issue of CPS by controlling the lagged dependent variable. The logistic regression in Column (2) is a 2-stage least squares (2SLS) regression by adopting 2 instrumental variables for CPS: CPS lagged by 2 years and the industry median CPS. The dependent variable, internal control material weaknesses, is equal to 1 for firms that report at

least one material weakness under auditor's opinion in that fiscal year and 0 for firms without any material weaknesses. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 8 Logistic regression of internal control material weaknesses on executive pay disparity including CEO and CFO incentives

		Dependent variable: Internal control material weaknesses					
		(1)		(2)		(3)	
Variables	Predicted sign	Coefficient estimate	*P*-value	Coefficient estimate	*P*-value	Coefficient estimate	*P*-value
Intercept	-	-0.611	0.23	-0.642	0.21	-0.641	0.21
CPS	**?**	**-1.029***	**0.00**	**-1.028***	**0.00**	**-1.016***	**0.00**
CEO_incentives	?	0.108	0.55			0.169	0.38
CFO_incentives	?			-0.209	0.56	-0.326	0.39
Size	-	-0.136***	0.00	-0.124***	0.00	-0.128***	0.00
Age	-	0.179***	0.00	0.173***	0.00	0.176***	0.00
Aggr_loss	+	0.241***	0.01	0.234***	0.01	0.236***	0.01
Foreign_transaction	+	0.189**	0.01	0.189**	0.01	0.189**	0.01
Sale_growth	+	0.226	0.22	0.246	0.18	0.238	0.20
Z_score	-	-0.133***	0.00	-0.131***	0.00	-0.132***	0.00
Segments	+	0.014	0.80	0.013	0.82	0.013	0.81
Restructure	+	3.681	0.27	3.360	0.31	3.692	0.27
Year dummies		Yes		Yes		Yes	
Industry dummies		Yes		Yes		Yes	
Observations		8298		8298		8298	

R-square	0.094	0.094	0.094

Table 8 reports logistic results of internal control material weaknesses on CPS from 2004 to 2012 including CEO and CFO incentives. The dependent variable, internal control material weaknesses, is equal to 1 for firms that report at least one material weakness under auditor's opinion in that fiscal year and 0 for firms without any material weaknesses. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. The CEO and CFO incentives are the ratios of ONEPCT normalized by ONEPCT plus cash pay, where ONEPCT is the effect of a one percentage point increase in a firm's stock price on the value of the firm's shares held by a manager. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 9 Logistic regression of internal control material weaknesses on CEO and CFO pay gap

Dependent variable: internal control material weaknesses

Variables	Predicted sign	Coefficient estimate	*P*-value
Intercept	-	-1.432***	0.01
CEO_CFO_Paygap	?	**-0.091***	**0.01**
Size	-	-0.067**	0.03
Age	-	0.097*	0.05
Aggr_loss	+	0.342***	0.00
Foreign_transaction	+	0.187***	0.01
Sale_growth	+	0.232	0.17
Z-score	-	-0.079***	0.00
Segments	+	0.036	0.48
Restructure	+	1.211	0.72
Year dummies		Yes	
Industry dummies		Yes	
Observations		8252	
R-square		0.089	

Table 9 reports logistic results of internal control material weaknesses on the pay gap between CEO and CFO from 2004 to 2012. The dependent variable, internal control material weaknesses, is equal to 1 for firms that report at least one material weakness under auditor's opinion in that fiscal year and 0 for firms without any material weaknesses. The independent variable, CEO_CFO_Paygap, is measured as the logarithm of the difference between the total compensation of CEO and CFO. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 10 Regression model of accounting conservatism on executive pay disparity

		Dependent variable: C_score	
Variables	Predicted sign	Coefficient estimate	*P*-value
Intercept	?	0.001	0.92
CPS	**?**	**0.040*****	**0.00**
Own	-	-0.070***	0.00
Lit	+	0.004	0.11
CFO	+	0.070***	0.00
R & D	+	0.023	0.28
Sale growth	-	-0.204***	0.00
Size	+	0.004***	0.01
Leverage	+	0.164***	0.00
MTB	-	-0.014***	0.00
Revt	+	0.009	0.15
Observations		10514	
R-square		0.20	

Table 10 reports regression results of C_score on CPS from 1993 to 2012. The dependent vaiable, C_score, is defined in Appendix 2. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All other explanatory variables are defined in Appendix 1. The standard errors are corrected for autocorrelation using the Newey-West procedure. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 11: Logistic regression of financial restatements on executive pay disparity

Variables	Predicted sign	Coefficient estimate	P-value
Dependent variable: Financial restatements			
Intercept	-	-3.211	0.90
CPS	**?**	**-0.530*****	**0.00**
Size	-	-0.093***	0.00
Age	?	0.038	0.15
Merger	-	-0.083	0.15
Financing	+	0.092**	0.02
Loss	+	0.184***	0.00
Current_accrual	?	-0.644	0.14
Leverage	+	0.442***	0.00
INV_INT_COV	-	-0.094*	0.05
Sale_growth	+	0.156	0.13
BM	+	0.417***	0.00
Fin_demand	-	-0.097	0.89
Audit_fees	?	0.027	0.42
Big_4	?	0.089	0.25
Year dummies		Yes	
Industry dummies		Yes	
Observations		13558	
R-square		0.128	

Table 11 reports logistic results of financial restatements on CPS from 1993 to 2012. The dependent variable, financial restatements, is equal to 1 for firms that have at least one financial restatement in that fiscal year and 0 otherwise. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 12 Logistic regression of internal control material weaknesses on executive pay disparity with a measure of industry-adjusted CPS

Dependent variable: internal control material weaknesses

Variables	Predicted sign	Coefficient estimate	*P*-value
Intercept	-	-1.527***	0.01
CPS_adjusted	**?**	**-1.092***	**0.00**
Size	-	-0.124***	0.00
Age	-	0.129**	0.01
Aggr_loss	+	0.328***	0.00
Foreign_transaction	+	0.300***	0.00
Sale_growth	+	0.115	0.53
Z-score	-	-0.133***	0.00
Segments	+	0.018	0.73
Restructure	+	3.634	0.28
Year dummies		Yes	
Industry dummies		Yes	
Observations		7942	
R-square		0.097	

Table 12 reports logistic results of internal control material weaknesses on CPS from 2004 to 2012 with a measure of industry adjusted CPS. The dependent variable, internal control material weaknesses, is equal to 1 for firms that report at least one material weakness under auditor's opinion in that fiscal year and 0 for firms without any material weaknesses. The independent variable, CPS_adjusted, is measured as the value of CPS minus the industry median value of CPS for that fiscal year. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 13 Regression model of accounting conservatism on executive pay disparity with a measure of industry-adjusted CPS

	Dependent variable: C_score		
Variables	Predicted sign	Coefficient estimate	*P*-value
Intercept	?	0.013	0.13
CPS_adjusted	**?**	**-0.003**	**0.82**
Own	-	-0.081***	0.00
Lit	+	0.003	0.193
CFO	+	0.063***	0.04
R & D	+	0.036*	0.08
Sale growth	-	-0.202***	0.00
Size	+	0.004***	0.00
Leverage	+	0.167***	0.00
MTB	-	-0.013***	0.00
Revt	+	0.007	0.25
Observations		11209	
R-square		0.15	

Table 13 reports regression results of C_score on CPS from 1993 to 2012 with a measure of industry adjusted CPS. The dependent vaiable, C_score, is defined in Appendix 2. The independent variable, CPS_adjusted, is measured as the value of CPS minus the industry median value of CPS for that fiscal year. All other explanatory variables are defined in Appendix 1. The standard errors are corrected for autocorrelation using the Newey-West procedure. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table14: Logistic regression of financial restatements on executive pay disparity with a measure of industry-adjusted CPS

Dependent variable: Financial restatements

Variables	Predicted sign	Coefficient estimate	*P*-value
Intercept	-	-6.209	0.48
CPS_adjusted	**?**	**-0.723****	**0.02**
Size	-	-0.154***	0.00
Age	?	0.085	0.11
Merger	-	-0.201*	0.07
Financing	+	0.197***	0.01
Loss	+	0.286***	0.00
Current_accrual	?	-0.493	0.54
Leverage	+	0.540*	0.06
INV_INT_COV	-	-0.057	0.51
Sale_growth	+	0.333*	0.10
BM	+	0.766***	0.00
Fin_demand	-	1.292	0.23
Audit_fees	?	0.067	0.28
Big_4	?	0.154	0.30
Year dummies		Yes	
Industry dummies		Yes	
Observations		10453	
R-square		0.136	

Table 14 reports logistic results of financial restatements on CPS from 1993 to 2012 with a measure of industry adjusted CPS. The dependent variable, financial restatements, is equal to 1 for firms that have at least one financial restatement in that fiscal year and 0 otherwise. The independent variable, CPS_adjusted, is measured as the value of CPS minus the industry median value of CPS for that fiscal year. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 15 Logistic regression of internal control material weaknesses on executive pay disparity with alternative measure of executive pay disparity

Dependent variable: internal control material weaknesses

Variables	Predicted sign	Coefficient estimate	P-value
Intercept	-	-1.213*	0.09
PAYGAP	?	**-0.093***	**0.01**
Size	-	-0.087**	0.01
Age	-	0.112**	0.04
Aggr_loss	+	0.325***	0.00
Foreign_transaction	+	0.295***	0.00
Sale_growth	+	0.232	0.22
Z-score	-	-0.125***	0.00
Segments	+	-0.013	0.82
Restructure	+	4.718	0.19
Year dummies		Yes	
Industry dummies		Yes	
Observations		7511	
R-square		0.096	

Table 15 reports logistic results of internal control material weaknesses on PAYGAP from 2004 to 2012. The dependent variable, internal control material weaknesses, is equal to 1 for firms that report at least one material weakness under auditor's opinion in that fiscal year and 0 for firms without any material weaknesses. The independent variable, PAYGAP, is measured as the log of the difference between the total compensation of the CEO and the median value of the total compensation of the top 4 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 16 Regression model of accounting conservatism on executive pay disparity with alternative measure of executive pay disparity

Dependent variable: C_score			
Variables	Predicted sign	Coefficient estimate	*P*-value
Intercept	?	0.044***	0.00
PAYGAP	**?**	**0.007***	**0.00**
Own	-	-0.084***	0.00
Lit	+	0.004	0.17
CFO	+	0.059***	0.00
R & D	+	0.018	0.28
Sale growth	-	-0.215***	0.00
Size	+	-0.000	0.99
Leverage	+	0.169***	0.00
MTB	-	-0.015***	0.00
Revt	+	0.009	0.17
Observations		10353	
R-square		0.15	

Table 16 reports regression results of C_score on PAYGAP from 1993 to 2012. The dependent vaiable, C_score, is defined in Appendix 2. The independent variable, PAYGAP, is measured as the log of the difference between the total compensation of the CEO and the median value of the total compensation of the top 4 executives. All other explanatory variables are defined in Appendix 1. The standard errors are corrected for autocorrelation using the Newey-West procedure. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 17: Logistic regression of financial restatements on executive pay disparity with alternative measure of executive pay disparity

		Dependent variable: Financial restatements	
Variables	Predicted sign	Coefficient estimate	*P*-value
Intercept	-	-3.768***	0.00
PAYGAP	**?**	**-0.041*****	**0.00**
Size	-	-0.126***	0.00
Age	?	0.113***	0.00
Merger	-	-0.155***	0.00
Financing	+	0.210***	0.00
Loss	+	0.230***	0.00
Current_accrual	?	-0.369***	0.00
Leverage	+	0.420***	0.00
INV_INT_COV	-	0.018***	0.00
Sale_growth	+	0.317***	0.00
BM	+	0.729***	0.00
Fin_demand	-	13.776	0.29
Audit_fees	?	0.032***	0.00
Big_4	?	0.096***	0.00
Year dummies		Yes	
Industry dummies		Yes	
Observations		9679	
R-square		0.126	

Table 17 reports logistic results of financial restatements on PAYGAP from 1993 to 2012. The dependent variable, financial restatements, is equal to 1 for firms that have at least one financial restatement in that fiscal year and 0 otherwise. The independent variable, PAYGAP, is measured as the log of the difference between the total compensation of the CEO and the median value of the total compensation of the top 4 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 18 Logistic regression of internal control material weaknesses on executive pay disparity by taking into account the agency problem

Dependent variable: Internal control material weaknesses

Variables	Predicted sign	(1) Coefficient estimate	(1) *P*-value	(2) Coefficient estimate	(2) *P*-value
Intercept	-	-1.351***	0.01	-1.799***	0.00
CPS	**?**	**-0.735****	**0.02**	**-0.732****	**0.02**
High_FCF	**?**	**0.770****	**0.03**		
Low_FCF	**?**	**0.064**	**0.80**		
CPS*High_FCF	**?**	**-2.251****	**0.02**		
CPS*Low_FCF	**?**	**-0.249**	**0.70**		
High_FCF_Residual	**?**			**0.602***	**0.07**
Low_FCF_Residual	**?**			**0.055**	**0.83**
CPS*High_FCF_Residual	**?**			**-1.991****	**0.03**
CPS*Low_FCF_Residual	**?**			**-0.311**	**0.64**
Size	-	-0.122***	0.00	-0.118***	0.00
Age	-	0.007***	0.00	0.157***	0.00
Aggr_loss	+	0.349***	0.00	0.340***	0.00
Foreign_transaction	+	0.281***	0.00	0.288***	0.00
Sale_growth	+	0.105	0.54	0.111	0.52
Z-score	-	-0.124***	0.00	-0.130***	0.00
Segments	+	0.038	0.46	0.031	0.53
Restructure	+	-0.340	0.91	-0.042	0.99
Year dummies		Yes		Yes	

Industry dummies	Yes	Yes
Observation	8524	8524
R-square	0.097	0.097

Table 18 reports logistic results of internal control material weaknesses on CPS from 2004 to 2012 by taking into account the agency problem. Column (1) adopts High_FCF (Low_FCF) as a dummy variable for firms with above (below) median cash flow and below (above) median Tobin's Q. Column (2) adopts High_FCF_Residual (Low_FCF_Residual) as a dummy variable for firms with above (below) median residual cash flow and below (above) median residual Tobin's Q. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 19 Logistic regression of internal control material weaknesses on executive pay disparity by taking into account the promotion probability

Dependent variable: internal control material weaknesses

Variables	Predicted sign	Coefficient estimate	*P*-value
Intercept	-	-0.679	1.00
CPS	?	**-4.477*****	**0.00**
New_CEO	?	**-0.919****	**0.03**
Insider	?	**-0.795*****	**0.00**
Homo	?	**-1.959***	**0.08**
CPS*New_CEO	?	**3.358*****	**0.00**
CPS*Insider	?	**2.468*****	**0.00**
CPS*Homo	?	**4.463***	**0.06**
CPS*New_CEO*Insider	?	**-1.896****	**0.02**
Size	-	-0.224***	0.00
Age	-	0.201***	0.00
Aggr_loss	+	0.363***	0.00
Foreign_transaction	+	0.360***	0.00
Sale_growth	+	0.664***	0.00
Z-score	-	-0.065**	0.03
Segments	+	0.086	0.15
Restructure	+	-5.923	0.11
Year dummies		Yes	
Industry dummies		Yes	

Observations	6082
R-square	0.163

Table 19 reports logistic results of internal control material weaknesses on CPS from 2004 to 2012 for taking into account the promotion probability. The dependent variable, internal control material weaknesses, is equal to 1 for firms that report at least one material weakness under auditor's opinion in that fiscal year and 0 for firms without any material weaknesses. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. New_CEO is defined as a dummy variable that equals 1 in the CEO's first year of service as a CEO and 0 otherwise. Insider is defined as a dummy variable that equals 1 if the CEO is an insider and 0 otherwise. Homo is defined as industry homogeneity to measure the similarity between firms within an industry after controlling for the market effects. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 20 Logistic regression of internal control material weaknesses on executive pay disparity for CEOs with above- and below-median ownership

Dependent variable: Internal control material weaknesses

Variables	Predicted sign	(1) CEO ownership above median		(2) CEO ownership below median	
		Coefficient estimate	*P*-value	Coefficient estimate	*P*-value
Intercept	-	-1.109	0.22	-3.742	0.94
CPS	**?**	**-0.481**	**0.41**	**-1.852*** **	**0.00**
Size	-	-0.210***	0.00	-0.065	0.27
Age	-	0.218*	0.09	0.205*	0.09
Aggr_loss	+	0.404**	0.02	0.500***	0.01
Foreign_transaction	+	0.423***	0.01	0.382**	0.01
Sale_growth	+	0.362	0.34	0.450	0.20
Z-score	-	-0.148**	0.02	-0.142**	0.01
Segments	+	0.053	0.64	-0.183*	0.09
Restructure	+	-8.020	0.38	-12.043	0.11
Year dummies		Yes		Yes	
Industry dummies		Yes		Yes	
Observations		2506		2535	
R-square		0.139		0.133	

Table 20 reports logistic results of internal control material weaknesses on CPS from 2004 to 2012 for CEOs with above- and below-median ownership. Column (1) reports the regression results for CEOs with above-median ownership. Column (2) reports the regression results for CEOs with below-median ownership. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 21 Logistic regression of internal control material weaknesses on executive pay disparity for CEOs above and below age of 62

Dependent variable: Internal control material weaknesses

Variables	Predicted sign	(1) CEO age>62 Coefficient estimate	P-value	(2) CEO age<62 Coefficient estimate	P-value
Intercept	-	0.609	0.73	-1.684**	0.03
CPS	**?**	**-0.845**	**0.38**	**-1.156***	**0.00**
Size	-	-0.209**	0.04	-0.126***	0.00
Age	-	0.006	0.97	0.191***	0.00
Aggr_loss	+	0.295	0.34	0.382***	0.00
Foreign_transaction	+	0.389*	0.09	0.320***	0.00
Sale_growth	+	-0.192	0.76	0.130	0.51
Z-score	-	-0.107	0.33	-0.126***	0.00
Segments	+	0.018	0.94	0.049	0.40
Restructure	+	5.260	0.71	-0.490	0.89
Year dummies		Yes		Yes	
Industry dummies		Yes		Yes	
Observations		1556		6775	
R-square		0.154		0.099	

Table 21 reports logistic results of internal control material weaknesses on CPS from 2004 to 2012 for CEOs above and below age of 62. Column (1) reports the regression results for CEOs above the age of 62. Column (2) reports the regression results for CEOs below the age of 62. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 22 Logistic regression of internal control material weaknesses on executive pay disparity for firms with above- and below-median institutional ownership

		Dependent variable: Internal control material weaknesses			
		(1) Institutional ownership above median		(2) Institutional ownership below median	
Variables	Predicted sign	Coefficient estimate	*P*-value	Coefficient estimate	*P*-value
Intercept	-	-2.029	0.83	-1.700*	0.09
CPS	**?**	**-1.032**	**0.10**	**-1.376****	**0.02**
Size	-	-0.172***	0.01	-0.186***	0.00
Age	-	0.205*	0.09	0.281**	0.01
Aggr_loss	+	0.298	0.13	0.470***	0.01
Foreign_transaction	+	0.291*	0.06	0.262*	0.09
Sale_growth	+	0.302	0.50	0.161	0.66
Z-score	-	-0.238***	0.00	-0.096*	0.05
Segments	+	0.372***	0.00	0.020	0.86
Restructure	+	-2.021	0.79	2.897	0.68
Year dummies		Yes		Yes	
Industry dummies		Yes		Yes	
Observations		2582		2577	
R-square		0.138		0.145	

Table 22 reports logistic results of internal control material weaknesses on CPS from 2004 to 2012 for firms with above- and below-median institutional ownership. Column (1) reports the regression results for firms with above-median institutional ownership. Column (2) reports the regression results for firms with below-median institutional ownership. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 23 Logistic regression of internal control material weaknesses on executive pay disparity for firms with above- and below-median analyst followings

		Dependent variable: Internal control material weaknesses			
		(1) Analyst followings above median		(2) Analyst followings below median	
Variables	Predicted sign	Coefficient estimate	P-value	Coefficient estimate	P-value
Intercept	-	-2.600	0.90	-2.984	0.99
CPS	**?**	**-0.674**	**0.10**	**-1.153*****	**0.00**
Size	-	-0.138***	0.01	-0.018	0.66
Age	-	-0.018	0.84	0.236***	0.00
Aggr_loss	+	0.111	0.42	0.557***	0.00
Foreign_transaction	+	0.181*	0.10	0.294***	0.00
Sale_growth	+	-0.037	0.90	0.269	0.25
Z-score	-	-0.196***	0.00	-0.103***	0.00
Segments	+	0.019	0.82	0.011	0.88
Restructure	+	9.97*	0.07	-6.483	0.13
Year dummies		Yes		Yes	
Industry dummies		Yes		Yes	
Observations		4513		4034	
R-square		0.084		0.137	

Table 23 reports logistic results of internal control material weaknesses on CPS from 2004 to 2012 for firms with above- and below-median analyst followings. Column (1) reports the regression results for firms with above-median analyst followings. Column (2) reports the regression results for firms with below-median analyst followings. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 24 Logistic regression of internal control material weaknesses on executive pay disparity for firms with above- and below-median independent directors%

		Dependent variable: Internal control material weaknesses			
		(1) Independent directors above median		(2) Independent directors below median	
Variables	Predicted sign	Coefficient estimate	P-value	Coefficient estimate	P-value
Intercept	-	-0.393	0.99	-4.910	0.94
CPS	**?**	**-1.681**	**0.13**	**--1.829****	**0.04**
Size	-	-0.177	0.13	-0.093	0.20
Age	-	-0.402*	0.07	0.318**	0.04
Aggr_loss	+	0.747**	0.02	0.558**	0.01
Foreign_transaction	+	0.589**	0.03	0.341*	0.08
Sale_growth	+	-0.272	0.69	0.787	0.11
Z-score	-	-0.006	0.97	-0.191*	0.06
Segments	+	-0.374	0.11	0.053	0.70
Restructure	+	45.978***	0.00	-2.308	0.83
Year dummies		Yes		Yes	
Industry dummies		Yes		Yes	
Observations		2076		2106	
R-square		0.098		0.101	

Table 24 reports logistic results of internal control material weaknesses on CPS from 2007 to 2012 for firms with above- and below-median independent directors%. Column (1) reports the regression results for firms with above-median independent directors%. Column (2) reports the regression results for firms with below-median independent directors%. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.

Table 25 Logistic regression of internal control material weaknesses on executive pay disparity for firms with or without female board presence

Dependent variable: Internal control material weaknesses

Variables	Predicted sign	(1) Firms with female board presence		(2) Firms without female board presence	
		Coefficient estimate	*P*-value	Coefficient estimate	*P*-value
Intercept	-	-3.237	0.95	-6.576	0.95
CPS	**?**	**-0.419**	**0.68**	**-1.262***	**0.08**
Size	-	-0.288***	0.05	0.023	0.73
Age	-	-0.283	0.15	0.55***	0.00
Aggr_loss	+	0.672**	0.02	0.381**	0.05
Foreign_transaction	+	0.183	0.43	0.569***	0.00
Sale_growth	+	0.550	0.39	0.690*	0.08
Z-score	-	0.210	0.13	-0.149**	0.03
Segments	+	0.228	0.21	-0.082	0.50
Restructure	+	19.326**	0.04	-5.428	0.58
Year dummies		Yes		Yes	
Industry dummies		Yes		Yes	
Observations		2452		2389	
R-square		0.082		0.094	

Table 25 reports logistic results of internal control material weaknesses on CPS from 2007 to 2012 for firms with or without female board presence. Column (1) reports the regression results for firms with female board presence. Column (2) reports the regression results for firms without female board presence. The independent variable, CPS, is measured as the total CEO compensation divided by the sum of the total compensation of the top 5 executives. All other explanatory variables are defined in Appendix 1. *, **, *** indicate significant at less than the 0.10, 0.05, 0.01 level respectively.