**School of Economics and Finance**

# An Investigation of Earnings Management Practices in Australian Firms

**Lan Sun**

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**Declaration**

This thesis contains no material that has been accepted for the award of any other degree or diploma in any university.

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

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**Abstract**

Earnings management is an area in which managers are able to exercise discretion over financial reporting to achieve various objectives. Researchers have been investigating the pervasiveness of earnings management and incentives that induce earnings management. However, the evidence is mixed and studies of using Australian data are scarce. This thesis is an empirical investigation of earnings management in the Australian context addressing if and why Australian firms engage in earnings management.

Based on a sample covering all ASX listed firms during the period of 2000 to 2006, this study examines the overall breadth and scope of earnings management behaviour in a broad context across Australian industry sectors and individual firms' characteristics. The result suggests that Australian firms engage in earnings management. The level of earnings management practices in some specific industries and the association of these practices with firms' characteristics may help the assessment and improvement of the overall quality of financial reporting.

Based on a sub-sample, this study also examines whether the practices of earnings management is induced by executive compensation incentives. It extends prior research by using more relevant, recent, and large-scale compensation data to capture the dynamic relations between earnings management and different forms of executive pay. Such dynamic relations may be of interest to compensation committees in designing compensation structures that balance the incentives to improve firms' performances with the incentive to earnings manipulation.

This study also examines whether earnings management is induced by benchmark beating incentives. It extends prior research by examining under what circumstance managers are more likely to beat benchmarks. The results suggest that managers beat two earnings benchmarks: reporting profits and sustaining prior year's earnings. More importantly, managers are more likely to exercise positive discretionary accruals to inflate earnings to beat *ex post* benchmarks when the true earnings are below relevant benchmarks. This will be of interest to regulators as an effective way to detect earnings management may be pronounced when the *ex ante* condition under which firms seek to manipulate earnings is identified.

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# Chapter 1
# Introduction

## 1.1 Introduction

Accounting earnings is one of the major indictors in annual reports that have been widely used by internal and external financial statement users in decision making. Investors will look for companies with favourable accounting earnings figures in making investment decision. Corporate policies such as executives' compensation, debt covenants, and capital raising are also shaped by reported earnings. Ideally, accounting earnings should be stated in a timely and reliable manner, truly reflecting a firm's financial performance and effectively facilitating the decision making process. However, the separation of ownership and control of a firm determines that managers will have control advantages over external information users in producing this information, and thus managers will have the opportunity to exercise discretions over reported earnings for their own benefit. This is regarded as earnings management behaviour. Earnings management is an issue that directly affects overall integrity of financial reporting and significantly influences resource allocation throughout the economy (Healy & Wahlen, 1999). The objective of this study is to conduct a comprehensive analysis in understanding earnings management of Australian firms: by undertaking an investigation of earnings management practices across Australian industries and managerial incentives.

## 1.2 Definitions of earnings management

There is no common definition for earnings management in the literature; the following are several different definitions that are often cited in the earnings management research. Securities and Exchange Commission defines it as *"Abusive earnings management involves the use of various forms of gimmickry to distort a company's true financial performance in order to achieve a desired result"* (SEC, 1999, p.84). The text book, 'Financial Accounting Theory', defines it as *"Earnings management is the choice by a manager of accounting policies so as to achieve some specific objective*" (Scott, 1997, p.369). Academia defines earnings management as

"*a purposeful intervention in the external financial reporting, with intent of obtaining some private gain*" (Schipper, 1989, p92). Recently, academia defines it as *"Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting number"* (Healy and Wahlen, 1999, p.386).

The above definitions suggest that earnings management is more likely to occur due to the contractual relationship between firms and stakeholders and the purpose of earnings management is to maximize managers own utilities. The terms "*distort a company's true financial performance"*, "*private gain*", and "*mislead*" appear to emphasize the opportunistic characteristic of earnings management. Managers exercise discretion over financial reporting to hide firms' true financial performance in order to maximize their own benefits; and, these benefits will occur at the expense of shareholders, bondholders or other stakeholders. However, some studies have documented the possibility that earnings management can improve the information content of accounting earnings. Holthausen and Leftwich (1983) further pointed out that managers exercise discretion in reported earnings to signal inside information with investors and thus help investors to predict firms' future performance.

To better understand earnings management, therefore, one needs to understand the distinction between earnings management and accounting fraud. Brown (1999) argues that there is no clear difference between earnings management and fraudulent reporting. Often, investors classify earnings management as fraud because they believe earnings management distorts true earnings. However, Dechow and Skinner (2000) suggested that earnings management is not fraudulent behaviour where the intention is to deceive, for instance, fabricating false invoices, recording forged transactions, falsifying altering documents, or deleting records. Rather, it is a matter of presentation and it could be regarded as a misstatement of reported earnings.

### 1.3 Approaches to detect earnings management

To date, earnings management activities have been detected through examining the changing of accounting choices, real transactions, total accruals and/or discretionary accruals, specific accruals, the distribution of reported earnings and income smoothing behaviour. Since the middle 1980s, the accrual approach has become the primary methodology in detecting earnings management.[1] Nevertheless, researchers require a sophisticated model to separate discretionary accruals from total accruals. Omitted variables, misspecification and lower testing power are the three major econometric limitations that most models present. The distribution method has emerged to avoid this problem but it is less useful in detecting contract-driven earnings management. This study uses discretionary accruals as a broad means of detection as discretionary accruals capture the aggregate effect of earnings manipulation. Earnings distribution is also used to detect earnings management to beat specific benchmarks.

The detection of earnings management has also been linked to management incentives because managerial incentive conditions are likely to influence earnings management. Executive compensation contract is an incentive where opportunistic earnings management behaviour is likely to be detected since CEOs are expected to have incentives to manipulate earnings if executive compensation is strongly linked to performance. A substantial literature has emerged to test the relationship between executive compensation and earnings management and has documented that compensation contracts create strong incentives for earnings management. Another setting for earnings management is earnings benchmarks. As capital markets put pressures on managers, managers have incentives to beat relevant benchmarks in order to avoid disappointing the markets.

Based on the premises of accrual method, executive compensation and benchmarks, this thesis focuses on two central investigations regarding earnings management in the Australian context: (1) the detection of earnings management across Australian industries (2) the management incentives that drive earnings management. The

[1] McNichols' (2000) survey shows that during the period of 1993 to 1999, *The Accounting Review, Contemporary Accounting Research, Journal of Accounting and Economics, Journal of Accounting, Auditing and Finance, Journal of Accounting and Public Policy, Journal of Accounting Research, Journal of Business Finance and Accounting, and Review of Accounting Studies* published 55 articles investigated earnings management. Of the 55 articles, 23 papers used total accruals or discretionary accruals approach and 22 of them concluded that they found evidence of earnings management.

investigation of these issues may help regulators to assess the appropriate level of management judgment over financial reporting. If earnings management is found to be pervasive in a particular industry, regulators may refine existing accounting standards or require additional disclosures to improve the quality of financial reporting for that industry. Moreover, if there are identifiable executive compensation incentives under which opportunistic earnings management is more likely to be triggered, compensation committees can consider recontracting with executives or redesigning an optimal compensation structure. Finally, if there are identifiable benchmarks that induce managers to inflate earnings, investors should reconsider the reliability of using benchmarks in evaluating firms' performances and investment decisions.

### 1.4 Motivations and objectives

This study is primarily motivated by the increasing concern of the academic, practitioners, regulators, and standard setters regarding the quality of earnings and financial reporting. Arthur Levitt, the chairman of the SEC, in his 1998 speech, "The Numbers Game", revealed that the use of premature revenue to meet Wall Street expectations is one of the fundamental problems with current financial reporting. In recent years there were several corporate collapses around the world: for example, Enron, Arthur Anderson, and WorldCom in the U.S.; Robert Maxwell, Swiss Air, Phillip Holzmann in the E.U.; HIH Insurance, One.Tel, and Harris Scarfe in Australia. These cases have impacted on investors' confidence in the capital markets and thus attracted research attention on earnings management behaviour. This study therefore is motivated to discover whether earnings quality has increased or declined over time.

Australian regulators have recognized the importance to strengthen an effective disclosure regime to ensure timely and reliable information, ethical practices and legislative standards. One of the milestones in accounting regulation change is the introduction of the Government's Corporate Law Economic Reform Program (CLERP) in 2002 and the enactment at 2004. To further strengthen the financial reporting framework of Australia, a range of rules have been covered including auditing profession, audit services, auditor independence, auditor liability, accounting standards, requirement for accounts to be true and fair, analyst independence,

shareholder participation and information. Given the sample period of this thesis covers years 2000 to 2006, it is possible that the introduction of CLERP may have an impact on the earnings management behaviour. The thesis' primary emphasis, however, is from a financial economics perspective. Areas such as auditing profession, audit services, auditor independence, and accounting standards are not primary focus of this thesis.

This thesis also conducts a comprehensive investigation of earnings management in an Australian context. Such comprehensive investigation includes the use of various approaches in detecting earnings management and the examination of various incentives that induce earnings management behaviour. It compares performances of Jones Model, Modified Jones Model, Cash Flow Model and Performance Adjusted Technique in earnings management detection. As the Australian academic research pertaining to executive compensation incentives and earnings benchmark beating behaviour is relatively limited, this study also thoroughly investigated these two incentives of earnings management.

This study also attempts to assess whether earnings management behaviour is widespread or attributable to a few firms in the Australian market. Previous studies have found earnings management behaviour consistent with various managerial incentives: to increase bonuses (Healy, 1985; Gaver et al., 1995; Guidry et al, 1999); to gain from stock options (Baker et al., 2003; Cheng and Warfield, 2005; Bergstresser and Philippon, 2006); to increase stock prices in equity offering (Teoh et al., 1998a; Teoh et al., 1998b); to avoid violating lending contracts (DeFond and Jiambalvo, 1994; DeAngelo and Skinner, 1994; Charitou et al.,2007); to reduce political costs (Watts and Zimmerman, 1978; Cahan, 1992; Han and Wang, 1998; Monem, 2003); and to meet or beat earnings benchmarks (Burgstahler and Dichev, 1997; Burgstahler and Eames, 1998; Holland and Ramsay, 2003; Coulton et al., 2005). However, few studies have examined the overall magnitude of earnings management and little evidence is provided towards the pervasiveness of earnings management, especially in Australia.

Further, this study examines the impact of executive compensation on earnings management as previous findings are mixed and inconsistent. On one hand, some researchers claim that they have detected earnings management behaviour that is

driven by compensation incentives. The existence of a compensation agreement induces management choice of accounting policies that will increase reported earnings (Watts and Zimmerman, 1978; Hagerman and Zmijewski, 1979; Zmijewski and Hagerman, 1981). On the other hand, some researchers argue that empirical evidence linking compensation and accounting policy choices are not conclusive (Holthausen, 1981; Bowen et al., 1981). Moreover, Healy (1985) found that managers will decrease earnings further when earnings fall below the lower bound of a bonus plan. However, others do not support Healy's bonus plan hypothesis. Holthausen et al. (1995) found no evidence that managers engage in downward earnings management when earnings are below the lower bound of a bonus. The inconsistency of the evidences across studies therefore casts doubt on the impact of compensation on earnings management.

Despite substantial research on earnings management in the U.S. market, Australian academic research has been relatively limited. This author has surveyed Australian studies of earnings management across all possible research databases and has listed these studies in Appendix 1. The review of Australian research not only shows that research on earnings management is limited within the Australian context, but also reveals the gaps within existing studies. The executive compensation incentives have not yet been well examined in the Australian context. Balachandran et al. (2008) found that managers with option holdings use two mechanisms (discretionary current accruals and on-market buyback announcements) to drive up share prices. However, other forms of executive compensation, such as salary, bonus, and shares are not examined. Also, they focus on on-market share buyback firms only with a small sample size of 138 firms. This may limit the generalizability of the findings.

The capital market in Australia is relatively small and highly concentrated with resource based companies compared to the U.S market. Analysts following Australian markets are fewer and the regulatory scrutiny level of the Australian market is argued to be lower than that of U.S (Chan et al., 2005). Also, the accounting standards, institutional structure, and corporate governance of Australia are different from those in the U.S. For instance, the required frequency of financial reporting is twice per year in Australia while in the U.S. it is four times per year. More importantly, Australian CEOs are commonly remunerated with salaries and bonuses than with

equity-based compensation; whereas in the U.S. stock options have replaced salaries and bonuses and have become the single largest component of CEOs' compensation since 1990s (Izan et al., 1998; Matolcsy and Wright, 2007; and Murphy, 1999). Given all these differences, it is not clear that the evidence gathered from U.S. firms would be applicable to those in Australia. Therefore, further investigation of whether and how executives' compensation affects earnings management within the Australian context is necessary.

The other limitation of existing studies is related to benchmark beating incentives. It is still a puzzle whether benchmark beating is caused by earnings management (Coulton, 2005). The evidence on earnings management behaviour to achieve benchmarks is based upon distribution of *ex post* reported earnings. However, these reported earnings could be due to the managers putting real effort into improving a firm's performance (Dechow et al., 2003). Therefore, previous evidence of benchmark beating for the purpose of earnings management, based only on distribution of reported earnings, is not conclusive. This issue is also unresolved in the Australian context. Using the distribution method, Holland and Ramsay (2003) detected earnings management by Australian firms to achieve earnings targets. However, Coulton et al. (2005) suggested that earnings discontinuity as an evidence of earnings management requires careful interpretation. Benchmark beating as a cause of earnings management still remains an open question. This thesis is motivated to examine these issues in a comprehensive manner and add additional evidence in this area of earnings management. This study extends Holland and Ramsay (2003) and Coulton et al. (2005) by investigating whether managers manipulate earnings to meet or beat two specific *ex ante* benchmarks: above-zero earnings (profits) and earnings increase (sustain prior year's earnings). This study differentiates the research design by conditioning the analysis and results on benchmarks of pre-managed earnings. Pre-managed earnings is used as a measure of true earnings level of a firm and this study postulates that managers use it to engage in earning manipulation only if the earnings are short of its benchmark levels on an *ex ante* basis. The examination of pre-managed earnings identity the *ex ante* condition under which firms seek to manipulate earnings. This study also quantifies the frequency of earnings management for benchmark beating purposes. Such information may be helpful for standard setters in

assessing the pervasiveness of earnings management and the overall integrity of financial reporting.

In summary, the major objectives are:

1. To detect whether earnings management takes place in the Australian context and to examine the overall magnitude and directions (upwards/downwards) of earnings management across industries and firms.
2. To investigate why earnings management takes place. This study intends to investigate two incentives that will induce earnings management: the executive compensation incentive and benchmark beating incentive.
3. To extend earnings management literature in two ways: first, the examination of executive compensation is extended to both total compensation and decomposed individual components; second, the examination of benchmark beating behaviour is extended to what extent benchmark beating is caused by earnings management and under what circumstance managers are more likely to exercise discretion to beat benchmarks.
4. To employ a combination of both discretionary accruals and the distribution methods in an attempt to improve the validity and reliability of the tests.

### 1.5 Significance of the study

This study will contribute to the earnings management literature in several ways. First, this study investigates the overall breadth and scope of earnings management behaviour in a broad context by a comprehensive analysis of reported earnings across Australian industry sectors and individual firm characteristics. This may be of interest to investors and regulators. The level of pervasiveness of earnings management practices in specific industries and the association of these practices with firm characteristics may help investors assess the overall quality of financial reporting.

Second, the detection of earnings management in this study goes beyond the general evidence on the existence of earnings management behaviour; it also investigates the causes of earnings management. This study examines two incentives—the executive compensation and the benchmark beating incentives. Moreover, to this author's best knowledge, no studies in Australia have been found to assess earnings management in

the context of executive compensation incentives and the tiers of CEO compensation package. This study takes a comprehensive view of the compensation contract and provides evidence on executive compensation mix and earnings management. This is the first attempt to address what is largely absent in Australian research: executive compensations, fixed and at-risk compensation, create different incentives for earnings management.

Third, the findings of earnings management related to executive compensation may be of interest to investors because such relations indicate opportunistic earnings management behaviour. Dechow et al. (1996) report substantial corporate costs due to opportunistic earnings management behaviour: firms which have committed accounting fraud experienced average 9% of losses in shareholder wealth. Teoh et al. (1998a, 1998b) and Teoh et al. (1998c) found IPO firms experience significant long-run underperformance in a five-year period after aggressive earnings management. When earnings management is driven by opportunistic management incentives, firms will ultimately pay a price and its negative impact on shareholders is economically significant. This study will contribute to investors since rational investors make investment decision primarily based on the prediction of firms' future performance and such prediction is largely influenced by current reported earnings.

Fourth, the results of this study may be of interest to compensation committees in designing compensation structures that balance the incentives to improve firm performance with the incentive to earnings manipulation. The positive effect of at-risk compensation on the magnitude and directions of earnings management has important implications for the design of executive compensation packages. In theory, a link between a CEO compensation and a firm performance will promote better incentive alignment and higher firm values (Jensen and Meckling, 1976). Thus, at-risk compensation may have a positive effect on firm value if the use of at-risk compensation is at some optimal level. Whenever it goes beyond the optimal level, the excessive part should lead to earnings management. In this case, compensation committees may re-contract with CEOs in an optimal at-risk compensation level that will rebalance the incentive to improve firm performance with the incentive to earnings management.

## 1.6 Main findings

This study found that Australian firms engage in earnings management. Using a estimation sample of 5,947 firm-year observations with broad industry representation including all ASX listed firms, significant earnings management evidence is found. The mean (median) total absolute value of discretionary accruals after adjusting cash flows and earnings effects is 0.1324 (0.0696), which represents an average magnitude of 13% of total assets. Specifically, a higher magnitude of earnings management is found to take place in the sectors of Metals & Mining, Information Technology, Energy, and Telecommunication & Utilities. Moreover, the magnitude of earnings management increased from 2000 to 2006. The mean (median) absolute value of adjusted discretionary accruals is 0.1064 (0.0561) for the year 2000, which has been increased to 0.1618 (0.0807) for the year 2006. Specifically, downward earnings management is found in Industrials while upward earnings management is documented in the sectors of Telecommunication & Utilities and Health Care. Year 2005 shows downward earnings manipulation while the year 2006 shows upward earnings manipulation.

This study then looks for explanations for the variation in earnings management behaviour. Firm characteristics such as size, book-to-market ratio, and profitability are found to play significant roles in shaping earnings management behaviour. The relationship between firm size and absolute adjusted discretionary accruals appears to be negatively monotonous by portfolios. It is also observed that as the absolute adjusted discretionary accruals increase, the book-to-market ratio decreases. Profitability tends to become poorer when absolute adjusted discretionary accruals are of increasing nature. Moreover, smaller size and lower book-to-market ratio firms are associated with both income-increasing and decreasing earnings management activities. The results regarding size are particularly strong. The average firm size (defined as a logarithm of the total assets) of the portfolio decrease as both positive and negative adjusted discretionary accruals increases with the smallest size being 9.5033 (10.3254) for the highest positive (negative) adjusted discretionary accruals portfolios.

This study also found that earnings management is associated with executive compensation. Using a subsample of 3,326 firm-year observations covering the period

of 2000 to 2006, this study found that executive compensation creates incentives for earnings management behaviour. The results show that fixed compensation has a negative impact on the magnitude of earnings management: for every one million dollar increase in CEOs' fixed compensation, the magnitude of adjusted discretionary accruals as a percentage of total assets will reduce by 4.67%. In contrast, for every one million dollar increase in CEOs' at-risk compensation, the magnitude of adjusted discretionary accruals as a percentage of the total assets will increase by 2.46%. When the fixed compensation and at-risk compensation is further decomposed, salaries are found to be significantly negatively associated with the magnitude of adjusted discretionary accruals while bonuses and options are found to be significantly positively associated with the magnitude of adjusted discretionary accruals. This suggests that fixed compensation is more likely to constrain earnings management as earnings management is costly. At-risk compensation, however, would induce managers to engage in earnings management because at-risk compensations are usually based on earnings performance and managers may opportunistically exercise discretions through accruals to exploit the nonlinearity in the payoffs.

Finally, this study found that earnings are managed through discretionary accruals to beat two earnings benchmarks: reporting profits and sustaining prior year's earnings. There is evidence of discontinuities in the distribution of reported earnings and changes in earnings while distributions of pre-managed earnings and pre-managed earnings changes do not show significant discontinuities. Further, the adjusted discretionary accruals have the effect of increasing the frequency of observations to report profits and earnings increases. The result suggests that 8.11% of the firms shifting from pre-managed earnings losses to report post-earnings profits; with 3.48% of the firms shifting from pre-managed small earnings losses to report small earnings profits. Similarly, 11.61% of firms shifting from pre-managed earnings declines to report earnings increases; with 5.53% shifting from pre-managed small earnings decrease to report small earnings increase. More importantly, the results show a significantly positive association between adjusted discretionary accruals and pre-managed earnings below the benchmark and this association holds true for two benchmarks and for both big and small regions. Therefore, this study suggests when pre-managed earnings below zero (prior year's earnings), firms are more likely to exercise positive discretionary accruals to inflate earnings to beat *ex post* benchmarks.

## 1.7 Organization of the thesis

This thesis consists of nine chapters and is organized as follows. This chapter, Chapter 1 is an introduction to the general background of earnings management research and provides motivations, objectives, and significances for this study. Chapter 2 reviews previous literature related to earnings management, executive compensation incentives and benchmark beating incentives. Chapter 3 discusses the research and investigation issues of this thesis developed from the review of literature. Chapter 4 describes research design, methodology, data sources, and empirical models used in this study. Chapter 5 presents the results of earnings management detection. Chapter 6 reports the findings of the association between earnings management and executive compensation incentives. Chapter 7 reports the findings of the association between earnings management and benchmark beating incentives. Chapter 8 pertains to sensitivity analysis that mainly examines the endogeneity issue. Finally, Chapter 9 summarizes the findings along with the implications, limitations, and discusses future research directions.

# Chapter 2
# Literature Review

## 2.1 Introduction

Earnings management behaviour has been detected through variety of methods, for example, through the changing of accounting choices, real transactions, total accruals and/or discretionary accruals, specific accruals, the distribution of reported earnings and income smoothing. Since the middle of 1980s, the accrual approach has become the primary focus (McNichols, 2000). GAAP requires that revenues be recognized when earned and should match expenses to those revenues, irrespective of whether cash has been received or paid. Accruals are used to reduce inconsistencies encountered as a result of difference in timing of the recognition (Dechow and Skinner, 2000). Managers believe that the accrual technique is a desirable vehicle to achieve their objectives as it is less visible and hard to detect (Dechow, 1994).

Earnings management is classified as contract or market driven (Dechow and Skinner, 2000). On one hand, earnings management can occur in management compensation contracts (for example, Healy, 1985) in solving the agency conflict between managers and shareholders; in debt contracting (for example, DeFond and Jiambalvo, 1994) which targets a firm's creditors; and in regulatory contracting (for example, Cahan, 1992) to avoid legal restrictions from regulators. On the other hand, earnings management either in the objective of avoiding losses or earnings declines (for example, Burgstahler and Dichev, 1997), sustaining previous earnings (Holland andRamsay, 2003), or meeting analysts' expectation (for example, Burgstahler and Eames, 1998), are documented to drive the stock market's performance. The following literature review is about the detection and incentives of earnings management which are the two central issues that this thesis will investigate.

## 2.2 Approaches in detecting earnings management

Empirical studies have documented various approaches in detecting earnings management, such as changing of accounting choice, real transactions, total

accruals/discretionary accruals, specific accruals, benchmark beating (earnings distributions approach) and income smoothing. This study mainly focuses on detecting earnings management through discretionary accruals, approaches other than total accruals/discretionary accruals are reviewed in Appendix 2.

### 2.2.1 Accounting choice

In the 1970s and early 1980s, a large number of studies found that managers exercise discretion through the choice of accounting methods or polices. Watts and Zimmerman (1978) documented that managers will lobby for and choose accounting policies which can decrease tax payments, help secure favourable regulations, reduce political costs, reduce information production costs, and increase accounting earnings. In testing whether the existence of incentive compensation plans effect managers' decisions in accounting choices, Hagerman and Zmijewski (1979) examined accounting choices of inventory method, depreciation method, the treatment of the investment tax credit, and pension costs amortization; Holthausen (1981) examined the case of depreciation switch-back policy; Bowen et al. (1981) focused on interest capitalization policy; and, Skinner (1993) studied depreciation policy and goodwill procedures. These studies examine one accounting method or choice at a given time and findings are mixed.

Other studies argue that using only one accounting method or choice somewhat limits the picture of a firm's income reporting strategy. These studies form a portfolio with different accounting choices in an attempt to detect the aggregate effect of accounting choices on reporting. For example, Zmijewski and Hagerman (1981) and Robbins et al. (1993) developed an optimal multi-dimensional income strategy and an income strategy score with the combination of accounting method choices that increased or decreased reported earnings respectively. These studies, regardless of whether investigating earnings management through the choice of individual accounting methods or the combination of different accounting methods, typically use a dichotomous variable or categorical variable to capture income-increasing or income-decreasing earnings management through the choice of accounting policies.

### 2.2.2 Real transactions

Besides changing accounting policies, managers can also manipulate earnings upwards or downwards through real transactions. Schipper (1989) is one of the first to consider that earnings management can be done through real management transactions: "*A minor extension of this (earnings management) definition would encompass 'real' earnings management, accomplished by timing investment or financing decisions to alter reported earnings or some subset of it*" (Schipper, 1989, p92). Bartov (1993) provided evidence that managers avoid reporting losses and debt covenant violations by selling fixed assets. Baber et al. (1991), Dechow and Sloan (1991) and Bushee (1998) documented that for-profit firms, managers are more likely to use R&D expenditures to manipulate earnings. Graham et al. (2005) surveyed 401 financial executives and showed that managers prefer to manage earnings through real actions as opposed to accounting actions in attempting to meet or beat earnings benchmarks. Roychowdhury (2006) further documented the type of transactions that have been used by managers to avoid reporting annual losses and negative changes in earnings. For example, price discounts are used to increase sales and overproduction is used to spread fixed overhead over more units thus reducing cost of goods sold.

### 2.2.3 Total accruals/discretionary accruals

A substantial literature detects earnings management based on discretionary accruals. Earnings have two components, cash flow from operations and total accruals. Total accruals are the management judgements and estimates about cash flows in order to make accounting earnings better reflect a firm's underlying economic performance. Total accruals, in further, is the sum of discretionary accruals and non-discretionary accruals. Non-discretionary accruals is the component that is imposed by the accounting regulator in adjusting a firm's cash flows. Discretionary accruals is the component that managers can choose within the flexibility of accounting regulations in adjusting a firm's cash flows. Due to this flexibility, discretionary accruals is the component that often gives managers opportunities to manipulate earnings (Dechow, 1994).

Healy (1985) was the first to introduce discretionary accruals to detect earnings management. He assumed that discretionary accruals is the component that is subject

to managerial discretion while non-discretionary accruals is the expected level of accruals in the firm given no earnings manipulation. As both components of accruals are unobservable, Healy further assumed that the discretionary accruals component in a given year is total accruals scaled by lagged total assets and so effectively, non-discretionary accruals are zero in expectation. He found that accruals are used by managers to maximize their bonus.

DeAngelo (1986) assumed that non-discretionary accruals follow a random walk and her approach in detecting earnings management is that the unusual behaviour of discretionary component of accruals should be reflected from the change in total accruals from year *t-1* to year *t*. This effectively sets the expectation of non-discretionary accruals in the current year as the prior year's total accruals. With this approach, she detected managers systematically understate earnings prior to the buyouts in a sample of 64 companies whose managers propose to go private by purchasing all of the publicly held common stock.

Both Healy and DeAngelo approach that assumed the non-discretionary accruals component is constant and all earnings management activities can be captured by total accruals. However, such assumptions are unlikely to be empirically descriptive. Kaplan (1985) suggested that the level of non-discretionary accruals should change from period to period in response to changes in economic circumstances. Although Healy (1985) and DeAngelo (1986) captured either income-increasing or income-decreasing techniques that managers have incentives to employ, they neglected the changing of non-discretionary accruals and they misclassified all accruals as a discretionary component. As such, both approaches tend to detect earnings management with error.

To overcome this limitation, Jones (1991) introduced a linear regression approach to control for non-discretionary determinants of accruals. She used changes in sales control for non-discretionary accruals of current assets and liabilities; property, plant and equipment control for the non-discretionary component of depreciation expense. The rationale is that a firm's working capital accruals depend on sales, while its depreciation accruals depend on the level of property, plant, and equipment. She estimated discretionary accruals, the proxy for earnings management, as residuals from regression of total accruals on nondiscretionary determinants of accruals. With

this estimation procedure, she subsequently detected that managers exercised more negative discretionary accruals to reduce income during the U.S. import relief investigations.

Dechow et al. (1995) pointed out that although all models used to separate total accruals between non-discretionary and discretionary components appear to produce reasonable, well specified tests for a random sample, the testing power is low and the level of discretionary accruals needs to be very large relative to earnings to be detected. They applied a time-series Jones Model to a sample where they have artificially manipulated earnings. They reported that a time-series Jones Model can detect earnings management close to 100% level only when the induced manipulation exceeds 50% of total assets. When the induced manipulation is equal to 5% of total assets, this model can only detect less than 30% of the manipulation. Dechow et al. (1995) also introduced a cross-sectional Modified Jones model. In this model, changes in account receivables is deducted from change in revenues in order to avoid measurement error when discretion is exercised through non-cash revenues (account receivables). They suggested that the power of testing earnings management is highest for the modified Jones model.

Peasnell et al. (2000) evaluated different models in detecting earnings management and suggested that the power to detect earnings management seems to be higher for the cross-sectional Jones Model. They stated that the rejection rates of the null of no earnings management can be as high as 40% of the cases when earnings manipulation equals only 2% of total assets. Nevertheless, Jeter and Shivakumar (1999) argued that the greater power of the cross-sectional model in detecting earnings management may also be attributable to model misspecification. Furthermore, when the models are applied to investigate earnings management in a sample with firm-years experiencing extreme financial performance, all models lead to misspecified tests.

Empirical studies further point out that detecting earnings management based upon discretionary accrual will result in misleading inferences about earnings management behaviour because this type of model suffers from correlated omitted variables problems and therefore is potentially misspecified. In particular, there were two sources identified as contributing to model misspecification.

First, researchers found the omitted operating cash flows can result in model misspecification. McNicholos and Wilson (1988) constructed ten operating cash flow portfolios and found systematic negative association between operating cash flows and accounting discretions across portfolios. Specifically, when operating cash flows are unusually high, managers tend to decrease earnings. When operating cash flows are poor, managers tend to increase earnings; however, if operating performance is extremely poor, some firms may decrease income further. This is the so-called 'taking bath' strategy. Dechow (1994) also found that changes in cash flow from operations is negatively correlated with total accruals. Furthermore, Dechow et al. (1995) showed that cash flows from operations influence the magnitude of discretionary accruals. The higher level of operating cash flows was associated with a lower level of discretionary accruals.

In order to control cash flow effects, Kasznik (1999) added the change in operating cash flows into the Modified Jones Model. This modification was later found to be necessary when Yoon and Miller (2002) detected an association between cash flows and earnings management from Korean industries. Baruat et al. (2006) applied this model and found discretionary accruals were used to achieve earnings benchmarks. Shuto (2007) also used this model and detected earnings management to be associated with executive compensation in Japanese firms.

Second, the model may also misspecify without controlling for extreme earnings performance. In fact, Kaszink (1999) showed a correlation between discretionary accruals and a firm's earnings performance. Firms with higher earnings tend to exhibit positive discretionary accruals while firms have lower earnings tend to show negative discretionary accruals. Presumably this arises because firms with abnormally high (low) earnings have positive (negative) shocks to earnings and that includes an accrual component. As a result, researchers are more likely to detect income-increasing earnings management for higher profitable firms and income-decreasing earnings management for lower profitable firms.

In order to address the correlated omitted variable problem that resulted from earnings performance, Kaszink (1999) suggested a Performance Adjust Technique (also known as Matched Portfolio Approach) to adjust estimated discretionary accruals by removing the effect of a firm's earnings performance. He sorted the estimated

discretionary accruals into percentile based on earnings performance (measured as return on assets). Then, he computed the median discretionary accruals for each percentile and subtracted it from each observation's discretionary accruals in that percentile. By doing that, evidences on earnings management are suggested to be more reliable as measurement errors that are potentially correlated with earnings performance are removed.

The other modifications in attempting to control for a firm's performance include Kothari et al. (2005) who directly introduced return on assets as an additional independent variable into the modified Jones Model. They also adopted a performance-matched approach. This approach calculates performance-matched discretionary accruals by matching the firm-year observation of the treatment firm with the firm-year observation for the control firm from the same industry and year with the closest return on assets in the current year or the prior year and then subtracting the control firm's discretionary accruals from the treatment firm's discretionary accruals.

Kang and Sivaramakrishnan (1995) used an instrumental variables (IV) approach in estimating discretionary accruals. The IV approach involves replacing the independent variables that are correlated with the error terms with instruments that are assumed to be highly correlated with the original variables, but uncorrelated with the error terms. They also used a generalized method of moment (GMM) method to estimate model parameters. However, as the data requirement and the complexity in applying the IV approach, this approach has not yet been thoroughly tested or widely adopted.

### 2.2.4 Specific accrual

Different from the total accrual approach, a specific accrual focuses on industry setting in which a single accrual is sizeable and requires substantial judgement. This approach detects earnings management from investigating management discretions through specific accrual account such as bank loan loss provisions, claim loss reserves for property-casualty insurers, and deferred tax valuation allowances. McNichols and Wilson (1988) detected that managers manipulate earnings through bad debt

provisions. Petroni (1992) documented earnings management evidences from claim loss reserve account. Beaver and Engel (1996) found that managers exercise discretions through the use of allowances of loan losses. Finally, Beneish (1997) found that earnings manipulation can be reflected from various indexes including days in receivable index, gross margin index, depreciation index, SG&A expense index, total accrual to total assets index. He constructed an earnings management score based on the weighted indexes and asserted that such a score is useful in detecting earnings management. This approach enables researchers to develop intuition for the key factors that influence the behaviour of the accrual in a particular industry. However, McNichols (2000) pointed out the findings from studying a specific accrual may not be generalized as those from the total accrual approach. It may preclude detection of earnings management behaviour if a specific accrual is not sufficiently sensitive.

### 2.2.5 Earnings distribution

The distribution approach in detecting earnings management is relatively new in the literature. Burgstahler and Dichev (1997) studied the density of the distribution of earnings after management. If managers engage in earnings management to beat earnings benchmarks, then the distribution of earnings will show less than expected observations just below the threshold, and more than expected observations just above the threshold. This will result in a discontinuity in the earnings distribution and the discontinuity (or earnings kink) is the evidence of the earnings management. Burgstahler and Dichev (1997), Degeorge *et al*. (1999) identified three psychological thresholds that managers are usually concern with—positive earnings, last year earnings, and analysts' consensus forecast.

A noteworthy feature of the distribution approach is that it infers earnings management while avoiding the measurement error and model misspecification problem inherent in accrual-based earnings management studies. McNichols (2000) pointed out that the distribution method is powerful in detecting earnings management as it allows the researcher to make a strong prediction from the frequency of earnings realizations rather than from a measure of discretionary accrual component of earnings. Moreover, the distribution method also provides a powerful tool in detecting

earnings management when large number of firms appears to manage earnings. Burgstaher and Dichev (1997, p101) state "*an investigation of the prevalence of the avoidance of earnings decreases and losses suggests that this is a pervasive phenomenon*". This method is particularly useful when a researcher's aim is to detect the frequency and scope of earnings management since it identifies a context in which large numbers of firms appear to manage earnings. It is of interest to regulators as they consider material any earnings management that converts losses into profits, triggers bonuses, or crosses performance thresholds for other covenants.

### 2.2.6 Income-smoothing

Literature used 'income smoothing' more often in the 1980s. Income-smoothing is a specific case of earnings management which has a clear objective to reduce the temporal volatility of earnings and to produce a steadily growing stream of profits (Schipper, 1989). The income smoothing hypothesis refers to managers who have an incentive to manipulate earnings to some predetermined budget number (see Fundenberg and Tirole, 1995; DeFond and Park, 1997). In the early stages researchers detect income-smoothing behaviour based on the comparison of earnings volatility between firms with more and less smooth reported earnings. Imhoff (1977) recognized that the problem with this approach is the difficulty in distinguishing naturally smoothed earnings from intentionally smoothed earnings. For instance, some industries have a less volatile income stream because of the produce nature is less affected by business cycles but not due to the smoothing activity. Imhoff (1977) and Eckel (1981) suggested that a firm could be classified as an income smoother if the variance of earnings is smaller than the variance of sales. Wang and Williams (1994) classified a firm as an income smoother if the firm's cash flows volatility is higher than earnings volatility. As cash flows are less subject to managerial manipulation than accruals, low earnings volatility indicates accruals have been used to reduce the earnings volatility. Such an approach is applied in detecting income-smoothing, which has a narrower application.

## 2.3 Earnings management and industry sectors

The magnitude of earnings management is likely to vary across industries because of differences in cash flow and sales volatility, operating cycle, intangibles use, and capital intensity. Knowing which industries exhibit higher magnitude of earnings management as opposed to other industries has implications for firm valuation and investment decisions (Francis *et al.*, 2008). Earnings management evidences have been found in the dual economy and some specific industries.

### 2.3.1 The dual economy

In the dual economy theory, Averitt (1968, pp.6−7) defines American economy as '*a composite of two business systems*' that later to be called the core and the periphery. Bluestone et al. (1973, pp.29−30) describe that '*the core economy is by far the largest sector…with high productivity and profits, intensive utilization of capital, high incidence of monopoly power and a high degree of unionization…Unlike core sector industries, the periphery lacks almost all of the advantages normally found in core firms.*'

Beck et al. (1978) operationally classified industries into core and periphery sector on the basis of two-digit SIC codes. The core sector includes Mining, Construction, Metals, Machinery, Transportation, Paper and Printing, Chemicals, Communications, Utilities, Finance and Real Estate. The periphery sector includes Agriculture, Furniture and Fixtures, Food and Tobacco, Textile, Retail, Business and Personal Services, and Entertainment. Theory of dual economy suggests that firms in the periphery sector face a more restricted opportunity structure and a higher degree of environmental uncertainty than firms in the core sector.

Belkaoui and Picur (1984) applied the dual economy theory in the study of earnings management and suggested that the periphery industry is more likely to manage earnings because they have more predispositions and more opportunities to do so. Using a sample of 171 U.S. firms, they found a larger frequency of income smoothing (a means of earnings management) in the periphery sector than in the core sector. In contrast, Albrecht and Richardson (1990) used a sample of 256 U.S. firms and argued that the different extent in earnings manipulation behaviour between core and periphery sectors is not supported.

Kinnunen et al. (1995) also tested this theory in Finnish industry and found that both the potential and the actual earnings management are significantly larger in the core sector of Finnish industry. In Australia, Jones and Sharma (2001) reported some evidence of the scope of earnings management where earnings are significantly less managed in the 'new economy' firms, including Health, Biotechnology, Information Technology, and Telecommunications.[2]

### 2.3.2 Specific industries

Except the dual economy, researchers have documented earnings management evidences on a specific industry. Robbins et al. (1993) focused on the U.S. healthcare industry and provided some insight into the linkage between management compensation incentives and management's choice of accounting methods. Key (1997) investigated discretionary accruals for firms in the cable television industry and documents that firms in this industry defer earnings during the time of Congressional hearings on deregulation the industry. Cahan et al. (1997) found that chemical firms engaged in income-decreasing earnings management during the time when the U.S. Government was reforming the environmental legislation. Hall and Stammerjohan (1997) show that managers of oil firms engage in earnings management as a response to high debt levels, pending legal damage rewards and foreign competition. Han and Wang (1998) found that during the 1990 Gulf War, oil industry firms used accruals to reduce quarterly earnings to relax the price control over gasoline so that they could increase the oil price and thus make profit. McNichols and Wilson (1998) found income-decreasing manipulation in printing and publishing, nondurable wholesale goods, and business services industries. Teoh et al. (1998a) show that over 30% firms that reported higher net income before seasoned equity offerings are from electronic equipment and service industries. Navissi (1999) found that New Zealand manufacturing firms who apply for price increases engage in downward earnings management. Beasley et al. (2000) documented evidence of earnings management among technology firms and financial-services firms. Nelson et al. (2002) reported significantly high earnings management attempts by firms in the electronics industry. Monem (2003) found a downward earnings management by the

[2] Jones and Sharma (2001) defined 'new economy' as firms with high growth, poorer earnings performance and poorer cash flows. In Australia, 214 firms were listed under new economy industry classification of ASX in March 2001. They were health and biotechnology, high technology, and telecommunications.

Australian gold-mining industry to reduce income tax after the introduction of the Australian Gold Tax in 1991.

Therefore, both studies of the dual economy and specific industries suggest that the industry classification has proved to be of considerable significance in the area of earnings management.

### 2.4 Earnings management and firm characteristics

Besides industry sectors, firm-level characteristics and their contribution to a higher (lower) propensity for earnings management is also worth examining. In this section, studies of firm characteristics including size, growth, profitability, leverage, book-to-market, capital intensity, and lagged total accruals and their impacts on earnings management are reviewed.

#### 2.4.1 Firm size

Firm size is documented as an influential factor in earnings management and there are two schools of thought about firm size. On one side, Watts and Zimmerman (1978) proved that large size firms are more political sensitive and easier to attract political exposure. The political concerns suggest that managers of large firms are more likely to engage in income-decreasing earnings management to reduce political costs. This is the political cost hypothesis which illustrates that larger firms are more likely to have implications for the determination of accounting numbers. Manzon (1992) also found that large firms use discretionary accruals to reduce earnings in order to minimize income tax. As large firms are followed by more analysts, Das et al. (1998) suggest that these firms face greater pressure to achieve earnings benchmarks than smaller firms.

On the other side, Bathke et al. (1989) documented a positive relationship between firm size and earnings stability. The underlying argument is that there is less need for large size firm to manage earnings because large firms have sufficient financial resources to diversify risk and to stabilize growth that lead to a more stable earnings stream. Koh (2003) and Holland and Jackson (2004) also suggested that larger firms are less likely to engage in earnings management as close scrutiny will constrain

managers' abilities to exercise discretions. Recently, Sanchez-Ballesta and Garcia-Meca (2007) found earnings management is more prevalent among smaller firms in the Spanish context because smaller firms tend to be neglected by financial analysts and regulators. In fact, in the earlier time, Sloan (1996) has already documented that smaller firms are associated with both income-increasing and decreasing earnings management.

### 2.4.2 Growth opportunities

Growth opportunity is another firm-level characteristic that has been studied frequently. Beaver et al. (1968) found that growth opportunities provide managers with incentive to smooth earnings as earnings volatility increases perceived firm risk which adversely affects the cost of the capital needed by the firm. Dechow et al. (1998) found that accruals are positively associated with sales growth. McNichols (2000) also shows that discretionary accruals are related to forecasted sales growth. Skinner and Sloan (2002) found that growth firms are penalized by the market if they report negative earnings surprise. Thus, high growth creates incentives for managers to meet earnings benchmarks. Richardson et al. (2002) also found that restatement firms[3] tend to be high growth firms. These firms are found to inflate earnings to meet or beat analysts' forecasts as they are under markets' pressure. Pincus and Rajgopal (2002) documented a positive association between firms growth level and earnings management. They explained that growth firms are more likely to hedge cash flows to assure the availability of funds. Young (1999) found that discretionary accruals are positively associated with firm growth since firms experiencing large growth will incur large current assets and current liabilities. He further pointed out that the impact of firm growth on current assets accruals and current liabilities accruals is not symmetrical; rather, most of the variation in working capital accruals is from current assets. Firth et al. (2007) recently pointed out that it is easier for fast growing firms to engage in earnings management than it is for mature firms since it is difficult to observe the business activities of fast growing firms.

[3] Restatements because of accounting errors are a symptom of poor earnings quality (Levitt, 2000). Earnings management can lead to earnings restatements.

### 2.4.3 Profitability

Profitability also affects the magnitude of earnings management and it involves two streams of studies. One stream of studies asserts that lower accounting profits provide motivation for firms to manipulate earnings because low profitable firms are possibly facing more financial constraints. White (1970) first documented that firms with declining profitability tend to smooth earnings. Ashari et al. (1994) reported that managers' incentives to smooth earnings will be stronger when the firm's profitability is poor and its fluctuations in income are severe. Wang (2004) argued that the firm's propensity for fraud is positively related to growth prospects and negatively related to the profitability of the firm's current assets. The underlying notation for his predications is that firms with good growth opportunities but low profitability should demand more external finance as these firms suffer from a cash flow squeeze.

The other stream of studies, however, argues that profit firms have greater incentives to manage earnings than do loss firms. Fudenberg and Tirole (1995) pointed out that earnings management firms tend to exhibit a high profitability as it affects managers' job security and the compensation contract, which gives managers implicit incentives to manipulate earnings. Moreover, Hayn (1995) reported that price-earnings relation for profit and loss firms is asymmetrical and the market rewards firms that report profits. In addition, Degeorege et al. (1999) showed that earnings management to meet or beat earnings benchmarks matters only if firms first report profits. These findings suggest that profit firms have greater market-based incentives than loss firms for managing earnings to meet the earnings benchmarks.

### 2.4.4 Leverage

Previous studies also show that high leverage firms tend to engage more in earnings management. Watts and Zimmerman (1978) documented that aggressive earnings management has been used by firms to improve debt ratings and prevent covenant violations. Press and Weintrop (1990) also suggested that the closer to default on debt covenants, the more managers will engage in earnings management. DeFond and Jiambalvo (1994) found that managers increased income one year prior to the covenant violation as managers tried to convince the creditors that the firm is in a good financial condition, and thereby avoid being in technical defaults. Dechow et al.

(2000) argued that by avoiding reporting a loss a firm potentially avoids costs of renegotiating with debtholders. Hence, they predict that debt level should be positively correlated with discretionary accruals.

However, DeAngelo and Skinner (1994) argued that managers of financially troubled firms would highlight the firm's financial difficulties by reducing the reported earnings so that they could obtain better terms in their contract renegotiations. Despite the evidence being mixed in terms of whether high leverage firms engage in income-increasing or income-decreasing earnings management, it is clear that firm's leverage affects earnings management in the presence of debt contracts and financial distress. Recently, Charitou et al. (2007) investigated the period from 1986 to 2004 and found that managers of 859 U.S. bankruptcy firms were involved in income-decreasing earnings management prior to the bankruptcy filing. They further explained that new management following management turnover shift earnings downwards as a part of wider strategy so that they can blame the 'old' management for the firm's distressed condition. Such explanation is consistent with DeAngelo and Skinner (1994).

### 2.4.5 Book-to-market

Discretionary accruals are also found to be affected by book-to-market. Book-to-market is a widely investigated anomaly that has been argued to affect future stock returns. Firms with high book-to-market ratios are usually composed of a relatively large proportion of assets-in-place and knowed as value stocks. In contrast, firms with low book-to-market ratio are more likely to have larger growth opportunities, these stocks are referred to as growth or glamour stocks. Low book-to-market predicts negative abnormal returns, whereas high book-to-market predicts positive abnormal returns. Beaver (2002) further pointed out that those accruals are also an important value-growth anomaly, and it is possibly linked to book-to-market anomaly. Subraranyam (1996) found that discretionary accruals are priced by the capital market and therefore are value relevant. Managers of low book-to-market firms tend to have greater incentives to engage in earnings management to beat earnings targets because stock prices in such firms are more sensitive to reported earnings. Sawichi and Shrestha (2008) investigated the relationship between earnings management and

insider trading, and found that on average, glamour firms with low book-to-market ratios have income-increasing discretionary accruals.

### 2.4.6 Capital intensity

Managers' ability to exercise discretion depends on the level of current assets/liabilities and noncurrent assets/liabilities. Capital intensity measures the portion of the firm's noncurrent (fixed) assets to the total assets base. Lower capital intensity implies higher proportion of current assets and lower proportion of noncurrent assets. Burgstahler and Dichev (1997) suggested that firms with large current assets/liabilities provide more room for the managers to exercise discretions through working capital accruals than the firms with large noncurrent assets (fixed)/liabilities. As such, lower capital intensity enhances managers' abilities in exercising discretions. Francis et al. (1999) used capital intensity ratio to measure the level of noncurrent assets/liabilities to current assets/liabilities and suggested that the lower the capital intensity ratio the higher the likelihood for managers to manipulate earnings through working capital accruals. In a similar vein, Bradshaw et al. (1999) suggested that managers have more discretion and flexibility over short-term working capital accruals. Young (1999) reported a negative association between capital intensity and the level of discretionary accruals.

### 2.4.7 Lagged total accruals

In the long run, earnings equal cash flows. Accruals will sum to zero over a managers' employment horizon with the firm and accruals applied in the current period being reversed in the future. For example, if a manager selects a negative accrual by increasing a bad debt provision in the current period, then the need for the same amount of bad debt provision in the future period is removed. Healy (1983) suggested that managers' decision in choosing discretionary accruals depend on their employment horizon. As discretionary accruals are constrained to sum to zero over an employment horizon, one period's use of discretionary accruals fixes their decision in the second period. This is the mean reverting feature of accruals. Dechow (1994), Dechow et al. (1995) and Sloan (1996) found that accruals are mean reverting. The

majority parts of the current period accruals will be mean revert in the next year. This means a higher level of lagged total accruals will constrain managers' abilities to manage earnings upward in current year. Dechow et al. (2003) suggested that accruals are less persistent than cash flows because accruals reverse in the following years. As such, some proportion of accruals can be predicted from last year's accruals. They include the lagged total accruals into the Modified Jones Model in an attempt to capture the predictable component of total accruals.

In all, these studies imply that the magnitude of earnings management is likely to vary among firms because of different characteristics in size, growth rate, profitability, leverage, book-to-market effect, capital intensity, and lagged total accruals. Therefore, the examination of firm characteristics may useful in discovering what kind of firms will exhibit higher level of earnings management.

### 2.5 The incentives of Earnings management

Earnings management is found to be driven by different managerial incentives. Previous studies have identified that executive compensation contracts create incentives for earnings management. Recent studies also found that the capital market induces managers to manipulate earnings. Positive earnings announcements often are followed by stock price increases. The following literature review is focused on earnings management incentives: the executive compensation incentive for the contract driven earnings management and the benchmark beating incentive for the capital market driven earnings management.

#### 2.5.1 Contract-driven Earnings management

In the literature, executive compensation is one type of contract that has been found to create strong incentives for earnings management.[4] Agency theory predicts that there is potential conflict of interest between managers and owners/shareholders,

[4] Other contracts include debt contracts and studies found there is an association between earnings management and debt covenant violations. These studies include Watts and Zimmerman (1978), McNichols and Wilson (1988), Press and Weintrop (1990), Healy and Palepu (1990), Beneish and Press (1993), Hall (1994), DeFond and Jiambalvo (1994), Sweeney (1994), and DeAngelo and Skinner (1994). Regulation could be viewed as a special form of contract between firms and regulators and regulation also creates incentives for earnings management. Watts and Zimmerman (1978) point out firms with high accounting earnings are more likely to decrease earnings in order to reduce political costs. Other studies include Han and Wang (1998), Cahan (1992), Lim and Matolcsy (1999), and Monem (2003).

owners/shareholders design management compensation contracts in order to constrain management to act in their best interest (Jensen and Meckling, 1976). Theoretically, management compensation contracts are viewed as devices to reduce the conflict of interest between managers and shareholders and, thereby, maximize a firm's value. However, these compensation contracts may induce earnings management simply because managers' compensation is either tied to accounting earnings (for example, bonus) or stock prices (for example, options). As such, there is a possibility that rewarding managers on the basis of reported earnings or stock performance may induce them to manipulate such figures to improve their apparent performance and, ultimately, their related compensations. In the following sections, studies related to the early executive compensation, bonus plan maximization hypothesis and equity-based compensation are reviewed.

#### 2.5.1.1 The early executive compensation studies

The early compensation hypothesis stems from the positive accounting theory. Watts and Zimmerman (1978) developed a positive accounting theory based on the proposition that managers attempt to maximize their utility which is directly related to their wealth. They argued that there are several factors that can increase management wealth: (1) decreased (delayed) tax payments, (2) favorable regulations, (3) reduced political costs, (4) reduced information production costs, and (5) increases in reported earnings that are used as a base measure in incentive bonus plans. The first four factors would, ceteris paribus, increase firm cash flows and thus lead to higher stock prices, while the last factor would directly increase management compensation. Using a sample of 52 firms which made submissions to the FASB (Financial Accounting Standards Board) about the proposed GPLA (General Price Level Adjustment) standard in 1974, they also found that managers will to choose accounting standards to report lower earnings that will result in lower tax, regulatory and political costs.

Although Watts and Zimmerman (1978) developed a theory hypothesizing the economic incentives managers have in selecting accounting policies, they did not provide direct evidence on the association between management compensation and earnings manipulation. Hagerman and Zmijewski (1979) later examined whether the existence of incentive compensation plans in addition to size, industry concentration,

risk, and capital intensity effected management discretions. In this study, management discretions are measured as four accounting choices of inventory method (LIFO versus FIFO), depreciation method (accelerated versus straight-line), the treatment of the investment tax credit (deferral versus flow-through), and pension costs amortization (less than 30 years versus more than 30 years). Using a random sample of 300 non-regulated industrial firms in 1975, they found that the existence of incentive compensation plans induced a management choice of accounting methods that would increase reported earnings.

Zmijewski and Hagerman (1981) extended Hagerman and Zmijewski (1979) and argued that management would adopt a multi-dimensional income strategy with each accounting policy choice being one dimension of that optimal strategy. An optimal strategy means management faces the trade-offs between income-increasing policies and income-decreasing policies. For instance, management compensation plans induce managers to inflate earnings while firm size encourages managers to deflate earnings. Using the same sample of Zmijewski and Hagerman (1979), Hagerman and Zmijewski (1981) found the existence of a profit-sharing plan, size, degree of concentration and debt to total assets ratio all influence a firm's accounting strategy. Based on the assumption that accounting policy decisions are made jointly, Hagerman and Zmijewski (1981) tested positive accounting theory using an overall model and individual factors that were hypothesized to be important in a manager's decision of accounting choices.

Using a sample of 96 firms which voluntarily switched depreciation method from an accelerated method to a straight-line method covering the period from 1955 to 1978, Holthausen (1981) modeled abnormal stock returns as a function of the existence of a management compensation plan, the impact of the depreciation change on reported earnings, the firm's deviation from its dividend constraint and the size of the firm. The function addresses two issues. First, there should be an impact of an unanticipated change of depreciation policy on the market value of the equity at the time of announcement. Second, abnormal stock returns should have a negative association with the existence of a management compensation plan if managers use income-increasing depreciation techniques to inflate their bonus. However, the evidence is not consistent with the hypothesis that management compensation

contracts are important determinants of the decision to change depreciation techniques.

Skinner (1993) related management compensation agreements with a firm's investment opportunity set. First, firms using incentive bonus plans are found to have higher mean and median gross property, plant and equipment to firm value ratios (more assets-in-place) but smaller Tobin's q and R&D ratios (fewer growth opportunities). Second, firms with bonus plans are more likely to select income-increasing depreciation and goodwill procedures. Based on these two findings, Skinner (1993) suggested that investment opportunity set affects accounting choice indirectly through its effect on the nature of a firm's compensation contracts.

However, this study has two limitations. First, the sub-sample Skinner (1993) used in testing the relation between the investment opportunity set and compensation contracts consists of the 100 largest firms from an estimation sample. Such a self-selection problem could result in a bias test as large firms have relatively more assets-in-place. Second, simultaneity problem could arise when investment opportunity, compensation and accounting choice determines each other. In this case, the error terms in the logit regression will be correlated with some of the independent variables, leading to inconsistent estimates of the coefficients.

The review of above studies reveals some common features of early research of compensation incentives. These studies focus on one-time events such as changes in a specific accounting method and ignore all other accounting choices. They typically use a single 0-1 dummy variable to estimate the impact of a short-term bonus plan and use a dichotomous variable or a categorical variable to capture income-increasing or income-decreasing earnings management through the choice of accounting policies.

#### 2.5.1.2 Bonus plan maximization hypothesis

Rather than using a single dummy variable to estimate the impact of a short-term bonus plan, there is another line of research that focuses on detailed bonus plans. Moreover, it uses discretionary accruals to capture earnings management through aggregate accounting choice. This line of research forms a more complete theory of earnings management and management compensation.

One of the most widely cited papers in this line of research is Healy (1985). Using a sample of 1,527 firm-year observations covering the period from 1930 to 1980, this study discovered that bonuses were not simple linear functions of accounting earnings. Instead, they are piecewise linear functions with lower and upper bounds defined in the funding formula for use in bonus computations.[5] That is, managers decrease income when earnings before discretionary accruals is below the lower bound of the bonus plan; (2) managers increase income when earnings before discretionary accruals fall between the upper and lower bounds of the bonus plan; (3) managers decrease income when earnings before discretionary accruals is above the upper bound of the bonus plan. Such a piecewise linear bonus function contradicts the conventional wisdom that managers with a bonus plan will always choose income-increasing accounting choices. In fact, when earnings are far below the lower bound, managers are more likely to adopt a 'bath taking' strategy to further reduce current earnings in order to increase the probability of meeting future earnings' targets. Later researchers refer Healy's theory of managers using discretionary accruals to maximize short-term bonus compensation as the bonus-maximization hypothesis.

Nevertheless, this study has three limitations. First, errors in measuring earnings before discretionary accruals are perfectly negatively correlated with measurement errors in discretionary accruals.[6] This implies a number of firm-years observations with positive measurement error in earnings before discretionary accruals are more likely to present negative measurement errors in discretionary accruals. Such relation increases the probability of incorrectly rejecting the null hypothesis. Second, Healy (1985) used the *chi*-square test of independence in the contingency table. This method is useful in determining whether a relationship exists between two variables, for example accruals and bonus plan parameters. However, it does not enable researchers to estimate or predict the value of one variable based on the value of the other (Kenkel, 1989). In order to determine that dependence does exist between accruals and bonus parameters, certain functional relationship between these two quantitative

[5] The lower bound, usually defined as invested capital, is the threshold that net income must exceed before a bonus can be earned. The upper bound, often defined as a percentage of cash dividend paid out or a maximum percentage of invested capital, limits the maximum bonus that can be rewarded.

[6] This is because the sum of the proxy variables (earnings before discretionary accruals and discretionary accruals) are constrained to equal the sum of the measured variables (cash flows and total accruals) by the accounting earnings identity where aaccounting earnings = cash flows + total accruals; also, accounting earnings = earnings before discretionary accruals + discretionary accruals.

variables needs to be further developed. Finally, Healy (1985) introduced discretionary accruals as a new proxy for earnings management which later was widely applied in measuring earnings management. However, the expected level of non-discretionary accruals is assumed to be zero and total accruals are used as a substitute of discretionary accruals. Kaplan (1985) pointed out those non-discretionary accruals are unlikely to be zero as working capital accounts fluctuate with the changing economic conditions of the firm. The substitution of total accruals for discretionary accruals makes the results of Healy's empirical tests difficult to interpret.

Gaver et al. (1995) extended Healy's work. The principle difference between the two studies is that Healy (1985) used total accruals while Gaver et al. (1995) used Modified Jones Model and Industry Index Model to estimate discretionary accruals. Using updated data with 837 firm-years covering the period from 1980 to 1990, Gaver et al. (1985) found that when earnings before discretionary accruals fall below the lower bound, managers appear to exercise positive discretionary accruals. Hence, Gaver et al. (1995) believed that their results were more consistent with the income smoothing hypothesis than with Healy's bonus hypothesis.

Holthausen et al. (1995) also extended Healy's work. These two studies have two essential differences. First, Healy (1985) made inferences about CEO incentives based on funding formulas while Holthausen et al. (1995) used a budget-based compensation scheme. Unlike funding formulas, a budget-based compensation scheme clearly defines minimum, target, and maximum bonus payments at the beginning of the year and thus allows authors to directly determine whether CEOs are below the lower bound, above the upper bound, or in between the lower and upper bound. This budget-based compensation scheme hence provides a direct linkage between the financial performance of the firm and the annual bonus earned by an executive.

Second, Healy (1985) made predictions about earnings management based on *ex ante* earnings before discretionary accruals. In contrast, Holthausen et al. (1995) replaced earnings before discretionary accruals with an *ex post* actual bonus. They predicted that managers have an incentive to select income-decreasing discretionary accruals if the actual bonus is below (above) the lower (upper) bound; while managers have an

incentive to select income-increasing accruals if the actual bonus is between the lower and upper bounds. Their approach is *ex post* and called as fixed-target hypothesis.

Using confidential compensation data with 443 firm-year observations provided by two different human resources consulting firms that covered periods of 1982 to 1984 and 1987 to 1991, Holthausen et al. (1995) estimated discretionary accruals from the Modified Jones Model. The results from *t*-tests and *chi*-square tests show a downward earnings manipulation at the upper bound relative to those between the lower and upper bound. However, results do not support that managers manipulate earnings downwards when compensations are below the lower bound of their contract.

Guidry et al. (1999) tested the bonus maximization hypothesis at the business unit level for a multinational conglomerate. Using 117 different U.S. business units and 179 business-unit-years observations over the 1994-1995 time period, they documented that business-unit managers manipulated earnings in order to maximize their short-term bonus plans. Given that incentives of individual managers may differ from one business unit to the other, income-increasing discretionary accruals in one business unit can offset income-decreasing discretionary accruals in another business unit. The investigation of business-unit level increases the probability for earnings management behaviour to be detected. Thus, this examination of earnings management at business-unit level was innovative.

In all, the focus of above studies is on whether discretionary accruals are consistent with the incentive provided by bonus plans. In the examination, they used discretionary accruals but not accounting choices as proxies for earnings management; they used bonus plan but not the actual compensation paid.

#### 2.5.1.3 Actual cash compensation and bonus

Recently studies began to investigate the effect of discretionary accruals on actual compensation paid. Using 3,439 firm-years observations from Compustat between 1980 and 1993, Balsam (1998) found that cash flows, discretionary accruals, and non-discretionary accruals are all significant determinants of CEO cash compensation; discretionary accruals receive less weight than other earnings components in the compensation function since they are subject to management manipulation.

Furthermore, managers use income-increasing discretionary accruals to increase compensation. The significant positive coefficient on this variable reveals that positive discretionary accruals are given more emphasis in compensation decisions than negative discretionary accruals.

In addition, the association between discretionary accruals and CEO cash compensation varies depending on the circumstance of the firm. The circumstance is defined as whether positive discretionary accruals are used to achieve earnings benchmarks: (1) report profits; (2) report income increases; (3) report income increases plus a drift factor.[7] The compensation committees can distinguish between the components of earning and reward managers when their discretionary behaviour achieves the firms' goals.

Shuto (2007) examined the effects of discretionary accruals and extraordinary items on Japanese executive compensation. In Japan, executive compensation is not publicly available and only the total amount of compensation paid to all directors is disclosed. Shuto (2007) used the total cash compensation data (the sum of salary and bonus) of the board of directors as a proxy for executive compensation and discretionary accruals were estimated from the Cash Flow Modified Jones model (Kasznik, 1999).

Using a large sample of 16,368 firm-year observations from the period between 1991 and 2000, Shuto (2007) first analyzed the relation between earnings components and executive compensation and found that non-discretionary earnings components are more value-relevant than discretionary components and shareholders are in favor of these more value-relevant earnings components in evaluating executive compensation. Moreover, this study found that managers who do not receive any bonus are more likely to exercise income-decreasing discretionary accruals and extraordinary items. Shuto (2007) interpreted this finding as evidence that managers engage in 'big bath' earnings management when there is no bonus rewarded.

Both Balsam (1998) and Shuto (2007) argued that the association between discretionary accruals and executive compensation varies depending on the

[7] Two drift factors are used, the first being the change in the consumer price index, and the second being the average growth in income over the previous five years

circumstances of a firm; the latter study examined two other circumstances: (1) when firm managers use unusually high (low) discretionary accruals to increase (decrease) income; (2) when firm managers use discretionary accruals to smooth income. The results from the Vuong (1989) test[8] suggested that shareholders should distinguish between the components of earnings and rewards managers when they smooth income to beat earnings target.

While beating relevant earnings benchmarks is found to be a circumstance under which managers will exercise positive discretionary accruals to maximize their compensation, neither study further explored the effects of missing earnings benchmarks on the CEO's compensation. Matsunaga and Park (2001) filled this gap by pointing out that CEO compensation would be reduced when a firm misses an earnings benchmark because the compensation committee may view this as a signal of poor management performance. Three earnings benchmarks were tested: (1) quarterly consensus analyst forecast; (2) the earnings for the same quarter of the previous year; and (3) zero profit.

Using 3,651 firm-year observations from 1993 to 1997, results showed significantly negative associations between the change in CEO cash bonuses and earnings below consensus analysts' forecasts and prior year earnings. Moreover, the Wald tests report the negative coefficient is significantly stronger when a firm misses the prior year's earnings more frequently, suggesting an incremental penalty on executives' compensation if the firm misses earnings benchmark more frequently. Although Matsunaga and Park's study did not involve the estimation of discretionary accruals, it has implications for studies of earnings management and executive compensation. Earnings benchmarks create incentives for managers to engage in earnings management as managers are penalized for lower bonuses when they missed earnings benchmarks.

#### 2.5.1.4 Equity-based compensation incentives

[8] Vuong (1989) test is designed to compare the explanatory power of the two competing models by computing the ratio of adjusted R-square of two competing models. Shuto (2007) used this test to imply that Net Income explains significantly more of the variation in Bonus than Non-discretionary Earnings.

Modern corporations adopt various mechanisms to align managers' incentives with those of shareholders. A contemporary executive compensation package mainly contains five components, base salary, annual bonus, stock options, stock grants, and long-term incentive plans (Murphy, 1999). As different form of compensation may have different risk and incentive profiles (Anderson et al., 2000), recent compensation related earnings management studies considered the interplay between the compensation components and their different incentives that may cause earnings management. Further, there has been a large increase in the level of CEO pay since 1980 and this growth has been driven drastically by the substantial increase in stock-option grants (Hall and Liebman, 2000). By tying executive pay to stock price outcomes, equity-based compensation encourages managers to make operating and investing decisions that maximize shareholder wealth. However, researchers suggest that tying management compensation to the stock price may bring a new set of problems. For example, CEOs who have high levels of option and stock holdings are found to manipulate earnings in order to increase their own utility at the expense of shareholders, which contrary to the designed incentive effects of equity compensation.

Gao and Shrieves (2002) investigated whether the five separate compensation — salary, bonus, options, restricted stock, and long-term incentive plans — embody different incentives for earnings management. They suggested that the non-linear payoffs from the stock options and bonus component of compensation create managerial incentives to exploit earnings manipulation to the large extent. Compared to options, restricted stocks create less incentive for earnings management because restricted stocks have linear payoffs based on stock price movements. With base salary, a manager who receives a fixed salary would have an incentive to reduce earnings management behaviour since earnings management behaviour is costly, with the costs of losing reputation, losing job, and increasing litigation risk. Finally, long-term incentive plans are compensated at a firm's long term performance, usually three to five years. Given the mean-reverting property of accruals, managers are likely to mitigate incentives to manage earnings.

Results from empirical analysis are generally consistent with the predication. Bonus and option compensation are positively and significantly related to discretionary accruals while salary is significantly negatively associated with discretionary accruals.

Restricted stocks are weakly associated with discretionary accruals with a positive sign. Long-term incentive plans are not associated with discretionary accruals. Moreover, they show that the relationship between compensation components and earnings management is conditional on proximity of pre-managed earnings to an earnings benchmark, the closer the level of pre-managed earnings to earnings benchmarks (zero earnings and prior year's earnings), the more likely that managers engage in earnings management.

Cheng and Warfield (2005) investigated five elements of executive equity incentives: option grants, unexercisable options, exercisable options, restricted stock grants, and stock ownership. They found that CEOs are more likely to sell shares in the year after earnings announcements when they have high unexercisable options or stock ownership. Moreover, the probability of earnings management is also higher for CEOs with high unexercisable options and ownership, and they tend to increase stock sales after earnings management. The underlying logic is that CEOs who are compensated heavily by equities tend to sell their shares in the future in order to reduce the risk exposure for holding them. Such trading behaviour induces earnings management to take place in an attempt to increase the price of the shares to be sold.

Without estimating discretionary accruals, Cheng and Warfield (2005) used the probability of meeting or just beating analyst's forecasts as proxy for earnings management and quantified that earnings management will be increased by 16.3 (30.5)% for every one standard deviation increase in unexercisable options (ownership). They also investigated whether equity compensation created an incentive for income smoothing. The form of income smoothing they defined was that managers avoid large positive earnings surprise equal to or greater than four cents. This finding was consistent with income smoothing behaviour that managers with consistently high equity incentives avoided reporting large positive earnings surprises, which leads to increased reserving for beating analysts' consensus forecasts in the future.

Ke (2001) linked beating profits and last year's earnings behaviour with CEOs' compensation and pointed out that CEO compensation incentives formed one set of

economic determinants of benchmark beating behaviour.[9] Using a sample of ExecuComp 1,311 publicly traded firms with 18,623 quarterly data during 1992 to 1998, the study showed that the probability of reporting small earnings increases is higher for CEOs with high equity-based compensation (measured by stock options and direct stock ownership), low future growth opportunities, low analysts pressure and low debt covenant constraints. Moreover, the duration of consecutive earnings increases is longer for CEOs with high equity-based compensation and bonus, low future growth opportunities, and low debt covenant constraints. Hence, Ke (2001) suggested that CEO compensation incentives, especially equity incentive, are important determinants of benchmark beating behaviour.

Baker et al. (2003) suggested if managers are rewarded with large portion of options relative to other forms of compensation, one way they could increase the value of the options would be to take actions to reduce the exercise price. This lower exercise price increases the likelihood that options would be 'in the money' in the future. They found firms that compensate their executive with greater shares of options relative to other forms of pay manage earnings downwards through negative discretionary accruals before the award date to reduce reported earnings and thus reduce the exercise price.

The two latest studies provide more evidence that tying management compensation to the stock price has the perverse effect of encouraging earnings management. Bergstresser and Philippon (2006) found that option holdings, option exercises and other insiders sell stocks that are associated with discretionary accruals. They suggested that stock and option holdings create strong incentives for CEOs to manipulate earnings upward. McAnally et al. (2006) reported that managers with larger option grants are more likely to miss earnings benchmarks by reporting small losses and small year-over-year earnings declines. As missing an earnings benchmark can lead to stock price decline which gives CEOs a lower strike price on option grants, they suggested that option grants create strong incentives for CEOs to miss earnings benchmarks via downward earnings management.

The above studies investigated management compensation contracts. These studies

[9] The second set of economic determinants is capital markets' expectation on future growth opportunities, analyst pressure, and debt covenant constraints.

claimed that compensation contracts create incentives for earnings management. Earnings management, for compensation maximization purpose, is often classified as contract-driven earnings management. Earnings management can be driven by capital market motives as well. In the following section, studies of capital market-driven earnings management, particularly, the behaviour of benchmark beating is reviewed.

### 2.5.2 Capital market-driven earnings management

Since 1990s, given the overall increase in stock-market valuation and the large increase in the value of equity-based compensation, researchers have noticed the importance of the capital market and its impact on earnings management. They started to depart from contractual agreements and shifted to capital-market incentives. Capital markets are found to create incentives for earnings management as short-term stock prices could be influenced by manipulated earnings. Dechow and Skinner (2000) summarized that there are four sets of earnings management studies that focus on capital markets: (1) analysis of whether managers meet or beat earnings benchmarks, (2) analysis of earnings management around equity offerings, (3) tests of whether investors are "fooled" by earnings management, and (4) tests of what is the capital market consequences after earnings management. In this section, analysis of incentives provided by stock market participants for managers to meet relatively simple earnings benchmarks is particularly focused.

#### 2.5.2.1 Benchmark beating behaviour

One stream of research on earnings management focuses on whether managers exercise discretion to meet or beat relevant earnings benchmarks (see Appendix 4). This stream of study suggested that earnings benchmarks induce earnings management because the stock prices normally would fall if a certain benchmark cannot be met (Bartov *et al.*, 2000; Skinner and Sloan, 2002). Two earnings benchmarks, zero earnings and prior year's earnings, are first examined by Burgstahler and Dichev (1997). They found that managers have incentives to avoid reporting losses and earnings declines. Beatty *et al.* (2002) further explained that markets will pay a premium to firms who show consistent earnings growth strings. Burgstahler and Eames (1998) added in evidence that analysts' consensus forecast is

another benchmark that managers would consider to meet. Two Australian studies investigated benchmark beating. Holland and Ramsay (2003) suggested that managers manipulate earnings to report profits and to sustain last year's earnings. However, Coulton *et al* (2005) did not take the view that benchmark beating behaviour is caused by earnings management.

In studying earnings benchmarks, earnings discontinuities in the distribution of earnings have been widely interpreted as evidence of benchmark beating. Hayn (1995) first observed there is a point of discontinuity around zero in the distribution of the earnings-to-price ratio with unusually high frequency firms just above zero and unusually low frequency firms just below zero. Based on the observation of discontinuity at zero earnings, she suggested that firms are expected to manage earnings upward to convert small losses to small profits because the earnings of profit-reporting firms are more strongly linked with current stock prices than the earnings of loss-reporting firms and that the magnitude of current losses is not related to stock price. Such a finding implies that managers of higher profit firms should have greater market-based incentives than those of low profit firms to manage earning to meet relevant earnings benchmarks.

Using two large samples, 64,466 and 75,999 observations covering the period from 1976 to 1994, one for testing profits benchmark and the other for testing the prior year's earnings benchmark, Burgstahler and Dichev (1997) showed the distributions of report earnings (changes) have less frequencies of firms report small losses (earnings decreases) and more frequencies of firms report small profits (earnings increases) compared to that of normal distribution. The unusually low frequencies of small losses (earnings decrease) and unusually high frequencies of small profits (earnings increases) result in a discontinuity around the benchmark in the distributions of earnings (change). Such discontinuities are interpreted as evidence on earnings management to report profits and earnings increases. Moreover, they quantify that 30%-44% (8%-12%) of the firms beat profits benchmark (prior year's earnings benchmark) when pre-managed earnings fall short of the benchmarks.[10] These estimates imply that the magnitudes of earnings management to avoid losses and earnings decreases are pervasive.

[10] Pre-managed earnings are true earnings prior to earnings manipulation.

Degeorge et al. (1999) developed an optimizing model on how earnings are managed to reach thresholds based on executive incentives. The presumption of the model is that earnings management arises from management wealth maximization incentive. In order to maximize their wealth, managers tend to manage earnings upwards when earnings falling just short of thresholds. When earnings are far from thresholds, whether below or above, managers tend to manage earnings downwards to make thresholds more attainable in the future.[11] Three thresholds are identified to help drive earnings management: to report profits, to sustain recent performance, and to meet analysts' expectations.

Using quarterly data on 5,387 firms over the 1974-1996 period, the distributions of change in earnings per share and the level of earnings per share both showed big jumps in density at two benchmarks, with too few observations falling just below it and too many at or just above it. Degeorge et al. (1999) interpreted the big jumps as evidence that executives manage earnings to sustain performance that is comparable with that of four quarters ago and to report strictly positive earnings. Moreover, the third big jump is found at the distribution of analysts' forecast error for earnings per share, suggesting analysts' consensus forecast is also an important threshold for managers. They inferred that the thresholds are hierarchically ordered: managers first consider to avoid losses, then to report increases, and finally to meet analysts' earnings forecasts.

Brown and Caylor (2005) acknowledged that the threshold hierarchy of Degeorge et al. (1999) has reversed since the mid-1990s. Meeting analysts' earnings forecasts has become predominant as firms that missed analysts' forecasts have been penalized more by the capital markets than those that missed profits and earnings increases benchmarks. In a survey of 401 financial executives, Graham et al. (2005) showed that managers view accounting earnings as a more important benchmark than cash flows and they want to meet or beat earnings benchmarks because they are concerned about subsequent effects on stock prices, their careers, and any benefits to external reputations.

[11] The underlying rationale of this model is similar to that of Healy's (1985) bonus maximization hypothesis; however, two studies test this model in an essentially different way. Healy (1985) relies on discretionary accruals, while Degeorge et al. (1999) use distribution method.

In a recent study, Daniel et al. (2008) represented a dividend benchmark that will also induce earnings management. As reported earnings is an important determinant of dividends, they suggested that managers should have the incentive to manage earnings upwards to avoid dividend cuts when managers anticipate that pre-managed earnings would otherwise fall short of the expected dividend levels.[12] They found there is a large discontinuity in the distribution of earning per share minus dividend per share for dividend payers, showing an unusually high frequency of dividend payers reporting earnings at a level just above the expected dividend benchmark. This study has implication for market research as well, because dividends are of first-order importance to investors and any dividend reductions are found to follow large negative stock price reactions.

#### 2.5.2.2 Economic consequences for benchmark beating

The foregoing demonstrations indicate that managers are more likely to engage in earnings management to meet or beat certain earnings benchmarks. There will be different economic consequences for a firm when either beats or misses an earnings benchmark. First, Barth et al. (1999) found that firms reporting continuous growth in annual earnings are priced at a premium, further, such a premium increases with the length of the string and reduces when the string disappears. Second, Skinner and Sloan (2002) found that high growth firms tend to avoid disappointing analysts. Even a small deviation from earnings expectations, growth firms' stock prices would fall sharply. Skinner and Sloan (2002) described this as the "torpedo effect" and they invoked the idea in Lakonishok et al. (1994) to explain it: investors tend to bid prices up of "growth" or "glamour" stocks as they are overly optimistic about the future earnings prospects of these stocks and these stocks' prices subsequently will fall when investors correct their over-optimism.

Dechow et al. (2000) found firms that meet analysts' forecasts are high growth and high market capitalization firms; however, those firms tend to show positive abnormal returns in the following year. This implies that benchmark beaters with high growth tend to avoid the "torpedo effect" by avoiding disappointing analysts. In a similar

[12] In this study, pre-managed earnings is measured as operating cash flows plus non-discretionary accruals minus preferred dividends, representing true income in the absence of earnings management.

vein, firms have a tendency to report several years of consecutive increases earnings. Taken a time-series approach, Myers and Skinner (2006) found that 746 U.S. firms reported at least 20 quarters of consecutive increases in quarterly earnings per share since 1962. More importantly, these firms consistently enjoyed abnormally strong stock market performances that averaged over 20% per year during the period in which they reported earnings strings, while these market premium disappeared once the strings ended.

The forementioned studies suggested that earnings benchmark beating behaviour has an economic consequence because market price movements are sensitive to a firm's earnings performance. Further, managers are assumed to be wealth-maximizers who recognize that their wealth is adversely impacted when their firms' stock prices drop if they fail to achieve benchmarks. This negative impact is especially strong when managers are compensated largely by stocks or options. As such, they will take steps to avoid reporting bad earnings news and try to meet or beat certain benchmarks. Earnings benchmarks, therefore, provide incentives for earnings management in attempt to drive capital markets up.

#### 2.5.2.3 Methods in beating benchmarks

Dechow et al. (2000) investigated this issue by using two separate samples, 44,913 firm-years observations that reporting small profits and 32,732 observations that just meet analysts' forecast. For the sample of firms that just beat the zero earnings benchmark, they found that these firms tend to exhibit higher working capital, discretionary accruals and positive special items compared to other firms. For the sample of firms that just meet analysts' forecasts, results showed that these firms have higher working capital and discretionary accruals relative to firms that just miss analysts' forecasts. These findings suggested that working capital, accruals and special items could be the mechanisms used to achieve earnings targets.

For a set of firms that are suspected of managing earnings upward to meet or slightly beat analysts' forecasts, Plummer and Mest (2001) found these firms either manage sales upward or manage operating expense downward. Nevertheless, there was no evidence to suggest that nonoperating expenses or depreciation expenses were

decreased in an attempt to manage earnings upward. This study also documented that firm characteristics were more likely to affect benchmark beating earnings management. These firms were more likely to have high levels of current assets and operating profit margin.

Phillips et al. (2003) detected earnings management to beat benchmarks through examining tax expense, total accruals and discretionary accruals. Deferred tax expenses were found to be associated with benchmark beating behaviour of reporting profits and earnings increases; whereas total accruals were found to be associated with benchmark beating behaviour of meeting analysts' earnings forecasts. The finding on deferred tax expenses suggested that managers manipulated earnings upwards primarily through generating book-tax differences of reported earnings.

Other studies have documented that managers are more likely to beat benchmarks when pre-managed earnings are below benchmarks. Payne and Robb (2000) found when pre-managed earnings were below market expectation managers will increase earnings toward analysts' forecasts; while when pre-managed earnings are above analysts' forecasts, managers will reduce income to reduce forecast errors. They explained that managers have conflicting incentives with respect to the use of discretionary accruals when pre-managed earnings exceed analyst' forecasts. On one hand, there is incentive for managers to employ income-decreasing accruals in order to 'store up' some income for future periods. On the other hand, managers may choose to preserve a positive earnings surprise in expectation of a favorable stock price reaction. Their findings supported the first prediction.

Nevertheless, Skinner (1994) pointed out that the incentive to minimize analysts' forecast errors may not apply to settings where pre-managed earnings are above analysts' forecasts. He argued that when pre-managed earnings are above analysts' forecasts, managers can choose to report higher earnings to increase stock prices now, or reduce earnings to the forecasted level. Economic penalties do not exist when the market is pleasantly surprised. However, the reverse nature of accrual accounting may support that when pre-managed earnings are above analysts' forecasts, managers tend to decrease income as they want to reserve some income for the future.

Barua et al. (2006) studied two benchmarks—analysts' forecasts and prior year

earnings and examined whether firm profitability is associated with earnings management to achieve these two benchmarks. They argue that the differential incentives as well as the propensity to manage earnings by profitable and non-profitable firms should be considered. Indeed, logistic regression shows that firms with profits before accruals management are more likely than firms with losses before accruals management to use accruals to meet or beat analysts' forecast and prior year's earnings when pre-managed earnings are below the benchmarks. This view is consistent with that of the earlier study of Hayn (1995).

#### 2.5.2.4 The relation between benchmark beating and earnings management

Earnings discontinuities are interpreted as evidence of benchmark beating. But whether those discontinuities are caused by earnings management is not clear. Many researchers thus try to investigate the connection between benchmark beating and earnings management. Dechow et al. (2003) combined the distribution method with the accrual-based approach in order to examine whether firms that just met benchmark of zero earnings and last year's earnings (zero changes in earnings) achieved these benchmarks through discretionary accruals. However, they failed to confirm that earnings discontinuities are caused by boosting of discretionary accruals. Further, they argued that the observed discontinuities are more likely due to managers taking real actions to improve a firm's performance or to meet earnings targets rather than earnings management itself.

Holland (2004) pointed out that pooled cross-sectional distribution of reported earnings may not provide statistically reliable results, if the peak of the distribution is adjacent to a threshold. The symmetric assumption used to test the frequency of earnings observation may not be justified and the choice of interval width is sensitive to the result. Beaver et al. (2007) documented another two factors of the asymmetric tax treatment of profit and loss firms and special items that may drive earnings discontinuity around these earnings benchmarks. They asserted that two-thirds of the discontinuity should be attributable to tax treatment and special items.

Deflators could be responsible for observed discontinuity around benchmarks as well.[13] Durtschi and Easton (2005) showed a discontinuity at zero in the distribution of market value of common equity deflated net income. However, such discontinuity disappeared when using un-deflated net income. They also failed to find earnings discontinuity when total assets or revenues were used as a deflator. They argued that first, a larger proportion of loss firms do not have a beginning of year price which could result in a deflator selection bias. Second, beginning of year prices for small loss firms are systematically lower than that of small profit firms. When net income is deflated by beginning of year price (market value of common equity), it will move small loss firms away from zero and small profit firms towards zero and thus induce an artificial discontinuity at zero.

The most recent studies lend strong support to the previous finings of earnings management to meet or beat single benchmarks. Jacob and Jorgensen (2007) argued that managers are particularly concerned about fiscal year earnings. Managers are also more likely to manage income for the fiscal year other than any other annual period because many bonuses and compensation schemes are based on fiscal year earnings; capital market considerations and other contractual motives for earnings management may be more salient at the end of the fiscal year; the fourth quarter affords managers the last opportunity during the year to achieve profitability and to obtain the most information about the amount of earnings needed to meet their targets. In order to support these arguments, they construct distributions for annual earnings measured over alternative periods, periods ending at the first, second, and third quarters of the fiscal year, and found the discontinuity around zero is visually apparent for fiscal year earnings but not for annual earnings computed for the alternative periods.

Another study that yields insights into the connection between benchmark beating and earnings management is Kerstein and Rai (2007). They used quarterly data and examined the change in the cumulative earnings distribution from the beginning to the end of the firm's fourth fiscal quarter. They argued that firms with either small profits or small losses at the end of the first three quarters are close to the zero-profit line of

[13] Common used deflators in the accounting and finance literature include market value of common equity, book value of common equity, sales, or total assets.

the cumulative earnings distribution, they will have lower costs of earnings management than firms further from the zero-profit line. As such, those firms are more likely to shift to the right of the distribution that leads to small annual profits. They chose firms with smallest cumulative losses or profits after three quarters as the treatment group and formed their control group by using the firms next to the treatment group. They found that treatment group firms in the smallest loss interval by the end of the third quarter shifted at a higher rate than the control firms into the smallest annual profit interval. Also, treatment firms in the smallest cumulative profits interval at the end of the third quarter have a higher rate than the control firms to remain in the smallest annual profit interval, rather than falling into the smallest annual loss interval. Therefore, they interpreted such abnormal shifts by treatment firms into the smallest annual profit interval as evidence of upward earnings management to report small annual profits.

In contrast to previous end-of-year earnings focus, Jacob and Jorgensen (2007) and Kerstein and Rai (2007) examined the change in the cumulative earnings distribution from the beginning to the end of the firm's fourth fiscal quarter. They lent strong support to the view that benchmark beating is caused by earnings management by identifying the abnormal movements—firms shift abnormally within the fourth-quarter earnings distribution to achieve annual profits. The merit of these two studies is also that investors and analysts can use quarterly data to unravel a part of a manager's earnings management in the fiscal year earnings by choosing to analyze a firm's performance reported on a different annual basis than the one reported in the annual financial statements. However, the limitation is that firms may also manage non-fiscal year period earnings since some contracts, for example, debt contracts, are based on earnings for rolling annual periods. If earnings were managed during a non-fiscal year period, the patterns induced by earnings management to meet fiscal-year targets would therefore become less distinct.

In Australia, Holland and Ramsay (2003) first detected earnings management to achieve earnings targets. They examined earnings distribution at two benchmarks of zero earnings and sustained last year's earnings by using a sample of approximately 480 firms each year covering the period of 1990 to 1997. They found more small profits and small earnings increased than expected and conversely, fewer small losses

and small earnings decreased than expected. Holland and Ramsay (2003) interpreted observed discontinuities as the evidence of Australian firms practicing earnings management in order to report positive earnings, and to sustain last year's earnings performance. However, Coulton et al. (2005) suggested that caution is required in interpreting earnings discontinuity as evidence of earnings management. Although they showed evidence comparable to Holland and Ramsay (2003) of an unusually large number of Australian firms reporting a small profit or small increase in earnings by using a sample of 6,436 firm-years observation for the period 1993 to 2002, they did not find significant differences between discretionary accruals for the benchmark beating and just miss groups.

## 2.6 Review of Australian studies

The review of Australian studies of earnings management in the appendix 1 shows that there are 17 published articles are related to earnings management during the period of 1998 to 2008. Earnings management evidences have been documented in the setting of income-smoothing (Black et al., 1998); price control and political concerns (Lim and Matolcsy, 1999; Godfrey and Jones, 1999; Monem, 2003); takeover (Eddey and Taylor, 1999); CEO changes (Wells, 2002; Godfrey et al., 2003); benchmark beating (Holland and Ramsay, 2003; Coulton et al.,2005); corporate governance and Institutional investor type (Koh, 2003; Hsu and Koh, 2005; Davidson et al., 2005; Koh, 2007); economic setting of Australia's 'Old' and 'New' economies (Jones and Sharma, 2001); banking industry (Anandarajan et al.,2007); and earnings restatements (Ahmed and Goodwin, 2007). The review of Australian research not only shows that research on earnings management is limited within the Australian context, but also reveals the gaps within existing studies. For example, the executive compensation incentives have not yet been well examined in the Australian context.

## 2.7 Chapter Summary

To date, researchers have questioned whether and why earnings management takes place. The literature review in this chapter is structured to surround these two issues—the detection of earnings management and earnings management incentives. Various approaches in detecting earnings management are first reviewed with the emphasis on

the accrual approach. Knowing which industries and what kind of firms are more likely to engage in earnings management enhances the detection of earnings management behaviour. So, studies of how earnings management activities vary across industries and firm characteristics are also reviewed. Various incentives that drive earnings management are then reviewed with the emphasis on executive compensation and benchmark beating behaviour. In general, the literature shows that empirical findings are mixed and inconsistent. Given the dynamic nature of earnings management behaviour, this thesis extends prior research by using more relevant, recent, and large-scale data to detect earnings management, capture earnings management behaviour from both industry sectors and firms. Also, this study examines the levels and mix of compensation incentives and benchmark beating incentives and their impacts on earnings management.

# Chapter3
# Research and Investigation Issues

## 3. 1 Introduction

Many empirical studies of earnings management investigate whether earnings management takes place. Since the mid-1980s, the investigation has focused primarily on accruals. Empirical studies of earnings management also focus on in which settings earnings management is more likely to take place. The first setting is executive compensation. Extensive literature has emerged to test the relationship between executive compensations and earnings management and many studies have documented the way compensation contracts create strong incentives for earnings management. The second setting is earnings benchmarks. As capital markets exert pressure on managers, managers have incentives to avoid disappointing the markets, and thus manage earnings upward to beat or meet relevant earnings benchmarks. However, the various methodological issues and inconsistent results of prior studies suggest that the detection of earnings management has as yet not been conclusively determined. Moreover, the relation between executive compensation and earnings management and the relation between benchmark beating and earnings management has not as yet been well understood.

Extensive prior research is drawn upon to formulate the research and investigation issues in this chapter. First, it critically evaluates the strengths and weaknesses of using accruals in detecting earnings management. Second, it takes a comprehensive view of the executive compensation contract, discussing the relation between executive compensation incentives and earnings management based on both total compensation and its decomposed individual components. Third, it demonstrates why benchmark beating creates incentives for earnings management and under what circumstance managers are more likely to exercise discretion to beat benchmarks. The discussion on how to detect earnings management through accruals will be the foundation for the subsequent investigation of the executive compensation and benchmark beating incentives.

### 3.2 The detection of earnings management

In order to detect potential earnings management, researchers first need to understand a firm's accounting practices because there are a variety of options that managers can use to either increase or decrease earnings. In the 1970s and early 1980s, a large number of studies found that managers can exercise discretion through the choice of accounting methods or polices. For example, managers can choose different accounting methods or policies, such as inventory valuation policy, depreciation method, and the treatment of bad-debt provision. Since the mid-1980s, studies of earnings management have focused primarily on the investigation of accruals. Many researchers in this field have tried to detect earnings management by disentangling accruals into discretionary and nondiscretionary accruals. Managers are expected to use discretionary accruals, shifting revenue between periods or deferring recognition of expenditures. Specific accrual, real transactions, income-smoothing, and benchmark beating are also used in detecting earnings management.

#### 3.2.1 Detecting earnings management through discretionary accruals

Fundamentally, more management discretions are made through accruals. More accruals are in place simply because the accounting system creates accruals in order to recognize revenues when they are earned and match expenses to those revenues, irrespective of whether cash has been received or paid. This matching principle makes accounting earnings a better economic measure of firm performance than cash flows.

Since the mid-1980s, there has been explosive growth in using accruals to detect earnings management. Healy (1985) noticed the fact that accruals modify the timing of reported earnings and thus enable managers to transfer earnings between periods. So, he broke down earnings into cash flow from operations and total accruals and estimated the discretionary proportion of accruals by using total accruals. The method of accrual proxy has been widely applied in detecting earnings management. For example, DeAngelo (1986) detected that managers systematically understate earnings prior to the buyouts through the changing of total accruals. Jones (1991) found that discretionary accruals are used to reduce income during import relief investigations. McNichols (2000) found that, between the periods of 1993 to 1999, the greatest number of studies used the accruals approach based on the Jones Model. She also

suggested discretionary accruals are widely accepted as a proper proxy for earnings management based upon the large number of published studies. Moreover, the review of executive compensation indicates many studies, for example, Holthausen et al. (1995), Gaver et al. (1995), Balsam (1998), Guidry et al. (1999) Gao and Shrieves (2002), and Shuto (2007) rely on the accrual method and focus on whether discretionary accruals are consistent with the incentive provided by executive compensations.

In terms of the perspective of manipulators, managers may prefer to use accruals in manipulating earnings. Under the accrual accounting system, managers are allowed to make adjustments to cash flows through accruals. Healy (1985) suggested that changing a firm's accounting policies is more costly. Managers are more likely to exploit the flexibility of accruals to shift earnings between periods by changing accruals. Managers are also more likely to exercise discretion through accruals rather than the cash flow component of earnings. Healy (1985) suggested that managers observe cash flows from operations at the end of each year and selects accruals to maximize their personal wealth.

Second, managers may prefer to use accruals because they find them to be more subtle and do not require disclosure. Accruals include many estimates and transactions, whose total effect on accounting earnings is neither disclosed nor easily estimable. In contrast, any change in accounting choices or real transactions must be disclosed, which makes managers' discretion easy to monitor. Gaver et al. (1995) pointed out that discretionary accruals are the prime measures for earnings management because the level of discretionary accruals is difficult to be monitored by outsiders. Holthausen et al. (1995) also explained that the reason why executives prefer to manipulate earnings through accruals instead of changing accounting methods is that auditors look for consistency in the accounting policy for each reporting period; therefore, any manipulation through a change to accounting policy would be easily detected.

From the perspective of detectors, researchers (or regulators) can understand earnings management better because accruals measure earnings management in a more comprehensive manner. First, earnings management does not always have to be related to changes in accounting policies, it goes beyond accounting choice. For

instance, managers can simply speed up sales by providing customers with attractive discounts and more flexible credit terms without changing any accounting policies or methods. Although some accounting choices are made to achieve a goal that is consistent with earnings management, not all accounting choices involve earnings management.

Second, the likelihood of detecting earnings management is increased since accruals aggregate the net effect of numerous accounting decisions and choices. Managers may exercise discretion through multiple accounting choices to accomplish a specific goal. In this case, examining accruals can capture the net effect of all accounting choices that a firm made during the period under consideration. In the context of executive compensation, for example, Healy (1985), Gaver et al. (1995), Holthausen et al. (1995) and Guidry et al. (1999) investigated the use of discretionary accruals to manage earnings to increase bonus payments. The research design in all these papers overcomes, at least partially, the problem of multiple accounting choices because they consider discretionary accruals in total. As a result, the aggregate measure increases the power of the tests, making it more likely to detect the existence of earnings management.

Third, researchers found it is difficult to detect earnings management through real actions, because there is no benchmark to determine the right actions that managers have taken. With business environment uncertainty, managers are protected by law. It is difficult to judge whether managers' actions in response to business environment uncertainty are right or wrong, thus making it difficult to found them liable for bad business decisions, if any. For example, Ball and Shivakumar (2008) are unable to detect real earnings management in their sample of IPO firms because the shadow financial statements do not disclose the benchmark against real actions.

Fourth, earnings management is more likely to be detected through discretionary accruals than through a specific accrual because, most of the time, managers tend to exercise discretion through different accruals. Moreover, the number of firms using a specific accrual to manipulate earnings may be relatively small compared to the number of firms using various accruals. Therefore, the specific accrual approach may preclude detection of earnings management behaviour if a specific accrual is not sufficiently sensitive. In addition, a specific accrual approach has often been applied

to banking industries where some particular accrual accounts are very material, due to the specific nature of the business. However, the aim of this thesis is to detect the magnitude and the direction of earnings management in the broader context of the Australian market. Discretionary accruals, therefore, offer a more general approach.

Finally, income-smoothing and earnings distribution are two methods of detecting specific forms of earnings management. For instance, the income-smoothing approach is useful in detecting earnings management which has a clear objective of reducing the temporal volatility of earnings and to produce a steadily growing stream of profits. The earnings distribution approach is useful in detecting the benchmark beating type of earnings management. Both methods have narrower applications in detecting earnings management. The approach of income-smoothing has lost its popularity while earnings distribution is relatively new.

Based on the discussion of the strengths and weaknesses of the accrual approach, this thesis advocates discretionary accruals, as proxies for the aggregate effect of earnings manipulation are more desirable than accounting choices, real transactions, income-smoothing and specific accrual. Therefore, the level of discretionary accruals is a prime candidate for earnings management. This thesis detects earnings management that is mainly focused on discretionary accruals.[14] Discretionary accruals, defined as the estimation error from various models, are the proxy for earnings management. Firms are hypothesized to engage in upwards earnings management if discretionary accruals are positive and significantly different from zero; while firms are hypothesized to engage in downwards earnings management if discretionary accruals are negative and significantly different from zero. Therefore, this study first hypothesizes that Australian firms use discretionary accruals to manipulate earnings.

*H1: Australian firms engage in earnings management via discretionary accruals*

### 3.2.2 Earnings management and industry setting

Prior studies suggest that it is probable that industry has an effect on a firm's earnings management decisions. First, earnings management behaviour may vary across

[14] Discretionary accruals are used for broad detection. Earnings distribution is also used to detect earnings management to beat specific benchmarks.

industries because different industries may have different accounting procedures. For example, manufacturers and retailers often have a higher level of inventories and account receivables. Managers of those firms thus can easily shift earnings through inventory valuation and bad debt provisions. Managers of banking firms are more likely to exercise discretion through issuing credit risks and interest rates while managers of the airline industry prefer to use depreciation policies. Different accounting policies also determine the level of flexibility managers can exploit in exercising discretions. In some industries, managers may have greater flexibility and thus have a greater propensity to manipulate earnings, while in other industries with restrictive accounting rules, managers may have less opportunities to engage in earnings management. For example, regulations are more restrictive in regulated industries than unregulated industries, which reduce the manager's discretion over accruals and limits the flexibility to manage earnings. Therefore, accounting procedures and regulations differences are expected to cause the variability of accruals and, thus, the variability of earnings management behaviour.

Second, the business cycle may differ among industries and this affects managers' decisions in exercising discretions. Eckel (1981) pointed out those managers' decisions are influenced by the environment of the firm and a model of functioning should imply certain operational practices and some accounting choices. Rajgohal et al. (2007) found that macro economic incentives, for example GDP, drive earnings management incentives. Hayn (1995) suggested the earnings response coefficients are smaller for firms reporting losses than for firms reporting profits. Investors' slow response may encourage firms in the industry during recession to decrease income further in order to reserve some income for the recovery phase of the business cycle. After the recession period, they will release those earnings reserves and report stronger earnings recovery than their peers. The implication is that firms within the same industry and in the same fiscal year may have similar incentives to engage in earnings management. Moreover, individual firms' earnings management activities in the same industry are expected to be highly correlated because of similar market conditions and business operating cycles.

Third, industry growth prospects may also influence earnings management behaviour. Prior studies provide evidence that industry prospects affect a firm's financial

decisions and capital structure (Harford, 2005; Mackay and Phillips, 2005). High growth industries, for example, information technology, are more likely to exhibit a fluctuating income stream. In Australia, fast growth industries tend to show lower average corporate profits while slow growth industries tend to exhibit higher average corporate profits (Jones and Sharma, 2001). Hence, financial variables may be more volatile in these fast growing industries, allowing good camouflage for more earnings manipulations.

Fourth, earnings management may vary over time. Various measures of earnings quality suggest the quality of financial reporting has declined over time. As Levitt (1998) stated there was a trend showing that the quality of financial reporting is on the decline and earnings management is on the rise. The issue of whether earnings management has increased over time is important for investors, researchers and regulatory bodies. If earnings management has indeed increased over time, a time-series analysis of financial statement is necessary and adjustments are required for varying levels of earnings quality. If earnings management varies across industries, auditors must take this into consideration in analyzing financial statements. Likewise, investors should take this into consideration in firm valuations.

Therefore, an industry-wide and time-series analysis of earnings management can shed light on the debate of whether or not earnings management takes place. Investigating earnings management across several industries and over time will be helpful, especially considering the backdrop of recent accounting scandals involving corporate collapses. Therefore, this thesis proposes the aggregate level and directions of earnings management varies across industries and time during the sample periods.

*H2: The Australian firms' earnings management behavior varies across industries and years*

### 3.2.3 Earnings management and firm characteristics

Earnings management behaviour is not independent from the firm's performance. Although firms in the same industry face similar market conditions and growth prospects, managers' decisions towards earnings management may vary across firms

because of different firm characteristics. Thus, it is expected that earnings management behaviour will vary across different firms.

#### 3.2.3.1 Firm size

Firm size is one of the most important firm characteristics that have been examined in the earnings management literature. Large firms are more likely to operate in a mature stage of the business cycle. They tend to enjoy more benefits of economy of scale than small firms and they tend to take fewer risks. Operating volatilities can be diversified through different business sectors. All this implies that large firms have lower overall operating volatility which consequently leads to lower variability of accruals. In addition, large firms are more politically sensitive, scrutinized more by analysts and institutional investors. Thus, they will have fewer incentives to manage earnings than small firms. Bathke et al. (1989), Sloan (1996), Koh (2003) Holland and Jackson (2004), Sanchez-Ballesta and Garcia-Meca (2007) all confirmed that firm size is negatively related to the earnings management. The exception is Watts and Zimmerman (1978) who suggested that, because large firms are more politically sensitive and bear high political costs, they will use income-decreasing earnings management to reduce political costs. Therefore, this thesis first hypothesizes that a firm's size has an effect on earnings management behaviour.

*H3.1: The Australian firms' earnings management behavior is associated with firm size*

#### 3.2.3.2 Growth opportunities

A firm's growth opportunities may come from two channels of external financing and internal operating. Financing from institutions can affect a firm's earnings management behaviour as a high level of debt may induce either upwards earnings management to avoid technical default (DeFond and Jimbalvo, 1994) or downwards earnings management to obtain better terms in the contract renegotiation (DeAngelo et al., 1994). Aggressive earnings management is also evidenced in capital raising through IPOs or SEOs (Teoh et al., 1998a, 1998b). When a firm's growth opportunity comes from internal operating results, that is, retained profits, Dechow et al. (1995)

showed that accruals are correlated with a firm's earnings performance. Others, Beaver et al. (1968), Dechow et al. (1998), Young (1999), McNichols (2000), Skinner and Sloan (2002), Pincus and Rajgopal (2002), and Firth et al. (2007) all suggested a positive association between a firm's growth level and earnings management. Therefore, this study also hypothesizes that earnings management levels will be higher when a firm's growth rate is higher.

*H3.2: The Australian firms' earnings management behavior is positively associated with growth opportunity*

#### 3.2.3.3 Profitability

The variability of accruals also depends on a firm's profitability. There are two sides of the arguments. On one hand, it is expected to be higher for firms suffering a loss, than for firms enjoying a profit, as firms suffering a loss will normally have a cash flow squeeze problem and therefore demand more from external finance (Wang, 2004), and external financing is found to trigger earnings management, as previously discussed. The variability of accruals is also higher when a firm is making a loss because losses indicates more transitory components of earnings as a result of accounting conservatism (Basu, 1997), and a part of transitory earnings components is accruals. On the other hand, earnings management is more likely to be present in a profit making firm. Hayn (1995) demonstrated that profitable firms have greater incentives than less profitable firms to manage earnings to meet earnings benchmarks, since their earnings are more responsive to market valuation than the earnings of loss-reporting firms. Barua et al. (2006) suggested the propensity to manage earnings by profitable and non-profitable firms should be considered. Therefore, this study expects that a firm's profitability has an impact on earnings management behaviour.

*H3.3: The Australian firms' earnings management behavior is associated with profitability*

#### 3.2.3.4 Leverage

Leverage is found to be associated with the level of earnings management. Watts and Zimmerman (1978), Press and Weintrop (1990), DeFond and Jiambalvo (1994), and Dechow et al. (2000) suggested that the higher a firm's leverage, the more likely the manager will be able to select upward earnings management to prevent covenant violation or to prevent adverse affects on their debt rating. However, DeAngelo & Skinner (1994) argued that managers of financially troubled firms would highlight the firm's financial difficulties by reducing the reported earnings so that they could obtain better terms in their contract renegotiations. Charitou et al. (2007) suggested that firms decrease earnings before bankruptcy because they can blame the 'old' management for the firm's distressed condition. Despite the two opposing arguments, a firm's leverage provides incentives for earnings management. In addition to providing the incentive, the higher debt level also gives managers more flexibility to exercise discretion through short-term liabilities. Therefore, this study also expects the behaviour of earnings management is affected by a firm's leverage level.

*H3.4: The Australian firms' earnings management behavior is associated with leverage*

#### 3.2.3.5 Book-to-market

Previous studies found the book-to-market ratio is a good indicator of the markets' expectation on future growth opportunities. High book-to-market ratio indicates value stocks while low book-to-market ratio indicates growth stocks (Fama and French, 1992; Smith and Watts, 1992). Several studies document how firms manage earnings to increase stock prices, so as to meet the market's expectation. Subraranyam (1996) found managers of low book-to-market firms tend to have greater incentives to engage in earnings management to beat earnings targets because stock prices in such firms are more sensitive to reported earnings. Bath et al. (1999) and Skinner and Sloan (2002) found that firms with low book-to-market ratio will suffer a disproportionately large decline in market value when they report an earnings disappointment. Sawichi and Shrestha (2008) also found that firms with low book-to-market ratio have income-increasing discretionary accruals. Therefore, this study proposes that earnings management behaviour will be negatively associated with a firm's book-to-market ratio.

*H3.5: The Australian firms' earnings management behavior is negatively associated with book-to-market ratio*

### 3.2.3.6 Capital intensity

When a firm operates in an environment with a long operating cycle, larger working capitals are required for a given level of operating activity. Working capital (or current) accruals are also demonstrated to be more important for mitigating timing and matching problems in cash flows than long-term operating accruals (Dechow, 1994). So, firms with longer operating cycles are expected to have more working capital, and more working capital accruals are utilized to reduce the timing and matching problems of cash flows. This is reflected in low capital intensity with a higher proportion of current assets/liabilities relative to noncurrent (fixed) assets/liabilities. Hence, low capital intensity is expected to provide more room for managers to exercise discretion through working capital accruals (Burgstahler and Dichev, 1997). Therefore, this study hypothesizes the capital intensity has a negative effect on earnings management behaviour.

*H3.6: The Australian firms' earnings management behavior is negatively associated with capital intensity*

### 3.2.3.7 Lagged total accruals

The mean reverting feature of accruals suggests that a high (low) level of lagged total accruals will reduce (increase) a manager's ability to manage earnings upward in the current year. In examining equity offering, Teoh et al. (1998c) found that managers increase accruals and thus overstate earnings in periods prior to initial public offers followed by a reversal of accruals in the year after issuing. In Australia, Koh (2003) found lagged total accruals are not associated with current year discretionary accruals. However, in a later study, Hsu and Koh (2005) suggested that lagged total accruals are negatively significant for most discretionary accrual models, which is consistent with the view that large prior year accruals reduce accounting flexibility for later

years. Therefore, lagged total accruals are expected to be negatively associated with a firm's earnings management behaviour.

*H3.7: The Australian firms' earnings management behavior is negatively associated with lagged total accruals*

### 3.3 Earnings management incentives

The detection of earnings management has been linked also to management incentives. Since it is difficult to detect the existence of earnings management, management incentives provide researchers with conditions under which earnings management activities are more likely to be detected. Many explicit and implicit contractual arrangements between a firm and its stakeholders are identified to provide incentives to managers to engage in earnings management. Researchers also have noticed the importance of the capital market and its impact on earnings management. They started to depart from contractual agreement and to shift to capital-market incentives.

#### 3.3.1 Executive compensation incentives

According to the agency theory, agency conflicts between managers and shareholders occur when a firm's ownership and operation are separated and when managers can better access a firm's information than shareholders (Jenson and Meckling, 1976). Managers may seek to maximize their own utility at the expense of corporate shareholders or debtholders (Jenson and Meckling, 1976; Fama, 1980; Fama and Jensen, 1983). Firms therefore design contracts "*to motivate a rational agent (manager) to act on behalf of a principal (shareholder) when the agent's interests would otherwise conflict with those of the principal*" (Scott, 1997, p.287). Two particular contracts that firms have designed to restrict managers' actions are management compensation contracts between the firm and its managers and debt contracting between the owners/managers and the debtholders.

Executive compensation contracting is a setting where earnings management behaviour is most likely to be detected. First, compensation contracts are often tied to reported earnings. Sibson and Company's (1991) survey indicates that earnings are

almost universally used in executive compensation contracts. It is also well established that accounting earnings directly affect CEOs bonuses and indirectly affect CEOs equity compensation through stock prices. As Bath et al. (1999) and Skinner and Sloan (2002) state, the market highly values stocks with future growth, and accounting earnings are viewed as an important signal for future growth opportunities. Peng and Roell (2004) found that the likelihood of litigation is associated with earnings management, and such correlation is at least partly driven by earnings management induced by executive incentive pay.

Second, earnings management may take place in the compensation contracting because it is costly for compensation committees and debtholders to "undo" earnings management. Sloan (1996) and Xie (2001) documented evidences that outsider investors are often fooled by managers' manipulation. Bradshaw *et al.* (2001) found evidence that investors do not appear to anticipate problems associated with high accruals and thus fail to see through the management's opportunistic behaviour. Even if investors can see through earnings manipulation, managers may still myopically manage earnings as long as investors use earnings information to evaluate the firm. This is why Shivakumar (2000) argued that even though capital markets are not fooled by earnings management, managers will engage in earnings management prior to equity offerings.

Third, compensation contracts create incentives for earnings management also because those contracts may not always be optimal. While initially firms may contract with their managers optimally, over time, managers' incentives could become misaligned with optimal levels. For example, when a firm is growing, more investment opportunities are emerging. Equity-based compensation in a fast growing firm tends to induce managers to take risky projects, which may lead to an increase in short-term stock prices and thus an increase in personal gain. The firm or shareholders may not be able to reduce equity-based compensation or re-contract with CEOs because managers may not work as hard as before, or shareholders themselves prefer the risky investments.

Given the above reasons, extensive literature has emerged testing the relationship between executive compensations and earnings management, and many studies have demonstrated that compensation contracts create strong incentives for earnings

management. Further, researchers point out that empirical analysis must consider the interplay between the components of total compensation since different components have different risk and incentive profiles (Anderson et al., 2000). Therefore, instead of focusing on only one compensation component, contemporary studies tend to examine compensation incentives through studying a mixed compensation package. To this researcher's best knowledge, no studies in Australia exist that assess earnings management in the context of executive compensation incentives and total CEO compensation packages. Therefore, this thesis takes a comprehensive view of the compensation contract and provides evidence on the executive compensation mix and earnings management.

#### 3.3.1.1 Total compensation

Modern executive total compensation packages contain main five components: salary, bonus, options, shares and long-term incentive plans (LTIPs). In Australia, total executive remuneration packages include salary, fees, benefits, bonuses, superannuation contributions, termination payments, shares, options granted, and long-term incentive plans. Although as total compensation increases, salary, bonus, options, shares, and LTIPs increase, creating different incentives for earnings management, the level of total compensation matters from the perspective of the CEO's personal wealth realization. Managers will exploit linear and non-linear payoff structures derived from different components of the compensation structure and tend to realize the largest gain from total compensation. For the components that are determined by accounting performance, managers will focus on reported earnings. For the components determined by stock performance, managers will focus on stock prices. Both reported earnings and stock prices can be influenced by accruals manipulation. Total compensation induces managers participation in accruals manipulation towards a high overall level of executive payment.

It is predicted that CEOs who receive relatively large sums of total compensation will engage in earnings management in a great magnitude, in particular, the direction of earnings management is more likely to be upwards and less likely to be downwards. Thus, this thesis first hypothesize that earnings management is associated with total executive compensation.

*H4.1: The Australian firms' earnings management behavior is positively associated with executive total compensation*

### 3.3.1.2 Fixed compensation

Earnings management, *per se*, carries costs. It is well-documented that firms that need to restate their financial statements experience a decrease of about 10% in firm value (Palmrose et al., 2004). Also, the likelihood of litigation increases with the extent of earnings management. Karpoff et al. (2006) provided the outcome of such litigation in detail: $13.6 billion in fines and $100 billion in reputational penalties and lawsuit damages for companies involved in financial misrepresentations during the period of 1978 to 2002. CEOs may also lose their jobs or reputations if aggressive earnings management leads to allegations of accounting fraud. Therefore, given that earnings management is costly, managers' decisions in exercising discretion depends on whether there is a favourable tradeoff between personal wealth realizations and earnings management costs.

A CEO who is compensated largely by fixed compensation should have less incentive to engage in earnings management because personal wealth gain may not exceed the costs significantly. Fixed compensation (for example, salary) is set at levels that are competitive within the market and is relatively insensitive to earnings change and price movement. When a manager's compensation is fixed, it is unlikely that the managers will scarify their reputations and jobs to be involved in earnings management practices, since any manipulation will not result in a dramatic increase in fixed compensation. In fact, when earnings management induces a high cost or a litigation risk, managers whose compensation is highly fixed would have an incentive to reduce the degree of earnings management in order to reduce the cost and risk.

Australian CEOs' fixed remuneration is made up of base salary, superannuation contributions, retirement and other benefits. This current study proposes fixed compensation will create disincentives for earnings management. Australian CEOs who receive relatively large amounts of fixed compensation will engage in earnings management of a lesser magnitude, including both upwards and downwards direction of earnings management.

*H4.2: The Australian firms' earnings management behavior is negatively associated with executive fixed compensation*

### 3.3.1.3 At-risk compensation

A typical structure of executive compensation consists of not only base salary, but also of incentive compensations, including both short-term and long-term incentive compensations. Short-term incentive plans mainly consist of cash bonuses, which are determined by a company's financial performance, such as reported earnings. Long-term incentive compensation is often made up of options, shares, and LTIPs and those components are tied to stock performance. The wealth of CEOs who receive incentive compensations is sensitive to either accounting earnings (i.e. bonuses) or stock prices (i.e. options, shares and LTIPs). In Australia, both short-term and long-term incentive compensations are classified as at-risk compensation. At-risk compensation of a CEO is a mix of cash bonus, options, shares, and LTIPs. Although the literature has documented important trends in the changing executive compensation structure, with equity-based compensation increasing substantially in the last decade, options, shares and LTIPs still remain a small proportion of Australian CEOs pay. Bonuses appear to dominate other incentive compensations.[15]

Theoretically, incentive compensation is designed as a mechanism to align managers' incentives with those of shareholders' (Jensen and Meckling, 1976). Managers should be motivated by the incentive compensation to put real efforts to improve earnings performance and shareholders' values. However, incentive compensation can also induce managers to fixate on earnings figures and short-term stock prices, which can lead to opportunistic behaviour of earnings management to increase their incentive payments. Watts and Zimmerman (1978), Healy (1985), Holthausen et al. (1995), and Gao and Shrieves (2002) have demonstrated how managers have incentives to manage earnings upwards to maximize their bonus rewards. Cheng and Warfield

[15] In Table 6.1, the descriptive statistics show that during the sample period of 2000 to 2006, 29.52% of CEOs received option grants, the average dollar value accounts for 10.55% of total compensation; 5.53% and 5.02% of CEOs received shares and LTIPs, fairly small proportions, the dollar values account for 2.25% and 2.91% of total compensation; 31.12% of CEOs received bonuses, the average amount is 14.29% of total compensation.

(2005) and Bergstresser and Philippon (2006) found that CEOs are more likely to engage in earnings management when they receive high equity-based compensation.

Given the relatively large proportion of bonuses that Australian CEOs receive, it is predicted that the effect of at-risk compensation on earnings management will mainly attribute to short-term incentive bonus compensation. Therefore, it is predicted that CEOs who receive relatively large amounts of at-risk compensation will engage in earnings management to a great magnitude, in particular, the direction of earnings management is more likely to be upwards and less likely to be downwards.

*H4.3: The Australian firms' earnings management behavior is positively associated with executive at risk compensation*

#### 3.3.1.4 Salary

Many researchers have explored whether incentive compensation drives earnings management without considering salaries (for example, Healy, 1985). Some of the researchers investigated the association between cash compensation, the sum of fixed salary and bonus, and earnings management, and drew conclusions without considering that these two components may have different effects (for example, Balsam, 1998). Gao and Shrieves (2002), who differentiated fixed compensation from other components, found that salary is significantly negatively associated with the aggregate magnitude of earnings management. They interpreted this result as the evidence that fixed compensation creates a disincentive for earnings management.

The argument that salary will reduce executives' incentive for earnings management is similar to that of fixed compensation. Salary, as the major component of executive fixed compensation, is determined at an average level within the industry. It is less fluctuated to the changes of reported earnings and stock prices. A CEO who is compensated largely by salaries is expected to have less incentive to engage in earnings management activities because such activities will not dramatically increase their salary payment; meanwhile, they may face a high cost in violating accounting regulations.

In Australia, salary is the single most important component in the executive compensation package.[16] As Australian CEOs receive relatively large amounts of salaries, this study proposes salary will create disincentives for earnings management. Australian CEOs who receive relatively large amounts of salary will engage in earnings management of lesser magnitude, including both upwards and downwards directions of earnings management.

*H4.4: The Australian firms' earnings management behavior is negatively associated with executive salary*

#### 3.3.1.5 Bonus

The link between bonuses and earnings management is one of the most thoroughly investigated areas of empirical research in earnings management. Bonuses create incentives for earnings management because a cash bonus plan is directly linked to accounting earnings. Jensen and Meckling (1976) suggested that managers would benefit from income-increasing manipulation when such manipulation transfers wealth from stakeholders to managers via higher bonuses. Watts and Zimmerman (1978) were among the first to propose that managers have incentives to maximize the value of their bonus awards by always selecting income-increasing accounting policies. In contrast to Watts and Zimmerman's positive accounting choice theory, Healy (1985) developed a competing bonus plan maximization hypothesis. He suggested that managers will select income-decreasing accruals in the years when pre-managed earnings are either far below the lower bound or well above the upper bound defined by the bonus plan. In all other years, managers are expected to select income-increasing accruals. However, Holthausen et al. (1995) did not support Healy's bonus plan hypothesis. They found no evidence that managers engage in downward earnings management when earnings are below the lower bonus bound. In fact, Gaver et al. (1995) found that managers select income-increasing accruals even when earnings fall below the lower bonus bound.

In Australia, bonuses represent the second largest fraction of the total executive compensation package. Bonuses are set, based on meeting or exceeding company

[16] In Table 6.1, the descriptive statistics show that above 90% of CEOs received salaries during the period from 2000 to 2006, the mean value accounts for 54.05% of total compensation.

profit targets, and eligibility for payment only exists when the company's after tax profit meets or exceeds the budget approved by the Board. As Australian CEOs receive relatively large levels of cash bonuses and bonuses are tied to earnings performance, this study proposes that Australian CEOs who receive relatively large amounts of cash bonuses will engage in earnings management in a large magnitude, in particular, the direction of earnings management is more likely to be upward and less likely to be downward.

*H4.5: The Australian firms' earnings management behavior is positively associated with executive bonus pay*

#### 3.3.1.6 Options

CEOs compensation generally includes some equity in order to encourage risky investments in order to increase firm value. However, if a CEO has too much wealth tied to stock prices then he/she will take action to artificially inflate reported earnings. Jensen and Meckling (2005) suggested the root of aggressive accounting is equity-based compensation, especially options. When compensation is tied to stock price, managers are motivated to use aggressive accounting to increase short-term stock prices and thus maintain the overvaluation of their equity holdings.

Prior studies show that option compensation creates bidirectional incentives. On the one hand, Cheng and Warfield (2005), and Bergstresser and Philippon (2006) found that option holdings and exercises create incentives to manage earnings upward. The values of option holdings and exercises are their intrinsic values. Since the intrinsic value is measured as the difference between the strike price and the exercise-date market price, ceteris paribus, the values of option holdings and exercises increase as the firm's stock price increase before the exercise date. Evidences from Cheng and Warfield (2005), and Bergstresser and Philippon (2006) thus suggested that managers use income-increasing discretionary accruals to increase stock prices surrounding the option exercise date. When CEOs receive option compensation, their wealth becomes a convex function of stock price; that is, they benefit from an increase in the stock price associated with earnings manipulation, whereas they do not lose much if the

stock price declines. Therefore, earnings management which increases the stock price will positively affect the value of the CEO's option holdings.

In contrast, Baker et al. (2003) and McAnally et al. (2008) demonstrated how option grants create incentives to lower current earnings. As the value of option grants is determined by the strike price which is the grant-date market price, the values of option grants can be increased by decreasing the stock price on or before the grant date. Findings from Baker et al. (2003) and McAnally et al. (2008) suggested that high option compensation is associated with downward earnings management, which temporarily depress as the firm's stock price prior to the option grant date, thereby lowering the options strike price.

Due to the availability of option grants data, this present study proposes that option grants create incentives for downwards earnings management. Australian CEOs who receive option grants will have a greater propensity to engage in earnings management, and in particular, the direction of earnings management is more likely to be downwards than upwards.

*H4.6: The Australian firms' earnings management behavior is positively associated with executive option grants*

#### 3.3.1.7 Shares

Share grants also tie CEO wealth to stock price and may create incentives for earnings management. However, CEOs' share grants have not been identified in the literature as an important determinant of earnings management (Cheng and Warfield, 2005). This is because, unlike options, share grants generate payoffs which have a symmetric relation to stock price. Unless CEOs can sell their equity prior to the earnings management, those shares expose CEOs to price declines. This implies that CEOs may not be associated with a higher magnitude of earnings management. Also, share grants are less frequently used and have a relatively smaller proportion than other components. Therefore, share grants do not create incentives for earnings management. This study examines share grants and proposes there is no association between Australian CEOs' share grants and earnings management.

*H4.7: The Australian firms' earnings management behavior is not associated with executive share grants*

#### 3.3.1.8 Long-term incentive plans

Long-term incentive plans are often based on a three to five-year moving average of a firm's performance, making CEO wealth a function of long-term firm value. Hence, LTIPs are likely to mitigate incentives of CEOs to manage earnings to boost short-term stock prices. Similar to shares, LTIPs are less frequently used and have a relatively smaller proportion in the total compensation. Therefore, LTIPs do not create incentives for earnings management. This study proposes there is no association between Australian CEOs' LTIPs and earnings management.

*H4.8: The Australian firms' earnings management behavior is not associated with executive LTIPs*

### 3.3.2 Benchmark beating incentives

Apart from compensation contract driven earnings management, capital markets also create incentives for earnings management. One stream of research on capital market incentive focuses on benchmark beating behaviour. This stream of studies suggests that earnings benchmarks provide a strong incentive for earnings management; and, a new approach, the earnings distribution approach has been introduced to detect benchmark beating behaviour.

#### 3.3.2.1 Earnings distribution approach

The earnings distribution method was introduced by Burgstahler and Dichev (1997). They hypothesized that managers have incentives to achieve some benchmarks, such as positive or a prior year's earnings, and they expect to observe a discontinuity in earnings distributions around zero earnings and zero changes in earnings. This approach assumes that if there is no earnings management, the distribution of earnings around these benchmarks should be smooth. This is because for a given region, the expected frequency is the average of the observed frequencies in the adjacent regions

of the earnings distribution and this is not valid for the distribution of earnings after manipulation. After manipulation, the distribution of earnings is no longer smooth. There will be fewer observations than expected just below the benchmarks, and more observations than expected just above the benchmarks. This occurs because the adjacent regions around the hypothesized benchmarks may be affected by manager manipulation. As a result, a discontinuity would be observed in the distributions of earnings and earnings changes. They interpret such discontinuity in the distributions as the evidence on managers manipulating earnings to report profits and to sustain last year's earnings.

A noteworthy feature of studies by Burgsthler and Dichev (1997) is that they make predictions based on the distribution of earnings after management without modeling discretionary and non-discretionary components of accruals. In other words, they infer earnings management while avoiding the measurement error and model misspecification problem inherent in the accrual approach. McNichols (2000) pointed out that the distribution method is an effective way in detecting earnings management as it allows the researcher to make a strong prediction from the frequency of earnings realizations rather than from a measure of discretionary accrual component of earnings.

Despite the merit of the distribution approach in detecting earnings management, recent studies question whether the observed discontinuities around zero earnings, last year's earnings and analysts' forecasts of earnings per share are caused by earnings management. This is indeed problematic since this approach detects earnings management from an *ex post* perspective. Beneish (1997, p.275) stated: "*A firm's financial reporting strategy depends on its business strategy and should be evaluated ex-ante, not ex-post*". So, findings relying on the distribution approach to detect earnings management are not conclusive, for the reasons outlined below.

Although earnings discontinuities after earnings management are observable, normal earnings levels in the absence of managerial manipulation are not defined. Kerstein and Rai (2007) pointed out that a key weakness in the distribution method is the absence of a well-specified earnings level prior to managerial manipulation. In fact, managers exercise discretion to beat earnings targets depending on the true nature of earnings. For example, managers may increase earnings to reach targets when pre-

managed earnings are below benchmarks; while managers can also decrease earnings when pre-managed earnings are well above benchmarks in order to save some income to beat benchmarks in the future (known as 'cookie jar' accounting). Also, managers may decrease earnings when pre-managed earnings levels are far below targets that management discretion is insufficient to reach (known as 'big bath taking'). Thus, all these circumstances could contribute to the *ex post* of earnings discontinuities that have been observed and researchers have not yet fully examined.

This study applies the distribution approach to detect capital market driven earnings management. The power of the distribution approach in detecting earnings management is expected to be increased if the compensation motive could be determined in the first place as compensation structure is also designed to achieve earnings targets.

#### 3.3.2.2 Benchmark beating

Among possible earnings targets, empirical studies suggest that executives have concerns about three benchmarks when they report earnings: to report profits (above zero positive earnings); to report a sustained performance (at least have last year's earnings); and to meet analysts' consensus earnings forecasts. There are possible reasons for managers to inflate earnings to beat those benchmarks.

Burgstahler and Dichev (1997) invoked two theories to explain why managers avoid reporting earnings losses and decreases. First, they used the transaction cost theory from Cornell and Shapiro (1987) and Conlisk (1996). A firm reporting losses or earnings decrease tends to face higher costs in transactions between the firm and its stakeholders as those stakeholders favour positive earnings information. Second, they borrowed the prospect theory from Kahneman and Tversky (1979) and postulated that decision makers may value losses and gains differently and so a firm may realize the largest value increase when it turns a loss into a profit. Thus, a firm is expected to report higher earnings to reduce transaction costs and to realize the largest value gain.

Moreover, there is close association between stock returns and earnings increases. The market penalizes firms that break a string of earnings increases. Barth et al. (1999) found that a company with consistently increasing earnings is priced at a

premium. However, the premium declines substantially when the earnings increase string is broken. DeAngelo et al. (1996) reported 14% negative abnormal stock returns for companies in the year when an earnings increase pattern ceased. Myers and Skinner (2006) found that firms smooth earnings to achieve earnings increase strings through quarterly earnings data.

Finally, shareholders' implicit contracts with management are defined in terms of these benchmarks. Previous studies document how shareholders increase their monitoring when a firm fails to meet their benchmarks, and managers are punished in the form of reduced compensation and an increased probability of dismissal (Matsunaga and Park, 2001). In Australian annual reports, corporate earnings figures are widely used as a key indicator of business performance. Earnings is one of the first measures highlighted and most executive reviews compare this year's earnings performance with those of previous years (Holland and Ramsay, 2003). Target Based Incentive Plans are the most common incentive schemes used in determining Australian CEOs compensation levels. Meeting or surpassing the previous year's earnings thus becomes an important trigger for earnings management (Hay Management Consultants, 1998).

Therefore, it is predicted that Australian firms beat benchmarks. If this is the case, there will be a lower frequency of firms reporting small losses and earnings decreases and a higher frequency of firms reporting small profits and earnings increases. As a result, earnings levels and changes will be distributed with a discontinuity at zero. Since the discontinuity would be consistent with, but not necessarily caused by earnings management to achieve benchmarks, the removal of discretionary accruals is expected to reduce the discontinuity around the benchmarks.

*H5.1: The frequency of small losses (earnings decreases) is lower than expected and the frequency of small profits (earnings increases) is higher than expected frequencies under a smooth distribution*

*H5.2: The frequency of small pre-managed loss (earnings decrease) and the frequency of small pre-managed profits (earnings increases) are equal to the expected frequencies under a smooth distribution*

#### 3.3.2.3 The condition of benchmark beating

Current theory states that managerial discretion is expected to reduce income fluctuation at some predetermined earnings targets and the propensity of managers to increase (decrease) current reported earnings depends on pre-managed earnings levels around earnings targets (Schipper, 1989).

Healy (1985) postulated that executives are rewarded by earnings-based bonuses and, therefore, they have strong incentives to inflate earnings to meet or beat relevant earnings targets. However, if pre-managed earnings are insufficient to reach any relevant earnings targets necessary to earnings bonuses, managers are expected to decrease earnings (also called 'earnings bath taking') to create reserves for future use.

Peasnell et al. (2000) examined the association between the composition of the board of directors and accrual management in two contrasting governance regimes, pre- and post-Cadbury periods in the UK. Managers use income-increasing discretionary accruals when pre-managed earnings undershoot target earnings; while less income-increasing accruals are used when the proportion of non-executive directors is high in the post-Cadbury period. Later, Peasnell et al. (2005) found that firms with a higher proportion of outside directors have a lower probability of inflating pre-managed earnings to avoid reporting losses and earnings declines. They also found weak evidence that outside directors influence income-decreasing earnings management when pre-managed earnings are well above benchmarks.

Barua et al. (2006) used pre-managed earnings rather than reported earnings and investigated whether profitable firms have different incentives in beating earnings benchmarks than loss marking firms. They found when pre-managed earnings are below both analysts' forecasts and prior period earnings, firms with profits before accruals management are more likely than firms with losses before accruals management to meet or beat earnings benchmarks.

Koh (2007) found that long-term institutional investors constrain earnings management to beat benchmarks. Benchmark beaters were defined as those firms with pre-managed earnings lower than their earnings targets, but with reported earnings greater than earnings targets through the use of positive discretionary accruals.

Likewise, non-benchmark beaters were defined as firms with pre-managed earnings greater than earnings targets and thus were unlikely to use accruals to meet/beat earnings benchmarks.

Finally, in Spain, Albornoz & Alcarria (2003) and Arnedo et al. (2007) found that income-increasing accounting policies were used when a firm's current pre-managed earnings exceeds target earnings. Therefore, the conditions under which managers are more likely to increase income to either report profits or earnings increases are also examined.

*H6: When pre-managed earnings are below zero (last year's earnings), managers will increase income to report profit (earnings increase)*

### 3.4 Chapter Summary

This chapter presents the research and investigation issues. The forming of the research and investigation issues is based on a critical review of the literature. Specifically, the detection of earnings management behaviour addresses the issue of whether Australian firms engage in earnings management; the examination of the executive compensation incentives and benchmark beating behaviour is developed to answer the question why Australian firms engage in earnings management, both contract-driven and capital market driven earnings management. The next chapter will discuss the research design and methodology used in examining these issues.

# Chapter 4
# Research Design, Methodologies and Data

## 4.1 Introduction

This chapter discusses research design and methodologies. The empirical tests are structured into three steps. First, test for general evidences on earnings management across Australian firms. Second, test for the relation between earnings management and executive compensations. Third, test for the relation between earnings management and benchmark beating behaviour. The sample selection procedure and the data sources used for these tests are also described.

## 4.2 Tests for earnings management evidences

Earnings management is measured by discretionary accruals. To obtain the discretionary accruals for a given firm, this study uses the Jones Model, Modified Jones Model, Modified Jones Cash Flow Model and Performance Adjust Technique. The financial variables for estimating earnings management and earnings management proxy are summarised in Table 4.1- Panel A and B, respectively.

### 4.2.1 Jones model

First, estimate coefficients $\alpha_1, \alpha_2, \alpha_3$ by using an estimation sample.

$$TA_{it} / A_{it-1} = a_1(1/A_{it-1}) + a_2(\Delta REV_{it} / A_{it-1}) + a_3(PPE_{it} / A_{it-1}) + \varepsilon_{it} \quad (4.1)$$

Where

| | | |
|---|---|---|
| $TA_{it}$ | = | Total accruals for firm *i* at year *t* |
| $A_{it-1}$ | = | Total assets for firm *i* at beginning of year *t* |
| $\Delta REV_{it}$ | = | Change in revenues for firm *i* between year *t-1* and *t* |
| $PPE_{it}$ | = | Gross property plant and equipment for firm i at year t |
| $\alpha_1, \alpha_2, \alpha_3$ | = | Industry year specific estimated coefficients |
| $\varepsilon_{it}$ | = | Error term |

An OLS regression of total accruals is regressed on the change in sales and gross property, plant and equipment. All variables are deflated by beginning year total assets to control for heteroscedasticity. Using an estimation sample with 5,947 observations, with nine combined GICS industry groups over the period from 1999 to 2006, the model is estimated for each combined GICS industry group and year with a minimum of 10 observations (see Section 4.7).

Second, estimate non-discretionary accruals ($NDA_{it}$) for the testing sample.

$$\hat{NDA}_{it} = \hat{\alpha}_1(1/A_{it-1}) + \hat{\alpha}_2(\Delta REV_{it}/A_{it-1}) + \hat{\alpha}_3(PPE_{it}/A_{it-1}) \quad (4.2)$$

Estimating the Jones model on the estimation sample, yields industry-year specific parameters that can be used to estimate non-discretionary accruals for the testing firms. Non-discretionary accruals are estimated as the fitted value from the Jones model. The testing sample has 3,326 observations, with each firm assigned to one of the nine combined industry groups based on GICS[17] code and the fiscal year over the period from 2000 to 2006. The estimation and testing samples are derived in the section 4.7.

Third, estimate discretionary accruals ($DA_{it}$) for the testing firms.

$$\hat{DA}_{it} = TA_{it} - \hat{NDA}_{it} \quad (4.3)$$

The discretionary accruals component of testing firms is finally estimated as the difference between actual total accruals and the estimated non-discretionary accruals. Since all the variables are deflated by lagged total assets, the magnitude of a firm's discretionary accruals is indicated as a percentage of the total assets of a firm.

There are two methods in computing total accruals, the balance sheet approach versus the cash flow statement approach. Under the balance sheet approach, total accruals are derived from balance sheets and income statements. To analyse data prior to 1988, this method is necessary as cash flow information is not available (Sloan, 1996). The detailed calculation of total accruals from balance sheet is:

$$TA_{it} = (\Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STD_{it} - DEP_{it})/A_{it-1} \quad (4.4)$$

[17] Global Industry Classification Standard (GICS) was introduced to Australian Stock Exchange in June 2001.

Where

| | | |
|---|---|---|
| $TA_{it}$ | = | Total accruals for firm *i* in year *t* |
| $\Delta CA_{it}$ | = | The change in current assets for firm *i* during period *t* |
| $\Delta CL_{it}$ | = | The change in current liabilities for firm *i* during period *t* |
| $\Delta Cash_{it}$ | = | The change in cash and cash equivalents for firm *i* during period *t* |
| $\Delta STD_{it}$ | = | The change in short-term debt for firm *i* during period *t* |
| $DEP_{it}$ | = | Depreciation expense for firm *i* during period *t* |
| $A_{it-1}$ | = | Lagged total assets for firm *i* |

From 1988, firms were required to report cash flow from operations. Hence, total accruals are able to be calculated directly from cash flow statements, as the difference between earnings and operating cash flows. Hribar and Collins (2002) examined these two methods of measuring total accruals and suggested that the direct cash flow approach avoids the substantial errors that the balance sheet approach has in accrual estimation. This study computes total accruals from cash flow statements.

$$TA_{it} = (E_{it} - CF_{it}) / A_{it-1} \qquad (4.5)$$

Where

| | | |
|---|---|---|
| $TA_{it}$ | = | Total accruals for firm *i* in year *t* |
| $E_{it}$ | = | Net income before extraordinary items for firm *i* in year *t* |
| $CF_{it}$ | = | Cash flows from operating activities for firm *i* in year *t* |
| $A_{it-1}$ | = | Lagged total assets for firm *i* |

### 4.2.2 Modified Jones model

The following Modified Jones model is very similar to the Jones model. All variables are defined in the Jones model (see Section 4.2.1) except $\Delta AR_{it}$, which is the change in account receivables for firm *i* between year *t-1* and *t*. The cross-sectional estimation procedure is the same as that of the Jones model.

$$TA_{it} / A_{it-1} = \alpha_1(1/A_{it-1}) + \alpha_2(\Delta REV_{it} / A_{it-1} - \Delta AR_{it} / A_{it-1}) + \alpha_3(PPE_{it} / A_{it-1}) + \varepsilon_{it} \qquad (4.6)$$

### 4.2.3 Cash Flow Modified Jones model

Despite the popularity of the Jones (1991) and the Modified Jones model, empirical studies have pointed out that these discretionary accrual estimation models suffer from omitted variables problems and therefore are potentially misspecified (See Section 3.2.1). In particular, there are two sources identified that contribute to model misspecification. First, McNichols and Wilson (1988) found that discretionary accruals are negatively associated with operating cash flows. Second, Dechow et al. (1995) found that the measurement error in estimation of discretionary accruals is correlated with firm extreme earnings performances—firms with low (high) earnings tend to have negative (positive) discretionary accruals.

In order to control the effect of operating cash flows, this study estimates discretionary accruals by using the following variation of the Modified Jones model with an additional variable, the change of operating cash flows, $\Delta CF_{it}$, which is consistent with Kasznik (1999). $\Delta CF_{it}$ is the change in operating cash flows for firm *i* between year *t-1* and *t*; other variables are defined as the Modified Jones model.

$$TA_{it} / A_{it-1} = \alpha_1(1/A_{it-1}) + \alpha_2(\Delta REV_{it}/A_{it} - \Delta AR_{it}/A_{it-1}) + \alpha_3(PPE_{it}/A_{it-1}) + \alpha_4 \Delta CF_{it} + \varepsilon_{it} \qquad (4.7)$$

### 4.2.4 Performance adjusted technique

In the spirit of Kasznik (1999), the performance adjusted technique is employed to control the effect of earnings performances. First, estimate discretionary accruals from the Cash Flow Modified Jones model. This generates estimates of unadjusted discretionary accruals. Second, rank the unadjusted discretionary accruals into percentile groups by their return on assets (ROA), defined as operating income deflated by lagged total assets. Finally, compute the median unadjusted discretionary accruals for each percentile and subtract it from each observation's unadjusted discretionary accruals in that percentile. The rational for standardizing the residuals in this way is that the firms identified as having higher-than-median residuals are in fact managing earnings at a rate higher than the median performance firm. By using the performance adjusted technique, omitted variables of a firm's earnings performances in the discretionary accruals estimation are likely to be addressed. Given a concern for controlling for performance on measured discretionary accruals, the alternative

method is Kothari et al (2005) performance matched or controlled model. The reason for using Kasznik (1999) method but not Kothari et al (2005) is that the former one imposes less data requirement while Kothari et al (2005) method required more data to form control firms in matching treatment firms. Nevertheless, Kothari et al (2005) method is worthwhile for future research.

$$DA\_ADJ_{it} = DA_{it} - Median(DA)_{pt} \quad (4.8)$$

Where

$DA\_ADJ_{it}$ = Adjusted discretionary accruals for firm *i* at year *t*

$DA_{it}$ = Raw discretionary accruals for firm *i* at year *t* obtained as residual from equation (4.7)

$Median(DA)_{pt}$ = Median value of the discretionary accruals for a portfolio, and *p* is the percentile ranking of raw discretionary accruals based on firm's ROA

### 4.3 Tests for executive compensation incentives

After examining whether earnings management takes place, the test then focused on why earnings management takes place. This section describes the methodology and models used to test whether earnings management behaviour is driven by executive compensation incentives.

#### 4.3.1 The structure of Australian executive pay

In Australia, the *Corporations Law, s300A,* dictates that the remuneration packages of all listed companies' directors and the five highest paid executives must be disclosed in the annual report. These disclosures include a total reward (TR) which comprises *fixed* remuneration (which is total employment cost or TEC) and *at-risk* remuneration which is made up of short term incentives (STI) and long term incentives (LTI). Each of these components are: salary, fees, benefits (including motor vehicles and accommodation), fringe benefits tax, bonuses, superannuation contributions, termination payments, the value of shares and options granted and long-term incentive plans (*Corporations Act*, 2001). A typical CEO compensation structure takes the following form:


*(Source: Annual Reports, Connect4 (2008), retrieved from http://www.connect4.com.au.dbgw.lis.curtin.edu.au/cgi-bin/subs/login.cgi)*

(1) *Fixed* remuneration

Fixed remuneration for the CEO/Managing Director is defined in terms of total employment cost (TEC). *Fixed* remuneration is made up of base salary, superannuation contributions, retirement and other benefits.

Base salary: is set at levels that are competitive within the market; it enables the company to attract and retain high calibre employees. External market data is used to benchmark salary levels within similar industries as well as the general market within Australia. It is documented that firm size determines the level of fixed salary (Murphy, 1999) and fixed salary is insensitive to stock price movement (Gao and Shrieves, 2002).

(2) *At-risk* remuneration

*At-risk* remuneration is made up of short-term and long-term incentives. Budgeted accounting profits and total shareholder returns are selected as the appropriate measure for triggering incentive payments.

(a) Short Term Incentive

Short term incentive is measured against the individual's Key Performance Indicators (KPIs), which is a combination of measures that include financial, strategic, customer service, cost and process improvement. The short term incentive is mainly referred to cash bonuses.

Bonus: is set based on meeting or exceeding company profit and eligibility for payment only exists when the company's after tax profit meets or exceeds the budget approved by the Board. The budget standards are highly firm-specific as to bonus plans.

(b) Long Term Incentive

The Long Term Incentive is designed to align the interests and values of CEOs with those of shareholders. So, this component has an equity nature, comprising options, shares and long-term incentive plans, in order to encourage employee retention and share ownership.

Options, Shares and LTIPs: The payment of options and shares are subject to two performance measures, total shareholders return (TSR) and earnings per share (EPS). The TSR performance is assessed by comparing the company's TSR ranking with the TSR performance of the comparator group of companies (S&P/ASX index) over the same period. The EPS performance is assessed as the average compound growth rate in the company's EPS, which requires an increase in the company's basic EPS. Long-term incentive plans are often based on a three to five-year moving average of a firm's performance.

### 4.3.2 The measures of executive pay

Early studies of compensation incentives typically use a single dummy variable measure to capture the impact of a short-term bonus plan on the choice of accounting policies (see Section 2.5.1.1). Later, researchers use bonus plan details as a measure of executive pay in testing a bonus maximization hypothesis (see Section 2.5.1.2). To date, these researchers have gone beyond the focus of bonus plans. They use actual compensation paid, and examine the potential influence of different components on earnings management behaviour (see Section 2.5.1.3 and 2.5.1.4). Furthermore, given a growing complex representations of the nature of executive compensation structures, simply using the percentage of total compensation may not be able to capture various aspects of compensation motives. Consistent with the most recent approach, this study uses actual compensation data in testing the relation between earnings management and compensation incentives. There is no consensus in research on executive compensation on whether and how to normalize pay measures to reduce heteroskedasticity related to differences in firm sizes. In this study, all compensation variables are measured in millions of dollars in order to make regression coefficients easily interpretable (see Table 4.1-Panel C).

### 4.3.3 Model specification

Based on the nature of the Australian executive compensation structure, this study uses a three tier approach to test the relation between earnings management and compensation incentives. First, the impact of executive total compensation on earnings management is examined. So, the first measure of compensation is the aggregate level of executive compensation (*TCOMP*) which is the sum salary, fees, benefits, fringe benefits tax, bonuses, superannuation contributions, termination payments, the value of shares and options granted and long-term incentive plans. Second, the total executive compensation is decomposed into *fixed* and *at- risk* remuneration and these two components are examined to see if they provide different incentives for earnings management. The second measure is *fixed* compensation (*FIX*) versus *at-risk* compensation incentive (*ATRISK*). Third, the *at-risk* components are decomposed into bonus, options, shares and LTIPs. Each individual component of *at-risk* remuneration plus salary is examined to see whether these components play a different role in determining earnings management behaviour. The third measure is salary (*SALARY*), bonus (*BONUS*), options (*OPTION*), shares (*SHARE*) and LTIPs (*LTIP*). Firm characteristics such as size, growth, profitability, leverage, book-to-market ratio, capital intensity and lagged total accruals are controlled as previous Chapter 3 suggests that firm characteristics may have a impact on earnings management (see Section 3.2.3).

The dependent variable is adjusted discretionary accruals (*DA_ADJ*). Earnings management can be measured by Jones model, Modified Jones model, Cash flow Modified Jones model and Performance Adjust Technique. Among all the models, the Performance Adjust Technique is suggested to be a more reliable measure of earnings management when discretionary accruals are found to be correlated with extreme earnings performance (see Section 5.3 Paragraph 12; Section 6.2 Paragraph 7). Therefore, *DA_ADJ* which incorporates the adjustment for earnings performance is suggested to yield a more reliable measure of earnings management when a firm is experiencing extreme earnings performance. This study uses *DA_ADJ* as proxy for earnings management in testing the executive compensation incentives and the equations are expressed as:

$$DA\_ADJ_{it} = \beta_0+\beta_1 TCOMP_{it}+\beta_2 SIZE_{it}+\beta_3 GROWTH_{it}+\beta_4 ROE_{it}+\beta_5 LEV_{it} +\beta_6 BM_{it}+\beta_6 CIR_{it}+\beta_7 LAGTA_{it}+\Sigma\alpha_j IND_j+\varepsilon_{it} \quad (4.9)$$

$$DA\_ADJ_{it} = \beta_0+\beta_1 FIX_{it}+\beta_2 ATRISK_{it}+\beta_3 SIZE_{it}+B_4 GROWTH_{it}+\beta_5 ROE_{it}+\beta_6 LEV_{it} +\beta_7 BM_{itt}+\beta_9 LAGTA_{it}+\Sigma\alpha_j IND_j+\varepsilon_{it} \quad (4.10)$$

$$DA\_ADJ_{it} = \beta_0+\beta_1 SALARY_{it}+\beta_2 BONUS_{it}+\beta_3 OPTION_{it}+\beta_4 SHARE_{it}+\beta_5 LTIP_{it} +\beta_6 SIZE_{it}+\beta_7 GROWTH_{it}+\beta_8 ROE_{it}+\beta_9 LEV_{it}+\beta_{10} BM_{it}+\beta_{11} CIR_{it} +\beta_{12} LAGTA_{it}+\Sigma\alpha_j IND_j+\varepsilon_{it} \quad (4.11)$$

Where

$DA\_ADJ_{it}$ = Adjusted discretionary accruals for firm i at year t, measured from equation (4.8)

$TCOMP_{it}$ = Dollar value of total compensation earned by CEOs in firm *i* at fiscal year *t*, measured in millions of dollars

$FIX_{it}$ = Dollar value of fixed compensation earned by CEOs in firm *i* at fiscal year *t*, measured in millions of dollars

$ATRISK_{it}$ = Dollar value of at-risk compensation earned by CEOs in firm *i* at fiscal year *t*, measured in millions of dollars

$SALARY_{it}$ = Dollar value of base salary earned by CEOs in firm *i* at fiscal year *t*, measured in millions of dollars

$BONUS_{it}$ = Dollar value of bonus earned by CEOs in firm *i* at fiscal year *t*, measured in millions of dollars

$OPTION_{it}$ = Dollar value of options granted to CEOs in firm *i* at fiscal year *t*, measured in millions of dollars

$SHARE_{it}$ = Dollar value of shares granted to CEOs in firm *i* at fiscal year *t*, measured in millions of dollars

$LTIP_{it}$ = Dollar value paid out to CEOs under the company's long term incentive plan in firm *i* at fiscal year *t*, measured in millions of dollars

$SIZE_{it}$ = Firm size for firm *i* for year *t*, measured by the logarithm of the total assets at year *t*

$GROWTH_{it}$ = Growth opportunity for firm *i* for year *t,* measured by the change of sales between year *t* and *t-1* divided by total assets at year *t*

$ROE_{it}$ = Profitability, measured by net operating income divided by total

equity for firm *i* at year *t*

$LEV_{it}$ = Leverage, measured by total debt to total assets for firm *i* in year *t*

$BM_{it}$ = Book-to-market effect ratio, measured by book value of common equity to market value of common equity for firm *i* in year *t*

$CIR_{it}$ = Capital intensity, measured as gross property, plant and equipment divided by total assets for firm *i* in year *t*

$LAGTA_{it}$ = Lagged total accruals, measured as the total accruals for firm *i* in year *t-1*

$\Sigma IND_j$ = Industry effects, 1 if firm *i* is from industry *j*, based on GICS industrial codes and 0 otherwise

$\beta_0$ *to* $\beta_{12}$ = Estimated coefficients on compensation variables and control variables

$\alpha_j$ = Estimated coefficients on industry dummy variables

$\varepsilon$ = Error term

### 4.4 Tests for benchmark beating incentives

After examining executive compensation incentives, this study further examines earnings management to see if it is driven by benchmark beating motives. This section describes the methodology and models used in testing benchmark beating behaviour.

The methodology in testing benchmarking beating behaviour is consistent with that of Burgstahler and Dichev (1997). First, histograms are used graphically to represent the pooled cross-sectional reported earnings, and to identify the discontinuities at zero for both earnings and change in earnings. Then, the number of observations reporting small positive earnings or earnings changes is tested to see whether it is significantly greater than expected while the number of observations reporting small negative earnings or earnings changes is also tested to see if it is significantly smaller than expected. If discontinuities are identified in the distributions of earnings; and, if the discontinuities are statistically significant, then the findings would be that Australian firms beat benchmarks — to either report more profits and/or sustain last year's earnings. The variables for testing benchmark beating behaviour are listed in Table 4.1- Panel D.

### 4.4.1 Earnings distribution method

First, empirical histograms of the earnings and change of earnings distributions are constructed. Income before extraordinary items was used as a measure of earnings. Scaled earnings level ($E_{it}$) is income before extraordinary items deflated by the beginning total assets, and scaled earnings change ($\Delta E_{it}$) is the difference of income before extraordinary items between current year and last year deflate by the beginning total assets. Silverman (1986, pp.43-48) and Scott (1992, pp.72-80) suggested that "*the interval width of a histogram should positively related to the variability of the data and negatively related to the number of observations*". The interval width of histograms was calculated as $2(IQR)n^{-1/3}$ , where *IQR* is the sample inter-quartile range and *n* is the number of observations. This returns an interval width of 0.04 for both earnings level and earnings change distributions. [18]

Second, observed discontinuities were tested to ascertain if they are significant. Burgstahler and Dichev (1997) assumed a smoothed normal distribution of earnings levels (changes) under the null where no earnings management takes place. In testing the null hypothesis, the Z-statistic is computed as the difference between the actual and expected number of observations in an interval divided by the estimated standard deviation of the difference. The Z-statistic represents the difference between the actual frequency in an interval and the expected frequency in that interval divided by the standard deviation of the difference, defined as:

$$Z = \frac{n - E(n)}{\sqrt{Var}} \tag{4.12}$$

Where

Z = represents the difference between the actual frequency in an interval and the expected frequency in that interval divided by the standard deviation of the difference

n = the actual number of observations in the interval

*E(n)* = the expected number of observations in the interval, defined as the

[18] Burgstahler and Dichev (1997) use interval widths of 0.005 for scaled earnings and 0.0025 for scaled changes in earnings. Holland and Ramsay (2003) use 0.01 for scaled net profit after tax and 0.005 for scaled changes in net profit after tax.

average of the number of observations in the intervals immediately adjacent to the interval

$\sqrt{Var}$ = the estimated standard deviation of the difference, calculate as:

$$\sqrt{Var} = \sqrt{N \cdot p_i(1-p_i) + (1/4)N \cdot (p_{i-1} + p_{i+1}) \cdot (1 - p_{i-1} - p_{i+1})}$$

$N$ = the total number of observations

$p_i$ = the probability that an observation will fall into interval $i$

Under the null hypothesis with smooth earnings distribution, the standardized difference of each interval with respect distribution should be equal to zero. If managers exercise positive discretionary accruals to report profits or earnings increase, it would be expected that the standardized difference is significantly negative for the interval immediately below zero and significantly positive for the interval immediately above zero.

### 4.4.2 The measure of pre-managed earnings

This study further examines the link between adjusted discretionary accruals and pre-managed earnings below earnings benchmarks. The prediction is that firms are more likely to engage in income-increasing earnings management when pre-managed earnings undershoot zero earnings and/or last year's earnings. Consistent with Peasnell et al. (2000), Payne and Robb (2000), Barua et al. (2006), and Koh (2007), it was estimated that pre-managed earnings level ($PME_{it}$) and pre-managed earnings change ($\Delta PME_{it}$) as reported earnings minus adjusted discretionary accruals and reported earnings change minus adjusted discretionary accruals respectively.

$$PME_{it} = E_{it} - DA\_ADJ_{it} \tag{4.13}$$

$$\Delta PME_{it} = \Delta E_{it} - DA\_ADJ_{it} \tag{4.14}$$

Where

$PME_{it}$ = Pre-managed earnings for firm $i$ for year $t$

$\Delta PME_{it}$ = Pre-managed earnings change for firm $i$ for year $t$

$E_{it}$ = Reported earnings for firm $i$ for year $t$, measured as income before

extraordinary items deflated by the beginning total assets

$\Delta E_{it}$ = Reported earnings change for firm *i* for year *t*, measured as the difference of income before extraordinary items between year *t* and year *t-1* deflated by the beginning total assets

$DA\_ADJ_{it}$ = Adjusted discretionary accruals obtained from equation (4.8)

### 4.4.3 Model specification

The impact of benchmark beating motives was tested on the extent of earnings management condition on pre-managed earnings level by estimating four regions for each of earnings benchmarks, where 1) pre-managed earnings (change) below zero; 2) pre-managed earnings (change) below zero but reported earnings (change) above zero; 3) pre-managed earnings (change) fall in the interval [−0.04,0]; and 4) pre-managed earnings (change) fall in the interval [ −0.04,0] but reported earnings (change) are within [0, +0.04]. It was predicted when pre-managed earnings are below benchmarks, managers will inflate earnings to report profits and earnings increase. Therefore, the coefficient on *BELOW_N* will be positive due to upward earnings management behaviour and this should hold for four different regions. The dependent variable is adjusted discretionary accruals (*DA_ADJ*) and the rationale is provided in Section 4.3.3 Paragraph 2.

$$DA\_ADJ_{it} = \beta_0 + \beta_1 BELOW\_N_{it} + \beta_2 SIZE_{it} + \beta_3 GROWTH_{it} + \beta_4 ROE_{it} + \beta_5 LEV_{it} + \beta_6 BM_{it} + \beta_6 CIR_{it} + \beta_7 LAGTA_{it} + \Sigma\alpha_j IND_j + \varepsilon_{it} \quad (4.15)$$

Where

$DA\_ADJ_{it}$ = Adjusted discretionary accruals scaled by total asset at year t-1, estimated from equation (4.8)

$BELOW\_N_{it}$ = Indicator variable equals to 1 if pre-managed earnings are below relevant benchmarks and zero otherwise. The test differentiated four regions for each earnings benchmark:

*BELOW_1* equals to 1 if pre-managed earnings (change) below zero and zero other wise

| | | |
|---|---|---|
| | | *BELOW_2* equals to 1 if pre-managed earnings (change) below zero but reported earnings (change) above zero; equals to 0 if both pre-managed earnings (change) and reported earnings (change) are below zero |
| | | *BELOW_3* equals to 1 if pre-managed earnings (change) less than zero but greater than −0.04; and zero if pre-managed earnings (change) greater than zero but less than +0.04 |
| | | *BELOW_4* equals to 1 if pre-managed earnings (change) less than zero but greater than −0.04 and at the same time reported earnings (change) greater than zero but less than +0.04; and equals to zero if both pre-managed earnings (change) and reported earnings (change) are less than zero but greater than −0.04 |
| $SIZE_{it}$ | = | Firm size for firm *i* for year *t*, measured by the logarithm of the total assets at year *t* |
| $GROWTH_{it}$ | = | Growth opportunity for firm *i* for year *t,* measured by the change of sales between year *t* and *t-1* divided by total assets at year *t* |
| $ROE_{it}$ | = | Profitability, measured by net operating income divided by total equity for firm *i* at year *t* |
| $LEV_{it}$ | = | Leverage, measured by total debt to total assets for firm *i* in year *t* |
| $BM_{it}$ | = | Book-to-market effect ratio, measured by book value of common equity to market value of common equity for firm *i* in year *t* |
| $CIR_{it}$ | = | Capital intensity, measured as gross property, plant and equipment divided by total assets for firm *i* in year *t* |
| $LAGTA_{it}$ | = | Lagged total accruals, measured as the total accruals for firm *i* in year *t-1* |
| $\Sigma IND_j$ | = | Industry effects, 1 if firm *i* is from industry *j*, based on GICS industrial codes and 0 otherwise |
| $B_2$ *to* $\beta_7$ | = | Estimated coefficients on compensation variables and control variables |
| $\alpha_j$ | = | Estimated coefficients on industry dummy variables |
| $\varepsilon$ | = | Error term |

### 4.5 Control variables

In the previous chapters, it is suggested that firm characteristics such as size, growth, profitability, leverage, book-to-market ratio, capital intensity and lagged total accruals may impact on earnings management (see Section 3.2.3). Therefore, these firm characteristics are controlled in testing both the executive compensation and benchmark beating incentives. The control variables are listed in Table 4.1- Panel E.

Firm Size: Firm size (*SIZE*) is measured as logarithm of total assets. Previous studies either found large firms are more likely to engage in earnings management to reduce political costs (for example, Watts and Zimmerman, 1978; Manzon, 1992; Das et al., 1998) or smaller firms are more likely to engage in earnings management because they tend to be neglected by regulators (for example, Sloan, 1996; Koh, 2003; Holland and Jackson, 2004; Sanchez-Ballesta and Garcia-Meca, 2007). This study predicts that firm size is associated with earnings management, but the predicted sign on size is not clear.

Growth opportunities: Growth opportunity (*GROWTH*) is measured as sales growth ratio. As previous studies found a firm's growth rate is positively associated with discretionary accruals and earnings management behaviour (see Dechow et al., 1998; Young, 1999; McNichols, 2000; Skinner and Sloan, 2001; Richardson et al., 2002; Pincus and Rajgopal, 2002; and Firth et al., 2007), this study predicts that a firm's growth opportunities will have a positive association with earnings management. So, the predicted sign on growth is positive.

Profitability: Profitability (*ROE*) is measured as return on equity, which is net income before extraordinary items over total equity.[19] Previous studies found either lower accounting profits provide motivation for firms to manipulate earnings as lower profit firms usually suffer from cash flow squeeze and demand for more external finance (for example, White, 1970; Ashari et al., 1994; Wang, 2004); or, higher profit firms have greater incentives to manage earnings as those firms face more market pressure

[19] A firm's profitability can be measured by both returns on assets (ROA) and returns on equity (ROE). ROE is used as a control variable rather than ROA because ROA has been already used in adjusting the impact of earnings performances on discretionary accruals (see Section 4.2.4).

to beat or meet earnings targets relative to loss making firms (for example, Hayn, 1995; Degeorege et al., 1999). This study predicts that profitability is associated with earnings management, but the predicted sign is unclear.

Leverage: Leverage is measured as total liability to total assets ratio (*LEV)*. Previous studies show that high leverage firms tend to manipulate earnings either upwards in order to avoid being in technical default (for example, Watts and Zimmerman, 1978; Press and Weintrop, 1990; DeFond and Jiambalvo, 1994; Dechow et al., 2000); or, downwards to highlight the firm's financial difficulties and thus obtain better terms in contract renegotiations (for example, DeAngelo and Skinner 1994; and Charitou et al., 2007). So, the leverage is controlled but the predicted sign is unclear.

Book-to-market: Book-to-market effect (*BM*) is measured as the ratio of book value to market value of common equity. Previous studies found that low book-to-market firms tend to have greater incentives to engage in earnings management to beat earnings targets because stock prices in such firms are more sensitive to reported earnings (see Subraranyam, 1996; Bath et al., 1999; Skinner and Sloan, 2002; Beaver, 2002; and Sawichi and Shrestha, 2008). So, the sign on book-to-market is predicted to be negative.

Capital intensity: Capital intensity ratio (*CIR*) is measured as gross property, plant and equipment over total assets. Previous studies suggest that capital intensity indicates the ability of managers in earnings management activities: lower capital intensity enhances managers' abilities in exercising discretions while higher capital intensity constrains managers' abilities in exercising discretions (see Burgstahler and Dichev, 1997; Francis et al., 1999; Bradshaw et al., 1999; and Young, 1999). Thus, a negative association is expected between earnings management and a firm's capital intensity.

Lagged total accruals: Lagged total accruals (*LAGTA*) is used as a proxy for accounting flexibility. Because the time series of a firm's discretionary accruals is mean reverting, a higher level of lagged total accruals will constrain a manager's ability to manage earnings in any current year (see Dechow, 1994; Dechow et al., 1995; sloan, 1996). Therefore, the sign on lagged total accruals is predicated to be negative.

Industry effects: Industry effects (*IND*) are controlled as sample firms are likely to concentrate on a small number of industries. *IND* takes a value of 1 if firm *i* is from GICS industry. Nine broad industry classifications are used, including Energy, Material, Metals & Mining, Industries, Consumer Discretionary, Consumer Staples, Health Care, Information Technology, and Telecommunication & Utilities. To avoid perfect collinearity with the intercept term,[20] the dummy variable representing the first sector—Energy—sector is omitted.

### 4.6 Estimation method of panel data structure

In testing the association between earnings management and executive compensation incentive; and, the association between earnings management and benchmark beating incentive, panel data are used. This section discusses the problem of OLS estimators within a panel data structure and the method employed in thesis in generating consistent estimators for a panel data set.

#### 4.6.1 Review of estimation method used in panel data structure

Panel data are characterized by pooling data that combines cross-sectional data on N spatial units (firms) and T time periods (years) to produce a data set of *NxT* observations. This study chooses panel data for two reasons. First, the pooled panel data provide a rich amount of information. The panel data set can increase the number of data points and decrease the likelihood of an omitted-variable problem. The panel design has a higher quality and quantity data than that of either cross-sections or time series design as the latter two research designs only consider one dimension (Gujarati, 2003); the panel data capture the variation of these two dimensions simultaneously (Pennings et al., 1999). Second, the pooled time series cross sectional design allows for testing the impact of a large number of predictors of the level and changing in the dependent variable within the framework of a multivariate analysis (Schmidt, 1997). Also, panel data allows for both variations of a single industry/firm over time and variations of all sampled industries/firms at a given point of time (Pindyck & Rubinfeld, 1991).

[20] Failure to omit one dummy variable will lead to the problem of dummy variable trap and OLS will not be able to estimated (Hill et al., 2001).

It is well known that OLS standard errors are correct when the error terms are independent and identically distributed (iid). However, within panel data structure, variables of interest are often cross-sectionally and serially correlated. For example, industry-specific shocks may induce correlation between firms in a given industry. Firm-specific shocks may be persistent and induce correlation across time. Moreover, some shocks maybe persistent and common among firms: business cycles will induce correlations between different firms across different years.

If this is the case, errors generated from OLS with panel data are more likely to be correlated across firms, such that errors in firm *i* at year *t* are correlated with errors in firm *j* at year *t*. At the same time, errors are more likely to be correlated from one period to the next, in such a way that errors in firm *i* at year *t* are correlated with errors in firm *i* at year *t+1*. Therefore, the OLS assumption of independence in regression error term is generally violated by the presence of both cross-sectional and time-series dependence (Greene, 2002).

Moreover, for OLS to be optimal it is important that all the errors have the same variance (homoschedasticity). However, there is a risk of producing a regression with heteroschestiastic in the pooled time-series cross-sectional setting because it is assumed that the level of the dependent variable is homogenous across firms and time periods while in the case of panel data the dependent variable may differ between firms (Beck and Katz, 1995). In fact, errors for individual firms belonging to the same group may be correlated, with heteroskedasticity and correlation.

Therefore, OLS standard errors would be biased when panel data are used in the regression analysis. Econometric researchers have worked out several solutions to this problem. First, the simplest way is to include dummy variables for each cluster, for example, use firm dummy variables and year dummy variables to account for cross-sectional dependence and time-series dependence. Second, use one-way cluster-robust standard errors (also known as Rogers or Huber-White standard errors) to adjust possible correlations within a cross-sectional dimension or a time-series dimension depending on which dimension is clustered (Huber, 1967; Rogers, 1993; Williams, 2000). The one-way cluster-robust standard errors generalize the heteroscedasticity robust standard errors of White (1980) with observations grouped into several

clusters. Third, use Fama-MachBeth procedure to adjust possible correlations between observations on different firms in the same year, but not to account for correlations between observations on the same firm in different years (Fama-MacBeth, 1973). Fourth, the Newey-West procedure traditionally is used to account for serial correlations of unknown form in the residuals of a single time-series (Newey and West, 1987). Now it has been modified for use in a pooled time-series cross-sectional data set by estimating correlations between lagged residuals in the same cluster (See Bertrand et al., 2004; and Doidge, 2004).

Although the above procedures to some extent correct either cross-sectional correlation or serial correlation, none is designed to deal with correlations in two dimensions (across firms and across time). This is because those techniques often cluster by firm and assume independence across time; or cluster by time and assume independence across firms. Unfortunately, with panel data structure, correlations are more likely to appear in two dimensions with both firm effects and time effects.

Recently, a new approach — two-way cluster-robust standard errors, was introduced to panel regressions in an attempt to fill this gap. Cameron et al. (2006b) and Thompson (2006) proposed an extension of one-way cluster-robust standard errors to allow for clustering along two dimensions. In this case, the variance estimate for an OLS estimator is $V(\hat{\beta}) = V(\hat{\beta})_{firm} + V(\hat{\beta})_{year} - V(\hat{\beta})_{white}$, where $V(\hat{\beta})_{firm}$ and $V(\hat{\beta})_{year}$ are the estimate variances that cluster by firm and year (Huber, 1967; Rogers, 1983; and Williams, 2000), respectively, and $V(\hat{\beta})_{white}$ is the estimate variance for the 'intersection' clusters — the within firm variance. Essentially, the two-way clustering method first obtains three different cluster-robust variance matrices for the OLS estimator from one-way clustering in, the firm dimension, the time dimension, and the intersection of the firm and time, respectively. Then, the first two variance matrices, clustering by firm and year are added together and the third intersection matrix is subtracted in order to correct for double-counting the within-firm variance. In this manner, two-way clustering is robust to both cross-sectional and time-series dependence.

In this study, panel data with repeated observations of enough cross-sections are used to examine the dynamics of change with short time series. Further, following Cameron et al. (2006b) and Thompson (2006) the two-way cluster-robust standard errors approach is adopted in an attempt to correct both cross-sectional correlation and serial correlation. The following section mathematically describes the estimation procedures of two-way cluster-robust regression estimation.

### 4.6.2 Estimation procedures of two-way cluster-robust regression

Consider a typical panel regression is expressed as:

$$y_{it}=X_{it}\beta + \epsilon_{it} \quad \text{for} \quad \begin{matrix} i = 1,\ldots, N \\ t = 1,\ldots, T \end{matrix}$$

where $y_{it}$ is a $T \times 1$ vector of observations on the dependent variable in the $i^{th}$ group, $X_{it}$ denotes a $T \times k$ matrix of observations on the explanatory variables; $\beta$ is the unknown $K \times 1$ vector of regression parameters and $\varepsilon_{it}$ is a $T \times 1$ vector of error terms; and $\varepsilon \sim N(0,\sigma^2)$. So the OLS estimator is:

$$\hat{\beta}_{OLS} = (X'X)^{-1}X'y$$

And the variance of the OLS estimator is:

$$V(\hat{\beta})_{OLS} = (X'X)^{-1}(X'\Omega X)(X'X)^{-1}$$

Where $\Omega$ is the unknown error variance matrices, which can be written as:

$$\Omega = E[\varepsilon_{it}\varepsilon_{it}' \,|\mathrm{X}_{it}] \text{ , or } \Omega = \begin{bmatrix} \sigma^2_{\varepsilon,11} & \sigma^2_{\varepsilon,12} & \cdots & \sigma^2_{\varepsilon,1N} \\ \sigma^2_{\varepsilon,21} & \sigma^2_{\varepsilon,22} & \cdots & \sigma^2_{\varepsilon,2N} \\ \vdots & \vdots & \ddots & \vdots \\ \sigma^2_{\varepsilon,N1} & \sigma^2_{\varepsilon,N2} & \cdots & \sigma^2_{\varepsilon,NN} \end{bmatrix}$$

The classical OLS specifies that:

$$\mathrm{E}\,[\varepsilon_{it}] = 0,$$

Var $[\varepsilon_{it}] = \sigma^2$,

Cov $[\varepsilon_{it,}\ \varepsilon_{js}] = 0$ if $t \neq s$ or $i \neq j$.

Then the error variance is $\Omega = \sigma^2 I_{NT}$ or $\Omega = \begin{bmatrix} \sigma^2 & 0 & \cdots & 0 \\ 0 & \sigma^2 & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & \sigma^2 \end{bmatrix}$

The above is the inference of an OLS estimator for a classical linear model. Now consider if errors for individuals belonging to the same group may be correlated, with general heteroscedasticity and correlation across firms or across times. If errors for individuals belonging to the same group are correlated across firms and times, then the method of two-way robust cluster estimation is robust. The estimation procedure of two-way robust cluster regression can be described in three steps:

1. OLS regression of y on X with variance matrix estimate computed using clustering by firms *i*, with *i* in {1,…N}, assigning each observation to firm cluster yields the White (1980) heteroscedasticity consistent estimator which is robust to correlation across firms at a moment in time.

$$V(\hat{\beta})_{firm} = (X'X)^{-1}(X'\hat{\Omega}X)(X'X)^{-1}$$

$$V(\hat{\beta})_{firm} = (X'X)^{-1}\left(\sum_{i=1}^{N}(e_i x_i)'(e_i x_i)\right)(X'X)^{-1}$$

2. OLS regression of y on X with variance matrix estimate computed using clustering on years *t*, with *t* in {1,…T}, assigning each observation to year cluster yields the White (1980) heteroscedasticity consistent estimator which is robust to correlation within a firm across time.

$$V(\hat{\beta})_{year} = (X'X)^{-1}(X'\hat{\Omega}X)(X'X)^{-1}$$

$$V(\hat{\beta})_{year} = (X'X)^{-1}\left(\sum_{t=1}^{T}(e_t x_t)'(e_t x_t)\right)(X'X)^{-1}$$

3. OLS regression of y on X with variance matrix estimate computed using clustering on both firms and years (*i*, *t*), with (*i*, *t*) in {(1,1),…(N,T)}. This is the usual White OLS standard error:

$$V(\hat{\beta})_{white} = (X'X)^{-1}(X'\hat{\Omega}X)(X'X)^{-1}$$

Ω is estimated by White's heteroscedastic-consistent covariance matrix by squaring OLS residuals of $e_{it.}$

$$\hat{\Omega} = \begin{bmatrix} e_1^2 & 0 & \cdots & 0 \\ 0 & e_2^2 & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & e_{NT}^2 \end{bmatrix}$$

So that,

$$V(\hat{\beta})_{white} = (X'X)^{-1}\left(\sum_{i=1}^{N}\sum_{t=1}^{T}(e_{it}x_{it})'(e_{it}x_{it})\right)(X'X)^{-1}$$

Thus, a two-way cluster-robust variance matrix by firm and by year is estimated as:

$$V(\hat{\beta}) = V(\hat{\beta})_{firm} + V(\hat{\beta})_{year} - V(\hat{\beta})_{white}$$

$$= (X'X)^{-1}\left(\sum_{i=1}^{N}(e_i x_i)'(e_i x_i)\right)(X'X)^{-1} + (X'X)^{-1}\left(\sum_{t=1}^{T}(e_t x_t)'(e_t x_t)\right)(X'X)^{-1}$$

$$-(X'X)^{-1}\left(\sum_{i=1}^{N}\sum_{t=1}^{T}(e_{it}x_{it})'(e_{it}x_{it})\right)(X'X)^{-1}$$

### 4.7 Data and sample selection

The starting point for the sample is the population of all ASX listed firms in the DataStream database including active file, suspended file and dead file with necessary annual accounting and market data from the period of 1999 to 2006. The initial sample includes 3,914 firms with 31,312 observations. This study excludes all firms in the financial sector with GICS code (4010-4040) since their financial statements are subject to special accounting regulations. They include 45 banks, 194 equity

investment instruments, 228 general financial, 5 life insurance, 44 nonequity invest instruments, 19 nonlife insurance, 276 real estates, altogether 811 firms and 6,488 observations. Regulated firms from Utilities sector have not been eliminated as the number is relatively few in Australia. Also excluded are 1,832 firm observations whose industry codes are unclassified by DataStream. A further 16,910 firm observations are omitted since necessary data for accrual estimation is missing: this includes the loss of observations for 1999 as lagged variables of total assets and first differencing taken for the variables of revenue, account receivables, and operating cash flows are required in equations (4.1), (4.6), and (4.7). Firms involved in restructuring activities with 10 observations are excluded. The entire ASX covers very large companies from the Top 200 ASX index, also included are many very small listed companies. Thus, the top and the bottom 1 % observations by extreme values of total assets are trimmed, including 125 observations. These sampling criteria resulted in a sample with necessary data for 5,947 firm-year observations for accrual estimation.[21]

Since the estimation of the cross-sectional accrual model requires at least ten firms per industry-year combination, industry groups with fewer than ten observations in a given sample year are combined if they have closer GICS codes. As Australian markets are dominated by gold and mining industries, the Metals & Mining sector is extracted from the Material sector to see whether this sector has an industry cluster effect on earnings management practices. Both Metals & Mining and Material sectors use the same code (GICS 1510). This procedure results in nine GICS industry groups, that is, Energy (1010), Material (1510), Metals & Mining (1510), Industrials (2010-2030), Consumer Discretionary (2510-2550), Consumer Staples (3010-3030), Health Care (3510-3520), Information Technology (4510-4530), and Telecommunication & Utilities (5010-5510). Each of the firm-year observations in the estimation sample is assigned into one of the nine combined industry groups according to the GICS code.

Executive compensation data are obtained from the Connect4 databases. First, there was a search conducted for all Chief Executives and/or Managing Directors (CEOs/MDs) from the Board position list. Some CEOs and MDs are not members of

[21] Note that not all the firms in the sample have data for all years. Untabulated statistics suggest that firm coverage varies from 335 firms in 2000 to 1,142 in 2006.

the company's Board of Directors, an additional search was made from the executive position list. Remuneration details are searchable under both director and executive lists. The detailed disclosure includes total compensation, directors fees, bonus, super, salary, allowances, non-cash benefits, retirement payment, motor, committee fees, long-term incentive plans (LTIP), options ($), shares ($) and consulting fees. The status of CEOs/MDs was "current" in the position of that particular fiscal year. Finally, all active, suspended, and dead firms from year 2000 to year 2006 were selected.

This searching procedure yielded an initial executive compensation data set of 7,672 firm-year observations. In order to obtain financial data needed to compute discretionary accruals, executive compensation data (from Connect4) was merged with the accrual estimation sample (from DataStream) by company code and by year. The merged data set contains 10,053 firm-year observations. In order to extract the data that contains both executive compensation and financial information, this study deleted 2,859 observations from which total executive compensation was missing, 9 observations of options, shares and LTIPs that had negative value. Also, 3,723 observations with missing financial data for accruals estimation were deleted. To ensure that the results are not sensitive to extreme outliers, observations in the top and bottom 1% of total compensation and discretionary accruals were eliminated. The intersection of these two databases and the selection process yielded a testing sample of 3,326 firm-year observations covering the period of 2000 to 2006.[22] Details of the sampling procedure are reported in Table 4.2.

Table 4.3 shows both industry-wise and year-wise distribution of the estimation sample. Nine GICS industry groups are represented in the estimation sample, containing a high proportion of Metals & Mining (1510), Consumer Discretionary (2510-2550), and Information Technology (4510-4530), 30.94%, 16.46%, and 13.05% respectively. Industry-wise distribution of the sample presents some evidence of industry clustering. Indeed, the industry clustering reflects the nature of the Australian economy. The Australian economy is dominated primarily by resource and consumer services. However, in recent years, Australia has experienced an explosive growth in the so-called 'new economy', comprising firms in information technology.

[22] Untabulated statistics indicate that firm coverage varies from 129 firms in 2000 to 864 in 2006.

As of March 2001, 214 companies are listed under 'new economy' industry classifications of the Australian Stock Exchange (ASX), contributing to more than 60% of the total market capitalization of the ASX (Jones and Sharma, 2001). This current study spans seven years from 2000 to 2006 and in general, the firm-year observations have steadily increased each year. Higher frequencies of firm-year distribution occur after the year 2002 (from 9.11% in 2001 to 15.62% in 2002), indicating the improvement of the disclosure environment in Australia with more companies disclosing their financial reports.

For the distribution of testing sample, Table 4.4 shows a very similar pattern that has been described in the estimation sample. The majority of the testing sample is comprised of firms in Metals & Mining (1510), Consumer Discretionary (2510-2550), and Information Technology (4510-4530), 30.64%, 16.48%, and 13.02% respectively. The firm-year observations have steadily increased from 2000 to 2006 with a big jump occurring in the year 2002 (from 5.56% in 2001 to 10.58% in 2002).

## 4.8 Chapter summary

This chapter discusses the methodologies and the empirical models, which are designed for testing overall evidences on earnings management in the Australian context; the relation between earnings management and executive compensations incentives; and the relation between earnings management and benchmark beating behaviour. Also, the sample selection procedure and the data sources used for these tests are described. In the next chapter, the results of first investigation issue—the overall detection of earnings management will be presented and discussed in detail.

# Chapter 5

# Empirical Analysis-Detection of Earnings Management

## 5.1 Introduction

This chapter presents the detection of earnings management in the Australian context. The detection is based upon analyzing the behaviour of discretionary accruals which is the proxy for earnings management. In the following sections, it first provides descriptive statistics on selected variables used for testing earnings management. Then, the estimation procedures of discretionary accruals based on the Jones model, the Modified Jones Model, the Cash Flow Modified Jones Model, and the Performance Adjusted Technique are described. Finally, evidences on earnings management behaviour across industry sectors and time are presented; also, the way earnings management behaviour varies across firm characteristics is analyzed.

## 5.2 Descriptive statistics (estimation sample)

Table 5.1 presents the descriptive statistics for the estimation sample. The estimation sample is defined as the sample with necessary data 5,947 firm-year observations for accrual estimation from the period of 1999 to 2006. Over the entire sample period, mean and median total assets are approximately $341 million and $24 million respectively, whereas standard deviation is relatively big ($1,064 million) reflecting that Australian firms are quite different in term of size even after the sample has been trimmed by extreme value of total assets. All other variables are deflated by beginning-of-period total assets. The estimation sample firms tend to be loss making firms. The income before extraordinary items as a portion of total assets ($E_{it}$) is negative (−0.2040). This is further confirmed by the overall operating cash flows ($CF_{it}$) being negative as a proportion of total assets (−0.1362). Mean total accruals ($TA_{it}$), calculated as the difference between incomes before extraordinary items and operating cash flows, are negative as well. The distribution is also skewed by some large companies as can be seen from the difference between the mean and the median values of sales, account receivables and property, plant and equipments.

### 5.3 Estimation of discretionary accruals

Table 5.2 reports summary statistics for cross-sectional OLS regressions based on the Jones model, the Modified Jones Model, and the Cash Flow Modified Jones Model. Discretionary accruals are estimated as residuals from these three models. Each of the three models is estimated cross-sectionally for nine GICS industry groups in each year from 2000 to 2006. So, the mean (median) coefficient estimates are the average values for 63 industry-year pairs. Mean (median) coefficients are in the upper line with *t*-statistics (*Wilcoxon z*-scores) and *p*-values in parentheses below. One sample *t*-test and *Wilcoxon* signed rank test are applied to test whether mean and median coefficients are significantly different from zero.

In concept, the predicted sign of the change in sales ($\Delta REV_{it}$) usually is ambiguous. A given change in sales can associate with either income-increasing accruals or income-decreasing accruals, depending on the relative change of current assets and current liabilities associated with operations. Property, plant, and equipment ($PPE_{it}$) should have a negative relationship with total accruals since the level of property, plant and equipment is linked to the income-decreasing accruals such as depreciation, depletion and amortization (Jones, 1991).

For the Jones Model, both mean and median coefficient estimates on $\Delta REV$ are positive, and 61.91% of the coefficient estimates are positive. The *Wilcoxon* signed rank test shows that the median coefficient on $\Delta REV$ is significant different from zero at 5% level. The mean and median coefficients on *PPE* are significantly negative at less than 1% level under both the *t*-test and the *Wilcoxon* signed rank test, further, 79.37% of the coefficient estimates are negative (which is equivalent to 20.63% positive).

For the Modified Jones Model, the sign on ( $\Delta REV - \Delta AR$ ) is unclear. Both mean and median coefficients are negative and insignificantly different from zero. Dechow et al. (1995) argued that it is easier for managers to exercise discretion over credit sales than cash sales. So, they modified the original Jones model by removing all the credit sales from revenue. This model implicitly assumes that all changes in credit sales result from earnings management, however, the ambiguous and insignificant

coefficient sign indicates that in an Australian context, earnings management activities may be carried out through accounts other than credit sales.

For the Cash Flow Modified Jones Model, Kasznik (1999) included the change in operating cash flows in the Modified Jones Model to control the effect of operating cash flows. This modification seems to improve the accrual estimation. Both mean and median coefficient estimates on ($\Delta REV_{it} - \Delta AR_{it}$) are positive; with 69.84% of the coefficient estimates being positive. Moreover, the *t*-test and the *Wilcoxon* signed rank test show that both mean and median coefficients are significantly different from zero at less than 1% level. The mean and median coefficients on $PPE_{it}$ are significantly negative at less than 1% level with 76.19% of the coefficient estimates being negative (which is equivalent to 23.813% positive). As expected, the variable $\Delta CF_{it}$ has a predominantly negative relationship with total accruals. The mean and median coefficients on $\Delta CF_{it}$ are significantly negative at less than 1% level, with 80.95% of the coefficients being negative (this means only 19.05% of the coefficient estimates are positive). This is consistent with the view that a change in cash flow from operations is negatively correlated with total accruals (Dechow et al., 1995; Kasznik, 1999; Baruat et al., 2006; and Shuto, 2007).

Comparing these three models, the mean adjusted *R*-square for the Jones Model and the Modified Jones Model are very close, 35.27% and 35.38% respectively. While the mean adjusted *R*-square for the Cash Flow Modified Jones Model is 46.80%, explaining more of the variation in total accruals than the Jones and the Modified Jones Model. Therefore, the Cash Flow Modified Jones Model from Kasznik (1999) is more reliable in estimating discretionary accruals with generally intuitive sign and higher explanatory power.

After obtaining discretionary accruals from the Jones model, the Modified Jones model and the Cash flow Modified Jones model respectively, this study further examines whether these discretionary accrual estimates are correlated with earnings performance. As Kaszink (1999) showed that firms with higher (lower) earnings exhibit significantly positive (negative) discretionary accruals, this study examines this possibility by analysing the empirical distribution of discretionary accruals estimates relative to the earnings levels.

First, based on the Cash Flow Modified Jones model, discretionary accruals are ranked on the level of earnings deflated by lagged total assets and assigned into percentiles according to their rank orders. Percentile 1 and 100 contain 59 observations respectively with the lowest and highest levels of earnings among the 5,947 observations. Figure 5.1 Panel A plots the mean discretionary accruals of the 100 percentiles. The pattern indicates that discretionary accruals are correlated with earnings performance. Most observations of mean discretionary accruals, from 19$^{th}$ percentile to 82$^{th}$ percentile, lie stable between 0.1 and −0.1. However, when earnings performance is increased (decreased), the distribution of discretionary accruals shows a clear upward (downward) trend. The mean discretionary accruals are positive and steadily increase from 91$^{th}$ percentile to 100$^{th}$ percentile; while the mean discretionary accruals are negative and drop from 10$^{th}$ percentile to 1$^{st}$ percentile.

Discretionary accruals can be used to either increase or decrease earnings. Positive discretionary accruals suggest income-increasing earnings management while negative discretionary accruals suggest income-decreasing earnings management. Large values of discretionary accruals are conventionally interpreted as evidence of earnings management. Under the null hypothesis of no earnings management, discretionary accruals are expected to be zero. In order to examine whether there is a systematic rejection of the null hypothesis of zero discretionary accruals, one sample *t*-test is conducted and *p*-values for the rejection of null hypothesis are plotted against 100 percentiles.

Figure 5.2 Panel A displays that the null hypothesis of zero discretionary accruals is rejected at a below 5% level for percentiles representing lower and higher levels of earnings. It clearly shows that the percentiles with lower earnings are more likely to exhibit negative discretionary accruals and significantly at or less than 5% level, while the percentiles with higher earnings are more likely to exhibit positive discretionary accruals at or less than 5% level. This graphic evidence is further confirmed by Table 5.3.

Table 5.3 shows the mean discretionary accruals are significantly negative at 5% level for 18 out of the lowest 20 percentiles; while the mean discretionary accruals is significantly positive at 5% level for 16 out of the highest 20 percentiles. However, for the rest of 60 percentiles, the null hypothesis of zero discretionary accruals is

rejected for only 10 percentiles. The finding suggests that estimation sample firms with low (high) earnings levels have, on average, negative (positive) discretionary accruals.

The above analysis implies that discretionary accruals yields biased metrics if measurement error in the proxy is correlated with earnings performance. If this measurement error is associated with the subsequent testing variable of interest, for example, the executive compensation, then findings will be biased. Therefore, well-specified models must include an adjustment for earnings performance. Consistent with Kasznik (1999), the performance adjust technique is employed to control for this potential bias. The median discretionary accruals for each percentile are assumed to reflect measurement error that is correlated with that level of earnings performance. In the estimation sample, the median discretionary accrual for each percentile is subtracted from the original discretionary accrual in that percentile. By doing that, measurement error in the discretionary accruals correlated with earnings performance is largely removed.

In table 5.4, Spearman correlation of discretionary accruals and earnings performance further shows the effect of applying performance adjusted technique. Before adjusting, the mean discretionary accruals are significantly correlated with the current earnings ($p<0.0001$), past earnings ($p<0.0001$), the absolute value of current earnings ($p<0.0001$) and return on assets ($p<0.0001$). After adjusting, the discretionary accruals are insignificantly correlated with the current earnings ($p=0.8817$), past earnings ($p=0.1913$), the absolute value of current earnings ($p=0.7100$), and return on assets ($p=0.1030$). Therefore, to some extent much of the measurement error that correlated with earnings performance is removed.

The Performance Adjusted Technique is suggested to yield a more reliable measure of earnings management when a firm is experiencing extreme earnings performance. While this is true for the estimation sample, the testing sample may not have this problem. In order to assess whether there is similar concern that discretionary accruals are correlated with extreme earnings performance for the testing sample firms, the analysis of the empirical distribution of discretionary accruals estimates relative to the earnings levels for the testing sample is thus repeated.

Using discretionary accruals from the Cash Flow Modified Jones Model, the testing sample also presents a pattern that discretionary accruals are correlated with extreme earnings performance. Figure 5.1Panel B indicates although the pattern is not as clear as that of the estimation sample, the mean discretionary accruals are positive and increased from 91$^{th}$ percentile to 100$^{th}$ percentile; while the mean discretionary accruals are negative and decreased from 10$^{th}$ percentile to 1$^{st}$ percentile.

Figure 5.2 Panel B displays that the null hypothesis of zero discretionary accruals is rejected at a below 5% level for percentiles representing lower and higher levels of earnings for the testing sample. Similarly, the percentiles with lower earnings are more likely to exhibit negative discretionary accruals and significantly at or less than 5% level; while the percentiles with higher earnings are more likely to exhibit positive discretionary accruals at or less than a 5% level.

Table 5.3 further confirms for the testing sample, the mean discretionary accruals are significantly negative at a 5% level for 15 out of the lowest 20 percentiles; while the mean discretionary accruals are significantly positive at a 5% level for 10 out of the highest 20 percentiles. However, for the rest of 60 percentiles, the null hypothesis of zero discretionary accruals is rejected for only 9 percentiles. Therefore, there is a similar concern for the testing sample firms where firms with low (high) earnings levels have, on average, negative (positive) discretionary accruals.

Table 5.4 Spearman correlation of discretionary accruals and earnings performance further shows the effect of applying the Performance Adjust Technique. Before adjusting, the mean discretionary accruals are significantly correlated with the current earnings ($p$<0.0001), past earnings ($p$<0.0001), the absolute value of current earnings ($p$<0.0001) and return on assets ($p$<0.0001). However, after adjusting, the discretionary accruals are insignificantly correlated with the current earnings ($p$=0.5151), the absolute value of current earnings ($p$=0.1897), and return on assets ($p$=0.9123). Nevertheless, the correlation between discretionary accruals and past earnings still presents some correlation ($p$=0.0696). To some extent, much of the measurement error that was correlated with earnings performance is removed.

Since discretionary accruals are also found to be correlated with extreme earnings performance in the testing sample, this study suggests that adjusted discretionary

accruals should be used as proxy for earnings management in testing the executive compensation incentives and benchmark beating in the latter chapters 6 and 7.

### 5.4 Evidences on industry and year

Industry classification has proved to be of considerable significance in prior research in the area of earnings management. Previous research has also documented earnings management evidences across individual industries. In this section, earnings management behaviour is first examined across Australian industries. Under the null hypothesis that an industry does not engage in earnings management, one should expect to see the discretionary component of accruals to be zero. This proposition is tested by examining the mean, median and proportion of discretionary accruals being positive. This study employs Student's *t*-test for the mean, the non-parametric *Wilcoxon* signed rank test for median and the binomial sign test for proportional differences.

#### 5.4.1 The magnitude of earnings management

Table 5.5 Panel A presents the overall magnitude of earnings management for each industry by using the Jones model. The overall magnitude of earnings management is measured by the absolute value of discretionary accruals as a percentage of beginning total assets, *Abs (DA_J)*. In general, the average magnitude of earnings management activity is 0.1654, indicating the average magnitude of earnings management that occurred among Australian industries is approximately around 17% of total assets which is relatively significant.

Specifically, the highest magnitude occurs in the Energy with mean (median) absolute discretionary accruals of 0.2593 (0.1087). Information Technology, Metals & Mining, and Telecommunication & Utilities show a relatively high magnitude of earnings management activity, with mean (median) absolute discretionary accruals of 0.2052 (0.1209), 0.2032 (0.0967), and 0.1806 (0.0976), respectively. The lowest magnitude of earnings management occurred in the Industrials with mean (median) absolute discretionary accruals of 0.0806 (0.0521). A bar graph displays the overall

magnitude of earnings management of the nine GICS industries (See Figure 5.3 Panel A).

Table 5.5 Panel B shows the overall magnitude of earnings management for each year by using the Jones model. In general, the overall magnitude of earnings management tends to increase from the year 2000 to the year 2006. The mean (median) absolute value of discretionary accruals is 0.1236 (0.0696) for the year 2000, which has been increased to 0.2153 (0.1001) of the year 2006. A line graph shows the increase trend of the overall magnitude of earnings management from the year 2000 to the year 2006 (See Figure 5.4 panel A).

Table 5.6 Panel A presents the overall magnitude of earnings management for each industry by using the Modified Jones model. In general, the Modified Jones model displays very similar results as that of the Jones model. The mean (median) total absolute value of discretionary accruals, *Abs (DA_MJ)*, shows the average magnitude of earnings management activity to be 0.1679 (0.0830) which is around 17% of total assets. Specifically, Energy, Information Technology, Metals & Mining, and Telecommunication & Utilities also show a relatively high magnitude of earnings management activity. The lowest magnitude of earnings management also occurs in the Industrials. A bar graph further displays the overall magnitude of earnings management of the nine GICS industries (See Figure 5.3 Panel B).

Table 5.6 Panel B shows the overall magnitude of earnings management for each year by using the Modified Jones model. In general, the overall magnitude of earnings management tends to increase from the year 2000 to the year 2006. The mean (median) absolute value of discretionary accruals is 0.1278 (0.0681) for the year 2000, which has been increased to 0.2180 (0.0980) by the year 2006. A line graph shows the increase trend of the overall magnitude of earnings management from the year 2000 to the year 2006 (See Figure 5.4 Panel B).

Table 5.7 Panel A presents the overall magnitude of earnings management for each industry by using the Cash Flow Modified Jones model. It shows the average magnitude of earnings management activity to be lower than that of the Jones Model and the Modified Jones model. The mean (median) total absolute value of discretionary accruals, *Abs (DA_CFO)*, is 0.1457 (0.0772). This average magnitude,

15% of total assets, is lower than the 17% of total assets from the Jones model and the Modified Jones model. This indicates that the Cash Flow Modified Jones model results in a low absolute measure of discretionary accruals.

Specifically, the highest magnitude of earnings management takes place in Information Technology with mean (median) absolute discretionary accruals of 0.1882 (0.1084). Followed by Metals & Mining and Telecommunication & Utilities, with mean (median) absolute discretionary accruals of 0.1824 (0.0872) and 0.1632 (0.1080), respectively. The magnitude of Energy has dropped into the fourth place, which was the first place in the Jones Model and the Modified Jones Model. The lowest magnitude of earnings management, however, still takes place in the Industrials, with the lowest mean (median) absolute discretionary accruals of 0.0740 (0.0453). A bar graph further displays the overall magnitude of earnings management of the nine GICS industries (See Figure 5.3 Panel C).

Table 5.7 Panel B shows the overall magnitude of earnings management for each year by using the Cash Flow Modified Jones model. Although the magnitudes from year to year are also lower compared to those of the Jones Model and the Modified Jones Model, the upwards trend remains during the period of 2000 to 2006. The mean (median) absolute value of discretionary accruals is 0.1162 (0.0638) for the year 2000, which has been increased to 0.1774 (0.0909) by the year 2006. A line graph shows the increase trend of the overall magnitude of earnings management from the year 2000 to the year 2006 (See Figure 5.4 Panel C).

Table 5.8 Panel A presents the overall magnitude of earnings management for each industry by using the Performance Adjusted Technique. It shows the average magnitude of earnings management activity has been further decreased as opposed to that of the Jones Model, the Modified Jones model and the Cash Flow Modified Jones Model. The mean (median) total absolute value of discretionary accruals, *Abs (DA_ADJ)*, is 0.1324 (0.0696). This average magnitude, 13% of total assets, is lower than the results from all previous three models. The decline in magnitude of earnings management suggested the measurement error in the discretionary accruals correlated with earnings performance is largely removed. Industries that are identified to have large negative discretionary accruals in the Jones model, the Modified Jones Model and the Cash Flow Jones Model may be influenced by a firm's extreme poor earnings

performance in a particular industry. Likewise, industries that are identified to have large positive discretionary accruals in the Jones model, the Modified Jones Model and the Cash Flow Jones Model may be influenced by a firm's extreme good earnings performance in a particular industry.

Specifically, the highest magnitude of earnings management takes place in the Metals & Mining and Information Technology, with mean (median) absolute discretionary accruals of 0.1694 (0.0834) and 0.1664 (0.0983), respectively, followed by Energy and Telecommunication & Utilities, with mean (median) absolute discretionary accruals of 0.1558 (0.0864) and 0.1512 (0.1014), respectively. The lowest magnitude of earnings management is very stable, remaining in the Industrials, with the lowest mean (median) absolute discretionary accruals of 0.0699 (0.0438). A bar graph further displays the overall magnitude of earnings management of the nine GICS industries (See Figure 5.3 Panel D).

Table 5.8 Panel B shows the overall magnitude of earnings management for each year by using the Performance Adjusted Technique. The magnitudes from year to year are also reduced as opposed to those of the Jones Model, the Modified Jones Model, and the Cash Flow Modified Jones Model. But the upwards trend is not mitigated during the period of 2000 to 2006. The mean (median) absolute value of discretionary accruals is 0.1064 (0.0561) for the year 2000, which has been increased dramatically to 0.1618 (0.0807) by the year 2006. A line graph shows the increase trend of the overall magnitude of earnings management from the year 2000 to the year 2006 (See Figure 5.4 Panel D).

### 5.4.2The directions of earnings management

In this section, the tests focus on the directions of earnings management—whether managers engage in upward (income-increasing) or downward (income-decreasing) earnings manipulations. Table 5.9 Panel A reports the results from using the Jones model. It shows that five out of nine GICS industries (Metals & Mining, Industrials, Health Care, Information Technology, and Telecommunication & Utilities) have signed discretionary accruals *DA_J* significantly different from zero. For each of the five industries, the mean, median and equal proportion of positive and negative values is statistically significant from zero under standard *p* values.

Specifically, the mean, median and proportion of negative discretionary accruals of Metals & Mining, Industrials, Health Care, and Information Technology are −0.0416, −0.0245 and 58% (1059 out of 1840), −0.0153, −0.0067 and 56% (173 out of 307), −0.0357, −0.0268 and 59% (333 out of 560), and −0.0628, −0.0459 and 60% (468 out of 776), respectively. In contrast, the mean, median and proportion of positive discretionary accruals of Telecommunication & Utilities are 0.0361, 0.0303 and 59% (106 out of 179). Two additional industries, Energy and Consumer Discretionary, exhibit discretionary accruals to be significantly different from zero when only *Wilcoxon* and *Binomial* tests are used. The *Wilcoxon* test suggests that the median value of discretionary accruals of Consumer Discretionary is 0.0211, significantly positive at less than 1% level. Also, the *Binomial* test shows that the proportion of positive discretionary accruals of Consumer Discretionary is 58% (569 out of 979) and significantly different from that of negative discretionary accruals. Finally, the *Binomial* sign test suggests that Energy has a large proportion of negative discretionary accruals 55% (234 out of 429), significantly different from the proportion of positive discretionary accruals.

Panel B indicates that year 2004 and 2005 have discretionary accruals significantly different from zero. For each of the two years, the mean, median and equal proportion of positive and negative values is statistically significant from zero under standard *p* values. Specifically, the mean, median and proportion of negative discretionary accruals of year 2004 and 2005 are −0.0262, −0.0096 and 54% (522 out of 965) and −0.0711, −0.0478 and 62% (669 out of 1078), respectively. When only the *Wilcoxon* test is used, year 2001, 2004 and 2005 show significantly negative median discretionary accruals. *Binomial* sign tests further indicate that the proportions of negative discretionary accruals are significantly different from the proportion of positive discretionary accruals for year 2001, 2002, 2004 and 2005; while only year 2000, shows a significantly proportion of positive discretionary accruals.

Table 5.10 reports the results from the Modified Jones model. Panel A also indicates that five out of nine GICS industries (Metals & Mining, Industrials, Health Care, Information Technology, and Consumer Discretionary) have signed discretionary accruals, *DA_MJ*, significantly different from zero. Different from the Jones model, the Modified Jones model shows the Consumer Discretionary is a significant industry.

In particular, the mean, median and proportion of positive discretionary accruals of Consumer Discretionary are 0.0130, 0.0255 and 59% (581 out of 979). Energy becomes insignificant in the binomial test. Finally, Telecommunication & Utilities is only significant in the *Wilcoxon* and *Binomial* tests. The *Wilcoxon* test suggests that the median value of discretionary accruals of Telecommunication & Utilities is 0.0337, significantly positive at less than 5% level. The *Binomial* test shows that the proportion of positive discretionary accruals of Telecommunication & Utilities 59% (105 out of 179) is significantly different from that of negative discretionary accruals.

These differences imply that fewer industries are detected to engage in earnings management when the Modified Jones Model is used in measuring discretionary accruals. As previously stated, the Modified Jones Model removes the change in account receivables from the change in revenues. The purpose for such modification is to eliminate the tendency of the Jones model to measure discretionary accruals with error when discretion is exercised through account receivables which are related to credit sales. In the situation that earnings manipulation is done through credit sales, the modified Jones model exhibits more power in detecting earnings management (Dechow et al., 1995).

Panel B indicates that years 2004 and 2005 have discretionary accruals significantly different from zero among all three tests. This is statistically similar to the Jones model. If only the *Wilcoxon* test is considered, the years 2000, 2001, 2004 and 2005 show significantly negative median discretionary accruals. If only the *Binomial* sign test is considered, the proportions of negative discretionary accruals are significantly different from the proportion of positive discretionary accruals for the years 2001, 2002, 2004 and 2005; while only the year 2000, shows a significant proportion of positive discretionary accruals.

Table 5.11 reports the results from the Cash Flow Modified Jones model. The improvement of the Cash Flow Modified Jones Model is that this model considers cash flows from operation could be a possible omitted variable in estimating discretionary accruals. Panel A shows when operating cash flows is taken into account in modeling discretionary accruals, four out of nine GICS industries (Metals & Mining, Consumer Discretionary, Health Care, and Information Technology) retain significant results from all *t*-test, *Wilcoxon* test and *Binomial* sign test. Different from

that of Jones model and Modified Jones Model, Industrials is only significant in *t*-test; Telecommunication & Utilities is only significant in *Binomial* sign test; and Consumer Staples become significant in *Binomial* sign test.

Panel B exhibits three years, 2002, 2005 and 2006 that have discretionary accruals significantly different from zero among all three tests. If the *Wilcoxon* test only is considered, year 2001, 2002, 2005 and 2006 show significant median discretionary accruals. If the *Binomial* sign test only is considered, the proportions of negative discretionary accruals are significantly different from the proportion of positive discretionary accruals for year 2002 and 2005; while only year 2006, shows a significant proportion of positive discretionary accruals.

Table 5.12 reports the results by using the Performance Adjust Technique. Panel A indicates that after adjusting earnings performance, five out of nine GICS industries (Energy, Industrials, Health Care, and Telecommunication & Utilities) have discretionary accruals significantly different from zero. For each of the five industries, the mean, median and equal proportion of positive and negative values is statistically significant from zero under standard *p* values. In contrast to the Jones model, the Modified Jones model and the Cash Flow Modified Jones model, discretionary accruals after adjusting earnings performance tend to shift from negative values to positive values. For example, Health Care now displays positive mean and median values of discretionary accruals and the proportion of positive discretionary accruals are larger than the proportion of negative discretionary accruals.

The shift from more negative discretionary accruals to more positive discretionary accruals implies that a firm's earnings performance has added noise in discretionary accruals estimation. Industries that are identified to have large negative discretionary accruals in the Jones model, the Modified Jones Model and the Cash Flow Jones Model may be influenced by a firm's extreme poor earnings performance in a particular industry. Likewise, industries that are identified to have large positive discretionary accruals in the Jones model, the Modified Jones Model and the Cash Flow Jones Model may be influenced by a firm's extreme good earnings performance in a particular industry. The possibility that discretionary accruals are correlated with earnings performances has been already shown in the previous discussion of the use of the Performance Adjust Technique (see Section 5.3).

After adjusting earnings performance, Telecommunication & Utilities remains significantly positive mean and median value of discretionary accruals. Also, the proportion of positive discretionary accruals is significant. The mean, median and proportion of positive discretionary accruals of Telecommunication & Utilities are 0.0517, 0.0576 and 64% (114 out of 179). Industrials remains significantly negative mean, median and proportion of negative value of discretionary accruals. The mean, median and proportion of negative discretionary accruals of Industrials are −0.0159, −0.0165 and 59% (182 out of 307). These two industry groups are robust even after adjusting earnings performance.

In contrast, the mean, median and proportion of positive discretionary accruals of Health Care are 0.0248, 0.0199 and 57% (321 out of 560). This suggests that previous results of negative means, medians and larger proportions of negative discretionary accruals from the Jones model, the Modified Jones Model and the Cash Flow Modified Jones model could stem from the measurement error in the estimates of discretionary accruals which is correlated with a firm's earnings performance. The *Wilcoxon* test and *Binomial* sign test suggest that Information Technology is significant. The median value of discretionary accruals of Information Technology is −0.0178, significantly negative at less than 10% level. The proportion of negative discretionary accruals is 56% (437 out of 776), significantly at less than 1% level.

A similar implication is found in testing year-wise earnings management evidence. Panel B shows that the year 2002 has significantly positive mean and median discretionary accruals and the year 2003 exhibits significantly positive mean and larger proportion of positive values of discretionary accruals. These results are contradictory to the Jones model, the Modified Jones Model and the Cash Flow Modified Jones mode, which show negative mean, median and larger proportion of negative values of discretionary accruals in the years 2002 and 2003, respectively. Such shifts indicate that some years that have been reported to have significantly negative discretionary accruals in the previous models may be driven by extremely poor earnings performance. Discretionary accruals tend to shift and display more positive mean values.

The year 2006 shows significantly positive discretionary accruals in all three tests with the mean, median and proportion of negative discretionary accruals being 0.0411, 0.0236 and 58% (625 out of 1078). The year 2005 shows significantly negative results with the mean, median and proportion of negative discretionary accruals being −0.0378, −0.0279 and 67% (653 out of 965).

Taken together, there is an industry wide variation in the practice of earnings management during the sample period of 2000 to 2006. Based on the performance adjusted discretionary accruals, this study suggests that earnings management is prevalent in five industries: Energy, Industrials, Health Care, Information Technology and Telecommunication & Utilities. The dual economy approach about earnings management posits that periphery sector firms are exposed to higher degrees of business uncertainty and a more restricted opportunity structure and are more likely to be exhibit higher frequency of earnings management than the core sector (Belkaoui and Picur, 1984). The Australian economy is dominated primarily by consumer service and in recent periods has experienced considerable growth in the so-called 'new economy', comprising firms in information technology, biotechnology and healthcare and Telecommunication. Overall, the evidence suggests that the periphery sector is more likely to engage in earnings management than the core sector. Moreover, earnings management activities are found in the years 2002, 2003, 2005 and 2006, with particularly strong earnings management occurring in the years 2005 and 2006. Although this is beyond the scope of this study, one possible reason could be that given the sample period coincides with the recent boom in resource sector in Australia and predominance of resource based firms in the sample, the firms may be engaging in earnings management. Given CLERP 9 is to improve financial reporting quality, one would expect a decline in earnings management behaviour after the introduction of CLERP 9 in 2002 and enactment in 2004. However, the findings in Chapter 5 show a upward trend which yields a very interesting insight and leave room for future research.

### 5.5 Evidences on firm characteristics

Above investigation shows that earnings management behaviour varies across Australian industry sectors. This section examines earnings management behaviour at

the individual firm level through several characteristics known to be associated with the magnitude and directions of earnings management. These characteristics are firm size, growth opportunities, profitability, leverage, book-to-market, capital intensity, and lagged total accruals.

### 5.5.1 The magnitude of earnings management

Previous analysis demonstrates the detection of earnings management relies upon the models used in estimating discretionary accruals. Evidence on earnings management, for example, the practices of earnings management across industries and years are presented to be different when the Jones Model, the Modified Jones Model, the Cash Flow Modified Jones Model and the Performance Adjusted Technique are used respectively (see Section 5.4). In order to remain consistent in interpreting the findings, the following analysis will focus on adjusted discretionary accruals only because the previous section illustrates that the Performance Adjusted Technique tends to yield a more reliable measure of earnings management (see Section 5.3)

First, ten portfolios were constructed according to the decile ranking of the absolute values of adjusted discretionary accruals to examine the magnitude of earnings management attributed to a firm's characteristics. Table 5.13 presents the average size, growth opportunity, profitability, leverage, book-to-market, capital intensity, and lagged total accruals within each portfolio constructed by the absolute value of adjusted discretionary accruals from the Performance Adjusted Technique. By construction, firms in the extreme decile portfolios are interpreted to possess the highest and lowest magnitude of earnings manipulation. The lowest decile portfolio-1 (Low) has mean absolute adjusted discretionary accruals, *Abs (DA_ADJ)*, of 0.0042 and the highest decile portfolio-10 (High) has mean *Abs (DA_ADJ*) of 0.6093.

It is observed that as the absolute adjusted discretionary accruals increase, the firm size (*SIZE*) decreases. Portfolio-10 (High), with the highest mean absolute adjusted discretionary accruals, seems to be comprised of smallest firms with a mean logarithm of total assets being 9.0633 while the portfolio-1 (Low), with the lowest mean absolute adjusted discretionary accruals , has the largest firms with mean logarithm of total assets of 11.0206. The relationship between size and absolute discretionary

accruals appears to be negatively monotonous by portfolios. The difference of firm sizes between two extreme portfolios is significant ($t$= −17.17, $p$<0.0001).

When growth opportunity (*GROWTH*) is examined, the relationship also appears to be related to high *Abs (DA_ADJ)* with high growths tending to occur in the portfolios that are above median portfolio 5. This indicates that firms with above median magnitude of earnings management are likely to exhibit faster growth rates than firms whose earnings management activity are below median magnitude. However, the relationship between growth and the absolute adjusted discretionary accruals is likely to be non-linear since the difference between portfolio 1 and 10 is insignificant ($t$= 0.18, $p$=0.8566).

Profitability (*ROE*) tends to become poorer when absolute adjusted discretionary accruals are of increasing nature. It is also interesting to note that *ROE* has negative means across most the portfolios, indicating a strong association of earnings management with low profitable firms. The High *Abs (DA_ADJ)* portfolio is making a loss while the Low *Abs (DA_ADJ)* portfolio is making a small profit. The High *Abs (DA_ADJ)* portfolio has a much lower profitability measure (−0.8501) than the Low *Abs (DA_ADJ)* portfolio (0.0596). This difference is significant at less than 1% level ($t$=−2.56, $p$=0.0108).

As regards the book-to-market ratio (*BM*), the relationship appears to be related to low *Abs(DA_ADJ)* with high book-to-market ratio firms tending to occur in the portfolios with lower mean absolute adjusted discretionary accruals. It is observed that as the absolute adjusted discretionary accruals increase, the book-to-market ratio decreases. The difference of book-to-market between two extreme portfolios is significant ($t$= −5.99, $p$<0.0001). This is expected as firms with high book-to-market ratios are more likely to have lower growth opportunities; these stocks are referred as value stocks. Therefore, the relationship between *BM* and *Abs (DA_ADJ)* should be opposite from the relationship observed from *GROWTH*.

There is no specific association between the magnitude of earnings management and leverage (*LEV*) and lagged total accruals (*LAGTA*). No pattern for changes was observed in *LEV* and *LAGTA*. The *t*-test for the difference of leverage between High *Abs (DA_ADJ)* and Low *Abs (DA_ADJ)* does not show any significant difference.

*LAGTA* has negative means across the majority portfolios. This is consistent with the mean-reverting nature of accruals as the majority parts of the current period accruals will be mean reverted in the next year. Nevertheless, the change of *LAGTA* is somewhat irregular across the portfolios with no significant difference between High and Low *Abs (DA_ADJ)* groups. Although no specific pattern was observed for changes in capital intensity (*CIR*), the difference between portfolio 1 and 10 is significant, with Low *Abs (DA_ADJ)* portfolio having higher capital intensity than High *Abs (DA_ADJ)* portfolio.

### 5.5.2 The directions of earnings management

The previous section reports that there were some firm characteristics that had an impact on the magnitude of earnings management. This section examines whether firm characteristics affect the direction of earnings management. In order to examine the direction of earning manipulation attributed to firm characteristics, discretionary accruals were split into positive and negative groups and ten portfolios were constructed according to the decile ranking of signed adjusted discretionary accruals. So, the portfolio formation procedure is conducted for upward (income-increasing) and downward (income-decreasing) earnings management respectively.

Table 5.14 presents the mean of the same firm characteristics (size, growth opportunity, profitability, leverage, book-to-market, capital intensity, and lagged total accruals) of decile portfolios of two groups of positive and negative discretionary accruals by using the Performance Adjusted Technique. In panel A, when the income-increasing adjusted discretionary accruals are considered (+*DA_ADJ*), it is observed that small size and lower book-to-market ratio firms are more likely to be involved in income-increasing earnings manipulation. The average size of the portfolio decrease as +*DA_ADJ* increases with the smallest size being 8.8459 for the highest +*DA_ADJ* portfolio (portfolio-10). The pattern for book-to-market is as monotonous as firm size, the mean *BM* for high +*DA_ADJ* portfolios are lower than those of the low +*DA_ADJ* portfolios. Testing for the extreme decile, the differences are statistically significant for both *SIZE* ($t$=−13.32, $p$<.0001) and *BM* ($t$=−7.09, $p$<.0001). Further, as +*DA_ADJ* increases, the profitability (*ROE*) tends to decrease. The mean *ROE* is positive for the lowest +*DA_ADJ* portfolio (portfolio-1) whereas the mean *ROE* is

negative for the highest *+DA_ADJ* portfolio (portfolio-10). The difference between these two extreme portfolios is significant at 10% level. Finally, the differences are also presented between extreme portfolios for *CIR* and *LAGTA*, but neither shows a clear pattern across the decile portfolios.

Panel B examines income-decreasing discretionary accruals (*−DA_ADJ*) and confirms the role of size and book-to-market in determining the directional effect of earnings manipulation. Consistent with earlier evidence, smaller size and lower book-to-market firms tend to be associated with income-decreasing earnings management. The evidence is particularly strong with the size factor, with the average size steadily decreasing as the *–DA_ADJ* becomes more negative. The average size in extreme deciles are significantly different ($t$=−10.43, $p$<.0001). The evidence regarding *BM* shows that, most high income-decreasing accruals are concentrated in firms with low *BM*. The mean *BM* of portfolio - 10, a decile portfolio of extreme *–DA_ADJ*, is 0.5262 and statistically different from that of the portfolio - 1 ($t$=−2.79, $p$=0.0055). In addition to size and book-to-market, there is evidence that high growth firms and poorer profitable firms tend to engage in more income-decreasing earnings management. Differences of *GROWTH* and *ROE* between highest negative *DA_ADJ* firms (portfolio - 10) and lowest negative *DA_ADJ* firms (portfolio - 1) are significant at 10% and 5% level, respectively. Although difference is present between extreme portfolios for *CIR* and *LAGTA* as well, the pattern is much less clear across the decile portfolios.

Overall, this study suggests that size and book-to-market ratio play significant roles in the earnings management behaviour of Australian firms between 2000 and 2006. Moreover, smaller size and lower book-to-market ratio firms are associated with both income-increasing and decreasing earnings management activities. Smaller firms and lower book-to-market firms in fact have a higher overall magnitude of earnings manipulation. The results regarding size are quite strong and are consistent with evidence of U.S. firms by Sloan (1996). The implication is firm size is generally correlated with industry. So, it is possible that earnings management is industry-specific rather than firm-specific. In terms of firm profitability, the results are consistent with Kinney and McDaniel (1989) who found that firms who restate their earning figures are likely to be less profitable. Profitability tends to become poorer

when the magnitude of earnings management is of an increasing nature. Moreover, lower profitability firms are particularly associated with income-decreasing earnings management. According to the taking-a-bath theory, when operating performance is poor, managers tend to increase earnings; however, if the operating performance is extremely poor, some firms may decrease income further. If managers attempt to take an opportunity of negative earnings in any particular period to depress earnings further then the negative earnings are likely to be clustered. Therefore, results from profitability provide some indirect evidence to support this conjecture.

### 5.6 Chapter Summary

This chapter provides a comprehensive analysis for earnings management practices within the Australian context. First, this study found that earnings management was prevalent among Australian industries during the sample period. Based upon discretionary accruals that estimated from the Performance Adjusted Technique, earnings management activities are detected in the industry sectors of Energy, Industrials, Health Care, Information Technology and Telecommunication & Utilities. Moreover, the variability of accruals that increased from the years 2000 to 2006, stayed at the high level in the year 2006. Results also show there is a firm wide variation in the practice of earnings management, with small size, low book-to-market ratio, and low profitability firms engaging in more earnings management. In the next chapters, the reasons why earnings management occurred in the Australian context will be analyzed. The industry effects and individual firm characteristics will be taken into account in the analysis as well.

# Chapter 6
# Empirical Analysis-Executive Compensation Incentives

## 6.1 Introduction

In the previous chapter, it was detected that earnings management took place in Australia. From this chapter, the analysis will focus on why earnings management takes place. The first setting this study will investigate is executive compensation incentives. This chapter first provides descriptive statistics on the selected variables in the testing sample. The testing sample is the intersection of two databases of Connect4 and DataStream with 3,326 firm-year observations covering the period of 2000 to 2006. The analysis of executive compensation incentives is able to be conducted given both the executive compensation data and accounting data are available in the testing sample.

Then, it analyzes the relationship between earnings management and executive compensations. The layout of the analysis is based on examining earnings management, both in magnitude and direction, and its association with executive compensation incentives, where executive compensations are decomposed into three tiers: total compensation; fixed remuneration versus at-risk remuneration; and salary, bonus, options, shares and LTIPs. The objective is to investigate to what extent the aggregate level of earnings management is driven by the executive compensation incentive and in which direction; and, whether different forms of executive pay will play different roles in shaping earnings management behaviour in terms of its overall magnitude and direction.

## 6.2 Descriptive statistics (testing sample)

In order to extract the data that contains both executive compensation and financial information, this chapter uses a testing sample with the intersection of two databases of Connect4 and DataStream. The intersection of these two databases and the selection process yields a testing sample of 3,326 firm-year observations covering the period of 2000 to 2006 (see Table 4.2). The analysis of executive compensation

incentives (Chapter 6) and the benchmark beating behavoiur (Chapter 7) are based on this testing sample. The variables in the testing sample include discretionary accruals, executive compensations, and control variables. Table 6.1 Panel A reports the absolute value of adjusted discretionary accruals, *Abs (DA_ADJ)*, has a mean (median) of 0.1114 (0.0643). The mean (median) signed adjusted discretionary accrual (*DA_ADJ*) is −0.0038 (0.0000). Distribution of adjusted discretionary accruals is symmetric with equal frequency of positive and negative values and median value of signed discretionary accruals is centred.

Table 6.1 Panel B presents descriptive statistics for the CEO compensation structure in the testing sample. The average total compensation for Australian CEOs is $0.54 million. The total compensation consists of fixed remuneration and at-risk remuneration. The average fixed component is $0.35 million, which is higher than the at-risk component $0.16 million. Most of CEOs in the sample firms (about 94%) receive fixed remuneration while only 31% receive at-risk pay. Further, a large proportion in the fixed compensation is cash salary; the average CEO salary is $0.29 million. Cash bonuses represent the second largest fraction of the total compensation package with $78,000, with 31.12% of firms having a bonus plan in the compensation package. The average stock option grant has a fair value of $57,600, valued using the Black-Scholes option pricing model (Black and Scholes, 1973). A majority of 29.52% of firms have an option scheme in place. Shares and Long-term incentive plans are fairly small, the proportion of firms providing shares and Long-term incentive plans to the CEO are 5.53% and 5.02%, respectively. CEOs receive share grants having an average market value of $12,300. The average Long-term incentive plan is $15,900. This is consistent with Izan et al. (1998) and Matolcsy and Wright (2007) who document that Australian CEOs are more commonly remunerated with cash than with equity-based compensation. This differs from US firms that typically offer options.[23]

The characteristic of Australian CEOs compensation structure is further confirmed in Figure 6.1. It shows the decomposition of the dollar value of the CEO compensation year by year from 2000 to 2006. In Australia, the salary is the single most important

[23] Murphy (1999) reports that since 1990s, stock options have replaced base salary and became the single largest component of compensation in almost all US industries. The reason for the popularity of option-based compensation is because there is income tax deduction for non-qualified options available in US.

component in the executive compensation package. Above 60% of the total executive compensation is from salary for all of the seven years. The bonus components, in general, are above 15% of the total compensation except in the year 2002 when it declined to 14.61%. Option grants were 11.31% of the total compensation in the year 2000, and declined to below 10% level between years 2001 and 2003. Until 2006, options grants have largely increased to 16.05%. Matolcsy and Wright (2007) provided some explanation for the drop in the options between years 2001 and 2003. They viewed these three years as the period of market uncertainty following the dot-com and NASDAQ crashes. In the period of market uncertainty, CEOs have less ability to influence a firm's stock price and therefore it would be less efficient for shareholders to tie CEO compensation to stock options. Finally, long-term incentive plans and shares components are all a small fraction below 10%.

In all, the Australian compensation market is dominated by fixed salaries and there has been less herding in the market. The lack of herding exhibited in the Australian compensation market could be influenced by the tax regulations since there is no formal tax deduction for equity-based compensation. As such, options and shares as a component of CEO compensation have not had significant importance in the Australian market.

Table 6.1 Panel C reports descriptive statistics for the control variables used in the empirical tests. The control variables indicate that firms vary in terms of size and growth. The mean and median firm sizes (*SIZE*) are 10.6360 and 10.2476 with a standard deviation of 2.0585. Testing sample firms also show a high growth rate (*GROWTH*), with mean and median of 1.4637 and 0.1006. This indicates that the distribution of growth rates is positively skewed which can be further predicted from the maximum growth rate of 547.0775. The standard deviation is also large 16.4156, implying some Australian firms have been rapidly growing during this period. In general, the profitability (*ROE*) is low, with mean and median values of −0.1290 and −0.0298, respectively. Firms are leveraged (*LEV*) to a considerable degree with means (median) of 0.1557 (0.0712), indicating approximately 16% (7%) of total assets is from debt. The mean book-to-market ratio (*BM*) is 0.6406 and the mean capital intensity ratio (*CIR*) is 0.3383.The distribution of lagged total accruals (*LAGTA*) is

skewed by some negative value as can be seen from the difference between the mean and the median values and relatively large standard deviation.

### 6.3 Executive compensation and the magnitude of earnings management

The following analysis is decomposition structured, with executive compensations decomposed into three tiers: total compensation; fixed remuneration versus at-risk remuneration; and salary, bonus, options, shares and LTIPs. The association between the magnitude of earnings management and each tier of compensation is examined respectively.

#### 6.3.1 Total compensation

The results of the association between the magnitude of earnings management and executive compensation incentives (Equation 4.9) are presented in Table 6.2. The first tier regression reports the association between the magnitude of earnings management and total executive compensations. Results show the coefficient for total compensation (*TCOMP*) is negative but insignificant, suggesting there is no association between the magnitude of earnings management and total executive compensation. The associations between absolute value of adjusted discretionary accruals and control variables show some significance. The coefficient on firm size (*SIZE*) is negative, significant at less than 1% level. The coefficient on sales growth (*GROWTH*) is positive, significant at less than 1% level as well. As expected, the coefficient on book-to-market ratio (*BM*) is significantly negative because higher book-to-market indicates lower growth rate, which should have the opposite effect on discretionary accruals from sales growth. The coefficient on profitability (*ROE*) is negative, significant at 5% level. In terms of industry effects, Material, Industrials, Consumer Discretionary, Consumer Staples, Health Care, Information Technology show significant negative association with the absolute value of adjusted discretionary accruals. This suggests these industries engage in less magnitude of earnings management that induced by executive compensation incentive. The regression has an adjusted *R*-square of 10.34%, *F*-statistic is 8.82.

So, there is no clear evidence to suggest that executive total compensation is a significant factor that determines the aggregate magnitude of earnings management behaviour. Although in Chapter 3, it is predicted that CEOs who receive relatively large amounts of total compensation will engage in earnings management in a great magnitude, the result does not support the prediction. The total compensation may not be a strong indicator in reflecting earnings management incentive because different compensation components may provide managers with different incentives and thus dilute the effect of total compensation on earnings management.

### 6.3.2 Fixed compensation versus at-risk compensation

In Table 6.2, the second tier reports results from the regression of absolute value of discretionary accruals on fixed compensation versus at-risk compensation components. The association between absolute value of adjusted discretionary accruals and executive compensation becomes clear when total compensation is decomposed into fixed components and at-risk components. The coefficient on fixed compensation (*FIX*) is negative and significant at less than 1% level. In contrast, the coefficient on at-risk compensation, including bonus, options, shares and long-term incentive plans (*ATRISK*), is positive and significant at 5% level after controlling firm characteristics and industry effects. As previously stated the dependent variable is the absolute value of discretionary accruals scaled by total assets. The coefficient on *FIX* therefore suggests that for every one million dollar increase in CEOs' fixed compensation, the magnitude of adjusted discretionary accruals as percentage of total assets will be reduced by 4.67%. Likewise, the coefficient on *ATRISK* suggests that for every one million dollar increase in CEOs' at-risk compensation, the magnitude of adjusted discretionary accruals as a percentage of total assets will increase by 2.46%.

In terms of control variables, the coefficient on firm size (*SIZE*) is negative, significant at less than 1% level. The coefficient on sales growth (*GROWTH*) is positive, significant at less than 1% level as well. The coefficient on book-to-market ratio (*BM*) has a negative sign and significant at 5% level. The coefficient on profitability (*ROE*) is negative, significant at 5% level. In addition, Material, Industrials, Consumer Discretionary, Consumer Staples, Health Care, Information Technology show significant negative association with the absolute value of adjusted

discretionary accruals. This suggests these industries engage in less magnitude of earnings management induced by executive fixed and at-risk compensations. The regression has an adjusted *R*-square of 10.92%, *F*-statistic is 9.26.

These results suggest a negative association between the aggregate magnitude of earnings management and executive fixed compensation. This is consistent with the prediction and Gao and Shrieves (2002) view that the overall magnitude of earnings management decrease as the level of fixed compensation increases, because earnings management is costly. Managers' incentives to engage in earnings management will be diminished when their compensation is fixed. Nevertheless, the positive association for at-risk compensation suggests that the overall magnitude of earnings management increases as the level of at-risk compensation increases. This indicates that at-risk compensation induces managers to engage in earnings management to increase their at-risk compensation. This finding is consistent with Watts and Zimmerman (1978), Hagerman and Zmijewski (1979), and Zmijewski and Hagerman (1981) who found that the existence of incentive compensation plans induces managers choice of accounting policies that will increase reported earnings.

### 6.3.3 Individual components - salary, bonus, options, shares and LTIPs

In Table 6.2, the third tier reports results from the regression of absolute value of adjusted discretionary accruals on each compensation component. In this stage, fixed compensation is further decomposed to salary;[24] and, at-risk compensation is further decomposed into bonus, options, shares and long-term incentive plans. Now the results show some dynamic relations between the aggregate level of earnings management and individual compensation components. First, the coefficient on salary (*SALARY*) is negative and significant at less than 1% level. Second, among at-risk component, the coefficients on bonus (*BONUS*) and options (*OPTION*) are positive, significant at 5% and 10% level, respectively. The positive coefficients suggest that for every one million dollar increase in CEOs' bonus and option grants, the magnitude of adjusted discretionary accruals as a percentage of total assets will increase by 3.07% and 1.65%, respectively.

[24] Since salary is the major component of the fix remuneration, other components such as super and retirement pay are not examined in the study.

In terms of control variables, the coefficient on firm size (*SIZE*) is negative, significant at less than 1% level. The coefficient on sales growth (*GROWTH*) is positive, significant at less than 1% level as well. As expected, the coefficient on book-to-market ratio (*BM*) is significantly negative because higher book-to-market indicates a lower growth rate, which should have the opposite effect on discretionary accruals from sales growth. The coefficient on profitability (*ROE*) is negative, significant at 5% level. Consistently, Material, Industrials, Consumer Discretionary, Consumer Staples, Health Care, Information Technology show significant negative association with the absolute value of adjusted discretionary accruals, suggesting these industries engage in less magnitude of earnings management induced by executive salary, bonus, options, shares and LTIP. The regression has an adjusted *R*-square of 11.11%, *F*-statistic is 10.10. This means the explanatory power of the model is also increased when compensation is further decomposed.

The above results, first, suggest a negative association between the aggregate magnitude of earnings management and executive fixed salary. This finding is consistent with the result from the previous regression where the absolute value of adjusted discretionary accruals is regressed on fixed compensations. Salary shows a similar implication as fixed compensation—the overall magnitude of earnings management decreases as the level of salary increases because earnings management is costly.

Second, there is a positive association between absolute value of adjusted discretionary accruals and bonus, suggesting that the overall magnitude of earnings management is an increasing function of executive bonus compensation. This finding is consistent with the bonus maximization hypothesis that managers increase reported earnings to maximize their bonus pay (See Healy, 1985; Robbins et al., 1993; Skinner, 1993; Gaver et al, 1995; Balsam, 1998; Guidry et al., 1999; Gao and Shrieves, 2002; and Shuto, 2007).

Third, the results show there is a positive association between the absolute value of adjusted discretionary accruals and option grants, reflecting the overall magnitude of earnings management increases as the level of option grants increases. The underlying reason might be that managers expect a nonlinear payoff from stock options and the

nonlinear payoff induces greater earnings management. This is suggested by Gao and Shrieves (2002). Alternatively, greater magnitude of earnings management may attribute to large downward manipulations. Baker et al. (2003) and McAnally et al. (2008) suggested that option grants create incentives for managers to decrease earnings as low earnings can lead to stock price decline which gives managers a lower strike price on option grant date.

Fourth, there is no evidence to suggest that executive shares awards and long-term incentive plans affect the aggregate magnitude of earnings management. The coefficients on shares (*SHARE*) and long-term incentive plans (*LTIP*) are positive but insignificant. Only a minority of companies in the sample issue shares and LTIP to compensate executives (See Table 6.1- Panel B). The weak relationship found could be attributable to this reason. Nevertheless, these findings are inconsistent with Gao and Shrieves (2002) who documented a weak evidence on a positive association between the absolute value of discretionary current accruals and executive restricted shares.

Finally, there is a contradiction on the controlled variables used in testing the association between the magnitude of earnings management and executive compensation. Recall in Table 5.13, results of portfolio method do not show a clear relationship between growth and the absolute adjusted discretionary accruals with the difference between portfolio 1 and 10 is insignificant ($t$= 0.18, $p$=0.8566). However, the regression result of Table 6.2 shows a significant positive association between the magnitude of earnings management and growth in testing total compensation, fixed versus at-risk compensations and individual components of compensation. One possible explanation for this statistical significance is that the growth opportunities affect executive compensation through the demand for skill and the premium paid to compensate for risk (Clinch, 1991; Gaver and Gaver, 1993; Anderson *et al*., 2000; Ittner *et al*., 2003). Thus, it is possible that some of the effect of compensation variables has been shifted to the growth variable when these two independent variables tend to move together. Kenkel (1989, p700) suggested that in economic models some degree of multicollinearity is always present and it is not an error in a regression model.

### 6.4 Executive compensation and the directions of earnings management

Having obtained the results regarding the overall magnitude of earnings management, this section further examines the separate effects of compensation structure variables that might have on upward (income-increasing) earnings management and downward (income-decreasing) earnings management. Recall, in testing the association between executive compensation and the aggregate magnitude of earnings management, the absolute value of adjusted discretionary accruals is used as proxy for aggregate earnings management magnitude. The value of absolute adjusted discretionary accruals is an unsigned measure of earnings management which captures the aggregate earnings manipulation (Reynolds and Francis, 2000). However, it does not show the direction, whether managers engage in earnings management upwards or downwards. Moreover, the aggregate measure may get diluted if both upward and downward earnings manipulations take place. For these reasons, in the following section, signed adjusted discretionary accruals are used as a dependent variable to further examine if executive compensations are associated with specific direction's earnings manipulation.

The sample is now divided into two subsamples according to the signs of the adjusted discretionary accruals, and for each subsample, models are estimated by regressing the signed adjusted discretionary accruals on the compensation structure variables and control variables. Firms with positive adjusted discretionary accruals are considered to have upward (income-increasing) earnings management while firms with negative adjusted discretionary accruals are assumed to engage in downward (income-decreasing) earnings management. By construction, two subsamples with positive adjusted discretionary accruals (1,647 observations) and negative adjusted discretionary accruals (1,649 observations) are approximately equal because of the mean standardization procedure of the Performance Adjusted Technique (Kasznik, 1999).

#### 6.4.1 Executive compensation and upward earnings management

In the context of executive compensation, upward earnings management is documented by Healy (1985), Robbins et al.(1993), Skinner (1993), Holthausen et al. (1995), Balsam (1998), Guidry et al., (1999), and Gao and Shrieves (2002). The

notion of managers use of income-increasing earnings management is consistent with management opportunistic behaviour of maximization of their personal wealth at the expense of other stakeholders. If managerial opportunism is the dominant driver of accounting discretion, then income-increasing earnings management is expected to be positively associated with executive compensation structure variables.

Table 6.3 shows that all models are improved in predicting income-increasing earnings management behaviour. The adjusted *R*-squares from regressions of positive adjusted discretionary accruals on total compensation (tier 1), on fixed compensation and at-risk compensation (tier 2), and on individual components (tier 3) are increased to 18.52%, 18.57% and 18.36% respectively. Also, *F*-statistics are improved to 15.97, 15.14 and 12.85 respectively, all significant at less than 1% level.

#### 6.4.1.1 Total compensation

Table 6.3, the first tier, presents the results from the regression of positive adjusted discretionary accruals on total executive compensation. The results show the coefficient on total compensation (*TCOMP*) is positive and significant at 10% level. The coefficient on firm size (*SIZE*) is negative, significant at less than 1% level. The coefficient on sales growth (*GROWTH*) is positive, significant at 5% level. The coefficient on leverage (*LEV*) is positive and significant at less than 1% level. Compared to the OLS results where the absolute value of adjusted discretionary accruals is modeled, both control variables of book-to-market ratio (*BM*) and profitability (*ROE*) become insignificant in the positive discretionary accruals model. This means some firm characteristics have different impacts on the direction of earnings manipulation. The coefficients on capital intensity (*CIR*), and lagged total accruals (*LAGTA*) remain insignificant. In terms of industry effects, Material, Metals & Mining, Industrials, Consumer Discretionary, Consumer Staples, and Health Care show significant negative association with the positive adjusted discretionary accruals. This suggests these industries engage in less upward earnings management when total compensation is examined.

As expected, the result shows that total executive compensation has an effect on positive discretionary accruals. Positive discretionary accruals increase as the level of

total compensation increases. The notion is that as total compensation increases, managers' motivations to use upwards earnings management to maximize their incentive payments increases. Although Australian CEOs are mainly remunerated by fixed salaries, executives still have the desire to improve incentive payments and improve the level of total compensation. So, when the opportunity that inflating reported earnings can increase their total compensation appears, managers will choose to do so even though there is a conflicting incentive from executive fixed compensation.

#### 6.4.1.2 Fixed compensation versus at-risk compensation

Table 6.3, the second tier, presents the results from the regression of positive adjusted discretionary accruals on fixed compensation and at-risk compensation. After total executive compensation is decomposed into fixed and at-risk components, the coefficient on fixed component (*FIX*) is negative but insignificant while the coefficient on at-risk compensation (*ATRISK*), which is the sum of bonus, options, shares and long-term incentive plans, is positive and significant at less than 1% level. In terms of control variables and industry effects, the results are very similar to the prior regression where total compensation is used as an explanatory variable.

The result from the fixed compensation shows that the fixed compensation component is not associated with upward earnings management. In Chapter 3, CEOs who receive relatively large amounts of fixed compensation are predicted to engage in earnings management of lesser magnitude, including both upwards and downwards direction of earnings management. The underlying reason for such prediction is that the fixed form of compensation will not increase as earnings levels increase during the fiscal year: given there is cost of earnings management, the fixed compensation should constrain upward earnings management. This actually implies a significantly negative association between fixed compensation and earnings management. Although the result shows the coefficient on fixed compensation is negative, it is not significant.

In contrast, the result from at-risk compensation shows there is a significantly positive association between at-risk compensation and positive adjusted discretionary accruals. At-risk compensations (*ATRISK*), including bonus, options, shares and long-term

incentive plans, are rewarded base upon either earnings performance or stock performance. Although options, shares and long-term incentive plans may not have an effect on upward earnings management, the increasing function embodied in at-risk compensation is expected to dominate and create a strong incentive for income-increasing earnings management since bonuses account for the majority part of at-risk compensation. Chapter 3 predicts that CEOs who receive relatively large amounts of at-risk compensation will engage in earnings management to a great magnitude, in particular, the direction of earnings management is more likely to be upwards and less likely to be downwards. So, the finding is consistent with the prediction in Chapter 3; and, it is also consistent with Watts and Zimmerman (1978), Hagerman and Zmijewski (1979), and Zmijewski and Hagerman (1981) who found that the existence of incentive compensation plans induce managers choice of accounting policies that will increase reported earnings.

#### 6.4.1.3 Individual components-salary, bonus, options, shares and LTIPs

Table 6.3, the third tier, presents the results from the regression of positive adjusted discretionary accruals on fixed salary, bonus, options, shares, and LTIP. First, the results show that the coefficients on fixed salary (*SALARY*), bonus (*BONUS*), shares (*SHARE*) and long-term incentive plans (*LTIP*) have predicted signs. However, they are not significant at any level. As such, the predictions that fixed salary will constrain upward earnings management while bonuses will induce upward earnings management behaviour are not supported. This is somewhat surprising because previous studies have found that the bonus component provides a strong incentive for upwards earnings management (See Healy, 1985; Skinner, 1993; Gaver et al, 1995; Balsam, 1998; Guidry et al., 1999; and Shuto, 2007).

Second, the results show a marginally significant positive association between positive adjusted discretionary accruals and options grants (*OPTION*). In Chapter 3, Australian CEOs who receive option grants are expected to engage in earnings management downwards. Previous studies of Baker et al. (2003) and McAnally et al. (2008) suggest that option grants create incentives for managers to decrease earnings as low earnings can lead to stock price decline which gives managers a lower strike

price on option grant date. However, this result is inconsistent with the prediction as well as findings from previous studies.

Third, shares and LTIPs are not correlated with upward earnings management. This is consistent with the prediction that shares and LTIPs do not create incentives for earnings management. In terms of control variables and industry effects, the results are very similar to the prior regression where fixed and at-risk compensation are used as an explanatory variable.

In all, the results from examining executive compensations and upward earnings management are somewhat surprising. Especially, the results on bonuses and option grants are inconsistent with the predictions. One concern for such inconsistency is that the model may have endogeneity problems. This concern will be addressed and examined later in the sensitivity analysis of Chapter 8.

### 6.4.2 Executive compensation and downward earnings management

The traditional way of testing earnings management and executive compensation incentives assumes that managers maximize their wealth by always selecting income-increasing accounting discretions. However, earnings management does not always have to mean upwards manipulation. Downwards earnings management also could be triggered when the lower limit of the bonus bound cannot be reached efficiently. Healy (1985) referred to the reduction of current earnings to ensure that future bonus boundary can be reached as the 'taking bath' strategy.[25] Also, option grants are found to create incentives to lower earnings (Baker et al., 2003; and McAnally et al., 2008).

In this section, the association between executive compensations and income-decreasing earnings management is also examined. Table 6.4 shows that, in general, negative discretionary accruals models have lower exploratory power relative to positive discretionary accruals models. The adjusted *R*-squares from regressions of negative discretionary accruals on total compensation (tier 1), on fixed and at-risk compensation (tier 2), and on individual components (tier 3) are 9.26%, 9.99% and

[25] This study does not conduct a direct test for 'bath taking' type of earnings management as bonus formulas with upper and lower bounds are required and I couldn't obtain such data.

10.07%, respectively. *F*-statistics are 8.62, 8.80 and 7.69, respectively, all significant at less than 1% level.

#### 6.4.2.1 Total compensation

Table 6.4, the first tier, presents the results from the regression of negative adjusted discretionary accruals on total executive compensation. The results show the coefficient on total compensation (*TCOMP*) is positive but insignificant. In terms of control variables, the results from the negative adjusted discretionary accruals model have shown some dramatic changes. First, the coefficient on firm size (*SIZE*) now becomes positive, significant at 5% level. Second, the coefficient on sales growth (*GROWTH*) turns to negative, significant at 5% level. Third, the coefficient on book-to-market ratio (*BM*) becomes positive, significant at 10% level. Nevertheless, the coefficient on leverage (*LEV*) remains positive and significant at less than 1% level. The coefficients on capital intensity (*CIR*), and lagged total accruals (*LAGTA*) are still insignificant.

In terms of industry effects, Consumer Discretionary shows a significantly positive association whereas Telecommunication & Utilities shows a significantly negative association with the negative adjusted discretionary accruals. This indicates the two industries have different impacts on downward earnings management, while Consumer Discretionary encourages, Telecommunication & Utilities discourages downward earnings manipulation.

It is predicted that CEOs who receive relatively large amounts of total compensation will engage in less downward earnings management. This prediction is based on the logic that CEOs total compensation increases as incentive (at-risk) proportion increases; and, managers will ultimately choose to report higher earnings to increase incentive compensations and therefore oppose income-decreasing earnings management. Though, the result shows there is no association between the total compensation and downward earnings management, it appears that income-decreasing earnings management is more likely to be explained by the control variables rather than main interest variable of total compensation.

#### 6.4.2.2 Fixed compensation versus at-risk compensation

Table 6.4, the second tier, presents the results from the regression of negative adjusted discretionary accruals on fixed versus at-risk compensation. The results show executive fixed compensation (*FIX*) is positively associated with negative adjusted discretionary accruals and significant at less than 1% level. Meanwhile, at-risk (*ATRISK*) compensation is negatively associated with negative adjusted discretionary accruals and significant at 5% level. In terms of control variables, the results show a very similar statistics to those of total compensation in the same table. In addition, Telecommunication & Utilities has a significantly negative association with the negative adjusted discretionary accruals, suggesting this industry discourages downward earnings management.

This result shows that managers with high fixed compensation would engage in more downwards earnings manipulations. One possible explanation that this study could offer is that managers with higher fixed compensation are often representing larger and multinational firms. These firms are more likely to attract public scrutiny and political attention. Previous evidences indicate that large firms use income-decreasing earnings management as a plausible and sustainable earnings management strategy to minimize the likelihood of adverse political attention and reduce political costs (See Watts and Zimmerman, 1978; Jones, 1991).

Moreover, managers can benefit from the reduced political costs. Watts and Zimmerman (1978) suggested that management incentive compensation is not the only factor determining accounting choices towards higher earnings. In fact, managers are more likely to choose accounting standards to report lower earnings that will result in lower tax, regulatory and political costs and thereby increase management wealth. This means when compensation is fixed, managers will be motivated to exploit other sources to increase their wealth.

As previously discussed, the overall magnitude of earnings management decreases as the level of fixed compensation increases because fixed compensation creates a disincentive for managers to engage in earnings management in the face of costly earnings management (see Section 6.3.2). These two settings are not mutually exclusive. An executive could be removed from the office if the remuneration is

deemed to be opportunistic; while shareholders are more likely to accept managers' action to reduce political costs or tax payment. This explanation is further evident from the control variable of firm size (*SIZE*). Firm size is generally used to proxy for political cost exposure (Watts and Zimmerman, 1978). It can be seen from testing the total compensation (Table 6.4 tier 1), fixed versus at-risk compensation (Table 6.4 tier 2), and individual compensation components (Table 6.4 tier 3), firm sizes are all significantly positive associated with negative adjusted discretionary accruals.

The result from at-risk compensation suggests that managers with high at-risk compensation would reduce downward earnings manipulations. When managers are remunerated by at-risk compensation, a counter-effect to the political cost motivation for income-decreasing earnings management probably occurs. They tend to be myopic and thus avoid any adverse effects on their incentive awards by reducing income-decreasing earnings management even though sometimes downwards earnings manipulation may bring lower tax payments and political costs to the firm. Therefore, a trade-off exists between direct wealth gain from the increased compensation and indirect wealth improvement from the reduction of political costs and taxes. Such trade-off determines managers' decision in exercising discretions.

#### 6.4.2.3 Individual components - salary, bonus, options, shares and LTIPs

Table 6.4 tier 3 presents the results from the regression of negative adjusted discretionary accruals on salaries, bonuses, options, shares, and LTIP. The fixed salary (*SALARY*) has a positive association with negative adjusted discretionary accruals, significant at 5% level. Among at-risk compensation components, only bonuses (*BONUS*) show a negative relation with negative adjusted discretionary accruals, significant at 5% level while the coefficients on option grants (*OPTION*), shares (*SHARE*) and long-term incentive plans (*LTIP*) are all insignificant. The results on the control variables are generally consistent with previous results in the same table. In addition, Telecommunication & Utilities has a significantly negative association with the negative adjusted discretionary accruals, suggesting this industry discourages downward earnings management.

This result from salary suggests that managers with high salary pay would engage in more downward earnings management. This is consistent with fixed compensation

incentives. The result from bonuses, however, suggests that managers with high bonuses pay would engage in less downward earnings management. The reasons have been demonstrated in the previous section of 6.4.2.2, which is similar to those of at-risk compensation. Possibly, bonus is the component that contributes to the significance of at-risk pay. Finally, shares and LTIPs are not correlated with downward earnings management. This is consistent with the prediction that shares and LTIPs do not create incentives for earnings management.

## 6.5 Chapter Summary

This chapter examines executive compensation incentives. Results show that executive compensation creates incentives for earnings management behaviour. Moreover, different compensation structures embody different incentives for earnings management. The theoretical model works better when executive compensation is decomposed; each tier of decomposition reveals a dynamic relation between executive pay and earnings management, both in magnitude and in direction. The findings indicate a variety of compensation-related incentive effects, with some features encouraging earnings management, and others, discouraging it. Particularly, fixed compensation and salary are more likely to constrain earnings management. However, at-risk compensation and bonuses induce managers to engage in earnings management because at-risk compensation is usually based on earnings performance and managers would opportunistically use discretionary accruals to exploit the nonlinearity in the payoffs on compensation which is tied to earnings performance. Therefore, a trade-off exists between the costs of earnings management and the benefits of wealth gain and such trade-off determines managers' decisions in exercising discretions. Option grants are found to be positively associated with the aggregate level of earnings management and upward earnings management. This is inconsistent with the expectation. Finally, no evidence is found that shares and long-term incentive plans are associated with earnings management, either the aggregate magnitude or the directions. In the next chapter, benchmark beating incentives will be examined.

# Chapter 7
# Empirical Analysis-Benchmark Beating Incentives

## 7.1 Introduction

This chapter examines the second earnings management incentive—the benchmark beating incentive. First, it provides descriptive statistics on the selected variables in testing the benchmark beating incentive. Then, it examines whether Australian firms beat two earnings benchmarks—reporting profits and sustaining last year's earnings. The examination is based on studying the distribution of reported earnings and earnings changes. It also analyzes to what extent the benchmark beating behaviour is caused by earnings management—the shifting of firms from below benchmarks to above benchmarks; the behaviour of adjusted discretionary accruals; and the relationship between earnings management and benchmark beating. In addition, 'cookie jar' and/or 'big bath' accounting are investigated to address the dynamic nature of earnings management surrounding the benchmarks.

## 7.2 Descriptive statistics (testing sample)

The sample used in testing benchmark beating incentives is the same as that of testing executive compensation incentives. There are 3,326 firm-year observations covering the period of 2000 to 2006. The sample selection procedure is presented in Table 4.2. Basic descriptive statistics of the sample are presented in Table 7.1. Mean (median) reported earnings ($E$) and earnings change ($\Delta E$) are −0.1242 (−0.0291) and 0.0396 (0.0033), respectively. Mean (median) pre-managed earnings ($PME$) and pre-managed earnings change ($\Delta PME$) are −0.1261 (−0.0409) and 0.0378 (−0.0011) respectively. Mean (median) adjusted discretionary accruals ($DA\_ADJ$) is −0.0038 (0.0000). The reason for using adjusted discretionary accruals has been demonstrated in the previous chapter - section of 6.2, Paragraph 7.

## 7.3 Analysis of benchmarks beating behaviour

Empirical studies suggest that executives are concerned about two benchmarks when they report earnings, that is, to report profits (positive earnings) and to report earnings increases (sustain last year's earnings). The possible reasons for managers to inflate earnings to report positive income and income increase are to reduce the costs in transactions between the firm and its stakeholders as those stakeholders favour positive earnings information (Burgstahler and Dichev, 1997); to turn a loss to a profit because a loss (earnings decrease) may negatively affect firms' credit ratings and their cost of capital (Burgstahler and Dichev, 1997); the market penalizes firms who break a string of earnings increase (Myers and Skinner, 2006); and, meeting or surpassing previous year's earrings is an important trigger for executives to receive high incentive compensations (Holland and Ramsay, 2003). Hence, profits and last year's earnings are the two important thresholds that managers would target. In the following sections, whether Australian firms beat these two benchmarks is first examined.

### 7.3.1 Evidence on reporting profits

In Chapter 3 Section 3.3.2.2, it is predicted that empirical distribution of earnings level will be discontinuous around zero, consistent with firms managing earnings to avoid small loss and report small profits. Figure 7.1 Panel A is a histogram of earnings levels scaled by beginning total assets with an interval width of 0.04 and range of −1 to +1. The scaled earnings levels greater than +1 or less than −1 are not shown here. The histogram of earnings levels shows a single-peaked, bell-shaped distribution with a distinct discontinuity at zero. It is observed there is less frequency of observation immediately below zero and more frequency of observation immediately above zero relative to expected frequencies under the assumption of smooth distribution. Positive values of earnings level consist of the firms reporting profits while negative values of earnings level consist of loss making firms. Such discontinuity indicates that small earnings losses occur less frequently and small earnings profits occur more frequently than would be expected in the smooth distribution.

The significance of this discontinuity around zero is confirmed by the statistical test. Applying Burgstahler and Dichev (1997) *Z*-statistics, Table 7.2 Panel A reports that

the z-statistic for the standardized differences for the interval immediately below (above) zero are −2.89 (5.52), both significant at 1% level. Therefore, by visual inspection and formal test, the discontinuity around zero earnings level is statistically significant, leading to a rejection of the null hypothesis that the distribution is relatively smooth in the absence of earnings management. This finding, to some extent, is consistent with previous studies using Australian data. Holland and Ramsay (2003) used an interval width of 0.01 for the range −0.25 to +0.24, and their test statistics are −2.83 for the interval immediately below zero and 3.85 for the interval immediately above zero. Coulton et al. (2005) used 0.01 interval width for the range of −0.24 to +0.24. The *Z*-statistic for the interval immediately above zero is 2.57. However, they did not report the *Z*-statistics immediately below zero.

It is also predicted that discontinuity at zero will disappear in the distribution of pre-managed earnings level. Following prior studies (for example, DeFond and Park, 1997), pre-managed earnings are computed as net income before extraordinary items minus adjusted discretionary accruals (both variables are scaled by beginning year total assets). Pre-managed earnings represent income in the absence of earnings management. The histogram for pre-managed earnings is generated in the same manner as that for reported earnings. Figure 7.1 Panel B displays that there is no discontinuity in the distribution of pre-managed earnings. The distribution of pre-managed earnings levels is relatively smooth around zero. There is little disparity between the frequencies immediately below and above zero. Further, Table 7.2 Panel B reports *Z*-statistics to be immediately below (−1.88) and above (1.90) zero, indicating that the frequency of the interval to report small losses and small profits are not significantly different from the expected frequency in the distribution of pre-managed earnings level.

### 7.3.2 Evidence on sustaining last year's earnings

Chapter 3 Section 3.3.2.2 also proposes that earnings are managed to sustain last years' earnings performance. Figure 7.2 Panel A shows the distribution of earnings changes scaled by beginning total assets with an interval width of 0.04 and a range of −1 to +1. Compared to the distribution of reported earnings, there is stronger statistical support for the argument that firms manage earnings to report income

increases. This is in contrast to Holland and Ramsay (2003) who documented weaker statistical support for earnings management to sustain the previous year's earnings, as opposed to reporting profits.

The histogram reveals a discontinuity at zero, with a lower than expected number of observations at the interval immediately below zero and higher than the expected number of observations at the interval immediately above zero. In Table 7.2 Panel A, the *Z*-statistics test the smoothness of earnings changes distributions in the intervals immediately below (at) zero are −6.15 (13.60), both significant at 1% level. Not surprisingly, in benchmark 1, managers are predicted to report small profits; earnings discontinuity thus occurred in the interval slightly above zero [0, 0.04]. However, if the purpose of earnings management is to sustain last year's earnings, which is proposed in the second benchmark, then the discontinuity of earnings change distribution would occur just at zero and, therefore, *Z*-statistics show significant positive value only for the zero interval rather than the interval slightly above zero. This implies that managers manipulate earnings to report the same earnings as the previous year.

Figure 7.2 Panel B shows a bell-shaped distribution of pre-managed earnings change without an outstanding discontinuity. It is observed to be a relatively symmetrical distribution with similar frequencies at immediately below and above zero. Table 7.2 Panel B reports that *Z*-statistics in the interval immediately below (above) zero is 1.19 (1.13), which is insignificantly different from the expected frequency in the distribution of pre-managed earnings change.

The above analysis shows there are visible and statistically significant discontinuities around zero in the distribution of earnings levels and earnings changes. It is observed that there is an unusually higher frequency for the interval immediately above zero and unusually lower frequency for the interval immediately below zero for each of these distributions. However, the distributions of pre-managed earnings levels and changes are not discontinuous around zero with indistinguishable frequency of observations for the interval immediately above (below) zero. This implies that adjusted discretionary accruals or earnings management may be the factor that contributes to the discontinuities in the distribution of earnings levels and changes, since pre-managed earnings levels and changes are constructed as reported earnings

levels and changes subtract adjusted discretionary accruals. Therefore, this study suggests that managers may exercise discretion through accruals to meet/beat the benchmarks.

### 7.4 Analysis of firms' shifting when true earnings below benchmarks

If managers are expected to meet/beat earnings targets through the use of adjusted discretionary accruals, adjusted discretionary accruals should have an effect on increasing the frequency of observations in reporting profits and earnings increases. So, in this section, it is examined if adjusted discretionary accruals increase the frequency of firm-year observations in reporting positive earnings levels and changes. The examination first focuses on broad intervals. Then, small intervals surrounding benchmarks are examined to test whether adjusted discretionary accruals increase the frequency of small positive earnings levels and changes.

Table 7.3 Panel A reports that adjusted discretionary accruals have the effect of significantly increasing the frequency of positive earnings levels from 42.29 % (1,407 observations) before earnings management to 45.36 % (1,509 observations) after earnings management. Further, 8.11 % of the total sample (270 observations) shifts from pre-managed earnings losses ($PME_{it} < 0$) to report post-earnings profits ($E_{it} \geq 0$). These firms are suspected of using positive adjusted discretionary accruals to transform earnings losses to profits. There is another 5.04 % (167 observations) allocated in the interval of pre-managed earnings making profits but reporting earnings losses ($PME_{it} \geq 0$ *and* $E_{it} < 0$). One potential reason for those firms to move from pre-managed earnings profits to reported earnings losses is the use of adjusted discretionary accruals to smooth earnings, which reduces the fluctuations in earnings.

Following Kanji (1993), the *Z* test is applied to evaluate significant changes in the frequency before and after a particular intervention.[26] Given that managers

[26] The Z statistics are consistent with Kanji (1993) who test for correlated proportions and evaluate the significant change in the frequency before and after a given intervention. If the number of observations shifts from pre-managed earnings losses interval to the reported earnings profits interval denoted by b, the number of observations shifts from pre-managed earnings profits to the reported earnings losses is denoted by c, and the total number of observations is denoted by N, then z-statistic is computed as:

$$Z = \frac{(b-c)/N}{\sqrt{\frac{(b+c)-(b-c)^2/N}{N(N-1)}}}$$

manipulate earnings through accruals, there should be a significant change in the frequency before and after such intervention. The frequency of firms that shift from pre-managed earnings losses to reported profits is higher than the frequency of firms that shift from pre-managed earnings profits to reported losses. The difference is 3.09 % (103 observations). Kanji *Z*-statistics confirm that such difference is significant (*z*-statistic = 5.87, *p*-value = 0.001) at the one percent level.[27] This indicates there are more firms shifting from pre-managed earnings losses to reporting profit rather than shifting from pre-managed earnings profits to reporting losses.

Adjusted discretionary accruals also significantly increase the frequency of firms reporting small profits. Table 7.3 Panel A shows within the small intervals of [−0.04, 0.04], the frequency of firm reporting small earnings profits increases from 12.59% (419 observations) to 16.86 % (561 observations). Further, 3.48 % (116 firm-year observations) shifts from pre-managed small earnings losses ($-0.04 \leq PME_{it} < 0$) to report small earnings profits ($0 \leq E_{it} < 0.04$), and 57 firm-years observations shift from pre-managed small earnings profits ($0 \leq PME_{it} < 0.04$) to report small earnings losses ($-0.04 \leq E_{it} < 0$). The Kanji test (*z*-statistics = 4.49, *p*-value = 0.001) confirms that the difference between two correlated proportions of *pre* and *post* earnings management is significant; moreover, the stimulus of managers' manipulations has produced a significant change in the proportion of reported small earnings profits.

Table 7.3 Panel B reports the impact of adjusted discretionary accruals on the frequency of firms reporting positive earnings changes. The frequency of observations reporting earnings is increased from 49.68% (1,652 observations) to 52.19% (1,736 observations). Moreover, there was an 11.61% (387) observations that shift from negative pre-managed earnings changes to reporting positive earnings changes; while there was an 9.1% (303) observations that shift from positive pre-managed earnings changes to report negative earnings changes. The frequency of firms shifting from pre-managed earnings decreases to reporting earnings increases is higher than the frequency of firms shifting from pre-managed earnings increases to reporting earnings decreases. The difference is 2.52 % (84 observations). Kanji *Z*-statistics confirm that such difference is significant (*z*-statistics = 3.81, *p*-value = 0.001) at one percent level. This finding is consistent with the argument that managers inflate earnings to

[27] Significant levels reported are two-tailed against the standardized normal distribution.

transform lower than previous year's earnings to report an earnings level which is higher than or at least equal to last year's earnings level.

In the small intervals of [−0.04, 0.04], adjusted discretionary accruals also significantly increase the frequency of firms to report small positive earnings changes. Table 7.3 Panel B shows that the frequency of firms reporting small earnings changes increases from 16.03 % (533 observations) before earnings management to 29.79 % (991 observations) after earnings management. Further, 5.53 % (184) observations shifts from pre-managed small earnings decrease ($-0.04 \leq \Delta PME_{it} < 0$) to report small earnings increase ($0 \leq \Delta E_{it} < 0.04$), and 136 firm-year observations shift from pre-managed small earnings increase ($0 \leq \Delta PME_{it} < 0.04$) to report small earnings decrease ($-0.04 \leq \Delta E_{it} < 0$). The Kanji test confirms that such changes in the proportion is significant before and after managers' manipulation ($z$-statistics= 2.68, $p$-value=0.01). Thus, adjusted discretionary accruals are used to manage earnings to transform small earnings decreases into small earnings increases or at least report the same earnings levels as the previous year.

In all, the results also show that adjusted discretionary accruals significantly increase the frequencies of observations reporting positive earnings levels and changes. Moreover, adjusted discretionary accruals significantly increase the frequencies of firms reporting small profits and small earnings increases. Therefore, this study suggests that adjusted discretionary accruals have the effect of increasing the frequency of observation in reporting profits and earnings increases.

### 7.5 The behaviour of discretionary accruals for true earnings below benchmarks

Previous sections of 7.3 and 7.4 suggest that adjusted discretionary accruals may have the effect of shaping discontinuities in the distribution of reported earnings levels and changes; and, the shifting of observations from pre-managed earnings below the benchmarks to above the benchmark. However, neither of them directly examine the behaviour of discretionary accruals. So, this section directly focuses on adjusted discretionary accruals, and its role, that allows managers to inflate earnings to meet relevant benchmarks when true earnings fall short of corresponding benchmarks.

Table 7.4 presents that 62.91 % of pre-managed earnings loss making firms ($PME_{it} < 0$) have positive adjusted discretionary accruals. In contrast, only 32.34 % of pre-managed earnings profits making firms ($PME_{it} \geq 0$) have positive adjusted discretionary accruals. Moreover, 69.14 % of pre-managed earnings lower than the previous year's earnings firms ($\Delta PME_{it} < 0$) have positive adjusted discretionary accruals, while only 30.58 % of pre-managed earnings higher than or equal to the previous year's earnings firms ($\Delta PME_{it} \geq 0$) show positive adjusted discretionary accruals.

Nevertheless, 37.09 % (30.86 %) pre-managed earnings loss making firms (lower than last years' earnings) exhibit negative adjusted discretionary accruals, possibly, these firms 'take a bath' when pre-managed earnings deficits are too large to be covered by adjusted discretionary accruals. There are also 67.66 % (69.42 %) of pre-managed earnings profits making firms (pre-managed earnings higher than or equal to last years' earnings) are identified with negative adjusted discretionary accruals. This is consistent with the argument that managers will decrease earnings to create some slack for future periods when current pre-managed earnings are well above benchmarks.

Table 7.5 Panel A reports mean (median) adjusted discretionary accruals for the intervals that show a large shift in observations. If adjusted discretionary accruals have an effect on a firm's shift when pre-managed earnings are below benchmarks, it is expected that the mean (median) value of adjusted discretionary accruals would be significantly different between *pre* and *post* managed earnings intervals. Results show that firms with pre-managed earnings below zero have significant positive mean (median) adjusted discretionary accruals, 0.0273 (0.0311); while firms with pre-managed earnings above zero exhibit significant negative mean (median) adjusted discretionary accruals with −0.0329 (−0.0292). Moreover, two-sample *t* tests show that adjusted discretionary accruals are significantly different between two sample of pre-managed earnings below and above zero firms (*t*-statistic = 25.96, $p < .0001$). These results support the prediction that a firm manages earnings conditional on pre-managed earnings level which predicts income-increasing (income-decreasing) earnings management when the firm's pre-managed earnings performance under-shoots (exceeds) the benchmark.

Within the small interval [-0.04, 0.04], firms with pre-managed earnings making small losses are found to engage in income-increasing earnings management. Mean (median) adjusted discretionary accruals of firms with $-0.04 \leq PME_{it} < 0$ are positive 0.0154 (0.0260) and significantly different from zero. Further, mean (median) adjusted discretionary accruals of firms with $0 \leq PME_{it} < 0.04$ are insignificant which makes sense as no earnings management will take place when pre-managed earnings are already meeting the benchmark. Two sample *t* tests show pre-managed earnings with small losses firms have significantly higher positive adjusted discretionary accruals than pre-managed earnings make small profit firms (*t*-statistic=2.98, *p*-value=0.0029).

Table 7.5 Panel B reports that firms with negative pre-managed earnings change show higher positive adjusted discretionary accruals than firms with positive pre-managed earnings change. Mean (median) adjusted discretionary accruals for firms with negative pre-managed earnings change is 0.0336 (0.0349), significant positive. While mean (median) adjusted discretionary accruals for firms have positive pre-managed earnings change is significant negative −0.0303 (−0.0334). Two-sample test for the difference shows adjusted discretionary accruals are significantly different between two samples of pre-managed earnings change below and above zero firms (*t*-statistic= 27.36, *p*<.0001). These results support the prediction that managers use positive adjusted discretionary accruals to report earnings increase when pre-managed earnings are below previous year's earnings.

Within the interval [-0.04, 0.04], firms with pre-managed earnings just below last year's earnings are found to manipulate earnings upward to report an earnings increase or sustain previous year's earnings. Mean (median) adjusted discretionary accruals of firms within $-0.04 \leq \Delta PME_{it} < 0$ are positive 0.0099 (0.0129) and significantly different from zero; while mean (median) adjusted discretionary accruals of firms within $0 \leq \Delta PME_{it} < 0.04$ are negative −0.0073 (−0.0090). Two-sample *t* tests indicate that pre-managed earnings with a small decrease has higher positive adjusted discretionary accruals compared with pre-managed earnings with a small increase or the same as previous year's earnings (*t*-statistic = 4.84, *p*-value <.0001).

Therefore, these results show that firms are more likely to exercise discretionary accruals to manage earnings upwards with a higher frequency and amount of positive discretionary accruals when the true earnings are below the benchmarks.

### 7.6 The relation of discretionary accruals and true earnings below benchmarks

This section extends above analysis, and tests whether adjusted discretionary accruals are associated with the extent to which pre-managed earnings would otherwise fall short of a particular benchmark. Firm characteristics and industry effects are controlled. The estimated coefficients and *t* statistics are White (1980) estimates in two-way cluster robust regression.

In Table 7.6 Panel A, Model (1) considers firms with pre-managed earnings are below zero (loss-making firms). The indicator variable *BELOW_1* equals one if a firm has pre-managed earnings below zero ($PME_{it} < 0$) and zero if above zero. This is a baseline regression testing general association between adjusted discretionary accruals and pre-managed earnings levels. The positive and significant coefficient estimates on *BELOW_1* in model 1 are consistent with the hypothesis that managers make positive adjusted discretionary accruals when pre-managed earnings are negative.

Since all firms may not manipulate earnings upward when their pre-managed earnings are below zero, the focus is further narrowed to those firms with pre-managed earnings that are below zero but reported earnings are above zero. So, in Model (2), the sample is restricted to *ex post* profits reporting firms only ($E_{it} \geq 0$). The coefficient on *BELOW_2* is significantly positive, indicating for those post profits reported firms, and managers, there is a tendency to use positive discretionary accruals when pre-managed earnings are negative.

The results are insensitive to the inclusion or exclusion of control variables. As predicted, the coefficients on *SIZE* are negative for both Model (1) and (2). However, the coefficient on *SIZE* is significant in Model (2) while insignificant in Model (1), this implies that small size firms are more likely to inflate earnings when pre-managed earnings are below zero but reported earnings are above zero. In both model (1) and (2), *ROE, LEV* and *CIR* are significantly positive, suggesting that earnings management is more likely to occur in higher profit, highly leveraged and capital

intensity firms when pre-managed earnings are less than zero. *GROWTH, BM* and *LAGTA* are insignificant and have no effect on discretionary accruals.

In terms of industry effects, Material, Industrials, Consumer Discretionary, Consumer Staples, Health Care, Telecommunication & Utilities show a significant positive association with adjusted discretionary accruals in model (1), suggesting firms of these industries have a tendency to inflate earnings to beat the benchmarks when pre-managed earnings are below zero. While in model (2), the significantly positive association holds only in the industry of Telecommunication & Utilities. The restriction of the sample to *ex post* profits reporting firms increase the adjusted $R^2$ from 20% to 35%. In other words, the restricted sample improves the model power in explaining cross-sectional variation in earnings management relative to earnings benchmark.

In Table 7.6 Panel A, Model (3) considers the intervals just around benchmark [-0.04, 0.04]. The indicator variable *BELOW_3* equals one if the firm has pre-managed earnings just below zero ($-0.04 \leq PME_{it} < 0$) and zero if just above zero ($0 \leq PME_{it} < 0.04$). The coefficient on *BELOW_3* is significantly positive which is consistent with the view that when firms' pre-managed earnings are slightly below zero, managers use income increasing adjusted discretionary accruals to inflate reported earnings to report small profits. In the small intervals surrounding the benchmarks, coefficients are significant for control variables *ROE*, *BM* and *LAGTA* and insignificant for *SIZE GROWTH, LEV* and *CIR*.

Model (4) considers whether the results will be sensitive when *ex post* earnings are taken into account. The sample is restricted to firms with pre-managed earnings just below zero but reported earnings just above zero ($0 \leq E_{it} < 0.04$). The coefficients on *BELOW_4* is still significantly positive which is consistent with the view that when firms pre-managed earnings are slightly below zero, managers use income increasing discretionary accruals to inflate reported earnings to report small profits. Surprisingly, the coefficient on *SIZE* turns positive and significant, suggesting that larger firms have a stronger effect than smaller firms in beating the benchmark to make small profits. This is inconsistent with the prediction of this researcher. In the small intervals surrounding the benchmarks, coefficients are significantly positive for control variables *ROE* and *LAGTA*. In terms of industry effects, Material, Industrials,

Consumer Discretionary, Consumer Staples, Health Care show a significant, positive association with adjusted discretionary accruals in Model (3), suggesting firms of these industries have a tendency to inflate earnings to report small profits when pre-managed earnings are below zero. While in Model (4), the industry effects are insignificant among all sectors. Adjusted $R^2$ are 56% and 64% for Model (3) and (4) respectively. It shows the predictive ability of a model has substantially increased as testing intervals move from a big region to a small and more specific region that surrounding the benchmarks.

In Table 7.6 Panel B, Model (1) tests firms with pre-managed earnings which are below last year's earnings (income decrease firms). The indicator variable *BELOW_1* equals one if a firm has pre-managed earnings below last year's earnings ($\Delta PME_{it} < 0$) and zero otherwise. The positive and significant coefficient on *BELOW_1* supports the view that managers use positive adjusted discretionary accruals to inflate earnings when pre-managed earnings are below last year's earnings. In Model (2), the sample is restricted to firms with reported earnings above last year's earnings ($\Delta E_{it} \geq 0$). The coefficient on *BELOW_2* is still significantly positive. This means that managers tend to use positive discretionary accruals to report income increases or at least sustain the previous year's earnings when pre-managed earnings fall short of the prior year's level.

In both Model (1) and (2), *SIZE* is significantly negative while *LEV* and *CIR* are significantly positive. *GROWTH* has no effect on earnings management behaviour. *ROE* has a positive association with discretionary accruals but is only significant for the sample where pre-managed earnings are less than those of the previous year. *LAGTA* only has a significantly positive association with discretionary accruals for the sample with pre-managed earnings less than that of the previous year and post earnings greater than the previous year's. The restriction of this study's sample to post earnings greater than last year's firms increase the adjusted $R^2$ from 17% to 30%. In terms of industry effects, Metals & Mining, Health Care and Telecommunication & Utilities show significant positive association with adjusted discretionary accruals in both Model (1) and (2), suggesting that firms of these industries have a tendency to inflate earnings to report earnings increases when pre-managed earnings are below the previous year's earnings.

In Table 7.6 Panel B, Models (3) and (4) test the intervals just around benchmark [-0.04, 0.04]. The indicator variable *BELOW_3* equals one if the firm has pre-managed earnings just below the previous year's earnings ($-0.04 \leq \Delta PME_{it} < 0$) and zero if just above the previous year's earnings ($0 \leq \Delta PME_{it} < 0.04$). In model 4, this thesis considers whether the results will be sensitive when *ex post* earnings are taken into account. The sample is restricted to firms with pre-managed earnings just below the previous year's earnings but reported earnings just above the previous year's earnings ($0 \leq \Delta E_{it} < 0.04$). Both coefficients on *BELOW_3* and *BELOW_4* are significantly positive which is consistent with the view that when firms pre-managed earnings is slightly below last year's earnings, managers use income increasing discretionary accruals to inflate reported earnings to report earnings slightly above the previous year's earnings or at least equal to the previous year's level.

As smaller firms face lower costs and are subject to less monitoring if earnings management is brought to light, the coefficient on *SIZE* is negative and significant for both Model (3) and (4). There is some weak evidence to suggest that high growth firms are associated with discretionary accruals when pre-managed earnings are below the previous year's earnings. The coefficient on *ROE* is positive and significant. This is consistent with Brown (2001) and Barua et al. (2006) who argue that the propensity for achieving benchmarks is systematically higher in profit-reporting firms compared to loss-reporting firms. *LEV, CIR* and *LAGTA* are all insignificant. In terms of industry effects, Telecommunication & Utilities is significant in Model (3); and, Material, Industrials, Consumer Staples, Health Care and Telecommunication & Utilities are significant in Model (4). These industries have a tendency to inflate earnings to report earnings increases when pre-managed earnings are below the previous year's earnings. Adjusted $R^2$ are improved in Model (4) relative to that of Model (3).

In summary, the analysis from sections 7.3 to 7.6 shows that adjusted discretionary accruals cause the discontinuities observed in the distributions of reported earnings. It has an effect on shifting the observations from pre-managed earnings below the benchmarks to across the benchmarks. Moreover, there is a significantly positive association between adjusted discretionary accruals and pre-managed earnings below

benchmarks, suggesting that managers inflate earnings to beat relevant benchmarks when true earnings would otherwise fall short of a particular benchmark.

### 7.7 Analysis of 'cookie jar' and/or 'big bath' type of earnings management

Prior research also documents income-decreasing earnings management in the situations when pre-managed earnings exceed targets by a substantial amount; and, when pre-managed earnings fall far below targets and accounting reserves are not sufficient to reach targets. These two situations are well known as 'cookie jar' and 'big bath' earnings management. So, this section is an additional analysis which examines whether these two situations hold.

In Table 7.6 Panel A and B, Model (5) replaces *BELOW* variables with two other variables *HIGH (LOW)* which are an indicator variable taking the value of one if the proxy for pre-managed earnings exceed (fall short) earnings benchmarks by a large margin and zero otherwise. Following Peasnell et al. (2005), the large margin is defined as pre-managed earnings for firm *i* in year *t* exceeding (falling short) of either of the two benchmarks, and, it is above (below) $75^{th}$ ($25^{th}$) percentile of the distribution of the exceeding (deficit) part. Specifically, *HIGH* is equal to one if 1) $PME_t > 0$ and $PME_t - 0 > 75^{th}$ *percentile* of the exceeding part, 2) $PME_t > E_{t-1}$ and, $PME_t - E_{t-1} > 75^{th}$ *percentile* of the exceeding part, respectively. *LOW* is equal to one if 1) $PME_t < 0$ and $PME_t - 0 < 25^{th}$ *percentile* of the deficit part, 2) $PME_t < E_{t-1}$ and, $PME_t - E_{t-1} < 25^{th}$ *percentile* of the deficit part, respectively. Managers are expected to manipulate earnings downwards when pre-managed earnings are well above (below) earnings benchmarks and therefore the coefficients on both *HIGH* and *LOW* will be negative.

Panel A shows the result for pre-managed earnings benchmarked against zero while Panel B provides findings for pre-managed earnings benchmarked against the previous year's earnings. Results are similar for both earnings benchmarks. The coefficients on *HIGH* are significantly negative for both benchmarks, indicating income-decreasing earnings management when pre-managed earnings are well above targets. This is consistent with the first argument of 'cookie jar' accounting—firms reduce current earnings in order to save some income for the future. However the

coefficients on *LOW* are significantly positive for both earnings benchmarks, which contradict the prediction. The results show that Australian firms increase income even when pre-managed earnings are far below targets. The theory of 'big bath' is not supported with the testing sample and investigation period.

Recall in Table 5.13, there is no specific association between the magnitude of earnings management and leverage and lagged total accruals. The *t*-test for the difference of leverage between High *Abs (DA_ADJ)* and Low *Abs (DA_ADJ)* does not show any significant difference. The change of *LAGTA* is somewhat irregular across the portfolios with no significant difference between High and Low *Abs (DA_ADJ)* groups. However, the regression results of Table 7.6 in Panel A and B show the leverage and lagged total accruals variables have generated some significant coefficients. For example, the coefficients on leverage are significant in Model (1), (2) and (5) of Panel A and B; and, the coefficients on lagged total accruals are significant in Model (3) and (4) of Panel A, Model (2) of Panel B. The reason for this contradiction on the controlled variables is that signed discretionary accruals which incorporate both income-increasing and income-decreasing earnings management are used in testing the benchmark beating behaviour whereas Table 5.13 focuses on the magnitude of earnings management which is measured as the absolute value of discretionary accruals. Therefore, the dependent variables in two tables are different.

## 7.8 Chapter summary

The chapter examines the second earnings management incentive—the benchmarks beating incentive. First, it provides descriptive statistics on the selected variables in testing the benchmarks beating incentive. Then, it examines whether Australian firms beat two earnings benchmarks—reporting profits and sustaining the previous year's earnings. The examination is based on studying the distribution of reported earnings and earnings changes. It also analyzes to what extent the benchmark beating behaviour is caused by earnings management—the shifting of firms from below benchmarks to above benchmarks; the behaviour of adjusted discretionary accruals; and the relationship between earnings management and benchmarks beating. In addition, 'cookie jar' and/or 'big bath' accounting are investigated to address the dynamic nature of earnings management surrounding benchmarks.

# Chapter 8
# Sensitivity Analysis

## 8.1 Introduction

Previous chapters found that earnings management takes place in the Australian context. Further, it is more likely to be driven by managerial incentives to maximize their compensations and to beat relevant earnings benchmarks.

Chapter 6 has reported that earnings management behaviour is motivated, at least partly, by executive compensations. One immediate concern is that executive compensation could be jointly determined with earnings management behaviour. While compensation induces managers to engage in opportunistic earnings management, earnings manipulation may enable managers to increase their compensations. If executive compensation is jointly determined with earnings management, previous results in testing the association between earnings management and executive compensations would be biased.

Chapter 7 has reported that managers have incentives to beat two earnings benchmarks: to report profits and to sustain the previous year's earnings. Moreover, managers are more likely to inflate income to beat benchmarks when the true earnings are below the benchmarks. True earnings are defined as pre-managed earnings and measured as reported earnings minus adjusted discretionary accruals. However, this method could induce a spurious association between earnings management and pre-managed earnings below the benchmarks, which is known as the backing-out problem (Lim and Lustgarten, 2002).

This thesis, therefore, is aware of the potential endogeneity issues in examining the association between earnings management and executive compensations; and, the backing-out problem in examining the association between earnings management and benchmark beating incentives. The examination of these two issues will be the main focus of the sensitivity analysis in this chapter.

## 8.2 The endogeneity problem

Previous studies have addressed a potential simultaneity problem that may exist between discretionary accruals and the compensation structure. There are two schools of thought. On one hand, Healy (1985), Gaver et al. (1995), Holthausen et al. (1995), Guidry et al. (1999), Gao and Shrieves (2002), Baker et al. (2003), Cheng and Warfield (2005), and Bergstresser and Philippon (2006) view earnings management as driven by executive compensation contracting. Managers' incentives for personal wealth maximiziation induce opportunistic earnings management behaviour to occur. This line of research typically models earnings management behaviour as a function of executive compensations.

On the other hand, some researchers investigate the effect of earnings management on executive compensations. Balsam (1998), Matsunaga and Park (2001), and Shuto (2007) explored whether positive discretionary accruals are positively associated with CEO cash compensation; they interpret such a relationship as evidence of pay for performance. The underlying economic reason is that the compensation committee distinguishes between the components of earnings and reward managers when they use upward earnings management to achieve the firms' earnings targets. In their models, executive compensation is modeled as a function of discretionary accruals.

The two streams of studies raise an issue of executive compensation being jointly determined with earnings management, that is, the incentives for high compensation leading to the use of income-increasing accruals, which then can result in additional compensation pay if the firms' earnings targets are achieved. If this is the case, compensation structure variables will be endogenous.

It is well known that one of the key assumptions of standard linear regression analysis is that the regressors (explanatory variables) are statistically independent of the error component of the model. Given a standard linear regression model $Y = X\beta + \epsilon$, where $Y$ denotes the $n \times 1$ vector of observations on the dependent variable, $X$ denotes the $n \times k$ matrix of observations on the explanatory variables (regressors), $\beta$ is the unknown $k \times 1$ vector of regression parameters and $\epsilon$ is $n \times 1$ vector of unobserved disturbance, it follows that the OLS estimator, $\hat{\beta}_{OLS} = \beta + (X'X)^{-1} X' \epsilon$, is a consistent estimator of the true coefficient when $E(\epsilon \mid X) = 0$. Regressors in this case are said to

be exogenous, which means they are determined outside the model. However, if this assumption is not true—if the regressors vary systematically with the error term—then OLS estimated coefficients are inconsistent and biased. Regressors might fail to be independent because they are simultaneously determined along with the dependent variables. Simultaneity occurs when there is a feedback relationship between one or more of the explanatory variables and the dependent variable (Greene, 2002).

One immediate concern for the OLS bias is the endogeneity of executive compensation which could be jointly determined with earnings management behaviour. In the presence of a simultaneity problem, regressors are said to be endogenous as E (ϵ | X) ≠ 0 and therefore lead to $\hat{\beta}_{OLS} \neq \beta$. One solution to this problem is to use *two-stage least squares* or 2SLS, or more generally as the *instrumental variables method* (Pindyck and Rubinfeld, 1981). This method requires replacing the endogenous variable on the right-hand side of the equations with a predicted value and such predicted value is constructed by regressing endogenous variable on a set of instrumental variables.

An instrumental variable must have two properties: it must be uncorrelated with the error term, and must explain part of the variability in the endogenous regressor. The best choice for instruments of the variables could be any independent variables useful for predicting the dependent regressors. Assume $Z_{it}$ represents instruments, so the 2SLS estimator for $\beta$ is $\hat{\beta}_{IV} = \beta + (X'P_Z X)^{-1} X'P_Z \epsilon$, where $P_Z = Z(Z'Z)^{-1}Z'$, $Z$ is an $n \times q$ matrix containing the instrumental variables. 2SLS estimator $\hat{\beta}_{IV}$ is a consistent estimator of $\beta$ when the endogenous regressor is replaced by a fitted value that is constructed from a set of instrumental variables, since these instruments should be uncorrelated with the error term, i.e. E (ϵ | Z) = 0.

Baker et al. (2003) were among the first to test for, and found evidence of, endogeneity in their models due to the variable of option compensation. They used two-stage least square approach (2SLS) to alleviate this problem. In the first stage, they regressed options on a set of instrumental variables including CEOs tenure, return on assets, the change in stock price, the market-to-book ratio, and an indicator variable for CEOs in their final year, plus all other exogenous variables in the discretionary accruals model. In the second stage, the fitted value of option was used

to replace the original option variable in the discretionary accruals model. They argued that the main advantage of this method is that discretionary accruals are modelled on the expected rather than realized option. Since the expected option is predicted from all exogenous variables, such measure should be exogenous or independent from discretionary accruals and therefore mitigate potential endogeneity problem.

This thesis considers that although in Chapter 6, the analysis of executive compensation incentives, the two-way cluster-robust regressions were adopted in an attempt to correct both cross-sectional correlation and serial correlation, estimators maybe still biased. This is because compensation structure variables *TCOMP, FIX, ATRISK, SALARY, BONUS, OPTIONS, SHARES, LTIP* on the right-hand side of the equations (4.9), (4.10), and (4.11) maybe endogenous and correlated with the error term.

Using *COMP* denotes various compensation structure variables. *COMP* is composed of a systematic part, which is its expected value *E(COMP)*, and a random part, which is the reduced form random error, that is,

$$COMP_{it} = E(COMP) + \nu_{it} \tag{8.1}$$

It is $\nu_{it}$ that causes compensation structure variables to be correlated with the error term $\varepsilon_{it}$. If the expected compensation is known, compensation structure variables in the equations (4.9), (4.10), and (4.11) could be replaced by equation (8.1) to obtain,

$$\begin{aligned} DA\_ADJ_{it} &= \alpha_0 + \alpha_1[E(COMP_{it}) + \nu_{it}] + \alpha_2 CONTROL_{it} + \sum \alpha_j IND_j + \varepsilon_{it} \\ &= \alpha_0 + \alpha_1 E(COMP_{it}) + \alpha_2 CONTROL_{it} + \sum \alpha_j IND_j + (\alpha_1 \nu_{it} + \varepsilon_{it}) \\ &= \alpha_0 + \alpha_1 E(COMP_{it}) + \alpha_2 CONTROL_{it} + \sum \alpha_j IND_j + \omega_{it} \end{aligned} \tag{8.2}$$

In equation (8.2), the regressor on the right-hand side is the expected compensation *E(COMP)*, which is predicted from instrumental and exogenous variables. Following Baker et al. (2003), since the expected compensation is predicted from instrumental and exogenous variables, it should not be correlated with the error term $\omega_{it}$ and therefore mitigate the endogeneity problem. So, given the equation is identified, its

parameters can be estimated in two steps: (1) estimate the parameters of the reduced form equations by OLS and obtain the predicted values of compensation structure variables, see equation (8.3); (2) replace the compensation structure variables on the right-hand side of the equation (4.9), (4.10), and (4.11) by their predicted values from (8.3) and estimate the parameters by OLS, see equation (8.4).

$$COMP_{it} = \delta_0 + \delta_1 Z_{it} + \delta_2 CONTROL_{it} + \sum \delta_j IND_j + \nu_{it} \quad (8.3)$$

$$DA\_ADJ_{it} = \alpha_0 + \alpha_1 \hat{COMP}_{it} + \alpha_2 CONTROL_{it} + \sum \alpha_j IND_j + \omega_{it} \quad (8.4)$$

Where $COMP_{it}$ = compensation structure variables, including total compensation, fixed pay (salary), at-risk pay, bonus, options, shares, and long-term incentive plans respectively; $Z_{it}$ = instrumental variables to estimate compensation, including total shareholder returns, firm values, the volatility of firms' stock price, dividend dummy variable, and tax dummy variable; $DA\_ADJ_{it}$ = adjusted discretionary accruals, including absolute adjusted discretionary accruals, positive and negative adjusted discretionary accruals, respectively; $CONTROL_{it}$ = control variables including size, growth, firm performance, book-to-market, capital intensity, and lag total accruals; all are assumed to be exogenous except lag total accruals; $\hat{COMP}_{it}$ = fitted value of compensation structure variables predicted from first-stage regression; $IND_j$ = industry dummy variables; $\nu_{it}$ and $\omega_{it}$ = error terms; *i, j* and *t* denote firm, industry and year subscripts, respectively.

So, in the first stage regression, the expected total compensation and its components are estimated from the instrumental variables. These variables are documented as determinants of executive compensation but are arguably not directly related to discretionary accruals. Also, the other independent variables in modelling discretionary accruals are included with the exception of lag total accruals (*LAGTA*) because lag total accruals might reverse and affect current year discretionary accruals (see Dechow et al., 2003). The estimation procedure is repeated for total compensation, fixed compensation, at-risk compensation, salary, bonus, options, shares and long-term incentive plans, respectively. In the second stage, the fitted values of these compensation structure variables are used to estimate the effects of executive compensation components on discretionary accruals.

### 8.3 The instrumental variables approach

The choice of instruments is based on the following studies.[28] Agency theory has long suggested that the executive compensation is designed to align managers' interests to shareholders to maximize firm value (Jensen and Meckling, 1976). Changes in CEO pay are found to be positively associated with changes in shareholder wealth and such positive association is commonly referred to as the pay-performance sensitivity (Coughlan and Schmidit, 1985; Murphy, 1985; Jensen and Murphy, 1990). Prior studies suggests that higher volatility of stock prices makes the stock price an imprecise measure of managerial performance and so will be associated with lower levels of equity-based compensation (Iyengar and Zampelli, 2008). Researchers argue that firms substitute equity compensations options and shares for straight cash salary in their CEOs' pay packages when firms have financial liquidity constraints (Mehran, 1995; Yermack, 1995). Finally, from the tax reduction standpoint, equity-based compensations offer tax advantages to executives since they do not pay income tax until the year of exercise. However, cash-based compensations offer tax advantages to corporations because cash compensations are immediately tax deductible from corporation income. So the equilibrium compensation structure is to achieve net tax savings between a corporation and its managers (Scholes and Wolfson, 1992).

Therefore, this study chooses total shareholder returns and firm values as instrumental variables to estimate the expected total compensation, fixed salary, and bonus. Total shareholder returns (*TSR*) is defined as one year total return to shareholders plus dividends. Firm value is measured by Tobin's Q (*TBQ*), calculated as the book value of assets plus the difference between the market and book values of common stock and divided by the book value of assets (Yermack, 1995). Positive associations between compensation and total shareholder returns and firm value are expected. In predicting equity-based compensation such as options, shares, LTIPs, and total compensation and at-risk compensation which contain equity incentives, the volatility of firm's stock price, financial liquidity constraint, and tax losses carried forward are used as instrumental variables, in addition to total shareholder returns and firm values. The volatility of a firm's stock price (*VOL*) is defined as the standard deviation of the

[28] Since the major purpose of thesis is detecting earnings management, the literature about executive compensation is not reviewed in detail. Only a few studies that document the determinants of the compensation are listed here in order to support the decision in choosing instrumental variables for compensation.

previous five years of stock returns. A negative coefficient is expected for this variable. Financial liquidity constraint is measured by using a dividend dummy variable (*DIV_DUMMY*) equal to one if a firm pays zero dividends during the year; a positive sign is expected for this coefficient. Firms having tax losses carried forward generally have lower marginal tax rates. Following Clinch (1991) and Yermack (1995), a tax dummy variable (*TAX_DUMMY*) set equal to one when firms have non-zero tax losses carried forward is used ; a positive coefficient is expected for this variable. The instrumental variables are summarised in Table 4.1- Panel F.

Besides the instrumental variables, some of the exogenous variables in equation (4.9), (4.10), and (4.11) are also used as control variables in estimating executive compensations (see Chapter 4). Firm size is controlled as larger and more complex firms hire better managers who, in turn, command higher levels of compensation (e.g. Ke *et al*., 1999; Anderson *et al*., 2000; Merhebi et al., 2006). A positive association between firm size and compensation structure variables is expected. Firm performance is controlled as prior studies suggest that executive compensation is positively correlated with accounting performance (e.g. Sloan, 1993; Core *et al*., 1999; Ke *et al*., 1999; Anderson *et al*., 2000; Bushman and Smith, 2001; Merhebi et al., 2006). Firm performance is expected to be positively associated with compensations. A firm's investment or growth opportunities are included based on the considerable evidence from prior research (e.g. Clinch, 1991; Gaver and Gaver, 1993; Anderson *et al*., 2000; Ittner *et al*., 2003). The investment opportunities affect executive compensation through the demand for skill and the premium paid to compensate for risk. A positive association between sales growth and the compensation incentives is predicted. In a similar manner, book-to-market ratio should be negatively correlated with compensation. Leverage is controlled, as debt holders may make a demand for a higher risk premier for supplying capital if managers are rewarded heavily by equity-based compensations. High equity-based compensation provides managers with strong incentives to maximize the value of equity which in turn transfers wealth from debt holders to shareholders (John and John, 1993). An inverse association between leverage and the compensation incentives is predicted. Erkens (2007) recently found that compensation arrangements are influenced by the mechanisms firms use to protect their intellectual property (intangible assets such as R&D). CEOs at firms that are more R&D intensive receive

more compensation than those at firms that are more capital intensive with larger tangible assets.[29] So, an inverse association between capital intensity and the compensation incentives is predicted. Finally, industry effects are controlled as many factors that influence individual firms' compensation structures may be common within organizational structures and industrial groupings. For example, in Australia, fixed remuneration is set at levels that are competitive within the market. External market data is used to benchmark salary levels within similar industries as well as the general market within Australia (Connect4, 2008).

### 8.4 Test for compensation endogenity

Before conducting 2SLS, Hausman test (Hausman, 1978) is first used to test for compensation endogeneity. Under the assumption of the appropriateness of the instruments, the Hausman test compares the performance of the least squares estimator $\hat{\beta}_{OLS}$ to an instrumental variable estimator $\hat{\beta}_{IV}$ and thus determines the existence of an endogeneity problem. If the Hausman test rejects the null that compensation and error term are uncorrelated, then compensation is endogeneous. Hence, the least squares estimator is not consistent, but the instrumental variables estimator is consistent. However, if the null hypothesis cannot be rejected so that compensation and error terms are uncorrelated, then compensation does not have an endogenity problem. In this case, both the least squares estimator and the instrumental variables estimator are consistent and the least squares estimator is the more efficient estimator.

Also, 2SLS estimation requires a necessary condition for identification. Identification means that instruments must come from those exogenous variables omitted from the equation in question; and the number of omitted exogenous variables is at least as large as the number of right-hand-side endogenous variables. This ensures that the equation is identified and its parameters can be estimated consistently (Greene, 2002). In this study, the number of instrumental variables and exogenous variables satisfies the necessary condition for identification. However, this might introduce another

[29] The reason is that innovating firms are concerned about CEOs leaving to use their R&D related information to exploit inventions on their own or with competitors. Those firms discourage CEOs from leaving the firm by providing them with sufficient compensation incentives. Capital intensive firms, however, are less concerned about intellectual property (Erkens, 2007).

problem of over-identification since there are multiple instruments and in some of the models the number of instruments exceeds the number of endogenous regressors. The Basmann (1960) test is used to test the over-identifying restrictions—to see if some of the instrumental variables are correlated with the error term. The null hypothesis of this test is the instrumental variables not appearing in any equation have zero coefficients with error. The alternative hypothesis is that at least one of the assumed zero coefficients is nonzero. If the Basmann test is rejected, then the instruments are not appropriated and thus the Hausman test should not proceed (Godfrey and Hutton, 1994).

Table 8.1 reports the results of the first-stage OLS estimation of the reduced form equations for the total compensation. The estimated coefficients on *TSR, TBQ*, *DIV_DUMMY,* and *TAX_DUMMY* are statistically significant with expected signs, indicating that instrumental variables represented by total shareholder returns, firm values, financial liquidity constraint, and tax losses carried forward affect the total compensation, *TCOMP*. Thus, they are useful in estimating expected value of the total compensation. The adjusted *R*-square of this first-stage model is 54.23% and the overall *F*-statistic is 84.25, which has a *p*-value of less than 0.0001.[30] Although these results imply a good fit of the reduced form equation to the data in the first stage, they might overstate the true explanatory power of the instruments as the control variables also contribute to this result. After removing the contribution of the control variables, the *partial* adjusted *R*-square is reduced to 30.28% and the *partial F*-statistic is increased to 144.42 with a *p*-value of less than 0.0001.

In testing endogeneity, the Hausman (1978) test shows that total compensation, *TCOMP*, is not endogenous. The test does not reject the hypothesis that *TCOMP* is exogenous in all three models of absolute discretionary accruals, positive discretionary accruals, and negative discretionary accruals. Also, the Basmann (1960) test for overidentifying restrictions does not reject the exogeneity of the instruments in

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[30] *F*-test is a joint test of the overall significance of a model. The *F*-test statistic is given by $F = \frac{(SST - SSE)/(K-1)}{SSE/(T-K)}$, where *SST* is the total sum of squares from the unconstrained model; *SSE* is the sum of squared errors from the unconstrained model; *K* is number of explanatory variables and *T* is sample size. The *F*-distribution has $K-1$ numerator degrees of freedom and $T-K$ denominator degrees of freedom (Greene, 2003). Partial *F*-statistic is bigger compared to *F*-statistic because *K* becomes smaller when control variables are excluded from the model.

all three models of absolute discretionary accruals, positive discretionary accruals, and negative discretionary accruals. Thus, the total compensation is not endogenous.

Table 8.2 reports the results of the first-stage OLS estimation of the reduced form equations for the fixed compensation and at-risk compensation. For the fixed compensation, the estimated coefficients on *TSR* and *TBQ* are statistically significant with expected signs, indicating that total shareholder returns and firm values are the determinants of executive fixed compensation. The adjusted *R*-square of the first-stage model in estimating expected fixed compensation is 51.65% and the overall *F*-statistic is 92.35, which has a *p*-value of less than 0.0001. After removing the contribution of the control variables, the *partial* adjusted *R*-square is dropped to 20.59% and the *partial F*-statistic is 44.93 with a *p*-value of less than 0.0001. This implies that control variables contribute to the explanatory power as well. Particularly, firm size (*SIZE*) plays a significant role in determining executives' fixed compensation with large *t*-statistic of 29.99 and *p*-value of less than 0.0001.

For at-risk compensation, five instrumental variables are used in estimating expected value of at-risk compensation since equity components of at-risk compensation may be affected by stock price volatility, financial liquidity constraint, and tax loss in addition to total shareholder returns and firm values. Nevertheless, Table 8.2 shows that only total shareholder returns (*TSR*) and firm values (*TBQ*) are statistically significant with expected signs. Although the coefficients on stock price volatility (*VOL*), financial liquidity constraint (*DIV_DUMMY*), and tax losses carried forward (*TAX_DUMMY*) have expected signs, they are not significant. The adjusted *R*-square of the first-stage model in estimating expected at-risk compensation is 36.23% and the overall *F*-statistic is 40.99, which has a *p*-value of less than 0.0001. After removing the contribution of the control variables, the *partial* adjusted *R*-square is 21.68% and *partial* F-statistic is 92.42 with a *p*-value of less than 0.0001.

The Hausman (1978) test is a joint test of endogenity when both fixed compensation and at-risk compensation are included in one equation. Table 8.2 shows that fixed compensation and at-risk compensations are jointly endogenous to positive discretionary accruals. The Hausman joint tests do not reject the hypothesis that fixed compensation and at-risk compensation are jointly exogenous in the absolute discretionary accruals model and negative discretionary accruals model, while the test

rejects that fixed compensation and at-risk compensation are jointly exogenous in the positive discretionary accruals model with a 10% significance level. The Basmann (1960) tests do not reject the over-identifying restrictions so the instruments are appropriated. The underlying notion for fixed compensation and at-risk compensation endogeneity could be that firm owners use high level of fixed pay as a mechanism to mitigate or constrain management opportunistic behaviour; firm owners could also reward managers with high at-risk payment if managers use upward earnings management to achieve the firms' earnings targets. Therefore, the outcomes of the tests suggest that to some extent income-increasing earnings management is jointly determined with executive fixed compensation and at-risk compensation. Fixed and at-risk compensation are endogenous to positive discretionary accruals.

In a similar vein, the endogenity problem is examined for individual compensation components. Table 8.3 shows for salary, the first-stage estimation result of expected salary is very close to that of fixed compensation. For bonus, both the coefficients of total shareholder returns (*TSR*) and firm values (*TBQ*) are statistically significant with expected signs. The adjusted *R*-square of the first-stage model in estimating expected bonus is 30.39% and the overall *F*-statistic is 38.27, which has a *p*-value of less than 0.0001. After removing the contribution of the control variables, the *partial* adjusted *R*-square drops to 11.65% while *partial* F-statistic increases to 112.70 with a *p*-value of less than 0.0001. This implies that control variables have explanatory power in predicting bonuses.

For options, shares and LTIPs, five instrumental variables are used in estimation since these components are equity based and stock price volatility, financial liquidity constraint and tax loss are expected to affect these payment, in addition to total shareholder returns and firm values. Table 8.3 shows weak results in estimating the expected value of options, shares and LTIPs. It appears that options can be explained by total shareholder returns (*TSR*) and firm values (*TBQ*) and shares and LTIPs can be explained by total shareholder returns (*TSR*) only. Although stock price volatility (*VOL*), financial liquidity constraint (*DIV_DUMMY*), and tax losses carried forward (*TAX_DUMMY*) have expected signs, they are not significant. Moreover, the adjusted *R*-squares of the first-stage model in estimating options, shares and LTIPs are low, 9.04%, 5.89%, and 12.69%, respectively. The overall *F*-statistics of options, shares,

and LTIPs models are 7.86, 11.39 and 11.56, respectively. Although after removing the contribution of the control variables, the *partial* F-statistics are significant for all three models, the *partial* adjusted *R*-squares decline to 3.95%, 5.44% and 6.72%, respectively. Low *partial* adjusted *R*-squares indicate that the reduced form equations in estimating options, shares and LTIPs do not have a good fit. This might be due to the weak instrumental variables selected for options, shares and LTIPs as one cannot determine whether an executive has an appropriate level of options compensation and stock granted in a given year (Yermack, 1995). Also, a survey shows that research on equity-based compensation and incentives has produced many contradictory findings with many fundamental questions remaining unanswered (Core *et al*., 2003).

The Hausman (1978) test is also a joint test of endogenity when salary, bonus, options, shares and LTIPs are included in one equation. Table 8.3 shows the Hausman joint tests do not reject the hypothesis that salary, bonus, options, shares and LTIPs are jointly exogenous in the absolute discretionary accruals model and negative discretionary accruals model. However, the Hausman joint test rejects that salary, bonus, options, shares and LTIPs are jointly exogenous in the positive discretionary accruals model, significant at less than 1% level. As previously stated, the Hausman test in testing total compensation endogeneity shows that total compensation (*TCOMP*) is not endogenous; here the joint test of salary, bonus, options, shares and LTIPs suggests that at least some individual components are endogenous to positive discretionary accruals. The Basmann (1960) test for over-identification is not required since the total number of instruments (*TSR, TBQ, VOL, DIV_DUMMY,* and *TAX_DUMMY*) equals the number of endogenous variables (*SALARY, BONUS, OPTION, SHARE,* and *LTIP*) in the equation and the model is said to be just identified. The outcomes of the Hausman tests suggest that income-increasing earnings management is jointly determined with some components of executive compensation, with some individual components possibly being endogenous to positive discretionary accruals.

### 8.5 Two-stage least squares estimation

The Hausman tests suggest that income-increasing earnings management is jointly determined with fixed compensation, at-risk compensation and some individual

components. Thus, 2SLS estimation is further used to model the relation between positive adjusted discretionary accruals (*+DA_ADJ*) and compensation components. Table 8.2 shows the coefficient on the expected fixed compensation (*E_FIX*) is negative and becomes significant at 5% level. This is somewhat different from robust regression results which show an insignificant negative association between positive adjusted discretionary accruals and realized fixed compensation (see Table 6.3). This means where endogeneity is concerned, managers tend to reduce opportunistic earnings management behaviour as their fixed compensation increases, which is consistent with the argument that fixed compensation provides disincentives for managers to practice aggressive earnings management given the cost of earnings management. It also shows that positive adjusted discretionary accruals are positively associated with expected at-risk compensation (*E_ATRISK*), significant at the 5% level. This implies that management opportunistic behaviour, using income-increasing discretionary accruals to inflate reported earnings and thus maximize the level of at-risk compensation remains when endogeneity is addressed. This is consistent with robust regression results (see Table 6.3).

Table 8.3 reports the results for the second-stage regression where positive discretionary accruals is regressed on the expected (fitted) values of salary (*E_SALARY*), bonus (*E_BONUS*), options (*E_OPTION*), shares (*E_SHARE*), and LTIPs (*E_LTIP*) those are predicted from the first-stage instrumental variable regressions and control variables. Results from 2SLS show that positive discretionary accruals are negatively associated with expected salary (*E_SALARY*) and positively associated with expected bonus (*E_BONUS*), both are significant at less than 1% level. The coefficients on expected options (*E_OPTION*) and expected LTIPs (*E_LTIP*) have the positive sign while the coefficient on expected shares (*E_SHARE*) has the negative sign. All three equity-based compensations are not significant in the second-stage regression.

The findings suggest that when endogeneity is concerned, expected salary is negatively associated with income-increasing earnings management while expected bonus is positively associated with income-increasing earnings management. This is inconsistent with robust regression results which show insignificant associations between positive adjusted discretionary accruals and realized salaries and bonuses

(see Table 6.3). Nevertheless, the implications are consistent with the theory. On one hand, the negative association between expected salary and positive discretionary accruals suggests that fixed salary provides disincentives for managers to practice aggressive earnings management as earnings management behaviour is costly. Managers tend to reduce opportunistic earnings management behaviour as their fixed salary increase. On the other hand, the positive association between expected bonus and positive adjusted discretionary accruals suggests that bonuses induce managers to engage in upward earnings management as bonuses are tied to accounting earnings performance. Managers would opportunistically use income-increasing discretionary accruals to exploit the nonlinearity in the payoffs on bonuses.

Further, the findings suggest that when endogeneity is concerned, expected options are not associated with income-increasing earnings management. This is inconsistent with the robust regression which shows that options (*OPTION*) are marginally significant and have a positive association with positive adjusted discretionary accruals (see Table 6.3). There are two possible explanations. First, option compensation is endogenous to opportunistic earnings management behaviour. Significant coefficient on realized options (*OPTION*) in robust regression probably stems from failure to properly consider the endogeneity problem. Therefore, positive adjusted discretionary accruals and expected options (*E_OPTION*) are no longer significant in the 2SLS. Second, insignificant coefficient on expected options (*E_OPTION*) in 2SLS probably results from the weak instruments used in estimating options. Option compensation *per se* may not be endogenous to opportunistic earnings management behaviour. If this is the case, then the robust regression result is valid. As current theory suggests that option grants create incentives for managers to decrease earnings, as low earnings can lead to a stock price decline which gives manager a lower strike price on option grant date (Baker et al., 2003; McAnally et al., 2008), the first explanation is thus supported.

### 8.6 The backing-out problem

Whereas the endogeneity issue is the major concern in examining the association between earnings management and executive compensations, there needs to be an awareness of the backing-out problem in testing benchmark beating behaviours. The

research design used in examining the link between earnings management and true earnings below certain benchmarks involves the contraction of pre-managed earnings (true earnings). The method of calculating pre-managed earnings essentially is to back out (deduct) estimates of adjusted discretionary accruals from reported earnings. Error in estimating adjusted discretionary accruals will lead automatically to equal error in the estimation of pre-managed earnings. This in turn could induce a spurious association between earnings management and pre-managed earnings below or above earnings benchmarks, which is known as the backing-out problem (Kang and Sivaramakrishnan, 1995; Lim and Lustgarten, 2002; and Peasnell et al., 2005).

The implicit argument about the backing out problem is provided as follows. Researchers typically use equation (a) to model benchmark beating earnings management. $DA_{it}$ is discretionary accruals for firm *i* at year *t*. $BELOW_{it}$ is an indicator variable equal to one if true earnings before earnings management is lower than relevant benchmarks, and zero otherwise. A positive regression coefficient indicates that managers use positive discretionary accruals to manipulate earnings upward when true earnings before manipulation is below earnings targets.

$$DA_{it} = \gamma_0 + \gamma_1 BELOW_{it} + \mu_{it} \quad \text{(a)}$$

Equation (a) can be further decomposed into (b) where $PME_{it}$ is true earnings before manager's manipulation; $B_{it}$ denotes relevant benchmarks that managers try to meet.

$$DA_{it} = \gamma_0 + \gamma_1 (PME_{it} - B_{it}) + \mu_{it} \quad \text{(b)}$$

Since $DA_{it}$ cannot be directly observed, researchers usually estimate $DA_{it}$ by using Jones (1991) model as follows:

$$TAC_{it} / TA_{it-1} = a_1 (1 / TA_{it-1}) + a_2 (\Delta REV_{it} / TA_{it-1}) + a_3 (PPE_{it} / TA_{it-1}) + \varepsilon_{it}$$

$$\hat{DA}_{it} = TAC_{it} / TA_{it-1} - \hat{\alpha}_1 (1 / TA_{it-1}) - \hat{\alpha}_2 (\Delta REV_{it} / TA_{it-1}) - \hat{\alpha}_3 (PPE_{it} / TA_{it-1})$$

$\hat{DA}_{it}$ is estimated as a proxy for $DA_{it}$. Recognizing measurement error related to the Jones model, the true value of discretionary accruals thereby is equal to the estimated discretionary accruals plus an error term:

$$DA_{it} = \hat{DA}_{it} + \eta_{it}$$

where $\eta_{it}$ represents measurement error in estimating the true discretionary accruals. Also in theory, reported earnings ($E_{it}$) should be equal to pre-managed earnings plus true discretionary accruals:

$$E_{it} = PME_{it} + DA_{it}$$

So, the regression model (b) can be expressed as:

$$\hat{DA}_{it} + \eta_{it} = \gamma_0 + \gamma_1[E_{it} - \hat{DA}_{it} - \eta_{it} - B_{it}] + \mu_{it} \qquad \text{(c)}$$

Since $E_{it} - \hat{DA}_{it} - B_{it}$ is equivalent to $BELOW_{it}$, the model finally would be:

$$\hat{DA}_{it} + \eta_{it} = \gamma_0 + \gamma_1[BELOW_{it} - \eta_{it}] + \mu_{it} \qquad \text{(d)}$$

As we know, the sample correlation coefficient is related to the slope of the sample regression line. If ($\hat{DA}_{it} + \eta_{it}$) denotes x and ($BELOW_{it} - \eta_{it}$) denotes y, the coefficient $\gamma_1$ is determined as:

$$\gamma_1 = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sum (x_i - \bar{x})^2} = \frac{\text{cov}\ (x, y)}{\text{var}\ (x)}$$

So that,

$$\gamma_1 = \frac{\text{cov}(\hat{DA}_{it} + \eta_{it}, BELOW_{it} - \eta_{it})}{\text{var}(\hat{DA}_{it} + \eta_{it})} \qquad \text{(e)}$$

$$= \frac{\text{cov}(\hat{DA}_{it}, BELOW_{it}) - \text{cov}(\hat{DA}_{it}, \eta_{it}) + \text{cov}(\eta_{it}, BELOW_{it}) - \text{var}(\eta_{it})}{\text{var}(\hat{DA}_{it} + \eta_{it})} \qquad \text{(f)}$$

The above equation (f) shows the numerator determines the sign of coefficient $\gamma_1$, assuming that the $\eta_{it}$ is pure noise and is uncorrelated with either $\hat{DA}_{it}$ or $BELOW_{it}$.[31] Moreover, when it is true that earnings management does not exist, it is expected that $\hat{DA}_{it}$ and $BELOW_{it}$ are unrelated and thus $\text{cov}(\hat{DA}_{it}, BELOW_{it})$ disappear. Thus:

$$\gamma_1 = -\text{var}(\eta_{it})$$

Given the null hypothesis ($H_0$) that managers do not use discretionary accruals to inflate earnings when pre-managed earnings are below relevant benchmarks, the claim that null hypothesis is false and thus rejecting the null is equivalent to claiming that coefficient $\gamma_1$ is not equal to zero; this is likely to be the case from the above derivation. The $\eta_{it}$ on both sides of the regression with opposite signs simply introduces a negative bias to the coefficient $\gamma_1$. As $\text{var}(\eta_{it})$ is always positive, the sign of coefficient $\gamma_1$ will always be negative. This is known as the "backing-out" problem. Although the above argument is based on discretionary accruals, this thesis proposes that the backing-out problem may exist in testing adjusted discretionary accruals.

If this is the case, a negative coefficient indicates that adjusted discretionary accruals and *BELOW* are inversely related: adjusted discretionary accruals will become more positive (negative) when pre-managed earnings is below (above) benchmarks. Lim and Lustgarten (2002) pointed out that researchers tend to reject the $H_0$ when it is true and interpret that managers manipulate earnings upward (downward) when pre-managed earnings are below (above) benchmarks. This is Type I error and can be resolved unless the term $\eta_{it}$ becomes zero. However, Dechow et al. (1998) suggested that estimation errors are likely to be present as long as discretionary accruals are estimated.

Lim and Lustgarten (1998) further argued that the artificial correlation between pre-managed earnings and accounting discretion would be significant by construction,

[31] Kang and Sivaramakrishnan (1995) and Lim and Lustgarten (2002) all assume that the middle two terms in expression (f) are zero.

even in the absence of earnings manipulation. To support their prediction, they used non-discretionary accruals to replace discretionary accruals in testing accounting discretion to smooth earnings when pre-managed earnings are below (above) targets and found similar results using either non-discretionary accruals or discretionary accruals. They pointed out that the results using non-discretionary accruals should differ from those using discretionary accruals since non-discretionary accruals are not supposed to involve earnings management and therefore they concluded that previous findings are simply a consequence of the mechanical association between discretionary accruals and pre-managed earnings.

To assess the extent to which the findings in Chapter 7 are being driven by the backing-out problem, Lim and Lustgarten's method is first used in the sensitivity analysis and all the tests are repeated by using non-discretionary accruals. Pre-managed earnings are re-defined as net income before extraordinary items minus non-discretionary accruals ($PME_{it} = E_{it} - NDA_{it}$). If the backing-out problem is the reason that drives empirical results in Table 7.6, this sensitivity analysis would expect similar results in the models after redefining $PME_{it}$ variable.

Table 8.4 Panel A and B shows that main testing variables $BELOW_{it}$ are negative in all the four models and significantly in Models (1) and (2) using *NDA* to define whether pre-managed earnings are below or above earnings benchmarks of either reporting profits or in sustaining previous years' earnings. Moreover, in Model (5), $HIGH_{it}$ is significantly positive while $LOW_{it}$ is negative and insignificant for benchmark 1 and significant for benchmark 2. This is inconsistent with the expectation that managers will increase earnings when pre-managed earnings are below benchmarks. Also, it is not consistent with income-decreasing earnings management when pre-managed earnings are well above benchmarks.

Peasnell et al. (2005) suggested that the solution to the backing-out problem is to use a measure of pre-managed earnings which is not mechanically related to discretionary accruals. In their research design, they used operating cash flow as an instrumental variable to substitute for pre-managed earnings. The underlying assumption is that operating cash flows are expected to be correlated with a firm's true earnings

performance, but they are not affected by the measurement error that results from the estimation of discretionary accruals.

Thus, this sensitivity analysis further checks the backing-out problem by using operating cash flows as the proxy for pre-managed earnings. Table 8.5 Panel A shows for benchmark 1, reporting profits, the results remain unchanged to those reported in the main text. Panel B shows in examining benchmark 2, sustaining last year's earnings, the results are qualitatively similar. These results suggest there is an association between earnings management and pre-managed earnings below or above earnings benchmarks when operating cash flows are used as a proxy for the true earnings. Therefore, the sensitivity analysis suggests that initial results are not simply a consequence of the backing-out problem.

### 8.7 Re-estimate the model by including year dummy

Chapter 5 reports evidence for variations in earnings management across different industries and years. Recall this thesis uses the two-way clustering method to estimate the models in Chapters 6 and 7 where first obtains three different cluster-robust variance matrices for the OLS estimator from one-way clustering in, the firm dimension, the time dimension, and the intersection of the firm and time, respectively. Although the models estimated in Chapters 6 and 7 control only for the industry effects, the two-way estimation method assigns each observation to year cluster yields the White (1980) heteroscedasticity consistent estimator which is robust to correlation within a firm across time. Nevertheless, to avoid the possibility that findings of significant coefficient may arise from the effects of common year-specific factors, the section re-estimates all the regression models by including year dummy variables for six years.

Table 8.6 shows the results of re-estimating the association between the magnitude of earnings management and executive compensation by controlling year effects. The first tier, executive total compensation remains insignificant; the second tier, the coefficient on the fixed compensation remains significantly negative while the coefficient on the at-risk compensation becomes insignificant; the third tier, bonus is the only component has significantly positive coefficient. All the year dummy

variables are significantly negative indicating the managers may reduce income during the sample period.

Table 8.8 shows the results of re-estimating the association between the upward earnings management and executive compensation by controlling year effects. The first tier, executive total compensation becomes insignificant; the second tier, the fixed compensation remains insignificant and at-risk compensation remains significantly positive association with the upward earnings management; the third tier, the only component that is significant is bonus, remaining significantly positive association with upward earnings management after controlling the year effects.

Table 8.10 shows the results of re-estimating the association between the downward earnings management and executive compensation by controlling year effects. The first tier, executive total compensation remains insignificant; the second tier, the coefficient of fixed compensation remains significantly positive while the coefficient of at-risk compensation becomes insignificant; the third tier, the coefficient of bonus is significantly negative while the coefficients of other components are insignificant.

Table 8.12 shows the results of re-estimating the association between adjusted discretionary accruals and pre-managed earnings below benchmarks by controlling year effects. Panel A and B reports the results of pre-managed earnings level and pre-managed earnings change respectively. The basic results remain the same after controlling year effects. Some year dummy variables are found to be significant such as year 2004, 2005 and 2006.

### 8.8 Re-estimate the model by using alternative measure of discretionary accruals

While this current study relies on the performance adjusted technique to estimate discretionary accruals, prior research also used Jones or Modified Jones Model to estimate discretionary accruals. In order to examine the degree to which differences in accruals estimation affect inferences about CEO compensation and earnings benchmarks, the section re-estimates the models by using alternative estimates of discretionary accruals from Modified Jones Model.

Table 8.7 shows the results of re-estimating the association between the magnitude of earnings management and executive compensation by using discretionary accruals from Modified Jones Model. The first tier, executive total compensation remains insignificant; the second tier, the fixed compensation remains significantly negative while the at-risk compensation becomes insignificant; the third tier, the coefficients of salary and bonus remain significantly negative and positive respectively.

Table 8.9 shows the results of re-estimating the association between the upward earnings management and executive compensation by using discretionary accruals from Modified Jones Model. The first tier, the total compensation remains significantly positive association with upward earnings management; the second tier, the coefficients of the fixed compensation and at-risk compensation remain significantly negative and positive respectively; the third tier, the coefficient of salary becomes significantly negative while the coefficient of bonus remains significant positive.

Table 8.11 shows the results of re-estimating the association between the downward earnings management and executive compensation by using discretionary accruals from Modified Jones Model. The first tier, the total compensation remains insignificant; the second tier, both coefficients of fixed compensation and at-risk compensation become insignificant; the third tier, the bonus component is significantly negatively associated with downward earnings management.

Table 8.13 shows the results of re-estimating the association between adjusted discretionary accruals and pre-managed earnings below benchmarks by using discretionary accruals from Modified Jones Model. Panel A and B reports the results of pre-managed earnings level and pre-managed earnings change respectively. The main findings remain the same by using Modified Jones Model. Some year dummy variables are found to be significant such as year 2001, 2003, 2005 and 2006.

### 8.9 Chapter Summary

This chapter examines the potential endogeneity between earnings management and executive compensations. First, the Hausman specification tests show that fixed compensation and at-risk compensations in the second tier; and, salary, bonus,

options, shares and LTIPs in the third tier, are jointly endogenous to upward earnings management. 2SLS results further confirm that managers decrease upward earnings management as their fixed compensation increases. Likewise, managers increase upward earnings management as their at-risk compensation and bonuses increase. However, 2SLS results do not support that equity-based compensations, option grants, shares and LTIPs create incentives for earnings management. Also, the sensitivity analysis shows that the previous finding that managers are more likely to inflate income to beat benchmarks when the true earnings are below the benchmarks, and this is not simply a consequence of the backing-out problem. The finding is robust when alternative methods in measuring pre-managed earnings have been used.

# Chapter 9
# Conclusions

## 9.1 Introduction

This chapter summarizes the study regarding the evidence of earnings management in the Australian context. It discusses the main findings of this study as well as their implications. Also, it identifies the limitations of this study, suggesting further research directions.

## 9.2 Conclusions

This study uses a joint approach to investigate whether and why Australian firms engage in earnings management. Such investigation is motivated by increasing concerns expressed by the public that financial reporting quality has been declining in recent years. Thus, the objective of this study is to detect earnings management in the Australian context. The detection is conducted in three stages: first, detection of the overall earnings management evidence based on industry sectors and firm characteristics (Chapter 5); second, examination of the executive compensation incentives (Chapter 6); third, examination of the benchmark beating incentives (Chapter 7).

In Chapter 5, this study found that Australian firms engage in earnings management. Using a estimation sample of 5,947 firm-year observations with broad industry representation including all ASX listed firms, significant industry effects were found, with Metals & Mining, Consumer Discretionary, Industrials, Health Care, Information Technology, and Telecommunication & Utilities showing higher earnings management activities. Moreover, the magnitude of earnings management which increased from 2000 to 2006, remained at the high level throughout 2006.

Further, several firm-level characteristics explain significant variation in earnings management behaviour. This study suggests that size played a significant role in shaping earnings management behaviour of Australian firms between 2000 and 2006.

It was revealed that smaller firms have a higher overall magnitude of earnings manipulation; smaller firms are associated with both income-increasing and decreasing earnings management activities. The results regarding size are quite strong and consistent with evidence of U.S. from Sloan (1996). This is also consistent with the view that large firms have less need to manage earnings as large firms have sufficient financial resources to diversify risk and to stabilize growth (Bathke et al., 1989; Koh, 2003; Holland and Jackson, 2004; Sanchez-Ballesta and Garcia-Meca, 2007).

Low book-to-market ratio firms are also found to be correlated with the overall magnitude of earnings management. It appears that low book-to-market firms are associated with both income-increasing and decreasing earnings management activities. This is consistent with Subraranyam (1996) who found that managers of low book-to-market firms tend to have greater incentives to engage in earnings management to beat earnings targets because stock prices in such firms are more sensitive to reported earnings. It is also consistent with Sawichi and Shrestha (2008) who found that firms with low book-to-market ratio have income-increasing discretionary accruals.

Earnings management is also found to be correlated with poor profitability. This is consistent with Kinney and McDaniel (1989) who found that firms who restate their earning figures are likely to be less profitable. Profitability tends to become poorer when the magnitude of earnings management is of an increasing nature. Moreover, lower profitability firms are particularly associated with income-decreasing earnings management. According to the taking-a-bath theory, when operating performance is poor, managers tend to increase earnings; however, if the operating performance is extremely poor, some firms may decrease income further. If managers attempt to take an opportunity of negative earnings in any particular period to depress earnings further then the negative earnings are likely to be clustered. Therefore, results from profitability provide some indirect evidence to support this conjecture.

Although previous studies document firms with higher growth, higher leverage, lower capital intensity and larger lagged total accruals exhibit higher variability of accruals, there is no evidence to support that growth, leverage, capital intensity and lagged total accruals affect earnings management behaviour.

In Chapter 6, this study found that earnings management over the period of 2000 to 2006 was associated with CEO's compensation. Using a subsample with 3,326 firm-year observations, this study examines that relationship between earnings management and executive compensations based on a three tiers' design: total compensation; fixed remuneration versus at-risk remuneration; and salary, bonus, options, shares and LTIPs. Each tier of decomposition reveals a dynamic relation between executive pay and earnings management, both in magnitude and in direction. The findings indicate a variety of compensation-related incentive effects, with some features encouraging earnings management, and others, discouraging it. Particularly, fixed compensation (salary) is more likely to constrain earnings management as earnings management is costly. At-risk compensation, however, would induce managers to engage in earnings management because at-risk compensation is usually based on earnings performance and managers would opportunistically use discretionary accruals to exploit the nonlinearity in the payoffs on compensation. This prediction also holds in the third level of testing when at-risk compensation is decomposed into bonus, options, shares and long-term incentive plans. Therefore, this study suggests that a trade-off exists between costs of earnings management and benefits of wealth gain and such trade-off determines managers' decisions in exercising discretions.

In Chapter 7, this study found that Australian firms beat earnings benchmarks. Using the same subsample of 3,326 observations from the period of 2000 to 2006, the study found there were visible and statistically significant discontinuities around zero in the distributions of earnings levels and earnings changes, with unusually high frequencies for the interval immediately above zero and unusually low frequency for the interval immediate below zero for each of these distributions. Further, the distributions of pre-managed earnings levels and changes are not discontinuous around zero with indistinguishable frequency of observations for the interval immediate above (below) zero. This study also found that discretionary accruals significantly increase the frequencies of observations reporting positive earnings levels and changes. The results suggest that 8.11% of the firms shift from pre-managed earnings losses to report post-earnings profits; with 2.44% of the firms shifting from pre-managed small earnings losses to report small earnings profits. Similarly, 11.61% of firms shift from

pre-managed earnings declines to report earnings increases; with 3.88% shifts from pre-managed small earnings decrease to report small earnings increase. Further, this study found that the significantly positive associations between discretionary accruals and below benchmark pre-managed earnings hold for both benchmarks and both big and small regions. Therefore, this study suggests that earnings are managed through discretionary accruals relative to earnings benchmarks of reporting profits and sustaining previous year's earnings.

In Chapter 8, the endogeneity of executive compensation and the backing-out problem are examined. The results suggest that fixed compensation and at-risk compensations are jointly endogenous to upwards earnings management. Moreover, salary, bonus, options, shares and LTIPs are jointly exogenous to upwards earnings management. 2SLS results show a significantly negative association between expected fixed compensation (expected salary) and upwards earnings management. 2SLS results also show a significantly positive association between expected at-risk compensation (expected bonuses) and upwards earnings management. However, three equity-based compensations, option grants, shares and LTIPs are not significant in 2SLS. These findings suggest that when endogeneity is concerned, fixed compensation and salaries still provide disincentives for managers to practice aggressive earnings management. Moreover, managers are more likely to use income-increasing discretionary accruals to inflate reported earnings and thus to maximize the level of at-risk compensation and bonuses.

In testing benchmark beating incentives, the backing-out problem is the major concern. The research design involves the contraction of pre-managed earnings and the method of calculating pre-managed earnings essentially is to back out (deduct) estimates of adjusted discretionary accruals from reported earnings. Error in estimating adjusted discretionary accruals may lead automatically to equal error in the estimation of pre-managed earnings. So, the sensitivity analysis further examines if there is a spurious association between earnings management and pre-managed earnings below or above earnings benchmark. Nevertheless, the result shows that the previous finding is robust. Managers are more likely to inflate income to beat benchmarks when the true earnings are below the benchmarks, and this is not simply a consequence of the backing-out problem.

### 9.3 Implications and limitation

The evidence presented in this study has several implications. First, it will be of interest to academia as the comprehensive investigation conducted by this study provides a better understanding of earnings management in terms of whether firms are engaging in earnings management, why they do so, what the characteristics of these firms are, and what the contracting incentives and capital market incentives are?

Second, this study contributes to investors who rely on financial statements in evaluating firm performance. This study reports the prevalence and the direction of earnings management that varies across macro-industry settings and micro-firm characteristics. The level of pervasiveness of earnings management practices in specific industries and the association of these practices with firm characteristics can help investors assess the overall quality of financial reporting.

Third, regulators who want to strengthen scrutiny or establish the public's trust will know the sources or where to start. The industry-wide analysis and firm-by-firm analysis suggest that the aggregate and direction of earnings management can be predicted from both industries and firms. Therefore, increased vigilance on the part of policy makers and regulators should be directed toward both the macro and micro economies.

Fourth, compensation committees may gain some insight in designing compensation structures that balance the incentive to improve a firm's performance with the incentive to earnings manipulation. This study found that executive compensation plays a role in determining earnings management activities. Executives may distort financial reporting to maximize their personal wealth if their incentives are not fully aligned with those of shareholders. Compensation committees, therefore, may consider what is the optimal compensation structure that can possibly reach the full alignment.

Finally, earnings management may be detected *ex post* when the financial statements are submitted. However, it maybe in standard-setters best interests if they can identify the *ex ante* condition that may induce the managers to exercise discretion. This study exploits the distributional properties of *ex post* earnings after management and links

such properties with *ex ante* pre-managed earnings to identify behaviour consistent with earnings management to beat benchmarks. Therefore, standard-setters may pronounce an effective way to detect earnings management based on *ex ante* condition under which firms seek to beat benchmarks.

There are several limitations of this study. First, the model misspecification problem may stem from incorrectly decomposing total accruals between discretionary accruals and non-discretionary accruals components. This leads to biased results contenting two possible situations: documents earnings management evidence when none actually takes place (type I errors); or there is earnings management but discretionary accruals are not statistically significant to support the evidence (type II error). Since the economic determinants of non-discretionary accruals are not always or completely considered in the empirical research design, researchers' findings widely suffer from omitted correlated variables problem. The conclusion that certain management incentives lead to earnings management may be erroneous if the estimation model has omitted correlated variables. In all, the research method in detecting earnings management becomes crucial for this field study. Researchers tend to follow or replicate existing statistical methods just because they are commonly accepted. A greater effort to develop new methodologies and more refined econometric techniques could advance the field.

Second, the role of corporate governance in constraining earnings management has been well documented in the literature. Several corporate governance mechanisms are found to be associated with the magnitude of earnings management, for example, the audit committee independence (Klein, 2002); board of director independence (Cornett et al, 2009); the proportion of the executive subject to an interlocked relation (Peasnell et al, 2005); Institutional ownership (Hand, 1990); CEO shareholdings (Warfield et al, 1995); CEO pay-for-performance sensitivity (Bergstresser and Philippon, 2006); CEO/chair duality (Jensen, 1993); number of board meetings per year (Vafeas, 1999). In this thesis, the testing of the relation between executive compensation and earnings management did not control for these corporate governance variables because the data are not available. This limitation is recognized and will be addressed in the future research.

Third, the primary objective of this thesis is to investigate whether earnings management takes place across Australian industries, whether executives manipulate earnings to increase their compensation and beat several earnings benchmarks. There are other areas including accounting regulations and auditing are also important to earnings management research. Monem (2003) found a downward earnings management by Australian gold-mining firms to reduce income tax prior to the introduction of the Australian Gold Tax on gold mining sector in 1991. Lim and Matolcsy (1999) investigate product price controls established by the Australian government in the early1970s, and find Australian firms reduced reported net income to increase the likelihood of approval of the requested price increase. These studies suggest that the introduction of a new law or any regulation changes may create incentives for earnings management.

Moreover, there is an increasing concern has expressed by practitioners, regulators, and standard setters over the quality of earnings during the past decades. Australian regulator recognized the importance to strengthen an effective disclosure regime to ensure timely and reliable information, ethical practices and legislative standards. One of the milestones in accounting regulation change is the introduction of the Government's Corporate Law Economic Reform Program (CLERP) in 2002 and the enactment at 2004. To further strengthen the financial reporting framework of Australia, a range of rules have been covered including auditing profession, audit services, auditor independence, auditor liability, accounting standards, requirement for accounts to be true and fair, analyst independence, shareholder participation and information. Given the sample period of this thesis covers years 2000 to 2006, it is possible that the introduction of CLERP may have an impact on the earnings management behaviour. One would expect that managers are less likely to engage in earnings management post CLERP 9. This current study is aware of the limitation of not incorporating the regulation change and its impact on earnings management behaviour. However, areas such as auditing profession, audit services, auditor independence, and accounting standards are not the primary focuses of this thesis. Results in Chapter 5 imply that earnings management has increased over time from years 2000 to 2006 in Australia. Given CLERP 9 is to improve financial reporting quality, the findings in Chapter 5 yield a very interesting insight and leave a room for future research.

## 9.4 Future research directions

There are several possible avenues for future research. First, the opportunistic hypothesis holds that managers seek to mislead investors, while the advocates of the information approach believe that earnings management can actually help investors. Although this thesis identifies that opportunistic behaviour of earnings management does exist in Australia, it has not distinguished between the opportunistic and signalling forms of earnings management. The interpretation of an association between accounting discretion and contracting incentives as evidence of opportunistic earnings management is premature unless one can show such discretion has negative economic consequences for shareholders' wealth. Therefore, future research will be necessary to differentiate the two forms of earnings management.

Second, this study examines two earnings management incentives, executive compensation and benchmarking beating, separately. However, managers may seek a result that could be due to the combined effects of several motivations. For example, compensation agreement also provides managers with economic incentives to beat earnings benchmarks because managers are remunerated based upon firm performance. Beating an earnings benchmark simply sends a signal of good firm performance to the firm's compensation committee who might reward managers accordingly (Matsunaga and Park, 2001). In Australia, earnings figures are the first measures highlighted in annual reports and widely used as a key performance indictor in evaluating executives. If executive compensation plays a role that connects earnings management and benchmark beating behaviour, a further examination of this triangulate relationship between them may help to reveal the hidden dynamic of earnings management practices in Australia.

Third, this study investigates earnings management based on the detection of overall evidence and managerial incentives without evaluating the underlying impact on capital markets. In fact, there is an economic role for earnings management in the capital markets. Researchers have found evidence of profitable trading strategies to earn abnormal returns by capturing the accrual anomaly which leads them to conclude that the market is inefficient (Sloan 1996; Subramanyam 1996; Xie 2001). Beneish (2001) called a new focus for future research to link earnings management contracting incentives and its effect; market reactions and prices effects of different earnings

components. Therefore, this study could go beyond the general evidence and cause of earnings management and further explore the economic consequences of this phenomenon in the context of market efficiency.

Finally, it was previously shown that the misspecification problem is common to all earnings management studies. To make further progress in developing more compelling tests of earnings management, this study suggests that future research designs should focus on financial statements in modelling. Researchers may use accounting expertise to pick up any multi-dimensional accounts discretion directly via financial statements. The structure of financial statements is still the first place that modelling should focus on as these are the infrastructure through which accounts discretions are manipulated.

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# Tables

## Table 4.1: Variable Definitions

**Panel A-Financial variables for estimating earnings management**

| Variable | Definition | DataStream Data item |
|---|---|---|
| $TA_{it}$ | Total accruals for firm *i* at year *t*, defined as the difference between net income before extraordinary items and operating cash flows | WC01551 WC04860 |
| $A_{it-1}$ | Total assets for firm *i* at beginning of year | WC02999 |
| $\Delta REV_{it}$ | Change in revenues for firm *i* between year *t-1* and *t* | WC01001 |
| $PPE_{it}$ | Gross property plant and equipment for firm *i* at year *t* | WC02301 |
| $\Delta CA_{it}$ | The change in current assets for firm *i* at year *t* | WC02201 |
| $\Delta CL_{it}$ | The change in current liabilities for firm *i* at year *t* | WC03101 |
| $\Delta Cash_{it}$ | The change in cash and cash equivalents for firm *i* at year *t* | WC02001 |
| $\Delta STD_{it}$ | The change in short-term debt for firm *i* at year *t* | WC03051 |
| $DEP_{it}$ | Depreciation expense for firm *i* during period *t* | WC01151 |
| $E_{it}$ | Net income before extraordinary items for firm *i* in year *t* | WC01551 |
| $CF_{it}$ | Cash flows from operating activities for firm *i* in year *t* | WC04860 |
| $\Delta CF_{it}$ | Change in operating cash flows for firm *i* between year *t-1* and *t* | WC04860 |
| $\Delta AR_{it}$ | Account Receivables | WC02051 |

**Panel B-Earnings management proxy (discretionary accruals)**

| Variable | Definition | Equation |
|---|---|---|
| DA_J | Discretionary accruals, estimated from Jones (1991) model | Eq.(4.1) |
| Abs (DA_J) | Absolute value of discretionary accruals from Jones (1991) model | |
| DA_MJ | Discretionary accruals, estimated from Modified Jones (1995) model | Eq.(4.6) |
| Abs (DA_MJ) | Absolute value of discretionary accruals from Modified Jones (1995) model | |
| DA_CFO | Discretionary accruals, estimated from Cash flow Modified Jones (1999) model | Eq.(4.7) |
| Abs (DA_CFO) | Absolute value of discretionary accruals from Cash flow Modified Jones model | |
| DA_ADJ | Adjusted discretionary accruals, estimated from Kasznik (1999) performance adjusted technique | Eq.(4.8) |
| Abs (DA_ADJ) | Absolute value of adjusted discretionary accruals, estimated from Kasznik (1999) performance adjusted technique | |

**Panel C-Executive compensation variables**

| Variable | Definition | Connect4 Data item |
|---|---|---|
| $TCOMP_{it}$ | Dollar value of total compensation earned by CEOs during the fiscal year, measured in millions of dollars | *Total* |
| $FIX_{it}$ | Dollar value of fixed compensation earned by CEOs during the fiscal year, which is the sum of salary, superannuation contributions, allowances, retirement and other benefits, measured in millions of dollars | *Salary+Super +Allowances +Retirement +Other* |

| | | |
|---|---|---|
| $ATRISK_{it}$ | Dollar value of at-risk compensation earned by CEOs during the fiscal years, which is the sum of bonus, options grants, shares grants and long-term incentive plans, measured in millions of dollars | *Bonus+Options+ Shares+LTIP* |
| $SALARY_{it}$ | Dollar value of base salary earned by CEOs during the fiscal year, measured in millions of dollars | *Salary* |
| $BONUS_{it}$ | Dollar value of bonus earned by CEOs during the fiscal year , measured in millions of dollars | *Bonus* |
| $OPTION_{it}$ | Dollar value of options granted to CEOs during the fiscal year, measured in millions of dollars | *Options* |
| $SHARE_{it}$ | Dollar value of shares granted to CEOs during the fiscal year, measured in millions of dollars | *Shares* |
| $LTIP_{it}$ | Dollar value paid out to CEOs under the company's long term incentive plan. These plans measure company performance over a period of more than one year (generally three years), measured in millions of dollars. | *LTIP* |

**Panel D-Benchmark variables**

| Variable | Definition | DataStream data item & Equation |
|---|---|---|
| $PME_{it}$ | Pre-managed earnings for firm *i* for year *t,* calculated as $E_{it}-(DA\_ADJ)_{it}$, | Eq. (4.13) |
| $\Delta PME_{it}$ | Pre-managed earnings change for firm *i* for year *t*, calculated as $\Delta E_{it}-(DA\_ADJ)_{it}$ | Eq.(4.14) |
| $E_{it}$ | Reported earnings for firm *i* for year *t*, measured as income before extraordinary items deflate by the beginning total assets | WC01551 |
| $\Delta E_{it}$ | Reported earnings change for firm *i* for year *t*, measured as the difference of income before extraordinary items between year *t* and year *t-1* deflate by the beginning total assets | WC01551 |
| $BELOW\_N_{it}$ | Indicator variable equals to 1 if pre-managed earnings below benchmarks and zero otherwise. Four regions are tested for each earnings benchmark:<br>*BELOW_1* equals to 1 if pre-managed earnings (change) below zero and zero otherwise;<br>*BELOW_2* equals to 1 if pre-managed earnings (change) below zero but reported earnings (change) above zero; equals to 0 if both pre-managed earnings (change) and reported earnings (change) are below zero;<br>*BELOW_3* equals to 1 if pre-managed earnings (change) less than zero but greater than −0.04; and zero if pre-managed earnings (change) greater than zero but less than +0.04;<br>*BELOW_4* equals to 1 if pre-managed earnings (change) less than zero but greater than −0.04 and at the same time reported earnings (change) greater than zero but less than +0.04; and equals to zero if both pre-managed earnings (change) and reported earnings (change) are less than zero but greater than −0.04 | − |
| $HIGH_{it}$ | Indicator variable taking the value of 1 if pre-managed earnings exceed earnings benchmarks by a large margin and zero otherwise. Large margin for HIGH is defined as:<br>1) $PME_t > 0$ and $PME_t - 0 > 75^{th}$ *percentile* of the exceed part for benchmark 1<br>2) $PME_t > E_{t-1}$ and, $PME_t - E_{t-1} > 75^{th}$ *percentile* of the exceed part for benchmark 2 | − |
| $LOW_{it}$ | Indicator variable taking the value of 1 if pre-managed earnings fall short earnings benchmarks by a large margin and zero otherwise. Large margin for LOW is defined as:<br>1) $PME_t < 0$ and $PME_t - 0 < 25^{th}$ *percentile* of the deficit part for benchmark 1<br>2) $PME_t < E_{t-1}$ and, $PME_t - E_{t-1} < 25^{th}$ *percentile* of the deficit part for benchmark 2 | − |

**Panel E-Control variables**

| Variable | Definition | DataStream data item |
|---|---|---|
| $SIZE_{it}$ | Firm size for firm *i* for year *t*, measured by the logarithm of the total assets at year *t* | WC02999 |
| $GROWTH_{it}$ | Growth opportunity for firm *i* for year *t,* measured by the change of sales between year *t* and *t-1* divided by total assets at year *t* | WC01001<br>WC02999 |
| $ROE_{it}$ | Profitability, measured by net operating income divided by total equity for firm *i* at year *t* | WC01551<br>WC03501 |
| $LEV_{it}$ | Leverage, measured by total debt (long term debt + short term debt) to total assets for firm *i* in year *t* | WC03251<br>WC03051 |
| $BM_{it}$ | Book-to-market effect ratio, measured by book value of common equity to market value of common equity for firm *i* in year *t* | WC03501<br>WC08001 |
| $CIR_{it}$ | Capital intensity, measured as gross property, plant and equipment divided by total assets for firm *i* in year *t* | WC02301<br>WC02999 |
| $LAGTA_{it}$ | Lagged total accruals for firm *i* in year *t-1*, measured as the difference between net income before extraordinary items and operating cash flows | WC01551<br>WC04860 |
| $\Sigma IND_j$ | Industry effects, 1 if firm *i* is from industry *j* other than Energy, based on GICS industrial codes and 0 if firm is from Energy | WC06010 |

**Panel F-Instrumental variables**

| Variable | Definition | DataStream data item |
|---|---|---|
| $TSR_{it}$ | One year total shareholders returns for firm i, calculated as the change in share price between year *t* and year *t-1*, plus dividends | P<br>WC05101 |
| $TBQ_{it}$ | Tobin's Q, calculated as the book value of assets plus the difference between the market and book values of common stock and divide by the book value of assets for firm *i* at year *t* | WC02999<br>WC08001<br>WC03480 |
| $VLO_{it}$ | The volatility of firm's stock price at year *t*, calculated as the standard deviation of the previous five years of stock returns | p |
| $DIV\_DUMMY_{it}$ | Dividend dummy variable, equals to one if a firm pays zero dividends during the year *t* and zero otherwise | WC05101 |
| $TAX\_DUMMY_{it}$ | Tax dummy variable, equals to one when a firm has nonzero tax loss carry-forwards in year *t* and zero otherwise | WC01451 |

## Table 4.2: Sample Selection

The sample comprises DataStream equity files including all ASX active, suspended, and dead equity firms from year 1999 to year 2006.

| Criteria | | Firm-years |
|---|---|---|
| Initial financial data from DataStream (1999-2006): | | 31,312 |
| Less: Financial firms | (6,488) | |
| Industries are not classified | (1,832) | |
| Missing data for accruals estimation | (16,910) | |
| Firms involved in restructuring activities | (10) | |
| Extreme data (trimmed firm size at 1% and 99% levels) | (125) | |
| **Estimation sample (2000-2006):** | | **5,947** |
| Initial executive compensation data from Connect4 (2000-2006): | | 7,672 |
| Merge two data bases by ASX code and by year: | | 10,053 |
| Less: Missing compensation data | (2859) | |
| Negative options, shares and LTIP | (9) | |
| Missing data for accruals estimation | (3723) | |
| Extreme data (trimmed total compensation at 1% and 99% levels) | (69) | |
| Extreme data (trimmed discretionary accruals at 1% and 99% levels) | (67) | |
| **Testing sample (2000-2006):** | | **3,326** |

## Table 4.3: Sample Distribution (Estimation sample)

### Panel A-by Industry

| GICS | Industry | Frequency | Percent | Cumulative Frequency | Cumulative Percent |
|---|---|---|---|---|---|
| 1010 | Energy | 429 | 7.21 | 429 | 7.21 |
| 1510 | Material | 428 | 7.20 | 857 | 14.41 |
| 1510 | Metals & Mining | 1840 | 30.94 | 2697 | 44.90 |
| 2010-2030 | Industrials | 307 | 5.16 | 3004 | 50.06 |
| 2510-2550 | Consumer Discretionary | 979 | 16.46 | 3983 | 66.52 |
| 3010-3030 | Consumer Staples | 449 | 7.55 | 4432 | 74.07 |
| 3510-3520 | Health Care | 560 | 9.42 | 4992 | 83.49 |
| 4510-4530 | Information Technology | 776 | 13.05 | 5768 | 96.54 |
| 5010-5510 | Telecommunication & Utilities | 179 | 3.01 | 5947 | 100.00 |

### Panel B-by Year

| Year | Frequency | Percent | Cumulative Frequency | Cumulative Percent |
|---|---|---|---|---|
| 2000 | 335 | 5.63 | 335 | 5.63 |
| 2001 | 542 | 9.11 | 877 | 14.75 |
| 2002 | 929 | 15.62 | 1806 | 30.37 |
| 2003 | 957 | 16.09 | 2763 | 46.46 |
| 2004 | 965 | 16.23 | 3728 | 62.69 |
| 2005 | 1078 | 18.13 | 4806 | 80.81 |
| 2006 | 1141 | 19.19 | 5947 | 100.00 |

## Table 4.4: Sample Distribution (Testing Sample)

### Panel A-by Industry

| GICS | Industry | Frequency | Percent | Cumulative Frequency | Cumulative Percent |
|---|---|---|---|---|---|
| 1010 | Energy | 210 | 6.31 | 210 | 6.31 |
| 1510 | Material | 237 | 7.13 | 447 | 13.44 |
| 1510 | Metals & Mining | 1019 | 30.64 | 1466 | 44.08 |
| 2010-2030 | Industrials | 185 | 5.56 | 1651 | 49.64 |
| 2510-2550 | Consumer Discretionary | 548 | 16.48 | 2199 | 66.12 |
| 3010-3030 | Consumer Staples | 274 | 8.24 | 2473 | 74.36 |
| 3510-3520 | Health Care | 335 | 10.07 | 2808 | 84.43 |
| 4510-4530 | Information Technology | 433 | 13.02 | 3241 | 97.45 |
| 5010-5510 | Telecommunication & Utilities | 85 | 2.56 | 3326 | 100.00 |

### Panel B-by Year

| Year | Frequency | Percent | Cumulative Frequency | Cumulative Percent |
|---|---|---|---|---|
| 2000 | 129 | 3.88 | 129 | 3.88 |
| 2001 | 185 | 5.56 | 314 | 9.44 |
| 2002 | 352 | 10.58 | 666 | 20.02 |
| 2003 | 310 | 9.32 | 976 | 29.34 |
| 2004 | 672 | 20.20 | 1648 | 49.55 |
| 2005 | 815 | 24.50 | 2463 | 74.05 |
| 2006 | 863 | 25.95 | 3326 | 100.00 |

## Table 5.1: Descriptive Statistics (Estimation sample)

**Panel A-Financial variables for estimating earnings management**

| Variable | N | Mean | Median | S.D. | Min | Max |
|---|---|---|---|---|---|---|
| $E_{it}$ | 5947 | −0.2040 | −0.0602 | 1.4657 | −70.5625 | 25.6167 |
| $CF_{it}$ | 5947 | −0.1362 | −0.0164 | 1.2249 | −38.7803 | 30.4333 |
| $TA_{it}$ | 5947 | −0.0678 | −0.0382 | 0.7495 | −39.4063 | 18.3716 |
| $REV_{it}$ | 5947 | 0.9837 | 0.4988 | 4.4185 | 0.0000 | 318.9833 |
| $AR_{it}$ | 5947 | 0.1947 | 0.0871 | 0.6267 | 0.0000 | 21.7824 |
| $PPE_{it}$ | 5947 | 0.6188 | 0.3644 | 1.8035 | 0.0000 | 54.8312 |
| $A_{t-1}$ ($millions) | 5947 | 340.8630 | 23.6650 | 1063.5990 | 404.0000 | 9341.2000 |

**Panel B-Estimated discretionary accruals from various models**

| Variable | N | Mean | Median | S.D. | Min | Max |
|---|---|---|---|---|---|---|
| DA_J | 5947 | -0.0226 | -0.0083 | 0.3791 | -7.8048 | 11.1034 |
| Abs (DA_J) | 5947 | 0.1654 | 0.0835 | 0.3418 | 0.0000 | 11.1034 |
| DA_MJ | 5947 | -0.0217 | -0.0084 | 0.3788 | -7.4080 | 11.0166 |
| Abs (DA_MJ) | 5947 | 0.1670 | 0.0830 | 0.3407 | 0.0000 | 11.0166 |
| DA_CFO | 5947 | -0.0124 | -0.0020 | 0.2946 | -5.9325 | 6.0573 |
| Abs (DA_CFO) | 5947 | 0.1457 | 0.0772 | 0.2563 | 0.0000 | 6.0573 |
| DA_ADJ | 5947 | 0.0060 | 0.0000 | 0.2776 | -5.6319 | 6.3579 |
| Abs (DA_ADJ) | 5947 | 0.1324 | 0.0696 | 0.2441 | 0.0000 | 6.3679 |

## Table 5.2: OLS Estimations of Accruals Models

Jones Model (Jones, 1991):

$$TA_{it} / A_{it-1} = a_1(1 / A_{it-1}) + a_2(\Delta REV_{it} / A_{it-1}) + a_3(PPE_{it} / A_{it-1}) + \varepsilon_{it}$$

Modified Jones model (Dechow, 1995):

$$TA_{it} / A_{it-1} = \alpha_1(1 / A_{it-1}) + \alpha_2(\Delta REV_{it} / A_{it-1} - \Delta AR_{it} / A_{it-1}) + \alpha_3(PPE_{it} / A_{it-1}) + \varepsilon_{it}$$

Cash Flow Modified Jones model (Kasznik, 1999)

$$TA_{it} / A_{it-1} = \alpha_1(1 / A_{it-1}) + \alpha_2(\Delta REV_{it} / A_{it} - \Delta AR_{it} / A_{it-1}) + \alpha_3(PPE_{it} / A_{it-1}) + \alpha_4 \Delta CF_{it} + \varepsilon_{it}$$

All variables are defined in Table 4.1. To obtain meaningful estimates, industries with less than 10 observations are combined based upon the GICS code. This procedure results into 9 GICS industry groups. So, the three models are estimated for each industry group in each year. N refers to 63 industry-year pairs regressions associated with the 5,947 firm-year observations. Mean (median) coefficients are reported with *t*-statistics (Wilcoxon *z*-scores) and *p*-values in parentheses below. Both parametric t-test and non-parametric Wilcoxon signed rank test are applied to test whether mean and median coefficients are significantly different from zero. *, **, *** indicate statistical significance at the 10%, 5% and 1% respectively (two tailed). Q1 and Q3 are the first and third quartiles of the distribution. %Positive indicates the proportion with positive signs. Adj-$R^2$is the average adjusted R-squares of 63 industry-year pairs regressions.

| Model | Coef. | Pred. Sign | N | Mean | Median | S.D. | Q1 | Q3 | % Positive | Adj.$R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Jones | $\alpha_1$ | ? | 63 | -216.4423<br>(-2.72)<br>(0.0084)*** | -203.1500<br>(-622)<br>(<0.0001)*** | 631.0616 | -402.4707 | -40.2367 | 19.05% | 0.3527 |
| | $\alpha_2$ | +/− | 63 | 0.0276<br>(1.44)<br>(0.1537) | 0.0142<br>(329)<br>(0.0231)** | 0.1516 | -0.0214 | 0.1094 | 61.91% | |
| | $\alpha_3$ | − | 63 | -0.0971<br>(-3.63)<br>(0.0006)*** | -0.0627<br>(-749)<br>(<0.0001)*** | 0.2121 | -0.1520 | -0.0182 | 20.63% | |
| Modified Jones | $\alpha_1$ | ? | 63 | -206.1356<br>(-2.47)<br>(0.0161)** | -201.7600<br>(-597)<br>(<0.0001)*** | 661.2156 | -364.8328 | -24.6774 | 23.81% | 0.3538 |
| | $\alpha_2$ | +/− | 63 | -0.0036<br>(-0.12)<br>(0.9036) | 0.0104<br>(142)<br>(0.3350) | 0.2346 | -0.0452 | 0.1030 | 53.97% | |
| | $\alpha_3$ | − | 63 | -0.0824<br>(-3.39)<br>(0.0012)*** | -0.0597<br>(-745)<br>(<0.0001)*** | 0.1923 | -0.1380 | -0.0112 | 20.63% | |
| Cash Flow Modified Jones | $\alpha_1$ | ? | 63 | -287.1323<br>(-5.31)<br>(<0.0001)*** | -217.4920<br>(-747)<br>(<0.0001)*** | 429.0845 | -426.7885 | -72.0463 | 14.29% | 0.4680 |
| | $\alpha_2$ | +/− | 63 | 0.0461<br>(2.76)<br>(0.0075)*** | 0.0372<br>(528)<br>(0.0002)*** | 0.1324 | -0.0156 | 0.1141 | 69.84% | |
| | $\alpha_3$ | − | 63 | -0.0827<br>(-6.07)<br>(<0.0001)*** | -0.0588<br>(-818)<br>(<0.0001)*** | 0.1079 | -0.1153 | -0.0034 | 23.81% | |
| | $\alpha_4$ | − | 63 | -0.2798<br>(-5.57)<br>(<0.0001)*** | -0.2868<br>(-760)<br>(<0.0001)*** | 0.3984 | -0.4769 | -0.0849 | 19.05% | |

## Table 5.3: Frequency of rejection discretionary accruals equal to zero based on earnings ranks

$DA_{it}$ is discretionary accruals, calculated as the accruals prediction error, the difference between total accruals and estimated non-discretionary accruals that estimated from Cash Flow Modified Jones Model in equation (4.7). DAs are ranked on the level of earnings deflated by lagged total assets and assigned into percentiles according to their rank orders. Null hypothesis is no systematic earnings management occurred (i.e. mean discretionary accruals equal to zero). Frequency of rejection represents the frequency of percentiles for which the null hypothesis of no earnings management is rejected at 5% level using a two-tailed test. The estimation sample contains 5,947 observations. The testing sample contains 3,326 observations.

| **Null Hypothesis** | **Estimation sample (N=5947) DA=0** | | **Testing Sample (N=3326) DA=0** | |
|---|---|---|---|---|
| | Test level:5% | | Test level:5% | |
| Percentile: | Frequency of rejection | | Frequency of rejection | |
| Lowest 10 | 9 | 90% | 7 | 70% |
| 20 | 9 | 90% | 8 | 80% |
| 30 | 1 | 10% | 2 | 20% |
| 40 | 0 | 0% | 1 | 10% |
| 50 | 3 | 30% | 1 | 10% |
| 60 | 0 | 0% | 1 | 10% |
| 70 | 0 | 0% | 1 | 10% |
| 80 | 6 | 60% | 3 | 30% |
| 90 | 6 | 60% | 3 | 30% |
| Highest 100 | 10 | 100% | 7 | 70% |

## Table 5.4: Comparison on spearman correlations of discretionary accruals with earnings performances before and after adjustment

$DA_{it}$ is discretionary accruals, calculated as the accruals prediction error, the difference between total accruals and estimated non-discretionary accruals that estimated from Cash Flow Modified Jones Model of equation (4.7). DAs are ranked on the level of earnings deflated by lagged total assets and assigned into percentiles according to their rank orders. For each observation, $DA\_ADJ_{it}$ is the $DA_{it}$ minus the median $DA_{pt}$ for corresponding percentile. $E_{it}$ and $E_{it-1}$ are net income before extraordinary items deflated by lagged total assets for year t and year t-1, respectively**.** $Abs(E_{it})$ is absolute value of earnings in year t. $ROA_{it}$ is return on assets, calculated as operating income divided by total assets. Spearman correlations between discretionary accruals and earnings performance variables are reported for both before and after adjustment and *p*-values are shown in parentheses below. *, **, *** indicate statistical significance at the 10%, 5% and 1% respectively (two tailed).

**Panel A - Estimation sample**

| Variable | $E_{it}$ | $E_{it-1}$ | $Abs(E_{it})$ | $ROA_{it}$ |
|---|---|---|---|---|
| Before adjust: | | | | |
| $DA_{it}$ | 0.3092 (<0.0001)*** | 0.2194 (<0.0001)*** | -0.1561 (<0.0001)*** | 0.3146 (<0.0001)*** |
| After adjust: | | | | |
| $DA\_ADJ_{it}$ | -0.0019 (0.8817) | 0.0169 (0.1913) | -0.0048 (0.7100) | 0.0211 (0.1030) |

**Panel B - Testing sample**

| Variable | $E_{it}$ | $E_{it-1}$ | $Abs(E_{it})$ | $ROA_{it}$ |
|---|---|---|---|---|
| Before adjust: | | | | |
| $DA_{it}$ | 0.4040 (<0.0001)*** | 0.2529 (<0.0001)*** | -0.1473 (<0.0001)*** | 0.4080 (<0.0001)*** |
| After adjust: | | | | |
| $DA\_ADJ_{it}$ | -0.0113 (0.5151) | -0.0315 (0.0696)* | -0.0227 (0.1897) | 0.0019 (0.9123) |

## Table 5.5: Univariate tests of the magnitude of earnings management by Jones Model

The magnitude of earnings management is measured as absolute value of discretionary accruals, *Abs (DA_J)*. The direction of earnings management is measured as signed discretionary accruals, *DA_J*. Discretionary accruals are obtained as the residual from Jones model (see Equation 4.1). The null hypotheses for parametric *t*-test is that mean is zero, for the Wilcoxon signed rank test is that the median is zero, and for the binomial sign test is that proportion of positive and negative are equal. Reported p-values are from two-tailed tests.

**Panel A - The magnitude of earnings management by industry**

| Industry | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/− | *t*-stat | *p* |
| Energy | 0.2593 | 8.89 | 0.0000 | 0.1087 | 46118 | 0.0000 | 429/0 | 215 | 0.0000 |
| Material | 0.1128 | 11.97 | 0.0000 | 0.0604 | 45903 | 0.0000 | 428/0 | 214 | 0.0000 |
| Metals & Mining | 0.2032 | 19.54 | 0.0000 | 0.0967 | 846860 | 0.0000 | 1840/0 | 920 | 0.0000 |
| Industrials | 0.0806 | 14.08 | 0.0000 | 0.0521 | 23639 | 0.0000 | 307/0 | 154 | 0.0000 |
| Consumer Discretionary | 0.1190 | 22.85 | 0.0000 | 0.0745 | 239855 | 0.0000 | 979/0 | 490 | 0.0000 |
| Consumer Staples | 0.0972 | 18.93 | 0.0000 | 0.0607 | 50513 | 0.0000 | 449/0 | 225 | 0.0000 |
| Health Care | 0.1320 | 19.32 | 0.0000 | 0.0779 | 78540 | 0.0000 | 560/0 | 280 | 0.0000 |
| Information Technology | 0.2052 | 17.38 | 0.0000 | 0.1209 | 150738 | 0.0000 | 776/0 | 388 | 0.0000 |
| Tele & Utilities | 0.1806 | 11.39 | 0.0000 | 0.0976 | 8055 | 0.0000 | 179/0 | 90 | 0.0000 |
| Total | 0.1654 | 37.31 | 0.0000 | 0.0835 | 8843189 | 0.0000 | 5947/0 | 2973 | 0.0000 |

**Panel B - The magnitude of earnings management by year**

| Year | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/− | *t*-stat | *p* |
| 2000 | 0.1236 | 15.65 | 0.0000 | 0.0696 | 28140 | 0.0000 | 335/0 | 168 | 0.0000 |
| 2001 | 0.1513 | 15.73 | 0.0000 | 0.0853 | 73577 | 0.0000 | 542/0 | 271 | 0.0000 |
| 2002 | 0.1295 | 20.59 | 0.0000 | 0.0708 | 215993 | 0.0000 | 929/0 | 465 | 0.0000 |
| 2003 | 0.1265 | 22.16 | 0.0000 | 0.0712 | 229202 | 0.0000 | 957/0 | 479 | 0.0000 |
| 2004 | 0.1648 | 15.39 | 0.0000 | 0.0753 | 233048 | 0.0000 | 965/0 | 483 | 0.0000 |
| 2005 | 0.1987 | 13.76 | 0.0000 | 0.1076 | 290791 | 0.0000 | 1078/0 | 539 | 0.0000 |
| 2006 | 0.2153 | 15.83 | 0.0000 | 0.1001 | 325756 | 0.0000 | 1141/0 | 571 | 0.0000 |

## Table 5.6: Univariate tests of the magnitude of earnings management by Modified Jones Model

The magnitude of earnings management is measured as absolute value of discretionary accruals, *Abs (DA_MJ)*. The direction of earnings management is measured as signed discretionary accruals, *DA_MJ*. Discretionary accruals are obtained as the residual from Modified Jones model (see Equation 4.6). The null hypotheses for parametric t-test is that mean is zero, for the Wilcoxon signed rank test is that the median is zero, and for the binomial sign test is that proportion of positive and negative are equal. Reported p-values are from two-tailed tests.

**Panel A-The magnitude of earnings management by industry**

| Industry | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | t-stat | p | Median | z-stat | p | +/− | t-stat | p |
| Energy | 0.2658 | 9.41 | 0.0000 | 0.1069 | 46118 | 0.0000 | 429/0 | 215 | 0.0000 |
| Material | 0.1139 | 12.08 | 0.0000 | 0.0609 | 45903 | 0.0000 | 428/0 | 214 | 0.0000 |
| Metals & Mining | 0.2037 | 19.65 | 0.0000 | 0.0968 | 846860 | 0.0000 | 1840/0 | 920 | 0.0000 |
| Industrials | 0.0809 | 14.58 | 0.0000 | 0.0552 | 23639 | 0.0000 | 307/0 | 154 | 0.0000 |
| Consumer Discretionary | 0.1178 | 22.22 | 0.0000 | 0.0742 | 239855 | 0.0000 | 979/0 | 490 | 0.0000 |
| Consumer Staples | 0.0965 | 18.81 | 0.0000 | 0.0599 | 50513 | 0.0000 | 449/0 | 225 | 0.0000 |
| Health Care | 0.1334 | 19.43 | 0.0000 | 0.0785 | 78540 | 0.0000 | 560/0 | 280 | 0.0000 |
| Information Technology | 0.2142 | 17.56 | 0.0000 | 0.1197 | 150738 | 0.0000 | 776/0 | 388 | 0.0000 |
| Tele & Utilities | 0.1748 | 11.44 | 0.0000 | 0.1002 | 8055 | 0.0000 | 179/0 | 90 | 0.0000 |
| Total | 0.1679 | 37.81 | 0.0000 | 0.0830 | 8843189 | 0.0000 | 5947/0 | 2973 | 0.0000 |

**Panel B- The magnitude of earnings management by year**

| Year | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/− | *t*-stat | *p* |
| 2000 | 0.1278 | 13.68 | 0.0000 | 0.0681 | 28140 | 0.0000 | 335/0 | 168 | 0.0000 |
| 2001 | 0.1541 | 15.66 | 0.0000 | 0.0804 | 73577 | 0.0000 | 542/0 | 271 | 0.0000 |
| 2002 | 0.1305 | 20.43 | 0.0000 | 0.0712 | 215993 | 0.0000 | 929/0 | 465 | 0.0000 |
| 2003 | 0.128 | 22.09 | 0.0000 | 0.0726 | 229202 | 0.0000 | 957/0 | 479 | 0.0000 |
| 2004 | 0.1648 | 15.43 | 0.0000 | 0.0778 | 233048 | 0.0000 | 965/0 | 483 | 0.0000 |
| 2005 | 0.1999 | 13.91 | 0.0000 | 0.1063 | 290791 | 0.0000 | 1078/0 | 539 | 0.0000 |
| 2006 | 0.218 | 16.3 | 0.0000 | 0.098 | 325756 | 0.0000 | 1141/0 | 571 | 0.0000 |

## Table 5.7: Univariate tests of the magnitude of earnings management by Cash Flow Modified Jones Model

The magnitude of earnings management is measured as absolute value of discretionary accruals, *Abs (DA_CFO)*. The direction of earnings management is measured as signed discretionary accruals, *DA_CFO*. Discretionary accruals are obtained as the residual from Cash Flow Modified Jones model (see Equation 4.7). The null hypotheses for parametric t-test is that mean is zero, for the Wilcoxon signed rank test is that the median is zero, and for the binomial sign test is that proportion of positive and negative are equal. Reported p-values are from two-tailed tests.

**Panel A-The magnitude of earnings management by industry**

| Industry | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/− | *t*-stat | *p* |
| Energy | 0.1605 | 15.38 | 0.0000 | 0.0851 | 46118 | 0.0000 | 429/0 | 215 | 0.0000 |
| Material | 0.1042 | 11.82 | 0.0000 | 0.0571 | 45903 | 0.0000 | 428/0 | 214 | 0.0000 |
| Metals & Mining | 0.1824 | 21.39 | 0.0000 | 0.0872 | 846860 | 0.0000 | 1840/0 | 920 | 0.0000 |
| Industrials | 0.0740 | 13.71 | 0.0000 | 0.0453 | 23639 | 0.0000 | 307/0 | 154 | 0.0000 |
| Consumer Discretionary | 0.1120 | 21.71 | 0.0000 | 0.0674 | 239855 | 0.0000 | 979/0 | 490 | 0.0000 |
| Consumer Staples | 0.0818 | 19.42 | 0.0000 | 0.0528 | 50513 | 0.0000 | 449/0 | 225 | 0.0000 |
| Health Care | 0.1303 | 19.38 | 0.0000 | 0.0785 | 78540 | 0.0000 | 560/0 | 280 | 0.0000 |
| Information Technology | 0.1882 | 20.86 | 0.0000 | 0.1084 | 150738 | 0.0000 | 776/0 | 388 | 0.0000 |
| Tele & Utilities | 0.1632 | 11.92 | 0.0000 | 0.1080 | 8055 | 0.0000 | 179/0 | 90 | 0.0000 |

**Panel B- The magnitude of earnings management by year**

| Year | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/− | *t*-stat | *p* |
| 2000 | 0.1162 | 13.86 | 0.0000 | 0.0638 | 28140 | 0.0000 | 335/0 | 168 | 0.0000 |
| 2001 | 0.1482 | 16.36 | 0.0000 | 0.0783 | 73577 | 0.0000 | 542/0 | 271 | 0.0000 |
| 2002 | 0.1165 | 24.73 | 0.0000 | 0.0719 | 215993 | 0.0000 | 929/0 | 465 | 0.0000 |
| 2003 | 0.1169 | 23.16 | 0.0000 | 0.0675 | 229202 | 0.0000 | 957/0 | 479 | 0.0000 |
| 2004 | 0.1507 | 16.25 | 0.0000 | 0.0687 | 233048 | 0.0000 | 965/0 | 483 | 0.0000 |
| 2005 | 0.1664 | 14.66 | 0.0000 | 0.0867 | 290791 | 0.0000 | 1078/0 | 539 | 0.0000 |
| 2006 | 0.1774 | 22.16 | 0.0000 | 0.0909 | 325756 | 0.0000 | 1141/0 | 571 | 0.0000 |

## Table 5.8: Univariate tests of the magnitude of earnings management by Performance Adjusted Technique

The magnitude of earnings management is measured as absolute value of adjusted discretionary accruals, *Abs (DA_ADJ)*. The direction of earnings management is measured as signed adjusted discretionary accruals, *DA_ADJ*. Discretionary accruals are obtained as the residual from Performance Adjusted Technique (see Equation 4.8). The null hypotheses for parametric t-test is that mean is zero, for the Wilcoxon signed rank test is that the median is zero, and for the binomial sign test is that proportion of positive and negative are equal. Reported p-values are from two-tailed tests.

**Panel A-The magnitude of earnings management by industry**

| Industry | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/− | t-stat | *p* |
| Energy | 0.1558 | 15.64 | 0.0000 | 0.0864 | 45903 | 0.0000 | 429/0 | 214 | 0.0000 |
| Material | 0.0939 | 12.56 | 0.0000 | 0.0532 | 45050 | 0.0000 | 428/0 | 212 | 0.0000 |
| Metals & Mining | 0.1694 | 20.42 | 0.0000 | 0.0834 | 833113 | 0.0000 | 1840/0 | 913 | 0.0000 |
| Industrials | 0.0699 | 14.37 | 0.0000 | 0.0438 | 23486 | 0.0000 | 307/0 | 153 | 0.0000 |
| Consumer Discretionary | 0.0973 | 21.19 | 0.0000 | 0.0555 | 235953 | 0.0000 | 979/0 | 486 | 0.0000 |
| Consumer Staples | 0.0709 | 18.98 | 0.0000 | 0.0441 | 49395 | 0.0000 | 449/0 | 222 | 0.0000 |
| Health Care | 0.1136 | 18.93 | 0.0000 | 0.0688 | 75488 | 0.0000 | 560/0 | 275 | 0.0000 |
| Information Technology | 0.1664 | 19.54 | 0.0000 | 0.0983 | 147648 | 0.0000 | 776/0 | 384 | 0.0000 |
| Tele & Utilities | 0.1512 | 13.24 | 0.0000 | 0.1014 | 8055 | 0.0000 | 179/0 | 90 | 0.0000 |
| Total | 0.1324 | 41.82 | 0.0000 | 0.0696 | 8686283 | 0.0000 | 5947/0 | 2947 | 0.0000 |

**Panel B- The magnitude of earnings management by year**

| Year | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/− | *t*-stat | *p* |
| 2000 | 0.1064 | 13.39 | 0.0000 | 0.0561 | 27806 | 0.0000 | 335/0 | 167 | 0.0000 |
| 2001 | 0.1248 | 16.54 | 0.0000 | 0.0723 | 73035 | 0.0000 | 542/0 | 270 | 0.0000 |
| 2002 | 0.1089 | 24.17 | 0.0000 | 0.0677 | 212291 | 0.0000 | 929/0 | 461 | 0.0000 |
| 2003 | 0.1101 | 23.13 | 0.0000 | 0.0623 | 223966 | 0.0000 | 957/0 | 473 | 0.0000 |
| 2004 | 0.1364 | 15.64 | 0.0000 | 0.0673 | 228245 | 0.0000 | 965/0 | 478 | 0.0000 |
| 2005 | 0.1494 | 13.61 | 0.0000 | 0.0769 | 286493 | 0.0000 | 1078/0 | 535 | 0.0000 |
| 2006 | 0.1618 | 20.77 | 0.0000 | 0.0807 | 318943 | 0.0000 | 1141/0 | 565 | 0.0000 |

## Table 5.9: Univariate tests of directions of earnings management by Jones Model

The direction of earnings management is measured as signed discretionary accruals, *DA_J*. Discretionary accruals are obtained as the residual from Jones model (see Equation 4.1). The null hypotheses for parametric *t*-test is that mean is zero, for the Wilcoxon signed rank test is that the median is zero, and for the binomial sign test is that proportion of positive and negative are equal. Reported *p*-values are from two-tailed tests.

**Panel A- The directions of earnings management by industry**

| Industry | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/– | *t*-stat | *P* |
| Energy | 0.0049 | 0.15 | 0.8775 | -0.0125 | -1193 | 0.6428 | 195/234 | -19 | 0.0664 |
| Material | -0.0049 | -0.45 | 0.6490 | 0.0041 | 2206 | 0.3896 | 225/203 | 11 | 0.3101 |
| Metals & Mining | -0.0416 | -3.65 | 0.0003 | -0.0245 | -186819 | <.0001 | 781/1059 | -139 | <.0001 |
| Industrials | -0.0153 | -2.09 | 0.0369 | -0.0067 | -2728 | 0.0797 | 134/173 | -19 | 0.0299 |
| Consumer Discretionary | 0.0080 | 1.24 | 0.2148 | 0.0211 | 31918 | 0.0003 | 569/410 | 79 | <.0001 |
| Consumer Staples | 0.0024 | 0.35 | 0.7254 | 0.0087 | 3869 | 0.1598 | 241/208 | 16 | 0.1309 |
| Health Care | -0.0357 | -4.11 | <.0001 | -0.0268 | 17565 | <.0001 | 227/333 | -53 | <.0001 |
| Information Technology | -0.0628 | -4.58 | <.0001 | -0.0459 | -41171 | <.0001 | 308/468 | -80 | <.0001 |
| Tele & Utilities | 0.0361 | 1.78 | 0.0823 | 0.0303 | 1859 | 0.0071 | 106/73 | 17 | 0.0165 |

**Panel B - The directions of earnings management by year**

| Year | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/– | *t*-stat | *p* |
| 2000 | 0.0009 | 0.08 | -0.933 | 0.0084 | 2617 | -0.1404 | 186/149 | 18 | -0.049 |
| 2001 | -0.0149 | -1.28 | -0.1995 | -0.0078 | -6196 | -0.0894 | 251/291 | -20 | -0.0938 |
| 2002 | 0.0026 | 0.34 | -0.7309 | -0.0068 | -8119 | -0.3212 | 433/496 | -32 | -0.0419 |
| 2003 | -0.0064 | -0.92 | -0.3594 | 0.0024 | -2309 | -0.7873 | 485/472 | 6 | -0.6981 |
| 2004 | -0.0262 | -2.19 | -0.0282 | -0.0096 | -32798 | -0.0001 | 443/522 | -39 | -0.012 |
| 2005 | -0.0711 | -4.58 | (<0.0001) | -0.0478 | -106139 | (<.0001) | 409/669 | -130 | (<0.0001) |
| 2006 | -0.0185 | -1.24 | -0.271 | 0.0034 | -7669 | -0.4911 | 579/562 | 9 | -0.6358 |

## Table 5.10: Univariate tests of directions of earnings management by Modified Jones Model

The direction of earnings management is measured as signed discretionary accruals, *DA_MJ*. Discretionary accruals are obtained as the residual from Modified Jones model (see Equation 4.6). The null hypotheses for parametric t-test is that mean is zero, for the Wilcoxon signed rank test is that the median is zero, and for the binomial sign test is that proportion of positive and negative are equal. Reported p-values are from two-tailed tests.

**Panel A- The directions of earnings management by industry**

| Industry | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/− | *t*-stat | *p* |
| Energy | 0.0152 | 0.49 | 0.6236 | -0.0106 | -785 | 0.7602 | 198/231 | -17 | 0.1223 |
| Material | -0.0036 | -0.33 | 0.7363 | 0.0043 | 2514 | 0.3268 | 223/205 | 9 | 0.4113 |
| Metals & Mining | -0.0420 | -3.69 | 0.0002 | -0.0243 | -187464 | <.0001 | 774/1066 | -146 | <.0001 |
| Industrials | -0.0160 | -2.23 | 0.0262 | -0.0106 | -3039 | 0.0507 | 136/171 | -17 | 0.0521 |
| Consumer Discretionary | 0.0130 | 2.00 | 0.0452 | 0.0255 | 42793 | <.0001 | 581/398 | 92 | <.0001 |
| Consumer Staples | 0.0027 | 0.39 | 0.6897 | 0.0083 | 3888 | 0.1578 | 242/207 | 18 | 0.1085 |
| Health Care | -0.0379 | -4.33 | <.0001 | -0.0275 | 18271 | <.0001 | 231/329 | -49 | <.0001 |
| Information Technology | -0.0616 | -4.32 | <.0001 | -0.0477 | -40981 | <.0001 | 306/470 | -82 | <.0001 |
| Tele & Utilities | 0.0182 | 0.90 | 0.3673 | 0.0337 | 1434 | 0.0385 | 105/74 | 16 | 0.0274 |

**Panel B- The directions of earnings management by year**

| Year | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/− | *t*-stat | *p* |
| 2000 | 0.0008 | 0.69 | -0.4904 | 0.0099 | 3317 | -0.0614 | 184/151 | 17 | -0.0802 |
| 2001 | -0.0139 | -1.17 | -0.2408 | -0.0072 | -6549 | -0.0725 | 255/287 | -16 | -0.183 |
| 2002 | 0.0039 | 0.5 | -0.6145 | -0.0073 | -5683 | -0.4212 | 436/493 | -28 | -0.0661 |
| 2003 | -0.0108 | -1.53 | -0.1281 | 0.0028 | -7706 | -0.3678 | 481/476 | 3 | -0.8971 |
| 2004 | -0.0232 | -1.59 | -0.0516 | -0.0096 | -25849 | -0.0028 | 449/516 | -33 | -0.0336 |
| 2005 | -0.0718 | -4.65 | (<0.0001) | -0.0491 | -106305 | (<0.0001) | 413/665 | -126 | (<0.0001) |
| 2006 | -0.0155 | -1.04 | -0.2982 | 0.0146 | -5131 | -0.6451 | 578/563 | 8 | -0.6786 |

## Table 5.11: Univariate tests of directions of earnings management by Cash Flow Modified Jones Model

The direction of earnings management is measured as signed discretionary accruals, *DA_CFO*. Discretionary accruals are obtained as the residual from Cash Flow Modified Jones model (see Equation 4.7). The null hypotheses for parametric t-test is that mean is zero, for the Wilcoxon signed rank test is that the median is zero, and for the binomial sign test is that proportion of positive and negative are equal. Reported p-values are from two-tailed tests.

**Panel A- The directions of earnings management by industry**

| Industry | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t-stat* | *p* | Median | *z-stat* | *p* | +/− | *t-stat* | *p* |
| Energy | 0.0166 | 1.28 | 0.2012 | -0.0029 | 248 | 0.9231 | 208/221 | -7 | 0.5624 |
| Material | -0.0022 | -0.21 | 0.8280 | 0.0043 | 2122 | 0.4079 | 220/208 | 6 | 0.5950 |
| Metals & Mining | -0.0272 | -2.85 | 0.0043 | -0.0102 | -78104 | 0.0006 | 851/989 | -69 | 0.0014 |
| Industrials | -0.0128 | -1.88 | 0.0611 | -0.0070 | -1741 | 0.2642 | 140/167 | -13 | 0.1377 |
| Consumer Discretionary | 0.0124 | 1.98 | 0.0476 | 0.0259 | 46203 | <.0001 | 597/382 | 107 | <.0001 |
| Consumer Staples | 0.0004 | 0.08 | 0.9389 | 0.0096 | 4611 | 0.0937 | 254/195 | 29 | 0.0061 |
| Health Care | -0.0335 | -3.90 | 0.0001 | -0.0232 | -16015 | <.0001 | 231/329 | -49 | <.0001 |
| Information Technology | -0.0279 | -2.48 | 0.0133 | -0.0371 | -28458 | <.0001 | 320/456 | -68 | <.0001 |
| Tele & Utilities | 0.0112 | 0.61 | 0.5421 | 0.0246 | 1121 | 0.1066 | 105/74 | 16 | 0.0247 |

**Panel B- The directions of earnings management by year**

| Year | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/− | *t*-stat | *p* |
| 2000 | 0.0008 | 0.69 | -0.4904 | 0.0099 | 3317 | -0.0614 | 184/151 | 17 | -0.0802 |
| 2001 | -0.0139 | -1.17 | -0.2408 | -0.0072 | -6549 | -0.0725 | 255/287 | -16 | -0.183 |
| 2002 | 0.0039 | 0.5 | -0.6145 | -0.0073 | -5683 | -0.4212 | 436/493 | -28 | -0.0661 |
| 2003 | -0.0108 | -1.53 | -0.1281 | 0.0028 | -7706 | -0.3678 | 481/476 | 3 | -0.8971 |
| 2004 | -0.0232 | -1.59 | -0.0516 | -0.0096 | -25849 | -0.0028 | 449/516 | -33 | -0.0336 |
| 2005 | -0.0718 | -4.65 | (<0.0001) | -0.0491 | -106305 | (<0.0001) | 413/665 | -126 | (<0.0001) |
| 2006 | -0.0155 | -1.04 | -0.2982 | 0.0146 | -5131 | -0.6451 | 578/563 | 8 | -0.6786 |

## Table 5.12: Univariate tests of directions of earnings management by Performance Adjusted Technique

The direction of earnings management is measured as signed adjusted discretionary accruals, DA_*ADJ*. Discretionary accruals are obtained as the residual from Cash Flow Models then adjust for earnings performance (see Equation 4.8). The null hypotheses for parametric t-test is that mean is zero, for the Wilcoxon signed rank test is that the median is zero, and for the binomial sign test is that proportion of positive and negative are equal. Reported p-values are from two-tailed tests.

**Panel A- The directions of earnings management by industry**

| Industry | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/− | t-stat | *p* |
| Energy | 0.0274 | 2.21 | 0.0280 | -0.0058 | -76 | 0.9764 | 201/228 | -13 | 0.2268 |
| Material | -0.0038 | -0.43 | 0.6638 | -0.0024 | -2090 | 0.4083 | 203/225 | -9 | 0.4091 |
| Metals & Mining | 0.0008 | 0.08 | 0.9285 | 0.0000 | -5447 | 0.8089 | 913/927 | -0.5 | 1.0000 |
| Industrials | -0.0159 | -2.55 | 0.0111 | -0.0165 | -4987 | 0.0012 | 125/182 | -28 | 0.0016 |
| Consumer Discretionary | 0.0055 | 0.99 | 0.3199 | 0.0033 | 9946 | 0.2554 | 508/471 | 22 | 0.2579 |
| Consumer Staples | 0.0008 | 0.13 | 0.8970 | 0.0005 | -341 | 0.8994 | 223/226 | 7 | 0.5060 |
| Health Care | 0.0248 | 3.26 | 0.0012 | 0.0199 | 17427 | <.0001 | 321/239 | 46 | <.0001 |
| Information Technology | 0.0377 | 0.36 | 0.7169 | -0.0178 | -11320 | 0.0656 | 339/437 | -45 | 0.0013 |
| Tele & Utilities | 0.0517 | 3.31 | 0.0011 | 0.0576 | 2881 | <.0001 | 114/65 | 24 | 0.0003 |

**Panel B- The directions of earnings management by year**

| Year | Parametric t-test | | | Wilcoxon Signed Rank Test | | | Binomial Sign Test | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | *t*-stat | *p* | Median | *z*-stat | *p* | +/− | *t*-stat | *p* |
| 2000 | 0.0008 | 0.69 | -0.4904 | 0.0099 | 3317 | -0.0614 | 184/151 | 17 | -0.0802 |
| 2001 | -0.0139 | -1.17 | -0.2408 | -0.0072 | -6549 | -0.0725 | 255/287 | -16 | -0.183 |
| 2002 | 0.0039 | 0.5 | -0.6145 | -0.0073 | -5683 | -0.4212 | 436/493 | -28 | -0.0661 |
| 2003 | -0.0108 | -1.53 | -0.1281 | 0.0028 | -7706 | -0.3678 | 481/476 | 3 | -0.8971 |
| 2004 | -0.0232 | -1.59 | -0.0516 | -0.0096 | -25849 | -0.0028 | 449/516 | -33 | -0.0336 |
| 2005 | -0.0718 | -4.65 | (<0.0001) | -0.0491 | -106305 | (<0.0001) | 413/665 | -126 | (<0.0001) |
| 2006 | -0.0155 | -1.04 | -0.2982 | 0.0146 | -5131 | -0.6451 | 578/563 | 8 | -0.6786 |

## Table 5.13: Firm characteristics by the magnitude of earnings management

The magnitude of earnings management is measured as absolute values of adjusted discretionary accruals, Abs (DA_ADJ). Absolute value of adjusted discretionary accruals is estimated from Performance Adjusted Technique. Portfolio ranking is based on decile portfolios based on one of the measures of the magnitude of earnings management. Means of each characteristic within each portfolio are reported. Firm size (SIZE), growth rate (GROWTH), profitability (ROE), leverage (LEV), book-to-market (BM), capital intensity (CIR), and lagged total accruals (LAGTA) are all defined in Table 4.1.

| Portfolio Ranking | N | Abs (DA_ADJ) | SIZE | GROWTH | ROE | LEV | BM | CIR | LAGTA |
|---|---|---|---|---|---|---|---|---|---|
| 1 (Low) | 594 | 0.0042 | 11.0206 | 3.6164 | 0.0596 | 0.1864 | 0.7230 | 0.3338 | -0.0220 |
| 2 | 595 | 0.0158 | 10.9569 | 0.7783 | -0.0066 | 0.1855 | 0.7945 | 0.3345 | -0.0506 |
| 3 | 595 | 0.0288 | 10.8358 | 0.5287 | -0.0937 | 0.1785 | 0.7788 | 0.3392 | -0.0639 |
| 4 | 595 | 0.0429 | 10.9754 | 4.5884 | -0.0376 | 0.1985 | 0.7399 | 0.3474 | -0.7111 |
| 5 | 594 | 0.0601 | 10.7166 | 0.8271 | -0.1303 | 0.1690 | 0.7777 | 0.3576 | -0.4708 |
| 6 | 595 | 0.0812 | 10.3109 | 1.3371 | -0.1077 | 0.1583 | 0.7014 | 0.3748 | -0.1450 |
| 7 | 595 | 0.1086 | 10.2824 | 6.8756 | -0.2227 | 0.1442 | 0.6970 | 0.3325 | -3.0001 |
| 8 | 595 | 0.1488 | 10.1419 | 2.7202 | -0.4921 | 0.1773 | 0.6079 | 0.3694 | -0.0960 |
| 9 | 595 | 0.2244 | 9.7793 | 3.5491 | -1.5115 | 0.1701 | 0.5356 | 0.3405 | -0.1372 |
| 10 (High) | 594 | 0.6093 | 9.0633 | 4.2532 | -0.8501 | 0.1757 | 0.4358 | 0.2720 | 0.0489 |
| *t*-test of Low=High | | 26.83 | −17.17 | 0.18 | −2.56 | −0.44 | −5.99 | −3.87 | 0.30 |
| (p-value) | | <0.0001 | <0.0001 | 0.8566 | 0.0108 | 0.6630 | <0.0001 | 0.0001 | 0.7669 |

## Table 5.14: Firm characteristics by directions of earnings management

The directions of earnings management is measured as signed value of adjusted discretionary accruals. Positive adjusted discretionary accruals, +DA_ADJ, indicate upward earnings management while negative adjusted discretionary accruals, −DA_ADJ, indicate downward earnings management. Adjusted discretionary accruals are estimated from Performance Adjusted Technique. Portfolio ranking is based on decile portfolios based on one of the measures of the directions of earnings management. Means of each characteristic within each portfolio are reported. Firm size (SIZE), growth rate (GROWTH), profitability (ROE), leverage (LEV), book-to-market (BM), capital intensity (CIR), and lagged total accruals (LAGTA) are all defined in Table 4.1.

**Panel A-Upward (income-increasing)**

| Portfolio Ranking | N | + DA_ADJ | SIZE | GROWTH | ROE | LEV | BM | CIR | LAGTA |
|---|---|---|---|---|---|---|---|---|---|
| 1 (Low) | 298 | 0.0050 | 11.0502 | 7.0356 | 0.0459 | 0.1829 | 0.7326 | 0.3406 | -0.0264 |
| 2 | 298 | 0.0168 | 10.8507 | 1.0730 | -0.0050 | 0.1793 | 0.8111 | 0.3475 | -0.0476 |
| 3 | 297 | 0.0299 | 10.7368 | 9.6551 | 0.0104 | 0.1784 | 0.7327 | 0.3253 | -0.8893 |
| 4 | 297 | 0.0434 | 10.6717 | 0.4498 | -0.0219 | 0.2157 | 0.7710 | 0.3742 | 0.0021 |
| 5 | 297 | 0.0609 | 10.4016 | 1.4830 | -0.2145 | 0.1710 | 0.8200 | 0.3734 | 0.0111 |
| 6 | 297 | 0.0829 | 10.2555 | 9.6449 | -0.0711 | 0.1692 | 0.6835 | 0.3901 | -0.0517 |
| 7 | 297 | 0.1118 | 10.0029 | 2.1288 | -0.0978 | 0.1477 | 0.7354 | 0.3722 | 0.0132 |
| 8 | 297 | 0.1551 | 9.8158 | 4.3584 | -0.4175 | 0.2028 | 0.6146 | 0.4005 | -0.0084 |
| 9 | 297 | 0.2409 | 8.9787 | 6.7278 | -2.7407 | 0.1812 | 0.4591 | 0.3148 | 0.4041 |
| 10 (High) | 298 | 0.6502 | 8.8459 | 4.1026 | -1.0444 | 0.1645 | 0.3759 | 0.3008 | 0.2279 |
| *t*-test of Low=High | | 19.07 | −13.32 | −0.43 | −1.72 | −0.53 | −7.09 | −1.66 | 2.14 |
| (*p*-value) | | <0.0001 | <0.0001 | 0.6700 | 0.0859 | 0.5941 | <0.0001 | 0.0976 | 0.0333 |

**Panel B-Downward (income-decreasing)**

| Portfolio Ranking | N | − DA_ADJ | SIZE | GROWTH | ROE | LEV | BM | CIR | LAGTA |
|---|---|---|---|---|---|---|---|---|---|
| 1 (Low) | 298 | -0.0050 | 11.1418 | 0.4910 | 0.0562 | 0.1678 | 0.7664 | 0.3301 | -0.0159 |
| 2 | 298 | -0.0166 | 11.0949 | 0.4284 | 0.0133 | 0.2001 | 0.7917 | 0.3222 | -0.0810 |
| 3 | 297 | -0.0296 | 10.9253 | 0.2665 | -0.1710 | 0.2007 | 0.7873 | 0.3538 | -0.0692 |
| 4 | 297 | -0.0441 | 11.2203 | 0.3519 | -0.0927 | 0.1594 | 0.7437 | 0.3287 | -0.5820 |
| 5 | 297 | -0.0611 | 10.9409 | 1.1434 | -0.0566 | 0.1584 | 0.7107 | 0.3376 | -0.9766 |
| 6 | 297 | -0.0815 | 10.4014 | 1.0554 | -0.1369 | 0.1508 | 0.7408 | 0.3554 | -0.2057 |
| 7 | 297 | -0.1076 | 10.4831 | 3.2797 | -0.3354 | 0.1334 | 0.6886 | 0.3114 | -6.1850 |
| 8 | 297 | -0.1451 | 10.5466 | 1.4832 | -0.4726 | 0.1723 | 0.5282 | 0.3468 | -0.1785 |
| 9 | 297 | -0.2129 | 10.3657 | 0.8928 | -0.3241 | 0.1363 | 0.5945 | 0.3318 | -0.2757 |
| 10 (High) | 298 | -0.5723 | 9.4757 | 4.4890 | -0.7642 | 0.2003 | 0.5262 | 0.2536 | -0.5468 |
| *t*-test of Low=High | | −18.67 | −10.43 | 1.80 | −2.41 | 0.97 | −2.79 | −3.64 | −3.04 |
| (*p*-value) | | <0.0001 | <0.0001 | 0.0735 | 0.0166 | 0.3328 | 0.0055 | 0.0003 | 0.0026 |

## Table 6.1: Descriptive Statistics (Executive Compensation Incentive)

All variables are defined in Table 4.1. N is firm-year observations. Testing sample has total observations 3,326 covering the period 2000-2006. Mean, median, standard deviation, minimum, and maximum are reported. %[a] is percentage of observations having positive values. %[b] is the mean value of a particular form of compensation as a percentage of the mean total compensation. %[c] is the number of observations paying a particular form of compensation as a percentage of total observations.

**Panel A-Various discretionary accrual variables**

| Discretionary Accruals (% of total assets) | N | Mean | Median | S.D. | Min | Max | %[a] |
|---|---|---|---|---|---|---|---|
| DA_J | 3326 | -0.0427 | -0.0126 | 0.2227 | -1.0399 | 0.6294 | 46.14 |
| Abs (DA_J) | 3326 | 0.1443 | 0.0837 | 0.1749 | 0.0000 | 1.0399 | |
| DA_MJ | 3326 | -0.0416 | -0.0119 | 0.2250 | -1.0392 | 0.6912 | 46.62 |
| Abs (DA_MJ) | 3326 | 0.1455 | 0.0838 | 0.1766 | 0.0838 | 1.0392 | |
| DA_CF | 3326 | -0.0271 | -0.0037 | 0.2068 | -1.0520 | 0.6340 | 48.57 |
| Abs (DA_CF) | 3326 | 0.1293 | 0.0766 | 0.1636 | 0.0002 | 1.0520 | |
| DA_ADJ | 3326 | -0.0038 | 0.0000 | 0.1826 | -0.9745 | 0.7168 | 50.05 |
| Abs (DA_ADJ) | 3326 | 0.1114 | 0.0643 | 0.1447 | 0.0000 | 0.9745 | |

**Panel B - Compensation variables**

| Compensation ($millions) | N | Mean | Median | S.D. | Min | Max | %[b] | %[c] |
|---|---|---|---|---|---|---|---|---|
| TCOMP | 3326 | 0.5460 | 0.3023 | 0.6949 | 0.0195 | 4.7195 | 100% | 100% |
| SALARY | 3135 | 0.2951 | 0.2107 | 0.2992 | 0.0000 | 3.1061 | 54.05% | 94.26% |
| BONUS | 1035 | 0.0780 | 0.0000 | 0.2215 | 0.0000 | 2.4400 | 14.29% | 31.12% |
| LTIP | 167 | 0.0159 | 0.0000 | 0.1315 | 0.0000 | 2.1130 | 2.91% | 5.02% |
| OPTION | 982 | 0.0576 | 0.0000 | 0.2149 | 0.0000 | 3.1729 | 10.55% | 29.52% |
| SHARE | 184 | 0.0123 | 0.0000 | 0.1102 | 0.0000 | 3.6241 | 2.25% | 5.53% |
| FIX | 3135 | 0.3515 | 0.2488 | 0.3611 | 0.0000 | 3.4908 | 64.38% | 94.26% |
| ATRISK | 1035 | 0.1637 | 0.0040 | 0.3940 | 0.0000 | 3.9695 | 29.98% | 31.12% |

**Panel C- Control variables**

| Control Variable | N | Mean | Median | S.D | Min | Max |
|---|---|---|---|---|---|---|
| SIZE | 3326 | 10.6360 | 10.2476 | 2.0585 | 6.0615 | 16.0499 |
| GROWTH | 2546 | 1.4637 | 0.1006 | 16.4156 | -1.0000 | 547.0775 |
| ROE | 3326 | -0.1290 | -0.0298 | 0.4658 | -7.5223 | 1.6375 |
| LEV | 3326 | 0.1557 | 0.0712 | 0.2293 | 0.0000 | 4.3394 |
| BM | 3318 | 0.6406 | 0.5124 | 0.8185 | -22.4270 | 10.3268 |
| CIR | 3326 | 0.3383 | 0.2770 | 0.2786 | 0.0000 | 0.9922 |
| LAGTA | 2954 | -0.2276 | -0.0326 | 4.8914 | -202.4092 | 15.0385 |

## Table 6.2: Two-way cluster robust regression results for the association between the magnitude of earnings management and executive compensation

This table reports two-way cluster robust regression results in testing the magnitude of earnings management and its association with executive compensations. The dependent variable is the magnitude of earnings management which is measured as absolute values of discretionary accruals. Absolute value of discretionary accruals is estimated from Performance Adjusted Technique - Abs (DA_ADJ). Explanatory variables are executive compensations which decomposed into three tiers: executive total compensation (TOMP); executive fixed remuneration (FIX) versus at-risk compensation (ATRISK); and, individual components including fixed salary (SALARY), bonuses (BONUS), options (OPTION), shares (SHARE), and long-term incentive plans (LTIP). Firm characteristics and industry effects are controlled. All variables are defined in Table 4.1. The estimated coefficients and *t* statistics are two-way cluster-robust adjusted with White (1980) method. *T*-statistics are given in parentheses, one-tailed tests when we have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

| Variable | Pred. Sign | (1) Total Compensation | | (2) Fixed v. At-risk | | (3) Individual Components | |
|---|---|---|---|---|---|---|---|
| | | Coef. | t-stat | Coef. | t-stat | Coef. | t-stat |
| Intercept | ? | 0.2646 | (9.8818)*** | 0.2481 | (9.0049)*** | 0.2467 | (9.1625)*** |
| TCOMP | + | -0.0004 | (-0.0707) | | | | |
| FIX | − | | | -0.0467 | (-4.5719)*** | | |
| ATRISK | + | | | 0.0246 | (3.4720)** | | |
| SALARY | − | | | | | -0.0477 | (-3.7910)*** |
| BONUS | + | | | | | 0.0307 | (3.3612)** |
| OPTION | + | | | | | 0.0165 | (2.1249)* |
| SHARE | ? | | | | | 0.0534 | (1.7515) |
| LTIP | ? | | | | | 0.0044 | (0.6541) |
| Control Variables: | | | | | | | |
| SIZE | ? | -0.0123 | (-5.2758)*** | -0.0099 | (-3.9231)*** | -0.0098 | (-4.1686)*** |
| GROWTH | + | 0.0005 | (5.9328)*** | 0.0005 | (6.2206)*** | 0.0005 | (6.2749)*** |
| ROE | ? | -0.0342 | (-3.2096)** | -0.0358 | (-3.4598)** | -0.0355 | (-3.4906)** |
| LEV | ? | 0.0031 | (0.2927) | 0.0046 | (0.4149) | 0.0048 | (0.4459) |
| BM | − | -0.0071 | (-2.1710)* | -0.0076 | (-2.5920)** | -0.0076 | (-2.5707)** |
| CIR | − | 0.0173 | (1.0823) | 0.0159 | (1.0111) | 0.0167 | (1.0735) |
| LAGTA | + | -0.0001 | (-0.8082) | -0.0002 | (-1.4490) | -0.0001 | (-1.2885) |
| Industry Effects: | | | | | | | |
| Material | | -0.0281 | (-2.6587)** | -0.0253 | (-2.4657)** | -0.0260 | (-2.5708)** |
| Metals & Mining | | -0.0269 | (-1.4948) | -0.0269 | (-1.5730) | -0.0266 | (-1.5168) |
| Industrials | | -0.0350 | (-3.4036)** | -0.0350 | (-3.2397)** | -0.0332 | (-3.0215)** |
| Consumer Discretionary | | -0.0436 | (-6.2751)*** | -0.0404 | (-6.2150)*** | -0.0400 | (-5.8618)*** |
| Consumer Staples | | -0.0439 | (-4.5123)*** | -0.0418 | (-4.1139)*** | -0.0413 | (-3.9254)*** |
| Health Care | | -0.0377 | (-4.8078)*** | -0.0383 | (-5.4727)*** | -0.0376 | (-5.5530)*** |
| Information Technology | | -0.0238 | (-2.4076)* | -0.0212 | (-1.9877)* | -0.0206 | (-2.0021)* |
| Tele & Utilities | | 0.0143 | (0.7079) | 0.0149 | (0.7154) | 0.0151 | (0.7527) |
| Adj. R-square | | 0.1034 | | 0.1092 | | 0.1111 | |
| F | | 8.82 | (<.0001) | 9.26 | (<.0001) | 10.10 | (<.0001) |
| N | | 3326 | | 3326 | | 3326 | |

## Table 6.3: Two-way cluster robust regression results for the association between the upward earnings management and executive compensation

This table reports two-way cluster robust regression results in testing upward earnings management and its association with executive compensations. The dependent variable is the direction of earnings management, upward earnings management, which is measured as positive discretionary accruals. Positive discretionary accruals, +DA_ADJ, are estimated from Performance Adjusted Technique. Explanatory variables are executive compensations which decomposed into three tiers: executive total compensation (TOMP); executive fixed remuneration (FIX) versus at-risk compensation (ATRISK); and, individual components including fixed salary (SALARY), bonuses (BONUS), options (OPTION), shares (SHARE), and long-term incentive plans (LTIP). Firm characteristics and industry effects are controlled. All variables are defined in Table 4.1. The estimated coefficients and *t* statistics are two-way cluster-robust adjusted with White (1980) method. T-statistics are given in parentheses, one-tailed tests when we have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

| Variable | Pred. Sign | (1) Total Compensation | | (2) Fixed v. At-risk | | (3) Individual Components | |
|---|---|---|---|---|---|---|---|
| | | Coef. | t-stat | Coef. | t-stat | Coef. | t-stat |
| Intercept | ? | 0.3180 | (9.2276)*** | 0.3088 | (9.2847)*** | 0.3084 | (9.2410)*** |
| TCOMP | + | 0.0099 | (2.2613)* | | | | |
| FIX | − | | | -0.0117 | (-0.7739) | | |
| ATRISK | + | | | 0.0202 | (3.8473)*** | | |
| SALARY | − | | | | | -0.0093 | (-0.7504) |
| BONUS | + | | | | | 0.0169 | (1.6425) |
| OPTION | − | | | | | 0.0238 | (2.1343)** |
| SHARE | ? | | | | | 0.0156 | (0.7318) |
| LTIP | ? | | | | | 0.0100 | (0.5834) |
| Control Variables: | | | | | | | |
| SIZE | ? | -0.0181 | (-6.5293)*** | -0.0167 | (-5.9011)*** | -0.0167 | (-5.7710)*** |
| GROWTH | + | 0.0005 | (3.0349)** | 0.0005 | (3.0314)** | 0.0005 | (3.0203)** |
| ROE | ? | -0.0152 | (-1.6626) | -0.0165 | (-1.7543) | -0.0167 | (-1.7481) |
| LEV | ? | 0.1167 | (8.9578)*** | 0.1160 | (9.1593)*** | 0.1158 | (8.8948)*** |
| BM | − | -0.0061 | (-1.2993) | -0.0063 | (-1.3216) | -0.0063 | (-1.3520) |
| CIR | − | 0.0037 | (0.1535) | 0.0030 | (0.1238) | 0.0030 | (0.1226) |
| LAGTA | + | 0.0207 | (1.7326) | 0.0209 | (1.7821) | 0.0210 | (1.8006) |
| Industry Effects: | | | | | | | |
| Material | | -0.0601 | (-3.0572)** | -0.0598 | (-3.0624)** | -0.0598 | (-3.0922)** |
| Metals & Mining | | -0.0451 | (-2.5411)** | -0.0461 | (-2.5714)** | -0.0465 | (-2.5331)** |
| Industrials | | -0.0861 | (-5.3662)*** | -0.0863 | (-5.2458)*** | -0.0858 | (-5.1232)*** |
| Consumer Discretionary | | -0.0680 | (-4.1423)*** | -0.0665 | (-4.0574)*** | -0.0667 | (-4.0678)*** |
| Consumer Staples | | -0.0756 | (-3.0199)** | -0.0754 | (-3.0201)** | -0.0749 | (-2.9116)** |
| Health Care | | -0.0418 | (-2.8670)** | -0.0426 | (-2.8837)** | -0.0431 | (-2.8633)** |
| Information Technology | | -0.0307 | (-1.5268) | -0.0303 | (-1.5023) | -0.0304 | (-1.5018) |
| Tele & Utilities | | -0.0467 | (-1.3364) | -0.0471 | (-1.3430) | -0.0473 | (-1.3539) |
| Adj. R-square | | 0.1852 | | 0.1857 | | 0.1836 | |
| F | | 15.97 | (<.0001) | 15.14 | (<0.001) | 12.85 | (<0.001) |
| N | | 1647 | | 1647 | | 1647 | |

## Table 6.4: Two-way cluster robust regression results for the association between the downward earnings management and executive compensation

This table reports two-way cluster robust regression results in testing downward earnings management and its association with executive compensations. The dependent variable is the direction of earnings management, downward earnings management, which is measured as negative discretionary accruals. Negative discretionary accruals, −DA_ADJ, are estimated from Performance Adjusted Technique. Explanatory variables are executive compensations which decomposed into three tiers: executive total compensation (TOMP); executive fixed remuneration (FIX) versus at-risk compensation (ATRISK); and, individual components including fixed salary (SALARY), bonuses (BONUS), options (OPTION), shares (SHARE), and long-term incentive plans (LTIP). Firm characteristics and industry effects are controlled. All variables are defined in Table 4.1. The estimated coefficients and *t* statistics are two-way cluster-robust adjusted with White (1980) method. T-statistics are given in parentheses, one-tailed tests when we have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

| Variable | Pred. Sign | (1) Total Compensation | | (2) Fixed v. At-risk | | (3) Individual Components | |
|---|---|---|---|---|---|---|---|
| | | Coef. | t-stat | Coef. | t-stat | Coef. | t-stat |
| Intercept | ? | -0.2545 | (-8.4355)*** | -0.2320 | (-7.8402)*** | -0.2276 | (-7.9449)*** |
| TCOMP | − | 0.0059 | (0.5915) | | | | |
| FIX | + | | | 0.0661 | (4.0395)*** | | |
| ATRISK | − | | | -0.0277 | (-2.7286)** | | |
| SALARY | + | | | | | 0.0700 | (3.0668)** |
| BONUS | − | | | | | -0.0456 | (-3.3606)** |
| OPTION | + | | | | | -0.0082 | (-0.3671) |
| SHARE | ? | | | | | -0.0551 | (-1.6422) |
| LTIP | ? | | | | | 0.0023 | (0.2007) |
| Control Variables: | | | | | | | |
| SIZE | ? | 0.0107 | (3.5528)** | 0.0076 | (2.6088)** | 0.0072 | (2.5002)** |
| GROWTH | + | -0.0005 | (-3.4778)** | -0.0005 | (-3.3671)** | -0.0005 | (-3.3174)** |
| ROE | ? | 0.0493 | (3.9615)*** | 0.0502 | (4.1935)*** | 0.0503 | (4.4360)*** |
| LEV | ? | 0.0813 | (4.3736)*** | 0.0766 | (4.3160)*** | 0.0761 | (4.6070)*** |
| BM | − | 0.0092 | (2.3143)* | 0.0102 | (2.8719)** | 0.0102 | (2.9201)** |
| CIR | − | -0.0308 | (-1.1782) | -0.0275 | (-1.1072) | -0.0295 | (-1.2042) |
| LAGTA | + | 0.0001 | (0.3808) | 0.0001 | (0.9128) | 0.0001 | (0.5795) |
| Industry Effects: | | | | | | | |
| Material | | 0.0003 | (0.0231) | -0.0041 | (-0.2764) | -0.0012 | (-0.0826) |
| Metals & Mining | | 0.0143 | (0.5371) | 0.0122 | (0.4739) | 0.0127 | (0.4618) |
| Industrials | | 0.0045 | (0.3628) | 0.0049 | (0.3496) | 0.0024 | (0.1646) |
| Consumer Discretionary | | 0.0276 | (2.1089)* | 0.0231 | (1.7800) | 0.0218 | (1.6679) |
| Consumer Staples | | 0.0194 | (1.3529) | 0.0154 | (0.9981) | 0.0167 | (1.1516) |
| Health Care | | 0.0403 | (1.2695) | 0.0406 | (1.3518) | 0.0411 | (1.2888) |
| Information Technology | | 0.0180 | (1.1596) | 0.0139 | (0.8423) | 0.0131 | (0.8478) |
| Tele & Utilities | | -0.0944 | (-2.1279)* | -0.0972 | (-2.1761)* | -0.0965 | (-2.1551)* |
| Adj. R-square | | 0.0926 | | 0.0999 | | 0.1007 | |
| F | | 8.62 | (<.0001) | 8.80 | (<.0001) | 7.69 | (<.0001) |
| N | | 1649 | | 1649 | | 1649 | |

## Table 7.1: Descriptive Statistics (Benchmark Beating Incentive)

All variables are defined in Table 4.1. N is firm-year observations. Testing sample has total observations 3,326 covering the period 2000-2006. Mean, Median, standard deviation (S.D.), minimum (Min), and maximum (Max) are reported.

**Panel A-Benchmark and discretionary accrual variables**

| Variables | N | Mean | Median | S.D. | Min | Max |
|---|---|---|---|---|---|---|
| E | 3326 | -0.1242 | -0.0291 | 0.3020 | -1.6713 | 0.5340 |
| ΔE | 3326 | 0.0396 | 0.0033 | 0.6166 | -2.8276 | 17.9975 |
| PME | 3326 | -0.1261 | -0.0409 | 0.3189 | -1.8191 | 0.6650 |
| ΔPME | 3326 | 0.0378 | -0.0011 | 0.6169 | -2.8641 | 17.8976 |
| DA_ADJ | 3326 | -0.0038 | 0.0000 | 0.1826 | -0.9745 | 0.7168 |

## Table 7.2: Frequency distribution of reported earnings and pre-managed earnings

Reported earnings level (change) and pre-managed earnings level (change) are defined in Table 4.1. The actual frequencies, Freq (%), are expressed as percentage of the total sample. The expected frequency, Exp, is computed as the mean of the frequency in the two adjacent intervals. For the sake of the brevity, only intervals with earnings (changes) scaled by total assets ranging from −0.2 to 0.2 are presented in the table. The intervals are of width 0.04 of total asset. The Z-statistics are computed against the standardized normal distribution using Burgstahler and Dichev (1997) method. The Z-statistic is expressed as: $Z = [n - E(n)]/\sqrt{Var} \sim N(0,1)$ which is the standardized difference distributed approximately normal with mean 0 and standard deviation 1; *n* is actual number of observations in the interval; *E(n)* is Expected number of observations in the interval, defined as the average of the number of observations in the intervals immediately adjacent to the interval; and, $\sqrt{Var}$ is the estimated standard deviation of the difference, calculate as: $\sqrt{N \cdot p_i(1-p_i) + (1/4)N \cdot (p_{i-1} + p_{i+1}) \cdot (1 - p_{i-1} - p_{i+1})}$ Where *N* is the total number of observations and $p_i$ is the probability that an observation will fall into interval *i*; Significance levels reported are two-tailed at 1% or better for the test of the intervals immediately below (above) benchmarks.

**Panel A-Reported earnings level and change**

| Intervals | E | | | ΔE | | |
|---|---|---|---|---|---|---|
| | Freq (%) | Freq-Exp | z-stat | Freq (%) | Freq-Exp | z-stat |
| −0.20 | 0.038 | 0.003 | 0.89 | 0.027 | 0.001 | 0.18 |
| −0.16 | 0.039 | −0.006 | −1.72 | 0.03 | −0.006 | −2.00 |
| −0.12 | 0.051 | 0.005 | 1.31 | 0.045 | −0.001 | −0.14 |
| −0.08 | 0.053 | −0.001 | −0.25 | 0.061 | −0.014 | −3.39 |
| −0.04 | 0.057 | −0.013 | −2.89*** | 0.105 | −0.032 | −6.15*** |
| 0 | 0.086 | −0.008 | −1.61 | 0.213 | 0.093 | 13.60*** |
| 0.04 | 0.131 | 0.070 | 5.52*** | 0.135 | 0.001 | 0.08 |
| 0.08 | 0.112 | 0.019 | 3.53 | 0.056 | −0.031 | −7.06 |
| 0.12 | 0.055 | −0.017 | −4.07 | 0.039 | −0.002 | −0.43 |
| 0.16 | 0.032 | −0.008 | −2.48 | 0.025 | −0.005 | −1.74 |
| 0.20 | 0.024 | 0.002 | 0.75 | 0.021 | 0.002 | 0.58 |

**Panel B-Pre-managed earnings level and change**

| Intervals | PME | | | ΔPME | | |
|---|---|---|---|---|---|---|
| | Freq (%) | Freq-Exp | z-stat | Freq (%) | Freq-Exp | z-stat |
| −0.20 | 0.037 | −0.002 | −0.60 | 0.053 | 0.026 | 1.93 |
| −0.16 | 0.043 | 0.003 | 0.85 | 0.039 | −0.017 | −1.33 |
| −0.12 | 0.044 | −0.007 | −1.94 | 0.058 | 0.002 | 0.11 |
| −0.08 | 0.058 | 0.005 | 1.24 | 0.074 | −0.001 | −0.06 |
| −0.04 | 0.063 | −0.008 | −1.88 | 0.092 | 0.021 | 1.19 |
| 0 | 0.083 | 0.006 | 1.26 | 0.068 | −0.019 | −1.19 |
| 0.04 | 0.092 | 0.010 | 1.90 | 0.082 | 0.019 | 1.13 |
| 0.08 | 0.081 | 0.004 | 0.83 | 0.058 | −0.021 | −1.41 |
| 0.12 | 0.063 | −0.002 | −0.46 | 0.076 | 0.024 | 1.45 |
| 0.16 | 0.049 | 0.003 | 0.77 | 0.047 | −0.008 | −0.58 |
| 0.20 | 0.029 | −0.006 | −1.92 | 0.034 | 0.004 | 0.34 |

## Table 7.3: Frequencies of observations shift from pre-managed earnings (changes) below benchmarks to above benchmarks

Reported earnings level (change) and pre-managed earnings level (change) are defined in Table 4.1. a, the total number of observations of which pre-managed earnings (change) belong to the interval [−0.04, 0]; b, the total number of observations of which pre-managed earnings (change) belong to the interval [0, 0.04]; c, the total number of observations of which reported earnings (change) belong to the interval [−0.04, 0]; d, the total number of observations of which reported earnings (change) belong to the interval [0, 0.04]. Significant levels reported are two-tailed against the standardized normal distribution. The Z statistics are consistent with Kanji (1993) who test for correlated proportions and evaluate the significant change in the frequency before and after a given intervention. If the number of observations shifts from pre-managed earnings losses interval to the reported earnings profits interval denoted by b, the number of observations shifts from pre-managed earnings profits to the reported earnings losses is denoted by c, and the total number of observations is denoted by N, then z-statistic is computed as: $Z = \frac{(b-c)/N}{\sqrt{\frac{(b+c)-(b-c)^2/N}{N(N-1)}}}$

**Panel A-Pre-managed earnings level**

| | $E_{it} < 0$ | $E_{it} \geq 0$ | Total | z-stat |
|---|---|---|---|---|
| Firm-years with | 1649 | 270 | 1919 | |
| $PME_{it} < 0$ | *49.60%* | *8.11%* | *57.71%* | |
| Firm-years with | 167 | 1240 | 1407 | 5.87*** |
| $PME_{it} \geq 0$ | *5.04%* | *37.25%* | *42.29%* | |
| Total | 1817 | 1509 | 3326 | |
| | *54.64%* | 45.36% | 100% | |
| | **$-0.04 \leq E_{it} < 0$** | **$0 \leq E_{it} < 0.04$** | | |
| Firm-years with | 60 | 116 | 361[a] | |
| $-0.04 \leq PME_{it} < 0$ | *1.80%* | *3.48%* | *10.85%* | |
| Firm-years with | 57 | 119 | 419[b] | 4.49*** |
| $0 \leq PME_{it} < 0.04$ | *1.71%* | *3.57%* | *12.59%* | |
| Total | 302[c] | 561[d] | 3326 | |
| | *9.07%* | *16.86%* | *100%* | |

**Panel B-Pre-managed earnings change**

| | $\Delta E_{it} < 0$ | $\Delta E_{it} \geq 0$ | Total | z-stat |
|---|---|---|---|---|
| Firm-years with | 1287 | 387 | 1674 | |
| $\Delta PME_{it} < 0$ | *38.71%* | *11.61%* | *50.32%* | |
| Firm-years with | 303 | 1349 | 1652 | |
| $\Delta PME_{it} \geq 0$ | *9.10%* | *40.58%* | *49.68%* | 3.81*** |
| Total | 1590 | 1736 | 3326 | |
| | *47.81%* | *52.19%* | 100% | |
| | **$-0.04 \leq \Delta E_{it} < 0$** | **$0 \leq \Delta E_{it} < 0.04$** | | |
| Firm-years with | 147 | 184 | 527[a] | |
| $-0.04 \leq \Delta PME_{it} < 0$ | *4.41%* | *5.53%* | *15.84%* | |
| Firm-years with | 136 | 202 | 533[b] | |
| $0 \leq \Delta PME_{it} < 0.04$ | *4.09%* | *6.07%* | *16.03%* | 2.68*** |
| Total | 712[c] | 991[d] | 3326 | |
| | *21.41%* | *29.79%* | *100%* | |

## Table 7.4: Frequencies of positive adjusted discretionary accruals when pre-managed earnings (changes) below benchmarks

This table evaluates whether firms with pre-managed earnings (changes) below benchmarks are more likely to exercise positive discretionary accruals to manage earnings upwards. PME is pre-managed earnings level, calculated as reported earnings minus adjusted discretionary accruals; ΔPME is pre-managed earnings change, calculated as reported earnings change minus adjusted discretionary accruals; DA_ADJ is adjusted discretionary accruals, estimated from performance adjusted technique.

| | **$DA\_ADJ_{it} < 0$** | **$DA\_ADJ_{it} \geq 0$** | **Total** |
|---|---|---|---|
| Firm-years with | 711 | 1208 | 1919 |
| $PME_{it} < 0$ | *37.09%* | *62.91%* | *100%* |
| Firm-years with | 952 | 455 | 1407 |
| $PME_{it} \geq 0$ | *67.66%* | *32.34%* | *100%* |
| Firm-years with | 516 | 1158 | 1674 |
| $\Delta PME_{it} < 0$ | *30.86%* | *69.14%* | *100%* |
| Firm-years with | 1147 | 505 | 1652 |
| $\Delta PME_{it} \geq 0$ | *69.42%* | *30.58%* | *100%* |

## Table 7.5: Adjusted discretionary accruals comparing firms with pre-managed earnings below to above benchmarks

This table evaluates whether mean (median) discretionary accruals are different between pre-managed earnings loss (decline) firms and pre-managed earnings profit (increase) firms. Two intervals are compared: 1) pre-managed earnings loss (decline) versus pre-managed earnings profit (increase); and 2) small pre-managed earnings loss (decline) versus small pre-managed earnings profit (increase). PME is pre-managed earnings level, calculated as reported earnings minus adjusted discretionary accruals; ΔPME is pre-managed earnings change, calculated as reported earnings change minus adjusted discretionary accruals; DA_ADJ is adjusted discretionary accruals, estimated from performance adjusted technique. T-statistics are based on *t*-test for the difference in means across samples and *p*-values are two-tailed.

**Panel A-Pre-managed earnings level**

| | $PME_{it} < 0$ | | | $PME_{it} \geq 0$ | | | Test for difference | |
|---|---|---|---|---|---|---|---|---|
| $DA\_ADJ_{it}$ | N | Mean | Median | N | Mean | Median | t-test | p-value |
| | 1919 | 0.0273*** | 0.0311*** | 1407 | −0.0329*** | −0.0292*** | 25.96 | <.0001 |

| | $-0.04 \leq PME_{it} < 0$ | | | $0 \leq PME_{it} < 0.04$ | | | Test for difference | |
|---|---|---|---|---|---|---|---|---|
| $DA\_ADJ_{it}$ | N | Mean | Median | N | Mean | Median | t-test | p-value |
| | 361 | 0.0154*** | 0.0260*** | 419 | 0.0010 | 0.0073 | 2.98 | 0.0019 |

**Panel B-Pre-managed earnings change**

| | $\Delta PME_{it} < 0$ | | | $\Delta PME_{it} \geq 0$ | | | Test for difference | |
|---|---|---|---|---|---|---|---|---|
| $DA\_ADJ_{it}$ | N | Mean | Median | N | Mean | Median | t-test | p-value |
| | 1674 | 0.0336*** | 0.0349*** | 1652 | −0.0303*** | −0.0334*** | 27.36 | <.0001 |

| | $-0.04 \leq \Delta PME_{it} < 0$ | | | $0 \leq \Delta PME_{it} < 0.04$ | | | Test for difference | |
|---|---|---|---|---|---|---|---|---|
| $DA\_ADJ_{it}$ | N | Mean | Median | N | Mean | Median | t-test | p-value |
| | 527 | 0.0099*** | 0.0129*** | 533 | −0.0073*** | −0.0090*** | 4.84 | <.0001 |

## Table 7.6: Two-way cluster robust regression results for the association between adjusted discretionary accruals and pre-managed earnings below benchmarks

This table reports two-way cluster robust regression results in testing earnings management and its association with benchmark besting incentive. All variables are defined in Table 4.1. The dependent variable is signed discretionary accruals, DA_ADJ, estimated from Performance Adjusted Technique. Main testing variables are pre-managed earnings below benchmarks, BELOW_1 in Model (1) to BELOW_5 in Model (5) which indicates different intervals in the distribution of earnings (changes). N is number of observations. The estimated coefficients and *t* statistics are two-way cluster-robust adjusted with White (1980) method. T-statistics are given in parentheses, one-tailed tests when we have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

**Panel A-Pre-managed earnings level**

| **Independent Variables** | **Pred. Sign** | **Model (1)** | **Model (2)** | **Model (3)** | **Model (4)** | **Model (5)** |
|---|---|---|---|---|---|---|
| Intercept | ? | -0.0450 | -0.0381 | -0.0052 | -0.0295 | 0.0271 |
| | | (-3.45)*** | (-2.44)** | (-0.35) | (-3.03)*** | (1.97)** |
| BELOW_1 ($PME_{it} < 0$) | + | 0.0819 | | | | |
| | | (25.87)*** | | | | |
| BELOW_2 ($PME_{it} < 0$, $E_{it} \geq 0$) | + | | 0.1126 | | | |
| | | | (29.39)*** | | | |
| BELOW_3 ($-0.04 \leq PME_{it} < 0$) | + | | | 0.0268 | | |
| | | | | (8.41)*** | | |
| BELOW_4 ($-0.04 \leq PME_{it} < 0$, $0 \leq E_{it} < 0.04$) | + | | | | 0.0403 | |
| | | | | | (19.29)*** | |
| HIGH | − | | | | | -0.0802 |
| | | | | | | (-26.04)*** |
| LOW | − | | | | | 0.0556 |
| | | | | | | (9.81)*** |
| Control Variables: | | | | | | |
| SIZE | − | -0.0012 | -0.0019 | -0.0015 | 0.0015 | -0.0026 |
| | | (-1.61) | (-2.28)** | (-1.50) | (2.32)** | (-3.36)*** |
| GROWTH | + | 0.0000 | 0.0000 | -0.0003 | 0.0002 | 0.0000 |
| | | (0.84) | (0.84) | (-1.45) | (0.18) | (0.29) |
| ROE | ? | 0.0856 | 0.0917 | 0.4518 | 0.0459 | 0.1222 |
| | | (14.10)*** | (8.82)*** | (25.67)*** | (3.03)*** | (10.69)*** |
| LEV | ? | 0.0159 | 0.0425 | 0.0007 | -0.0021 | 0.0134 |
| | | (3.66)*** | (4.48)*** | (0.07) | (-0.29) | (2.78)*** |
| BM | | 0.0008 | 0.0026 | -0.0168 | 0.0001 | -0.0000 |
| | | (0.30) | (0.88) | (-4.12)*** | (0.16) | -0.01 |
| CIR | | 0.0270 | 0.0465 | 0.0025 | -0.0066 | 0.0345 |
| | | (2.24)** | (2.94)*** | (0.17) | (-1.00) | (2.90)*** |
| LAGTA | | -0.0000 | 0.0000 | -0.0000 | -0.0000 | 0.0000 |
| | | (-0.16) | (0.12) | (-2.43)** | (-2.90)*** | (0.44) |
| Industry Effects: | | | | | | |
| Material | | 0.0350 | 0.0053 | 0.0398 | 0.0095 | 0.0262 |
| | | (2.38)** | (0.25) | (2.37)** | (1.14) | (1.86)* |
| Metals & Mining | | -0.0220 | -0.0284 | -0.0034 | 0.0117 | -0.0218 |
| | | (-1.61) | (-1.47) | (-0.17) | (1.17) | (-1.62) |
| Industrials | | 0.0325 | -0.0233 | 0.0326 | 0.0071 | 0.0205 |
| | | (2.36)** | (-0.94) | (1.90)** | (0.86) | (1.52) |
| Consumer Discretionary | | 0.0320 | -0.0115 | 0.0288 | 0.0061 | 0.0273 |
| | | (2.32)** | (-0.57) | (1.77)** | (0.79) | (2.00)** |
| Consumer Staples | | 0.0295 | -0.0127 | 0.0352 | 0.0052 | 0.0197 |
| | | (2.01)** | (-0.60) | (2.07)** | (0.68) | (1.33) |
| Health Care | | 0.0306 | 0.0039 | 0.0266 | -0.0067 | 0.0194 |
| | | (1.92)* | (0.19) | (1.34)** | (-0.74) | (1.25) |
| Information Technology | | -0.0043 | -0.0181 | 0.0123 | 0.0133 | 0.0015 |
| | | (-0.27) | (-0.83) | (0.56) | (1.42) | (0.09) |
| Telecommunication & Utilities | | 0.0687 | 0.0597 | 0.0339 | 0.0131 | 0.0694 |
| | | (3.78)*** | (2.49)** | (1.32) | (1.06) | (3.89)*** |
| N | | 3326 | 1430 | 468 | 156 | 3326 |
| Adj. $R^2$ | | 0.2005 | 0.3521 | 0.5610 | 0.6437 | 0.2441 |

**Table 7.6 (Contd.)**

**Panel B-Pre-managed earnings change**

| Independent Variables | Pred. Sign | Model( 1) | Model (2) | Model (3) | Model (4) | Model (5) |
|---|---|---|---|---|---|---|
| Intercept | ? | 0.0071 | 0.0697 | -0.0105 | -0.0056 | 0.0493 |
| | | (0.55) | (3.66)*** | (-0.58) | (-0.50) | (3.29)*** |
| BELOW_1 ( $\Delta PME_t < 0$) | + | 0.0612 | | | | |
| | | (23.20)*** | | | | |
| BELOW_2 ($\Delta PME_t < 0$, $\Delta E_t \geq 0$) | + | | 0.1004 | | | |
| | | | (26.06)*** | | | |
| BELOW_3 ($-0.04 \leq \Delta PME_t < 0$) | + | | | 0.0189 | | |
| | | | | (5.36)*** | | |
| BELOW_4 ($-0.04 \leq \Delta PME_t < 0$, $0 \leq \Delta E_t < 0.04$) | + | | | | 0.0354 | |
| | | | | | (21.09)*** | |
| HIGH | − | | | | | -0.0407 |
| | | | | | | (-11.07)*** |
| LOW | − | | | | | 0.0351 |
| | | | | | | (8.26)*** |
| Control Variables: | | | | | | |
| SIZE | − | -0.0052 | -0.0074 | -0.0036 | -0.0010 | -0.0061 |
| | | (-7.05)*** | (-8.13)*** | (-3.54)*** | (-2.05)** | (-7.22)*** |
| GROWTH | + | 0.0000 | 0.0000 | 0.0002 | 0.0002 | 0.0000 |
| | | (1.04) | (1.36) | (2.82)** | (0.51) | (1.06) |
| ROE | ? | 0.0402 | 0.0002 | 0.0877 | 0.0243 | 0.0415 |
| | | (7.03)*** | (0.03) | (7.9)*** | (2.68)*** | (5.37)*** |
| LEV | ? | 0.0167 | 0.0408 | 0.0023 | -0.0008 | 0.0193 |
| | | (3.78)*** | (4.86)*** | (0.20) | (-0.13) | (3.28)*** |
| BM | + | 0.0038 | 0.0019 | 0.0020 | 0.0052 | -0.0004 |
| | | (1.57) | (0.61) | (0.36) | (0.78) | (-0.16) |
| CIR | | 0.0364 | 0.0509 | -0.0056 | -0.0060 | 0.0353 |
| | | (3.26)*** | (3.35)*** | (-0.37) | (-0.48) | (3.06)*** |
| LAGTA | | 0.0001 | 0.0018 | -0.0000 | -0.0034 | 0.0000 |
| | | (1.52) | (1.97)** | (-1.47) | (-1.21) | (0.44) |
| Industry Effects: | | | | | | |
| Material | | 0.0197 | 0.0114 | 0.0225 | 0.0374 | 0.0243 |
| | | (1.40) | (0.57) | (1.19) | (1.99)** | (1.75)* |
| Metals & Mining | | -0.0244 | -0.0361 | 0.0240 | 0.0147 | -0.0234 |
| | | (-1.81)* | (-1.85)* | (1.10) | (0.62) | (-1.73)* |
| Industrials | | 0.0122 | -0.0313 | 0.0263 | 0.0429 | 0.0192 |
| | | (0.91) | (-1.58) | (1.48) | (2.47)** | (1.41) |
| Consumer Discretionary | | 0.0186 | -0.0180 | 0.0217 | 0.0269 | 0.0262 |
| | | (1.38) | (-0.91) | (1.13) | (1.33) | (1.94)* |
| Consumer Staples | | 0.0116 | -0.0113 | 0.0216 | 0.0369 | 0.0158 |
| | | (0.81) | (-0.55) | (1.13) | (1.92)* | (1.08) |
| Health Care | | 0.0400 | -0.0002 | 0.0248 | 0.0374 | 0.0200 |
| | | (2.68)*** | (-0.01) | (1.21) | (1.79)* | (1.31) |
| Information Technology | | 0.0062 | -0.0205 | 0.0205 | 0.0339 | 0.0015 |
| | | (0.40) | (-0.90) | (0.86) | (1.42) | (0.10) |
| Telecommunication & Utilities | | 0.0859 | 0.0716 | 0.0830 | 0.0667 | 0.0689 |
| | | (4.97)*** | (2.93)*** | (3.36)*** | (2.56)** | (3.81)*** |
| N | | 3326 | 1430 | 468 | 156 | 3326 |
| Adj. $R^2$ | | 0.1749 | 0.2997 | 0.1078 | 0.5845 | 0.1405 |

## Table 8.1: 2SLS regression in examining the endogeneity of total compensation

This table reports results in examining the endogeneity of executive total compensation. In the first-stage OLS regression, total compensation is treated as endogenous and regressed on a set of instrumental variables and control variables. The lower part of the table shows the partial R-squared and the partial F-statistic from the first-stage regression. The values for the two specification tests: the Basmann test of over-identifying restrictions and the Hausman test for the endogeneity. All variables are defined in Table 4.1. T-statistics are given in parentheses, one-tailed tests if have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

| Independent Variables | Pred. Sign | First-Stage | |
|---|---|---|---|
| | | Dependent Variable: TCOMP | |
| Intercept | ? | -2.2766 | (-17.8498)*** |
| | | | |
| Instruments: | | | |
| TSR | + | 0.5303 | (8.3628)*** |
| TBQ | + | 0.0300 | (3.6226)*** |
| VOL | − | -0.0028 | (-0.7023) |
| DIV_DUMMY | + | 0.1180 | (2.5326)** |
| TAX_DUMMY | + | 0.1013 | (2.4106)** |
| | | | |
| Control variables: | | | |
| SIZE | + | 0.2611 | (29.8032)*** |
| GROWTH | + | -0.0010 | (-0.5792) |
| ROE | + | -0.0139 | (-1.6027) |
| LEV | − | -0.0174 | (-0.2326) |
| BM | − | -0.0567 | (-3.2428)*** |
| CIR | − | -0.0748 | (-0.9948) |
| LAGTA | | | |
| | | | |
| Industry effects: | | | |
| Material | ? | 0.0256 | (0.3000) |
| Metals & Mining | ? | -0.0914 | (-1.1997) |
| Industrials | ? | 0.0869 | (0.9776) |
| Consumer Discretionary | ? | 0.0446 | (0.5517) |
| Consumer Staples | ? | -0.0751 | (-0.8591) |
| Health Care | ? | 0.1090 | (1.1904) |
| Information Technology | ? | 0.0596 | (0.6882) |
| Tele & Utilities | ? | -0.1405 | (-1.2230) |
| | | | |
| N | | 3326 | |
| Adjusted R-square | | 0.5423 | |
| Partial R-squares | | 0.3028 | |
| F-statistic | | 84.25 (<.0001) | |
| Partial F-statistic | | 144.42 (<.0001) | |
| White test | | 230.26 (.0017) | |
| DW | | 1.60 | |
| Basmann: Abs (DA_ADJ) | | $\chi^2 = 1.12$ | (p=0.3250) |
| Basmann: +DA_ADJ | | $\chi^2 = 1.65$ | (p=0.1927) |
| Basmann: −DA_ADJ | | $\chi^2 = 0.67$ | (p=0.5130) |
| | | | |
| Hausman: Abs(DA_ADJ) | | F = 0.17 | (p=0.6801) |
| Hausman: +DA_ADJ | | F = 1.42 | (p=0.2342) |
| Hausman: −DA_ADJ | | F = 0.02 | (p=0.8846) |

## Table 8.2: 2SLS regression in examining the endogeneity of fixed and at-risk compensation

This table reports results in examining the endogeneity of executive fixed and at-risk compensation. In the first-stage OLS regression, fixed and at-risk compensation are treated as endogenous and regressed on a set of instrumental variables and control variables, respectively. The second-stage regression replaces the fixed compensation and at-risk compensation by their predicted values from the first-stage regression. E_FIX is expected fixed compensation and E_ATRISK is expected at-risk compensation. The lower part of the table shows the partial R-squared and the partial F-statistic from the first-stage regression. The values for the two specification tests: the Basmann test of over-identifying restrictions and the Hausman test for the endogeneity. All variables are defined in Table 4.1. T-statistics are given in parentheses, one-tailed tests if have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

| Independent Variable | Pred. Sign | First-Stage | | Second-Stage |
|---|---|---|---|---|
| | | Dependent variable | | Dependent variable |
| | | FIX | ATRISK | +DA_ADJ |
| Intercept | ?,?,? | -1.1012 | -1.2403 | 0.1258 |
| | | (-16.45) | (-11.8085)*** | (1.5012) |
| E_FIX | ~,~,+ | | | -0.4622 |
| | | | | (-2.1994)** |
| E_ATRISK | ~,~,+ | | | 0.2682 |
| | | | | (2.1677)** |
| Instruments: | | | | |
| TSR | +,+,~ | 0.1988 | 0.3625 | |
| | | (5.92)*** | (8.6920)*** | |
| TBQ | +,+,~ | 0.0100 | 0.0182 | |
| | | (2.27)*** | (3.3305)*** | |
| VOL | −,−,~ | | -0.0016 | |
| | | | (-0.62) | |
| DIV_DUMMY | +,+,~ | | 0.0497 | |
| | | | (1.5909) | |
| TAX_DUMMY | +,+,~ | | 0.0438 | |
| | | | (1.5043) | |
| Control variables: | | | | |
| SIZE | +,+,? | 0.1342 | 0.1233 | 0.0082 |
| | | (29.26) | (17.4238)*** | (0.6900) |
| GROWTH | +,+,? | -0.0006 | -0.0003 | 0.0019 |
| | | (-0.69) | (-0.3040) | (1.6594)* |
| ROE | +,+,? | -0.0106 | -0.0014 | -0.0070 |
| | | (-2.33) | (-0.2433) | (-0.8414) |
| LEV | −,−,? | 0.0770 | -0.1035 | 0.1232 |
| | | (1.94) | (-2.0755)** | (5.8471)*** |
| BM | −,−,? | -0.0246 | -0.0380 | -0.0093 |
| | | (-2.65) | (-3.2794)*** | (-1.5893) |
| CIR | −,−,− | -0.0598 | -0.0132 | -0.0220 |
| | | (-1.50) | (-0.2652) | (-1.0425) |
| LAGTA | ~,~,+ | | | -0.0100 |
| | | | | (-0.6916) |
| Industry effects: | | | | |
| Material | ?,?,? | 0.0497 | 0.0167 | -0.0165 |
| | | (1.10) | (0.2922) | (-0.6876) |
| Metals & Mining | ? ?,? | -0.0237 | -0.0313 | -0.0514 |
| | | (-0.59) | (-0.6222) | (-2.2521)** |
| Industrials | ?,?,? | -0.0011 | 0.1433 | -0.0804 |
| | | (-0.02) | (2.3961)** | (-3.0373)*** |
| Consumer Discretionary | ?,?,? | 0.0795 | 0.0151 | -0.0136 |
| | | (1.86) | (0.2793) | (-0.5230) |

**Table 8.2 (Contd.)**

| Independent Variable | Pred. Sign | First-Stage Dependent variable FIX | First-Stage Dependent variable ATRISK | Second-Stage Dependent variable +DA_ADJ |
|---|---|---|---|---|
| Consumer Staples | ?,?,? | 0.0068 | -0.0321 | -0.0507 |
| | | (0.15) | (-0.5491) | (-2.1975)** |
| Health Care | ?,?,? | 0.0331 | 0.1080 | -0.0553 |
| | | (0.68) | (1.7925)* | (-2.0862)** |
| Information Technology | ?,?,? | 0.0491 | 0.0498 | -0.0019 |
| | | (1.07) | (0.8707) | (-0.0817) |
| Tele & Utilities | ?,?,? | -0.0578 | -0.0436 | -0.0373 |
| | | (-0.95) | (-0.5761) | (-1.3676) |
| N | | 3326 | | |
| Adjusted R-square | | 0.5165 | 0.3623 | 0.1718 |
| Partial R-squares | | 0.2059 | 0.2168 | |
| F-statistic | | 92.35(p<.0001) | 40.99(p<.0001) | |
| Partial F-statistic | | 44.93(p<.0001) | 92.42(p<.0001) | |
| White test | | 172.42 | 216.52 | |
| | | (0.0005) | (0.0105) | |
| DW | | 1.68 | 1.66 | |
| Basmann: Abs (DA_ADJ) | | | | $\chi^2$ = 1.12 (p=0.3250) |
| Basmann: +DA_ADJ | | | | $\chi^2$ = 1.43 (p=0.2341) |
| Basmann: −DA_ADJ | | | | $\chi^2$ = 0.67 (p=0.5130) |
| Hausman: Abs(DA_ADJ) | | | | F =0.13 (p=0.7174) |
| Hausman: +DA_ADJ | | | | F = 2.89 (p=0.0564) |
| Hausman: −DA_ADJ | | | | F = 1.03 (p=0.3569) |

## Table 8.3: 2SLS regression in examining the endogeneity of individual compensation components

This table reports results in examining the endogeneity of executive individual compensation components. In the first-stage OLS regression, salary, bonuses, options, shares, and LTIPs are treated as endogenous and regressed on a set of instrumental variables and control variables, respectively. The second-stage regression replaces the salary, bonuses, options, shares, and LTIPs by their predicted values from the first-stage regression. The lower part of the table shows the partial R-squared and the partial F-statistic from the first-stage regression. The values for the two specification tests: the Basmann test of over-identifying restrictions and the Hausman test for the endogeneity. All variables are defined in Table 4.1. T-statistics are given in parentheses, one-tailed tests if have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

| Independent Variables | Pred. Sign | First Stage Dependent variable | | | | | Second Stage Dependent variable |
|---|---|---|---|---|---|---|---|
| | | SALARY | BONUS | OPTION | SHARE | LTIP | +DA_ADJ |
| Intercept | | -0.8975 | -0.5572 | -0.3528 | -0.0390 | -0.1227 | 0.0184 |
| | | (-16.5888)*** | (-11.1639)*** | (-5.3837)*** | (-1.2143) | (-2.9231)*** | (0.1659) |
| E_SALARY | ~,~,− | | | | | | -1.8956 |
| | | | | | | | (-3.6425)*** |
| E_BONUS | ~,~,+ | | | | | | 2.4050 |
| | | | | | | | (3.1871)*** |
| E_OPTION | ~,~,+ | | | | | | 0.4449 |
| | | | | | | | (1.2210) |
| E_SHARE | ~,~,+ | | | | | | -0.1066 |
| | | | | | | | (-0.4959) |
| E_LTIP | ~,~,+ | | | | | | 0.0150 |
| | | | | | | | (0.2301) |
| Instruments: | | | | | | | |
| TSR | +,+,~ | 0.2264 | 0.1660 | 0.0521 | 0.0238 | 0.0985 | |
| | | (8.4182)*** | (6.6905)*** | (2.0040)** | (1.8552)*** | (5.9958)*** | |
| TBQ | +,+,~ | 0.0084 | 0.0077 | 0.0076 | 0.0005 | 0.0004 | |
| | | (2.4064)** | (2.3897)** | (2.2464)** | (0.2926) | (0.1920) | |
| VOL | −,−,~ | | | -0.0001 | -0.0002 | -0.0008 | |
| | | | | (-0.03) | (-0.25) | (-0.79) | |
| DIV_DUMMY | +,+,~ | | | 0.0181 | 0.0040 | 0.0111 | |
| | | | | (0.9287) | (0.4133) | (0.9024) | |
| TAX_DUMMY | +,+,~ | | | 0.0097 | 0.0070 | 0.0052 | |
| | | | | (0.5313) | (0.7800) | (0.4544) | |
| Control variables: | | | | | | | |
| SIZE | +,+,? | 0.1114 | 0.0592 | 0.0364 | 0.0053 | 0.0098 | 0.0412 |
| | | (29.9940)*** | (17.2781)*** | (8.2396)*** | (2.4526)** | (3.4572)*** | (2.1264)** |
| GROWTH | +,+,? | -0.0005 | -0.0004 | 0.0001 | 0.0002 | -0.0001 | 0.0023 |
| | | (-0.6493) | (-0.5970) | (0.1357) | (0.6274) | (-0.2311) | (1.9596)* |
| ROA | +,+,? | -0.0074 | -0.0013 | 0.0010 | -0.0003 | -0.0005 | -0.0093 |
| | | (-2.0028)** | (-0.3722) | (0.2660) | (-0.1474) | (-0.2292) | (-1.0964) |

**Table 8.3 (Contd.)**

| Independent Variables | Pred. Sign | First Stage Dependent variable | | | | | Second Stage Dependent variable |
|---|---|---|---|---|---|---|---|
| | | SALARY | BONUS | OPTION | SHARE | LTIP | +DA_ADJ |
| LEV | −,−,? | 0.0146 | -0.0229 | -0.0173 | -0.0143 | -0.0288 | 0.1776 |
| | | (0.4592) | (-0.7845) | (-0.5562) | (-0.9340) | (-1.4651) | (6.3527)*** |
| BM | −,−,? | -0.0331 | -0.0195 | -0.0075 | -0.0027 | -0.0048 | -0.0138 |
| | | (-4.4555)*** | (-2.8424)*** | (-1.0387) | (-0.7719) | (-1.0530) | (-2.2106)** |
| CIR | −,−,− | -0.0575 | -0.0198 | -0.0100 | -0.0140 | 0.0247 | -0.0544 |
| | | (-1.8038)* | (-0.6716) | (-0.3229) | (-0.9206) | (1.2612) | (-2.2768)** |
| LAGTA | ~,~,+ | | | | | | -0.0493 |
| | | | | | | | (-2.1227)** |
| Industry effects: | | | | | | | |
| Material | ?,?,? | 0.0430 | 0.0380 | -0.0376 | -0.0039 | -0.0007 | -0.0373 |
| | | (1.1881) | (1.1395) | (-1.0558) | (-0.2232) | (-0.0290) | (-1.1161) |
| Metals & Mining | ? ?,? | -0.0543 | -0.0376 | 0.0168 | -0.0140 | -0.0031 | -0.0656 |
| | | (-1.6802)* | (-1.2604) | (0.5349) | (-0.9093) | (-0.1577) | (-2.6980)*** |
| Industrials | ?,?,? | 0.0201 | 0.0209 | -0.0430 | -0.0055 | 0.0943 | -0.0572 |
| | | (0.5329) | (0.6011) | (-1.1516) | (-0.3007) | (3.9452)*** | (-1.5441) |
| Consumer Discretionary | ?,?,? | 0.0660 | -0.0135 | -0.0036 | -0.0044 | 0.0138 | 0.1139 |
| | | (1.9239)* | (-0.4272) | (-0.1056) | (-0.2661) | (0.6471) | (2.3640)** |
| Consumer Staples | ?,?,? | -0.0152 | -0.0112 | -0.0593 | -0.0016 | 0.0112 | -0.0359 |
| | | (-0.4106) | (-0.3276) | (-1.6260) | (-0.0906) | (0.4855) | (-1.0969) |
| Health Care | ?,?,? | 0.0119 | 0.0274 | 0.0697 | -0.0071 | 0.0065 | -0.1248 |
| | | (0.3071) | (0.7638) | (1.8557)* | (-0.3873) | (0.2729) | (-3.6454)*** |
| Information Technology | ?,?,? | 0.0494 | 0.0080 | 0.0048 | -0.0043 | 0.0208 | 0.0563 |
| | | (1.3449) | (0.2366) | (0.1353) | (-0.2451) | (0.9235) | (1.8581)* |
| Tele & Utilities | ?,?,? | -0.0270 | 0.0031 | -0.0441 | -0.0154 | 0.0121 | -0.0905 |
| | | (-0.5543) | (0.0700) | (-0.9335) | (-0.6638) | (0.4044) | (-2.3067)** |
| N | | 3326 | | | | | |
| Adjusted R-square | | 0.5469 | 0.3039 | 0.0904 | 0.0589 | 0.1269 | 0.1929 |
| Partial R-squares | | 0.1593 | 0.1165 | 0.0395 | 0.0544 | 0.0672 | |
| F-statistic | | 104.03(p<.0001) | 38.27(p<.0001) | 7.86(p<.0001) | 11.39(p<.0001) | 11.56(p<.0001) | 7.09(p<.0001) |
| Partial F-statistic | | 161.44(p<.0001) | 112.70(P<.0001) | 11.39(p<.0001) | 18.21(p<.0001) | 24.79(p<.0001) | |
| White test | | 186.33 | 204.02 | 214.01 | 77 | 91 | 330.68 |
| | | (0.0019) | (0.0001) | (0.0143) | (0.1956) | (0.2247) | (0.2006) |
| DW | | 1.43 | 1.58 | 1.93 | 2.06 | 1.92 | 1.82 |
| Basmann: Abs (DA_ADJ) | | | | | just identified | | |
| Basmann: +DA_ADJ | | | | | just identified | | |
| Basmann: −DA_ADJ | | | | | just identified | | |
| Hausman: Abs(DA_ADJ) | | | | | F =0.99 (p=0.4230) | | |
| Hausman: +DA_ADJ | | | | | F = 4.42 (p=0.0006) | | |
| Hausman: −DA_ADJ | | | | | F = 0.47 (p=0.8003) | | |

## Table 8.4: Examining the backing-out problem by using non-discretionary accruals to replace adjusted discretionary accruals

The dependent variable is non-discretionary accruals (NDA), measured as the difference between total accruals (reported earnings minus operating cash flows) and DA_ADJ. Pre-managed earnings level (PME) are defined as reported earnings (E) minus NDA; pre-managed earnings change (ΔPME), calculated as reported earnings change (ΔE) minus NDA. The remaining variables are defined in Table 4.1. N is number of observations. The estimated coefficients and *t* statistics are two-way cluster-robust adjusted with White (1980) method. T-statistics are given in parentheses, one-tailed tests when we have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

**Panel A-Pre-managed earnings level**

| Independent Variables | Pred. Sign | Model (1) | Model (2) | Model (3) | Model (4) | Model (5) |
|---|---|---|---|---|---|---|
| Intercept | ? | 0.0789 | 0.0416 | 0.0698 | -0.0234 | 0.0470 |
| | | (5.61)*** | (2.25)** | (2.89)*** | (-0.58) | (2.83)*** |
| BELOW_1 ($PME_{it} < 0$) | + | -0.0282 | | | | |
| | | (-8.00)*** | | | | |
| BELOW_2 ($PME_{it} < 0$, $E_{it} \geq 0$) | + | | -0.0313 | | | |
| | | | (-5.11)*** | | | |
| BELOW_3 ($-0.04 \leq PME_{it} < 0$) | + | | | -0.0077 | | |
| | | | | (-1.35) | | |
| BELOW_4 ($-0.04 \leq PME_{it} < 0$, $0 \leq E_{it} < 0.04$) | + | | | | -0.0092 | |
| | | | | | (-0.88) | |
| HIGH | − | | | | | 0.0220 |
| | | | | | | (6.02)*** |
| LOW | − | | | | | -0.0067 |
| | | | | | | (-1.29) |
| Control Variables: | | | | | | |
| SIZE | − | -0.0069 | -0.0053 | -0.0086 | -0.0055 | -0.0057 |
| | | (-8.63)*** | (-5.41)*** | (-5.18)*** | (-2.01)** | (-5.97)*** |
| GROWTH | + | 0.0000 | 0.0000 | 0.0007 | 0.0016 | 0.0000 |
| | | (0.46) | (0.08) | (2.53)** | (0.56) | (0.63) |
| ROE | ? | 0.0009 | 0.0432 | -0.0190 | 0.2640 | 0.0029 |
| | | (0.14) | (3.53)*** | (-0.70) | (3.08)*** | (0.32) |
| LEV | ? | 0.0251 | 0.1003 | 0.0737 | 0.0370 | 0.0254 |
| | | (5.37)*** | (9.06)*** | (3.98)*** | (1.17) | (3.59)*** |
| BM | | 0.0046 | 0.0024 | 0.0070 | 0.0222 | 0.0058 |
| | | (1.60) | (0.60) | (1.18) | (1.69)* | (1.94)* |
| CIR | | 0.0472 | 0.0157 | -0.0008 | -0.0294 | 0.0389 |
| | | (3.52)*** | (0.77) | (-0.03) | (-0.62) | (2.88)*** |
| LAGTA | | 0.0000 | 0.0000*** | -0.0000 | -0.0000 | 0.0000 |
| | | (0.82) | (2.62) | (-0.30) | (-1.74)* | (0.38) |
| Industry Effects: | | | | | | |
| Material | | 0.0084 | 0.0374 | 0.0062 | -0.0090 | 0.0131 |
| | | (0.49) | (1.31) | (0.19) | (-0.15) | (0.77) |
| Metals & Mining | | -0.0239 | -0.0181 | -0.0046 | 0.0243 | -0.0231 |
| | | (-1.55) | (-0.79) | (-0.14) | (0.55) | (-1.48) |
| Industrials | | -0.0137 | 0.0277 | -0.0022 | 0.0241 | -0.0033 |
| | | (-0.83) | (0.81) | (-0.07) | (0.56) | (-0.21) |
| Consumer Discretionary | | 0.0003 | 0.0210 | 0.0110 | 0.0478 | 0.0047 |
| | | (0.02) | (0.82) | (0.33) | (1.09) | (0.29) |
| Consumer Staples | | 0.0059 | 0.0118 | 0.0166 | 0.0745 | 0.0133 |
| | | (0.35) | (0.41) | (0.53) | (1.24) | (0.77) |
| Health Care | | 0.0587 | 0.0453 | 0.0391 | 0.0910 | 0.0564 |
| | | (3.53) | (1.75) | (1.09) | (1.60) | (3.36)*** |
| Information Technology | | -0.0038 | -0.0163 | 0.0101 | 0.0064 | -0.0052 |
| | | (-0.22) | (-0.62) | (0.29) | (0.12) | (-0.29) |
| Telecommunication & Utilities | | 0.0822 | 0.0869 | 0.0588 | 0.0268 | 0.0812 |
| | | (3.81) | (2.74) | (1.16) | (0.65) | (3.80)*** |
| N | | 3326 | 1430 | 468 | 156 | 3326 |
| Adj. $R^2$ | | 0.0671 | 0.0860 | 0.0618 | 0.0323 | 0.0631 |

**Table 8.4 (Contd.)**

**Panel B-Pre-managed earnings change**

| Independent Variables | Pred. Sign | Model (1) | Model (2) | Model (3) | Model( 4) | Model (5) |
|---|---|---|---|---|---|---|
| Intercept | ? | 0.0644 | 0.0856 | 0.0610 | 0.0433 | 0.0495 |
| | | (4.76) | (3.91) | (2.48)** | (1.17) | (3.05)*** |
| BELOW_1 ( $\Delta PME_t < 0$) | + | -0.0291 | | | | |
| | | (-10.47)*** | | | | |
| BELOW_2 ($\Delta PME_t < 0$, $\Delta E_t \geq 0$) | + | | -0.0212 | | | |
| | | | (-4.35)*** | | | |
| BELOW_3 ($-0.04 \leq \Delta PME_t < 0$) | + | | | -0.0035 | | |
| | | | | (-0.83) | | |
| BELOW_4 ($-0.04 \leq \Delta PME_t < 0$, $0 \leq \Delta E_t < 0.04$) | + | | | | -0.0083 | |
| | | | | | (-1.51) | |
| HIGH | − | | | | | 0.0234 |
| | | | | | | (5.73)*** |
| LOW | − | | | | | -0.0258 |
| | | | | | | (-6.69)*** |
| Control Variables: | | | | | | |
| SIZE | − | -0.0054 | -0.0065 | -0.0068 | -0.0091 | -0.0050 |
| | | (-6.92)*** | (-6.25)*** | (-5.49)*** | (-5.57)*** | (-5.31)*** |
| GROWTH | + | 0.0000 | 0.0000 | -0.0001 | 0.0020 | 0.0000 |
| | | (0.35) | (0.48) | (-0.25) | (1.20) | (0.28) |
| ROE | ? | 0.0225 | 0.0151 | 0.0086 | 0.2011 | 0.0215 |
| | | (3.75)*** | (1.77)* | (0.60) | (5.59)*** | (2.73)*** |
| LEV | ? | 0.0251 | 0.0617 | 0.0859 | 0.1486 | 0.0256 |
| | | (5.38)*** | (6.42)*** | (6.99)*** | (7.84)*** | (3.93)*** |
| BM | | 0.0047 | 0.0047 | 0.0045 | 0.0116 | 0.0041 |
| | | (2.75) | (1.27) | (1.24) | (1.98)** | (1.47) |
| CIR | | 0.0403 | 0.0183 | -0.0048 | -0.0320 | 0.0410 |
| | | (3.01)*** | (0.99) | (-0.30) | (-1.12) | (3.08)*** |
| LAGTA | | 0.0000 | 0.0000 | -0.0000 | -0.0000 | 0.0000 |
| | | (0.09) | (1.36) | (-0.23) | (-0.83) | (0.39) |
| Industry Effects: | | | | | | |
| Material | | 0.0149 | 0.0402 | 0.0019 | 0.0034 | 0.0150 |
| | | (0.91) | (1.89)** | (0.09) | (0.11) | (0.91) |
| Metals & Mining | | -0.0218 | -0.0254 | -0.0235 | 0.0108 | -0.0222 |
| | | (-1.46) | (-1.29) | (-1.10) | (0.39) | (-1.48) |
| Industrials | | -0.0078 | 0.0117 | -0.0027 | 0.0076 | -0.0008 |
| | | (-0.50) | (0.49) | (-0.14) | (0.26) | (-0.05) |
| Consumer Discretionary | | 0.0051 | 0.0204 | -0.0018 | 0.0102 | 0.0068 |
| | | (0.34) | (0.97) | (-0.09) | (0.34) | (0.45) |
| Consumer Staples | | 0.0101 | 0.0395 | 0.0037 | 0.0132 | 0.0127 |
| | | (0.61) | (1.72)** | (0.18) | (0.43) | (0.77) |
| Health Care | | 0.0504 | 0.0394 | 0.0200 | 0.0406 | 0.0495 |
| | | (3.10)*** | (1.79)** | (0.91) | (1.17) | (3.05)*** |
| Information Technology | | -0.0044 | -0.0105 | -0.0156 | -0.0109 | -0.0057 |
| | | (-0.26) | (-0.46) | (-0.69) | (-0.30) | (-0.33) |
| Telecommunication & Utilities | | 0.0765 | 0.0850 | 0.0857 | 0.1179 | 0.0714 |
| | | (3.75)*** | (2.83)*** | (2.89)*** | (2.85) | (3.47)*** |
| N | | 3326 | 1430 | 468 | 156 | 3326 |
| Adj. $R^2$ | | 0.0786 | 0.0723 | 0.0691 | 0.1924 | 0.0881 |

## Table 8.5: Examining the backing-out problem by using operating cash flow to replace pre-managed earnings

The dependent variable is signed adjusted discretionary accruals, DA_ADJ. Pre-managed earnings levels (PME) are defined as operating cash flows (CF); pre-managed earnings change (ΔPME) is defined as the change of cash flows. The remaining variables are defined in Table 4.1. N is number of observations. The estimated coefficients and *t* statistics are two-way cluster-robust adjusted with White (1980) method. T-statistics are given in parentheses, one-tailed tests if have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

**Panel A-Pre-managed earnings level**

| **Independent Variables** | **Pred. Sign** | **Model (1)** | **Model (2)** | **Model (3)** | **Model( 4)** | **Model (5)** |
|---|---|---|---|---|---|---|
| Intercept | ? | -0.0174 | -0.0150 | -0.0075 | 0.0212 | 0.0161 |
| | | (-1.05) | (-0.70) | (-0.35) | (0.48) | (1.07) |
| BELOW_1 ($PME_{it} < 0$) | + | 0.0532 | | | | |
| | | (12.01)*** | | | | |
| BELOW_2 ($PME_{it} < 0, E_{it} \geq 0$) | + | | 0.0785 | | | |
| | | | (12.20)*** | | | |
| BELOW_3 ($-0.04 \leq PME_{it} < 0$) | + | | | 0.0188 | | |
| | | | | (3.38)*** | | |
| BELOW_4 ($-0.04 \leq PME_{it} < 0, 0 \leq E_{it} < 0.04$) | + | | | | 0.0204 | |
| | | | | | (2.23)** | |
| HIGH | − | | | | | -0.0511 |
| | | | | | | (-14.64)*** |
| LOW | − | | | | | 0.0693 |
| | | | | | | (12.63)*** |
| Control Variables: | | | | | | |
| SIZE | − | -0.0021 | -0.0027 | -0.0003 | -0.0017 | -0.0025 |
| | | (-2.30)** | (-2.41)** | (-0.24) | (-0.65) | (-3.08)*** |
| GROWTH | + | 0.0000 | 0.0000 | 0.0001 | 0.0008 | 0.0000 |
| | | (0.88) | (0.38) | (5.14)*** | (1.29) | (0.78) |
| ROE | ? | 0.0696 | 0.0959 | 0.4674 | 0.4595 | 0.1218 |
| | | (7.14)*** | (5.10)*** | (10.33)*** | (3.70) | (10.10)*** |
| LEV | ? | 0.0223 | 0.0812 | 0.0036 | 0.0269 | 0.0222 |
| | | (4.17)*** | (5.66)*** | (0.46) | (0.92) | (4.87)*** |
| BM | | 0.0042 | 0.0027 | 0.0027 | 0.0121 | 0.0028 |
| | | (1.51) | (0.73) | (0.56) | (1.50) | (1.09) |
| CIR | | 0.0553 | 0.0243 | 0.0146 | -0.0852 | 0.0591 |
| | | (4.21)*** | (1.17) | (0.78) | (-2.06)** | (4.65)*** |
| LAGTA | | 0.0000 | 0.0000 | -0.0000 | -0.0000 | 0.0000 |
| | | (0.72) | (2.84)*** | (-1.08) | (-1.73)* | (0.73) |
| Industry Effects: | | | | | | |
| Material | | 0.0256 | 0.0450 | 0.0234 | 0.0076 | 0.0154 |
| | | (1.63) | (1.84)* | (0.88) | (0.13) | (1.04) |
| Metals & Mining | | -0.0283 | -0.0266 | -0.0261 | 0.0090 | -0.0299 |
| | | (-1.95)* | (-1.24) | (-0.95) | (0.18) | (-2.14)** |
| Industrials | | 0.0178 | 0.0047 | 0.0102 | 0.0390 | 0.0088 |
| | | (1.22) | (0.15) | (0.39) | (0.74) | (0.64) |
| Consumer Discretionary | | 0.0270 | 0.0229 | 0.0218 | 0.0352 | 0.0225 |
| | | (1.84)* | (0.96) | (0.83) | (0.68) | (1.60) |
| Consumer Staples | | 0.0203 | 0.0388 | 0.0238 | 0.0411 | 0.0128 |
| | | (1.27) | (1.48) | (0.91) | (0.74) | (0.84) |
| Health Care | | 0.0447 | 0.0367 | 0.0403 | 0.0574 | 0.0307 |
| | | (2.69)*** | (1.52) | (1.37) | (0.95) | (1.85)** |
| Information Technology | | 0.0007 | -0.0135 | -0.0002 | -0.0043 | -0.0016 |
| | | (0.04) | (-0.54) | (-0.01) | (-0.07) | (-0.10) |
| Telecommunication & Utilities | | 0.0888 | 0.0935 | 0.0957 | 0.1061 | 0.0798 |
| | | (4.46)*** | (2.96)*** | (2.82)*** | (1.67)* | (4.09)*** |
| N | | 3326 | 1430 | 468 | 156 | 3326 |
| Adj. $R^2$ | | 0.0986 | 0.1561 | 0.3802 | 0.2837 | 0.1619 |

**Table 8.5 (Contd.)**

**Panel B-Pre-managed earnings change**

| Independent Variables | Pred. Sign | Model (1) | Model (2) | Model (3) | Model( 4) | Model (5) |
|---|---|---|---|---|---|---|
| Intercept | ? | 0.0418 | 0.0178 | 0.0424 | 0.0424 | 0.0480 |
| | | (2.56)** | (0.83) | (1.71)* | (1.14) | (2.87)*** |
| BELOW_1 ( $\Delta PME_t < 0$) | + | 0.0116 | | | | |
| | | (4.37)*** | | | | |
| BELOW_2 ($\Delta PME_t < 0$, $\Delta E_t \geq 0$) | + | | 0.0261 | | | |
| | | | (8.19)*** | | | |
| BELOW_3 ($-0.04 \leq \Delta PME_t < 0$) | + | | | 0.0012 | | |
| | | | | (0.32) | | |
| BELOW_4 ($-0.04 \leq \Delta PME_t < 0$, $0 \leq \Delta E_t < 0.04$) | + | | | | 0.0056 | |
| | | | | | (0.78) | |
| HIGH | − | | | | | -0.0085 |
| | | | | | | (-2.34)** |
| LOW | − | | | | | 0.0102 |
| | | | | | | (2.82)*** |
| Control Variables: | | | | | | |
| SIZE | − | -0.0057 | -0.0053 | -0.0067 | -0.0085 | -0.0059 |
| | | (-6.21)*** | (-4.74)*** | (-5.38)*** | (-3.60)*** | (-6.26)*** |
| GROWTH | + | 0.0000 | 0.0000 | 0.0000 | 0.0009 | 0.0000 |
| | | (0.98) | (0.41) | (0.86) | (0.88) | (0.98) |
| ROA | ? | 0.0281 | 0.0606 | 0.1092 | 0.3897 | 0.0306 |
| | | (3.54)*** | (3.47)*** | (6.20)*** | (4.90)*** | (3.78)*** |
| LEV | ? | 0.0243 | 0.0976 | 0.0540 | 0.0908 | 0.0244 |
| | | (3.79)*** | (6.59)*** | (3.95)*** | (3.30)*** | (3.82)*** |
| BM | | 0.0037 | 0.0042 | 0.0042 | 0.0067 | 0.0041 |
| | | (1.36) | (1.29) | (1.24) | (1.38) | (1.46) |
| CIR | | 0.0509 | 0.0318 | 0.0333 | -0.0052 | 0.0477 |
| | | (3.86)*** | (2.03)** | (2.48)** | (-0.23) | (3.57)*** |
| LAGTA | | 0.0000 | 0.0000 | -0.0000 | -0.0000 | 0.0000 |
| | | (1.00) | (0.81) | (-0.23) | (-1.92)* | (0.42) |
| Industry Effects: | | | | | | |
| Material | | 0.0147 | 0.0292 | 0.0043 | 0.0037 | 0.0171 |
| | | (0.89) | (1.55) | (0.25) | (0.12) | (1.04) |
| Metals & Mining | | -0.0292 | -0.0231 | -0.0255 | -0.0196 | -0.0243 |
| | | (-1.90)** | (-1.33) | (-1.49) | (-0.68) | (-1.60) |
| Industrials | | -0.0014 | 0.0087 | -0.0068 | 0.0094 | -0.0006 |
| | | (-0.09) | (0.46) | (-0.42) | (0.34) | (-0.04) |
| Consumer Discretionary | | 0.0151 | 0.0221 | 0.0039 | 0.0109 | 0.0109 |
| | | (0.97) | (1.22) | (0.24) | (0.38) | (0.70) |
| Consumer Staples | | 0.0114 | 0.0329 | 0.0070 | 0.0097 | 0.0149 |
| | | (0.68) | (1.70)* | (0.41) | (0.33) | (0.89) |
| Health Care | | 0.0493 | 0.0497 | 0.0436 | 0.0517 | 0.0547 |
| | | (2.88)*** | (2.52)** | (2.41)** | (1.54) | (3.30) |
| Information Technology | | 0.0027 | -0.0068 | -0.0203 | -0.0186 | -0.0026 |
| | | (0.15) | (-0.33) | (-1.08) | (-0.55) | (-0.15) |
| Telecommunication & Utilities | | 0.0916 | 0.0938 | 0.0859 | 0.0738 | 0.0878 |
| | | (4.29)*** | (3.59)*** | (3.54)*** | (2.03)** | (4.12) |
| N | | 3326 | 1430 | 468 | 156 | 3326 |
| Adj. $R^2$ | | 0.0547 | 0.0694 | 0.1141 | 0.2137 | 0.0559 |

## Table 8.6: Re-estimate the association between the magnitude of earnings management and executive compensation by controlling year effects

This table reports OLS regression results in testing the magnitude of earnings management and its association with executive compensations. The dependent variable is the magnitude of earnings management which is measured as absolute values of discretionary accruals. Absolute value of discretionary accruals is estimated from Performance Adjusted Technique-Abs (DA_ADJ). Explanatory variables are executive compensations which decomposed into three tiers: executive total compensation (TOMP); executive fixed remuneration (FIX) versus at-risk compensation (ATRISK); and, individual components including fixed salary (SALARY), bonuses (BONUS), options (OPTION), shares (SHARE), and long-term incentive plans (LTIP). Firm characteristics, industry and year effects are controlled. All variables are defined in Table 4.1. The estimated coefficients and *t* statistics are calculated using White (1980) method. *T*-statistics are given in parentheses, one-tailed tests when we have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

| Variable | Pred. Sign | (1) Total Compensation | | (2) Fixed v. At-risk | | (3) Individual Components | |
|---|---|---|---|---|---|---|---|
| | | Coef. | t-stat | Coef. | t-stat | Coef. | t-stat |
| Intercept | ? | 0.2868 | (8.1250)*** | 0.2790 | (7.8151)*** | 0.2763 | (7.7336)*** |
| TCOMP | + | -0.0045 | -0.8190 | | | | |
| FIX | − | | | -0.0265 | (-1.8164)* | | |
| ATRISK | + | | | 0.0075 | 0.8485 | | |
| SALARY | − | | | | | -0.0215 | -1.4020 |
| BONUS | + | | | | | 0.0513 | (2.2038)** |
| OPTION | + | | | | | 0.0083 | 0.6200 |
| SHARE | ? | | | | | -0.0007 | -0.0440 |
| LTIP | ? | | | | | -0.0226 | -1.0819 |
| Control Variables: | | | | | | | |
| SIZE | ? | -0.0065 | (-2.7241)*** | -0.0056 | (-2.2629)** | -0.0054 | (-2.2096)** |
| GROWTH | + | 0.0005 | (2.8323)*** | 0.0005 | (2.8378)*** | 0.0005 | (2.8381)*** |
| ROE | ? | -0.0321 | (-4.3204)*** | -0.0327 | (-4.4027)*** | -0.0322 | (-4.3274)*** |
| LEV | ? | 0.0121 | 0.8746 | 0.0127 | 0.9171 | 0.0124 | 0.8984 |
| BM | − | -0.0046 | -1.2733 | -0.0049 | -1.3560 | -0.0050 | -1.3914 |
| CIR | − | 0.0045 | 0.3086 | 0.0040 | 0.2719 | 0.0049 | 0.3360 |
| LAGTA | + | 0.0004 | 0.7347 | 0.0004 | 0.6603 | 0.0004 | 0.6526 |
| Industry Effects: | | | | | | | |
| Material | | -0.0307 | (-1.8509)* | -0.0293 | (-1.7627)* | -0.0293 | (-1.7619)* |
| Metals & Mining | | -0.0288 | (-1.9578)* | -0.0287 | (-1.9501)* | -0.0283 | (-1.9291)* |
| Industrials | | -0.0365 | (-2.0887)** | -0.0363 | (-2.0804)** | -0.0326 | (-1.8538)* |
| Consumer Discretionary | | -0.0496 | (-3.2242)*** | -0.0479 | (-3.1125)*** | -0.0474 | (-3.0760)*** |
| Consumer Staples | | -0.0549 | (-3.2822)*** | -0.0538 | (-3.2170)*** | -0.0520 | (-3.1048)*** |
| Health Care | | -0.0408 | (-2.3798)** | -0.0410 | (-2.3897)** | -0.0400 | (-2.3308)** |
| Information Technology | | -0.0170 | -1.0325 | -0.0155 | (-0.9418) | -0.0145 | -0.8795 |
| Tele & Utilities | | 0.0349 | 1.6295 | 0.0355 | (1.6609)** | 0.0368 | (1.7194)* |
| Year Effects: | | | | | | | |
| 2001 | | -0.0650 | (-2.7764)*** | -0.0635 | (-2.7118)*** | -0.0625 | (-2.6694)*** |
| 2002 | | -0.0974 | (-4.3188)*** | -0.0952 | (-4.2195)*** | -0.0948 | (-4.1968)*** |
| 2003 | | -0.0743 | (-3.4231)*** | -0.0730 | (-3.3621)*** | -0.0732 | (-3.3741)*** |
| 2004 | | -0.0903 | (-4.3980)*** | -0.0893 | (-4.3512)*** | -0.0904 | (-4.4001)*** |
| 2005 | | -0.0736 | (-3.5996)*** | -0.0726 | (-3.5504)*** | -0.0732 | (-3.5806)*** |
| 2006 | | -0.0773 | (-3.7829)*** | -0.0760 | (-3.7190)*** | -0.0774 | (-3.7882)*** |
| Adj. R-square | | 0.0623 | | 0.0630 | | 0.0642 | |
| F | | 7.85 | (<0.0001) | 7.63 | (<0.0001) | 6.99 | (<0.0001) |
| N | | 3326 | | 3326 | | 3326 | |

## Table 8.7: Re-estimate the association between the magnitude of earnings management and executive compensation by using discretionary accruals from Modified Jones Model

This table reports OLS regression results in testing the magnitude of earnings management and its association with executive compensations. The dependent variable is the magnitude of earnings management which is measured as absolute values of discretionary accruals. Absolute value of discretionary accruals is estimated from Modified Jones Model (DA_MJ). Explanatory variables are executive compensations which decomposed into three tiers: executive total compensation (TOMP); executive fixed remuneration (FIX) versus at-risk compensation (ATRISK); and, individual components including fixed salary (SALARY), bonuses (BONUS), options (OPTION), shares (SHARE), and long-term incentive plans (LTIP). Firm characteristics, industry and year effects are controlled. All variables are defined in Table 4.1. The estimated coefficients and *t* statistics are based on White (1980) method. *T*-statistics are given in parentheses, one-tailed tests when we have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

| Variable | Pred. Sign | (1) Total Compensation | | (2) Fixed v. At-risk | | (3) Individual Components | |
|---|---|---|---|---|---|---|---|
| | | Coef. | t-stat | Coef. | t-stat | Coef. | t-stat |
| Intercept | ? | 0.2820 | (6.7333)*** | 0.2739 | (6.2093)*** | 0.2673 | (4.2364)*** |
| TCOMP | + | -0.0040 | (-0.5026) | | | | |
| FIX | − | | | -0.0297 | (-1.9930)* | | |
| ATRISK | + | | | 0.0109 | (0.9453) | | |
| SALARY | − | | | | | -0.035 | (-1.7361)* |
| BONUS | + | | | | | 0.0919 | (1.6643)* |
| OPTION | + | | | | | 0.0196 | (1.3390) |
| SHARE | ? | | | | | -0.0164 | (-0.9638) |
| LTIP | ? | | | | | -0.018 | (-1.0776) |
| Control Variables: | | | | | | | |
| SIZE | ? | -0.0049 | -1.5131 | -0.0039 | (-1.1645) | -0.0036 | (-1.0522) |
| GROWTH | + | 0.0004 | 0.9417 | 0.0004 | (0.9509) | 0.0004 | (1.2290) |
| ROE | ? | -0.0530 | (-2.9541)** | -0.0536 | (-2.9950)** | -0.0526 | (-4.0267)*** |
| LEV | ? | -0.0056 | -0.3763 | -0.0047 | (-0.3072) | -0.0053 | (-0.2422) |
| BM | − | -0.0065 | (-3.3492)** | -0.0068 | (-3.7196) | -0.0071 | (-1.6477)* |
| CIR | − | 0.0340 | 0.7672 | 0.0334 | (0.7539) | 0.0348 | (1.6359) |
| LAGTA | + | 0.0008 | (7.1064)*** | 0.0007 | (6.0797)*** | 0.0007 | (2.0582)** |
| Industry Effects: | | | | | | | |
| Material | | -0.0157 | -1.3512 | -0.0142 | (-1.1875) | -0.0134 | (-0.6082) |
| Metals & Mining | | -0.0087 | -0.2585 | -0.0086 | (-0.2610) | -0.0082 | (-0.4593) |
| Industrials | | -0.0366 | (-4.4303)*** | -0.0367 | (-4.5376)*** | -0.0301 | (-1.0708) |
| Consumer Discretionary | | -0.0394 | (-3.2388)** | -0.0376 | (-3.1951)** | -0.0368 | (-1.9302)* |
| Consumer Staples | | -0.0302 | (-3.1854)** | -0.0289 | (-3.2101)** | -0.0255 | (-0.9979) |
| Health Care | | -0.0382 | (-4.3483)*** | -0.0386 | (-4.5600)*** | -0.0367 | (-1.6401) |
| Information Technology | | 0.0075 | 0.3415 | 0.0091 | (0.4097) | 0.0109 | (0.4973) |
| Tele & Utilities | | 0.0308 | 1.1834 | 0.0315 | (1.1811) | 0.0344 | (0.7300) |
| Year Effects: | | | | | | | |
| 2001 | | -0.0699 | (-1.7635)* | -0.0681 | (-1.7162)* | -0.0668 | (-1.6769)* |
| 2002 | | -0.0991 | (-2.4025)** | -0.0966 | (-2.3379)** | -0.0958 | (-2.3075)** |
| 2003 | | -0.0804 | (-1.8557)* | -0.0789 | (-1.8185)* | -0.0789 | (-1.8082)* |
| 2004 | | -0.0977 | (-2.3247)** | -0.0966 | (-2.2948)** | -0.0978 | (-2.3114)** |
| 2005 | | -0.0726 | (-1.7283)* | -0.0716 | (-1.6998)* | -0.0724 | (-1.7136)* |
| 2006 | | -0.0782 | (-1.8653)* | -0.0767 | (-1.8271)* | -0.0791 | (-1.8778)* |
| Adj. R-square | | 0.0696 | | 0.0707 | | 0.07710 | |
| F | | 5.49 | (<0.0001) | 5.27 | (<0.0001) | 5.98 | (<0.0001) |
| N | | 3326 | | 3326 | | 3326 | |

## Table 8.8: Re-estimate the association between the upward earnings management and executive compensation by controlling year effects

This table reports OLS regression results in testing upward earnings management and its association with executive compensations. The dependent variable is the direction of earnings management, upward earnings management, which is measured as positive discretionary accruals. Positive discretionary accruals, +DA_ADJ, are estimated from Performance Adjusted Technique. Explanatory variables are executive compensations which decomposed into three tiers: executive total compensation (TOMP); executive fixed remuneration (FIX) versus at-risk compensation (ATRISK); and, individual components including fixed salary (SALARY), bonuses (BONUS), options (OPTION), shares (SHARE), and long-term incentive plans (LTIP). Firm characteristics, industry and year effects are controlled. All variables are defined in Table 4.1. The estimated coefficients and *t* statistics are based on White (1980) method. *T*-statistics are given in parentheses, one-tailed tests when we have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

| Variable | Pred. Sign | (1) Total Compensation | | (2) Fixed v. At-risk | | (3) Individual Components | |
|---|---|---|---|---|---|---|---|
| | | Coef. | t-stat | Coef. | t-stat | Coef. | t-stat |
| Intercept | ? | 0.3410 | (9.5719)*** | 0.3290 | (9.1052)*** | 0.3291 | (9.0851)*** |
| TCOMP | + | 0.0082 | 1.4341 | | | | |
| FIX | − | | | -0.0211 | -1.3903 | | |
| ATRISK | + | | | 0.0220 | (2.4053)** | | |
| SALARY | − | | | | | -0.0214 | -1.3474 |
| BONUS | + | | | | | 0.0217 | (1.8008)* |
| OPTION | − | | | | | 0.0220 | 1.3464 |
| SHARE | ? | | | | | 0.0199 | 0.5583 |
| LTIP | ? | | | | | 0.0264 | 0.8350 |
| Control Variables: | | | | | | | |
| SIZE | ? | -0.0176 | (-7.5851)*** | -0.0158 | (-6.5975)*** | -0.0158 | (-6.5505)*** |
| GROWTH | + | 0.0005 | (2.9854)*** | 0.0005 | (3.0383)*** | 0.0005 | (3.0332)*** |
| ROE | ? | -0.0115 | -1.5775 | -0.0131 | (-1.7836)* | -0.0131 | (-1.7764)* |
| LEV | ? | 0.1005 | (7.2585)*** | 0.1002 | (7.2509)*** | 0.1002 | (7.2339)*** |
| BM | − | -0.0043 | -1.0802 | -0.0046 | -1.1411 | -0.0046 | -1.1360 |
| CIR | − | -0.0059 | -0.4424 | -0.0069 | -0.5195 | -0.0070 | -0.5202 |
| LAGTA | + | 0.0108 | 1.3264 | 0.0111 | 1.3674 | 0.0111 | 1.3670 |
| Industry Effects: | | | | | | | |
| Material | | -0.0624 | (-3.2930)*** | -0.0616 | (-3.2580)*** | -0.0617 | (-3.2525)*** |
| Metals & Mining | | -0.0527 | (-3.0169)*** | -0.0539 | (-3.0864)*** | -0.0539 | (-3.0758)*** |
| Industrials | | -0.0924 | (-4.4476)*** | -0.0928 | (-4.4726)*** | -0.0930 | (-4.4662)*** |
| Consumer Discretionary | | -0.0723 | (-4.1148)*** | -0.0701 | (-3.9870)*** | -0.0701 | (-3.9788)*** |
| Consumer Staples | | -0.0774 | (-4.0649)*** | -0.0770 | (-4.0512)*** | -0.0773 | (-4.0416)*** |
| Health Care | | -0.0489 | (-2.6381)*** | -0.0498 | (-2.6894)*** | -0.0498 | (-2.6787)*** |
| Information Technology | | -0.0334 | (-1.7656)* | -0.0324 | (-1.7173)* | -0.0325 | (-1.7153)* |
| Tele & Utilities | | -0.0422 | (-1.9058)* | -0.0428 | (-1.9351)* | -0.0428 | (-1.9328)* |
| Year Effects: | | | | | | | |
| 2001 | | -0.0109 | -0.4456 | -0.0107 | -0.4385 | -0.0108 | -0.4428 |
| 2002 | | -0.0271 | -1.1748 | -0.0263 | -1.1416 | -0.0264 | -1.1431 |
| 2003 | | -0.0387 | (-1.7170)* | -0.0384 | (-1.7065)* | -0.0386 | (-1.7074)* |
| 2004 | | -0.0285 | -1.3404 | -0.0289 | -1.3591 | -0.0289 | -1.3571 |
| 2005 | | -0.0135 | -0.6319 | -0.0140 | -0.6554 | -0.0140 | -0.6533 |
| 2006 | | -0.0099 | -0.4710 | -0.0092 | -0.4401 | -0.0092 | -0.4369 |
| Adj. R-square | | 0.1844 | | 0.1867 | | 0.1843 | |
| F | | 11.82 | (<0.0001) | 11.51 | (<0.0001) | 10.15 | (<0.0001) |
| N | | 1647 | | 1647 | | 1647 | 1647 |

## Table 8.9: Re-estimate the association between the upward earnings management and executive compensation by using discretionary accruals from Modified Jones Model

This table reports OLS regression results in testing upward earnings management and its association with executive compensations. The dependent variable is the direction of earnings management, upward earnings management, which is measured as positive discretionary accruals. Positive discretionary accruals, +DA_MJ, are estimated from Modified Jones Model. Explanatory variables are executive compensations which decomposed into three tiers: executive total compensation (TOMP); executive fixed remuneration (FIX) versus at-risk compensation (ATRISK); and, individual components including fixed salary (SALARY), bonuses (BONUS), options (OPTION), shares (SHARE), and long-term incentive plans (LTIP). Firm characteristics, industry and year effects are controlled. All variables are defined in Table 4.1. The estimated coefficients and *t* statistics are based on White (1980) method. *T*-statistics are given in parentheses, one-tailed tests when we have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

| Variable | Pred. Sign | (1) Total Compensation | | (2) Fixed v. At-risk | | (3) Individual Components | |
|---|---|---|---|---|---|---|---|
| | | Coef. | t-stat | Coef. | t-stat | Coef. | t-stat |
| Intercept | ? | 0.3183 | (8.7049) | 0.3030 | (8.1931)*** | 0.2978 | (8.0234)*** |
| TCOMP | + | 0.0004 | (0.0680)*** | | | | |
| FIX | − | | | -0.0318 | (-2.4285)** | | |
| ATRISK | + | | | 0.0167 | (1.9517)* | | |
| SALARY | − | | | | | -0.0259 | (-1.9154)* |
| BONUS | + | | | | | 0.0326 | (2.6078)*** |
| OPTION | − | | | | | 0.0000 | (0.0015) |
| SHARE | ? | | | | | 0.0050 | (0.1334) |
| LTIP | ? | | | | | 0.0112 | (0.6358) |
| Control Variables: | | | | | | | |
| SIZE | ? | -0.0114 | (-4.7066)*** | -0.0095 | (-3.8204)*** | -0.0093 | (-3.7079)*** |
| GROWTH | + | 0.0003 | (1.6074) | 0.0003 | (1.6701)* | 0.0003 | (1.6696)* |
| ROE | ? | 0.0399 | (3.1014)*** | 0.0377 | (2.9334)*** | 0.0367 | (2.8559)*** |
| LEV | ? | 0.0916 | (6.1148)*** | 0.0921 | (6.1605)*** | 0.0909 | (6.0769)*** |
| BM | − | -0.0069 | (-1.6761)* | -0.0070 | (-1.6968)* | -0.0072 | (-1.7436)* |
| CIR | − | 0.0271 | (1.8870)* | 0.0262 | (1.8246)* | 0.0262 | (1.8258)* |
| LAGTA | + | 0.0013 | (0.1730) | 0.0011 | (0.1432) | 0.0013 | (0.1743) |
| Industry Effects: | | | | | | | |
| Material | | -0.0975 | (-5.2311)*** | -0.0968 | (-5.2065)*** | -0.0952 | (-5.1165)*** |
| Metals & Mining | | -0.1119 | (-6.3385)*** | -0.1128 | (-6.4097)*** | -0.1127 | (-6.3965)*** |
| Industrials | | -0.1349 | (-6.7384)*** | -0.1366 | (-6.8361)*** | -0.1340 | (-6.6416)*** |
| Consumer Discretionary | | -0.1168 | (-6.6054)*** | -0.1151 | (-6.5258)*** | -0.1149 | (-6.5054)*** |
| Consumer Staples | | -0.1132 | (-6.0242)*** | -0.1136 | (-6.0647)*** | -0.1120 | (-5.9603)*** |
| Health Care | | -0.0738 | (-3.8298)*** | -0.0762 | (-3.9616)*** | -0.0773 | (-4.0138)*** |
| Information Technology | | -0.0945 | (-4.8630)*** | -0.0934 | (-4.8192)*** | -0.0931 | (-4.7993)*** |
| Tele & Utilities | | -0.0752 | (-3.1496)*** | -0.0760 | (-3.1960)*** | -0.0750 | (-3.1528)*** |
| Year Effects: | | | | | | | |
| 2001 | | -0.0031 | (-0.1419) | -0.0001 | (-0.0063) | 0.0008 | (0.0355) |
| 2002 | | -0.0088 | (-0.4101) | -0.0056 | (-0.2640) | -0.0041 | (-0.1895) |
| 2003 | | -0.0041 | (-0.1958) | -0.0017 | (-0.0795) | -0.0001 | (-0.0050) |
| 2004 | | -0.0191 | (-0.9747) | -0.0177 | (-0.9096) | -0.0159 | (-0.8119) |
| 2005 | | -0.0173 | (-0.8797) | -0.0156 | (-0.7983) | -0.0146 | (-0.7467) |
| 2006 | | 0.0023 | (0.1182) | 0.0042 | (0.2168) | 0.0052 | (0.2672) |
| Adj. R-square | | 0.1203 | | 0.1253 | | 0.1467 | |
| F | | 7.64 | (<0.0001) | 7.65 | (<0.0001) | 6.89 | (<0.0001) |
| N | | 1647 | | 1647 | | 1647 | 1647 |

## Table 8.10: Re-estimate the association between the downward earnings management and executive compensation by controlling year effects

This table reports OLS regression results in testing downward earnings management and its association with executive compensations. The dependent variable is the direction of earnings management, downward earnings management, which is measured as negative discretionary accruals. Negative discretionary accruals, −DA_ADJ, are estimated from Performance Adjusted Technique. Explanatory variables are executive compensations which decomposed into three tiers: executive total compensation (TOMP); executive fixed remuneration (FIX) versus at-risk compensation (ATRISK); and, individual components including fixed salary (SALARY), bonuses (BONUS), options (OPTION), shares (SHARE), and long-term incentive plans (LTIP). Firm characteristics, industry and year effects are controlled. All variables are defined in Table 4.1. The estimated coefficients and *t* statistics are based on White (1980) method. *T*-statistics are given in parentheses, one-tailed tests when we have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

| Variable | Pred. Sign | (1) Total Compensation | | (2) Fixed v. At-risk | | (3) Individual Components | |
|---|---|---|---|---|---|---|---|
| | | Coef. | t-stat | Coef. | t-stat | Coef. | t-stat |
| Intercept | ? | -0.2546 | (-4.2732)*** | -0.2516 | (-4.2106)*** | -0.2467 | (-4.1291)*** |
| TCOMP | − | 0.0143 | 1.5952 | | | | |
| FIX | + | | | 0.0392 | (1.6710)* | | |
| ATRISK | − | | | -0.0018 | -0.1249 | | |
| SALARY | + | | | | | 0.0313 | 1.2545 |
| BONUS | − | | | | | -0.0544 | (-1.7486)* |
| OPTION | + | | | | | 0.0016 | 0.0625 |
| SHARE | ? | | | | | 0.0086 | 0.3358 |
| LTIP | ? | | | | | 0.0434 | 1.4019 |
| Control Variables: | | | | | | | |
| SIZE | ? | -0.0021 | (-0.5026) | -0.0025 | -0.6049 | -0.0029 | -0.6845 |
| GROWTH | + | -0.0005 | (-1.7534)* | -0.0005 | (-1.7455)* | -0.0005 | (-1.7400)* |
| ROE | ? | 0.0498 | (4.0033)*** | 0.0494 | (3.9836)*** | 0.0484 | (3.8948)*** |
| LEV | ? | 0.0528 | (2.3261)** | 0.0516 | (2.2646)** | 0.0515 | (2.2603)** |
| BM | − | 0.0053 | 0.9685 | 0.0058 | 1.0471 | 0.0058 | 1.0518 |
| CIR | − | -0.0103 | -0.3927 | -0.0093 | -0.3565 | -0.0110 | -0.4199 |
| LAGTA | + | -0.0010 | -1.4929 | -0.0010 | -1.4263 | -0.0010 | -1.4371 |
| Industry Effects: | | | | | | | |
| Material | | 0.0084 | 0.3278 | 0.0065 | 0.2511 | 0.0084 | 0.3262 |
| Metals & Mining | | 0.0087 | 0.3965 | 0.0077 | 0.3485 | 0.0075 | 0.3375 |
| Industrials | | -0.0012 | -0.0444 | -0.0018 | -0.0685 | -0.0061 | -0.2329 |
| Consumer Discretionary | | 0.0374 | 1.5474 | 0.0352 | 1.4533 | 0.0337 | 1.3932 |
| Consumer Staples | | 0.0363 | 1.4042 | 0.0345 | 1.3334 | 0.0335 | 1.2894 |
| Health Care | | 0.0379 | 1.2830 | 0.0381 | 1.2893 | 0.0369 | 1.2475 |
| Information Technology | | 0.0025 | 0.1008 | 0.0005 | 0.0182 | -0.0012 | -0.0456 |
| Tele & Utilities | | -0.1532 | (-4.0403)*** | -0.1556 | (-4.1020)*** | -0.1562 | (-4.1194)*** |
| Year Effects: | | | | | | | |
| 2001 | | 0.1236 | (3.2613)*** | 0.1226 | (3.2328)*** | 0.1208 | (3.1840)*** |
| 2002 | | 0.1699 | (4.5633)*** | 0.1682 | (4.5123)*** | 0.1679 | (4.5032)*** |
| 2003 | | 0.1133 | (3.2523)*** | 0.1123 | (3.2213)*** | 0.1142 | (3.2762)*** |
| 2004 | | 0.1471 | (4.4555)*** | 0.1465 | (4.4360)*** | 0.1491 | (4.5148)*** |
| 2005 | | 0.1300 | (3.9511)*** | 0.1293 | (3.9288)*** | 0.1310 | (3.9825)*** |
| 2006 | | | | | | | |
| Adj. R-square | | 0.0629 | | 0.0626 | | 0.0644 | |
| F | | 4.62 | (<0.0001) | 4.44 | (<0.0001) | 4.14 | (<0.0001) |
| N | | 1649 | | 1649 | | 1649 | |

## Table 8.11: Re-estimate the association between the downward earnings management and executive compensation by using discretionary accruals from Modified Jones Model

This table reports OLS regression results in testing downward earnings management and its association with executive compensations. The dependent variable is the direction of earnings management, downward earnings management, which is measured as negative discretionary accruals. Negative discretionary accruals, −DA_MJ, are estimated from Modified Jones Model. Explanatory variables are executive compensations which decomposed into three tiers: executive total compensation (TOMP); executive fixed remuneration (FIX) versus at-risk compensation (ATRISK); and, individual components including fixed salary (SALARY), bonuses (BONUS), options (OPTION), shares (SHARE), and long-term incentive plans (LTIP). Firm characteristics, industry and year effects are controlled. All variables are defined in Table 4.1. The estimated coefficients and *t* statistics are based on White (1980) method. *T*-statistics are given in parentheses, one-tailed tests when we have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

| Variable | Pred. Sign | (1) Total Compensation | | (2) Fixed v. At-risk | | (3) Individual Components | |
|---|---|---|---|---|---|---|---|
| | | Coef. | t-stat | Coef. | t-stat | Coef. | t-stat |
| Intercept | ? | -0.3320 | (-4.7910)*** | -0.3354 | (-4.8084)*** | -0.3204 | (-4.6047)*** |
| TCOMP | − | 0.0026 | (0.2310) | | | | |
| FIX | + | | | 0.0125 | (0.3836) | | |
| ATRISK | − | | | -0.0077 | (-0.4226) | | |
| SALARY | + | | | | | 0.0157 | (0.4469) |
| BONUS | − | | | | | -0.1048 | (-2.8866)*** |
| OPTION | + | | | | | 0.0020 | (0.0731) |
| SHARE | ? | | | | | 0.0364 | (1.1183) |
| LTIP | ? | | | | | 0.0109 | (0.0312) |
| Control Variables: | | | | | | | |
| SIZE | ? | 0.0047 | (0.9758) | 0.0050 | (1.0175) | 0.0042 | (0.8509) |
| GROWTH | + | -0.0006 | (-1.5129) | -0.0006 | (-1.4969) | -0.0006 | (-1.5085) |
| ROE | ? | 0.0585 | (4.8530)*** | 0.0580 | (4.8140)*** | 0.0568 | (4.7283)*** |
| LEV | ? | 0.0537 | (2.0598)** | 0.0528 | (2.0198)** | 0.0527 | (2.0221)** |
| BM | − | 0.0068 | (1.0546) | 0.0069 | (1.0599) | 0.0068 | (1.0495) |
| CIR | − | -0.0457 | (-1.5491) | -0.0455 | (-1.5424) | -0.0467 | (-1.5904) |
| LAGTA | + | -0.0016 | (-1.9283)* | -0.0015 | (-1.9009)* | -0.0015 | (-1.8914)* |
| Industry Effects: | | | | | | | |
| Material | | -0.0420 | (-1.3426) | -0.0433 | (-1.3795) | -0.0411 | (-1.3142) |
| Metals & Mining | | -0.0467 | (-1.8167)* | -0.0474 | (-1.8437)* | -0.0488 | (-1.9067)* |
| Industrials | | -0.0334 | (-1.0484) | -0.0342 | (-1.0699) | -0.0412 | (-1.2900) |
| Consumer Discretionary | | -0.0194 | (-0.6667) | -0.0205 | (-0.7031) | -0.0233 | (-0.8024) |
| Consumer Staples | | -0.0356 | (-1.1264) | -0.0374 | (-1.1781) | -0.0390 | (-1.2314) |
| Health Care | | 0.0255 | (0.7948) | 0.0246 | (0.7673) | 0.0212 | (0.6628) |
| Information Technology | | -0.0700 | (-2.3846)** | -0.0711 | (-2.4146)** | -0.0737 | (-2.5109)** |
| Tele & Utilities | | -0.1005 | (-2.4835)** | -0.1019 | (-2.5174)** | -0.1051 | (-2.6065)*** |
| Year Effects: | | | | | | | |
| 2001 | | 0.1481 | (3.0595)*** | 0.1476 | (3.0482)*** | 0.1364 | (2.8010)*** |
| 2002 | | 0.1899 | (4.1056)*** | 0.1890 | (4.0784)*** | 0.1893 | (4.0995)*** |
| 2003 | | 0.1660 | (3.7762)*** | 0.1659 | (3.7705)*** | 0.1669 | (3.8081)*** |
| 2004 | | 0.1836 | (4.3792)*** | 0.1835 | (4.3729)*** | 0.1854 | (4.4339)*** |
| 2005 | | 0.1422 | (3.4096)*** | 0.1422 | (3.4083)*** | 0.1429 | (3.4391)*** |
| 2006 | | 0.1709 | (4.0604)*** | 0.1707 | (4.0519)*** | 0.1733 | (4.1300)*** |
| Adj. R-square | | 0.0813 | | 0.0637 | | 0.0717 | |
| F | | 4.77 | (<0.0001) | 4.57 | (<0.0001) | 4.59 | (<0.0001) |
| N | | 1649 | | 1649 | | 1649 | |

## Table 8.12: Re-estimate the association between adjusted discretionary accruals and pre-managed earnings below benchmarks by controlling year effects

This table reports OLS regression results in testing earnings management and its association with benchmark besting incentive by controlling year effects. All variables are defined in Table 4.1. The dependent variable is signed discretionary accruals, DA_ADJ, estimated from Performance Adjusted Technique. Main testing variables are pre-managed earnings below benchmarks, BELOW_1 in Model (1) to BELOW_5 in Model (5) which indicates different intervals in the distribution of earnings (changes). N is number of observations. The estimated coefficients and *t* statistics are based on White (1980) method. *T*-statistics are given in parentheses, one-tailed tests when we have explicit predictions and two-tailed otherwise.*, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

**Panel A-Pre-managed earnings level**

| Independent Variables | Pred. Sign | Model (1) | Model (2) | Model (3) | Model (4) | Model (5) |
|---|---|---|---|---|---|---|
| Intercept | ? | -0.1899 | 0.0165 | -0.0263 | -0.0181 | -0.0853 |
| | | (10.30)*** | (0.64) | (-0.84) | (-1.46) | (-4.81)*** |
| BELOW_1 ($PME_{it} < 0$) | + | 0.1262 | | | | |
| | | (24.85)*** | | | | |
| BELOW_2 ($PME_{it} < 0$, $E_{it} \geq 0$) | + | | 0.1135 | | | |
| | | | (12.51)*** | | | |
| BELOW_3 ($-0.04 \leq PME_{it} < 0$) | + | | | 0.0321 | | |
| | | | | (4.71)*** | | |
| BELOW_4 ($-0.04 \leq PME_{it} < 0$, $0 \leq E_{it} < 0.04$) | + | | | | 0.0352 | |
| | | | | | (10.49)*** | |
| HIGH | − | | | | | -0.1180 |
| | | | | | | (-23.24)*** |
| LOW | − | | | | | 0.0686 |
| | | | | | | (10.35)*** |
| Control Variables: | | | | | | |
| SIZE | − | 0.0078 | -0.0012 | 0.0013 | 0.0014 | 0.0066 |
| | | (6.12)*** | (-0.54) | (0.62) | (1.61) | (5.30)*** |
| GROWTH | + | 0.0000 | 0.0000 | -0.0023 | 0.0012 | 0.0000 |
| | | (-0.36) | (0.55) | (-1.67)* | (2.04)** | (-0.34) |
| ROE | ? | 0.0001 | -0.0007 | 0.1609 | 0.0007 | 0.0004 |
| | | (0.17) | (-1.00) | (12.54)*** | (0.10) | (0.69) |
| LEV | ? | -0.0100 | -0.0035 | -0.0378 | 0.0078 | -0.0209 |
| | | (-0.88) | (-0.24) | (-1.68) | (0.78) | (-1.88)* |
| BM | | 0.0017 | 0.0041 | -0.0173 | 0.0000 | 0.0004 |
| | | (0.66) | (1.25) | (-4.25)*** | (-0.03) | (0.15) |
| CIR | | 0.0261 | 0.0510 | 0.0011 | -0.0086 | 0.0356 |
| | | (2.51)*** | (3.47)*** | (0.07) | (-1.39) | (3.52)*** |
| LAGTA | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | | (-0.13) | (0.01) | (-0.31) | (-1.06) | (0.36) |
| Industry Effects: | | | | | | |
| Material | | 0.0393 | 0.0183 | 0.0411 | 0.0067 | 0.0308 |
| | | (3.38)*** | (0.99) | (2.19)** | (0.89) | (2.72)*** |
| Metals & Mining | | -0.0163 | -0.0154 | -0.0049 | 0.0083 | -0.0150 |
| | | (-1.59) | (-1.04) | (-0.28) | (1.07) | (-1.49) |
| Industrials | | 0.0346 | -0.0108 | 0.0347 | 0.0058 | 0.0249 |
| | | (2.77)*** | (-0.47) | (1.75)* | (0.75) | (2.05)** |
| Consumer Discretionary | | 0.0361 | 0.0049 | 0.0295 | 0.0040 | 0.0329 |
| | | (3.37)*** | (0.30) | (1.65)* | (0.56) | (3.15)*** |
| Consumer Staples | | 0.0329 | 0.0007 | 0.0357 | 0.0044 | 0.0230 |
| | | (2.80)*** | (0.04) | (1.93)* | (0.60) | (2.00)** |
| Health Care | | 0.0320 | 0.0134 | 0.0276 | -0.0060 | 0.0219 |
| | | (2.62)*** | (0.80) | (1.40) | (-0.70) | (1.84)* |
| Information Technology | | -0.0034 | -0.0084 | 0.0177 | 0.0121 | 0.0042 |
| | | (-0.29) | (-0.51) | (0.84) | (1.42) | (0.37) |
| Telecommunication & Utilities | | 0.0667 | 0.0629 | 0.0379 | 0.0144 | 0.0692 |
| | | (4.22)*** | (3.07)*** | (1.59) | (1.60) | (4.49)*** |
| Year Effects: | | | | | | |
| 2001 | | 0.0037 | -0.0133 | -0.0117 | -0.0036 | -0.0023 |
| | | (0.36) | (-0.84) | (-0.78) | (-0.66) | (-0.23) |
| 2002 | | 0.0119 | -0.0023 | 0.0065 | 0.0057 | 0.0001 |
| | | (1.56) | (-0.19) | (0.56) | (1.03) | (0.01) |
| 2003 | | 0.0053 | -0.0057 | 0.0069 | 0.0022 | -0.0043 |
| | | (0.77) | (-0.53) | (0.64) | (0.53) | (-0.64) |
| 2004 | | 0.0167 | -0.0030 | 0.0021 | -0.0013 | 0.0083 |
| | | (2.44)*** | (-0.28) | (0.19) | (-0.29) | (1.25) |
| 2005 | | -0.0204 | -0.0426 | -0.0042 | 0.0007 | -0.0243 |
| | | (-3.03)*** | (-3.94)*** | (-0.37) | (0.14) | (-3.70)*** |
| 2006 | | 0.0697 | 0.0611 | 0.0035 | 0.0013 | 0.0476 |
| | | (5.46)*** | (4.04)*** | (0.27) | (0.19) | (3.98)*** |
| N | | 3326 | 1430 | 468 | 156 | 3326 |
| Adj. $R^2$ | | 0.2052 | 0.1561 | 0.3204 | 0.5989 | 0.2451 |

**Panel B-Pre-managed earnings change**

| Independent Variables | Pred. Sign | Model( 1) | Model (2) | Model (3) | Model (4) | Model (5) |
|---|---|---|---|---|---|---|
| Intercept | ? | -0.0572 | 0.1053 | -0.0022 | 0.0232 | 0.0430 |
| | | (-2.02)** | (4.64)*** | (-0.09) | (2.05)** | (2.50)** |
| BELOW_1 ( $\Delta PME_t < 0$) | + | 0.1509 | | | | |
| | | (14.55)*** | | | | |
| BELOW_2 ($\Delta PME_t < 0$, $\Delta E_t \geq 0$) | + | | 0.1031 | | | |
| | | | (14.32)*** | | | |
| BELOW_3 ($-0.04 \leq \Delta PME_t < 0$) | + | | | 0.0179 | | |
| | | | | (3.15)*** | | |
| BELOW_4 ($-0.04 \leq \Delta PME_t < 0$, $0 \leq \Delta E_t < 0.04$) | + | | | | 0.0339 | |
| | | | | | (14.54)*** | |
| HIGH | − | | | | | -0.1100 |
| | | | | | | (-20.31)*** |
| LOW | − | | | | | 0.0844 |
| | | | | | | (13.97)*** |
| Control Variables: | | | | | | |
| SIZE | − | 0.0045 | -0.0056 | -0.0034 | -0.0024 | -0.0065 |
| | | (1.94)* | (-3.38)*** | (-2.18)** | (-3.59)*** | (-5.61)*** |
| GROWTH | + | 0.0001 | 0.0000 | 0.0044 | 0.0001 | 0.0000 |
| | | (0.67) | (0.64) | (2.48)** | (0.17) | (-0.27) |
| ROE | ? | -0.0001 | -0.0003 | 0.0082 | 0.0013 | -0.0002 |
| | | (-0.46) | (-1.57) | (3.52)*** | (2.10)** | (-1.01) |
| LEV | ? | 0.0162 | -0.0010 | 0.0577 | -0.0011 | 0.0155 |
| | | (1.52) | (-0.11) | (3.73)*** | (-0.14) | (1.90)* |
| BM | + | 0.0085 | 0.0028 | 0.0025 | 0.0020 | 0.0019 |
| | | (2.72)*** | (0.89) | (0.76) | (0.81) | (0.79) |
| CIR | | 0.0599 | 0.0423 | -0.0048 | 0.0016 | 0.0316 |
| | | (3.61)*** | (3.03)*** | (-0.33) | (0.28) | (3.11)*** |
| LAGTA | | 0.0000 | 0.0014 | 0.0000 | -0.0026 | 0.0001 |
| | | (0.00) | (1.82)* | (-0.06) | (-1.62) | (0.48) |
| Industry Effects: | | | | | | |
| Material | | -0.0100 | -0.0026 | 0.0242 | 0.0011 | 0.0139 |
| | | (-0.47) | (-0.16) | (1.55) | (0.16) | (1.20) |
| Metals & Mining | | -0.0448 | -0.0342 | 0.0252 | 0.0003 | -0.0193 |
| | | (-2.63)*** | (-2.39)** | (1.64) | (0.04) | (-1.90)* |
| Industrials | | -0.0488 | -0.0495 | 0.0273 | 0.0016 | 0.0011 |
| | | (-1.90)* | (-2.62)*** | (1.72)* | (0.24) | (0.08) |
| Consumer Discretionary | | -0.0179 | -0.0248 | 0.0227 | -0.0026 | 0.0150 |
| | | (-0.96) | (-1.64) | (1.50) | (-0.40) | (1.42) |
| Consumer Staples | | -0.0176 | -0.0267 | 0.0221 | 0.0045 | 0.0095 |
| | | (-0.84) | (-1.64) | (1.42) | (0.66) | (0.82) |
| Health Care | | -0.0236 | -0.0107 | 0.0262 | 0.0035 | 0.0373 |
| | | (-1.24) | (-0.66) | (1.56) | (0.48) | (3.11)*** |
| Information Technology | | -0.0330 | -0.0182 | 0.0197 | 0.0018 | 0.0080 |
| | | (-1.75)* | (-1.12) | (1.08) | (0.21) | (0.70) |
| Telecommunication & Utilities | | 0.0524 | 0.0646 | 0.0838 | -0.0132 | 0.0785 |
| | | (2.31)** | (3.12)*** | (3.77)*** | (-0.72) | (5.17)*** |
| Year Effects: | | | | | | |
| 2001 | | -0.0042 | -0.0045 | -0.0195 | 0.0082 | 0.0005 |
| | | (-0.23) | (-0.32) | (-1.39) | (1.48) | (0.05) |
| 2002 | | 0.0001 | -0.0226 | -0.0069 | 0.0036 | 0.0157 |
| | | (0.01) | (-2.10)** | (-0.75) | (0.99) | (2.07)** |
| 2003 | | -0.0037 | -0.0086 | -0.0004 | 0.0056 | 0.0128 |
| | | (-0.31) | (-0.84) | (-0.05) | (1.54) | (1.89)* |
| 2004 | | -0.0045 | -0.0140 | 0.0117 | 0.0033 | 0.0134 |
| | | (-0.37) | (-1.41) | (1.32) | (0.92) | (1.97)** |
| 2005 | | -0.0468 | -0.0339 | -0.0048 | 0.0056 | -0.0192 |
| | | (-3.79)*** | (-3.47)*** | (-0.53) | (1.61) | (-2.85)*** |
| 2006 | | 0.0772 | 0.0441 | 0.0025 | 0.0010 | 0.0346 |
| | | (5.21)*** | (4.74)*** | (0.39) | (0.10) | (2.98)*** |
| N | | 3326 | 1430 | 468 | 156 | 3326 |
| Adj. $R^2$ | | 0.2259 | 0.1586 | 0.0746 | 0.5736 | 0.2575 |

## Table 8.13: Re-estimate the association between adjusted discretionary accruals and pre-managed earnings below benchmarks by using discretionary accruals from Modified Jones Model

This table reports OLS regression results in testing earnings management and its association with benchmark besting incentive. All variables are defined in Table 4.1. The dependent variable is signed discretionary accruals, DA_MJ, estimated from Modified Jones Model. Main testing variables are pre-managed earnings below benchmarks, BELOW_1 in Model (1) to BELOW_5 in Model (5) which indicates different intervals in the distribution of earnings (changes). N is number of observations. The estimated coefficients and *t* statistics are based on White (1980) method. *T*-statistics are given in parentheses, *, **, *** indicate statistical significance at the 10%, 5% and 1% respectively.

**Panel A-Pre-managed earnings level**

| Independent Variables | Pred. Sign | Model (1) | Model (2) | Model (3) | Model (4) | Model (5) |
|---|---|---|---|---|---|---|
| Intercept | ? | -0.2700 | -0.0572 | -0.1941 | -0.0181 | -0.1650 |
| | | (-10.80)*** | (-2.02)** | (-5.70)*** | (-1.41) | (-8.01) |
| BELOW_1 ($PME_{it} < 0$) | + | 0.1140 | | | | |
| | | (17.01)*** | | | | |
| BELOW_2 ($PME_{it} < 0$, $E_{it} \geq 0$) | + | | 0.1509 | | | |
| | | | (14.55)*** | | | |
| BELOW_3 ($-0.04 \leq PME_{it} < 0$) | + | | | 0.0349 | | |
| | | | | (4.65)*** | | |
| BELOW_4 ($-0.04 \leq PME_{it} < 0$, $0 \leq E_{it} < 0.04$) | + | | | | 0.0401 | |
| | | | | | (11.74)*** | |
| HIGH | − | | | | | -0.1149 |
| | | | | | | (-19.25)*** |
| LOW | − | | | | | 0.0463 |
| | | | | | | (5.92)*** |
| Control Variables: | | | | | | |
| SIZE | − | 0.0167 | 0.0045 | 0.0125 | 0.0010 | 0.0155 |
| | | (9.77)*** | (1.94)* | (5.68)*** | (1.10) | (10.77) |
| GROWTH | + | 0.0000 | 0.0001 | -0.0020 | 0.0013 | 0.0000 |
| | | (-0.39) | (0.67) | (-1.18) | (2.24)*** | (-0.14) |
| ROE | ? | 0.0001 | -0.0001 | 0.0706 | -0.0010 | 0.0001 |
| | | (0.29) | (-0.46) | (8.53)*** | (-0.24) | (0.55) |
| LEV | ? | -0.0069 | 0.0162 | -0.0995 | 0.0064 | -0.0129 |
| | | (-0.55) | (1.52) | (-3.82)*** | (0.67) | (-1.48) |
| BM | | 0.0036 | 0.0085 | -0.0092 | -0.0021 | 0.0033 |
| | | (1.31) | (2.72)*** | (-1.93)* | (-1.43) | (1.25) |
| CIR | | 0.0373 | 0.0599 | 0.0156 | -0.0107 | 0.0388 |
| | | (2.48)** | (3.61)*** | (0.86) | (-1.62) | (3.23) |
| LAGTA | | 0.0000 | 0.0000 | -0.0001 | 0.0000 | 0.0001 |
| | | (0.10) | (0.00) | (-0.80) | (-1.92)* | (0.42) |
| Industry Effects: | | | | | | |
| Material | | 0.0240 | -0.0100 | 0.0980 | 0.0077 | 0.0147 |
| | | (1.48) | (-0.47) | (4.63)*** | (0.96) | (1.07) |
| Metals & Mining | | -0.0354 | -0.0448 | 0.0279 | 0.0138 | -0.0326 |
| | | (-2.41)** | (-2.63)*** | (1.34) | (1.92)* | (-2.69) |
| Industrials | | 0.0152 | -0.0488 | 0.0902 | 0.0066 | 0.0061 |
| | | (1.00) | (-1.90)* | (3.97)*** | (0.82) | (0.42) |
| Consumer Discretionary | | 0.0293 | -0.0179 | 0.0838 | 0.0051 | 0.0244 |
| | | (1.93)* | (-0.96) | (4.00)*** | (0.71) | (1.95) |
| Consumer Staples | | 0.0210 | -0.0176 | 0.0777 | 0.0047 | 0.0113 |
| | | (1.26) | (-0.84) | (3.61)*** | (0.63) | (0.82) |
| Health Care | | 0.0002 | -0.0236 | 0.0758 | -0.0085 | -0.0064 |
| | | (0.01) | (-1.24) | (3.32)*** | (-1.03) | (-0.45) |
| Information Technology | | -0.0182 | -0.0330 | 0.0041 | 0.0165 | -0.0164 |
| | | (-1.02) | (-1.75)* | (0.17) | (1.77)* | (-1.21) |
| Telecommunication & Utilities | | 0.0591 | 0.0524 | 0.0494 | 0.0026 | 0.0614 |
| | | (3.15)*** | (2.31)* | (1.73) | (0.25) | (3.48) |
| Year Effects: | | | | | | |
| 2001 | | -0.0019 | -0.0042 | -0.0003 | 0.0177 | -0.0060 |
| | | (-0.14) | (-0.23) | (-0.02) | (2.81)** | (-0.50) |
| 2002 | | 0.0041 | 0.0001 | 0.0026 | 0.0060 | -0.0048 |
| | | (0.50) | (0.01) | (0.20) | (1.10) | (-0.53) |
| 2003 | | -0.0009 | -0.0037 | 0.0075 | 0.0082 | -0.0058 |
| | | (-0.11) | (-0.31) | (0.64) | (1.96)** | (-0.73) |
| 2004 | | 0.0051 | -0.0045 | 0.0124 | 0.0039 | 0.0007 |
| | | (0.64) | (-0.37) | (1.03) | (0.78) | (0.09) |
| 2005 | | -0.0256 | -0.0468 | -0.0128 | 0.0027 | -0.0278 |
| | | (-3.24)*** | (-3.79)*** | (-1.07) | (0.60) | (-3.50) |
| 2006 | | 0.0445 | 0.0362 | 0.0023 | 0.0010 | 0.0366 |
| | | (3.46)*** | (2.04)*** | (0.25) | (0.09) | (3.67)*** |
| N | | 3326 | 1430 | 468 | 156 | 3326 |
| Adj. $R^2$ | | 0.1510 | 0.2249 | 0.2617 | 0.6262 | 0.1678 |

**Panel B-Pre-managed earnings change**

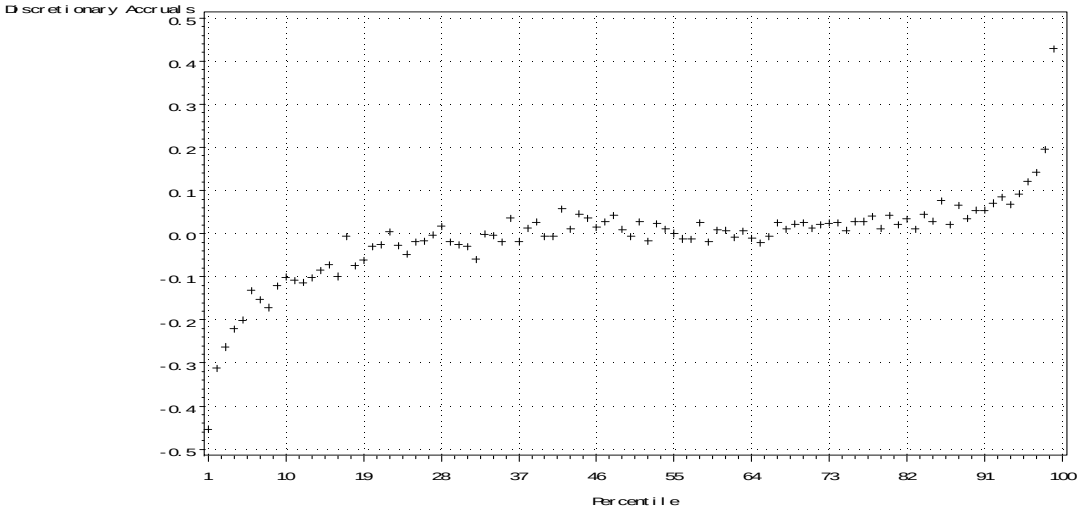
| Independent Variables | Pred. Sign | Model( 1) | Model (2) | Model (3) | Model (4) | Model (5) |
|---|---|---|---|---|---|---|
| Intercept | ? | -0.2700 | 0.0133 | -0.1462 | -0.0012 | -0.0784 |
| | | (-12.94)*** | (0.56) | (-5.22)*** | (-0.11) | (-4.09)*** |
| BELOW_1 ( $\Delta PME_t < 0$) | + | 0.1140 | | | | |
| | | (19.67)*** | | | | |
| BELOW_2 ($\Delta PME_t < 0$, $\Delta E_t \geq 0$) | + | | 0.1136 | | | |
| | | | (15.58)*** | | | |
| BELOW_3 ($-0.04 \leq \Delta PME_t < 0$) | + | | | 0.0234 | | |
| | | | | (3.61)*** | | |
| BELOW_4 ($-0.04 \leq \Delta PME_t < 0$, $0 \leq \Delta E_t < 0.04$) | + | | | | 0.0290 | |
| | | | | | (12.75)*** | |
| HIGH | − | | | | | -0.1157 |
| | | | | | | (-18.64)*** |
| LOW | − | | | | | 0.1024 |
| | | | | | | (15.54)*** |
| Control Variables: | | | | | | |
| SIZE | − | 0.0167 | 0.0020 | 0.0079 | 0.0001 | 0.0047 |
| | | (11.67)*** | (1.18) | (4.26)*** | (0.19) | (3.64)*** |
| GROWTH | + | 0.0000 | 0.0000 | -0.0011 | 0.0002 | 0.0000 |
| | | (-0.21) | (0.43) | (-1.03) | (0.28) | (-0.24) |
| ROE | ? | 0.0001 | -0.0001 | 0.0132 | 0.0022 | 0.0002 |
| | | (0.28) | (-0.27) | (4.12)*** | (0.79) | (0.74) |
| LEV | ? | -0.0069 | -0.0015 | -0.0218 | -0.0056 | -0.0014 |
| | | (-0.79) | (-0.15) | (-0.94) | (-0.65) | (-0.17) |
| BM | + | 0.0036 | 0.0042 | 0.0062 | 0.0009 | 0.0033 |
| | | (1.34) | (1.21) | (1.50) | (0.40) | (1.33) |
| CIR | | 0.0373 | 0.0474 | 0.0261 | 0.0020 | 0.0404 |
| | | (3.07)*** | (3.18)*** | (1.60) | (0.35) | (3.55)*** |
| LAGTA | | 0.0000 | 0.0021 | 0.0000 | -0.0002 | 0.0000 |
| | | (0.09) | (2.41)** | (-0.16) | (-0.09) | (0.36) |
| Industry Effects: | | | | | | |
| Material | | 0.0240 | -0.0100 | 0.0351 | 0.0013 | 0.0121 |
| | | (1.73)* | (-0.59) | (1.94)* | (0.22) | (0.93) |
| Metals & Mining | | -0.0354 | -0.0370 | 0.0054 | -0.0007 | -0.0298 |
| | | (-2.89)*** | (-2.42)** | (0.32) | (-0.11) | (-2.59)*** |
| Industrials | | 0.0152 | -0.0509 | 0.0452 | 0.0012 | -0.0018 |
| | | (1.02) | (-2.62)*** | (2.50)** | (0.19) | (-0.13) |
| Consumer Discretionary | | 0.0293 | -0.0255 | 0.0455 | 0.0026 | 0.0180 |
| | | (2.31)** | (-1.62) | (2.62) | (0.43) | (1.51) |
| Consumer Staples | | 0.0210 | -0.0243 | 0.0430 | 0.0048 | 0.0082 |
| | | (1.50) | (-1.42) | (2.38)*** | (0.77) | (0.62) |
| Health Care | | 0.0002 | -0.0311 | 0.0386 | 0.0022 | 0.0131 |
| | | (0.01) | (-1.77)* | (1.98)* | (0.31) | (0.97) |
| Information Technology | | -0.0182 | -0.0238 | 0.0262 | 0.0027 | -0.0052 |
| | | (-1.33) | (-1.37) | (1.24) | (0.30) | (-0.40) |
| Telecommunication & Utilities | | 0.0591 | 0.0355 | 0.1032 | -0.0137 | 0.0662 |
| | | (3.30)*** | (1.64) | (3.82)*** | (-0.74) | (3.95)*** |
| Year Effects: | | | | | | |
| 2001 | | -0.0019 | 0.0101 | -0.0253 | 0.0045 | -0.0025 |
| | | (-0.15) | (0.68) | (-1.70)* | (0.73) | (-0.22) |
| 2002 | | 0.0041 | -0.0143 | -0.0134 | 0.0044 | 0.0095 |
| | | (0.46) | (-1.29) | (-1.21) | (1.29) | (1.12) |
| 2003 | | -0.0009 | -0.0056 | -0.0049 | 0.0009 | 0.0129 |
| | | (-0.11) | (-0.52) | (-0.46) | (0.24) | (1.70)* |
| 2004 | | 0.0051 | -0.0150 | 0.0014 | 0.0102 | 0.0078 |
| | | (0.63) | (-1.44) | (0.14) | (2.86)*** | (1.02) |
| 2005 | | -0.0256 | -0.0308 | -0.0179 | 0.0037 | -0.0240 |
| | | (-3.18)*** | (-2.99)*** | (-1.72)* | (1.05) | (-3.18)*** |
| 2006 | | 0.0747 | 0.0391 | 0.0020 | 0.0025 | 0.0446 |
| | | (5.11)*** | (4.95)*** | (0.28) | (0.19) | (3.98)*** |
| N | | 3326 | 1430 | 468 | 156 | 3326 |
| Adj. $R^2$ | | 0.2285 | 0.1731 | 0.1164 | 0.4644 | 0.2486 |

# Figures

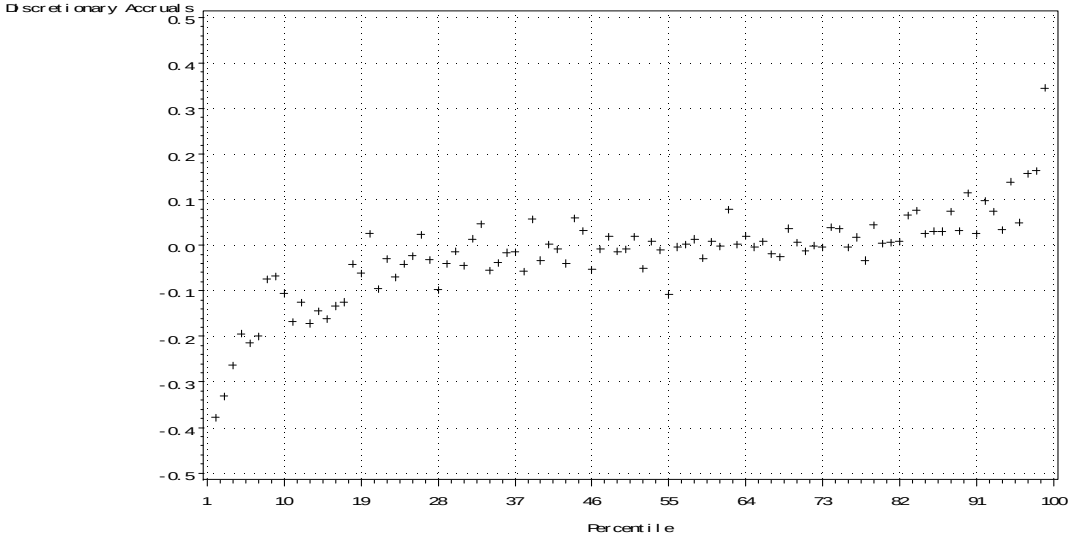
## Figure 5.1: Distribution of discretionary accruals based on earnings performances

Discretionary accruals are calculated as the residual from equation (4.7) then ranked on the level of earnings deflated by lagged total assets and assigned into percentiles according to their rank orders. The estimation sample contains 5,947 observations. The testing sample contains 3,326 observations. Mean discretionary accruals between −0.5 and 0.5 are plotted for the 100 percentiles.

**Pane A-Estimation sample**



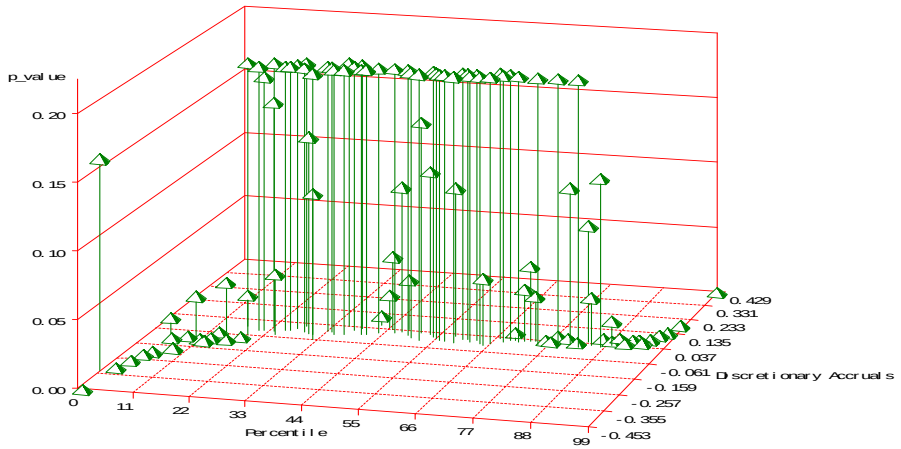

**Panel B-Testing Sample**



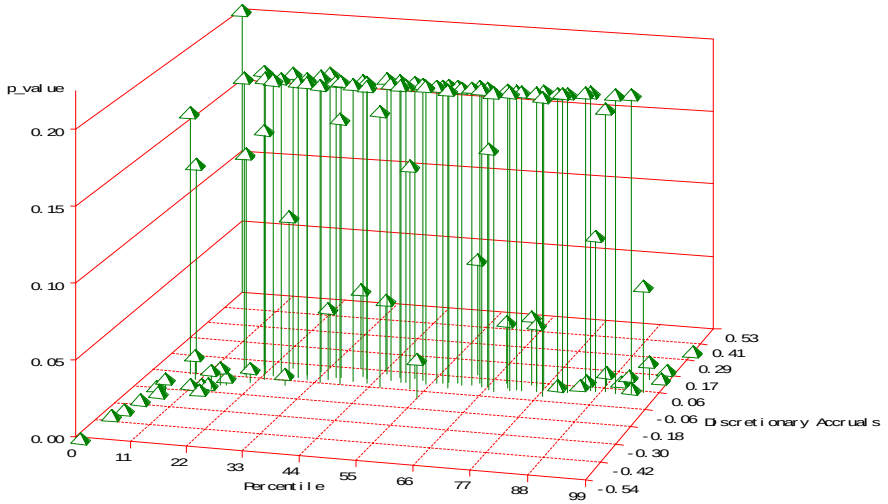
## Figure 5.2: Scatter plot of discretionary accruals, earnings performance ranks and significance levels

The X-axis is defined by Discretionary Accruals, the Y-axis is defined by Percentiles, and the Z-axis is defined by P-value. Discretionary accruals are calculated as the residual from equation (4.7) then ranked on the level of earnings deflated by lagged total assets and assigned into percentiles according to their rank orders. P-value is generated from testing the null hypothesis of no earnings management (mean discretionary accruals equal to zero) using a two-tailed test. 0.00, 0.05, 0.10, 0.15 and 0.20 refer to the significance level of 0%, 5%, 10%, 15% and 20% respectively. Mean discretionary accruals between −0.5 and 0.5 are plotted for the 100 percentiles against corresponding p-value for the rejection of no earnings management. The estimation sample contains 5,947 observations. The testing sample contains 3,326 observations.

**Panel A-Estimation sample**



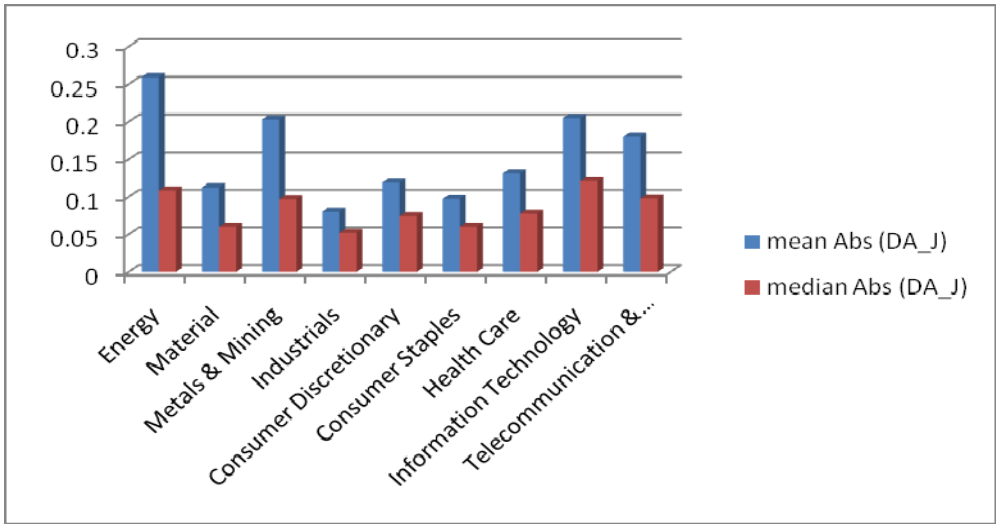

**Panel A-Testing Sample**



## Figure 5.3: The magnitude of earnings management by industry

The X-axis is defined by industry. The Y- axis is defined by the magnitude of earnings management. The magnitude of earnings management is measured as mean (median) value of discretionary accruals that estimated from Jones Model, Modified Jones Model, Cash Flow Modified Jones Model, and Performance Adjusted Technique. The estimation sample contains 5,947 observations.

**Panel A-Jones Model**




**Panel B-Modified Jones Model**

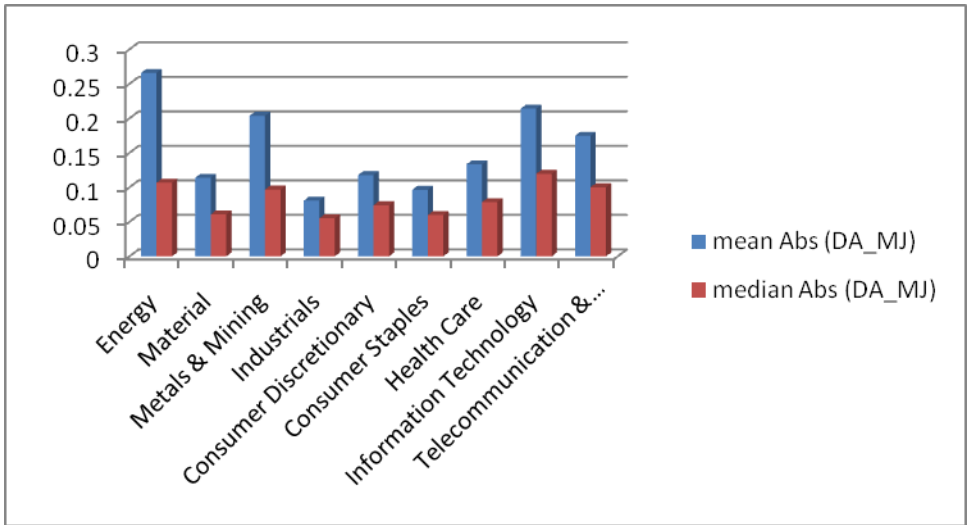
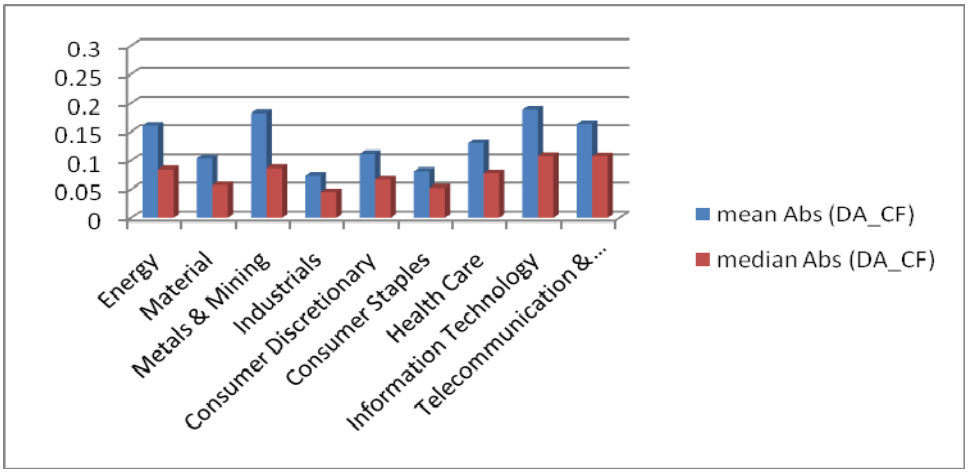
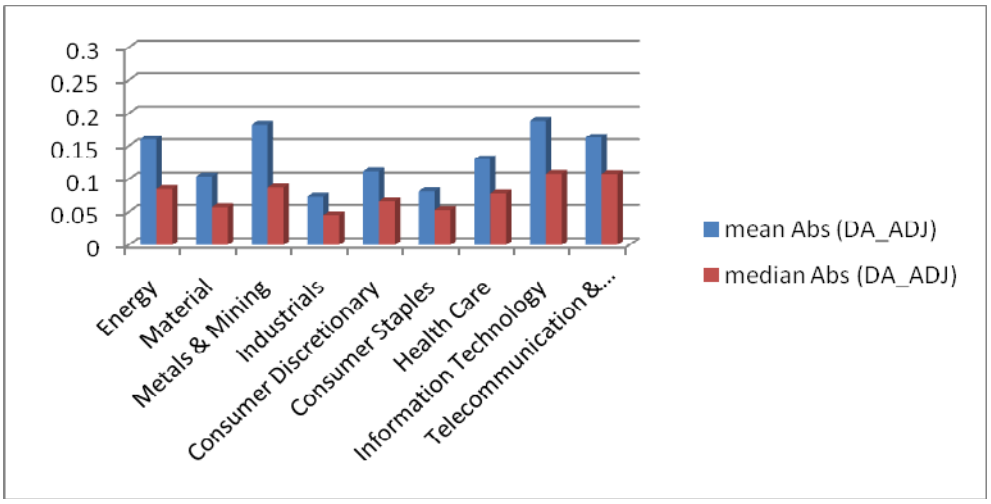


**Figure 5.3 (Contd.)**

**Panel C-Cash Flow Modified Jones Model**



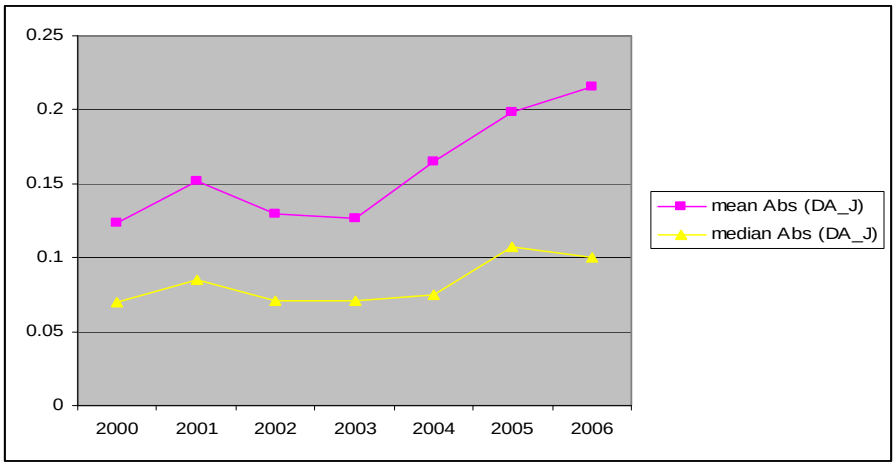

**Panel D-Performance adjusted Technique**



## Figure 5.4: The trend of earnings management by year

The X-axis is defined by year. The Y- axis is defined by the magnitude of earnings management. The magnitude of earnings management is measured as mean (median) value of discretionary accruals that estimated from Jones Model, Modified Jones Model, Cash Flow Modified Jones Model, and Performance Adjusted Technique. The estimation sample contains 5,947 observations.

**Panel A-Jones Model**




**Panel B-Modified Jones Model**

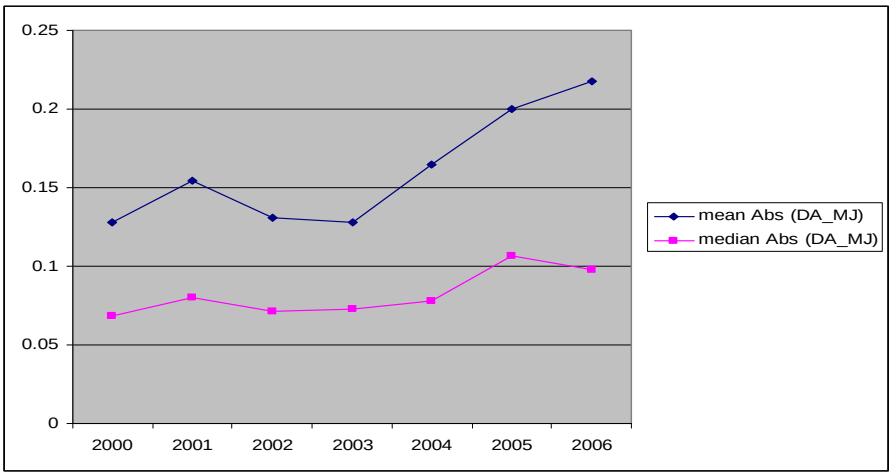
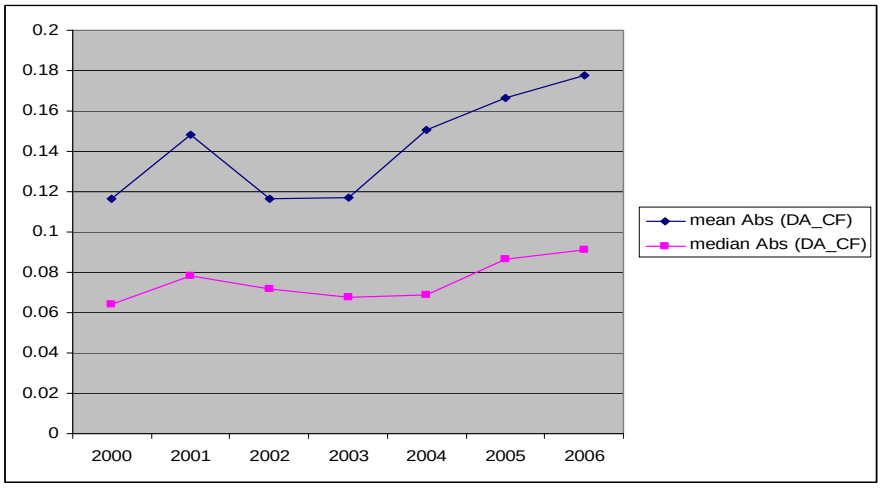
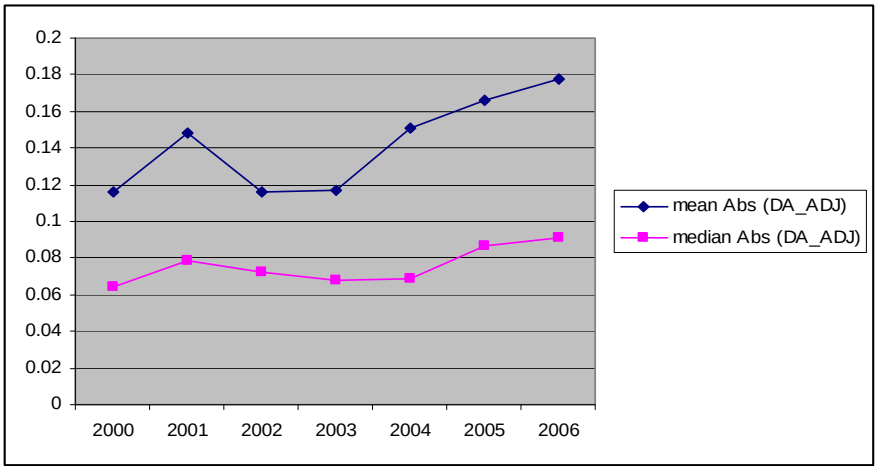


**Figure 5.4 (Contd.)**

**Panel C-Cash Flow Modified Jones Model**

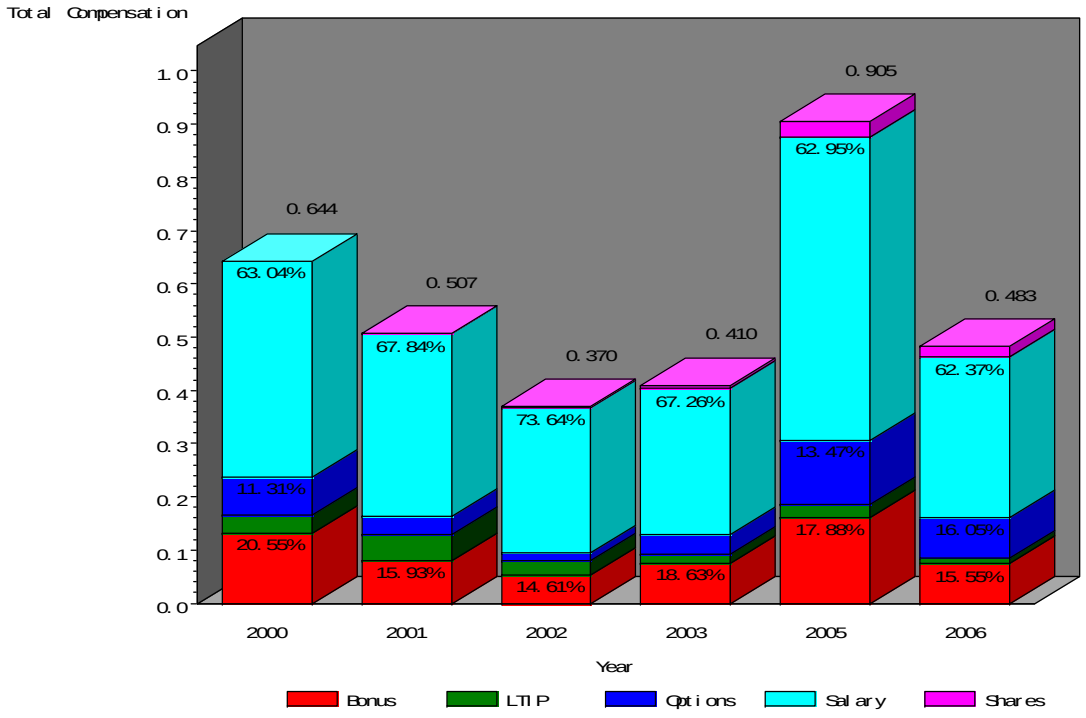



**Panel D-Performance Adjusted Technique**



## Figure 6.1: Decomposition of Australian CEOs compensation components

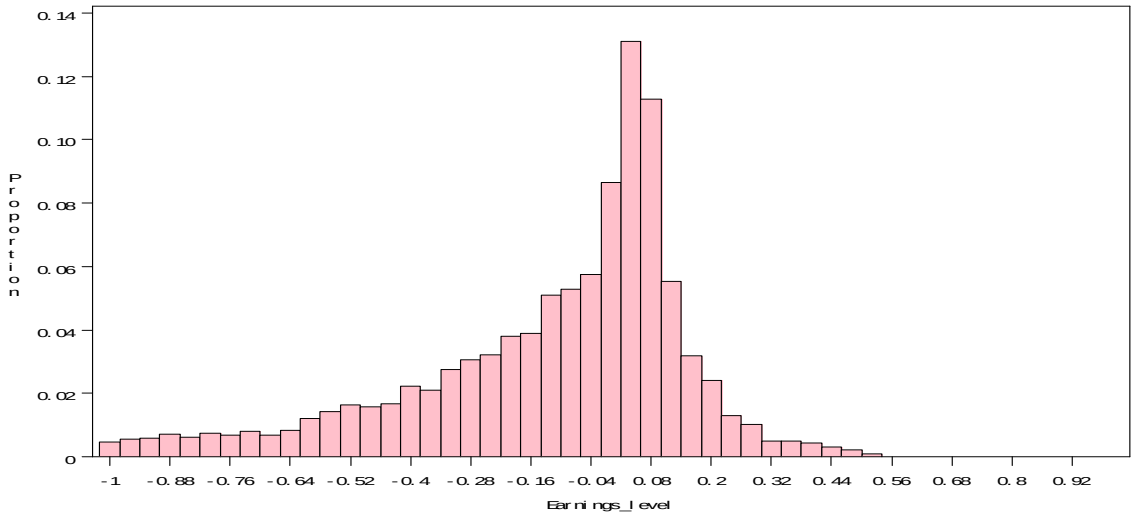
The X-axis is defined by year (2000-2006). The Y- axis is defined by average dollar value of total compensation. Total compensation is the dollar value of total compensation earned by CEOs during the fiscal year, measured in millions of dollars (Connect4 variable *Total*). Salary is the dollar value of base salary earned by CEOs during the fiscal year, measured in millions of dollars (Connect4 variable *Salary*); Bonus is the dollar value of bonus earned by CEOs during the fiscal year , measured in millions of dollars (Connect4 variable *Bonus*); Options is the dollar value of options granted by CEOs during the fiscal year, measured in millions of dollars (Connect4 variable *Options*); Shares is the dollar value of shares granted by CEOs during the fiscal year, measured in millions of dollars (Connect4 variable *Shares*); LTIP is the dollar value of long-term incentive plan granted by CEOs during the fiscal year, measured in millions of dollars (Connect4 variable *LTIP*). For each year, the average total compensation is displayed on the top of the bar chart with the proportion of each compensation component displayed inside of the bar chart if the individual component earned in that particular year is above 10% of total compensation.



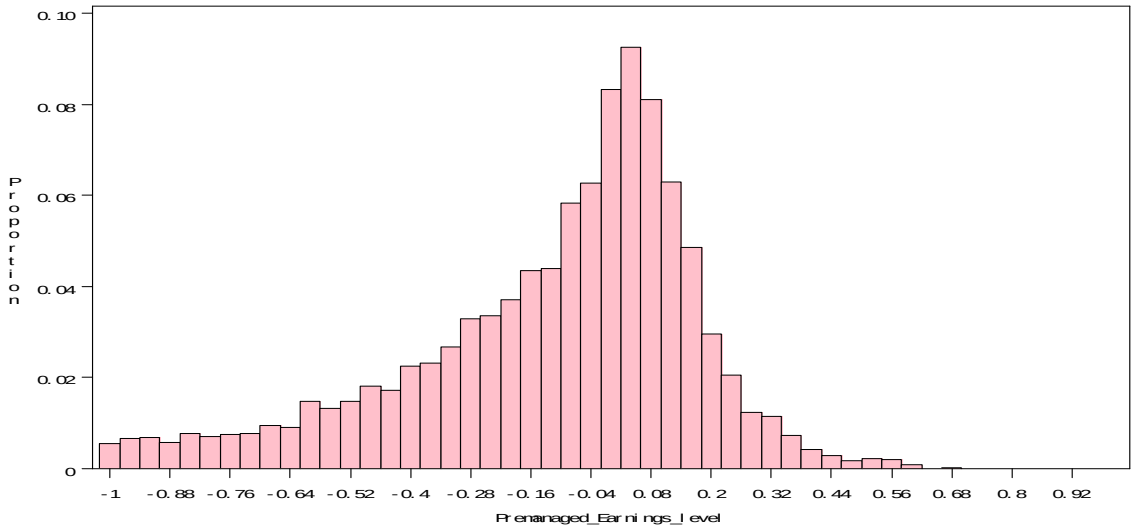
## Figure 7.1: Histograms of earnings and pre-managed earnings

This figure is the histograms of reported earnings level and pre-managed earnings level. The X-axis is earnings level and pre-managed earnings level. The Y- axis is the proportion of observation fall into a particular interval. Earnings level is scaled by beginning total assets. Pre-managed earnings level is calculated as reported earnings level minus adjusted discretionary accruals (estimated from Performance Adjusted Technique). The histograms have an interval width of 0.04 and rang of [−1, 1]. Intervals greater than 1 or less than −1 are not shown here.

**Panel A-Earnings levels**



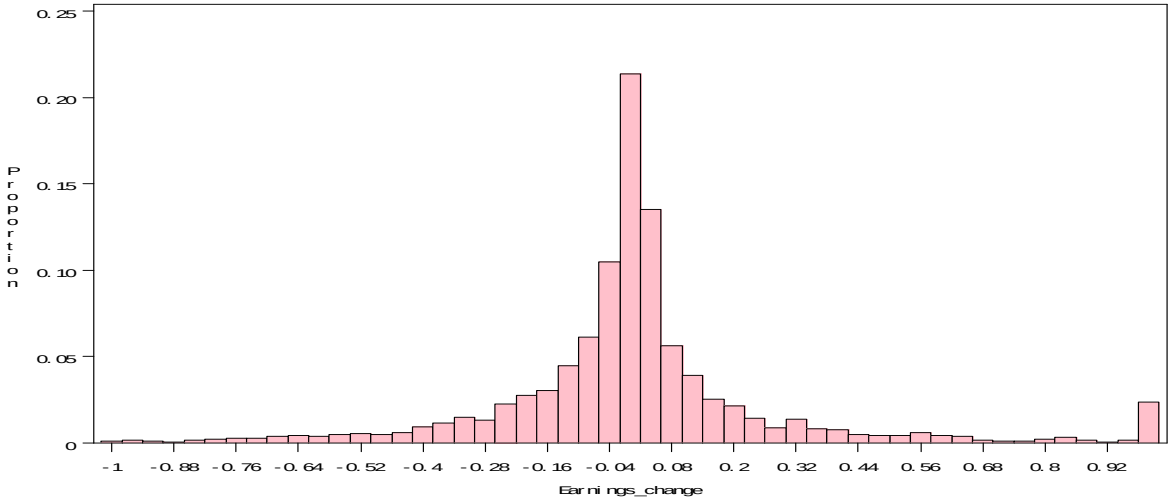

**Panel B-Pre-managed earnings level**



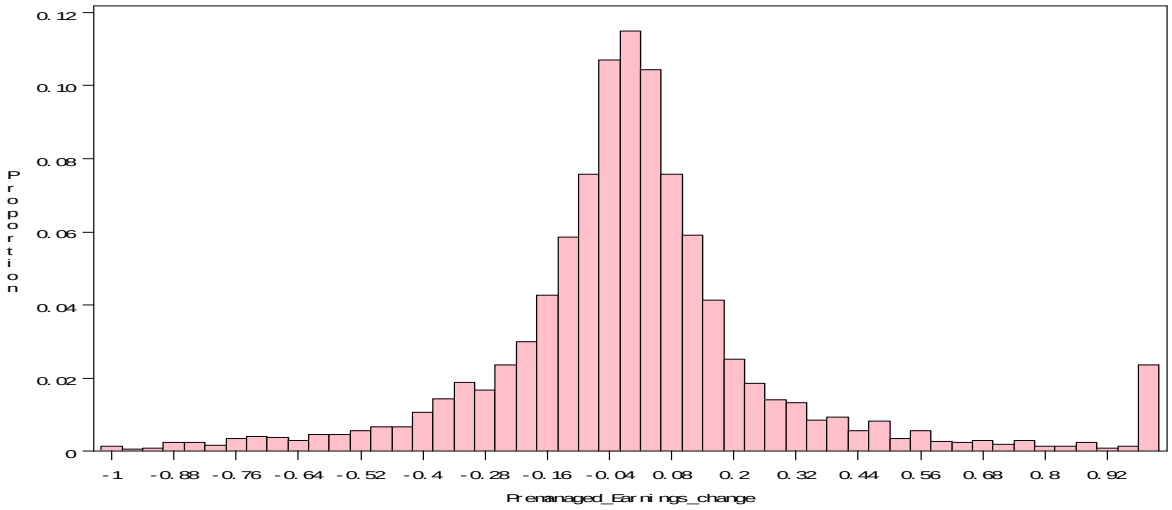
## Figure 7.2: Histograms of earnings change and pre-managed earnings change

This figure is the histograms of reported earnings change and pre-managed earnings change. The X-axis is earnings change and pre-managed earnings change. The Y- axis is the proportion of observation fall into a particular interval. Earnings change is scaled by beginning total assets. Pre-managed earnings change is calculated as reported earnings change minus adjusted discretionary accruals (estimated from Performance Adjusted Technique). The histograms have an interval width of 0.04 and rang of [−1, 1]. Intervals greater than 1 or less than −1 are not shown here.

**Panel A-Earnings changes**




**Panel B-Pre-managed earnings changes**



# Appendices

## Appendix 1: Review of Australian Evidence on EM

| Studies | Setting in detecting EM | Sample | Methodology in detecting EM | Finding |
|---|---|---|---|---|
| Black et al. (1998) | Income smoothing using asset sales | 503 firm-year observations for Australian and New Zealand; 696 firm-year observations for UK (1985 – 1995) | Earnings smoothing is measured as the change in pre-tax annual ordinary income before extraordinary items, exclusive of income from asset sales | Do not find income from asset sales is associated with the change in income before extraordinary items. Firms which revalue assets in the UK and ANZ samples do not engage in income smoothing through asset sales |
| Lim and Matolcsy (1999) | Product price controls | 94 firms divided into two groups based on the degree of price scrutiny (1973- 1975) | Jones model and modified Jones model<br>Independent-sample t-tests | Found firms subject to price controls adjust discretionary accruals downward to reduce reported net income and to increase the likelihood of approval of the requested price increase during the period of scrutiny |
| Godfrey and Jones (1999) | Income smoothing and political cost | 58 ASX listed firms of which 42 are smoothers and 16 are non-smoothers (1985-1993) | Logistic regression<br>Student t-test and Mann Whitney U test for the difference of political cost and contracting variables between smoothers and non-smoothers | 1.Firms with highly unionized workforces and subject to labor-related political costs are more likely to smooth reported earnings via the classification of recurring gains and losses<br>2.Firms with low ownership concentration are more likely to engage in income smoothing |
| Eddey and Taylor (1999) | Takeovers | 43 Australian takeover targets (1986-1991) | Discretionary accruals: measured as the difference between the change in earnings and the change in cash flows from operations comparing the bid year t to the year prior to the bid t-1 | Fail to support the hypothesis: bid-rejecters manage earnings upwards to claim that the current bid is under the 'true' value of the firm; while bid-accepters manage earnings downwards to make the bid look more attractive |
| Jones and Sharma (2001) | Earnings management in Australia's 'Old' and 'New' economies | All listed ASX firms (1991-2000) | Jones model<br>Raw total accruals | New economy firms are associated with significantly less management of accruals than old economy firms |

| | | | | |
|---|---|---|---|---|
| Wells (2002) | Earnings management and CEO changes | 65 CEO changes reported by 42 firms (1985-1994) | Abnormal and extraordinary items; Discretionary accruals from Modified Jones model | New CEOs undertake 'earnings bath' in the year of CEO change by using abnormal and extraordinary items. Little evidence for discretionary accruals |
| Godfrey et al. (2003) | Earnings management and CEO changes | 63 firms that changed CEOs (1992-1998) | Discretionary accruals: measured as the difference between the change in earnings and the change in cash flows from operations comparing year t to year t-1 | Found downward earnings management in the year of CEO change and upward earnings management in the year after a CEO change, supporting new managers manipulate earnings to impress |
| Monem (2003) | Earnings management in response to the introduction of the Australian Gold Tax | 45 Australian gold-mining industry with 433 observations (1976-1990) | Modified Jones model | Document downward earnings management in the period June 1985-May 1988 to mitigate political costs; while upward earnings management in the period of June 1988-December 1990 to maximize earnings prior to the introduction of income tax on gold mining |
| Holland and Ramsay (2003) | Benchmark beating | 5030 observations for earnings level benchmark ( 1990-2000); 4557 observations for earnings change benchmark (1991-2000) | Distribution method | Found evidence of discontinuities in the distribution of reported earnings and earnings change Such discontinuities are interpreted as Australian firms manage earnings to ensure reporting of positive profits and to sustain the previous year's profit performance |
| Koh (2003) | Institutional investor type | 107 firm-year observations with non-financial firms (1993-1997) | Jones model | Found non-linear relation between institutional ownership and earnings management: a positive association at the lower institutional ownership levels (short-term institutional investors create incentives); and a negative association at the higher institutional ownership levels (long-term institutional investors constrain) |

| | | | | |
|---|---|---|---|---|
| Hsu and Koh (2005) | Institutional investor type | 201 firm-year observations with non-financial firms from (1993-1997) | Modified Jones model | Found non-linear relation between institutional ownership and earnings management, which is more likely to occur when firms have stronger incentives to meet/beat earnings benchmarks-profits and prior year's earnings |
| Coulton et al. (2005) | Benchmark beating | Estimation sample: 6436 firm-years (1993-2002);Subsample:2906 firm-years(1993-2002) | Distribution method<br>Modified Jones model<br>Lagged modified Jones model<br>Forward-looking modified Jones model | Benchmark beating is not caused by earnings management |
| Davidson et al. (2005) | Internal governance structures | 434 listed firms in 2000 | Modified Jones model | A firm's internal governance structure constrains earnings management: non-executive directors on the board and on the audit committee, the existence of an audit committee are significantly associated with lower likelihood of earnings management |
| Koh (2007) | Institutional investor type | 5150 firm-years (1995-1998) | Modified Jones model adjust performance (Kothari et al., 2005) | Long-term institutional investors constrain earnings management to meet/beat earnings benchmarks<br>Transient institution investors is not associated with aggressive earnings management |
| Anandarajan et al. (2007) | Earnings management in Australian banks | 50 Australian commercial banks (1991-2001) | Use ratio of earnings before taxes and loan loss provisions (LLPs) to total assets | Found Australian banks use loan loss provisions (LLPs) for capital and earnings management |
| Ahmed and Goodwin (2007) | Earnings restatements | 195 earnings restatements from (1970-2003) | 3 types of earnings restatements:<br>1)Policy changes<br>2)Revisions in estimates<br>3)Errors and unknown | Three reasons for earnings restatements, accounting policy changes, revision of estimates, and errors and unknown. Restatement firms are high growth and small in size |
| Balachandran et al. (2008) | On-market share buybacks, exercisable share options | 138 on-market buyback firms (1996-2003) | Discretionary current accruals measured from a variation of the cross-sectional modified Jones model (Teoh et al., 1998a) | Managers with option holdings rely on reported earnings to influence share price. They use two mechanisms: discretionary current accruals and on-market buyback announcements to drive up share prices |

## Appendix 2: Review of Empirical Studies on Approaches in Detecting EM

| Approaches | Studies | Earnings Management Proxy |
|---|---|---|
| Accounting choice | Watts and Zimmerman (1978) | Corporate lobbying on accounting standards |
| | Hagerman and Zmijewski (1979) | Accounting choices of inventory method, depreciation method, the treatment of the investment tax credit, and pension costs amortization |
| | Holthausen (1981) | Depreciation switch-back policy |
| | Bowen et al. (1981) | Interest capitalization policy |
| | Zmijewski and Hagerman (1981) | Aggregate accounting choices of inventory method, depreciation method, the treatment of the investment tax credit, and pension costs amortization |
| | Skinner (1993) | Depreciation and goodwill methods |
| | Robbins et al. (1993) | Aggregate GAAP choices |
| | Christie and Zimmerman (1994) | Aggregate GAAP choices |
| | Teoh et al. (1998c) | Depreciation method |
| Real transactions | Bartov (1993) | Sell fixed assets |
| | Baber et al. (1991) | Cut R&D expenditures |
| | Dechow and Sloan (1991) | Cut R&D expenditures |
| | Bushee (1998) | Cut R&D expenditures |
| | Herrmann et al. (2003) | Sell fixed assets and marketable securities |
| | Roychowdhury (2006) | Price discounts and overproduction |
| Total accruals/discretionary accruals | Healy (1985) | Total accruals |
| | DeAngelo (1986) | Change in total accruals |
| | Jones (1991) | Discretionary accruals, estimated as residual from regression of total accruals on change in sales and property, plant and equipment |
| | Dechow et al. (1995) | Discretionary accruals, estimated as residual from regression of total accruals on change in sales adjusted for change in account receivables, and property, plant and equipment |
| | Kang and Sivaramakrishnan (1995) | Discretionary accruals, estimated as residual from regression of noncash current assets less liabilities on lagged levels of these balances, adjusted for increases in sales, expenses and property, plant and equipment |

| | | |
|---|---|---|
| | Kasznik (1999) | Discretionary accruals, estimated as residual from regression of total accruals on change in sales adjusted for change in account receivables, property, plant and equipment, and change in operating cash flows; discretionary accruals is then adjusted for earnings performance by using performance adjust technique |
| | Kothari et al. (2005) | Discretionary accruals, estimated as residual from regression of total accruals on change in sales adjusted for change in account receivables, property, plant and equipment, and return on assets; discretionary accruals is then adjusted for earnings performance by using performance-matched approach |
| Specific accrual | McNichols and Wilson (1988) | Bad debt provision |
| | Petroni (1992) | Claim loss reserve |
| | Beaver and Engel (1996) | Allowance of loan losses |
| | Beneish (1997) | Receivable index, gross margin index, depreciation index, SG&A expense index, total accrual to total assets index |
| Earnings distribution | Burgstahler and Dichev (1997) | Discontinuity in the distribution of reported earnings level and earnings change |
| | Degeorge et al. (1999) | Discontinuity in the distribution of reported earnings level, earnings change and analysts' forecast of earnings per share |
| Income smoothing | Imhoff (1977) | The variance of sales to the variance of earnings |
| | Eckel (1981) | The variance of sales to the variance of earnings |
| | Wang and Williams (1994) | The variance of cash flows to the variance of earnings |

## Appendix 3: Review of Empirical Studies on Compensation Incentives

| Study | Sample | Dependent Variable | Independent Variable | Methodology | Findings |
|---|---|---|---|---|---|
| Watts and Zimmerman (1978) | 52 U.S. firms response to General Price Level Adjustments (GPLA) in 1974 | Dichotomous variable for corporate lobbying on accounting standards (firm favored versus firm opposed GPLA) | Dummy variable for the existence of bonus plans (1 if firm had a management incentive scheme and 0 otherwise) | Mann-Whitnery U test Discriminant analysis | 1. Managers of unregulated small size firms with lower political costs will increase earnings<br>2. Managers of regulated or large firm will decrease earnings which result in lower tax, regulatory and political costs |
| Hagerman and Zmijewski (1979) | 300 non-regulated U.S. industrial firms in 1975 | Dichotomous variable for accounting choices (1 if income-increasing policy and 0 if income-decreasing policy) | Dummy variable for the existence of incentive plan (1 if firm had management profit-sharing plan and 0 if no profit-sharing plan) | Probit analysis | The existence of incentive compensation plans induce management choice of depreciation method, the treatment of investment tax credit and pension costs amortization period that will increase reported earnings |
| Zmijewski and Hagerman (1981) | 300 firms used in Hagerman and Zmijewski (1979) | N-chotomous variable for the combination of income-increasing and income-decreasing strategy | Dummy variable for the existence of incentive plan (1 if firm had management profit-sharing plan and 0 if no profit-sharing plan) | N-chotomous probit analysis | The existence of a profit-sharing plan, size, degree of concentration and debt to total assets ratio all influence the accounting strategy of a firm. |
| Holthausen (1981) | 96 firms switched depreciation from an accelerated method to a straight-line method (1955 - 1978 ) | Abnormal stock returns around depreciation switch announcement | Dummy variable for the existence of bonus plans | Multiple regression analysis | No evidence supports management compensation contracts are important determinants of the decision to change depreciation techniques |
| Healy (1985) | 94 Fortune U.S. industrial firms (1930-1980) | 1. Total accruals (estimated as the difference between reported earnings and operating cash flows)<br>2. Voluntary changes in accounting procedures on earnings. | Bonus plan parameters group with lower, middle, and upper bounds | Contingency table Chi-square test<br>T-test compare the mean differences | 1.Managers are more likely to choose income-decreasing accruals when their bonus plan upper and lower bounds are binding, and income-increasing accruals when these bounds are not binding<br>2.changes in accounting procedures are associated with adoption or modification of bonus plan |

| | | | | | |
|---|---|---|---|---|---|
| Skinner (1993) | A estimation sample of 504 firms in 1987 with a sub-sample of the 100 largest firm | Categorical scale: 0 for income-decreasing strategy; 1 for neither income-increasing nor decreasing ; 2 for income-increasing strategy | Dummy variable for the existence of bonus plans | T-test<br>Wilcoxon tests<br>Logit regression | Firms with bonus plans are more likely to select income-increasing depreciation and goodwill procedures after controlling for investment opportunity |
| Gaver et al. (1995) | 837 firm-years (1980 to 1990) | Discretionary accruals:<br>Healy's total accruals<br>Modified Jones model<br>Industry index model | Bonus plan parameters group with lower, middle, and upper bounds | T-test<br>Chi-square test | Support income smoothing hypothesis-managers select positive (income-increasing) discretionary accruals when earnings before discretionary accruals fall below the lower bound |
| Holthausen et al. (1995) | 443 firm-year observations (1982 to 1984, and 1987 to 1991) | Discretionary accruals:<br>Healy's total accruals<br>Modified Jones model | Budget-based compensation scheme with defined lower, inside, and upper bounds | T-test<br>Chi-square test | Found managers manipulate earnings downwards when their bonuses are at the maximum |
| Balsam (1998) | 3,439 firm-years observations from COMPUSTAT (1980-1993) | Cash salary and bonuses paid to CEO | Discretionary accruals from Jones model | Regression analysis | Found positive association between discretionary accruals and CEO cash compensation, such association depends on the circumstance of the firm |
| Guidry et al. (1999) | 117 U.S. business units with 179 business-unit-years observations (1994-1995) | Total accruals<br>Discretionary accruals from Modified Jones model<br>Inventory reserve | The parameters of compensation plans with lower, middle, and upper bounds | Two-sample t-tests<br>Two-sample Wilcoxon tests | Found managers make discretionary accrual decisions to maximize their short-term bonuses at the business unit level for a multinational conglomerate |
| Matsunaga and Park (2001) | 3,651 firm-year observations (1993 – 1997) | Change in CEO's bonus deflated by prior year salary | Dummy variables: equals to 1 if earnings are below the consensus analyst forecast, last year earnings and zero; and 0 otherwise | Pooled regression<br>Wald tests | The board reduces CEO pay when the firm's quarterly earnings fall short of the consensus analyst forecast or the earnings for the same quarter of the prior year |
| Ke (2001) | 1,311 publicly traded firms with 18,623 quarterly data from EXECOMP database (1992-1998) | Change in quarterly EPS | The ratio of bonus to total compensation<br>Equity incentives measured from Core & Guary (1998) method | Probit model<br>Cox hazards model | The probability of reporting small increase in earnings is higher and The duration of consecutive earnings increases is longer for CEOs with high equity-based compensation |

| | | | | | |
|---|---|---|---|---|---|
| Gao and Shrieves (2002) | 7,301 firm-year observations from ExecuComp database (1992-2000) | Absolute value of the scaled discretionary current accruals | Dollar value of salary, bonus, option, restricted stock, long-term incentive plans, incentive intensity of stock option awards and restricted stock award | Multiple regression | 1. Discretionary accruals are positively related to bonuses and options while negatively related to salary<br>2.The relationship is conditional on proximity of pre-managed earnings to an earnings benchmark |
| Baker et al. (2003) | 168 firms with 1100 firm-year observations collected from Wall Street Journal survey (1992-1998) | Signed discretionary accruals from Modified Jones Model | 1.The ratio of option award to the sum of salary, bonus, and option exercises<br>2. The fitted value of option ratio | 2SLS using fitted value of option ratio | Firms that compensate their executive with greater shares of options manage earnings downwards through negative discretionary accruals before the award date |
| Cheng and Warfield (2005) | 9472 firm-years observation ExecuComp database (1993-2000) | 1.CEOs' net sales of share in year t+1<br>2.the probability of earnings surprise per share be either negative, zero or one cent | Equity incentives—option grants, unexercisable options, ownership, exercisable options | Multiple regression<br>Logistic regression | CEOs with high equity incentives are more likely to meet or beat analysts' forecasts; CEOs with high equity incentives increasing their stock sales after earnings management |
| Bergstresser and Philippon (2006) | Entire Compustat for Accounting Data (1976-2000); 4199 ExecuComp data (1993-2000);15654 Thomson Financial Insiders trading data (1996-2001) | Absolute and signed total accruals<br>Modified Jones model | CEO equity incentive measured as the ratio of a CEO's total compensation that would come from a one percentage point increase in the equity value of the firm | Regression | 1.CEOs with overall compensation that is more closely tied to the value of stock and option holdings are associated with higher levels of earnings management<br>2. CEOs exercise unusually large numbers of options and sell large numbers of shares during the high accruals periods |
| McAnally et al. (2006) | 1,744 firms with 9,954 firm-years observations (1992-2004) | Dummy variable equals to 1 if a firm miss earnings benchmark and zero otherwise | Option grants, exercises and holding<br>book-tax difference proxy for earnings management | Logistic regression<br>OLS regression<br>Seemingly unrelated regression (SUR) | option grants create strong incentives for CEOs to miss earnings benchmarks via downward earnings management |
| Shuto (2007) | 16,368 firm-year observations (1991- 2000) | Total cash compensation data (the sum of salary and bonus) of the board of directors as a proxy for executive compensation | Discretionary accruals from modified CFO Jones model (Kasznik, 1999) | Regression<br>Logistic regression<br>Vuong (1989) test the difference of explanatory power between two models<br>2SLS | 1.Managers use discretionary accruals to increase compensation<br>2.Managers who do not receive bonus adopt bath taking strategy<br>3.The association between discretionary accruals and executive bonus varies depends on the circumstances of the firm |

## Appendix 4: Selective review of empirical studies on Benchmark Beating Incentives

| Studies | Sample | Benchmarks | Findings |
|---|---|---|---|
| Burgstahler and Dichev (1997) | 64,466 firm-years for earnings change;75999 firm-years for earnings level from Compustat (1976-1994) | Two benchmarks:<br>1.profits<br>2.prior year's earnings | 1.Benchmark beating occur due to the transaction costs theory and the prospect theory<br>2.Two components of earnings, cash flows from operations and changes in working capital, are identified as the mechanisms of earnings management |
| Degeorge *et al*. (1999) | 5387 firm-quarters from Compustat (1974-1996) | Three benchmarks:<br>1.profits<br>2.prior year's earnings<br>3.analysts' expectations | 1.Benchmarks are hierarchically ordered: to avoid losses, then is to report increases in quarterly earnings, and last is to meet analysts' earnings forecasts<br>2. Managers tend to manage earnings upwards when earnings falling just short of thresholds and manage earnings downwards when earnings far from thresholds |
| Dechow et al. (2000) | 44,913 and 24656 firm-years from I/B/E/S and Compustat (1988-1998) | Two benchmarks:<br>1.profits<br>2.analysts' forecast | 1. Found firms manage earnings to report profits and to meet analysts' expectations<br>2.Found working capital, accruals and special items could be used as a mechanism to achieve earnings targets |
| Payne and Robb (2000) | 13532 firm-years from I/B/E/S and Compustat (1988-1997) | One benchmark:<br>1.analysts' forecasts | Found income smoothing when pre-managed earnings are below market expectation managers will move earnings toward analysts'' forecasts; when pre-managed earnings are above analysts' forecasts, managers will reduce income thereby reduces analysts' forecast errors |
| Matsunaga and Park (2001) | 3,651 firm-year observations (1993 – 1997) | Three benchmarks:<br>1.quarterly profits<br>2.quarterly earnings increase<br>3. quarterly analyst forecast | CEO bonus payments provide CEOs with economic incentives to meet/beat benchmarks: bonus decrease when the firm's quarterly earnings fall short of the analysts forecast and fall short of the earnings for the same quarter of the last year |
| Plummer and Mest (2001) | 17667 firm-years and 5112 firm-years from Line Investment Survey (1971-1989) | Three benchmarks:<br>1.sales forecast<br>2.operating expense forecast<br>3.non-operating expenses or depreciation expenses | Firms manage earnings upward by managing sales upward and managing operating expense downward; current assets and high operating margin percentages are both associated with an increased likelihood that a firm uses sales to manage earnings upward |

| | | | |
|---|---|---|---|
| Holland and Ramsay (2003) | 5030 firm-years for earnings level; 4557 firm-years for earnings change from IRESS (1990-1997) | Two benchmarks:<br>1.profits<br>2.last year's earnings | 1. Australian firms practice earnings management in order to report positive earnings, and to sustain last year's earnings performance<br>2.Larger firms show stronger results<br>3.no discontinuity in the distribution of cash flows and change of cash flows, suggest cash flows do not play a role in EM |
| Dechow et al. (2003) | 47847 firm-years from Compustat (1988-2000) | One benchmark:<br>1.profits | 1.Small profit firms have high DA relative to other firms; however, both small profits and small loss firms have high DA, and have a similar proportion of +DA<br>2.Earnings kink is caused by other reasons rather than EM, e.g. managers make real effort to report profits; different scaling methods |
| Cheng and Warfield (2005) | 9472 firm-years observation from ExecuComp (1993-2000) | One benchmark:<br>1.analysts' forecast | 1.Found that managers with high stock-based compensation are more likely to report earnings to meet/beat analysts' forecasts<br>2.Support income-smoothing, managers with high stock-based compensation are less likely to report large positive earnings surprises |
| Coulton et al. (2005) | 6436 firm-years estimation sample; 2906 for subsample from Aspect database (1993-2002) | Two benchmarks:<br>1.profits<br>2.last year earnings | Found unusual kink around zero in the distribution of earnings levels or earnings changes, but authors view that the kink in earnings distribution is relatively poor proxy for EM, it is not caused by earnings management |
| Barua et al. (2006) | 23348 firm-years from I/B/E/S and Compustat (1992-2002) | Two benchmarks:<br>1.analysts' forecasts<br>2. prior year earnings | Profitable firms having greater incentives than loss firms to manage earnings to meet earnings benchmarks: profit firms are more likely than loss firms to meet/beat analysts' forecasts when pre-managed earnings are below analysts' forecasts; profit firms are more likely than loss firms to meet/beat last year's earnings when pre-managed earnings are below last year' earnings |
| Daniel et al. (2007) | S&P 1500 firms Execucomp data (1992-2005) | One NEW benchmark:<br>1.expected dividend level | Earnings determines dividend payment, so managers have incentives to manage earnings upwards to avoid dividend cuts when pre-managed earnings fall below expected dividend level |