# INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

**The quality of this reproduction is dependent upon the quality of the copy submitted.** Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

ProQuest Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600

# The Dynamic Relation between CEOs Compensation and Earnings Management

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business at Virginia Commonwealth University

By:

Amal A. Said

Master of Science, Old Dominion University, Norfolk, VA, 1997
Master of Accounting, Cairo University, Egypt, 1994
Bachelor of Accounting, Cairo University, Egypt, 1986

Director: Dr. Benson Wier
Associate Professor
Department of Accounting

Virginia Commonwealth University
Richmond, Virginia
May 2003

**School of Business**
**Virginia Commonwealth University**

This is to certify that the dissertation prepared by Amal A. Said entitled The Dynamic Relation between CEOs Compensation and Earnings Management has been approved by her committee as satisfactory completion of the dissertation requirement for the degree of Doctor of Philosophy in Business.

Dr. Benson Wier, Director
Virginia Commonwealth University

Dr. Carol Scotese Lehr, Committee Member
Virginia Commonwealth University

Dr. Tanya S. Nowlin, Committee Member
Virginia Commonwealth University

Dr. Robert B. Thompson, Committee Member
American University

Dr. Jayaraman Vijayakumar, Committee Member
Virginia Commonwealth University

Dr. Michael Sesnowitz, Dean of School of Business
Virginia Commonwealth University

Dr. F. Douglas Boudinot, Dean of Graduate School
Virginia Commonwealth University

May 9, 2003

## ACKNOWLEDGEMENT

Thanks to the members of my dissertation committee, Dr. Benson Wier (Director), Dr. Tanya Nowlin, Dr. Robert Thompson, Dr. Jayaraman Vijayakumar, and Dr. Carol Lehr, to whom I am heavily indebted. Their advice, understanding and suggestions have been invaluable to me. Special thanks to Dr. Wier for his guidance and support and for playing a tough role as a mentor and a director. Thanks to Dr. Nowlin for all the kindness, time, and knowledge that she shared with me.

I would like to thank my parents for their love and constant support. They planted the seeds for my passion for education. This work could not have been possible without the continuous encouragement, support and understanding of my husband and soul mate, Hassan. Special thanks to my children, Ahmed, Raghad and Yusuf for their patience and understanding. I hope this work will inspire them. My family gave me the strength to pursue this seemingly endless job. I am grateful to all of them for the confidence in me. For their support, each shares in my accomplishment.

I offer my gratitude to the special friends, family, and colleagues who provided the support system for me along the way. Finally, I thank my professors at Virginia Commonwealth University for contributing to my academic development. VCU will always have a special place in my heart.

# DEDICATION

To the memory of my father. For the encouragement and inspiration to pursue education to my fullest abilities.

# TABLE OF CONTENTS

# LIST OF TABLES

## ABSTRACT

THE DYNAMIC RELATION BETWEEN CEOs COMPENSATION AND EARNINGS MANAGEMENT

By Amal A. Said, Ph. D.

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business at Virginia Commonwealth University

Virginia Commonwealth University, 2003

Director: Dr. Benson Wier
Associate Professor
Department of Accounting

Incentives and opportunities induce managers to manipulate earnings. While a growing body of research considered managers' compensation motives in explaining earnings management behavior, a gap still exists between academia and practice on the pervasiveness, form, and severity of earnings management. This study empirically examines how earnings management simultaneously interacts with the level and structure of managers' compensation. It is predicted that the level and mix of compensation will affect the extent and form of earnings management.

The objectives of this study are fourfold. First, the study investigates the magnitude

of earnings management as explained by total compensation, including stock-based compensation. Second, the study examines whether the structure of compensation (bonus-based compensation versus stock-based compensation) provide different incentives for CEOs to manipulate earnings, thereby affecting the extent of earnings management. Third, I test whether earnings management takes the form of income-smoothing as the mix of compensation changes. Finally, the study considers the dynamic nature of the relation between earnings management and compensation.

Based on more relevant, recent, and large-scale compensation data to capture the levels and mix of compensation using continuous compensation variables, the study investigates both the form and the extent of earnings management and the possible, but yet untested, endogeneity between earnings management and compensation. In addition to ordinary least squares analysis, I develop a set of simultaneous equations that captures managers' incentives to manipulate earnings and to maximize compensation. The results of the two-stage least squares are consistent with the total and mix of compensation as significant determinants of the extent and form of compensation.

Using a sample of panel data of 3,938 firm-year observations covering the period 1992-1998, the study provides evidence consistent with the level and mix of compensation as determinants of the magnitude (in absolute value) of earnings management. The results provide strong evidence that CEOs have incentives to manage earnings to increase their total compensation and to maximize their bonus-based and stock-based compensation. Using a sample of 2,529 firm-year observations covering the period 1994-1998, the evidence is consistent with managers smoothing more (less)

income as the bonus mix (stock-based compensation) increases (decreases). The evidence is consistent with managerial opportunism as opposed to efficient contracting.

I also find compelling evidence documenting the joint determination of earnings management and compensation. The Hausman specification test for endogeneity shows that the magnitude of earnings management and income-smoothing are endogenous to total compensation. Regarding the mix of compensation, the tests indicate that the extent of earnings management is endogenous to stock-based compensation while income-smoothing is endogenous to bonus-based compensation. Furthermore, the results of the same test indicate that total and mix of compensation are endogenous to the magnitude of earnings management whereas incentive compensation (bonus-based and stock-based) is endogenous to income-smoothing. This evidence indicates that earnings management behavior and compensation are endogenous and suggests the necessity to consider their endogenous nature in examining their relationship.

# CHAPTER 1

# INTRODUCTION

This study investigates the two-way relationship between executives' earnings management behavior and compensation. More specifically, the study empirically examines how earnings management simultaneously interacts with the level and structure of managers' compensation. It is predicted that the level and mix of compensation will affect the extent and form of earnings management.

Asymmetric information between managers and outside parties about the firm and its prospects, incentives and opportunities might induce managers to manipulate earnings. Managers use their knowledge about the business and its opportunities to select reporting methods, estimates, and disclosures that might not accurately reflect their firms' underlying economics (Healy and Wahlen 1999). Much accounting research has investigated whether managers exercise their accounting discretion to influence reported earnings. Prior research has focused on the discretion allowed under GAAP to manage reported earnings (e.g., Hunt et al. 1996; Pincus 1993; Sloan 1996; Subramanyam 1996). Following an important paper by Healy (1985), a large number of studies examined managers' accruals choices for evidence of earnings management. Researchers have examined many different incentives for earnings management including capital market, regulatory, and contracting motivations.

Researchers have provided evidence on capital market motivations: (i) prior to

management buyouts (DeAngelo 1988); (ii) prior to seasoned equity offers (Teoh et al. 1998b), initial public offerings (IPOs) (Teoh et al. 1998a), and stock-financed acquisitions (Erickson and Wang 1999); (iii) to meet the expectations of financial analysts or management (Abarbanell 2003; Burgstahler and Eames 1998; Kasznik 1999); and (iv) to influence expectations of specific types of investors (Bushee 1998). Also, there is evidence on regulatory motivation of earnings management including both industry regulations (Adiel 1996; Beatty et al. 1995; Collins et al. 1995; Moyer 1990; Scholes et al. 1990) and anti-trust and other regulations (Cahan 1992; Jones 1991; Key 1997). In addition, researchers have provided evidence on contracting motivations of earnings management in lending contracts (Beatty and Weber 2003; DeAngelo et al. 1994; DeFond and Jiambalvo 1994; Dichev and Skinner 2002; Healy and Palepu 1990; Holthausen 1981; Sweeney 1994) and in management compensation contracts (Gaver et al. 1995; Guidry et al. 1999; Healy 1985; Holthausen 1981; Holthausen et al. 1995a).

Management compensation agreements help reduce the conflict of interest between corporate managers and stockholders; these plans are designed to motivate managers to maximize firm value (Smith and Watts 1982). Managers choose reporting strategies that maximize expected compensation, taking into account the effect of earnings reports on investors' perceptions and subsequently management's compensation (Goel and Thakor 2003).

The objectives of this study are fourfold. The first objective is to investigate the magnitude of earnings management explained by compensation. Specifically, the question is whether there is a relation between the extent of earnings management and the

level of compensation. The second objective is to examine whether this relation differs according to the compensation mix (bonus-based compensation versus stock-based compensation). The third objective is to test whether earnings management takes the form of income-smoothing as the components of compensation change. Finally, the study considers whether the relation between earnings management and compensation is of a dynamic nature where this relation is simultaneously determined.

## Importance of the Study

This study is motivated by the increasing interest of the academic and business communities regarding the level and structure of executive compensation (see for example, Duru and Reeb 2002). The study is also motivated by concerns expressed by practitioners, regulators, and standard setters over the quality of earnings coupled with the academic debate on the extent and significance of earnings management. Earnings management has been much in the news lately. For example, the popular press ran a cover story titled "Who Can You Trust?" that suggested that the credibility of earnings reports was being eroded by earnings management (Business Week October 5, 1998). The former Chairman of the SEC, Arthur Levitt, expressed concerns over earnings management and its effect on resource allocation in a series of speeches to the financial community.[1]

[1] Arthur Levitt Jr., former Chairman of the Securities and Exchange Commission (SEC) commented in 1998:"Too many corporate managers, auditors, and analysts are participants in a game of nods and winks. In the zeal to satisfy consensus earnings estimates and project a smooth earnings path, wishful thinking may be winning the day over faithful representation." In his 1998's speech at New York University entitled, "The Numbers Game", Arthur Levitt included management abuses of "big bath" restructuring charges and write-offs of purchased in-process R&D as threats to the credibility of financial reporting. Since that time, there have been initiatives by major Blue Ribbon committees, significant SEC enforcement actions, and SEC releases on accounting, reporting, and audit-committee matters, as well as related projects in the FASB and AICPA.

The study is important for academia. Dechow and Skinner (2000) address the gap between academics' perceptions from one side and practitioners and regulators' perceptions from the other side on the existence of earnings management and its impact, if any, on market participants. While practitioners and regulators perceive earnings management as pervasive and problematic, academics are more sanguine. This study should contribute to the academic research related to earnings management, compensation, and the usefulness of accounting numbers.

The extent and form of earnings management related to compensation is important to accounting standard setters, regulators, investors, analysts, practitioners, and researchers because of the on-going concern over earnings management. A number of studies examined managers' motivation to manipulate earnings, including the influence of short-term bonus plans on managers' discretionary accruals decisions. Healy (1985) reported that managers use discretionary accruals to maximize short-term bonus compensation. Recent studies (Gaver et al. 1995; Guidry et al. 1999) reexamined the issue of short-term bonus plans and earnings management. The results of these studies are mixed. Holthausen et al. (1995a) and Guidry et al. (1999) reported evidence consistent with Healy's bonus-maximization hypothesis. However, contrary to Healy (1985), Guidry et al. (1999) found no evidence that managers make income-decreasing discretionary accruals when earnings are below the minimum necessary to earn a bonus. Gaver et al. (1995) reported results that support income-smoothing and are inconsistent with Healy's bonus-maximization hypothesis.

The mixed results of prior studies cast doubt that managers' bonus-based

compensation influences their accounting choices. Previous research suggests that managers have competing incentives to engage in income-smoothing (reputation, stock ownership, and stock-based compensation) or bonus-maximization (bonus-based compensation) behavior. Goel and Thakor (2003) provide analytical evidence that managers smooth income when compensation is tied to stock price. Thus, a firm whose manager's compensation contract is tied to long-run performance is more likely to smooth earnings than a firm whose manager's compensation contract is tied to short-term performance.

## Outline of the Study

The current study provides a link between earnings management research and other areas of accounting research. Specifically, this study explores the link between contracting and governance research.[2] Although this study draws upon extensive prior research, it differs from previous work in several important aspects. First, this study uses information about bonus-based compensation as well as stock-based compensation. Empirical research in this area focuses on top executives (most often CEOs) of public firms.[3] Papers since Healy (1985) presented evidence of managers' attempts to manage

[2]Positive accounting theory, initiated by Watts (1977) and Watts and Zimmerman (1978), investigates how contracts based on financial accounting numbers affect firms' accounting practices. Positive accounting research (Watts and Zimmerman 1986; 1990) attempts to explain management's accounting choices, largely in terms of agency theory and contracting costs. Therefore, contracting research focuses on the use of accounting numbers in contracts. The positive theory literature usually takes contracts as given, and investigates how the use of accounting numbers in contracts influences firms' measurement of accounting numbers. Governance research is concerned with how the information and limits of information provided by financial accounting measures affect their use in contracts, and how financial accounting information affects firms' resource allocation decisions and productivity through a variety of corporate control mechanisms.

[3] In addition to the literature on top U.S. executives, there is a recent line of research focusing on compensation of business-unit managers within the hierarchies of large firms (Guidry et al. 1999; Holthausen et al. 1995b).

earnings through discretionary accruals. Holthausen et al. (1995a) provided evidence that managers manipulate earnings to take advantage of the structure of compensation plans to maximize their compensation over time.

However, most previous studies are criticized for either using a dummy variable for the existence of compensation plans (Skinner 1993) or using only information about salary plus accounting-based compensation (Abdel-Khalik et al. 1987; Antle and Smith 1985; Defeo et al. 1989; Healy et al. 1985). Compensation plans have been undergoing major changes in recent years with increasing popularity of stock-based compensation. Although stock-based compensation was a small part of total compensation in the 1980's (Lambert and Larcker 1987), stock-based compensation is now a significant part of the pay of many CEOs. Moreover, there is significant cross-sectional variation in the fraction of total pay that is derived from stock-based compensation plans (Gode and Mohanram 2000). Therefore, this study is the first study to investigate the relation between the compensation mix and earnings management, covering a more recent period, and using continuous variables for compensation level and structure.[4]

Second, this study focuses on both the level and form of earnings management. Previous studies have either focused on the magnitude of earnings management (Bernard and Skinner 1996; Gode and Mohanram 2000; Warfield et al. 1995) or the form of earnings management (DeFond and Park 1997; Skinner 1993). Therefore, both the extent of earnings management (absolute value) and the form of earnings management and how

[4] The only recent study that looks at stock-based compensation is Gode and Mohanram's study (2000). Gode and Mohanram (2000) study the effects of managerial attempts to manage earnings through discretionary accruals. They investigate whether the level of discretionary accruals affects the relative use of earnings and stock prices in CEOs' compensation.

the different levels and structures of compensation affect them are of interest to this study. The questions that arise are whether the extent of earnings management varies with the level and structure of compensation and whether earnings management via income-smoothing will depend on the conflicting incentives provided by compensation. Answering these questions might provide insight into the conflicting results of earnings management and whether it is in the form of bonus-maximization (Healy 1985) or income-smoothing (DeFond and Park 1997; Subramanyam 1997).

Third, positive accounting theory (Watts and Zimmerman 1986; 1990) attempts to explain earnings manipulation behavior, largely in terms of agency theory and contracting costs. Under this paradigm, most of the earlier earnings management research assumes the firm's observed contracts to be given, or exogenous to current managerial decision-making. Managers select accounting methods either *ex ante*, to efficiently resolve the firm's agency problems, or *ex post*, to opportunistically exploit them (Dhaliwal et al. 1999).

More recent studies, however, recognized that accounting choice is an integral part of the firm's organizational policy structure. Under this perspective, managers enhance the design of efficient contracts through endogenous accounting-method-choice decisions made in concert with other corporate policy decisions, such as those regarding capital structure, dividend policy, and corporate form (Dhaliwal et al. 1999). While a growing body of work has examined these components separately as functions of each other, only recently have researchers begun to explore the hypothesis that they are simultaneously determined. According to Fields et al. (2001), accounting research has failed to

distinguish between exogenous and endogenous variables. Therefore, this study addresses this concern by examining the dynamic relation between earnings management and compensation and investigates the potential endogeneity between earnings management and compensation.

## Contributions of the Study

Results on the extent and form of earnings management as related to the level and mix of compensation are important to researchers, accounting standard setters, regulators, investors, analysts, practitioners, and managers. This study contributes to academic research related to earnings management, compensation, and the usefulness of accounting numbers. Researchers who are interested in earnings management and compensation motives for earnings management should be interested in this study. The results should provide a better understanding of the significance of compensation in earnings management behavior. Understanding why managers select various accounting methods from the set of those acceptable under GAAP is basic to increasing our knowledge of how to use accounting information for designing efficient contracts and for valuing securities (Dhaliwal et al. 1999). This study contributes to the literature on positive accounting theory in several ways.

First, although there has been empirical evidence that compensation affects accounting procedure choice (Watts and Zimmerman 1986; 1990), there is little evidence on the extent of this relation. The present study is the first to examine the relation between compensation mix and earnings management. Accounting researchers have long been interested in the determinants of accounting choices and in examining

management's selection among discretionary accounting methods and techniques (Watts and Zimmerman 1986). One variable overlooked in many early accounting studies that has emerged significantly in more recent investigations is the management's compensation (levels and mix). The fact that management compensation appears to be related to accounting choice suggests that studies that have ignored management's compensation structure are incomplete and possibly misleading. Therefore, examinations of the potential relations between management's compensation and accounting choices are necessary to provide more complete theories of accounting choices and to assist in the further development of compensation research.

Second, most previous studies viewed accounting choice as a function of managers' incentives to behave opportunistically, given contracts in place (Holthausen and Leftwich 1983; Skinner 1993; Watts and Zimmerman 1986). This study reduces the chances of biasing the results by explicitly allowing the compensation be jointly determined with earnings management. Exploring the simultaneous relation between earnings management and compensation is important for better understanding how compensation affects managers' earnings management behavior.

Also, empirical evidence on the extent of earnings management for compensation purposes should be of interest to regulators and standard setters in assessing the pervasiveness of earnings management and how it affects the integrity of financial reporting. Standard setters are likely to be interested in evidence on how various levels and components of compensation could affect managers' motives to manage earnings and their implications for the value-relevance of earnings, financial statement analysis, and

the quality of financial reporting. This study should contribute by providing evidence on management's motivations for earnings management and, thereby, helping regulators better allocate scarce resources for enforcement of standards. Standard setters tend to act to reduce managers' ability to exercise discretion in the reporting process, apparently based on the assumption that managers exercise their accounting discretion opportunistically. If instead, managers use their discretion to increase the informativeness of accounting earnings, standard setters may want to rethink their approach. Evidence on the magnitude and frequency of earnings management should help standard setters assess the extent of earnings management and whether stakeholders are deceived by it.

The remainder of the dissertation is organized as follows. Chapter 2 reviews the previous research pertaining to earnings management and compensation and relates it to this study. Chapter 3 includes the hypothesized relation between earnings management and compensation. Chapter 4 describes the research methodology including data sources, variables measurement, empirical models to test the hypothesized relation between earnings management and compensations. Chapter 5 presents the results of the empirical tests and sensitivity analysis. Chapter 6 includes the summary and conclusion.

# CHAPTER 2

# LITERATURE REVIEW

Research in economics has modeled the firm as a set of contracts among individuals and assumed that individuals act to maximize their own utility (Fama 1980; Fama and Jensen 1983; Jensen and Meckling 1976). Gordon (1964), in an early attempt to derive a positive theory of accounting, assumed that management selects accounting procedures to maximize its own utility. The implication of this assumption is that management acts in its own self-interest.

The potential conflict of interest between managers and non-manager equity owners has been extensively investigated in the finance literature. Jensen and Meckling (1976) analyze this conflict and indicate that as managers' percentage ownership of the residual claims of a firm decreases, increases in the value of those residual claims have less effect on managers' wealth.[5] However, because the compensation of these individuals is determined differentially, conflicts of interest arise (Holthausen 1981).

A crucial issue in financial accounting is the degree to which managers manipulate reported earnings for their own gains. Researchers have been interested in examining managers' incentives to manipulate earnings. Managers choose to make or defer expenditures (such as R&D and advertising) and choose among acceptable accounting methods for reporting the same economic transactions (such as depreciation

[5] Watts and Zimmerman (1978) assumed that management's utility is a positive function of the

methods and/or inventory valuation methods). Judgment is required in working capital management (such as inventory levels and receivables policies) and to estimate numerous future economic events (such as expected lives and salvage values of long-term assets, obligations for pension benefits and other post-employment benefits, deferred taxes, and losses from bad debts and assets impairments).

Managers can also use accounting judgment to make financial reports more informative for users by overcoming limitations to current accounting standards. According to Healy and Wahlen (1999, 368), "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 numbers." Management compensation plans often allow managers to share profits in excess of a target level, typically stated in terms of accounting numbers. Since accounting numbers are the product of accounting measurement and allocation methods, managers' wealth can be affected by changes in these rules (Healy 1985; Holthausen and Leftwich 1983).

Positive accounting theory (Watts and Zimmerman 1986; 1990) attempts to explain earnings management, largely in terms of agency theory and costs. Within the agency cost framework, management compensation agreements are viewed as devices to overcome the conflict between management and stockholders, and thus minimize agency costs. One function of financial reporting is to constrain management to act in the

---

expected compensation in future periods and a negative function of the dispersion of future compensation.

agency cost framework, management compensation agreements are viewed as devices to overcome the conflict between management and stockholders, and thus minimize agency costs. One function of financial reporting is to constrain management to act in the shareholders' interest. Management compensation agreements are designed to motivate managers to maximize firm value and, thereby, help reduce the conflict of interest between corporate managers and stockholders (Smith and Watts 1982).

Earnings management research is ongoing with a substantial number of papers published in recent years (see McNichols 2000). Several studies have investigated the extent to which certain events affect managers' accounting manipulation. Studies have examined managers' accounting behavior around the time of going public (DeAngelo 1986), proxy contests (DeAngelo 1988), ITC import relief investigations (Jones 1991), labor union contract negotiations (Liberty and Zimmerman 1986), and anti-trust investigations (Cahan 1992). Several studies investigate management's incentives to influence the menu of accepted accounting techniques and to choose among available alternatives (Holthausen 1981). Watts and Zimmerman (1978) hypothesize that management considers the effects of reported accounting numbers on taxes, regulation, political costs, management compensation, information production costs, and the probability and associated costs of violating lending agreements as motivational factors for manipulating earnings.

Accountants have been interested in the role that executive compensation contracts play in understanding managers' earnings management behavior and whether management compensation plans affect the accounting manipulation decisions of

managers. Accounting research has focused on the relation between accounting numbers and compensation plans. In fact, this focus is part of a comprehensive investigation of accounting numbers and managerial incentives.

This study examines the relation between managers' compensation contracts and managers accounting manipulation behavior and whether compensation explains the form and extent of earnings management. Therefore, this part of the study reviews the relevant prior literature and relates this study to previous studies.

**Prior Research: Evidence of Compensation-Related Earnings Management**

The earnings management literature attempts to explain why managers manipulate earnings, how they do so, and the consequences of this behavior. These questions are the focus of a significant area of inquiry within financial reporting research. A number of studies examined managers' motivation to manage earnings. Watts and Zimmerman (1978) provide the beginnings of a positive theory of accounting by exploring factors influencing management's attitudes on accounting standards that are likely to affect corporate lobbying on accounting standards. Using a sample of 49 firms that submitted written responses to the FASB's 1974 Discussion Memorandum on General Price Level Adjustments, Watts and Zimmerman (1978) examined the relation between the effect on income of the FASB's proposed price level adjustments and the existence of bonus plans (in addition to taxes, bookkeeping costs, political costs, firm size and regulatory status) to explain their choice.

Watts and Zimmerman (1978) hypothesized that a change in accounting standards that increases the firm's reported earnings would, *ceteris paribus*, favor management

since it leads to greater incentive income. The authors used dichotomous variables to capture both the accounting choice (firms opposing versus supporting) and the existence of bonus plans (solicited from questionnaires, proxy statements, and annual reports). The results of a Mann-Whitney U test and discriminate analysis support their prediction that managers' lobbying positions before the FASB on price level accounting were to discourage expected government intervention. The negative sign of the existence of management compensation plan is consistent with their predictions and the empirical results are consistent with the theory.

Hagerman and Zmijewski (1979) investigated whether the existence of incentive compensation plans (in addition to size, industry concentration, risk (beta), and capital intensity) affect individual accounting choices. Using a random sample of 300 firms, Hagerman and Zmijewski (1979) used dichotomous dependent variables to examine four specific choices among alternative accounting methods related to depreciation (accelerated versus straight-line), inventory (FIFO versus LIFO), accounting for investment tax credits (flow through versus deferral), and accounting for past service costs (period of amortization). The authors used a dummy variable for the existence of bonus plans. The results of the probit analyses provide evidence that the existence of a management compensation plan is important in determining the choice of three of the four accounting procedures.

Holthausen (1981) examined whether the existence of bonus plans (using a dummy variable) explains managers' income-increasing behavior as related to depreciation using a sample of 96 firms (covering the period 1955-1978) that voluntarily

switched depreciation method from an accelerated method to a straight-line method. Holthausen (1981) investigated management compensation contracts (and bond indenture agreements) to derive testable implications concerning management's incentives to choose among alternative accounting techniques and the effect of that choice on the market value of the common stock (abnormal returns).

Holthausen (1981) hypothesized that if managers can positively affect their bonus by changing to income-increasing accounting methods (switching to straight-line depreciation), abnormal performance of common stock should be negatively related to the existence of a management compensation plan that is based on accounting numbers at the time of the announcement of an unanticipated change. This hypothesis is contrasted with two alternative hypotheses that have appeared in the literature, the no-effects hypothesis and the mechanistic hypothesis. The evidence from both price and non-price data is not consistent with management compensation contracts being an important determinant of the decision to voluntarily change depreciation methods.

Collins et al. (1981) examined the economic reasons for the observed negative abnormal returns of firms whose reported earnings and stockholders' equity were negatively affected by the proposed elimination of full cost accounting in the oil and gas industry. Specifically, Collins et al. (1981) used a sample of 571 firms that are affected by SFAS # 19 and tested the hypothesis (among others) that management compensation agreements defined in terms of accounting numbers explain the cross-sectional variation in abnormal stock performance. The result of regressing cumulative abnormal returns on independent variables that include a dummy variable for the existence of bonus plans

significantly supports the hypothesized sign.

Zmijewski and Hagerman (1981) revisited Hagerman and Zmijewski (1979) and examined the effect of bonus plans (dummy variable) on the firm's accounting choices of depreciation method, inventory choice, pension cost, and investment tax credit. The results of the *n*-chotomus probit analysis using the same sample and the same firm characteristics as in Hagerman and Zmijewski (1979), with total debt/total assets as an additional firm characteristic, reveal significantly different results. Zmijewski and Hagerman (1981) find evidence that managers choose income-increasing techniques more often in firms with accounting-based compensation plans than in those firms without them. The existence of incentive compensation plans is significant and in the hypothesized direction for the three income strategy assumptions.

Using a list of known interest capitalizers provided by the FASB, Bowen et al. (1981) examined the management compensation hypothesis (in addition to those related to size and leverage) to explain why firms choose to capitalize, rather than to expense, interest expense prior to the SEC's 1974 issuance of Accounting Series Release No. (ASR) 163. Bowen et al. (1981) hypothesized that the existence of a bonus plan is a factor in the decision to capitalize interest. However, using 91 matched pairs in 1974, Bowen et al. (1981) found that the existence of bonus plans (a dummy variable) was not a significant factor in the decision to capitalize interest (a dummy variable), providing evidence inconsistent with their hypothesis.

Healy (1985) examined the format of typical bonus contracts to provide a characterization of their accounting incentive effects. Healy (1985) tested the association

between managers' accruals and changes in accounting procedure decisions and their income reporting incentives under bonus plans. Healy (1985) hypothesized that because short-term bonuses based on accounting earnings comprise a large part of their compensation, managers choose discretionary accruals to maximize their short-term bonuses. Healy (1985) assumed that each manager observes income before discretionary accruals and makes either income-increasing or income-decreasing discretionary accruals based on his or her incentives. The resulting implications are that: (1) when income before discretionary accruals is sufficiently below the lower bound or above the upper bound, managers will make income-decreasing discretionary accruals (big bath) in anticipation of increasing the probability of earning a bonus in the future; and (2) when earnings before discretionary accruals fall between the upper and lower bounds or are sufficiently close to the lower bound, the manager will make income-increasing discretionary accruals.

Using a sample of 94 large U.S. industrial firms (1527 firm-year observations) covering a fifty-year period from 1930-1980, Healy (1985) examined the sign and magnitude of discretionary accruals as a function of expected earnings before discretionary accruals, the parameters of the bonus plan, the limit on discretionary accruals, the manager's risk preferences, and the discount rate. Healy (1985) also tested whether accruals differ for companies with different bonus plan formats. Healy (1985) used contingency tables to assign each firm-year to one of three portfolios (upper, lower, and middle bounds) according to the bonus plan parameters and for each subcomponent of accruals.

Consistent with his hypothesis, Healy (1985) reported evidence that discretionary accruals are more negative for managers with bonus-related incentives to manage earnings downward than for managers with incentives to manage earnings upward. The results reveal that managers use discretionary accruals to maximize short-term bonus compensation (bonus-maximization hypothesis). The results suggest that (1) accruals policies are related to income-reporting incentives of their bonus contracts, and (2) changes in accounting procedures are associated with adoption or modification of their bonus plan.

Focusing on a private, not-for-profit hospital setting, Robbins et al. (1993) examined the relation between the existence of bonus plans (among other variables) and income-increasing versus income-decreasing accounting methods related to depreciation and inventory cost flow. Robbins et al. (1993) used a sample of 298 hospitals and a dummy variable to indicate the existence of bonus plans (solicited from CFOs through a questionnaire) to test their hypotheses. They used a score for the extent to which a set of accounting method choices (inventory and depreciation methods) results in a strategy that tends to increase or decrease reported earnings. Results of the univariate tests and logistic regression provide significant evidence on the hypothesized relations and in the predicted direction.

Using a sample of 504 firms in 1987 and a subsample of the 100 largest firms of his full sample, Skinner (1993) examined the relation between firms' investment opportunities, their debt and compensation contracts, their size and financial leverage, and their accounting procedure choices. Skinner used inventory cost flow assumptions

from 0 (most income-decreasing technique) to 2 (most income-increasing technique) as the dependent variable. Using maximum likelihood, Skinner regressed accounting procedure choice on a dummy bonus plan variable to capture compensation (among other variables). Skinner found that accounting choice is positively related to the existence of a bonus plan (depreciation and amortization only). Therefore, the probability of choosing income-increasing accounting alternatives (straight-line depreciation and/or using 40-years for amortization) is larger when the firm has a bonus plan that ties the bonus directly to accounting earnings. Skinner (1993) provides empirical evidence on the bonus plan hypothesis.

Ali and Kumar (1994) examined the main and interactive effects of compensation (among other variables) on earnings management behavior. The purpose of their study was to test whether the interactive effects provide better tests and results. Using a sample of 41 firms that adopted SFAS # 87 (Employers' Accounting for Pensions) early in 1986, Ali and Kumar (1994) investigated the relation between the existence of bonus plans and the financial statement effects of accounting choice. The authors used dummy variables for the early adoption in 1986 and the existence of bonus plan and an interaction term for the existence of bonus plan and income effect. The results of the probit/logit analysis provided mixed results. The interaction model provided significant results, however, the other two models that excluded the interaction effect reveal mixed results.

Recent studies (Gaver et al. 1995; Guidry et al. 1999; Holthausen et al. 1995a) reexamined the issue of short-term bonus plans and earnings management. Holthausen et al. (1995a) extended Healy (1985) and used confidential compensation data provided by

two different human resource consulting firms for 1982-1983 & 1987-1990 (443 firm-year observations) of executive-specific short-term bonus plans to investigate the extent to which executives manipulate earnings to maximize the present value of bonus plan payments (fixed-target earnings manipulation). In addition, Holthausen et al. (1995a) examined whether bonus contracts influence managers' choice of investment decisions (such as advertising, R&D, and capital expenditures) and their management of gain/loss items.

Using Healy's total accruals and discretionary accruals models, Holthausen et al. (1995a) found evidence consistent with Healy (1985) and with the hypothesis that managers manipulate earnings downwards when their bonuses are at their maximum (upper bound). The *t*-tests and Chi-square tests for the mean and median, respectively, provide evidence consistent with Healy that managers make income-decreasing discretionary accruals after they reach their maximum bonus level. However, unlike Healy (1985), they found no evidence that managers manipulate earnings downwards when earnings are below the minimum necessary to receive any bonus (lower bound). In addition, Holthausen et al. (1995a) found no evidence that investment decisions are influenced by the annual bonus compensation contract. Finally, they found no evidence that variables which proxy for cross-sectional differences in managers' incentives to manipulate compensation and in the board's incentives to monitor performance explain cross-sectional variation in the extent of earnings manipulation.

Gaver et al. (1995) reexamined Healy's (1985) tests using funding formulas disclosed in proxy statements during the 1980s. Using a sample of 102 firms (837 firm-

years) between 1980 and 1990, Gaver et al. (1995) partially replicated and extended Healy (1985) by investigating the relation between accruals and bonus plans' lower and middle bounds. Utilizing a methodology similar to that of Healy (1985) and Holthausen et al. (1995a), Gaver et al. (1995) assigned portfolios based on earnings relative to bonus plan bounds. The results in Gaver et al. (1995) are consistent with the income-smoothing hypothesis rather than with Healy's (1985) bonus hypothesis. Gaver et al. (1995) found that when earnings before discretionary accruals fall below the lower bound, managers select income-increasing discretionary accruals and vice versa.

The purpose of Guidry et al.'s study (1999) was to investigate managers' earnings management decisions to maximize short-term bonuses. Guidry et al. (1999) used a similar methodology to that of Healy (1985) and constructed three portfolios (lower, middle, and upper) to test the bonus-maximization hypothesis. Guidry et al. (1999) used 179 business-unit years for a large multinational conglomerate in the period 1994-1995. Like Healy (1985), Holthausen et al. (1995a) and Gaver et al. (1995), Guidry et al. (1999) assigned business-unit-year observations to one of the three portfolios based on the actual bonus received by business-unit managers.

Guidry et al. (1999) used the total accruals model, the modified Jones' discretionary accruals model, and specific accruals to test for earnings management. They used two-sample parametric t-tests and Wilcoxon two-sample non-parametric tests to examine the differences in means and distributions among the portfolios, respectively. Contrary to Healy (1985), Guidry et al. (1999) found no evidence that managers make income-decreasing discretionary accruals when earnings are below the minimum

necessary to earn a bonus. Guidry et al.'s (1999) results support income-smoothing and are inconsistent with Healy's bonus-maximization hypotheses. Guidry et al. (1999) refer to the smoothing hypothesis as behavior consistent with managers seeking to minimize the difference between budget and actual performance over time.

**Conclusion of Prior Research and Relationship to This Study**

Academic researchers have long argued that in settings where managerial welfare is tied to accounting results, managers have incentives to manipulate accounting numbers (Watts and Zimmerman 1986). The review of the literature on earnings management and compensation highlights the advancement of that important line of research. Studies reveal the importance of considering managers accounting behavior. Table 1 summarizes the important studies, the samples used, the variables, and the results of those studies. An indication of the level of interest by researchers in the findings of the earnings management literature is in the several reviews on this important topic (for example: Dechow and Skinner 2000; Healy and Wahlen 1999; Schipper 1989).

[Insert Table 1 about here]

Despite this broad interest, the empirical results of these studies are conflicting and the interpretations of the evidence are controversial. The inconsistency of the evidence across studies casts doubt on the impact of compensation on earnings management. Although some researchers found support for earnings management behavior related to compensation (for example, Watts and Zimmerman 1978; Zmijewski and Hagerman 1981), others did not find such evidence (see for example, Holthausen 1981; Bowen et al. 1981). Even the significant evidence on earnings management related

to compensation is inconsistent. For example, Zmijewski and Hagerman (1981), Healy (1985), and Skinner (1993) found that the relation between earnings management and compensation depicts an income-increasing behavior supporting the bonus-maximization hypothesis. On the other hand, Holthausen et al. (1995a), Gaver et al. (1995) and Guidry et al. (1999) found evidence supporting income-smoothing behavior.

In fact, there might be several explanations for these mixed results. One reason is the various methodologies utilized in studies that examine the relation between earnings manipulation and compensation. Table 2 provides a taxonomy of these differing methodologies. Researchers have used accounting choice and accruals models to detect earnings management. Even within accounting choices, researchers used different methodologies to detect earnings management. For example, Watts and Zimmerman (1978) examined the relation between voting and lobbying for changes in accounting methods and compensation. Ali and Kumar (1994) used early adoption of mandated accounting choices to capture earnings manipulation behavior. Hagerman and Zmijewski (1979), Zmijewski and Hagerman (1981), Bowen et al. (1981), Healy (1985), Robbins et al. (1993), and Skinner (1993) used a dummy variable or an ordinal scale for the voluntary switching to different accounting methods (such as inventory, depreciation, interest capitalization) to reflect earnings management by managers. Finally, Holthausen (1981) and Collins et al. (1981) tested the price effect or the no-effect hypothesis of accounting choices. On the other hand, Healy (1985), Holthausen et al. (1995a), Gaver et al. (1995) and Guidry et al. (1999) relied on different accruals models (total versus discretionary) to test for earnings management.

[Insert Table 2 about here]

Another possible reason for the conflicting results on the relation between earning management and compensation is the specification of the compensation variable. Table 3 provides a taxonomy of the research on the relation between earnings management and compensation using compensation as the explanatory variable. Most studies captured the compensation variable using a dummy variable for the existence of bonus plans (see for example, Watts and Zimmerman 1978; Hagerman and Zmijewski 1979; Zmijewski and Hagerman 1981; Bowen et al. 1981). Dummy variables may not be sufficiently powerful to detect compensation-related earnings management across firms (Holthausen and Leftwich 1993). Recent studies, starting with Healy (1985), used bonus plan parameters to capture the dimensions of compensation. However, previous studies restricted their attention to firms' annual bonus plans, ignoring stock-based compensation. The different levels and components of compensation can add insight to the investigation of the economic consequences of earnings management.

[Insert Table 3 about here]

Therefore, this study extends prior research by using more relevant, recent, and large-scale compensation data to capture the levels and mix of compensation using continuous compensation variables. [6] Also, this study investigates both the form and the extent of earnings management. In addition, this study investigates the possible, but yet untested, endogeneity between earnings management and compensation. The expected simultaneity is motivated by studies that suggest a relation between earnings management

[6] In addition to the different methodologies and variable specification used in prior research, studies

and compensation may be in the other direction. This other line of research suggests a relation between earnings management and compensation where compensation is the dependent variable (see for example, Abel-Khalik et al. 1987; Clinch and Magliolo 1992; Defeo et al. 1989; Healy et al. 1987). Therefore, this study empirically examines how the magnitude and form of earnings management simultaneously interacts with the level and structure of managers' compensation.

---

varied in their settings and time frame.

# CHAPTER 3

# HYPOTHESES DEVELOPMENT

Prior accounting research has focused attention on whether managers exercise their accounting discretion to influence reported earnings. Empirical studies of earnings management as explained by compensation provide mixed results. In addition, the academic and business communities have shown strong interest regarding the level and structure of executive compensation (Duru and Reeb 2002). However, the inconsistent results of prior research coupled with various methodological issues suggest that the relation between compensation and earnings management is not well understood. Therefore, this study extends the earnings management literature by using both the level of total compensation and its mix, including the stock-based component, to examine the extent and form of the simultaneous relation between earnings management and compensation. I draw upon extensive prior research to formulate the research hypotheses.

## Compensation-Level Hypothesis

This study investigates the extent of earnings management as explained by compensation. There is mixed evidence on whether compensation affects earnings management. Part of these conflicting results may be due to different measures of the compensation variable. Most studies used either a dummy variable for the existence of a bonus plan (see for example, Watts and Zimmerman 1978; Hagerman and Zmijewski 1979; Zmijewski and Hagerman 1981; Bowen et al. 1981) or bonus parameters (Healy

1985; Holthausen et al. 1995a; Gaver et al. 1995; Guidry et al. 1999).[7] This study examines the question of whether compensation, measured as a continuous variable, is related to the extent of earnings manipulation.

The literature also documents important trends in the use of accounting numbers in top executive compensation contracts. There is statistical evidence that over the last decade, accounting profitability measures have become relatively less important in determining cash compensation of top executives, as these plans have shifted toward the use of alternative performance measures including market performance. In addition, cash compensation itself appears to have become a less important component of the overall compensation of top executives as stock and stock option portfolios have increased. Therefore, this study operationalizes the compensation variable using not only the cash compensation but also the total compensation, including stock-based compensation.

The magnitude, in absolute value terms, of total discretionary accruals is the proxy used to detect earnings management. I expect that firms in which top executives receive relatively large amounts of compensation are more likely to manipulate earnings. This is based on the assumptions that as total compensation increases, bonus-based and stock-based compensation increase creating managers' motivations to manipulate earnings. I hypothesize that the magnitude of earnings manipulation increases as total compensation increases. The hypothesis stated in the alternative form is:

*H1: The propensity to manage earnings is positively related to the level of total*

[7] On the other hand, few studies used a continuous variable for compensation to examine the effect of accounting numbers on compensation, i.e., not in the framework of the impact of compensation on earnings management. For example, Abdel-Khalik (1985 and 1987), Antle and Smith (1985), Defeo et al. (1989), and Healy et al. (1987) used the dollar amount of salary plus bonus to capture compensation.

*compensation.*

I predict a positive relationship between the level of total compensation and the extent (absolute value) of earnings management.

**Incentive Hypotheses**

The question is not only whether there is a relation between earnings management and the level of compensation but also whether this relation differs according to the compensation mix: bonus-based compensation versus stock-based incentive compensation. The typical problem analyzed in the principal-agent literature is of risk-neutral stockholders attempting to induce risk-averse agents to take optimal actions (Smith and Watts 1992). The motivational effects of incentive plans on effort-and-risk-averse managers are well articulated in the agency cost literature (Baiman 1989). Incentive contracts are used to tie managers' compensation to a performance measure (e.g., accounting earnings and/or stock prices) that reflects the effects of managers' actions on firm value. Deferred salary payment, insurance plans, non-qualified stock options, restricted stock, stock appreciation rights, performance plans, and bonus plans are popular forms of incentive compensation (Healy 1985). Bonus schemes and performance plans explicitly depend on accounting earnings.[8]

Healy (1985) hypothesizes that managers have an economic incentive to manipulate earnings in order to increase their cash compensation. Healy (1985), and others, interpreted his results as an indication of a strong association between accruals

[8] Bonus and performance plans award managers the value of performance units or shares in cash or stock if certain earnings' targets (typically written in terms of earnings per share, return on total assets, or return on equity) are attained (Healy 1985). The earnings goal horizons are annual and long-term (three or five years) in bonus and performance plans, respectively.

and managers' income-reporting incentives under their bonus plans. Subsequent researchers have pointed to these results as primary evidence that executives engage in the manipulation of earnings as a result of their compensation contracts. In fact, Healy (1985) and Holthausen et al. (1995a) present evidence that managers manipulate earnings to take advantage of the structure of compensation plans to maximize their compensation over time.

Bonus-based compensation plans are important components of CEOs' compensation (Ittner and Larcker 1997 and 1998). Prior research focused on compensation includes Antle and Smith (1985 and 1986), Lambert and Larcker (1987), Sloan (1993), and Smith and Watts (1992). However, most earlier compensation studies used only information about salary plus cash bonus. Most of these studies developed the expected accruals behavior of a manager under the assumption that managers attempt to maximize the expected present value of bonus compensation and that managers have no other compensation tied to accounting earnings nor do they consider the effects of accounting changes, taxes, lending agreements, rate-of-return regulation, etc. (Holthausen et al. 1995a).

The predictions of agency theory (Lambert and Larcker 1987; Banker and Datar 1989) are about the relative weights on earnings and stock prices as explanatory variables for total compensation. Using only salary plus bonus ignores the information contained in stock-based compensation. Although stock-based compensation was a small part of total compensation in the 1980s (Lambert and Larcker 1987), stock-based compensation is now a significant component of CEOs' compensation. Moreover, there is significant

cross-sectional variation in the fraction of total pay that is derived from stock price-based plans.[9] The only recent study that looks at earnings management and stock-based compensation is Gode and Mohanram's study (2000). [10]

Therefore, this study uses information about bonus-based compensation as well as stock-based compensation to examine whether the mix of incentive compensation affects the extent of earnings manipulation. I expect that firms in which top executives receive relatively large amounts of incentive compensation in the form of a bonus are more likely to manipulate earnings. Consequently, I hypothesize that the magnitude of earnings manipulation increases as the component of bonus in compensation increases. Moreover, I hypothesize that the magnitude of earnings management is associated with the mix of stock-based compensation. The hypotheses stated in the alternative form are:

*H2.1: The propensity to manage earnings is positively related to the bonus-based mix of compensation.*

*H2.2: The propensity to manage earnings is related to the stock-based mix of compensation.*

---

[9] Core and Guay (1999) provide different reasons why firms substitute stock option compensation for cash compensation including: cash compensation is expensed whereas the value of stock option grants is only disclosed in the footnotes to the financial statements; cash and financing constraints; grants of options and restricted-stock are not subject to the US Internal Revenue Code section 162(m) one million dollar limit on tax-deductibility of fixed cash pay; and stock options are a less visible means of increasing executive pay.

[10] Gode and Mohanram (2000) examined the effects of managerial attempts to manage earnings through discretionary accruals. They investigated whether the level (extent) of discretionary accruals affects the relative use of earnings and stock prices in CEOs' compensation. However, earnings management was the independent variable, where they focused on the extent of earnings manipulation rather than its form.

I expect a positive relationship between the bonus incentive mix of compensation and the extent (absolute value) of earnings management. However, it is difficult to make predictions concerning the effect of stock-based compensation and earnings management. Therefore, there is no *a priori* expectation on the relation between earnings management and stock-based compensation since this is the first study to empirically examine this relation.

**Income-Smoothing Hypotheses**

Studies testing the relation between compensation and earnings management examined either the form of earnings management (see for example, DeFond and Park 1997) or the magnitude of earnings manipulation (see for example, Bernard and Skinner 1996; Gode and Mohanram 2000). This study focuses on both the extent and form of earnings management. Specifically, the study examines whether different components of compensation result in different earnings management schemes. Therefore, this study considers whether earnings management takes the form of income-smoothing as the components of compensation change. The question is whether firms with different compensation mixes tend to make income-increasing accounting choices (Skinner 1993) or to reduce the variability of reported earnings (Dhaliwal et al. 1999).

A number of studies examine managers' motivation to manipulate earnings, including the influence of short-term bonus plans on managers' discretionary accruals decisions (Healy 1985; Gaver et al. 1995; Holthausen et al. 1995a). Healy (1985) hypothesizes that because short-term bonuses based on accounting earnings compromise a large part of their compensation, managers choose discretionary accruals to maximize

their short-term bonuses. Healy (1985) assumes that each manager observes income before discretionary accruals and makes either income-increasing or income-decreasing discretionary accruals based on his/her incentives. Healy (1985) reports that managers use discretionary accruals to maximize short-term bonus compensation (bonus-maximization hypothesis).

Recent studies (Holthausen et al. 1995a; Gaver et al.1995) reexamined the issue of short-term bonus plans and earnings management. Holthausen et al. (1995a) report evidence consistent with Healy that managers make income-decreasing discretionary accruals after they reach their maximum bonus level. Guidry et al.'s (1999) results are consistent with Healy's bonus-maximization hypothesis. However, contrary to Healy, they find no evidence that managers make income-decreasing discretionary accruals when earnings are below the minimum necessary to earn a bonus. The results in Gaver et al. (1995) are inconsistent with Healy's bonus-maximization hypotheses and support income-smoothing.

Conflicting incentives also limit the power of tests of the bonus-maximization hypothesis. Prior research suggests that managers have competing incentives to engage in income-smoothing (i.e., stock-based compensation) or bonus-maximization (i.e., bonus-based compensation) behavior. In an effort to maximize their wealth, managers must consider the joint effects that discretionary accruals decisions have on their reputation, stock ownership, stock-based compensation, and earnings-based compensation. However, previous research suggests that reputation, stock ownership, and stock-based compensation induce managers to engage in different earnings management behavior.

Specifically, stock-based compensation might motivate managers towards income-smoothing behavior.[11]

Managers choose a reporting strategy that maximizes expected compensation, taking into account the effect of earnings reports on investors' perceptions and consequently management's' compensation.[12] For example, several studies (Hunt et al. 1995; Trueman and Titman 1988; Moses 1987) suggest that income-smoothing affects market perceptions of earnings volatility leading to higher share prices giving managers with significant stock holdings or stock-based compensation incentive to smooth earnings. Goel and Thakor (2003) provide analytical evidence that managers smooth income when compensation is tied to stock price. Interestingly, what might cause income-smoothing is managers' concern about long-term stock price performance rather than just the current stock price. Thus, a firm whose manager's compensation contract is tied to long-run performance is more likely to smooth earnings than a firm whose manager's compensation contract is tied to short-term performance.

[11] Earnings management means manipulating reported earnings so that they do not accurately represent economic earnings at every point in time. Income-smoothing is a special case of earnings management involving intertemporal smoothing of reported earnings relative to economic earnings making earnings look less variable through time (Goel and Thakor 2000). Income-smoothing is extensively documented, see: Hunt et al. (1996), Pincus and Rajgopal (2002), Schipper (1989), and Subramanyam (1996). Factors that generally provide managers with incentives to smooth income include maintaining a stable rate of dividend payouts, offsetting the impact of mark-to-market accounting, reducing income taxes, and increasing compensation.

[12] The existing literature has provided alternative explanations for income-smoothing ranging from income-smoothing as a signaling device (Barnea et al. 1975; Dye 1988), income-smoothing as cost-minimizing (Trueman and Titman 1988), and income-smoothing as managerial self-interest (Lambert 1984).

Therefore, this study examines the form of earnings management as a function of the components of management compensation. I hypothesize that the propensity to smooth earnings is a decreasing function of bonus-based compensation. In other words, managers with high bonus-based compensation are more likely than low earning-based compensation to select income-increasing accounting choices rather to smooth earnings. In addition, I hypothesize that the propensity to smooth earnings is an increasing function of stock-based compensation. Managers are more likely to smooth earnings when their compensation is tied to long-term performance than tied to short-term performance. The hypotheses stated in the alternative form are:

*H3.1: Managers practice less income-smoothing as the component of bonus-based compensation increases.*

*H3.2: Managers practice more income-smoothing as the component of stock-based compensation increases.*

I predict a negative relationship between managers' income-smoothing behavior and bonus-based compensation. In addition, I expect a positive relationship between managers' income-smoothing behavior and stock-based compensation.

**Endogeneity Hypothesis**

Asymmetric information and managers' use of their judgment to select reporting methods, estimates, and disclosures create opportunities to manipulate earnings. Earnings management behavior is motivated, at least partly, by management compensation. Previous studies (Holthausen et al. 1995a) provide evidence that managers manipulate earnings to take advantage of the structure of the compensation plans to maximize their

compensation over time. In addition, earnings management also affects the amount of compensation. Goei and Thakor (2003) suggest that managers choose reporting strategies that maximize expected compensation, taking into account the effect of earnings reports on investors' perceptions and subsequently management's compensation. The main interest in this study is the interaction between the level and mix of compensation and earnings management. Therefore, this study investigates whether the relation between earnings management and compensation is simultaneously determined. My purpose is to explore how earnings management interacts with the level and structure of managers' compensation suggesting a two-way feedback between earnings management and compensation.

Prior research provides evidence on the effect of compensation on earnings management (for example, Bowen et al. 1981; Gaver et al. 1995; Guidry et al. 1999; Hagerman and Zmijewski and Hagerman 1981; Healy 1985; Watts and Zimmerman 1978). These studies, however, do not actually demonstrate that the assumed manipulation enabled managers to increase their compensation. In the meantime, Abdel-Khalik (1985), Abdel-Khalik et al. (1987), Defeo et al. (1989), and Healy et al. (1987) provide some evidence that earnings management affects compensation.

While a growing body of work has examined these components separately as functions of each other, only recently have researchers begun to explore the hypothesis that they are jointly determined. For example, researchers explored the potential joint determination of compensation with investment activity (Holthausen et al. 1995a; Johnson et al. 2000; Lee 1998). Therefore, this study relaxes the assumptions of prior

research that ignored the endogeneity in agency relations. Specifically, the study incorporates the endogenous nature of compensation and earnings management. Exploring the joint determination of earnings management and compensation is important because we gain insight into how compensation affects managers' earnings management behavior. In addition, I seek to establish the link between earnings management and compensation. By explicitly allowing the compensation form to be jointly determined with earnings management, I reduce the chance that the results are biased when their simultaneity is ignored. Thus, the fourth hypothesis is:

*H4: Compensation and earnings management are endogenously determined.*

I expect that the relation between the level and mix of compensation and earnings management to be simultaneous.

In the conclusion to this chapter, this study builds on and extends prior studies to develop four research hypotheses regarding the relation between compensation and earnings management. Specifically, hypotheses 1 through 4 posit a positive relation between the propensity to manage earnings and the level and mix of compensation through a two-way relation. In addition, the study hypothesizes that the form of earnings management is contingent on the mix of compensation. The next chapter introduces the methodology used to test the research hypotheses and the data, variables, and models.

# CHAPTER 4

# RESEARCH METHODOLOGY

In this chapter, I describe the sample selection process and the data used to test the research hypotheses. I also discuss the research design and the empirical models used to investigate the simultaneous relation between earnings management and compensation.

## Sample and Variables Measurement

### Data Sources

I use panel data to test the research hypotheses. Panel data allows the study of both variations of a single firm over time and variations of many firms at a given point in time (Pindyck and Rubinfeld 1998). In addition, other advantages of panel data are the increased number of data points (additional degrees of freedom and power of tests) and the decreased likelihood of an omitted-variables problem. I obtain data on CEOs' compensation and ownership from Standard and Poor's Execucomp database. COMPUSTAT is used as the source for firms' financial data. Information about the components of compensation was not available before 1992.[13] Therefore, I use a sample of firms with annual data available over the period 1992-1998 to test for the magnitude of earnings management through accruals.[14] To be included in the sample, a company must satisfy the data availability requirement on the two databases.[15]

---

[13] The U.S. Securities and Exchange Commission has required firms to disclose information about CEOs' compensation starting December 31, 1992.

[14] I use a sample of firms with quarterly data to test for income-smoothing.

[15] I exclude insurance and bank industries (SIC=60-69) from the sample.

**The Earnings Management Proxy**

Managers could manage earnings through the choice of accounting policies, accruals, and/or real economic decisions. Evidence suggests that it is more costly for managers to transfer earnings between periods by changing accounting procedures than by changing accruals (Healy 1985). Firms rarely change accounting procedures annually, whereas, managers appear to have greater flexibility to change accruals.[16] Therefore, I use accruals to capture earnings management behavior.

Despite the popular wisdom that earnings management exists, it has been remarkably difficult for researchers to convincingly document (Healy and Wahlen 1999). This problem arises primarily because empirical studies of earnings management often use abnormal accruals as a proxy for the managed (discretionary) component of earnings based on the abnormal accruals research design pioneered by Healy (1985), De Angelo (1986 and 1988), Liberty and Zimmerman (1986) among others.[17] This requires an estimation model that separates total accruals into its discretionary and nondiscretionary

[16] Accounting earnings consist of cash flows from operations and accruals. Accruals modify the timing of reported earnings and are composed of non-discretionary accruals and discretionary accruals. Non-discretionary accruals are accounting adjustments to the firm's cash flows mandated by accounting standard-setting bodies (e.g., the Securities Exchange Commission and the Financial Accounting Standards Board). Discretionary accruals are adjustments to cash flows selected by the manager. The manager chooses discretionary accruals from an opportunity set of generally accepted procedures defined by accounting standard-setting bodies. Therefore, discretionary accruals enable managers to transfer earnings between periods (Healy 1985). Managers observe cash flows from operations and non-discretionary accruals at the end of each year and selects discretionary accounting procedures and accruals to maximize their expected utility (Healy 1985).

[17] Previous studies used different models as proxies for earnings management. For example Healy (1985), Holthausen et al. (1995a), Gaver et al (1995), and Guidry et al. 1999) used total accruals as a proxy for earnings management. Jones (1991) and Healy (1985) used Jones model to estimate discretionary accruals. Holthausen et al. (1995a), Gaver et al (1995), Gode and Mohanram (2000), and Guidry et al. (1999) used the modified Jones model, developed by Dechow et al. (1995), as a proxy for discretionary accruals. Holthausen et al. (1995a), Gaver et al (1995) used the market-index model to estimate discretionary accruals.

components. Once the model is estimated (either in time-series or cross-sectionally), the researcher uses forecasted values to estimate nondiscretionary accruals. Estimated discretionary accruals are the residuals from the regressions.

Following empirical studies on earnings management, I use discretionary accruals as a proxy for the managed component of earnings. Since a firm's discretionary accruals are unobservable, an estimation model that separates total accruals into its discretionary and nondiscretionary components is used. [18] Earnings management studies relied on different estimation methods for accruals. Therefore, I estimate discretionary accruals using a variation of the cross-sectional modified Jones (1991) model.[19] This involves the estimation of a cross sectional regression for each sample firm using existing public firms matched on industry (same two-digit SIC code) during the same fiscal year.

Consistent with prior research (Bowen et al. 1986; DeFond and Jiambalvo 1994),

---

[18] McNichols (2000) discusses the trade-offs associated with the different designs commonly used in the earnings management literature to test for accruals: aggregate accruals, specific accruals, and the distribution of earnings after management. As opposed to the aggregate accruals design, a number of recent studies examine earnings management by focusing on specific accruals, which enhances precision but does not capture accruals manipulations in many other accounts. McNichols and Wilson (1988) examined bad debt provisions. Beatty et al. (1995), Beaver et al. (1989), Moyer (1990), Scholes et al. (1990), and Wahlen (1994) examined loan loss provisions for banks. Beaver and McNichols (1998), Petroni (1992), and Petroni et al. (1999) examined claim loss reserves for property-casualty insurers. Ayers (1998), Miller and Skinner (1998), and Visvanathan (1998) examined deferred tax valuation allowances. In addition, a number of studies use a new approach to test earnings management (Burgstahler and Dichev 1997 and 1998; Burgstahler and Eames 1998; Degeorge et al. 1999; Myers and Skinner 2000; Plummer and Mest 2001). These studies examine the distribution of reported earnings around predicted thresholds (for example, to avoid earnings decreases and losses, to meet or beat analysts' earnings forecasts, etc....) to assess whether there is evidence of earnings management. The primary advantage of this approach is that there is no need to rely on a model to decompose earnings components into their discretionary and nondiscretionary parts. In addition, this approach captures any effects of earnings management through the firm's management of cash flows. However, these distribution-based studies require strong *a priori* reasons for earnings management, a requirement not valid in this study.

[19] Following Barton (2001) and Kasznik (1999), I am using the cross-sectional version of the Jones (1991) model as opposed to the time series version (see for example: Holthausen et al. 1995a). The cross-sectional model controls for effects of industry-wide economic conditions on total accruals and allows the coefficients to vary across years (DeFond and Jiambalvo 1994; Kasznik 1999). Furthermore, the time series regression requires at least ten years of data, a requirement that might limit the sample size negatively.

I define total accruals as the difference between net income before extraordinary items and operating cash flows (DeAngelo 1988). Total accruals are calculated directly from the statement of cash flows to avoid measurement error (Hribar and Collins 2002). Then, I use total accruals in the cross-sectional, industry regressions specified as follows:

$$TAC_{i,t} = \beta_0 + \beta_1 PPE_{i,t} + \beta_2 \Delta ADJREV_{i,t} + \varepsilon_{i,t} \quad (1)$$

where *TAC* is the total accruals defined above; *PPE* is gross property, plant, and equipment; and *ΔADJREV* is the change in net revenue adjusted for the change in accounts receivables. I scale all variables in the discretionary accruals model by lagged total assets to reduce heteroscedacity (Jones 1991; Gaver et al. 1995). Ordinary least squares regression is used to obtain estimates for the parameters. Then, the estimated regression coefficients are used in the fitted equation to estimate non-discretionary accruals and the residuals proxy for discretionary accruals.

The expectation parameters are based on the Jones (1991) and Dechow et al. (1995) models adjusting accruals for the level of property, plant, and equipment and the change in revenue, and therefore, relaxing Healy's (1985) assumption.[20] Property, plant, and equipment are included based on the assumption that a large portion of total depreciation expense in a given period is nondiscretionary in that period (DeAngelo 1986; Jones 1991). Revenue is assumed to affect working capital accounts (Cahan 1992). Following Dechow et al. (1995) and Kasznik (1999), I relax Jones's assumption that revenues are nondiscretionary and, therefore, adjust the sales revenue variable for

[20] Healy assumed that expected accruals are constant across the comparison groups used, that cash flows are not manipulated by managers, accruals decisions affect only earnings (not cash flows), and the level of accruals does not vary with economic activity (Kaplan 1985).

accounts receivables. Results in Dechow et al. (1994) are consistent with the modified version of the Jones model measuring earnings management with less error in the presence of sales manipulations (through credit sales recognition). Therefore, the modified Jones model is considered among the best models currently available for detecting accounting manipulation (Holthausen et al. 1995a).

I use the variable *ABSDAC* as the absolute value of discretionary accruals to measure the magnitude of discretionary accruals. I use the variable *SMOOTH* to test whether earnings management takes the form of income-smoothing. Following Pincus and Rajgopal (2002), I proxy for income-smoothing using the discretionary accruals-smoothing ratio for each firm-year based on quarterly data. The discretionary accruals-smoothing ratio (*SMOOTH*) is the standard deviation of the firm's unmanaged quarterly earnings in year *t* divided by the standard deviation of its quarterly earnings in the same year.[21] Larger values of *SMOOTH* imply smoothing using discretionary accruals since that reduces the variability of earnings, the denominator, relative to the variability of nondiscretionary earnings, the numerator (Pincus and Rajgopal 2002). A smoothing-ratio greater than one indicates income-smoothing.

**Compensation Variables**

CEOs' compensation packages generally consist of five components: base salary, cash bonus compensation, stock options, restricted stock, and other long-term compensation. Base salary and cash bonus are awarded based on managers' performance against predetermined goals for a relatively short period of time, usually one year. Other

[21] Unmanaged quarterly earnings is defined as nondiscretionary quarterly earnings and calculated as

long-term incentive plans, e.g., performance plans, reward managers on the basis of certain goals, including accounting, for a three-to-five-year period into the future. Stock options and restricted stock are awarded to align managers' interests with those of investors in the long run, since the value of stock options and restricted stock varies with market prices.

I use two measures of compensation: level and mix. The level of compensation (*TOTCOM*) is operationalized as total compensation calculated as the sum of salary, annual cash bonus, long-term incentive plans, estimated value of stock options, restricted stock and other long-term compensation, scaled by lagged total assets. Following previous studies, the value of stock options is estimated using the Black-Scholes formula and the value of restricted stock is based on the market price on the grant date.

Bonus-based compensation and stock-based compensation are used to capture the mix of compensation. Bonus-based compensation (*BONCOM*) is calculated as annual bonus scaled by lagged total assets. Stock-based compensation (*STKCOM*) is calculated as the sum of the estimated value of stock options and restricted stock, scaled by lagged total assets.

**Models of the Relation between Earnings Management and Compensation**

I use the following general model to test hypotheses 1 through 4:

$$DAC_{i,t} = \alpha_{10} + \alpha_{11}\, COMP_{i,t} + \alpha_{12}\, DAC\ CONTROLS_{i,t} \qquad (2)$$

where *DAC* is discretionary accruals defined as the absolute value of discretionary accruals (*ABSDAC*) or smoothing ratio (*SMOOTH*); *COMP* is compensation measured as

---

quarterly operating cash flows plus quarterly nondiscretionary accruals (using modified cross-sectional

total compensation (*TOTCOM*), bonus-based compensation (*BONCOM*), or stock-based compensation (*STKCOM*); *DAC CONTROLS* are additional explanatory variables for the discretionary accruals equation. I discuss these variables in the next section and Table 4 summarizes them and their measurement. I use ordinary least squares (OLS) to estimate the model in equation (2).

[Insert Table 4 about here]

The focus of this research is to investigate the dynamic relation between earnings management and compensation. I assume that compensation and earnings management decisions are endogenous components: i.e., they are endogenous to managers, and decisions about each affect the other. This requires the use of a simultaneous equation system that relates earnings management and compensation. Therefore, I develop a two-equation system in which the compensation regression includes the accruals variable and the accruals regression includes the compensation variable.[22] I use the following general model to test hypotheses 1 through 4:

$$DAC_{i,t} = \alpha_{10} + \alpha_{11}\, COMP_{i,t} + \alpha_{12}\, DAC\ CONTROLS_{i,t} \quad (3)$$

$$COMP_{i,t} = \alpha_{20} + \alpha_{21}\, DAC_{i,t} + \alpha_{22}\, COMP\ CONTROLS_{i,t} \quad (4)$$

where *DAC* is discretionary accruals defined as the absolute value of discretionary accruals (*ABSDAC*) or smoothing ratio (*SMOOTH*); *COMP* is compensation measured as total compensation (*TOTCOM*), bonus-based compensation (*BONCOM*), or stock-based compensation (*STKCOM*); *DAC CONTROLS* and *COMP CONTROLS* are additional explanatory variables for the discretionary accruals and compensation equations,

---

Jones model) scaled by quarterly lagged total assets.

[22]The simultaneous equation approach provides a way to relax the assumptions of prior research

respectively. The simultaneous equation estimation procedure requires that at least some exogenous (or instrumental) variables be included in each equation and excluded from the other. Therefore, these exogenous and predetermined variables are crucial for the application of the simultaneous equation procedure. I discuss these variables in the next section and they are summarized in Table 4.

The identification of a set of simultaneous equations requires variables whose values are not determined directly within the system. The number of exogenous variables in the compensation and accruals equations satisfies the order condition for identification. However, this might introduce another problem related to overidentification of the model. Therefore, I use the Basmann (1960) test for correlated omitted variables. The Bassman test examines the null hypothesis that relevant exogenous variables not appearing in an equation have zero coefficients. Furthermore, the fact that the data is cross-sectional requires testing for heteroscedasticity. Hence, I use a combination of Basmann, Hausman, and White tests in addition to regular tests for time-series data (i.e., tests for serial correlation and multicollinearity).

I use two-stage least squares (2SLS) to estimate the model in equations (3) and (4). Estimating the system of equations using 2SLS addresses the effect of solving both the correlated omitted variable and endogeneity problems. I determine the predicted values of the two endogenous variables (*DAC* and *COMP*) and include them along with the exogenous variables in second-stage regressions. Therefore, the endogenous variables are simultaneously determined by an interrelated series of equations.

---

regarding the endogenous nature of either the compensation (level and structure) or earnings management.

H1 states that the level of compensation affects the magnitude of earnings management. Therefore, I use the absolute value of discretionary accruals, *ABSDAC*, and the total compensation scaled by lagged total assets, *TOTCOM*, to test the relation between the level of compensation and the extent of earnings management. H1 is supported if $\alpha_{11}$, $\alpha_{21}$, or both are positive and significant in equations (3) and (4).

According to H2, I expect a positive relationship between the bonus-based compensation and the absolute value of earnings management. However, there is no *a priori* assumption on the relation between earnings management and stock-based compensation. Accordingly, I use the absolute value of discretionary accruals, *ABSDAC*, and bonus-based and stock-based compensation for *TOTCOM*, *BONCOM* and *STKCOM*, respectively. I predict a positive sign for *BONCOM* and make no prediction for *STKCOM*.

H3 states that the mix of compensation affects the form of earnings management. Specifically, H3.1 predicts a negative relationship between managers' income-smoothing behavior and bonus-based compensation. I use *SMOOTH* and *BONCOM* to test for this relation. H3.2 expects a positive relationship between managers' income-smoothing behavior and stock-based compensation. Therefore, *SMOOTH* and *STKCOM* are substituted for *DAC* and *COMP*, respectively, in equations (2) and (3). I expect significant and positive coefficients for the endogenous variables.

H4 states that there is a simultaneous relation between compensation and earnings management. Therefore, I expect the signs for *COMP* in the earnings management equation and the *DAC* in the compensation equation to be positive. I test for endogeneity

using Hausman (1978) specification tests.

**Control Variables Common for Earnings Management and Compensation**

Prior research in both compensation and earnings management suggest that size, growth opportunities, managerial ownership, and regulation are related to compensation and earnings management. The inclusion of the size variable, *SIZE*, in both earnings management and compensation equations is motivated by the political cost theory (Watts and Zimmerman 1978). I measure *SIZE* as the log of total sales for the year. In addition, higher growth firms are more likely to manage earnings (Pincus and Rajgopal 2002). The more a firm's value is dependent on growth opportunities, the more exposure it faces regarding earnings volatility. Previous research has documented that compensation is also associated with the investment opportunity set (Baber et al. 1996; Gaver and Gaver 1993). The investment opportunity set affects compensation through the demand for skill and the premium paid to compensate for risk (Lulseged and Christie 2003). One proxy for growth opportunities (*IOS*) is the market-to-book (M/B) ratio measured as the market value of equity plus book value of debt divided by book value of assets at the beginning of the year.

Theory predicts that managerial ownership affects the agency problem between managers and shareholders resulting in a systematic relation with earnings management (Warfield et al. 1995). However, stock holdings, bonuses, and stock options may provide managers with different incentives to manage earnings (Barton 2001). In addition, ownership structure affects the mix of compensation (Lulseged and Christie 2003). In other words, different ownership structures affect the relation between compensation and

earnings management in various ways. Following Duru and Reeb (2002), I measure managerial ownership (*OWN*) as the percentage of outstanding shares owned by the CEO.

I also include the regulatory environment (*REG*) as a control variable in equations (2) and (3). Firms operating in a regulated industry behave differently (Smith and Watts 1992). Regulation constrains managers' actions, presumably making earnings management more difficult (Warfield et al. 1995). In addition the total and mix of compensation is different for regulated firms. Therefore, I use a dummy variable (*REG*) to denote regulated industries (gas and electric utility, SIC=49). *REG* equals one for firms operating in a regulated industry and zero otherwise.

**Control Variables for Earnings Management**

Earnings management literature suggests a relation between some additional variables and earnings management. I include the lag of earnings management, *LAGDAC* and *LAGSMTH*, due to the reversing nature of earnings. Managers' accounting choice decisions in one year affects and is affected by accounting choices in other years.

Dechow et al. (1994) found that cash flows from operations are negatively correlated with total accruals. Therefore, I include cash flows from operations (*CFO*) as a control variable in equation (2). Leverage (*LEV*) and the cost of capital (*DPOR*) are related to managers' earning behavior. The more debt a firm has, the more likely it is to manage earnings to reduce the probability of financial distress in the presence of debt contracts (Barton 2001; Pincus and Rajgopal 2002). I use total debt scaled by total assets to proxy for financial leverage. Also, firms with higher earnings volatility have to

maintain a lower dividend level to avoid costs of cutting their dividend (cost of capital). Therefore, managers have the incentive to smooth income to maintain a more stable dividend payout ratio (Minton and Schrand 1999; Pincus and Rajgopal 2002). I compute dividend payout ratio (*DPOR*) as dividends to common shareholders divided by earnings before extraordinary items.

Monitoring environment and industry flexibility to manipulate earnings affect the accruals decision. Monitoring is considered a restriction on managers' ability to opportunistically manage discretionary accruals (Pincus and Rajgopal 2002). Exchange membership and the quality of an audit reflect a superior information environment. Therefore, I use an indicator variable (*MONDAC1*) that equals 1 if a firm's shares are traded on the NYSE, 0 otherwise. I also use a dummy variable (*MONDAC2*) that equals 1 if a firm's auditor is a Big Five firm.

Managers' flexibility to manage earnings might affect their manipulation behavior (Barton 2001). The extent of discretion exercised in a particular industry determines managers' flexibility to manipulate earnings. I use the root mean squared error of the cross-sectional accruals expectation regression used to estimate discretionary accruals as a proxy for industry flexibility (*FLEX*).

**Control Variables for Compensation**

Prior compensation literature suggests that lagged compensation, effectiveness of monitoring, the horizon problem, tenure, and risk are determinants of CEOs' compensation.[23] To control for the problem of potential omitted variables, I include these

[23] See for example, Duru and Reeb (2002).

variables as controls in the compensation equation. I include the lag of compensation, *LAGTOT*, *LAGBON* and *LAGSTK*. Changes in accounting procedures affect earnings and compensation, including bonus plan bounds, in the current and future years. Therefore, managers consider the effect of alternative accounting methods on the present value of their compensation awards.

I use a dummy variable equals to one if the CEO is also the chairman of the board of directors and zero otherwise to control for the effectiveness of monitoring (*MONCOMP*) by the board of directors. I include a dummy variable that is unity when the CEO is 64 years or older to control for the horizon problem (*HOR*). I control for the tenure (*TENU*) using the number of years as a CEO. In addition, prior research has documented that compensation is associated with systematic risk. Therefore, I control for systematic risk *(RISK)* measured as the standard deviation of stock returns calculated over 60 months prior to the beginning of the fiscal year.

# CHAPTER 5

# EMPIRICAL RESULTS AND ANALYSES

This chapter describes the sample selection procedure, provides descriptive statistics on selected variables, and presents the results of the ordinary and two-stage least squares regressions used to test the research hypotheses.

## Sample and Descriptive Statistics

I use the ExecuComp database to obtain compensation details, executive ownership and compensation control data. The version of the data set I use includes annual information on the top five executives for 9,714 firm-year observations for the years 1992-1998. I obtain information needed to compute discretionary accruals and control variables from Compustat. The intersection of these two databases and the selection process yields a final sample of 3,938 firm-year observations covering the period from 1992 to 1998. However, since testing income-smoothing requires quarterly data, the same set of procedures results in a final sample of 2,529 firm-year observations covering the period 1994-1998.[24]

I eliminate annual observations with multiple CEOs by using the executive specified in Execucomp as being the CEO for all or most of the fiscal year. Firm-year observations are deleted due to missing data for the accruals estimation model. I also eliminate observations with undue influence on the parameters of the accruals estimation model. Because I use the modified Jones model to estimate discretionary accruals, I

[24] I use the period 1994-1998 because most of the quarterly data required to compute income-smoothing

require at least 5 firm-years per industry (2-digit SIC) for inclusion in the sample. Financial institutions (SICs 6000-6999) are deleted because discretionary accruals estimation is problematic for these firms. Following prior studies (e.g., DeFond and Park 1997; Gul et al. 2000), I trim the sample to mitigate outlier effects.[25] Table 5 describes the sample selection procedures.

[Insert Table 5 about here]

Table 6 provides details on the industry characteristics of the sample and the distribution of the observations across years. Typical of samples in which Compustat data is used, the majority of the sample is comprised of firms in manufacturing and natural resources (SIC codes 1000-3999), 59.45% and 65.3% for the discretionary accruals sample and income-smoothing sample, respectively. The number of firm-years in the sample is consistent across time except for the first (1992) and last (1998) years. For 1992, fewer firms are expected since the SEC first required electronic filing of proxy statements and disaggregation of compensation in 1992. The last year for the version of ExecuComp I am using is 1998 leading to incomplete data in 1998. The frequency of observations across years for the discretionary accruals sample ranges from a low of 143 in 1992 to a high of 706 in 1997. For the income-smoothing sample, the frequency of observations ranges from a low of 430 in 1994 to a high of 580 in 1997.

[Insert Table 6 about here]

---

directly from the statement of cash flow is missing before 1994.

[25] I winsorize the data using a 1% criteria on each tail.

Table 7 reports the descriptive statistics of variables representing selected financial characteristics, compensation data, endogenous variables, and control variables used in the subsequent analyses. Most of the results are similar to those reported by prior studies. Since the analysis is over a relatively short period of time in which inflation was low, I use nominal dollar amounts and make no adjustments for inflation. Note that not all the companies in the sample have data for all years.

Panel A of Table 7 summarizes the descriptive statistics of selected financial data. Although the sample firms may not represent the Compustat population, they are similar to firms analyzed in other compensation studies. The firms are large, with mean sales and assets in excess of $3 billion. The sample firms tend to be profitable, with mean (median) return on assets of 4.7% (5.4%) for the discretionary accruals sample and 4.9% (5.6%) for the income-smoothing sample. The distribution is also skewed by some very large firms as can be seen from the large difference between the mean and the median values of sales and assets.

[Insert Table 7 about here]

Panel B of Table 7 reports descriptive statistics for CEO compensation data. For the discretionary accruals sample, the median CEO total compensation is $1.5 million. Of this total, 33% is salary, 20% is bonus, and 22% is stock-based compensation. Similarly, in the income-smoothing sample, the median CEO total compensation is $1.7 million. Thirty percent represents salary, 20% is bonus, and 25% is stock-based compensation. Compensation is skewed and has high variability across firms. For example, the standard deviation of total compensation is approximately $2.7 million for the discretionary

accruals sample and approximately $2.9 million for the income-smoothing sample.

Panel C of Table 7 reports descriptive statistics for the dependent and control variables used in the empirical tests. Consistent with previous studies, the estimate of discretionary accruals (*DAC*) computed by the modified Jones model has a mean and median that is slightly negative. The mean and median absolute values of discretionary accruals (ABSDAC) are 0.05 and 0.03, respectively. The mean (median) smoothing ratio (*SMOOTH*) is 5.19 (3.24). This is indicative of extensive smoothing of income through discretionary accruals (Pincus and Rajgopal 2002).[26]

Across the two samples, mean (median) total compensation scaled by lagged total assets (*TOTCOM*) is approximately 4 (2) with considerable variation among observations (standard deviation of about 8).[27] Stock-based compensation (*STKMIX*) is greater than bonus-based compensation (*BONMIX*). The mean and median for *BONMIX*, defined as annual bonus scaled by lagged total assets, are approximately 2 and 0.7. The mean and median for *STKMIX*, defined as the sum of the values of stock options and restricted stock scaled by lagged total assets, are the same as those for *BONMIX*, with more variation in *STKMIX*.

Descriptive statistics for the control variables indicate that firms are leveraged (*LEV*) to a considerable degree in both samples with means (medians) of approximately 1.2 (0.2). Also, observations in both samples reflect relatively high growth firms (*IOS*), with mean (median) of approximately 3.3 (1.5). Approximately 7% of the observations are in regulated industries for the discretionary accruals sample, whereas only 1% of the

[26] Values in excess of 1 indicate more variability in earnings before discretionary accruals than in

firm-years for the income-smoothing sample are regulated firms. Operating cash flows, scaled by lagged total assets, averages –0.4 (median = -0.1) for the two samples.

Few firms pay dividend. The mean (median) dividend payout ratio is 0.27 (0.12) and 0.21 (0.10) for the discretionary accruals and income-smoothing samples, respectively. Across both samples, seventy percent of firms' shares are traded on the NYSE and 98% are audited by one of the Big 5 accounting firms. Industry flexibility is measured as the square root of the sum of the squared residuals scaled by the number of degrees of freedom. The data comes from the two-digit SIC code regressions used to estimate discretionary accruals. The average *FLEX* over both samples is 0.09.

The median CEO ownership of the company is 3% and median CEO tenure is 7 years. The CEO chairs the board in over 90% of the observations and over 13% of the firm-years have CEOs close to retirement (older than 64). The mean level of risk (measured by the standard deviation of stock returns calculated over 60 months) is 0.34 for both the discretionary and income-smoothing samples.

**Magnitude of Earnings Management**

Table 8 presents summary statistics for the magnitude of earnings management (*ABSDAC*) based on ordinary least squares (OLS). The signs and significance of the control variable coefficients in columns 1-3 are as expected and consistent with prior research. Specifically, the magnitude of earnings management increases for high growth firms and decreases for regulated firms. Also, as size, leverage, and extreme cash flows increase, the extent of earnings manipulation decreases. In addition, the magnitude of

---

earnings after discretionary accruals.

earnings management increases for firms in industries with more flexible GAAP and for firms not listed on the NYSE. The lagged value of the absolute discretionary accruals, *LAGDAC*, is positive and significant indicating accrual reversals.[28]

[Insert Table 8 about here]

Table 8, also, reports the results of estimating equation (2) using the level and mix of compensation. The regressions have an adjusted $R^2$ of approximately 15%. As expected, the coefficient for *TOTCOM* is positive and significant at the 1% level (column 4). This result supports H1, i.e., the magnitude of earnings management increases as the level of total compensation increases. Columns 5 and 6 show the coefficients from regressing *ABSDAC* on the mix of compensation. The coefficients for *BONMIX* and *STKMIX* are positive and significant at the 5% and 1% levels, respectively. These results indicate that CEOs have incentives to manage earnings to increase their bonus-based and stock-based compensation, indicating support for H2.

The results from estimating simultaneous equations for earnings management and compensation using two-stage least squares (2SLS) are presented in Tables 9, 10, and 11. Following Barton (2001), I use 2SLS since all of the systems, except for the *BONMIX* model, are overidentified according to the Basmann (1960) test.[29] In addition to addressing the effect of solving the correlated omitted variable problem, 2SLS accounts for potential endogeneity of the variables included as regressors. Furthermore, 2SLS is

---

[27] All compensation variables are scaled by lagged total assets.

[28] Managers who manipulate earnings in one period have to manage earnings in subsequent periods to achieve the same level of earnings (Barton 2001; Hunt et al. 1996).

[29] The Basmann (1960) test rejects the hypotheses that the equations *ABSDACs*, *TOTCOM*, and *STKMIX* are not overidentified. The test does not reject the hypothesis that the *BONMIX* equation is not overidentified.

valid asymptotically, providing consistent and unbiased estimates, and is not affected by misspecification and measurement errors.[30]

The Hausman (1978) specification test for endogeneity shows that *ABSDAC* is endogenous to total compensation and stock-based compensation. However, the Hausman test does not reject the hypothesis that *ABSDAC* is exogenous in the *BONMIX* equation. I conduct Hausman specification tests for compensation equations and find that *TOTCOM*, *BONMIX*, and *STKMIX* are endogenous to the magnitude of earnings management. These results suggest that the extent of earnings management and compensation are determined jointly, except for *ABSDAC* in the *BONMIX* equation. Therefore, the results of the Hausman test provide partial support for H4.

Table 9 reports the results for the *ABSDAC* and *TOTCOM* equations. Similar to the results from OLS, I find strong evidence that the magnitude of earnings management (*ABSDAC*) is positively associated with total compensation (*TOTCOM*). The association is significant at the 1% level of significance. This implies that managers manipulate earnings to increase their level of total compensation. Not surprisingly, the lagged values of *ABSDAC* and *TOTCOM* are significant. Other than *MONDAC1* and *FLEX*, the signs of the coefficients of the control variables in the *ABSDAC* equation are not as expected and differ from those based on OLS.[31]

For example, the relation between *SIZE* and *ABSDAC* is expected to be negative.

---

[30] 2SLS yields consistent and unbiased estimates even in the presence of measurement error. The procedure is also robust to the presence of other estimation problems such as collinearity and specification error (see: Barton 2001; Kennedy 1998). In fact, there seems to be specification problems in OLS regressions of *ABSDAC*. The White statistics reject the joint hypothesis that the equations are well specified and homoscedastic.

[31] This is consistent with the conclusion from the Hausman test and the possible endogeneity in

However, the coefficient is significantly positive. This might be explained by the notion that larger firms are followed by more analysts and are pressured to report more predictable earnings (Pincus and Rajgopal 2002). This result is consistent with large firms managing earnings extensively to meet earnings predictions.

[Insert Table 9 about here]

*SIZE* in the *TOTCOM* equation is negative and significant. *IOS* in the *TOTCOM* equation is positive and significant, consistent with the conjecture that firms with larger investment opportunity sets require more skilled managers to make those investment decisions (Smith and Watts 1992). *OWN* in the *TOTCOM* equation is negative and significant, consistent with the assumption that ownership by the CEO substitutes for increased pay. The coefficient for *REG* in *TOTCOM* equation is as expected, negative and significant. This is consistent with the evidence in Murphy (1998) that CEOs of firms in regulated industries such as utilities have relatively lower pay. *MONCOMP* is significantly positive, a result consistent with opportunism theories (Lulseged and Christie 2003). As expected, *RISK* is significantly positive in the *TOTCOM* equation, as risky firms require skilled managers who need to be compensated for the additional risk (Lulseged and Christie 2003).

Table 10 reports the results for the *ABSDAC* and *BONMIX* equations. Similar to the OLS results, I find evidence that the magnitude of earnings management (*ABSDAC*) is associated with bonus-based compensation (*BONMIX*). Although the coefficient for *BONMIX* is positive and significant in the *ABSDAC* equation, the coefficient for

---

*ABSDAC* and compensation variables.

*ABSDAC* is negative but insignificant in the *BONMIX* equation. This result suggests that managers determine the level of bonus-based compensation independently of their decisions about manipulating earnings, but that the extent to which they manage earnings is directly related to the amount of bonus-based compensation, after controlling for other determinants of earnings management. [32]

[Insert Table 10 about here]

Again, the lagged values of *ABSDAC* and *BONMIX* are significant. Other than for *OWN*, the coefficients for the control variables in the *ABSDAC* equation are as expected and consistent with those based on OLS. Specifically, the significant and negative coefficient for *SIZE* is consistent with the political cost hypothesis. Also, the result of *IOS* is a reflection of growth firms managing earnings to avoid underinvestment. Turning to the *BONMIX* equation, I find that larger firms on average pay lower proportions of bonus-based compensation, a result consistent with Holthausen et al. (1995). Also, unregulated firms on average pay lower percentages of bonus-based compensation. *HOR* and *TENU* have positive but statistically insignificant coefficients.

Table 11 reports the results for the *ABSDAC* and *STKMIX* equations. Similar to the results from OLS, the magnitude of earnings management (*ABSDAC*) is positively associated with stock-based compensation (*STKMIX*). Therefore, managers seem to manage earnings to maximize the value of their stock. The positive and significant coefficient of *ABSDAC* in the *STKMIX* model is an indication that the weight on bonus

[32] Recall that the conclusion of the Hausman exogeneity test suggests that *ABSDAC* is not endogenous in the *BONMIX* equation. According to Lulseged and Christie (2003), treating variables as endogenous when they are not reduces the efficiency of the estimators without introducing inconsistency, provided the system is identified. Since *BONMIX* equation is identified (Basmann p-value of 0.441), the estimators

plans declines whereas the weight on stock-based compensation increases as managers increase earnings management. This is consistent with firms with potentially higher levels of earnings management using non-earnings-based metrics of compensation (Gode et al. 2000).

[Insert Table 11 about here]

Although the coefficients for *LAGDAC*, *REG*, *CFO*, *MONDAC1*, *MONDAC2*, and *FLEX* in the *ABSDAC* equation have the same sign as the original model, only *LAGDAC* and *FLEX* are statistically significant. *SIZE* and *IOS* have the opposite signs consistent with managers considering their stock-based compensation incentives in manipulating earnings.

Compared to the *BONMIX* equation, some of the control variables in the *STKMIX* equation, as expected, have the opposite sign of those in the *BONMIX* equation. I predicted that stock-based compensation would be greater for large firms. However, the *SIZE* variable is negatively associated with *STKMIX*. A possible explanation for this negative relation might be due to the problem of multiple motivations.[33] As expected, the *IOS* coefficient is positive and significant. This result is consistent with the argument in Smith and Watts (1992) that more stock-based compensation is expected in firms with high growth opportunities.[34]

*OWN* in the *STKMIX* equation is negative and significant, consistent with the

---

remain consistent.

[33] Fields et al. (2001) addresses this concern and how the use of proxies with differing amounts of measurement error contributes to inference problems.

[34] The basis for this argument is that owners use stock-based compensation in firms with high growth opportunities (where it is difficult to monitor managers directly) as a substitute for direct monitoring to align management behavior with owner preferences.

conjecture that less stock-based compensation is used if stock holdings are larger. This result suggests that CEO ownership and stock-based compensation are used as substitute mechanisms to mitigate the conflict of interest between managers and shareholders. I predicted that firms in regulated industries use less stock-based compensation. Although the coefficient for *REG* in the *STKMIX* equation reveals the expected negative relation, the association is statistically insignificant. As expected by the opportunism hypothesis, the coefficient for *MONCOMP* is positive and significant. *RISK* is positive and significant in the *STKMIX* equations. This might be explained by the mathematical relation between *RISK* and the value of stock options included as part of stock-based compensation.[35]

In conclusion, it seems that most of the control variables successfully identify the simultaneous equations. Taken together, the results suggest that managers jointly determine the extent of earnings management and total compensation. In addition, managers determine the extent of earnings management and stock-based compensation. The level of total compensation positively affects the magnitude of earnings management. Also, as incentive compensation (bonus-based and stock-based compensation) increases, managers are motivated to increase the extent of earnings manipulation through discretionary accruals to maximize their compensation.

**Earnings Management through Income-Smoothing**

Table 12 presents OLS results for earnings management through income-smoothing (*SMOOTH*). Tables 13, 14, and 15 provide results from estimating

[35] The value of stock options is estimated using the Black-Scholes formula which is based on the

simultaneous equations for income-smoothing (*SMOOTH*) and compensation using 2SLS. The Basmann (1960) test does not reject the hypothesis that the *STKMIX* equation is not overidentified. However, the test rejects the hypotheses that the equations for *SMOOTH*, *TOTCOM*, and *BONMIX* are not overidentified.

[Insert Table 12 about here]

The Hausman specification tests for endogeneity show that *SMOOTH* is endogenous to total compensation and bonus-based compensation. The Hausman exogeneity test does not reject the hypothesis that *SMOOTH* is exogenous in the *STKMIX* equation. Again, the results of the Hausman tests provide partial support for H4.

[Insert Tables 13, 14, and 15 about here]

In general, the OLS and 2SLS regressions for income-smoothing have lower adjusted $R^2$ (around 4%) compared to the results for earnings management via discretionary accruals (Tables 8, 9, 10 and 11). The coefficient for *TOTCOM* is insignificant in the OLS *SMOOTH* equation, but significantly negative (at the 10% level) using 2SLS. *BONMIX* is positive and significant at the 1% level in the *SMOOTH* equation using both OLS and 2SLS. Contrary to expectations, this result provides strong evidence that managers smooth income as the bonus-based component of compensation increases.

Examining the effect of stock-based compensation on income-smoothing, the coefficient for *STKMIX* in the *SMOOTH* equation is negative and significant at the 1% level using both OLS and 2SLS. This result is inconsistent with expectations that

---

standard deviation of stock returns calculated over 60 months prior to the beginning of the fiscal year.

managers smooth income as the proportion of stock-based compensation increases. However, this might be explained by the results of earnings management. It might be the case that managers tend to increase the magnitude of earnings management through income-increasing and/or income-decreasing accruals rather than smoothing income. Therefore, the results do not support H3 but rather consistent with opportunism hypothesis.

The signs of the coefficients on the control variables in the income-smoothing equations using both OLS and 2SLS are similar. The lagged value of *SMOOTH* is significant. However, some of the coefficients are not as predicted. Specifically, the ratio of income-smoothing increases for low growth firms, a result consistent with low growth firms managing earnings via income-smoothing to avoid underinvestment.

Also, the coefficient for *LEV* is positive and significant suggesting that income-smoothing increases as leverage increase. A justification for a positive relation between *SMOOTH* and *LEV* might be that income-smoothing reduces the likelihood of reporting severe losses and technical default (Pincus and Rajgopal 2002). In other words, managers of highly-levered firms smooth earnings to free up binding accounting-based debt covenants, increase debt capacity, and reduce debt-financing cost (by reducing creditors' perception of firm risk) (Barton 2001; Smith and Stulz 1985). In addition, the propensity to smooth earnings increases for firms in industries with more flexible GAAP (only using OLS or when *STKMIX* is included in the 2SLS regression) and for firms listed on the NYSE (except when *STKMIX* is consider using 2SLS regression).

*SIZE* is negative and significant in the *SMOOTH* equation when *TOTCOM* is

considered using 2SLS. *SIZE* is also negative and significant using both OLS and 2SLS when considering stock-based compensation in the *SMOOTH* equation. Specifically, the significantly negative coefficient for *SIZE* is consistent with the political cost hypothesis. *OWN*, *REG*, and *CFO* are only significant when considering stock-based compensation in the *SMOOTH* equation using OLS, whereas *MONDAC2* is significantly positive when including bonus-based compensation in the *SMOOTH* equation using OLS. The dividend payout ratio (*DPOR*) does not seem to affect managers' income-smoothing behavior.

Regarding the effect of income-smoothing on the level and mix of compensation, the three compensation models have similar adjusted $R^2$ compared to those for earnings management via discretionary accruals. Tables 13, 14, and 15 provide no evidence that managers consider their income-smoothing behavior in determining their compensation. Given the evidence of simultaneity between income-smoothing and bonus-based compensation (both p-values are significant), it seems that managers consider both decisions jointly. Also, the results of the Hausman test for endoegneity suggest that *STKMIX* is endogenous to managers' decision to smooth income. However, CEOs determine the level of total compensation independently of their decisions about smoothing earnings.

With regard to the control variables for compensation, the lagged variables of compensation and all common explanatory variables, including *SIZE*, *IOS*, *OWN*, and *REG*, identify the simultaneous equations.[36] The significantly negative coefficients of *SIZE* in the three compensation equations are contrary to expectations. As expected, *IOS*

[36] However, *IOS* and *OWN* are insignificant in the *BONMIX* equation. *REG* is insignificant in both

in the *TOTCOM* and *STKMIX* equations is positive and significant. This result is consistent with the conjecture that firms with larger investment opportunity sets require more skilled managers to make those investment decisions and that more stock-based compensation is expected in firms with high growth opportunities (Smith and Watts 1992).

*OWN* in the *TOTCOM* and *STKMIX* equations is negative and significant, consistent with the assumption that ownership by the CEO substitutes for increased total pay and as a substitute mechanisms to mitigate the conflict of interest between managers and shareholders. As expected in regulated firms, the coefficient for *REG* in the *TOTCOM* equation is negatively significant consistent with CEOs of such industries as utilities having relatively lower compensation.

Turning to those control variables that are specific to compensation, only *RISK* is significantly positive in both the *TOTCOM* and *STKMIX* equations. This is consistent with risky firms requiring skilled managers who need to be compensated for that additional risk. Contrary to the opportunism hypothesis, the coefficient for *MONCOMP* is insignificant. It is expected that managers approaching retirement (*HOR*) or who have been at their positions for an extended period of time (*TENU*) prefer certain levels or forms of compensation.[37] However, neither *HOR* nor *TENU* are significant in any of the compensation equations.

In conclusion, the results from the income-smoothing regressions suggest that managers jointly determine the extent to smooth earnings and total compensation. They

---

*BONMIX* and *STKMIX* equations.

also consider both the extent to smooth earnings and bonus-based compensation. The level of total compensation and the mix of stock-based compensation negatively affect the ratio of income-smoothing. This could be explained by the fact that income-smoothing lowers risk by reducing stock return volatility. However, as bonus-based compensation increases, managers are motivated to manipulate earnings through income-smoothing. These results are consistent with the opportunism hypothesis.

**Sensitivity Analysis**

I conduct sensitivity tests to check the robustness of the results. Specifically, I test whether the significant relations between the extent and form of earnings management and the level and mix of compensation are due to model misspecification, measurement error, or alternative definitions in control variables.

Model misspecification could arise by assuming constant intercept and slopes. Following prior studies using 2SLS (Barton 2001; Pincus and Rajgopal 2002), I estimate fixed-effects models by including dummy variables for each industry group identified in Panel A of Table 2 (except Mining, Extraction and Construction) and each year (except 1992 and 1994 for the discretionary accruals sample and income-smoothing sample, respectively) to control for industry-specific and time-varying economic factors.[38] The results are not reported, as they are qualitatively similar to the original results.

I conduct three-stage least squares (3SLS) estimation, which accounts both for endogeneity and measurement error due to omitted variables in earnings management (*ABSDAC* and *SMOOTH*) and compensation variables (*TOTCOM*, *BONMIX*, and

[37] Managers make myopic decisions as they get closer to retirement.

*STKMIX*). In other words, 3SLS controls for cross-equation correlation in the residuals resulting from omitted variables. The 3SLS results (not reported) are qualitatively similar to the 2SLS results leading to similar inferences.

I use alternative definitions of control variables to check the robustness of the results to alternative measures of *SIZE*, *LEV*, *CFO*, and *RISK*. I use two alternative proxies for *SIZE*: log of total assets and log of market value of equity.[39] An alternative measure for *LEV* is the ratio of total debt to market value of equity. For *CFO*, I use the absolute value of operating cash flow, scaled by lagged total assets.[40] Following Dowell et al. (2002), I use a definition of *RISK* that mitigates effects of heteroskedasticity. Specifically, I define *RISK* as the log of the firm's standard deviation of stock returns.

The results regarding the absolute value of discretionary accruals (*ABSDAC*) are indifferent to these variations. Therefore, results supporting the research hypothesis of the magnitude of earnings management via accruals are robust to the alternative measures. However, the results on the association between smooth (*SMOOTH*) and total compensation are not robust to alternative measures of control variables. Specifically, the significantly negative coefficient for *TOTCOM* in the *SMOOTH* equation is no longer significant if alternative measures of *LEV*, *CFO*, and *RISK* are used.[41]

---

[38] I also tested whether the results are sensitive to year or industry by dropping 1998 and the Consumer and Business Services industry.

[39] Using log of market value of equity provides the same results. However, *ABSDAC* in the *BONMIX* equation is positive but insignificant. Also, *IOS* becomes significant and *RISK* is now positive but insignificant.

[40] The relation between *CFO* and *ABSDAC* becomes positive (insignificant).

[41] The coefficient for *SMOOTH* is significant at the 0.10 level in the *BONMIX* equation if the alternative definition of *LEV* is used. This result suggests that managers decrease their reliance on bonus as part of compensation as the ratio of income-smoothing increases.

# CHAPTER 6

# SUMMARY AND CONCLUSION

This chapter summarizes the study, discusses the conclusions, identifies research limitations of this study, and suggests future avenues of research.

This study integrates and extends prior studies on the relation between earnings management and compensation. The objective of the study is to empirically examine the extent and form of managers' earnings manipulation behavior and how it simultaneously interacts with the level and structure of compensation. Information asymmetry between managers and outside parties about the firm and managers' use of their judgment and discretion available to them create opportunities to manipulate earnings. Earnings management behavior is motivated, at least, partially, by management compensation.

Compensation agreements mitigate the agency problem or conflict of interest between managers and shareholders. Incentive contracts are used to tie managers' compensation to a performance measure that reflects the effects of managers' actions on firm value. Since accounting numbers are the product of accounting measurement and allocation methods, managers' wealth can be affected by changes in theses rules.

This study is motivated by concerns expressed by regulators, practitioners and the public over the quality of earnings. Despite the scandals and allegations of accounting abuses, a gap exists between academics, on one hand, and practitioners and regulators, on the other, on the extent and form of earnings management. The study is also motivated by

the increasing interest of the academic and business communities regarding the level and structure of CEO compensation, with increasing popularity of stock-based compensation including stock-options.

This study extends prior research by using information about the level of compensation, bonus-based compensation, and stock-based compensation. The current study is the first study of which I am aware that uses data on the structure of compensation covering a more recent period and using continuous variables for the level and mix of compensation in the context of earnings management behavior. It examines the extent of earnings management as explained by the level and mix of compensation and whether the form of earnings manipulation depends on the conflicting incentives provided by compensation. In addition, the study investigates the potential endogeneity between earnings management and compensation, thereby providing insight into the nature of this relation.

The study draws upon extensive prior research to develop four research hypotheses. I hypothesize that the magnitude of earnings manipulation (measured in absolute terms) increases as total compensation and bonus incentive mix of compensation increase. I hypothesize that the extent of earnings management is a function of the stock-based component of compensation. The study examines managers' earnings management behavior that takes the form of income-smoothing. I hypothesize a negative relation between income-smoothing and bonus mix of compensation while expect a positive relation between income-smoothing behavior and stock-based incentive mix of compensation. Finally, the study incorporates the endogenous nature of compensation

and earnings management. I hypothesize that there is a simultaneous relation between compensation and earnings management.

Using a sample of panel data of 3,938 firm-year observations covering the period 1992-1998, the OLS and 2SLS regressions provide evidence consistent with the level and mix of compensation as determinants of the magnitude of earnings management via discretionary accruals. The results provide strong evidence that CEOs have incentives to manage earnings to increase their total compensation and to maximize their bonus-based and stock-based compensation. These results support the compensation-level and incentive hypotheses.

Using a sample of 2,529 firm-year observations covering the period 1994-1998, the OLS and 2SLS regressions provide evidence consistent with managers smoothing income as the bonus mix increases. Surprisingly, the results of OLS and 2SLS show a significantly negative relationship between managers' income-smoothing behavior and stock-based compensation. These results are inconsistent with my expectations. In fact, this is consistent with managers not engaging in earnings management in the absence of expected self-benefits. Also, this implies that managers do not believe that information markets are perfect (Fields et al. 2001). A potential explanation for the negative relation between income-smoothing and stock-based compensation is that managers are consumed by income-increasing and income-decreasing earnings management rather than income-smoothing as the stock-based component of compensation increases. This is evidence of managerial opportunism rather than efficient contracting.

The Hausman specification test for endogeneity shows that the magnitude of

earnings management is endogenous to total compensation and stock-based compensation. In addition, the results of the Hausman test for endogeneity suggest that total compensation, bonus-based compensation, and stock-based compensation are endogenous to the magnitude of earnings management. The Hausman specification test for endogeneity shows that income-smoothing behavior is endogenous to total compensation and bonus-based compensation. Furthermore, the results of the same test indicate that incentive compensation (bonus-based and stock-based) is endogenous to income-smoothing. In general, these results provide partial support for the endogeneity hypothesis. This raises the issue of the importance of considering the endogenous nature of earnings management and compensation (Fields et al. 2001).

The results suggest that managers manipulate earnings using discretionary accruals and income-smoothing taking advantage of the structure of compensation to maximize their compensation over time. The results indicate the necessity to consider the endogenous nature of earnings management and compensation in examining their relationship.

The results are important to researchers, accounting standard setters, regulators, investors, analysts, practitioners, and managers. The results should provide a better understanding of the significance of compensation in earnings management behavior, thereby providing insight into the use of accounting information for designing efficient contracts. Empirical evidence on the extent and form of earnings management for compensation purposes should be of interest to regulators and standard setters in assessing the pervasiveness of earnings management and how it affects the integrity of

financial reporting. The results should help regulators better allocate resources for enforcement of standards.

The study contributes to academic research related to earnings management and compensation. The study contributes to positive accounting research by considering the effect of total compensation (including stock-based compensation) rather than analyzing only part of the compensation function. Also, the study provides evidence on managerial behavior contingent on the structure of compensation. In addition, the study relaxes the assumptions of prior research that ignored the endogeneity in agency relations. Thus, this study explicitly allows compensation to be jointly determined with earnings management. This reduces the chances of biasing the results by ignoring their simultaneity and provides a better understanding of how compensation affects managers' earnings management behavior.

The results of this study are subject to several caveats. As is the case with other earnings management studies, the results of this study are limited by the ability of the estimation models to detect earnings management. According to Fields et al. (2001), the models used to detect accrual management may not be of sufficient power to differentiate between accruals management and real performance.

While this study focuses on a single motivation to manage earnings and attempted to control for covariates, the issue of multiple, and potentially conflicting, motivations is not fully considered in this study, as is the case with most of earnings management studies (Fields et al. 2001).[42] For example, neither this study, nor the current literature,

[42] Accounting research as applied to accounting choice uses control variables to reflect multiple

model the expected behavior of a manager in a situation where the choice that maximizes the expected future incentive compensation also increases the probability of debt covenant violations.

Whether the results of this study, based on the estimated discretionary accruals, hold true when considering single or multiple accounting procedures is a matter of concern. Managers may complement or substitute discretionary accruals with accounting procedures, making it difficult to generalize the results without considering accounting procedures. Although discretionary accruals examine the net effect of all accounting choices on the accruals of the firm for the period under consideration, single accounting choices may be utilized to achieve different objectives. Hunt et al. (1996) find that managers manage LIFO inventories to smooth earnings and lower debt-related costs but not to minimize taxes.

The results of this study support the opportunism hypothesis rather than the efficient hypothesis. Future research could investigate the consequences of the relation between earnings management and compensation on firm performance. This could provide insight into whether earnings management as motivated by compensation is efficient or opportunistic. Furthermore, investigating the consequences of this relation on investors' mispricing behavior might help in assessing whether stakeholders are deceived by earnings management.

Another research avenue could be to investigate the forms of earnings management. Specifically, the results of this study indicate that managers tend not to

---

motivations. However, this approach suffers from three problems; namely: using inappropriate proxies,

smooth earnings as total compensation and stock-based compensation increase. This might be due to managers' tendency to manage earnings through income-increasing and income-decreasing. Research could investigate whether managers use income-smoothing and income-decreasing/increasing as substitutes or complements.

Future research may attempt to develop a methodology to be used to accommodate the complexity of the earnings management environment and the mechanism by which this environment impacts management incentives. Rather than replicating current studies with slightly different settings, future research could consider the simultaneous impact of multiple earnings management methods, multiple incentives and econometric complications.

---

using proxies with different amounts of measurement errors, and assuming linearity (for more details see: Fields et al. 2001).

# REFERENCES

# REFERENCES

Abarbanell, J.2003. Can stock recommendations predict earnings management and analysts' earnings forecast errors? *Journal of Accounting Research* 41(1): 1- 31.

Abdel-Khalik, A. 1985. The effect of LIFO-switching and firm ownership on executives' pay. *Journal of Accounting Research* 23 (Autumn): 427-447.

Adiel, R. 1996. Reinsurance and the management of regulatory ratios and taxes in the property-Casualty insurance industry. *Journal of Accounting and Economics* 22 (1-3): 207-240.

Ali, A., and K. R. Kumar. 1994. The magnitude of Financial Statement Effects and Accounting Choice: The case of the adoption of SFAS 87. *Journal of Accounting and Economics* 18 (July): 89-114.

Antle, R., and A. Smith. 1985. Measuring executive compensation: Methods and an application. *Journal of Accounting Research* (Spring): 296-325.

Antle, R., and A. Smith. 1986. An empirical investigation into the relative performance evaluation of corporate executives. *Journal of Accounting Research* 24 (Spring): 1-39.

Ayers, B. C. 1998. Deferred tax accounting under SFAS No. 109: An empirical investigation of its incremental value-relevance relative to APB No. 11. *The Accounting Review* 73 (April): 195-212.

Baber, W. R., S.N. Janakiraman, and S. Kang. 1996. Investment opportunities and the structure of executives compensation. *Journal of Accounting and Economics* (21): 297-318.

Baiman, S. 1989. Agency research in managerial accounting: A second look. *Accounting, Organizations, and Society* 15: 341-371.

Banker, R. D., and S. M. Datar. 1989. Sensitivity, precision and linear aggregation of signals for performance evaluation. *Journal of Accounting Research* 21 (Spring): 21-39.

Barnea, A., J. Ronen, and S. Sadan. 1975. The implementation of accounting objectives: An application to extraordinary items. *The Accounting Review* 50 (January): 56-68.

Barton, J. 2001. Does the use of financial derivatives affect earnings management decisions? *The Accounting Review* 76 (January): 1-26.

Basmann, R. L. 1960. On finite sample distributions of generalized classical linear identifiabiltiy test statistics. *Econometrica* 45: 939-952.

Beatty, A., S. Chamberlin, and J. Magliolo. 1995. Managing financial reports of commercial banks: The influence of taxes, regulatory capital and earnings. *Journal of Accounting Research* 33 (Autumn): 231-261.

Beatty, A., and J. Weber. 2003. The effects of debt contracting on voluntary accounting method changes. *The Accounting Review* 78 (January): 119-142.

Beaver, W., C. Eger, S. Ryan, and M. Wolfson. 1989. Financial reporting, supplemental disclosures and bank share prices. *Journal of Accounting Research* (Autumn): 157-178.

Beaver, W., and M. McNichols. 1998. The characteristics and valuation of loss reserves of property-casualty insurers. Working paper, Stanford University.

Bernard, V., and D. J. Skinner. 1996. What motives managers' choice of discretionary accruals? *Journal of Accounting and Economics* 22 (August-December): 313-325.

Bowen, R. M., E. W. Noreen, and J. M. Lacey. 1981. Determinants of the Corporate Decision to Capitalize Interest. *Journal of Accounting Research* 3 (August): 151-179.

Bowen, R. M., D. Burgstahler, and L.A. Daley. 1986. Evidence on the relationships between earnings and various measures of cash flows. *The Accounting Review* 61: 713-725.

Burgstahler, D., and I. Dichev. 1997. Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics* 24 (1): 99-126.

Burgstahler, D., and I. Dichev. 1998. Incentives to manage earnings to avoid earnings decreases and losses: Evidence from quarterly earnings. Working paper, University of Washington.

Burgstahler, D., and M. Eames. 1998. Management of earnings and analysts forecasts. Working paper, University of Washington.

Bushee, B. 1998. The influence of institutional investors on myopic R&D investment behavior. *The Accounting Review* 73 (July): 305-333.

Cahan, S. 1992. The effect of antitrust investigations on discretionary accruals: A refined

test of the political cost hypothesis. *The Accounting Review* 67: 77-95.

Hribar, P., and D. Collins. 2002. Errors in estimating accruals: Implications for empirical research. *Journal of Accounting Research* 40(1): 105-134.

Collins, J., D. Shackelford, and J. Wahlen. 1995. Bank differences in the coordination of regulatory capital, earnings and taxes. *Journal of Accounting Research* 33 (2): 263-291.

Collins, D., M. Rozeff, and D. Dhaliwal. 1981. The economic determinants of the market reaction to proposed mandatory accounting changes in the oil and gas industry. *Journal of Accounting and Economics* (3): 37-71.

Core, J., and W. Guay. 1999. The use of equity grants to manage optimal equity incentive levels. *Journal of Accounting and Economics* (28): 151-184.

DeAngelo, L.E. 1986. Accounting numbers as market valuation substitutes: A study of management buyouts of public stockholders. *The Accounting Review* 61 (): 400-420.

DeAngelo, L.E. 1988. Managerial competition, information costs, and corporate governance: The use of accounting performance measures in proxy contests. *Journal of Accounting and Economics* 10 (): 3-36.

DeAngelo, L. E., H. DeAngelo, and D. J. Skinner. 1994. Accounting choices of troubled companies. *Journal of Accounting and Economics* 17 (1): 113-143.

Dechow, P. M. 1994. Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. *Journal of Accounting and Economics* 18 (July): 3-42.

Dechow, P. M., and D. J. Skinner. 2000. Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons* 14 (June): 235-250.

Dechow, P. M., R. Sloan, and A. Sweeny. 1995. Detecting earnings management. *The Accounting Review* 70 (April): 193-225.

Defeo, V., R. Lambert, and D. Larcker. 1989. The executive compensation effects of equity-for-debt swaps. *The Accounting Review* 54 (): 201-227.

DeFond, M. L., and C. W. Park. 1997. Smoothing in anticipation of future earnings. *Journal of Accounting and Economics* 23 (July): 115-139.

DeFond, M. L., and C. W. Park. 2001. The reversal of abnormal accruals and the market

valuation of earnings surprises. *The Accounting Review* 76 (July): 375-404.

DeFond, M. L., and J. Jiambalvo. 1994. Debt covenant violation and manipulation of accruals. *Journal of Accounting and Economics* 17 (January): 145-176.

Degeorge, F., J. Patel, and R. Zechhauser. 1999. Earnings management to exceed thresholds. *Journal of Business* 72 (1): 1-36.

Dhaliwal, D. S., W. G. Heninger, and K. E. Hughes II. 1999. The investment opportunity set and capitalization versus expensing methods of accounting choice. *Accounting and Finance* (39): 151-175.

Dichev, I., and D. Skinner. 2002. Large-sample evidence on the debt-covenant hypothesis. *Journal of Accounting Research* 40 (September): 195-235.

Duru, A., and D. Reeb. 2002. Geographic and industrial corporate diversification: The level and structure of executive compensation. *Journal of Accounting, Auditing & Finance* 17(1): 1-24.

Dye, R. 1988. Earnings management in an overlapping generations model. *Journal of accounting Research* 26 (Autumn): 195-235.

Erickson, M., and S. Wang. 1999. Earnings management by acquiring firms in stock for stock mergers. *Journal of Accounting and Economics* 27 (April): 149-176.

Fama, E. F. 1980. Agency problems and the theory of the firm. *Journal of Political Economy* 88: 288-307.

Fama, E. F., and M. C. Jensen. 1983. Separation of ownership and control. *Journal of Law and Economics* 26: 301-326.

Fields, T., T. Lys, and L. Vincent. 2001. Empirical research on accounting choice. *Journal of Accounting and Economics* 31 (September): 255-307.

Gaver, J., and K. Gaver. 1993. Additional evidence on the association between the investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Accounting and Economics* 16 (January-July): 125-160.

Gaver, J., K. Gaver, and J. Austin. 1995. Additional evidence on bonus plans and income management. *Journal of Accounting and Economics* 19 (): 3-28.

Gode, D., and P. S. Mohanram. 2000. The relative use of earnings and stock prices in CEO compensation. Working paper, New York University.

Goel, A. M., and A. Thakor. 2003. Why do firms smooth earnings? *The Journal of Business* 76 (1): 151-192.

Gordon, M. J. 1964. Postulates, principles and research in accounting. *The Accounting Review* 64 (April): 251-263.

Guidry, F., A. Leone, and S. Rock. 1999. Earnings-based bonus plans and earnings management by business-unit managers. *Journal of Accounting and Economics* 26 (January): 113-142.

Gul, F.A., S. Leung, and B. Srinidhi. 2000. The effect of investment opportunity set and debt level on earnings-returns relationship and the pricing of discretionary accruals. Working paper, City University of Hong Kong.

Hagerman, R. L., and M. E. Zmijewski. 1979. Some economic determinants of accounting policy choice. *Journal of Accounting and Economics* 1 (August): 141-161.

Hausman, J. 1978. Specification tests in econometrics. *Econometrica* 46: 1252-1271.

Healy, P. M. 1985. The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics* 7 (April): 85-107.

Healy, P. M., S. Kang, and K. G. Palepu. 1987. The effect of accounting procedure changes on CEOs' cash salary and bonus compensation. *Journal of Accounting and Economics* 9 (l): 7-34.

Healy, P. M., and K. G. Palepu. 1990. Effectiveness of accounting-based dividend covenants. *Journal of Accounting and Economics* 12 (1-3): 97-124.

Healy, P. M., and J. M. Wahlen. 1999. A review of the earnings management literature and its implications for standard setting. *Accounting Horizons* 13 (December): 365-383.

Holthausen, R. W. 1981. Evidence on the effect of bond covenants and management compensation contracts on the choice of accounting techniques: The case of the depreciation switch-back. *Journal of Accounting and Economics* 3 (March): 73-109.

Holthausen, R. W., and R. Leftwich. 1983. The economic consequences of accounting choice: Implications of costly contracting and monitoring. *Journal of Accounting and Economics* 5(): 77-117.

Holthausen, R. W., D. Larcker, and R. Sloan. 1995a. Annual bonus schemes and the manipulation of earnings. *Journal of Accounting and Economics* 19 (February): 29-74.

Holthausen, R. W., D. Larcker, and R. Sloan. 1995b. Business unit innovation and the structure of executive compensation. *Journal of Accounting and Economics* 19 (March-May): 279-313.

Hunt, A., S. Moyer, and T. Shevlin. 1996. Managing interacting accounting measures to meet multiple objectives: A study of LIFO firms. *Journal of Accounting and Economics* 21 (3): 339-374.

Ittner, C. D., and D. F. Larcker. 1998. Innovations in performance measurement: Trends and research implications. *Journal of Management Accounting Research* 10(0): 205-238.

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

Johnson, M., J. Magliolo, and R. Natarajan. 2000. Compensation mix, investment opportunity sets and firm performance. Working paper, University of Texas at Dallas.

Jones, J. 1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29 (Autumn): 193-228.

Kang, S., and K. Sivaramakrishnan. 1995. Issues in testing earnings management and an instrumental variables approach. *Journal of Accounting Research* 33 (): 353-368.

Kaplan, R. S. 1985. Comments on Paul Healy: Evidence on the effect of bonus schemes on accounting procedure and accrual decisions. *Journal of Accounting and Economics* (7): 109-113.

Kasznik, R. 1999. On the association between voluntary disclosure and earnings management. *Journal of Accounting Research* 37 (Spring): 57-82.

Kennedy, P. 1998. *A Guide to Econometrics*. 4th edition. Cambridge, MA: The MIT Press.

Key, K. G. 1997. Political cost incentives for earnings management in the cable television industry. *Journal of Accounting and Economics* 23 (3): 309-337.

Lambert, R. A. 1984. Income smoothing as rational equilibrium behavior. *The Accounting Review* 59 (October): 604-618.

Lambert, R., and D. Larcker. 1986. An analysis of the use of accounting and market measures of performance in executive compensation contracts. *Journal of Accounting Research* 25 (Supplement): 85- 129.

Lee, H. 1998. Does equity-based compensation extend managers' time horizon? A study on the relationship between compensation structure and investment. Working paper, Carnegie Mellon University.

Liberty, S., and J. Zimmerman. 1986. Labor union contract negotiations and accounting choices. *The Accounting Review* (October): 697-712.

Lulseged, A., and A. A. Christie. 2003. Efficient contracting and endogeneity in corporate governance and compensation. Working paper, Rutgers University.

McNichols, M. 2000. Research design issues in earnings management studies. *Journal of Accounting and Public Policy* 19 (Winter): 313-345.

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

Miller, G. S., and D. J. Skinner. 1998. Determinants of the valuation allowances for deferred tax assets under SFAS No. 109. *The Accounting Review* 73 (April): 213-233.

Minton, B., and C. Schrand. 1999. The impact of cash flow volatility on discretionary investment and the costs of debt and equity financing. *Journal of Financial Economics* 54 (3): 423-460.

Moses, O. D. 1987. Income smoothing and incentives: Empirical tests using accounting changes. *The Accounting Review* 62 (April): 358-377.

Moyer, S. 1990. Capital adequacy ration regulations and accounting choices in commercial banks. *Journal of Accounting and Economics* 13 (2): 123-154.

Myers, L. A., and D. J. Skinner. 2000. Earnings momentum and earnings management. Working paper, University of Michigan.

Penalva, F. 1998. Loss reserves and accounting discretion in the property-casualty insurance industry. Working paper, University of California at Berkeley.

Petroni, K. R. 1992. Optimistic reporting in the property casualty insurance industry. *Journal of Accounting and Economics* 15 (): 485-508.

Petroni, K. R., S. Ryan, and J. Wahlen. 1999. Discretionary and non-discretionary revisions of loss reserves by property-casualty insurers: Differential implications for future profitability, risk, and market value. Working paper, Indiana University.

Pincus, M., and S. Rajgopal. 2002. The interaction between accrual management and hedging: Evidence from oil and gas firms. *The Accounting Review* 77 (January): 127-

160.

Pindyck, R. S., and D. L. Rubinfeld. 1998. *Econometric models and economic forecasts.* Boston: Irwin McGraw-Hill.

Plummer, E., and D. P. Mest. 2001. Evidence on the management of earnings components. *Journal of Accounting, Auditing & Finance, 16(4):* 301-323.

Robbins, W. A., R. Turpin, and P. Polinski. 1993. Economic incentives and accounting choice strategy by nonprofit hospitals. *Financial Accountability & Management* 9 (August): 159-175.

Schipper, K. 1989. Commentary on earnings management. *Accounting Horizons* 4 (September): 91-102.

Scholes, M., G. P. Wilson, and M. Wolfson. 1990. Tax planning, regulatory capital planning, and financial reporting strategy for commercial banks. *Review of Financial Studies* 3 (): 625-650.

Skinner, D. J. 1993. The investment opportunity set and accounting procedure choice. *Journal of Accounting and Economics* 16 (October): 407-445.

Sloan, R. G. 1993. Accounting earnings and top executive compensation. *Journal of Accounting and Economics* 16 (January-July): 55-100.

Sloan, R. G. 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71 (July): 289-315.

Smith, C. W., and R. M. Stulz. 1985. The determinants of firms' hedging policies. *Journal of Financial and Qualitative Analysis* 20(December): 391-405.

Smith, C. W., Jr., and R. L. Watts. 1982. Incentive and tax effects of executive compensation plans. *Australian Journal of Management* (7): 139-157.

Smith, C. W., Jr., and R. L. Watts. 1992. The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics* 24 (December): 263-292.

Subramanyam, K. R. 1996. The pricing of discretionary accruals. *Journal of Accounting and Economics* 22 (August-December): 249-281.

Sweeny, A. P. 1994. Debt-covenant violations and managers' accounting responses. *Journal of Accounting and Economics* (May): 281-308.

Teoh, S. H., I. Welch, and T. J. Wong. 1998a. Earnings management and the long-term market performance of initial public offerings. *Journal of Finance* 53 (December): 1935-1974.

Teoh, S. H., I. Welch, and T. J. Wong. 1998b. Earnings management and the underperformance of seasoned equity offerings. *Journal of Financial Economics* 50 (October): 63-99.

Trueman, B., and S. Titman. 1988. An explanation for accounting income smoothing. *Journal of Accounting Research* 26 (Supplement): 127-139.

Visvanathan, G. 1998. Deferred tax valuation allowances and earnings management. *Journal of Financial Statement Analysis* 3 (4): 6-15.

Wahlen, J. 1994. The nature of information in commercial bank loan loss disclosures. *The Accounting Review* (July): 455-478.

Warfield T. D., J. J. Wild, and K. L. Wild. 1995. Managerial ownership, accounting choices, and informativeness of earnings. *Journal of Accounting and Economics* 20 (July): 61-91.

Watts, R. L., and J. L. Zimmerman. 1978. Towards a positive theory of the determinants of accounting standards. *The Accounting Review* 53 (January): 112-134.

Watts, R. L., and J. L. Zimmerman. 1986. *Positive Accounting Theory*. Englewood Cliffs, NJ: Prentice Hall.

Watts, R. L., and J. L. Zimmerman. 1990. Positive accounting theory: A ten-year perspective. *The Accounting Review* 65 (January): 131-156.

Zmijewski, M. E., and R. L. Hagerman. 1981. An income strategy approach to the positive theory of accounting standard setting/choice. *Journal of Accounting and Economics* 3 (August): 129-149.

# TABLES

**TABLE 1**
**Studies on the Effect of Compensation on Earnings Management**

| Study | Sample | Accounting Response Variable | Compensation Variable | Results |
|---|---|---|---|---|
| Watts and Zimmerman (1978) | 49 Firms lobbying against FASB's 1974 DM on General Price Level Adjustments. | Dichotomous variable for corporate lobbying on accounting standards. | Dummy variable for the existence of bonus plans. | Evidence consistent with the effect of existence of bonus plans on lobbying. |
| Hagerman and Zmijewski (1979) | 300 random firms. | Dichotomous variables for four accounting choices: depreciation, inventory, investment tax credit, and period of amortization. | Dummy variable for the existence of bonus plans. | The existence of a management compensation plan is important in determining the choice of three of the four accounting choices. |
| Holthausen (1981) | 96 firms from 1955-1978 that voluntary switched depreciation methods. | Abnormal returns around depreciation switch-back announcement. | Dummy variable for the existence of bonus plans. | No evidence of compensation as a determinant to changing depreciation method. |
| Collins et al. (1981) | 57 firms affected by SFAS#19 in 1977. | Cumulative abnormal returns for firms affected by the proposal. | Dummy variable for the existence of bonus plans. | Compensation explains cross-sectional variation in abnormal stock performance. |
| Zmijewski and Hagerman (1981) | 300 random firms. | Overall income strategy of depreciation method, inventory choice, pension cost, and investment tax credit. | Dummy variable for the existence of bonus plans. | Managers choose income-increasing techniques more often in firms with accounting based compensation plans. |

**TABLE 1 (continued)**
**Studies on the Effect of Compensation on Earnings Management**

| Study | Sample | Accounting Response Variable | Compensation Variable | Results |
|---|---|---|---|---|
| Bowen et al. (1981) | 91 matched pairs of interest capitalizing firms and not interest capitalizing firms during 1974. | Propensity to capitalize interest. | Dummy variable for the existence of bonus plans. | The frequency of explicit management compensation packages is not greater for the interest capitalization group. |
| Healy (1985) | 94 Fortune U.S. industrial firms covering the period 1930-1980. | Accruals and changes in accounting procedures tests. | The parameters of compensation plans (lower, middle, and upper bounds). | (1) Accrual policies are related to income-reporting incentives of bonus contracts and (2) changes in accounting procedures are associated with adoption or modification of bonus plan. |
| Robbins et al. (1993) | 298 hospitals. | Dichotomous variables for depreciation and inventory. | Dummy variable for the existence of bonus plans. | The existence of bonus plans is significant for private, non-profit hospital setting. |

**TABLE 1 (continued)**
**Studies on the Effect of Compensation on Earnings Management**

| Study | Sample | Accounting Response Variable | Compensation Variable | Results |
|---|---|---|---|---|
| Skinner (1993) | A full sample of 504 firms in 1987 and a subsample of the 100 largest of the full sample. | A scale for accounting procedure choices including: inventory method, depreciation method, and goodwill amortization period. | Dummy variable for the existence of bonus plans. | Evidence on the bonus plan hypothesis for income-increasing depreciation and goodwill procedures. |
| Ali and Kumar (1994) | 41 firms early adopters of SFAS 87. | Dummy variable for early adoption. | Dummy variable for the existence of bonus plans. | Support for compensation effect and its interaction income effect. |
| Holthausen et al. (1995) | 443 firm-year observations (1982-1990). | Accruals using total accruals and Modified Jones' models. | Bounds format of bonus plans (lower, inside, and upper bounds). | Managers manipulate earnings downwards when their bonuses are at their maximum. |
| Gaver et al. (1995) | 102 firms (1980-1990). | Accruals using three models: total, modified Jones, and industry index models. | Bonus plan parameters (lower and middle bounds). | Results are consistent with income smoothing hypothesis. |
| Guidry et al. (1999) | 179 business-unit years for a conglomerate during 1994-1995. | Accruals using three models: total, modified Jones, and specific accruals models. | The parameters of compensation plans (lower, middle, and upper bounds). | Support for income smoothing rather than Healy's bonus-maximization hypotheses. |

**TABLE 2**
**Taxonomy of the Research on the Relation between Earnings Management and Compensation Based on the Type of Evidence of the Accounting Manipulation Behavior**

| Type of Evidence | Choices of Accounting Methods | Impact of Accounting Choice on Stock prices | Voting and Lobbying Behavior | Early Adoption | Accruals |
|---|---|---|---|---|---|
| Methodology | Examine the relation between voluntary accounting method choice and compensation. | Examine the relation between abnormal performance of returns at the event of changing accounting method and compensation. | Examine the relation between voting and lobbying for changes in accounting methods and compensation. | Examine the relation between early adoption of mandatory accounting procedures and compensation. | Examine the relation between accruals (total and/or discretionary) and compensation. |
| Studies | ▪ Hagerman and Zmijewski (1979)<br>▪ Zmijewski and Hagerman (1981)<br>▪ Bowen et al. (1981)<br>▪ Healy (1985)<br>▪ Robbins et al. (1993)<br>▪ Skinner (1993) | ▪ Holthausen (1981)<br>▪ Collins et al. (1981) | ▪ Watts and Zimmerman (1978) | ▪ Ali and Kumar (1994) | ▪ Healy (1985)<br>▪ Holthausen et al. (1995)<br>▪ Gaver et al. (1995)<br>▪ Guidry et al. (1999) |

**TABLE 3**
**Taxonomy of the Research on the Relation between Earnings Management and Compensation Based on Compensation as the Explanatory Variable**

| Compensation Variable | Existence of Compensation Plan (Dummy Variable) | Bonus Plan Parameters |
|---|---|---|
| Studies | ▪ Watts and Zimmerman (1978)<br>▪ Hagerman and Zmijewski (1979)<br>▪ Zmijewski and Hagerman (1981)<br>▪ Holthausen (1981)<br>▪ Collins et al. (1981)<br>▪ Bowen et al. (1981)<br>▪ Healy (1985)<br>▪ Robbins et al. (1993)<br>▪ Skinner (1993)<br>▪ Ali and Kumar (1994) | ▪ Healy (1985)<br>▪ Holthausen et al. (1995)<br>▪ Gaver et al. (1995)<br>▪ Guidry et al. (1999) |

**TABLE 4**
**Variable Definitions**

**Endogenous Variables**

***Earnings management***

*ABSDAC* = the absolute value of discretionary accruals. The cross-sectional modified Jones (1991) model is used to estimate discretionary accruals as the residuals from the following regression (all variables are scaled by lagged total assets, Compustat item #6):

$TAC_{i,t} = \beta 0 + \beta 1\ PPE_{i,t} + \beta 2\ \Delta ADJREV_{i,t} + \varepsilon_{i,t}$

Where:

*TAC* = total accruals defined as the difference between earnings before extraordinary items and discontinued operations (Compustat item #18). and cash flows from operations (Compustat item # 308);

*PPE* = gross property, plant, and equipment (Compustat item #7);

*ΔADJREV* = the change in net revenue adjusted for the change in accounts receivables (Compustat items #12 - #2).

*SMOOTH* = smoothing ratio defined as the standard deviation of firm *i*'s year *t* quarterly earnings before discretionary accruals divided by the standard deviation of firm *i*'s year *t* quarterly earnings. I define earnings as income before extraordinary items (quarterly Compustat item #8) and earnings before discretionary accruals as operating cash flows (quarterly Compustat item #108) plus nondiscretionary accruals estimated as the fitted value using the following cross-sectional modified Jones (1991) model on a quarterly basis (all variables are scaled by lagged total assets, quarterly Compustat item # 44):

$TAC_{i,t} = \beta 0 + \beta 1\ PPE_{i,t} + \beta 2\ \Delta ADJREV_{i,t} + \varepsilon_{i,t}$

Where:

*TAC* = total accruals defined as the difference between earnings before extraordinary items and discontinued operations (quarterly Compustat item #8) and cash flows from operations (quarterly Compustat item #108);

*PPE* = gross property, plant, and equipment (quarterly Compustat #118);

*ΔADJREV* = the change in net revenue adjusted for the change in accounts receivables (quarterly Compustat items #2 - #37).

I adjust data items reported on a cumulative basis in Compustat to reflect quarterly values.

***Compensation***

*TOTCOM* = level of total compensation defined as total compensation scaled by lagged total assets. Total compensation is calculated as the sum of salary, annual cash bonus, long-term incentive plans, estimated value of stock options, restricted stock and other long-term compensation.

*BONMIX* = mix of bonus-based compensation defined as annual bonus scaled by lagged total assets.

**TABLE 4 (continued)**

*STKMIX* = mix of stock-based compensation defined as the estimated value of stock options and restricted stock scaled by lagged total assets.

**Predetermined/Exogenous Variables**

***Earnings management and compensation Regressions***

*SIZE* = size variable measured as log of total sales for the year.

*IOS* = growth opportunities variable measured as the market value of equity plus book value of debt divided by book value of assets at the beginning of the year.

*OWN* = managerial ownership variable measured as the ratio of shares owned by the CEO to total shares outstanding.

*REG* = regulatory environment variable measured as a dummy variable that equals 1 if the is a utility firm (gas and electric utility, 2-digit SIC code 49), and zero otherwise.

***Earnings management Regressions***

*LAGDAC* = lagged values of the absolute value of discretionary accruals (*ABSDAC*).

*LAGSMTH* = lagged values of the ratio of income-smoothing (*SMOOTH*).

*CFO* = cash flows from operations scaled by lagged total assets.

*LEV* = leverage measured as total debt divided by total assets.

*DPOR* = cost of capital captured by the dividend payout ratio, measured as dividends per share to common shareholders divided by earnings per share.

*MONDAC1* = monitoring environment measured as an indicator variable that equals 1 if a firm's shares are traded on the NYSE, and zero otherwise.

*MONDAC2* = monitoring environment measured as an indicator variable that equals 1 if a firm's auditor is a Big Five firm, and zero otherwise.

*FLEX* = industry flexibility measured as the root mean squared error of the cross-sectional accruals expectation regression used to estimate discretionary accruals.

***Compensation Regressions***

*LAGTOT* = lagged values for total compensation (*TOTCOM*).

*LAGBON* = lagged values for bonus-based compensation (*BONMIX*).

*LAGSTK* = lagged values for stock-based compensation (*STKMIX*).

*MONCOMP* = effectiveness of monitoring by the board of directors. I include a dummy variable equal to one if the CEO is also the chairman of the board of directors, and zero otherwise.

*HOR* = horizon problem as a dummy variable that is unity when the CEO is 64 years or older, and zero otherwise.

*TENU* = tenure measured as the number of years as a CEO.

*RISK* = firm risk measured as the standard deviation of stock returns calculated over 60 months prior to the beginning of the fiscal year.

# TABLE 5
## Sample Selection

| Criteria | Discretionary Accruals Sample [a] | Income-Smoothing Sample [b] |
|---|---|---|
| Execucomp firm-years data [c] | 9,714 | 8,125 |
| Compustat data unavailable to estimate discretionary accruals [d] | (3,268) | (3,703) |
| Compustat data unavailable for control variables | (1,446) | (1,004) |
| Extreme observations [e] | (1,062) | (889) |
| Final sample | 3,938 | 2,519 |

[a] Data available 1992-1998.

[b] Data available 1994 -1998.

[c] Observations for multiple executives in one year are eliminated. I use the executive specified in Execucomp as being the CEO for all or most of the fiscal year.

[d] Financial institutions (SIC 6000-6999) are excluded because discretionary accruals for these firms are problematic. Observations are dropped from the sample if data items for estimating discretionary accruals are missing or there are less than five observations in 2-digit SIC.

[e] One percent at each tail of variables with extreme observations are deleted in order to mitigate outlier effects.

# TABLE 6
## Sample Distribution

### Panel A: Industry Composition

| SIC Codes | Industry | Discretionary Accruals Sample[a] | | Income-Smoothing Sample[b] | |
|---|---|---|---|---|---|
| | | Number | Percentage | Number | Percentage |
| 10-19 | Mining, Extraction and Construction | 155 | 3.94 | 123 | 4.88 |
| 20-29 | Manufacturing (non-durables) | 927 | 23.54 | 631 | 25.05 |
| 30-39 | Manufacturing (durables) | 1259 | 31.97 | 891 | 35.37 |
| 40-49 | Transportation and Utilities | 544 | 13.81 | 218 | 8.65 |
| 50-59 | Wholesale and Retailers | 632 | 16.05 | 390 | 15.48 |
| 70-89 | Consumer and Business Services | 421 | 10.69 | 266 | 10.56 |

### Panel B: Year-Wise Distribution

| Year | Discretionary Accruals Sample[a] | | Income-Smoothing Sample[b] | |
|---|---|---|---|---|
| | Number | Percentage | Number | Percentage |
| 1992 | 143 | 3.63 | - | - |
| 1993 | 476 | 12.09 | - | - |
| 1994 | 703 | 17.85 | 430 | 17.07 |
| 1995 | 700 | 17.78 | 485 | 19.25 |
| 1996 | 701 | 17.80 | 578 | 22.95 |
| 1997 | 706 | 17.93 | 580 | 23.03 |
| 1998 | 509 | 12.93 | 446 | 17.71 |

[a] 3938 firm-year observations covering the period 1992-1998.
[b] 2519 firm-year observations covering the period 1994 -1998.

# TABLE 7
## Descriptive Statistics

| Variable | Discretionary Accruals Sample[a] | | | Income-Smoothing Sample[b] | | |
|---|---|---|---|---|---|---|
| | Mean | Median | Std.Dev. | Mean | Median | Std.Dev. |
| **Panel A: Financial Variables** | | | | | | |
| Sales ($millions) | 3,207.86 | 1,003.28 | 7,747.01 | 3,311.74 | 975.49 | 7,863.91 |
| Assets ($millions) | 3,249.22 | 901.18 | 8,159.09 | 3,024.03 | 821.91 | 6,619.73 |
| Return on Assets (%) | 4.72 | 5.35 | 11.42 | 4.88 | 5.59 | 11.42 |
| **Panel B: CEO Compensation Data** | | | | | | |
| Salary ($thousands) | 536.63 | 483.87 | 278.73 | 549.17 | 499.17 | 286.38 |
| Bonus ($thousands) | 450.62 | 300.00 | 590.07 | 482.59 | 325.00 | 573.53 |
| Value of options granted ($thousands) | 1,027.94 | 328.18 | 1,936.09 | 1,200.98 | 422.23 | 2,179.41 |
| Value of restricted stock ($thousands) | 138.45 | 0.00 | 679.35 | 144.80 | 0.00 | 671.65 |
| Long-term incentive payout ($thousands) | 117.56 | 0.00 | 584.22 | 123.53 | 0.00 | 565.22 |
| Other annual ($thousands) | 37.49 | 0.00 | 192.98 | 37.50 | 0.00 | 188.59 |
| All other ($thousands) | 93.30 | 17.17 | 391.25 | 110.32 | 18.50 | 455.86 |
| **Total compensation ($thousands)** | 2,401.99 | 1,486.40 | 2699.41 | 2,648.89 | 1,661.97 | 2933.73 |
| **Panel C: Test Variables** | | | | | | |
| ***Discretionary Accruals*** | | | | | | |
| *DAC* | -0.001 | -0.001 | 0.08 | | | |
| *ABSDAC* | 0.049 | 0.031 | 0.06 | | | |
| *SMOOTH* | | | | 5.19 | 3.24 | 5.71 |
| ***Level and Mix of Compensation*** | | | | | | |
| *TOTCOM* | 3.96 | 1.80 | 7.64 | 4.24 | 2.06 | 7.94 |
| *BONMIX* | 0.64 | 0.29 | 1.06 | 0.69 | 0.33 | 1.08 |
| *STKMIX* | 2.08 | 0.35 | 6.47 | 2.23 | 0.47 | 6.74 |
| ***Common Control Variables*** | | | | | | |
| *SIZE* | 6.98 | 6.91 | 1.50 | 6.98 | 6.88 | 1.51 |
| *IOS* | 3.26 | 1.45 | 5.02 | 3.35 | 1.55 | 4.84 |
| *OWN* | 0.03 | 0.003 | 0.06 | 0.03 | 0.004 | 0.06 |
| *REG* | 0.07 | 0.00 | 0.26 | 0.01 | 0.00 | 0.11 |
| ***Earnings Management Control Variables*** | | | | | | |
| *CFO* | -0.42 | -0.09 | 2.49 | -0.49 | -0.10 | 2.11 |
| *LEV* | 1.12 | 0.19 | 3.05 | 1.22 | 0.21 | 3.23 |
| *DPOR* | 0.27 | 0.12 | 2.54 | 0.21 | 0.10 | 1.16 |
| *MONDAC1* | 0.70 | 1.00 | 0.46 | 0.68 | 1.00 | 0.47 |
| *MONDAC2* | 0.98 | 1.00 | 0.15 | 0.98 | 1.00 | 0.15 |
| *FLEX* | 0.09 | 0.08 | 0.06 | 0.09 | 0.08 | 0.06 |
| ***Compensation Control Variables*** | | | | | | |
| *MONCOMP* | 0.99 | 1.00 | 0.09 | 0.99 | 1.00 | 0.08 |
| *HOR* | 0.13 | 0.00 | 0.34 | 0.13 | 0.00 | 0.34 |
| *TENU* | 8.96 | 7.00 | 7.75 | 9.21 | 7.00 | 8.04 |
| *RISK* | 0.34 | 0.31 | 0.15 | 0.34 | 0.32 | 0.14 |

Variables are defined in Table 4.

[a] 3938 firm-year observations covering the period 1992-1998.

[b] 2519 firm-year observations covering the period 1994-1998.

# TABLE 8
## OLS Regression Results for the Magnitude of Earnings Management

| Variable | Expected Sign | *ABSDAC* (1) | *ABSDAC* (2) | *ABSDAC* (3) | *ABSDAC* (4) | *ABSDAC* (5) | *ABSDAC* (6) |
|---|---|---|---|---|---|---|---|
| *Intercept* | + | 0.101*** | 0.062*** | 0.064*** | 0.049*** | 0.056*** | 0.055*** |
| *TOTCOM* | + | | | | 0.0008*** | | |
| *BONMIX* | + | | | | | 0.002** | |
| *STKMIX* | ? | | | | | | 0.0009*** |
| *SIZE* | - | -0.008*** | -0.005*** | -0.005*** | -0.003*** | -0.005 *** | -0.004*** |
| *IOS* | + | 0.002*** | 0.001*** | 0.001*** | 0.0008*** | 0.001*** | 0.0009*** |
| *OWN* | - | | | | -0.025* | -0.03* | -0.024* |
| *REG* | - | -0.027*** | -0.002*** | -0.009*** | -0.009*** | -0.01*** | -0.01*** |
| *LAGDAC* | + | | | 0.080*** | 0.075*** | 0.08*** | 0.075*** |
| *CFO* | - | -0.002*** | -0.001*** | -0.002*** | -0.002*** | -0.002 *** | -0.002 *** |
| *LEV* | - | -0.003*** | -0.001*** | -0.002*** | -0.001*** | -0.002*** | -0.001*** |
| *DPOR* | + | | -0.000 | -0.000 | -0.0006 | -0.0008 | -0.0007 |
| *MONDAC1* | - | | -0.001*** | -0.008*** | -0.008*** | -0.009*** | -0.008*** |
| *MONDAC2* | - | | 0.001 | 0.002 | 0.005 | 0.006 | 0.004 |
| *FLEX* | + | | 0.243*** | 0.227*** | 0.219*** | 0.223*** | 0.22*** |
| Adjusted $R^2$ | | 0.079 | 0.128 | 0.144 | 0.153 | 0.146 | 0.153 |
| # Observations | | 3789 | 3789 | 3737 | 3698 | 3698 | 3698 |
| P (F) | | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| DW | | 1.80 | 1.84 | 1.96 | 1.96 | 1.96 | 1.96 |

Variables are defined in Table 4.
The ? in expected signs represents no prediction.
*, **, *** Significant at 0.10, 0.05, and 0.01 level, respectively.

# TABLE 9
## 2SLS Results for the Relation between the Magnitude of Earnings Management and Level of Compensation

$$ABSDAC = \alpha + \beta_1 TOTCOM + \beta_2 SIZE + \beta_3 IOS + \beta_4 OWN + \beta_5 REG + \beta_6 LAGDAC + \beta_7 CFO + \beta_8 LEV + \beta_9 DPOR + \beta_{10} MONDAC1 + \beta_{11} MONDAC2 + \beta_{12} FLEX + \varepsilon$$

$$TOTCOM = \alpha + \beta_1 ABSDAC + \beta_2 SIZE + \beta_3 IOS + \beta_4 OWN + \beta_5 REG + \beta_6 LAGTOT + \beta_7 MONCOMP + \beta_8 HOR + \beta_9 TENU + \beta_{10} RISK + \varepsilon$$

| Variable | Expected Sign | *ABSDAC* | *TOTCOM* |
|---|---|---|---|
| Intercept | ?, ? | -0.019 | 5.163** |
| | | | |
| Endogenous Variables | | | |
| *TOTCOM* | +, ¬ | 0.005*** | |
| *ABSDAC* | ¬, + | | 23.209*** |
| | | | |
| Common Explanatory Variables: | | | |
| *SIZE* | -, + | 0.003** | -1.067*** |
| *IOS* | +, + | -0.0007* | 0.097*** |
| *OWN* | -, ? | 0.004 | -4.557** |
| *REG* | -, - | -0.003 | -0.724* |
| | | | |
| Variables for Earnings Management: Equation: | | | |
| *LAGDAC* | +, ¬ | 0.107*** | |
| *CFO* | -, ¬ | -0.0002 | |
| *LEV* | -, ¬ | 0.0006 | |
| *DPOR* | +, ¬ | -0.0004 | |
| *MONDAC1* | -, ¬ | -0.005* | |
| *MONDAC2* | -, ¬ | 0.012 | |
| *FLEX* | +, ¬ | 0.175*** | |
| | | | |
| Variables for Compensation Equation: | | | |
| *LAGTOT* | ¬, + | | 0.152*** |
| *MONCOMP* | ¬, ? | | 2.898** |
| *HOR* | ¬, ? | | -0.226 |
| *TENU* | ¬, ? | | -0.0006 |
| *RISK* | ¬, ? | | 4.230*** |
| | | | |
| Adjusted $R^2$ | | 0.125 | 0.299 |
| Number of observations | | 2494 | 2494 |
| P (F) | | 0.0001 | 0.0001 |
| DW | | 1.94 | 2.02 |
| P (Hausman: *TOTCOM*) | | 0.0001 | |
| P (Hausman: *ABSDAC*) | | | 0.0062 |
| Basmann p-value | | 0.0001 | 0.01 |

Variables are defined in Table 4.
The ? and ¬ in expected signs represent no prediction and the variable is not in the model, respectively.
*, **, *** Significant at 0.10, 0.05, and 0.01 level, respectively.

# TABLE 10
## 2SLS Results for the Relation between the Magnitude of Earnings Management and Bonus-Based Compensation

$$ABSDAC = \alpha + \beta_1 BONMIX + \beta_2 SIZE + \beta_3 IOS + \beta_4 OWN + \beta_5 REG + \beta_6 LAGDAC + \beta_7 CFO + \beta_8 LEV + \beta_9 DPOR + \beta_{10} MONDAC1 + \beta_{11} MONDAC2 + \beta_{12} FLEX + \varepsilon$$

$$BONMIX = \alpha + \beta_1 ABSDAC + \beta_2 SIZE + \beta_3 IOS + \beta_4 OWN + \beta_5 REG + \beta_6 LAGBON + \beta_7 MONCOMP + \beta_8 HOR + \beta_9 TENU + \beta_{10} RISK + \varepsilon$$

| Variable | Expected Sign | *ABSDAC* | *BONMIX* |
|---|---|---|---|
| Intercept | ?, ? | 0.038*** | 0.832*** |
| Endogenous Variables | | | |
| *BONMIX* | +, ¬ | 0.003* | |
| *ABSDAC* | ¬, + | | -0.298 |
| Common Explanatory | | | |
| *SIZE* | -, - | -0.004*** | -0.095*** |
| *IOS* | +, - | 0.0005* | 0.004 |
| *OWN* | -, ? | -0.024 | -0.201 |
| *REG* | -, - | -0.01** | -0.174*** |
| Variables for Earnings Management Equation: | | | |
| *LAGDAC* | +, ¬ | 0.130*** | |
| *CFO* | -, ¬ | -0.0004 | |
| *LEV* | -, ¬ | 0.0008 | |
| *DPOR* | +, ¬ | -0.0007 | |
| *MONDAC1* | -, ¬ | -0.008*** | |
| *MONDAC2* | -, ¬ | 0.017** | |
| *FLEX* | +, ¬ | 0.202*** | |
| Variables for Compensation Equation: | | | |
| *LAGBON* | ¬, + | | 0.535*** |
| *MONCOMP* | ¬, ? | | 0.084 |
| *HOR* | ¬, ? | | 0.042 |
| *TENU* | ¬, + | | 0.002 |
| *RISK* | ¬, ? | | -0.008 |
| Adjusted $R^2$ | | 0.137 | 0.466 |
| Number of observations | | 2494 | 2494 |
| P (F) | | 0.0001 | 0.0001 |
| DW | | 1.91 | 2.23 |
| P (Hausman: *BONMIX*) | | 0.0394 | |
| P (Hausman: *ABSDAC*) | | | 0.9588 |
| Basmann p-value | | 0.0001 | 0.441 |

Variables are defined in Table 4.
The ? and ¬ in expected signs represent no prediction and the variable is not in the model, respectively.
*, **, *** Significant at 0.10, 0.05, and 0.01 level, respectively.

# TABLE 11
## 2SLS Results for the Relation between the Magnitude of Earnings Management and Stock-Based Compensation

$$ABSDAC = \alpha + \beta_1 STKMIX + \beta_2 SIZE + \beta_3 IOS + \beta_4 OWN + \beta_5 REG + \beta_6 LAGDAC + \beta_7 CFO + \beta_8 LEV + \beta_9 DPOR + \beta_{10} MONDAC1 + \beta_{11} MONDAC2 + \beta_{12} FLEX + \varepsilon$$

$$STKMIX = \alpha + \beta_1 ABSDAC + \beta_2 SIZE + \beta_3 IOS + \beta_4 OWN + \beta_5 REG + \beta_6 LAGSTK + \beta_7 MONCOMP + \beta_8 HOR + \beta_9 TENU + \beta_{10} RISK + \varepsilon$$

| Variable | Expected Sign | *ABSDAC* | *STKMIX* |
|---|---|---|---|
| Intercept | ?, ? | -0.011 | 1.008 |
| | | | |
| Endogenous Variables | | | |
| *STKMIX* | ?, ¬ | 0.008*** | |
| *ABSDAC* | ¬, + | | 22.456*** |
| | | | |
| Common Explanatory | | | |
| *SIZE* | -, + | 0.002* | -0.525*** |
| *IOS* | +, + | -0.0009** | 0.060*** |
| *OWN* | -, - | 0.036 | -5.422*** |
| *REG* | -, - | -0.005 | -0.109 |
| | | | |
| Variables for Earnings Management Equation: | | | |
| *LAGDAC* | +, ¬ | 0.101*** | |
| *CFO* | -, ¬ | -0.0001 | |
| *LEV* | -, ¬ | 0.001 | |
| DPOR | +, ¬ | -0.0002 | |
| *MONDAC1* | -, ¬ | -0.003 | |
| *MONDAC2* | -, ¬ | 0.01 | |
| *FLEX* | +, ¬ | 0.157*** | |
| | | | |
| Variables for Compensation Equation: | | | |
| *LAGSTK* | ¬, + | | 0.088*** |
| *MONCOMP* | ¬, ? | | 2.254* |
| *HOR* | ¬, ? | | -0.248 |
| *TENU* | ¬, + | | -0.008 |
| *RISK* | ¬, ? | | 3.301*** |
| | | | |
| Adjusted $R^2$ | | 0.106 | 0.150 |
| Number of observations | | 2494 | 2494 |
| P (F) | | 0.0001 | 0.0001 |
| DW | | 1.98 | 2.04 |
| P (Hausman: *STKMIX*) | | 0.0001 | |
| P (Hausman: *ABSDAC*) | | | 0.0051 |
| Basmann p-value | | 0.0013 | 0.05 |

Variables are defined in Table 4.
The ? and ¬ in expected signs represent no prediction and the variable is not in the model, respectively.
*, **, *** Significant at 0.10, 0.05, and 0.01 level, respectively.

# TABLE 12
## OLS Regression Results for Income-Smoothing

| Variable | Expected Sign | *SMOOTH* (1) | *SMOOTH* (2) | *SMOOTH* (3) | *SMOOTH* (4) | *SMOOTH* (5) | *SMOOTH* (6) |
|---|---|---|---|---|---|---|---|
| Intercept | + | 5.67*** | 4.19*** | 3.14*** | 3.41*** | 1.97* | 3.35*** |
| *TOTCOM* | ? | | | | -0.02 | | |
| *BONMIX* | - | | | | | 0.44*** | |
| *STKMIX* | + | | | | | | -0.03*** |
| *SIZE* | - | -0.04 | -0.09 | -0.06 | -0.08 | 0.06 | -0.08*** |
| *IOS* | + | -0.11*** | -0.11*** | -0.10*** | -0.09*** | -0.11*** | -0.09*** |
| *OWN* | + | | | | 1.01 | 1.32 | 0.93* |
| *REG* | - | -1.06 | -0.98 | -0.69 | -0.72 | -0.46 | -0.69** |
| *LAGSMTH* | + | | | 0.07*** | 0.07*** | 0.07*** | 0.07*** |
| *CFO* | - | 0.03 | 0.03 | 0.02 | 0.02 | 0.03 | 0.02 *** |
| *LEV* | + | 0.19*** | 0.20*** | 0.21*** | 0.19*** | 0.22*** | 0.19*** |
| *DPOR* | + | | 0.01 | -0.07 | -0.07 | -0.05 | -0.07 |
| *MONDAC1* | - | | 0.50* | 0.55** | 0.55* | 0.50* | 0.54*** |
| *MONDAC2* | - | | 1.06 | 1.29* | 1.27 | 1.39* | 1.27 |
| *FLEX* | + | | 4.67** | 5.55*** | 5.57*** | 5.12** | 5.61*** |
| Adjusted $R^2$ | | 0.006 | 0.01 | 0.04 | 0.04 | 0.05 | 0.04 |
| #observations | | 2437 | 2436 | 2200 | 2176 | 2176 | 2176 |
| P (F) | | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| DW | | 1.64 | 1.64 | 1.70 | 1.71 | 1.72 | 1.71 |

Variables are defined in Table 4.
The ? and ¬ in expected signs represent no prediction and the variable is not in the model, respectively.
*, **, *** Significant at 0.10, 0.05, and 0.01 level, two-tailed test, respectively.

# TABLE 13
## 2SLS Results for the Relation between Income-Smoothing and Level of Compensation

$$SMOOTH = \alpha + \beta_1 TOTCOM + \beta_2 SIZE + \beta_3 IOS + \beta_4 OWN + \beta_5 REG + \beta_6 LAGSMTH + \beta_7 CFO + \beta_8 LEV + \beta_9 DPOR + \beta_{10} MONDAC1 + \beta_{11} MONDAC2 + \beta_{12} FLEX + \varepsilon$$

$$TOTCOM = \alpha + \beta_1 SMOOTH + \beta_2 SIZE + \beta_3 IOS + \beta_4 OWN + \beta_5 REG + \beta_6 LAGTOT + \beta_7 MONCOMP + \beta_8 HOR + \beta_9 TENU + \beta_{10} RISK + \varepsilon$$

| Variable | Expected Sign | *SMOOTH* | *TOTCOM* |
|---|---|---|---|
| Intercept | ?, ? | 6.53*** | 6.96*** |
| Endogenous Variables: | | | |
| *TOTCOM* | ?, ¬ | -0.17* | |
| *SMOOTH* | ¬, + | | -0.10 |
| Common Explanatory Variables: | | | |
| *SIZE* | -, + | -0.37** | -1.10*** |
| *IOS* | +, + | -0.05 | 0.12*** |
| *OWN* | +, ? | -0.10 | -4.89** |
| *REG* | -, - | -1.23 | -2.44** |
| Variables for Earnings Management Equation: | | | |
| *LAGSMTH* | +, ¬ | 0.08*** | |
| *CFO* | -, ¬ | 0.02 | |
| *LEV* | +, ¬ | 0.08 | |
| *DPOR* | +, ¬ | -0.08 | |
| *MONDAC1* | -, ¬ | 0.65* | |
| *MONDAC2* | -, ¬ | 0.62 | |
| *FLEX* | +, ¬ | 3.84 | |
| Variables for Compensation Equation: | | | |
| *LAGTOT* | ¬, + | | 0.17*** |
| *MONCOMP* | ¬, ? | | 1.86 |
| *HOR* | ¬, ? | | -0.29 |
| *TENU* | ¬, ? | | 0.002 |
| *RISK* | ¬, ? | | 6.72*** |
| Adjusted $R^2$ | | 0.04 | 0.26 |
| Number of observations | | 1709 | 1709 |
| P (F) | | 0.00 | 0.00 |
| DW | | 1.74 | 2.05 |
| P (Hausman: *TOTCOM*) | | 0.12 | |
| P (Hausman: *SMOOTH*) | | | 0.09 |
| Basmann p-value | | 0.00 | 0.04 |

Variables are defined in Table 4.
The ? and ¬ in expected signs represent no prediction and the variable is not in the model, respectively.
*, **, *** Significant at 0.10, 0.05, and 0.01 level, respectively.

# TABLE 14
## 2SLS Results for the Relation between Income-Smoothing and Bonus-Based Compensation

$$SMOOTH = \alpha + \beta_1 TOTCOM + \beta_2 SIZE + \beta_3 IOS + \beta_4 OWN + \beta_5 REG + \beta_6 LAGSMTH + \beta_7 CFO + \beta_8 LEV + \beta_9 DPOR + \beta_{10} MONDAC1 + \beta_{11} MONDAC2 + \beta_{12} FLEX + \varepsilon$$

$$BONMIX = \alpha + \beta_1 SMOOTH + \beta_2 SIZE + \beta_3 IOS + \beta_4 OWN + \beta_5 REG + \beta_6 LAGBON + \beta_7 MONCOMP + \beta_8 HOR + \beta_9 TENU + \beta_{10} RISK + \varepsilon$$

| Variable | Expected Sign | *SMOOTH* | *BONMIX* |
|---|---|---|---|
| Intercept | ?, ? | 2.32* | 0.86*** |
| Endogenous Variables: | | | |
| *BONMIX* | -, ¬ | 0.88*** | |
| *SMOOTH* | ¬, + | | -0.03 |
| Common Explanatory Variables: | | | |
| *SIZE* | -, - | 0.11 | -0.08*** |
| *IOS* | +, - | -0.10*** | 0.003 |
| *OWN* | +, ? | 0.80 | -0.12 |
| *REG* | -, - | -0.30 | -0.17 |
| Variables for Earnings Management Equation: | | | |
| *LAGSMTH* | +, ¬ | 0.08*** | |
| *CFO* | -, ¬ | 0.03 | |
| *LEV* | +, ¬ | 0.17** | |
| *DPOR* | +, ¬ | -0.06 | |
| *MONDAC1* | -, ¬ | 0.67** | |
| *MONDAC2* | -, ¬ | 0.46 | |
| *FLEX* | +, ¬ | 2.57 | |
| Variables for Compensation Equation: | | | |
| *LAGBON* | ¬, + | | 0.65*** |
| *MONCOMP* | ¬, ? | | 0.07 |
| *HOR* | ¬, ? | | 0.07 |
| *TENU* | ¬, + | | 0.001 |
| *RISK* | ¬, ? | | -0.11 |
| Adjusted $R^2$ | | 0.04 | 0.54 |
| Number of observations | | 1709 | 1709 |
| P (F) | | 0.00 | 0.00 |
| DW | | 1.75 | 2.22 |
| P (Hausman: *BONMIX*) | | 0.04 | |
| P (Hausman: *SMOOTH*) | | | 0.03 |
| Basmann p-value | | 0.00 | 0.08 |

Variables are defined in Table 4.
The ? and ¬ in expected signs represent no prediction and the variable is not in the model, respectively.
*, **, *** Significant at 0.10, 0.05, and 0.01 level, respectively.

# TABLE 15
## 2SLS Results for the Relation between Income-Smoothing and Stock-Based Compensation

$$SMOOTH = \alpha + \beta_1 TOTCOM + \beta_2 SIZE + \beta_3 IOS + \beta_4 OWN + \beta_5 REG + \beta_6 LAGSMTH + \beta_7 CFO + \beta_8 LEV + \beta_9 DPOR + \beta_{10} MONDAC1 + \beta_{11} MONDAC2 + \beta_{12} FLEX + \varepsilon$$

$$STKMIX = \alpha + \beta_1 SMOOTH + \beta_2 SIZE + \beta_3 IOS + \beta_4 OWN + \beta_5 REG + \beta_6 LAGSTK + \beta_7 MONCOMP + \beta_8 HOR + \beta_9 TENU + \beta_{10} RISK + \varepsilon$$

| Variable | Expected Sign | *SMOOTH* | *STKMIX* |
|---|---|---|---|
| Intercept | ?, ? | 8.33*** | 3.11 |
| Endogenous Variables: | | | |
| *STKMIX* | +, ¬ | -0.62*** | |
| *SMOOTH* | ¬, + | | -0.10 |
| Common Explanatory Variables: | | | |
| *SIZE* | -, + | -0.59*** | -0.56*** |
| *IOS* | +, + | -0.02 | 0.05** |
| *OWN* | +, - | -2.62 | -4.77** |
| *REG* | -, - | -1.58 | -1.30 |
| Variables for Earnings Management Equation: | | | |
| *LAGSMTH* | +, ¬ | 0.07*** | |
| *CFO* | -, ¬ | 0.02 | |
| *LEV* | +, ¬ | 0.02 | |
| *DPOR* | +, ¬ | -0.11 | |
| *MONDAC1* | -, ¬ | 0.35 | |
| *MONDAC2* | -, ¬ | 1.04 | |
| *FLEX* | +, ¬ | 5.69** | |
| Variables for Compensation Equation: | | | |
| *LAGSTK* | ¬, + | | 0.07*** |
| *MONCOMP* | ¬, ? | | 1.16 |
| *HOR* | ¬, ? | | -0.37 |
| *TENU* | ¬, + | | -0.003 |
| *RISK* | ¬, ? | | 5.76*** |
| Adjusted $R^2$ | | 0.04 | 0.12 |
| Number of observations | | 1709 | 1709 |
| P (F) | | 0.00 | 0.00 |
| DW | | 1.78 | 1.98 |
| P (Hausman: *STKMIX*) | | 0.00 | |
| P (Hausman: *SMOOTH*) | | | 0.44 |
| Basmann p-value | | 0.06 | 0.31 |

Variables are defined in Table 4.
The ? and ¬ in expected signs represent no prediction and the variable is not in the model, respectively.
*, **, *** Significant at 0.10, 0.05, and 0.01 level, respectively.

# VITA

Amal A. Said was born on September 28, 1966, in Cairo Egypt. She received General Certificate of Education Diploma from London University in 1982. She received her Bachelor of Accounting with honor in 1986 from Cairo University, Egypt. She received her Master of Accounting from Cairo University in 1994. Amal received her Master of Science in Accounting in 1997 from Old Dominion University, Norfolk, VA. She received her Ph.D. in 2003 from Virginia Commonwealth University, Richmond, VA. Amal has been teaching accounting at Cairo University, Old Dominion University and Virginia Commonwealth University. Amal received the Phi Kappa Phi Honor Society scholarship and Virginia Commonwealth graduate fellowship. She is a fellow of the American Accounting Association Doctoral Consortium. Amal presented several papers in national and regional meetings and has several publications. She is a member of the American Accounting Association and Beta Gamma Sigma (Business Honor Society).