FEAR OF REPORTING BAD NEWS: WHY RISK AND LOSS AVERSION CAN TEMPT TOP EXECUTIVES TO CREATE INFORMATION ASYMMETRY

A Dissertation

by

SUBRATA CHAKRABARTY

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2009

Major Subject: Management

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ABSTRACT

Fear of Reporting Bad News: Why Risk and Loss Aversion Can Tempt Top Executives to Create Information Asymmetry.

(August 2009)

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Top executives sometimes attempt to create information asymmetry through corporate reporting manipulation. In the United States, one method was not to report financials in certain quarters (this was a legal option before 1970), and a second method is to report inaccurate financials (which has been a major concern in the 1990s-2000s). This study argues that when cognitive bias of loss aversion is high, a firm's risk can induce such attempts to create information asymmetry. This argument is based on prospect theory's loss aversion axiom, which states that people psychologically weigh losses more strongly than equivalent gains.

In this study, a firm's risk is theoretically operationalized using independent variables of firm-specific risk (firm's unsystematic risk as assessed by stock market) and default risk (difficulty the firm faces in meeting its debt market obligations). Correspondingly, loss aversion is theoretically operationalized using moderator variables of institutional ownership concentration (as an indicator of shareholder resistance to loss aversion) and top executive in-the-money stock options to salary ratio (as an indicator of

personal wealth that is exposed to loss if a firm approaches bankruptcy). Hypotheses are tested using data collected for a 6 year period from 1964 to 1969 and for a 9 year period from 1997 to 2006.

Findings suggest that when cognitive bias of loss aversion is high, firm-specific risk in stock market and default risk in debt market may cause top executives to be fearful of reporting bad news, tempting them to create information asymmetry as a result. An implication is that the encouragement of risk (as recommended by agency theory) without factoring in the role of loss aversion (as highlighted by prospect theory's loss aversion axiom) can be counterproductive.

DEDICATION

To those who awaken and enlighten our intellect

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I thank my committee chair, Dr. Asghar Zardkoohi, and my committee members, Dr. Michael A. Hitt, Dr. R. Duane Ireland, Dr. Ramona L. Paetzold, and Dr. Donald R. Fraser, for their kind guidance and support throughout the course of this research.

I am extremely grateful to my committee for nurturing this dissertation with their valuable insights and suggestions. Importantly, they have taught me how to go about learning, how to go about thinking, what questions to ask, how to go about analyzing information, how to convey findings, and therefore extend knowledge and theory.

Thanks also go to fellow PhD students, faculty, and staff for making my time at Texas A&M University a great experience. Finally, thanks to my parents, sister, and friends for their encouragement.

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CHAPTER I

INTRODUCTION

Capital market stakeholders (that is, shareholders and creditors) require access to corporate financial/accounting information to assess a firm's strategic competitiveness (Freeman & McVea, 2001). Despite the importance of such corporate information to capital market stakeholders, it is surprising that top executives sometimes attempt to create information asymmetry through corporate reporting manipulation (Arthaud Day, Certo, Dalton, & Dalton, 2006; Healy & Palepu, 2001). In other words, by manipulating the manner in which corporate information is publicly reported, top executives may try to hide factual negative information about the firm, and instead present a depiction that is more satisfactory to capital market stakeholders (Healy & Palepu, 2001; Jensen, 2003). This is a major issue in strategic management research because (i) such corporate reporting manipulation essentially misleads capital market stakeholders, and (ii) strategic management scholars emphasize strategies for improving firm performance rather than creating misleading perceptions of firm performance (Arthaud Day et al., 2006; O'Connor, Priem, Coombs, & Gilley, 2006; Zhang, Bartol, Smith, Pfarrer, & Khanin, 2008).

Recent research has made considerable progress, finding that such attempts by top executives to create information asymmetry through corporate reporting manipulation have been motivated by compensation incentive mechanisms such as stock

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This dissertation follows the style of *Strategic Management Journal*.

options (Burns & Kedia, 2006; Efendi, Srivastava, & Swanson, 2007; O'Connor et al., 2006; Zhang et al., 2008). Nevertheless, a study of US business history reveals a theoretical gap, that is, the problem of top executives attempting to create information asymmetry through corporate reporting manipulation actually *predates* the existence of stock options. Specifically, stock option trading first started with inception of the Chicago Board Options Exchange (CBOE) in 1973 (Fontnouvelle, Fishe, & Harris, 2003) and stock options started becoming a substantial component of executive compensation beginning in the mid 1980s (Hall, 2003: 23). However, the literature suggests that even before 1970, many firms chose to create information asymmetry by not reporting their financials for certain quarters (Taylor, 1965). This happened in the 1960s despite the prevalent norm and repeated insistence from major US stock exchanges and Security Exchange Commission (SEC) to report financials every quarter consistently (Butler, Kraft, & Weiss, 2007; Taylor, 1965). Hence, history suggests that top executives have often attempted to create information asymmetry, even in the absence of incentive mechanisms such as stock options. Therefore, it seems that in addition to the recently observed effects of stock options, certain other fundamental antecedents have played a role in motivating top executives to create information asymmetry through corporate reporting manipulation.

The purpose of this study is to extend corporate governance research by further exploring the question of why top executives are motivated to engage in the behavior of creating information asymmetry through corporate reporting manipulation. The key constructs used to address this question in this study are *risk* (defined as the firm's

actions that ideally aim for large gains but also exposes the firm to a chance of large losses) (Eisenmann, 2002; March & Shapira, 1987; Sanders & Hambrick, 2007), and *loss aversion* (defined as a "distaste for losses") (Thaler, Tversky, Kahneman, & Schwartz, 1997: 648). This study argues that when loss aversion is high, a firm's risk can tempt top executives to engage in attempts to create information asymmetry. This argument is theoretically grounded in prospect theory's loss aversion axiom, which states that people cognitively weigh losses more strongly than equivalent gains (Benartzi & Thaler, 1995; Thaler et al., 1997; Tversky & Kahneman, 1992). An important implication of this argument is that agency theory's recommendations that encourage greater risk without regard for prospect theory's loss aversion axiom can become counterproductive by creating a fear of reporting bad news. To appreciate this argument it is important to understand how corporate information may affect those who receive it and those who provide it.

Capital market stakeholders, as receivers of information, prefer frequent and accurate information (Eisenhardt, 1989; Freeman & McVea, 2001). In contrast, top executives, as providers of information, may not prefer the same. Top executives may have concerns about how capital market stakeholders might interpret the information. More specifically, capital market stakeholders invest in firms, encourage top executives in firms to take risk in order to assure superior returns for their investment, and continually seek information on whether a firm's risk is yielding gains or losses (Aaker & Jacobson, 1987; March & Shapira, 1987). Though a firm's risk comprises its actions or context that ideally aim for large gains (to assure returns on investment for capital

market stakeholders), it also exposes the firm to a chance of large losses (with likelihood that investment obtained from capital market stakeholders can be lost) (Eisenmann, 2002; March & Shapira, 1987; Sanders & Hambrick, 2007). Even though risk by definition implies that negative outcomes are possible, top executives bear the wrath of capital market stakeholders when they disclose any negative information. When capital market stakeholders receive information that the firm's risk is yielding losses rather than gains, they become highly dissatisfied and even call for penalizing actions against top executives (Hambrick & D'Aveni, 1988; Sanders & Hambrick, 2007).

Such "strong distaste for losses" is a cognitive bias that is termed *loss aversion* (Thaler et al., 1997: 648), and the corresponding axiom in prospect theory literature is that people cognitively weigh losses more strongly than equivalent gains (Benartzi & Thaler, 1995; Thaler et al., 1997; Tversky & Kahneman, 1992). Studies have shown that at a subconscious level "losses loom larger than corresponding gains," and that on average, the dissatisfaction from a loss is more than twice the satisfaction from an equivalent amount of gain (Tversky & Kahneman, 1991: 1039). For example, people on average need to be compensated a bit more than $200 to fully overcome a dissatisfaction of losing $100 because they "feel the $100 loss more than the $200 gain," that is, "the disutility of losing $100 is roughly twice the utility of gaining $100" (Thaler et al., 1997: 648-649). This implies that even if disclosed amounts of positive information and negative information are technically equal, top executives might be unfairly assessed as mediocre because stakeholders give approximately twice the weight to negative information and become easily dissatisfied (Benartzi & Thaler, 1995; Kahneman, 2003).

Hence, top executives face a dilemma. On the one hand, capital market stakeholders seek information, and on the other hand, disclosure of negative information can create more dissatisfaction than it logically should. The cognitive bias of loss aversion tilts the balance against disclosure of negative information and in favor of disclosure of either positive or no information.

In sum, though a firm's risk can yield both positive and negative outcomes, its top executives will be concerned that capital market stakeholders might give more weight to negative information and become easily dissatisfied. To prevent this dissatisfaction, top executives might feel tempted to create information asymmetry (Kahneman, 2003). As illustrated in the theoretical framework in Figure 1, this study will suggest that the greater the risk, the more likely it is that a firm's top executives will attempt to create information asymmetry. Further, the association between risk and attempts to create information asymmetry will be moderated by the extent of loss aversion. When loss aversion is high, a firm's risk will have a strong influence on attempts to create information asymmetry. When loss aversion is low, the association between firm's risk and attempts to create information asymmetry will weaken.

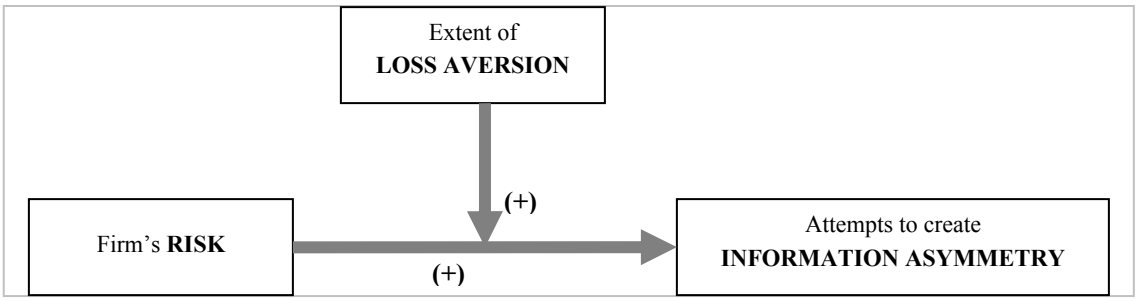


Figure 1. Theoretical framework

The remaining sections will expand on the theoretical framework in Figure 1 as follows. First, theoretical and descriptive background is provided on the two ways in which top executives have historically attempted to create information asymmetry: (i) attempts to create information asymmetry in the 1960s by not following the consistent quarterly reporting norm, and (ii) attempts to create information asymmetry in the 1990s-2000s through inaccurate reporting. Second, in the theory development and hypotheses section, a firm's risk is theoretically operationalized in accordance with capital market stakeholder perspectives as: (i) firm-specific risk (firm's unsystematic risk as assessed by stock market), and (ii) default risk (difficulty faced by firm in meeting its debt market obligations). Hypotheses suggest that both these types of risk influence attempts to create information asymmetry in both eras (inconsistent reporting in the 1960s and inaccurate reporting in the 1990s-2000s). Furthermore, hypotheses suggest that the extent of loss aversion moderates the influence of risk. The moderator variables (indicative of loss aversion) are institutional ownership concentration (as an indicator of shareholder resistance to loss aversion) and top executive in-the-money stock options to salary ratio (as an indicator of personal wealth that is exposed to loss if firm approaches bankruptcy). Third, the methods section elaborates on the sample, procedure, and measures.

Finally, the discussion section elaborates on the implication of this study, that is, it provides an alternative theoretical explanation for why top executives create information asymmetry. Traditionally, agency theory literature (Eisenhardt, 1989; Jensen, 1986, 2000; Jensen & Meckling, 1976) has suggested that (i) executives

opportunistically create information asymmetry because of their own self-interest, (ii) stock market investors should demand greater firm-specific risk for greater returns, and (iii) higher debt ensures greater managerial efficiency. While agency theory explanations are well established, this study highlights the paradox that such demands for greater firm-specific risk and higher debt might turn counterproductive by creating a fear of reporting negative news. A firm's risk constitutes both firm-specific risk in the stock market and default risk in the debt market. Risk, by definition, implies that both positive and negative outcomes are possible. However, because of the cognitive bias of loss aversion, negative information related to the firm's risk may be given much more weight than equivalent positive information. Hence, top executives fear reporting negative information because they worry that the capital market stakeholders will give more weight to negative information and become dissatisfied. Hence, in contrast to agency theory explanations noted above, this study suggests that (i) attempts to create information asymmetry can be a result of fear of reporting bad news to capital market stakeholders, (ii) when loss aversion is high, firm-specific risk in stock market can turn counterproductive by creating a fear of reporting bad news, and (iii) when loss aversion is high, default risk in debt market can turn counterproductive by creating a fear of reporting bad news.

CHAPTER II

BACKGROUND: INFORMATION ASYMMETRY THROUGH CORPORATE REPORTING MANIPULATION

One of the well established "organizational assumptions" in corporate governance literature is that of "information asymmetry" (Eisenhardt, 1989: 59). In this study, the term information asymmetry means that top executives have private information that is not made available to capital market stakeholders (Dalton, Hitt, Certo, & Dalton, 2007; Eisenhardt, 1989; Jensen & Meckling, 1976; Kochhar & Hitt, 1998). Information asymmetry is a manifestation of top executives having an "incentive to lie or hide information" (Jensen, 2003: 393). Corporate reporting manipulation is an attempt to purposefully create information asymmetry through acts of either concealing or falsifying factual corporate level financial/accounting data (Arthaud Day et al., 2006; Fields, Lys, & Vincent, 2001; Healy & Palepu, 2001; Jensen, 2003). This may mislead others into perceiving the firm's performance in a more positive light than it actually is (Eisenhardt, 1989; Gardner & Martinko, 1988; Jensen, 2003). There are two opportunistic aspects associated with information asymmetry, namely, "adverse selection (i.e., hidden information) and moral hazard (i.e., hidden actions)" (Sanders & Boivie, 2004: 167). Correspondingly, top executives have attempted to create information asymmetry through corporate reporting manipulation in the following two ways. (1) *Inconsistent reporting*: Top executives may choose (if legally possible) to completely avoid reporting financials in certain periods, because such complete hiding

of information gives them flexibility to average out privately known negative information with positive information over an extended interval and helps prevent potential panic/distress in the stock market. (2) *Inaccurate reporting*: Top executives may report inaccurate financials to the public, after privately carrying out hidden actions of unethically manipulating the numbers. The following sections describe the historical and theoretical background of both these types of corporate reporting manipulation.

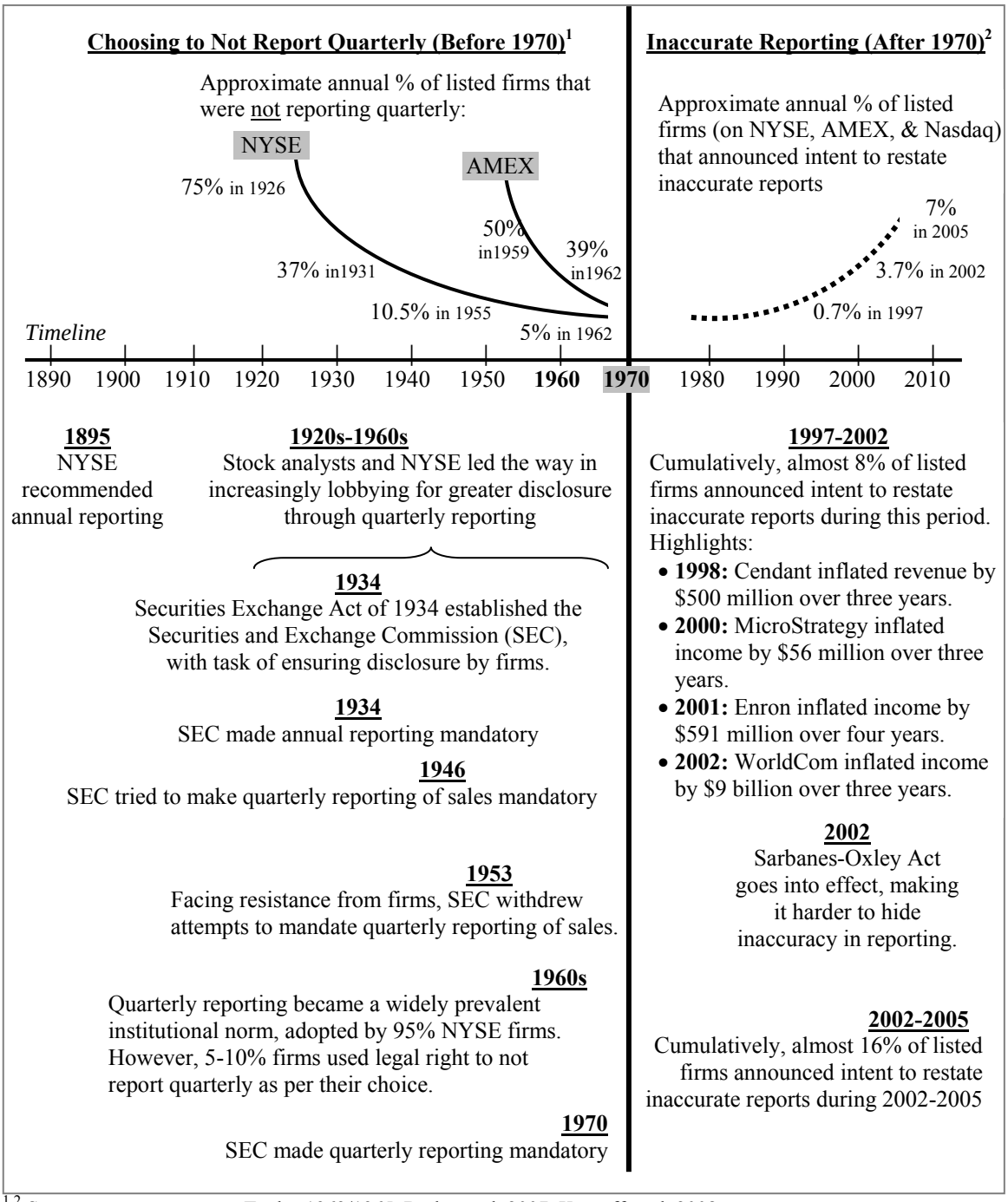
Inconsistency in Following Quarterly Reporting Norm: The 1960s

In the 1960s, some US firms avoided reporting their financials for certain quarters of their choice, even though quarterly reporting had become a legitimate and widely established norm by the 1960s (Butler et al., 2007). To stop such deviations from the norm, quarterly reporting norm was converted into a legally binding requirement in 1970. The following sections describe the resistance by firms against quarterly reporting, the lobby that favored consistent quarterly reporting, the inconsistency in following quarterly reporting norm by some firms in 1960s, and the theoretical arguments on the utility of choice to withhold reports.

The resistance against quarterly reporting. As illustrated in Figure 2, quarterly reporting was made mandatory in 1970, but the debate on the need for quarterly reporting started long before. There was considerable resistance against mandatory quarterly reporting, and the SEC's initial 1946 proposal requiring limited quarterly sales reporting had to be revoked in 1953 because of this resistance (Taylor, 1965). A compelling reason for this resistance was that quarterly reporting fails to account for the seasonal and/or fluctuating nature of income and can therefore provide an unreliable and

misleading picture[1] (Fields et al., 2001; Leftwich, Watts, & Zimmerman, 1981; Taylor, 1963). For example, in a complaint to the SEC, a firm named 'A. C. Gilbert Co.' argued that "our business is highly seasonal, since we manufacture trains and toys for Christmas business" and that disclosing "results reflecting the first half-year's operations would tend to disturb stockholders, distributors, brokers, and lending institutions" (Taylor, 1963: 133). Another firm 'Iron Fireman Manufacturing Co.' complained to the SEC that "violent variations in profits that resulted from the seasonal factor" can make interim quarterly reports misleading (Taylor, 1963:138). Because of such concerns, researchers such as Gilman (1939: 77) suggested that "seasonal characteristics rule out any accounting period shorter than a year" and a firm's internal quarterly reports "are seldom considered sufficiently reliable" for assessing a firm's overall strategic competitiveness. Further, fluctuations can happen even in non-seasonal and diversified businesses. For example, Ampco Metal Inc. argued: "Our operations and widely diversified products repeatedly show extreme volume shifts. We have had years when our entire profit for the year was earned in one quarter. This does not occur in any seasonal pattern" (Taylor, 1963: 132). Hence, a major reason behind the resistance against mandatory quarterly reporting was that it would provide an unreliable and misleading picture because of the fluctuating nature of income during a year.

[1] Another reason sometimes offered is the additional costs in preparing quarterly financial reports. However, this reason was considered relatively unimportant because "the marginal out-of-pocket costs of external reporting are low for many listed firms because they have some form of internal interim reporting" (Leftwich, Watts, & Zimmerman, 1981: 60).



[1,2] Sources: www.nyse.com, Taylor 1963/1965, Butler et al. 2007, Karpoff et al. 2008, www.gao.gov, www.sec.gov

[1] Reporting financials every quarter had become a widely prevalent norm by the 1960s. Despite this, some listed firms in the 1960s chose to not follow the norm of consistent quarterly reporting. This was finally made illegal by SEC in 1970.

[2] Quarterly reporting has been mandatory since 1970. Inaccurate reporting has been increasingly visible in 1990s-2000s.

Figure 2. History of information asymmetry through corporate reporting manipulation

The lobby for quarterly reporting. On the other side of the debate was a growing lobby that favored mandatory quarterly reporting. The argument advanced by those taking this position was that stock analysts have a valid need for continual information about a firm's strategic competitiveness (Fields et al., 2001; Healy, Hutton, & Palepu, 1999; Taylor, 1965). For example, one stock analyst wrote to the SEC complaining that "during the intervals between annual reports, a great deal can happen which will affect the value of a security both by itself and in relation to other issues" (Taylor, 1965: 93). The stock analyst suggested to the SEC that quarterly reports will "put the investor on notice of such trends or developments and make it possible to take prompt action when such is called for" (Taylor, 1965: 93).

Figure 2 illustrates the evolution of financial reporting regulation in the United States. Since the 1920s, both stock analysts and the New York Stock Exchange (NYSE) were at the forefront of lobbying for consistent quarterly reporting, and continually pressured firms to report quarterly (Butler et al., 2007; Taylor, 1965). When the SEC was established in 1934, the purpose was to ensure greater information disclosure by firms. The SEC made annual reporting mandatory in 1934, and thereafter worked toward encouraging quarterly reporting. Quarterly reporting was often grudgingly adopted by top executives; for example, one executive complained that the NYSE "has put undue pressure on us and starting in August 1964 we are planning to issue quarterly reports even though it is against our better judgment" (Taylor, 1965: 91). In response to continual pressure, the annual percentage of NYSE firms that were not reporting quarterly showed a gradual decline. As illustrated in Figure 2, the decline was from

around 75% in 1926, to 37% in 1931, to 10.5% in 1955, to 6.5% in 1959, and to 5% in 1962 (Butler et al., 2007; Taylor, 1963; Taylor, 1965). While the SEC and NYSE were at the forefront of demanding quarterly reporting, smaller exchanges such as the American Stock Exchange (AMEX) found it tougher to demand quarterly reporting because of strong opposition from its listed firms (Taylor, 1963). Nevertheless, because of intense lobbying by stock analysts and the SEC, quarterly reporting was increasingly becoming a norm in the United States, and the percentage of AMEX firms not adopting quarterly reporting showed a rapid decline from around 50% in 1959 to 39% in 1962 (Taylor, 1963: 195). Recognizing this trend, AMEX amended its stance in 1962 to largely mimic that of the NYSE, by requiring quarterly reporting from newly listed firms and urging established firms to consider adopting quarterly reporting (Taylor, 1963). In sum, under continual pressure from stock analysts, the SEC, and stock exchanges, quarterly reporting became a widely prevalent institutional norm by the 1960s.

Inconsistency in following quarterly reporting norm during the 1960s. Though quarterly reporting had become an institutional norm by the early 1960s, some listed firms (around 5-10% firms on the NYSE and around 20-30% firms on the AMEX) continued to resist the norm and strategically chose to not report quarterly, or at least not do so on a consistent basis. These few firms made use of their legal right to hide information (by not following the consistent quarterly reporting norm) because there was no mandatory regulation/law against this practice (Butler et al., 2007; Taylor, 1965). Despite the legality of these actions in the 1960s, the actions were not necessarily legitimate in terms of the prevailing norm of consistent quarterly reporting, because

legitimacy requires that actions follow the socially constructed system of norms (Suchman, 1995: 574). This discrepancy caused considerable angst among those who favored consistent quarterly reporting by all firms. For example, the Chairman of the American Stock Exchange (AMEX) in a letter in 1962 noted that "rightly or wrongly over the years" quarterly reporting has "tended to become a commonly accepted practice" and that he was "continually receiving complaints from stockholders of listed companies concerning the lack of interim earnings reports" (Taylor, 1965: 90). Finally, the SEC publicized and proposed the need for mandatory quarterly reporting on a new 10-Q form in September 1969, adopted the proposal for mandatory quarterly reporting in October 1970, and the institutional regulation came into force starting December 1970 (Butler et al., 2007). The enforcement of this 1970 SEC institutional regulation mandating consistent quarterly reporting ended the legal choice that US firms had for withholding information by not reporting quarterly results on a consistent basis.

Theoretical arguments on utility of choice to withhold reports. While the prerogative to choose non-disclosure (by not reporting consistently in quarterly intervals) was made illegal for US firms in 1970, it continues to be a legally allowed alternative in some other countries and some scholars continue to advocate the need for such an alternative (Alford, Jones, Leftwich, & Zmijewski, 1993; Bhojraj & Libby, 2005). A legal alternative for non-disclosure would provide top executives with flexibility to (i) prevent potential panic/distress selling of stock during chosen periods when they are privately aware of negative information and (ii) hope that future gains will average out current losses in the next financial report, thereby giving capital market

stakeholders a more satisfying impression of its strategic competitiveness (Easley, Kiefer, O'Hara, & Paperman, 1996; Leuz & Verrecchia, 2000).

By lengthening the gap between reporting events, top executives can average out the negative information with positive information during the extended interval (Thaler et al., 1997). As noted, when a firm's corporate information is shared with the capital market frequently, capital market stakeholders will weigh more heavily the negative signals rather than the positive signals and thus are more likely to perceive that the firm is in trouble (Benartzi & Thaler, 1995; Kahneman, 2003). To counter this, top executives can create a favorable (and accurate) impression in the capital market by simply lengthening the gap between reporting events and thereby average out the negative information with positive information during chosen periods (Thaler et al., 1997). As a hypothetical example, suppose that a firm's activities yield a gain of $150 in one quarter and a loss of $100 in another quarter. Then, following prospect theory's loss aversion axiom on the differential weighting of gains and losses, capital market stakeholders will psychologically feel a dissatisfaction of net loss of $50 over the two quarters: [$150 – 2*($100) = –$50]. However if the firm reports over an extended interval of two quarters (rather than every one quarter) then its actual net gains shown to capital market stakeholders would be [$150 – $100 = +$50] and shareholders would be satisfied because they do not see the losses. The averaging of negative information with positive information over an extended period of time mitigates the problem of psychological loss aversion (Thaler et al., 1997).

Further, Welker (1995: 803) suggests that when a firm opts for such "non-announcement periods" it can prevent panic/distress selling of stock. When "firm-specific information may exist but has not been publicly disclosed by the firm," stock market traders are hesitant to buy and sell stocks of the firm (Welker, 1995: 803). Welker (1995: 803) suggests that this hesitancy arises because stock market traders want to avoid "adverse selection" while buying/selling stocks. That is, the absence of information about strategic competitiveness of a firm makes it harder to judge the value of the firm's stock (Chi, 1994; Kochhar & Hitt, 1998), and less informed stock market traders will protect themselves against potential losses from trading with possibly better informed stock market traders (Welker, 1995). Taking advantage of this knowledge that stock market traders will be unwilling to trade in the absence of information, a firm's top executives might choose to avoid reporting financials whenever they are privately aware of some negative information. This prevents any potential panic/distress selling of stock, and gives top executives the time needed to average out the negative information with positive information before reporting the information.

In sum, the literature suggests that top executives might prefer a flexible legal option that allows them to withhold reporting of their quarterly financials, especially when they have private information that they do not want to announce publicly at that particular point of time (Alford et al., 1993; Bhojraj & Libby, 2005).

Inaccurate Reporting: The 1990s-2000s

As noted, the legal option to create information asymmetry by not following the consistent quarterly reporting norm ended in 1970, meaning that top executives who

feared reporting negative news could no longer use this legal option. Since then, some top executives have been increasingly tempted to take an unethical and illegal action that creates information asymmetry. That is "the temptation to make the numbers by fudging the accounts" (Heineman, 2007: 100) and thereby report inaccurate financials (Arthaud Day et al., 2006; Zhang et al., 2008). The following sections describe the historical and theoretical backgrounds of inaccurate reporting in the 1990s-2000s.

Inaccurate reporting in 1990s-2000s. A restatement announcement is a public acknowledgment that corporate reporting has been inaccurate and that the firm intends to restate its inaccurate reports as a correction (Arthaud Day et al., 2006). The firm makes such announcements when the hidden action of inaccurate reporting is caught and revealed by some entity (such as auditors, someone in the firm, the SEC, or certain undisclosed parties) (USGAO, 2002: 23). The literature suggests that restatement announcements (announcing the need to correct inaccurate reports) were hardly visible before the 1990s (Dechow, Sloan, & Sweeney, 1996; Karpoff, Lee, & Martin, 2008). Before 1970, firms had a legal choice to avoid reporting their quarterly financials, and therefore they had no utility for the unethical and illegal choice of inaccurate reporting. In the first few decades after 1970 (that is, 1970s-1980s), there were a very low number of public restatement announcements, probably because weaker institutional regulations prevented the detection of inaccurate reporting (Dechow et al., 1996; Karpoff et al., 2008). With gradual strengthening of institutional regulations, incidences of restatements increasingly came to light in the 1990s-2000s (Dechow et al., 1996; Karpoff et al., 2008). A prominent example was WorldCom, which had inaccurately booked some of

its expenses as investments in assets, leading to higher but inaccurately stated profits (Moore, Tetlock, Tanlu, & Bazerman, 2006).

The U. S. Government undertook a major initiative to identify restatement announcement events during the period 1997 to 2006 (USGAO, 2003, 2007). Restatements identified by GAO are a result of major accounting problems and not a result of minor changes or errors in accounting procedures (Arthaud Day et al., 2006; Zhang et al., 2008). The GAO "focused on financial restatements resulting from accounting irregularities, including so-called 'aggressive' accounting practices, intentional and unintentional misuse of facts applied to financial statements, oversight or misinterpretation of accounting rules, and fraud" (USGAO, 2003: 4). The GAO then excluded any restatements that were routine and not a result of accounting irregularities. For example, they "excluded restatements resulting from mergers and acquisitions, discontinued operations, stock splits, issuance of stock dividends, currency-related issues, changes in business segment definitions, changes due to transfers of management, changes made for presentation purposes, general accounting changes under generally accepted accounting principles (GAAP), litigation settlements, and arithmetic and general bookkeeping errors" (USGAO, 2003: 5). Hence, the restatements identified by the GAO and used in this study represent attempts to create information asymmetry through inaccurate reporting.

As illustrated in Figure 2, the approximate annual percentage of listed firms (on the NYSE, the AMEX, and the Nasdaq stock exchanges) that restated because of inaccurate reporting increased from 0.7% in 1997, to 3.7% in 2002, and to 7% in 2005

(USGAO, 2002, 2007). Of these, the restatement announcements by Enron in 2001 (which had inflated income by $591 million over a four-year period) and WorldCom in 2002 (which had inflated income by $9 billion over a three-year period) received wide publicity and condemnation. In response to such corporate scandals, the Sarbanes-Oxley Act was enacted in July 2002, which made it harder for firms to hide information through inaccurate reporting, and led to more cases of inaccurate reporting being revealed. Cumulatively, more than 20% of listed firms have announced an intention to restate inaccurate reports at some point of time during the 1997-2005 period (with 8% of listed firms announcing restatements sometime during the 1997-2001 period before Sarbanes-Oxley, and 16% of listed firms announcing restatements sometime during the 2002-2005 period) (USGAO, 2007).

Theoretical literature on inaccurate reporting. The various inaccurate reporting scandals in 1990s-2000s mean that top executives are often tempted to create a more favorable impression with capital market stakeholders by releasing inaccurate statements (Moore et al., 2006). The market and the public learns about this when the firm acknowledges that its financial reports have been inaccurate, and that it intends to restate the financial reports as a correction (Arthaud Day et al., 2006; O'Connor et al., 2006; Zhang et al., 2008). The strategic management literature notes that "restatements tend to involve intentional actions taken by firm leaders", "constitute a more direct breach of stakeholder trust," and hurts organizational legitimacy (Arthaud Day et al., 2006: 1121). The action to "generate an inflated earnings report" is a "hidden action" (Crocker & Slemrod, 2007: 698), and the literature refers to such hidden actions as a 'moral hazard'

(Kochhar & Hitt, 1998; Sanders & Boivie, 2004). Moral hazard implies "non-compliance" or shirking of contractually required actions (Durand & Vargas, 2003: 668) and the "evasion of a broadly specified obligation" that executives had otherwise promised to oblige in good faith (Chi, 1994: 277-279). Prospect theory suggests that such reluctance to show negative information might be because of the cognitive bias of loss aversion (Kahneman, 2003; Thaler et al., 1997; Tversky & Kahneman, 1992; Wiseman & Gomez-Mejia, 1998). To counter loss aversion, top executives might be tempted to create a more favorable impression by releasing inaccurate statements that show higher gains and possibly lower losses (Hambrick, Finkelstein, & Mooney, 2005; Moore et al., 2006).

In the next section, theories on risk and loss aversion are used to explain why top executives attempt to create information asymmetry through these two forms of corporate reporting manipulation (inconsistent reporting in the 1960s and inaccurate reporting in the 1990s-2000s).

CHAPTER III

THEORY DEVELOPMENT AND HYPOTHESES

As illustrated earlier in the general theoretical framework (Figure 1), this study suggests that risk influences attempts to create information asymmetry. The connotation of the term *risk* varies across disciplines, and top executives who actually practice strategic management have their own connotation (March & Shapira, 1987). The common person defines risk as "exposure to possible loss, injury, or danger," psychologists define risk in terms of "perceptions of people exposed to potential loss," economists define risk as variability in returns, technology scientists define risk as "the probability of event times the impact of the event," and sociologists define risk in terms of "hazards and insecurities" in society (Shrivastava, 1995: 119-120). The literature suggests that top executives take a firm-level perspective and view a "risky" action or context as one "with a wide range of possible outcomes" and which "contains a threat of a very poor outcome" for the firm (March & Shapira, 1987: 1407). Even though a firm's risk taking ideally aims for large gains, they also expose the firm to a chance of large losses, whereby the investment obtained from capital market stakeholders can be lost (Eisenmann, 2002; March & Shapira, 1987; Sanders & Hambrick, 2007). Studies show that top executives seem to be primarily concerned about negative outcomes rather than positive outcomes associated with risk (March & Shapira, 1987: 1407). Accordingly, in the strategic management literature, a firm's risk from the perspective of its top executives is usually defined as the firm's "exposure to a chance of a salient loss"

(Eisenmann, 2002: 514) or "the likelihood that most or all of an investment will be lost" (Sanders & Hambrick, 2007: 1059).

Further, risk plays an important role in a variety of strategic management research streams (Bromiley, Miller, & Rau, 2001; March & Shapira, 1987). For example, risk has been found to be an important variable in product diversification and international diversification (Hitt, Hoskisson, & Ireland, 1994), vertical integration (D'Aveni & Ilinitch, 1992), corporate governance and compensation (Eisenmann, 2002; Sanders & Hambrick, 2007; Wiseman & Gomez-Mejia, 1998), corporate social responsibility (Bansal & Clelland, 2004), and general firm performance (Aaker & Jacobson, 1987; Amit & Wernerfelt, 1990). As noted in the theoretical framework in Figure 1, this study limits its focus to the influence of risk on attempts to create information asymmetry.

Previous research has theoretically and empirically operationalized firm's risk in a variety of ways because of the wide variety of theoretical perspectives used in strategic management (Bromiley et al., 2001; Helfat & Teece, 1987). The accepted practice is that "the choice of risk measure should reflect the relevant stakeholder perspective for testing any particular theory" (Bromiley et al., 2001: 266). Because this study investigates information asymmetry between top executives and capital market stakeholders, and because capital market stakeholders include both stock market and debt market stakeholders, this study will theoretically operationalize risk using: (1) firm-specific risk (firm's unsystematic risk as assessed by stock market), and (2) default risk (difficulty

faced by firm in meeting its debt market obligations)[2] (Alchian & Woodward, 1991; Bromiley et al., 2001; Jensen & Meckling, 1976). Further, because firm-specific risk will be measured using stock market data and default risk will be measured using accounting data, this satisfies the recommendation in the literature that both stock market and accounting measures of risk be used for greater validity (Bromiley et al., 2001). The next few sections address the influence of firm-specific risk in the stock market, while later sections address the influence of default risk in the debt market.

Influence of Firm-Specific Risk on Attempts to Create Information Asymmetry

Stock market investors often desire that top executives take greater firm-specific risk for higher returns (Hambrick et al., 2005; Sanders & Hambrick, 2007; Wiseman & Gomez-Mejia, 1998). Firm-specific risk (also known as business risk or unsystematic risk) is the stock market's assessment of the risk involved with a firm's actions and context, and this risk is reflected as the portion of variability in stock returns attributable to the firm's actions and context (Amit & Wernerfelt, 1990; Bansal & Clelland, 2004). Strategic management scholars have highlighted the need to understand the consequences of firm-specific risk (Aaker & Jacobson, 1987; Amit & Wernerfelt, 1990; Bettis, 1983; Hambrick et al., 2005; Sanders & Hambrick, 2007; Wiseman & Gomez-

[2] While firm-specific risk and default risk are defined and measured differently (using respective stock market and debt market parameters), they are somewhat interrelated forms of a firm's risk because of the "tension between creditors and stockholders" whereby firm-specific risk may affect creditors and default risk (or bankruptcy risk) may affect stockholders (Alchian & Woodward, 1991: 141). For example, stockholders have incentive to encourage greater firm-specific risk, because the creditors bear part of the downside cost on any losses, but stockholders get all of the upside gains. Further, when firm-specific risk is higher, creditors find it harder to assess the value of firm's assets because of the associated volatility in stock prices, and therefore find it harder to make credit-lending decisions. Likewise, firms close to bankruptcy usually witness drop in stock prices, and common stockholders of bankrupt firms get the last priority upon sale of assets (whereas creditors get the first priority). Hence, top executives have to be equally concerned about managing both firm-specific risk in stock market and default risk in debt market to keep capital market stakeholders satisfied as a whole (Alchian & Woodward, 1991).

Mejia, 1998). Because firm-specific risk reflects the variation in a stock's return due to firm-specific actions and context, it plays an important role in strategy evaluation as the stock market's assessment of a firm's risk (Amit & Wernerfelt, 1990). Stock market investors monitor a firm's risk taking activities by studying financial statements or follow recommendations of stock analysts who do the same (Lintner, 1965). If firm-specific risk assessed by the stock market is low, it implies that the firm's actions are expected to yield steady and ordinary revenue streams (that is, gains/losses are expected to be small in variation). In contrast, if firm-specific risk assessed by the stock market is high, the firm's actions are expected to yield either large gains (if the risk taken is successful) or large losses (if the risk taken is unsuccessful).

Prospect theory research suggests that the human cognitive bias of loss aversion holds true for stock market investors too; that is, stock market investors hate to lose more than they love to win (Benartzi & Thaler, 1995; Haigh & List, 2005; Kahneman, 2003). The extent to which stock market investors blame executives when firm-specific risk yields losses is usually much greater than the extent to which stock market investors praise executives when firm-specific risk yields equivalent gains. Because of such unbalanced reactions by loss-averse stock market investors, top executives fear that they will have to bear a disproportionate amount of blame and be portrayed as mediocre or below average leaders if they report bad news (Aaker & Jacobson, 1987; Amihud & Lev, 1981; Hambrick et al., 2005).

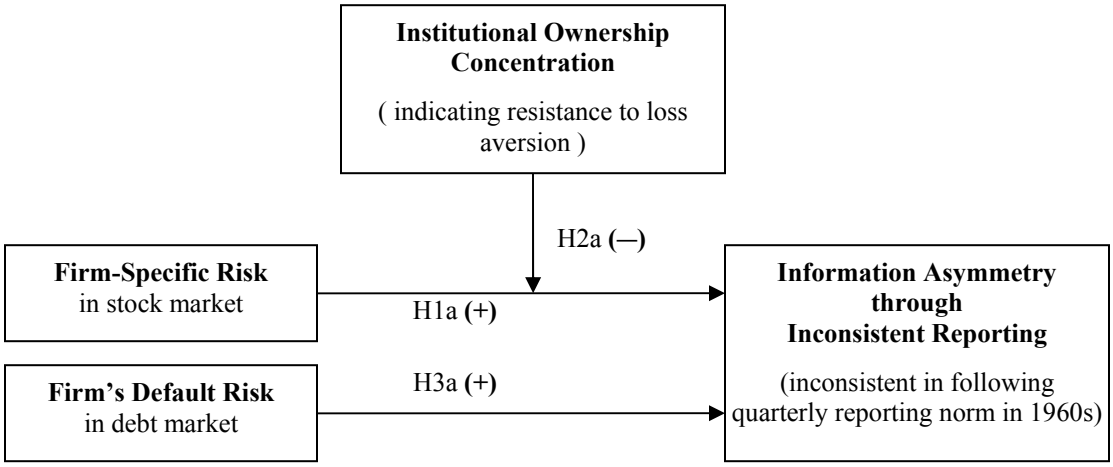
However, top executives attach great value to their personal reputation, and want to avoid being portrayed as mediocre or below average leaders (Eisenhardt, 1989; Fanelli & Misangyi, 2006). Because top executives are constantly under pressures that "demand both risk taking and assured success," they believe that they need to somehow "change the odds" (March & Shapira, 1987: 1414). The organizational decline literature suggests when top executives fall short of expectations, they often enter a state of denial by behaving as if the "problem does not exist or that it is not serious" and provide false encouragement by "hiding bad news from creditors and stockholders" to soothe their own fear of reprisal (Hambrick & D'Aveni, 1988: 16). Further, impression management theory suggests that top executives attempt to manage the impression they give by 'putting their best foot forward' by hiding negative news and providing only optimistic and pleasant news (Davidson, Jiraporn, Young Sang, & Nemec, 2004; Fanelli & Misangyi, 2006; Sutton & Callahan, 1987). Accordingly, top executives might be tempted to hide information (that is, suppress the disclosure of negative signals emanating from firm-specific risk taking), so that the psychological dissatisfaction from loss aversion can be avoided (Benartzi & Thaler, 1995; Kahneman, 2003).

Overall, the above theoretical arguments suggest that the greater the firm-specific risk, the greater the likelihood of attempts to create information asymmetry through corporate reporting manipulation. As discussed earlier, attempts to create information asymmetry through corporate reporting manipulation have happened in two ways: inconsistent reporting in the 1960s, and (ii) inaccurate reporting in the 1990s-2000s. First, even though quarterly reporting had become a legitimate and widely established norm in the 1960s, some US firms did not follow this norm consistently. Second, there have been a large number of announcements on the need to restate inaccurate reports in the 1990s-2000s. Based on the theoretical reasons discussed above, it can be concluded that firm-specific risk influenced attempts to create information asymmetry in both these eras (this is illustrated in Figure 3).

Hypothesis 1a. Firm-specific risk has a positive influence on attempts to create information asymmetry through inconsistent reporting (in the 1960s).

Hypothesis 1b. Firm-specific risk has a positive influence attempts to create information asymmetry through inaccurate reporting (in the 1990s-2000s).

Attempts to Create Information Asymmetry in 1960s:
Firms sometimes choose to extend the time-gap between financial reports, that is, they do not follow the consistent quarterly reporting norm.



Attempts to Create Information Asymmetry in 1990s-2000s:
Firms sometimes report inaccurate financial statements, which need to be eventually restated as a correction.

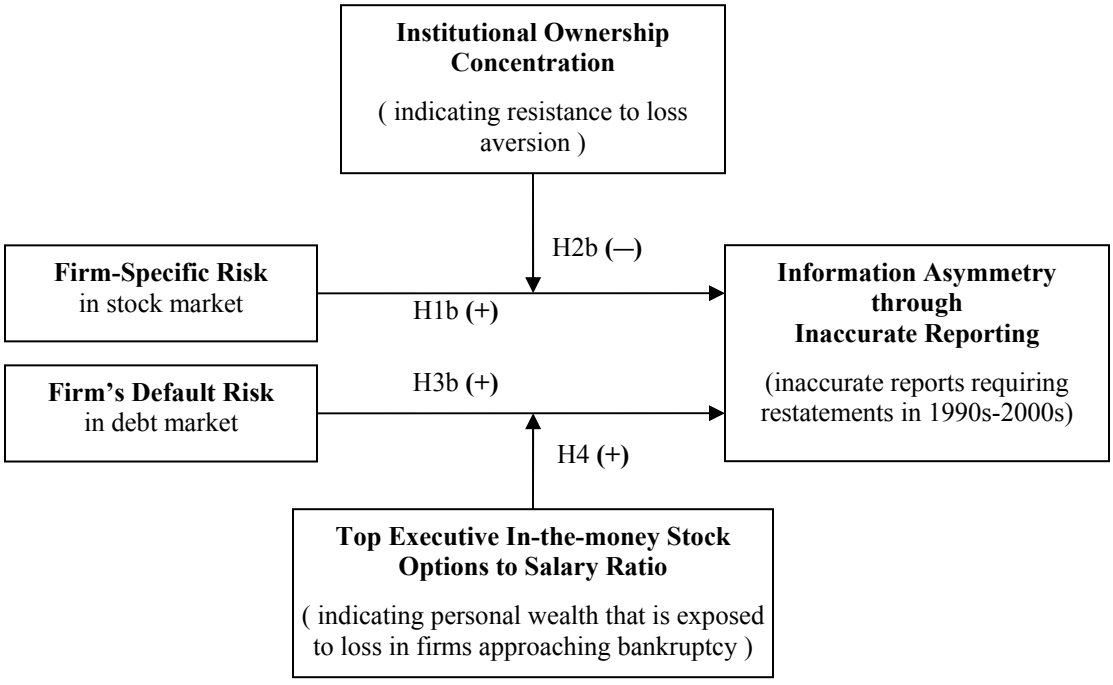


Figure 3. Models and hypotheses

Interactive Effect of Firm-Specific Risk and Loss Aversion

The previous section suggested that firm-specific risk influences attempts to create information asymmetry. The argument was that top executives fear reporting bad news because they worry about the cognitive bias of loss aversion among shareholders. However, the extent of loss aversion among shareholders can vary (Benartzi & Thaler, 1995; Haigh & List, 2005; List, 2003). That is, the strength of the association between firm-specific risk and attempts to create information asymmetry might be contingent upon the extent to which the firm's shareholders are loss averse. The concept of 'myopic loss aversion' can help explain this contingency.

The commonly held view about stock market traders is that they are myopically loss averse (Haigh & List, 2005; Laverty, 1996). Myopic loss aversion is defined as the "combination of short horizons and strong distaste for losses" (Thaler et al., 1997: 648). Here, myopia refers to the relative tendency to "make short-term choices rather than adopt long-term policies" (Thaler et al., 1997: 648), and prospect theory's 'loss aversion' axiom suggests that people cognitively weigh losses more strongly than equivalent gains (Benartzi & Thaler, 1995; Kahneman, 2003; Thaler et al., 1997; Tversky & Kahneman, 1992; Wiseman & Gomez-Mejia, 1998). Such myopic loss aversion or 'short-termism' is usually noticed when ownership is diffused, that is, a large number of shareholders own small stakes (Baysinger, Kosnik, & Turk, 1991; Hansen & Hill, 1991; Laverty, 1996). Shareholders with small stakes exhibit myopic loss aversion tendencies because they "have neither the interest nor the knowledge to wait for the long run" and therefore tend to buy/sell stocks based on short term indicators (Laverty, 1996: 833).

In contrast, there is resistance against myopic loss aversion tendencies when ownership is largely concentrated in a few committed and knowledgeable shareholders, such as institutional investors (Baysinger et al., 1991; David, Hitt, & Gimeno, 2001; Hansen & Hill, 1991). Institutional ownership concentration is defined as the extent to which a large amount of a firm's shares are owned by few institutional owners (Baysinger et al., 1991). Higher institutional ownership concentration can be an indicator of shareholder resistance to myopic loss aversion tendencies. First, because institutional investors usually hold diversified portfolios of stocks, they are less affected by short-term losses from firm-specific risk of a particular stock and instead aim for long-term gains from the stock (Baysinger et al., 1991: 212). Second, institutional investors holding large stakes of a firm's stock find it harder to move in and out of stock positions, and therefore develop a long-term commitment to the firm (Baysinger et al., 1991: 213). Freeman and Evan (1990: 342) explain that "while the assets of stockholders who hold a small percentage of the shares of stock are re-deployable in an almost costless manner, this is not true for stockholders who hold large blocks of shares." This is because "the market for shares would discount the value of these shares if they were all offered for sale at one time" and therefore, "large shareholders incur asset specificity" that promotes their long-term commitment and reduces their myopic loss aversion (Freeman & Evan, 1990: 342).

Third, because institutional investors are highly specialized investors who invest on behalf of others, they need to be accountable for any significant position taken in a firm. As a result, institutional investors employ highly experienced and trained

professionals to carry out extensive analysis on the inherent quality and value of firms that they invest in (List, 2003; Sanders & Boivie, 2004). This reduces governance uncertainty and boosts their confidence to make a long-term commitment to the firm (List, 2003; Sanders & Boivie, 2004). For example, David et al (2001: 153) note that dominant institutional investors with large ownership stakes "exercise influence through activism that successfully pressures firms to make appropriate long-term investments." Further, a content analysis by Abrahamson and Park (1994: 1327) of letters sent by firms to shareholders found that firms with dominant institutional investors were less fearful of reporting negative news. The reduced fear of reporting negative news was because the dominant institutional investors actively encouraged long-term strategies instead of worrying about short-term losses. In contrast, letters from firms with diffused and/or non-institutional shareholders (that is, the gamut of diffused non-institutional shareholders, diffused institutional shareholders, and dominant non-institutional shareholders) indicated a greater fear of reporting negative news, because such shareholders were more concerned about short-term losses (Abrahamson & Park, 1994: 1327).

Hence, institutional ownership concentration is an indicator of resistance to loss aversion. As illustrated in Figure 3, institutional ownership concentration moderates the influence of firm-specific risk on attempts to create information asymmetry in both the 1960s and 1990s-2000s. When institutional ownership concentration is low (that is, loss aversion is high), firm-specific risk is more likely to tempt top executives to create information asymmetry. When institutional ownership concentration is high (that is, loss

aversion is low), firm-specific risk is less likely to tempt top executives to create information asymmetry.

Hypothesis 2a. The extent of institutional ownership concentration (as an indicator of resistance to loss aversion) moderates the association between firm-specific risk and inconsistent reporting in the 1960s, such that the association is more positive when institutional ownership concentration is lower than when it is higher.

Hypothesis 2b. The extent of institutional ownership concentration (as an indicator of resistance to loss aversion) moderates the association between firm-specific risk and inaccurate reporting in the 1990-2000s, such that the association is more positive when institutional ownership concentration is lower than when it is higher.

The four hypotheses suggested above focus on the influence of firm-specific risk on attempts to create information asymmetry. Our focus now shifts to the influence of an alternative form of risk, that is, the influence of default risk in debt market on attempts to create information asymmetry. Incorporating both these forms of risk satisfies recommendations in strategic management literature that scholars should (i) use both stock market and accounting measures of risk for greater validity, and (ii) use constructs that reflect relevant stakeholder perspectives – that is, both stock market and debt market stakeholders from whom top executives might attempt to conceal information (Bromiley et al., 2001).

Influence of Default Risk on Attempts to Create Information Asymmetry

Though both firm-specific risk in the stock market and default risk in the debt market are manifestations of a firm's risk, they are not identical (D'Aveni & Ilinitch, 1992; Miller & Bromiley, 1990; Miller & Reuer, 1996). In contrast to firm-specific risk (which is reflected as volatility in stock price due to firm specific factors), a firm's default risk is defined as the extent to which a firm finds it difficult to meet its current debt obligations of paying back interest and/or principal owed to creditors (Altman & Saunders, 1997; D'Aveni & Ilinitch, 1992; Miller & Reuer, 1996). This risk of defaulting on debt payments is also called bankruptcy risk because it might lead toward bankruptcy in the future (Altman & Saunders, 1997; D'Aveni & Ilinitch, 1992; Miller & Reuer, 1996). This section suggests that attempts to create information asymmetry through corporate reporting manipulation may be influenced by default risk. This is because the greater the default risk, the greater is (i) the fear that reporting bad news may dissatisfy the firm's creditors, (ii) the corresponding fear of loss in reputation among various other stakeholders, and (iii) the corresponding fear of loss in personal wealth.

First, top executives in firms with higher default risk may attempt to create information asymmetry because they have greater fear that reporting bad news may dissatisfy capital market stakeholders and push the firm closer toward bankruptcy. Higher default risk invites greater scrutiny and loan monitoring from loss-averse creditors and heightens the fear of reporting bad news in top executives (Laverty, 1996: 833-834). Top executives fear reporting bad news because creditors have considerable leeway in deciding whether to continue supporting top executives, and a firm's

"bankruptcy occurs when creditors withdraw their support from a firm's top management team" (D'Aveni, 1990: 121). Given that negative information is cognitively weighed much more strongly than equivalent positive information (Kahneman, 2003), if top executives in firms with higher default risk report negative information, then it will become more difficult to procure support from the dissatisfied creditors and can push the firm even closer toward bankruptcy (D'Aveni, 1990). Hence, top executives might fear reporting bad news because they need to ensure continued support from creditors to avoid pushing the firm closer toward bankruptcy.

Second, top executives in firms with higher default risk are more likely to create information asymmetry because they have a greater fear of loss in reputation. For example, the literature notes that default risk is a "gloomy and depressing" scenario (Tabb, 1995: 5) and can be a major "discrediting label" or "stigma" on the reputation of top executives (Sutton & Callahan, 1987: 405). The risk of future bankruptcy causes "key organizational audiences to have negative reactions towards a firm" such as "denigrating an organization and its leaders," and increases "the probability of organizational death and threatens managerial careers" (Sutton & Callahan, 1987: 405). Top executives greatly fear such loss in reputation because it can malign their career and hurt their standing in the job market (Paetzold, Dipboye, & Elsbach, 2008; Sutton & Callahan, 1987). Various other stakeholders such as its suppliers, customers, and employees, may also react negatively. Its suppliers may begin to search for alternative buyers and may demand upfront or immediate payments. Its customers/buyers may become uncertain about the firm, may begin to search for alternative sources of supplies,

and begin to cut down on the amount they buy from the firm. Its high-performing employees may begin to search for alternative employment with firms that might be in competition with their current employer. These negative reactions to reporting of bad news can push a firm with high default risk further towards bankruptcy (Sutton & Callahan, 1987).

Third, top executives in firms with higher default risk are more likely to create information asymmetry because they have greater fear of loss in personal wealth. Agency theory assumes that top executives are motivated by their self-serving greed for greater personal wealth, and that this greed can be positively directed toward improving firm performance by implementing incentive compensation systems that link their pay to firm performance (Eisenhardt, 1989; Jensen, 1986). For example, the literature suggests that top executives be given stock-based compensation because they will try to improve firm performance in order to personally benefit from a corresponding increase in stock price (Hambrick et al., 2005; Jensen, 1986). However, this assumption is less likely to hold in firms with higher default risk in the debt market. For example, it has been recently observed that stock based compensation systems seem to be an effective way of rewarding top executives for improving firm performance, but only "as long as a company is out of range of bankruptcy" (Jensen, 2003: 401).

The issue to be considered here is that in firms with higher default risk in the debt market, the potential to increase stock price becomes more limited. This is because stock market investors know that the firm might face bankruptcy in the future and are hesitant to pay a higher price for the stock. In fact, they are more likely to sell the stock

out of fear that the firm might go bankrupt in the future. Because of this gloomy scenario, top executives are more worried about finding ways to avoid a decline in stock price, avoid getting closer to bankruptcy, and avoid a corresponding loss in their personal wealth (Laverty, 1996; Sutton & Callahan, 1987; Wiersema & Bantel, 1993). That is, top executives are less likely to be gain seeking and more likely to be loss averse as the firm is pushed closer toward bankruptcy. Hence, in firms with higher default risk, top executives have greater fear that they may lose their existing personal wealth if they push the firm closer toward bankruptcy by reporting bad news, and this aversion to loss in personal wealth might tempt them to find ways to conceal the bad news.

In sum, top executives in firms with higher default risk may have greater fear of reporting bad news. This is because bad news can dissatisfy capital market stakeholders and push the firm closer toward bankruptcy, with corresponding losses in reputation and wealth. To avoid such scenarios, top executives in firms with higher default risk may become defensive about their strategic decisions (Powell, 1991). For example, top executives might escalate their commitment to their failed strategic decisions (Zardkoohi, 2004: 115), and they might do so by both deluding themselves (by assuming that all is okay) and hiding information from others, instead of accepting the mistakes (Hambrick & D'Aveni, 1988: 16). In contrast, top executives in firms with lower default risk are less likely to fear the same because the firms are farther away from bankruptcy. Accordingly, it can be hypothesized that the greater the default risk, the greater the likelihood of attempts to create information asymmetry (through inconsistent reporting in the 1960s, and inaccurate reporting in the 1990s-2000s).

Hypothesis 3a. Default risk has a positive influence on attempts to create information asymmetry through inconsistent reporting (in the 1960s).

Hypothesis 3b. Default risk has a positive influence on attempts to create information asymmetry through inaccurate reporting (in the 1990s-2000s).

Interactive Effect of Default Risk and Loss Aversion

The previous section suggested that default risk in the debt market influences attempts to create information asymmetry. An argument was that top executives fear reporting bad news because they worry about loss in personal wealth if the bad news pushes the firm closer toward bankruptcy. However, the extent of aversion to loss in personal wealth can vary, depending upon how much wealth the top executive stands to lose if the firm gets closer toward bankruptcy (Bateman, Kahneman, Munro, Starmer, & Sugden, 2005; Schmidt & Traub, 2002). That is, the strength of the association between default risk and attempts by top executives to create information asymmetry might be contingent upon the extent to which their personal wealth is exposed to loss if their firm approaches bankruptcy.

In this regard, there are two points to be noted. First, a testable hypothesis can be suggested only for the 1990s-2000s because compensation data that is needed to empirically operationalize a top executive's personal wealth is not available for the 1960s. Second, as discussed earlier, recent research had made considerable progress by showing that stock options influenced inaccurate reporting in the 1990s-2000s (Burns & Kedia, 2006; Efendi et al., 2007; O'Connor et al., 2006; Zhang et al., 2008). This section extends this recent research by suggesting that the strength of the hypothesized

association between default risk and attempts to create information asymmetry is positively moderated by the extent to which top executives are exposed to loss in the value of their stock options.

Stock options have been a substantial component of executive compensation since the mid 1980s (Coffee, 2005; Hall, 2000, 2003; Zardkoohi & Paetzold, 2004). If top executives report bad news that pushes the firm closer toward future bankruptcy, the portion of their personal wealth that is in the form of executive stock options can lose value (Betker, 1995: 171-172; Gilson & Vetsuypens, 1993). An executive's stock options "represent a share of the firm's future wealth" (Blasi, Kruse, & Bernstein, 2003: xvii). Unlike salaries and bonuses that are based on past performance, stock options are a type of equity based compensation that are designed to motivate top executives to increase the future value of the firm's stock (Hall, 2000; Zardkoohi & Paetzold, 2004). Executives prefer stock options to be 'in-the-money', that is, the market price exceeds the grant price, because top executives will gain financially if they can exercise any vested in-the-money stock options and sell the stock (Efendi et al., 2007; Zhang et al., 2008). In contrast, during the time that stock options are 'out-of-the-money' (meaning that the market price is below the grant price), the stock options are essentially worthless (Efendi et al., 2007; Zhang et al., 2008). As noted earlier, in firms with higher default risk, the potential to increase stock price becomes more limited because stock market investors know that the firm might face bankruptcy in the future. Accordingly, top executives mostly worry about finding ways to prevent a decline in the current value of their existing in-the-money stock options. That is, they become "loss averse when

subjectively valuing their options" (Devers, Wiseman, & Holmes, 2007: 203). Hence, when top executives have in-the-money stock options, greater default risk can heighten their fear of losing the in-the-money stock options, and this fear can tempt top executives to conceal negative information.

As illustrated in Figure 3, the strength of the association between default risk and attempts to create information asymmetry through inaccurate reporting in the 1990s-2000s is positively moderated by the extent to which in-the-money stock options constitute top executive compensation.[3] When the ratio of in-the-money options to salary for a top executive is high (that is, executive's aversion to loss in personal wealth is high), the association between default risk and attempts to create information asymmetry will be strongest. This is because top executives of firms with higher default risk might lose their in-the-money stock options if disclosure of negative information pushes their firms closer to bankruptcy. However, when the ratio of in-the-money options to salary for top executives is low (that is, executive's aversion to loss in personal wealth is low), the association between default risk and attempts to create information asymmetry would weaken because the top executives will not lose as much.

Hypothesis 4. The extent of top executive's in-the-money stock options to salary ratio (as an indicator of aversion to loss in personal wealth) moderates the association between default risk and inaccurate reporting in the 1990-2000s,

[3] Though in-the-money stock options is an appropriate indicator of loss aversion in the context of default risk related hypotheses, it was not necessarily so in the context of firm-specific risk related hypotheses in previous sections. This is because the volatility of stock price due to firm-specific risk sometimes make top executives gain seeking rather than loss averse (Devers, Wiseman, & Holmes, 2007). Hence, moderator variable of loss aversion was operationalized using institutional ownership concentration for the firm-specific risk related hypotheses, and moderator variable of loss aversion is operationalized using in-the-money stock options to salary ratio for default risk related hypotheses.

such that the association is more positive when top executive's in-the-money stock options to salary ratio is higher than when it is lower.

CHAPTER IV

METHODS

Sample and Procedure

Data from numerous sources are merged to create two unique longitudinal databases.

The 1964-1969 sample. *Compustat Quarterly* is the primary source of data to identify firms that reported inconsistently[4]. For further verification, data on inconsistency of quarterly reporting is hand-collected from the index of *Moody's Industrial News Reports* (similar to Butler *et al.*, 2007) and then compared and collated with quarterly reporting of income/sales data from the *Compustat-Quarterly* dataset. These two data sources are used to verify which of the two classifications applies to each firm: (i) firm is consistently reporting quarterly in all years throughout the chosen period, versus (ii) firm is inconsistent in following quarterly reporting norm during the chosen period. For data collection and verification, the starting year is 1964 and the ending year is 1972. This is because (i) the Compustat-Quarterly database starts in 1962, but has considerably fewer firms and many missing values before 1964, and (ii) there is

[4] Compustat Industrial Quarterly's SAS database uses ".S" and ".A" as special missing codes/markers to indicate data items that are not reported quarterly (see page 686 of SAS ETS 9.1 User's Guide (4 Volume Set). 2004. SAS Institute: Cary, NC.). ".S" values imply *semi-annual* reporting. ".S" appears in 1st and 3rd quarters of the year to indicate that data in the 2nd and 4th quarters represents semi-annual figures rather than quarterly figures. ".A" values imply *annual* reporting. ".A" appears in the 1st, 2nd, and 3rd quarters of the year to indicate that data in the 4th quarter represents an annual figure rather than quarterly figures. The special missing codes '.S' and '.A' are used in the Compustat Industrial Quarterly's SAS dataset only. These special missing codes are a bit different in non-SAS datasets (see page 1 of chapter 2 and pages 1-2 of chapter 5 in the Compustat Technical Guide. 2003. McGraw-Hill: Centennial, CO.). Such data codes change over time. For example, in Compustat Xpressfeed on WRDS, for semiannually or annually (instead of quarterly) reported data, a corresponding Data Code variable (variable name with _DC appended) contains a code of either 2 (semiannual) or 3 (annual) (see FAQs on Compustat Xpressfeed North America in WRDS).

no need to go beyond 1972 because data for the three-year period of 1970-72 is sufficient to verify that the sampled firms reported quarterly on a consistent basis after the 1970 SEC regulation. As discussed earlier (and illustrated in Figure 2), it is during the 1964-1969 period that quarterly reporting had become a widely prevalent norm, and despite this, certain firms were going against the norm. Hence, the six-year period of 1964-1969 period is chosen for hypothesis testing.

The 1997-2006 sample. As discussed earlier, the GAO has identified restatement announcement events during the period 1997 to 2006 (USGAO, 2002-2007), which is the sampling period for restatement announcements events for this study. Restatement data are not collected for years before 1997 because the literature suggests that institutional regulations might not have been strong enough to monitor and detect inaccurate statements and their restatements during earlier decades (Dechow et al., 1996; Karpoff et al., 2008). For example, studies that have tried collecting restatement data for 1970s/1980s in the US have reported a very low number of restatement announcements per year (less than 0.5% of publicly listed firms) (Karpoff et al., 2008). Hence, the 1997-2006 period dictated by the GAO datasets is appropriate for restatements data.

Matched sampling. For both the 1964-69 focal group (that engaged in inconsistent reporting) and the 1997-2006 focal group (that engaged in inaccurate reporting), respective control groups are created by an exact match in year, 4-digit SIC industry code, and stock exchange, and then a closest match in total assets. The matched sampling steps are as follows. First, a pool of potential control firms is created by including all publicly listed firms, but removing firms that are included in the focal

group (that engaged in inconsistent/inaccurate reporting). Second, a one-to-many match is found between each focal firm and a set of potential control firms based on an exact match for the year, 4-digit SIC industry code, and stock exchange. Third, it is narrowed down to a one-to-one match between each focal firm and a control firm (from the set of potential control firms) by selecting a control firm whose total asset size is closest to that of the focal firm. Once a control firm is selected as a match for a particular focal firm, the control firm is removed from the pool of firms available for matching with the remaining focal firms. This ensures that the same control firm is not matched with any other focal firm.[5] This method is consistent with matched sampling procedures that have been widely used in the literature on corporate reporting manipulation (Arthaud Day et al., 2006; Butler et al., 2007; Efendi et al., 2007).

Measures

Attempts to create information asymmetry through corporate reporting manipulation. Measurement proxies in the two time-periods are as follows.

(i) *1964-69:* The first proxy for attempts to create information asymmetry is inconsistency in following the quarterly reporting norm during 1960s. There are two ways this inconsistency can be measured. First, it can be measured as a *binary variable: inconsistent versus consistent reporting*. This essentially measures the *probability of inaccurate reporting* in a logistic regression. A value of 1 is given to the focal group of firms that did not follow the consistent quarterly reporting norm during the 1964-69 period (both income statements and balance sheets were not reported during certain

[5] SAS code demos for such matching are available on WRDS forums.

quarters). A value of 0 is given to the control group of firms that strictly followed the consistent quarterly reporting norm throughout the 1964-69 period (by reporting both income statements and balance sheets every quarter). For both the focal and control groups, firms that were delisted or newly listed during the 1964-72 period are excluded to ensure a stable set of firms and prevent any entry/exit/survival bias (Butler et al., 2007). Logistic regression will be the appropriate analytical tool when this binary measure is the dependent variable, and the independent variables would be firm-year observations with the data classified into the two groups.

Second, the *severity of reporting inconsitency* can be measured by capturing the variance from quarterly reporting during the 1964-69 period. This is calculated using the variance formula $(\Sigma_i (X_i - 3)^2)/N$, where X_i is the average time-gap in months between reports and $(X_i – 3)$ is the deviation from quarterly time-gap (3 months) in the i^{th} year across i = 1 to N years (with N = 6 years in this study). If a firm avoids reporting in certain quarters, then the average time-gap X_i will be greater than 3 months, and there will be a positive variance over the 1964-69 period. However, if a firm reports every quarter consistently, there will be zero variance. Equivalent data for matched consistent reporting firms (having zero variance) are included as controls. For severity of reporting inconsistency as the dependent variable, Tobin regression will be the appropriate analytical tool because the measure is left censored at 0.

(ii) *1997-2006:* The second proxy for attempts to create information asymmetry is restatement announcement events in 1990s-2000s that are a result of inaccurate reporting. Unlike the earlier period, this would follow an event study methodology. The

year of restatement announcement for a firm will be the event under consideration, and the independent variables lag behind the restatement event by 1-year. As per recent research on restatements, inaccurate reporting can be measured as a b*inary variable: inaccurate versus accurate reporting* (Arthaud Day et al., 2006; Zhang et al., 2008). A value of 1 is given to the focal group of firms associated with restatement announcement events, that is, an event announcing the need to restate inaccurate reports. A value of 0 is given to the matched control group of firms that are not associated with any restatement announcements. Logistic regression will be the appropriate analytical tool when this binary measure is the dependent variable.

Second, the *severity of reporting inaccuracy* is measured using stock market correction/reaction upon restatement events. As expected, this correction is almost always negative (that is, the stock prices fall) and is proportional to the severity of reporting inaccuracy (Efendi *et al.*, 2007; Palmrose, Richardson, & Scholz, 2004). Accordingly, severity of inaccuracy is measured by reverse scaling the cumulative market-adjusted abnormal returns during the (-1,0,1) days surrounding the restatement event. Equivalent data for the matched (non-restating/accurate reporting) firms are included as controls. OLS regression will be the appropriate analytical tool when this market correction measure of severity is the dependent variable.

Firm-specific risk. Firm-specific risk (also known as business risk or unsystematic risk or residual risk) captures the portion of variability in a stock's return that can be attributed to firm-specific actions and context (Bansal & Clelland, 2004). In contrast, market risk (also known as systematic risk or beta) captures the portion of

variability in a stock's return that can be attributed to market-wide forces (Helfat & Teece, 1987). As discussed earlier, this study focuses on firm-specific risk. This is measured as the value of the residual (root mean square of error) in the capital asset pricing model's (CAPM's) equation for all firm-years using the *CRSP* dataset and *Eventus* software. In addition, some researchers suggest that top executives might be concerned about total risk (combination both firm-specific risk and market risk) rather than just the firm-specific risk (Amit & Wernerfelt, 1990; Bansal & Clelland, 2004; Helfat & Teece, 1987). Accordingly, for validity purposes, an alternative second measure used in this study is the firm's total risk (measured as total variance in stock market returns).

Default risk. Default risk is measured as the reverse scale of the Altman's Z score (Altman, 1968; Graham, Li, & Qiu, 2008). Further, in line with Jensen's (1986: 326) arguments about the need of "cash for debt service," default risk is additionally measured as the debt-to-cash ratio (Deakin, 1972; La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1997). This is calculated as the ratio of a firm's current debt liabilities (defined as the total short-term debt and the current portion of long-term debt that is due in one year) to cash held by the firm (defined as cash and all securities readily transferable to cash as listed in the current asset section). Data for calculating these measures are obtained from *Compustat* dataset.

Institutional ownership concentration. One measure of institutional ownership concentration is the log transformation of the Herfindahl measure, that is $\log_e \Sigma_i (S_i^2)$, where S_i is the percentage of the firm's equity owned by the i^{th} institutional owner across

i = 1 to n institutional owners, where each owns at least 0.2 percent of a firm (Baysinger et al., 1991: 208). This measure incorporates the number of institutional stockholders and differentially weighs the sizes of their holdings by giving large institutional owners more weight than smaller owners (Baysinger et al., 1991: 208). A second measure of institutional ownership concentration is the average percentage of ownership per institutional owner (Baysinger & Butler, 1985: 185), that is $(\Sigma_i\ S_i)/n$, where the numerator $(\Sigma_i\ S_i)$ is the total percentage of a firm's equity held by all 'n' institutional owners. This measure is log transformed to $\log_e((\Sigma_i\ S_i)/n)$ to account for its skewed distribution.

Data for calculating both the 'Herfindahl' measure and the 'average' measure of institutional ownership concentration are available in *Thomson Reuters CDA/Spectrum Institutional (13f) Holdings dataset*, but only after 1980. The only source of institutional ownership data that goes back to the 1960s is printed copies of the *S&P Security Owner's Stock Guide*. This source contains only minimal aggregated data on (i) total percentage of a firm's ownership held by all institutional owners, and (ii) total number of institutional owners. Therefore, hand-collected data from this source allows calculation of only the 'average' measure of institutional ownership concentration (but is not sufficient to calculate the 'Herfindahl' measure). In sum, the 'Herfindahl' measure of institutional ownership concentration can be calculated for only the 1997-2006 period only, and the 'average' measure of institutional ownership concentration can be calculated for both 1964-1969 and 1997-2006 periods.

Top executive in-the-money stock options to salary ratio. This ratio is adopted from Efendi et al. (2007: 688). The numerator 'in-the-money stock options' is measured as the total estimated dollar value of the CEO's unexercised (vested and unvested) in-the-money options; the denominator is the CEO's base salary. As the default risk increases, the stock price might drop and the in-the-money stock options may go out of the money, but the base salary will usually hold constant. Hence, this ratio captures the extent to which a CEO is exposed to loss in personal wealth if reporting of bad news pushes the firm closer toward bankruptcy. Because stock options were non-existent during the 1960s, this ratio is measured only for 1997-2006 using the data from the Execcomp database (Efendi et al., 2007).

Control variables. Control variables are chosen based on the suggestions of past research on restatements (Arthaud Day et al., 2006; Efendi et al., 2007; Zhang et al., 2008). First, Compustat data for the 1960s and 1990s-2000s are used to calculate financial measures. *Firm's total assets* is used as a control variable because the matched sampling procedures rely on the closest possible match of total assets (because an exact match is rare). *Firm performance* is measured as return on assets (ROA), and is used as a control variable because research suggests that restating firms usually suffered from poor firm performance (Arthaud Day et al., 2006; Efendi et al., 2007; Zhang et al., 2008). *Overvaluation* is measured as market-to-book ratio (also known as simple Tobin's Q), and is used as a control variable because research suggests that firms may manipulate reports in order to convince investors of growth prospects (Butler *et al.*, 2007; Efendi *et al.*, 2007; Graham *et al.*, 2008). Second, recent studies have indicated the necessity to

control for variables related to CEO compensation structure, the data for which are available in Compustat-Execcomp (Efendi et al., 2007; Zhang et al., 2008). However, CEO compensation data are not available for the 1960s, and hence two compensation-related control variables *(CEO's base salary, and CEO bonus to salary ratio)* are included only for the 1990s-2000s. Finally, a *Sarbanes Oxley* dummy variable is used for the 1990s-2000s model to control for the Sarbanes Oxley act that became effective on 30-July-2002. It has a value of 0 for restatement firms and corresponding control firms with a restatement event date before 30-July-2002, and a value of 1 for restatement firms and corresponding control firms with a restatement event date after 30-July-2002.

CHAPTER V

RESULTS

Data Analysis Procedures

Sample size and descriptive statistics. Given that data had to be collected and merged from numerous sources, the final usable sample size for the 1964-1969 period is 396 firm-years (33 inconsistent reporting firms plus 33 matched control firms, over the 6 year period), and the final usable sample size for the 1997-2006 period is 628 firm-restatement-years (314 restatement events plus 314 matched controls). The means, standard deviations, and correlations for the variables are provided in Table 1.

Longitudinal difference in risk between focal and control groups. For illustrative purposes, Figure 4 shows the longitudinal difference 'Δ risk' between the focal group of firms (that attempt to create information asymmetry) and the matched control group of firms. The annual Δ risk values are positive. Throughout the 1964-69 period, the average risk of the focal group of firms that attempted 'inconsistent reporting' was higher than the average risk of the control group of matched firms that were consistent in quarterly reporting. In the 1997-2006 period, the average risk of the focal group of firms during the 4 years prior to their respective restatement events was higher than the average risk of the control group of matched firms that reported accurately.

Table 1. Descriptive statistics: (a) 1964-1969 values in italics with grey background in upper half, and (b) 1997-2006 values in lower half

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9a)	(9b)	(10a)	(10b)	(11a)	(11b)	(12)
Dependent Variables															
1) Info. Asymmetry versus Symmetry • 1964-1969: Inconsistent versus Consistent Reporting • 1997-2006: Inaccurate versus Accurate Reporting	–	*0.72**	*0.07*	*-0.21**	*-0.14**	–	–	–	***0.23****	***0.23****	***0.24****	***0.24****	–	*-0.14**	–
2) Severity of Info. Asymmetry • 1964-1969: Severity of Reporting Inconsistency • 1997-2006: Severity of Reporting Inaccuracy: *reverse scaled* market correction % on restatement [(R1)]	0.21*	–	*0.17**	*-0.14**	*-0.20**	–	–	–	***0.14****	***0.15****	***0.24****	***0.07***	–	*-0.11**	–
Independent Variables (Controls, Predictors, Moderators))															
3) Firm Size: Total Assets (in Millions of US Dollars)	0.02	-0.06	–	*0.07*	*-0.17**	–	–	–	*-0.61**	*-0.48**	*0.25**	*-0.04*	–	*-0.14**	–
4) Firm Performance: RoA	-0.06	-0.13*	0.13*	–	*0.49**	–	–	–	*-0.30**	*-0.28**	*-0.46**	*-0.30**	–	*0.05*	–
5) Overvaluation: Market-to-Book Ratio	-0.04	-0.00	-0.71*	-0.08*	–	–	–	–	*0.02*	*-0.05*	*-0.24**	*-0.23**	–	*0.05*	–
6) CEO Salary (in 100,000s of US Dollars)	-0.02	-0.10*	0.65*	0.17*	-0.46*	–	–	–	–	–	–	–	–	–	–
7) CEO Bonus to Salary Ratio	-0.03	-0.04	0.42*	0.20*	-0.47*	0.29*	–	–	–	–	–	–	–	–	–
8) Sarbanes Oxley	0.00	-0.14*	0.08*	0.03	-0.05	0.09*	0.05	–	–	–	–	–	–	–	–
9a) Firm-Specific Risk: CAPM residual (in 0.01 of units)	**0.11***	**0.25***	-0.40*	-0.41*	0.18*	-0.31*	-0.18*	-0.43*	–	*0.95**	*0.07*	*0.28**	–	*-0.04*	–
9b) Firm's Total Risk: Market Returns Variance (in 0.001 of units)	**0.10***	**0.26***	-0.30*	-0.44*	0.10*	-0.26*	-0.12*	-0.35*	0.95*	–	*0.12**	*0.28**	–	*-0.09*	–
10a) Default Risk: *reverse scaled* Altman Z [(R2)]	**0.06**	**0.10***	0.16*	-0.67*	-0.06	-0.09*	-0.10*	0.02	0.22*	0.27*	–	*0.22**	–	*-0.19**	–
10b) Default Risk: Debt-to-Cash Ratio	**0.04**	**-0.01**	0.32*	0.03	-0.13*	0.16*	0.02	-0.03	-0.21*	-0.17*	0.11*	–	–	*0.03*	–
11a) Institutional Own Conc (IOC): Herfindahl Measure	-0.03	-0.04	-0.31*	0.08*	0.28*	-0.08*	-0.11*	0.19*	-0.02	-0.07	-0.20*	-0.16*	–	–	–
11b) Institutional Own Conc (IOC): Average Measure	-0.02	0.01	-0.79*	-0.08	0.68*	-0.55*	-0.38*	0.00	0.20*	0.10*	-0.09*	-0.16*	0.59*	–	–
12) In-the-Money Options to Salary Ratio (in 10s of units)	0.08*	0.12*	0.11*	0.07	-0.21*	-0.02	0.15*	-0.15*	0.15*	0.20*	-0.01	-0.13*	-0.10*	-0.28*	–
Mean	*0.50*	*5.87*	*6.17*	*0.06*	*5.61*	–	–	–	*2.17*	*0.70*	*2.94*	*1.76*	–	*0.26*	–
	0.50	1.83	7.51	0.02	2.06	6.12	0.94	0.65	2.57	1.07	3.42	0.66	5.25	3.51	2.27
Std. Dev.	*0.50*	*8.19*	*1.54*	*0.04*	*3.85*	–	–	–	*1.36*	*1.12*	*1.19*	*3.46*	–	*0.34*	–
	0.50	7.75	1.67	0.13	1.57	2.82	1.09	0.48	1.48	1.33	1.42	0.66	0.79	0.68	5.49
Min	*0.00*	*0.00*	*3.15*	*-0.13*	*0.38*	–	–	–	*0.53*	*0.03*	*0.00*	*0.00*	–	*0.00*	–
	0.00	-15.24	4.45	-0.66	0.87	0.30	0.00	0.00	0.74	0.08	0.00	0.00	0.97	1.33	0.00
Max	*1.00*	*24.30*	*9.34*	*0.16*	*20.63*	–	–	–	*10.02*	*10.07*	*4.77*	*16.63*	–	*1.70*	–
	1.00	41.61	12.54	0.21	10.71	14.72	6.63	1.00	7.73	7.07	8.49	6.49	8.71	5.26	37.6

* $p \leq 0.05$; For 1997-2006 period, sample size N = 628 firm-restatement-years (314 restatement events plus 314 matched controls); For 1964-1969 period, sample size N = 396 firm-years (33 inconsistent reporting firms plus 33 matched controls, over the 6 year period). Dollar values adjusted for inflation. Independent variables winsorized at 1st and 99th percentiles.
[(R1)] Reverse scaled value of Market Correction % = (0.00 – original value) , [(R1)] Reverse scaled value of Alt Z = (maximum value – original value)
Firm-Specific Risk variable was rescaled by multiplying by 100, Total Risk variable was rescaled by multiplying by 1000, and Options/Salary Ratio variable was rescaled by dividing by 10.

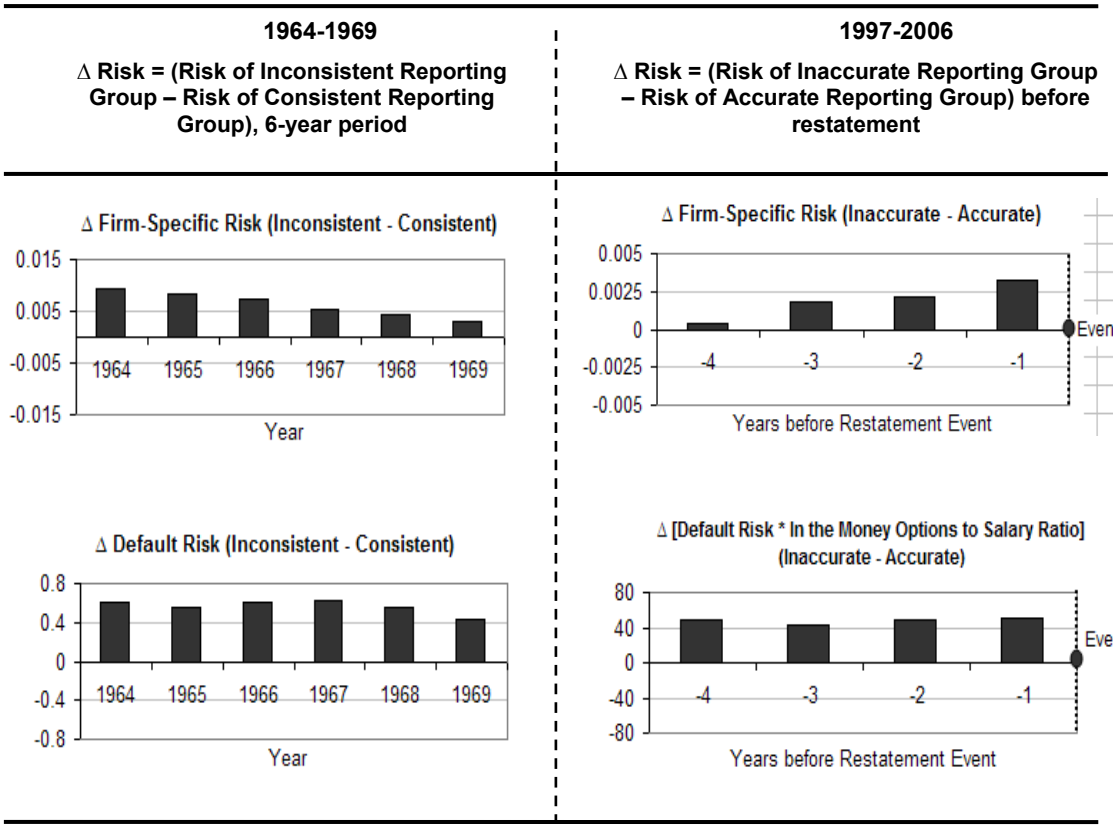


Figure 4. Longitudinal difference in risk between focal and control groups

Regression tables. Tables 2, 3, and 4 provide the regression results. The units of independent variables were centered (mean = 0) because it avoids multicollinearity issues in interactions. Some variables were rescaled because the original units of variables were vastly different in magnitude. Centering and rescaling does not change the significance levels or directions of regression coefficients. The values of variance inflation factors (VIFs) in the hierarchical regression analyses were well below the rule-of-thumb cut-off of 10, which suggest that there is no evidence of any multicollinearity

problems. When logistic regression is used, odds ratios (e^{β}) are provided instead of coefficients (β) for easier interpretation of the logistic regression results[6].

Table 2 provides the regression results for attempts to create information asymmetry through inconsistent reporting during 1964-69. Steps A1 through A7 in Table 2 are logistic regressions with *probability* of inconsistent reporting as the DV. Steps B1 through B7 in Table 2 are Tobin regressions with *severity* of reporting inconsistency as the DV (Tobin regression is used instead of OLS regression because this DV is inherently left-censored at 0).

Tables 3 and 4 provide the regression results for attempts to create information asymmetry through inaccurate reporting (indicated by restatement events) during 1997-2006. Steps A1 through A7 in Table 3 are logistic regressions with *probability* of inaccurate reporting as the DV. Steps B1 through B7 in Table 2 and steps C1 through C7 in Table 3 are OLS regressions with *severity* of reporting inaccuracy as the DV. While the steps B1 through B7 in Table 3 use only half the sample (inaccurate reporting firms only), the steps C1 through C7 in Table 4 use the full sample (which makes it necessary to introduce a dummy variable for inaccurate reporting firms, with three-way interactions involving this dummy variable to test hypothesis 2b and hypothesis 4).

[6] Odds ratio is the change in likelihood of the dependent variable for a one unit (one standard deviation) change in the independent variable. Odds ratio of lesser than one indicates a negative influence.

Table 2. Inconsistent reporting, 1964-69: Logistic regressions and Tobin regressions

	Inconsistent versus Consistent Reporting, 1964-1969 1 = Firms Do Not Consistently Report Quarterly 0 = Matched Control Firms Consistently Report Quarterly							**Severity of Reporting Inconsistency, 1964-1969** Variance from Quarterly Reporting						
	Logistic Regressions: Odds Ratios e^{β}							**Tobin Regression: Unstandardized Parameter Estimates β**						
	Controls	Primary Measures			Alternative Measures			Controls	Primary Measures			Alternative Measures		
Steps:	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7
Intercept	*0.99*	1.06	1.06	1.07	1.13	1.17	1.13	-0.18	-0.08	-0.08	-0.19	-0.56	-0.46	-0.56
Controls														
Firm Size: Total Assets	1.12**	1.58**	1.55**	1.60**	1.42**	1.36**	1.43**	1.23**	2.77**	2.70**	2.74**	0.15*	1.35*	1.35*
Firm Performance: RoA	*0.00*	*0.15*	*0.10*	*0.07*	*0.08*	*0.06*	*0.04*	-56.04	15.10	14.91	14.64	-26.10	-24.94	-25.60
Overvaluation: Market-to-Book Ratio	*0.99*	*0.95*	*0.95*	*0.95*	*0.96*	*0.96*	*0.96*	-0.45†	-0.56*	-0.56*	-0.53*	-0.45†	-0.46†	-0.45†
Primary Measures for Hypotheses														
H1a: Firm-Specific Risk: CAPM residual		**2.45****	2.42**	2.20**					**3.80****	3.72**	2.98**			
H3a: Default Risk: *reverse scaled* Altman Z		**1.20**†	1.18	1.20†					**2.19****	2.10**	2.19**			
Inst. Own Conc. (IOC) Average			*0.58*	*0.75*						-2.01	-0.91			
H2a: Firm Specific Risk * IOC Average.				***0.28****							**-4.27**			
Alternative Measures for Hypotheses														
H1a: Firm's Total Risk: market ret. variance					**5.02****	4.64**	4.21**					**3.08****	2.82**	2.28†
H3a: Default Risk: Debt-to-Cash Ratio					**1.13****	1.15**	1.14**					**0.13**	0.16	0.16
Inst. Own Conc. (IOC) Average						*0.52†*	*0.48†*						-3.49	-3.46
H2a: Firm Total Risk * IOC Average							***0.09****							**-2.65**
Model Evaluation: Likelihood Ratio. χ^2	22.1**	68.6**	71.2**	79.8**	67.5**	70.9**	78.7**	50.5**	95.8**	96.6**	98.9**	416.6**	418.6**	418.9**
Accuracy of Prediction (%Concordant)	63.1%	72.6%	73.1%	74.0%	73.0%	74.0%	74.7%							
Pseudo (Nagelkerke rescaled) R-square	0.07	0.21	0.22	0.25	0.25	0.26	0.29							

† $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$ (conservative two-tailed) .

Logistic Regressions: Odd ratios $\mathbf{e^{\beta}}$ less than 1.00 indicate a *negative* influence. Statistical significance of individual coefficients obtained using LR tests.

Tobin Regression is used because the continuous dependent variable 'Variance from Quarterly Reporting' is left censored at 0.

All Regressions: Independent variables were centered (mean = 0). Firm-Specific Risk variable is in 0.01 units, it was rescaled by multiplying by 100. Total Risk variable is in 0.001 units, it was rescaled by multiplying by 1000. Dollar values adjusted for inflation. Independent variables winsorized at 1st and 99th percentiles.

For 1964-1969 period, Sample Size N = 396 firm-years (33 inconsistent reporting firms plus 33 matched controls, over 6 years).

Maximum variance inflation factor (VIF) is 2.51, which is lower than the cut off 10.0, and implies that multicollinearity is not a problem

Table 3. Inaccurate reporting, 1997-2006: Logistic regressions (full sample) and OLS regressions (for inaccurate firms only)

	Inaccurate versus Accurate Reporting, 1997-2006 1 = Event Announcing Need to Restate Inaccurate Reports 0 = Non-Restating Matched Control Firm for Event								**Severity of Reporting Inaccuracy, 1997-2006** % drop in share price (reverse scaled market reaction) on restatement event (inaccurate reporting firms only)						
	Logistic Regressions: Odds Ratios e^{β}								**OLS Regression: Unstandardized Parameter Estimates β**						
	Controls	Primary Measures			Alternative Measures				Controls	Primary Measures			Alternative Measures		
Steps:	A1	A2	A3	A4	A5	A6	A7		B1	B2	B3	B4	B5	B6	B7
Intercept	1.06	1.07	1.07	1.11	1.06	1.06	1.22*		3.20**	3.07**	3.06**	3.11**	3.07**	3.06**	3.14**
Controls (Year dummies included)															
Firm Size: Total Assets	1.15*	1.26**	1.21*	1.27*	1.16*	1.16	1.18		0.57	0.88†	1.28*	1.30*	0.66	1.67*	1.78*
Firm Performance: RoA	*0.39*	*0.88*	*0.82*	1.24	*0.95*	*0.84*	*0.86*		-14.69**	-9.00	-9.69	-10.38†	-7.89†	-8.73†	-8.28†
Overvaluation: Market-to-Book	1.03	*0.99*	*0.93*	*0.94*	1.00	*0.95*	*0.99*		1.36**	1.16**	1.30**	1.52**	1.15**	1.53**	1.74**
CEO Salary	*0.94*	*0.94*	*0.95*	*0.94*	*0.95*	*0.97*	*0.95*		-0.39	-0.40	-0.51†	-0.49†	-0.37	-0.40	-0.42
CEO Bonus to Salary Ratio	*0.91*	*0.89*	*0.89*	*0.86†*	*0.90*	*0.90*	*0.87*		-0.23	-0.26	-0.30	-0.28	-0.21	-0.19	-0.11
Sarbanes Oxley	1.02	1.36	1.32	1.33	1.21	1.20	1.28		-2.90*	-1.43	-1.98	-1.74	-1.43	-1.53	-1.25
Primary Measures for Hypotheses															
H1b: Firm-Specific Risk: CAPM residual		**1.30****	1.27**	1.28**						**1.28****	1.34**	1.39**			
H3b: Default Risk: *reverse scaled* Alt Z		***0.96***	*0.96*	1.02						**0.00**	0.00	0.11			
Inst. Own Conc. (IOC) Herfindahl			1.02	1.02							0.19	1.23			
In-the-Money Options/Salary Ratio			1.04†	1.04							-0.06	-0.16			
H2b: Firm Specific Risk * IOC Herfindahl				***0.79****								**-0.36**			
H4: Default Risk Alt Z *Options/Salary				**1.05***								**0.78****			
Alternative Measures for Hypotheses															
H1b: Firm's Total Risk: market variance					**1.24***	1.22*	**1.28***						**1.54****	1.68**	**1.73****
H3b: Default Risk: Debt-to-Cash Ratio					**1.14**	1.14	**1.50***						**0.87**	0.74	**1.07**
Inst. Own Conc. (IOC) Average						1.12	1.15							2.52†	3.00*
In-the-Money Options/Salary Ratio						1.04†	1.11*							-0.06	-0.10
H2b: Firm Total Risk *IOC Average							***0.78****								**1.08***
H4: Def. Risk Debt/Cash * Options/Sal							**1.19****								**0.33**
Model Evaluation: Likelihood Ratio. χ^2	7.1	17.5*	20.5*	39.0**	14.1†	17.3†	31.5**	R^2:	0.14**	0.17**	0.17**	0.20**	0.18**	0.18**	0.20**
Accuracy of Prediction (%Concordant)	55.3	58.8	58.9	62.7	57.6	57.9	61.0	ΔR^2:		0.03*	0.00	0.03**	0.04**	0.00	0.02†
Pseudo (Nagelkerke rescaled) R-square	0.02	0.04	0.04	0.08	0.03	0.04	0.07								

† $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$ (conservative two-tailed) .

Logistic Regressions: Odd ratios e^{β} less than 1.00 indicate a *negative* influence. Statistical significance of individual coefficients obtained using LR tests.

All Regressions: Independent variables were centered (mean = 0). Firm-Specific Risk variable is in 0.01 units, it was rescaled by multiplying by 100. Total Risk variable is in 0.001 units, it was rescaled by multiplying by 1000. Options/Salary Ratio variable is in 10s of units, it was rescaled by dividing by 10. Dollar values adjusted for inflation. Independent variables winsorized at 1st and 99th percentiles. Max VIF = 2.86

For logistic regression, sample size N = 628 firm-restatement-years (314 restatement events plus 314 matched controls). For OLS regression, sample size = 314 restatement events.

Table 4. Inaccurate reporting, 1997-2006: OLS regressions (for market reaction. full sample of inaccurate and accurate reporting firms)

Severity of Reporting Inaccuracy, 1997-2006
% drop in share price (reverse scaled market reaction) during
restatement event (for both inaccurate reporting firms and matched accurate reporting firms)

OLS Regression: Unstandardized Parameter Estimates β

Primary Measures	C1	C2	C3	C4	**Alternative Measures**	C1	C5	C6	C7
Intercept	0.24	0.37	0.30	0.17	Intercept	0.24	0.37	0.26	0.10
Controls (Year dummies included)					*Controls (Year dummies included)*				
Inaccurate Reporting Dummy (1=Inaccurate, 0=Accurate)	3.04**	2.83**	2.77**	2.92**	Inaccurate Reporting Dummy (1=Inaccurate, 0=Accurate)	3.04**	2.82**	2.84**	3.03**
Firm Size: Total Assets	0.29	0.50	0.42	0.44	Firm Size: Total Assets	0.29	0.34	0.73†	0.76*
Firm Performance: RoA	-7.87**	-3.92	-4.23	-4.24	Firm Performance: RoA	-7.87**	-3.33	-4.05	-3.82
Overvaluation: Market-to-Book	0.89**	0.76**	0.82**	0.85**	Overvaluation: Market-to-Book	0.89**	0.76**	0.98**	1.01**
CEO Salary	-0.25†	-0.25†	-0.19	-0.20	CEO Salary	-0.25†	-0.22	-0.22	-0.22
CEO Bonus to Salary Ratio	-0.09	-0.12	-0.24	-0.22	CEO Bonus to Salary Ratio	-0.09	-0.10	-0.08	-0.09
Sarbanes Oxley	-1.22†	-0.33	-0.47	-0.50	Sarbanes Oxley	-1.22†	-0.33	-0.36	-0.31
Predictors					*Predictors*				
H1b: Firm-Specific Risk: CAPM residual		**0.82****	-0.32	-0.35	*H1b:* Firm's Total Risk: market variance		**1.04****	-0.46	-0.60
H3b: Default Risk: *reverse scaled* Alt Z		**0.04**	-0.16	-0.26	*H3b:* Default Risk: Debt-to-Cash Ratio		**0.65**	0.11	0.02
Moderators and Two-way Interactions					*Moderators and Two-way Interactions*				
Inst. Own Conc. (IOC) Herfindahl			-0.06	-0.04	Inst. Own Conc. (IOC) Herfindahl			1.09	1.34
In-the-Money Options Salary Ratio			-0.09	-0.12	In-the-Money Options Salary Ratio			-0.11	-0.12
Firm Specific Risk * IOC Herfindahl			-0.15	-0.08	Firm Specific Risk * IOC Herfindahl			-0.69*	-0.04
Default Risk Alt Z *Options/Salary			0.51**	0.24**	Default Risk Alt Z *Options/Salary			0.23	0.09
Firm Specific Risk * Inacc. Rep. Dummy			1.98**	2.02†	Firm Specific Risk * Inacc. Rep. Dummy			2.53**	2.68**
Default Risk Alt Z * Inacc. Rep. Dummy			0.67	0.79	Default Risk Alt Z * Inacc. Rep. Dummy			1.08	1.27
IOC Herfindahl * Inacc. Rep. Dummy			0.61	0.63	IOC Herfindahl * Inacc. Rep. Dummy			0.37	0.25
Options/Salary * Inacc. Rep. Dummy			0.47	0.48	Options/Salary * Inacc. Rep. Dummy			0.59†	0.59†
Three-way Interactions					*Three-way Interactions*				
H2b: Firm Specific Risk * IOC Herfindahl * Inaccurate Reporting Dummy				**-0.20**	*H2b:* Firm Total Risk *IOC Average * Inaccurate Reporting Dummy				-0.96
H4: Default Risk Alt Z *Options/Salary * Inaccurate Reporting Dummy				**0.49†**	*H4:* Def. Risk Debt/Cash * Options/Sal * Inaccurate Reporting Dummy				0.25
R^2:	0.10**	0.12**	0.18**	0.19**	R^2:	0.10**	0.13**	0.18**	0.19**
ΔR^2:		0.02*	0.06**	0.01	ΔR^2:		0.03**	0.05**	0.01

† $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$ (conservative two-tailed) .
Logistic Regressions: Odd ratios $\mathbf{e^{\beta}}$ less than 1.00 indicate a *negative* influence. Statistical significance of individual coefficients obtained using LR tests.
All Regressions: Independent variables were centered (mean = 0). Firm-Specific Risk variable is in 0.01 units, it was rescaled by multiplying by 100. Total Risk variable is in 0.001 units, it was rescaled by multiplying by 1000. Options/Salary Ratio variable is in 10s of units, it was rescaled by dividing by 10. Dollar values adjusted for inflation. Independent variables winsorized at 1st and 99th percentiles. For 1997-2006 OLS regression, sample size N = 628 firm-restatement-years (314 restatement events plus 314 matched controls).

Interpreting disordinal (crossover) interactions. In coming sections, interaction plots will be provided for statistically significant interactions. Most of the interactions are found to be *disordinal interactions* because the lines in the plot actually cross within the range of the data. Note that "the more specific term *crossover interaction* is sometimes applied interactions with effects in opposite directions" (Cohen, 2003: 286). Nonetheless, all disordinal interactions (including crossover interactions) have a *crossing point*, that is the "value of the predictor at which the simple regression lines cross" (Cohen, 2003: 288).

Let us assume that M positively moderates the positive association between predictor X and dependent variable Y. That is, the coefficients of the main effect and interaction effect are all positive. Let us further assume that on plotting the interaction, we find that it is disordinal with a crossing point of X = *C*. The disordinal interaction can then be interpreted as follows: At values of X > C, any value of X will be associated with higher value of Y when Z is higher rather than lower; however at values of X < C, any value of X will be associated with higher value of Y when Z is lower rather than higher.

Main effect: Influence of Firm-Specific Risk

Hypothesis 1a (influence of firm-specific risk, 1964-69 period). Hypothesis 1a suggested that firm-specific risk has a positive influence on attempts to create information asymmetry through inconsistent reporting (in the 1960s). Logistic regression is carried out with the binary dependent variable of inconsistent versus consistent reporting. The *probability* of inconsistent reporting is positively and significantly

influenced by both measures of firm-specific risk: the primary measure of firm's unsystematic risk using CAPM residual ($e^{\beta} = 2.45$, $p<0.01$ in step A2 of Table 2), and the alternative total risk measure ($e^{\beta} = 5.02$, $p<0.01$ in step A5 of Table 2). The results for the corresponding Tobin regression with dependent variable of *severity* of reporting inconsistency lead to similar conclusions for the main effects. The main effects of the firm-specific risk (CAPM residual measure ($\beta = 3.80$, $p<0.01$ in step B2 of Table 2) and firms's total risk ($\beta = 3.08$, $p<0.01$ in step B5 of Table 2)) in the stock market are significant.

Hence, results suggest that hypothesis 1a is supported for both *probability* of inconsistent reporting as the dependent variable (DV) and *severity* of reporting inconsistency as the DV.

Hypothesis 1b (influence of firm-specific risk, 1997-2006 period). Hypothesis 1b suggested that firm-specific risk has a positive influence attempts to create information asymmetry through inaccurate reporting (in the 1990s-2000s). Logistic regression is carried out with the binary dependent variable of inaccurate versus accurate reporting. The *probability* of inaccurate reporting is positively influenced by both measures of firm-specific risk: the primary measure of firm's unsystematic risk using CAPM residual ($e^{\beta} = 1.30$, $p<0.01$ in step A2 of Table 3), and the alternative total risk measure ($e^{\beta} = 1.24$, $p<0.05$ in step A5 of Table 3). The results in the corresponding OLS regressions with the dependent variable of *severity* of reporting inaccuracy lead to similarly supportive conclusions. The main effect for CAPM residual measure of firm-

specific unsystematic risk is significant ($\beta = 1.28$ with $p<0.01$ in step B2 of Table 3, and $\beta = 0.82$ with $p<0.01$ in step C2 of Table 4).

Hence, results suggest that Hypothesis 1b is supported for both *probability* of inconsistent reporting as the dependent variable (DV) and *severity* of reporting inconsistency as the DV.

Interaction: Influence of Firm-Specific Risk Moderated by Institutional Ownership Concentration

Hypothesis 2a (influence of firm-specific risk moderated by institutional ownership concentration, 1964-69 period). Hypothesis 2a suggested that the extent of institutional ownership concentration (as an indicator of resistance to loss aversion) moderates the association between firm-specific risk and inconsistent reporting in the 1960s, such that the association is more positive when institutional ownership concentration is lower than when it is higher.

It was noted earlier that the *probability* of inconsistent reporting is positively and significantly influenced by measures of firm-specific risk in the stock market (in steps A2 and A5 of Table 2). The average measure of institutional ownership concentration negatively and significantly moderates these main effects ($e^{\beta} = 0.28$ with $p<0.01$ in step A4 of Table 2, and $e^{\beta} = 0.09$ with $p<0.01$ in step A7 of Table 2, respectively).

The interactions plots are illustrated in Figure 5 and Figure 6. The interactions are disordinal. Figure 5 suggests a crossing point of firm-specific risk (CAPM residual) = 1.95e-02 units. Most of the firms in the sample seem to be having a value of firm-specific risk > 1.95e-02 units. In firms with firm-specific risk > 1.95e-02 units, firm-

specific risk will be associated with a higher *probability* of inconsistent reporting when institutional ownership concentration is lower rather than higher (that is, when loss aversion is higher rather than lower). However, in firms with firm-specific risk (CAPM residual) < 1.95e-02 units, firm-specific risk will be associated with a higher *probability* of inconsistent reporting when institutional ownership concentration is higher rather than lower (that is, when loss aversion is lower rather than higher). Figure 6 can be similarly interpreted.

Results for the corresponding Tobin regression with dependent variable of *severity* of reporting inconsistency does not lead to similar conclusions for the moderating effects. As noted earlier, the main effects of measures of firm-specific risk in stock market are significant (in steps B2 and B5 or Table 2). However, the moderator variable 'average measure of institutional ownership concentration' does not play a statistically significant role in these associations (β = -4.27 with $p>0.10$ in step B4 of Table 2, and β = -2.65 with $p>0.10$ in step B7 of Table 2, respectively).

Hence, results suggest that for *probability* of inconsistent reporting as the DV, Hypothesis 2a finds support at firm-specific risk values that are greater than a certain crossover value. However, for *severity* of reporting inconsistency as the DV, this hypothesis is not supported.

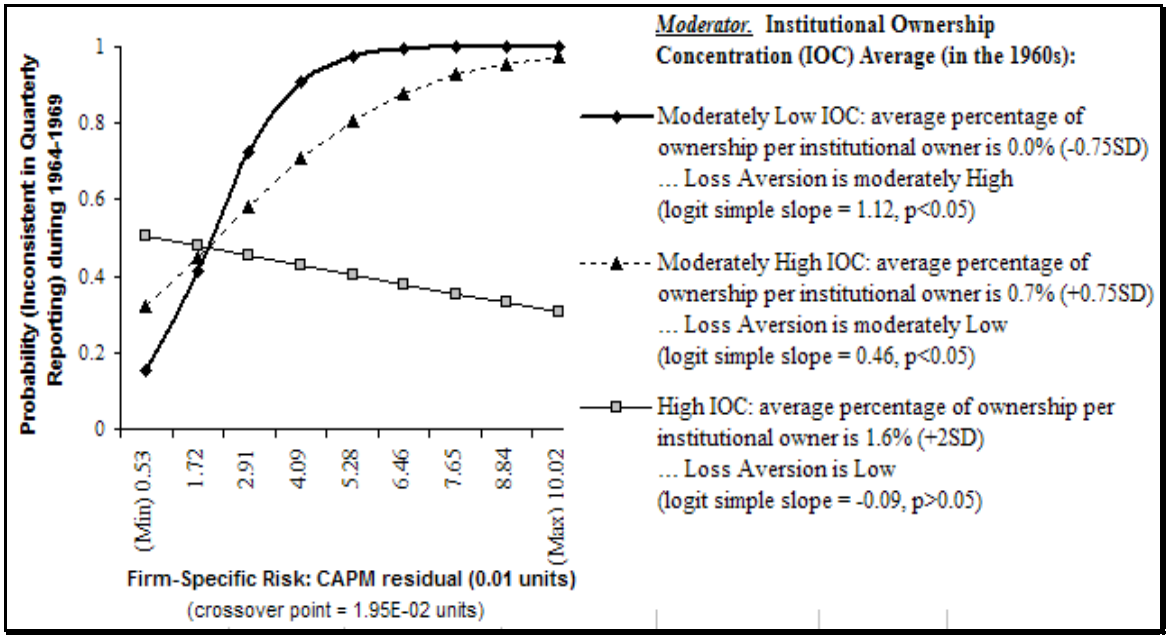


Figure 5. Interaction plot for hypothesis 2a (logistic regression, primary measures): Institutional ownership concentration (average proxy) moderates the association between firm-specific risk (CAPM residual) and probability of inconsistent reporting during 1964-69

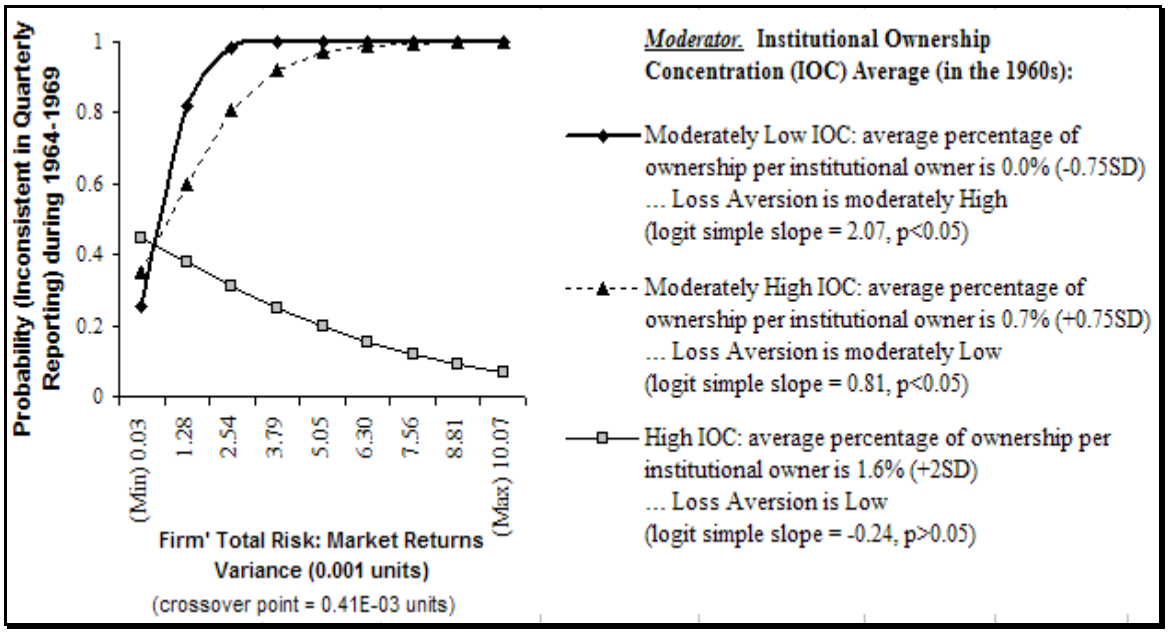


Figure 6. Interaction plot for hypothesis 2a (logistic regression, alternative measures): Institutional ownership concentration (average proxy) moderates the association between firm's total risk (market returns variance) and probability of inconsistent reporting during 1964-69

Hypothesis 2b (influence of firm-specific risk moderated by institutional ownership concentration, 1997-2006 period). Hypothesis 2b suggested that the extent of institutional ownership concentration (as an indicator of resistance to loss aversion) moderates the association between firm-specific risk and inaccurate reporting in the 1990-2000s, such that the association is more positive when institutional ownership concentration is lower than when it is higher.

It was noted earlier that both measures of firm-specific risk have significant and positive main effects on the *probability* of inaccurate reporting (in steps A2 and A5 of Table 3). Both measures of resistance to loss aversion (that is, the Herfindahl measure of institutional ownership concentration (e^{β} = 0.79, $p<0.01$ in step A4 of Table 3) and average measure of institutional ownership concentration (e^{β} = 0.78, $p<0.05$ in step A7 of Table 3)) show a significantly negative moderation of these main effects.

The interactions plots are illustrated in Figure 7 and Figure 8. The interactions are disordinal. Figure 7 suggests a crossing point of firm-specific risk (CAPM residual) = 2.65e-02 units. Most of the firms in the sample seem to be having a value of firm-specific risk (CAPM residual) > 2.65e-02 units. In firms with firm-specific risk > 2.65e-02 units, firm-specific risk will be associated with a higher *probability* of inaccurate reporting when institutional ownership concentration is lower rather than higher (that is, when loss aversion is higher rather than lower). However, in firm's with firm-specific risk < 2.65e-02 units, firm-specific risk will be associated with a higher *probability* of inaccurate reporting when institutional ownership concentration is higher rather than

lower (that is, when loss aversion is lower rather than higher). Figure 8 can be similarly interpreted.

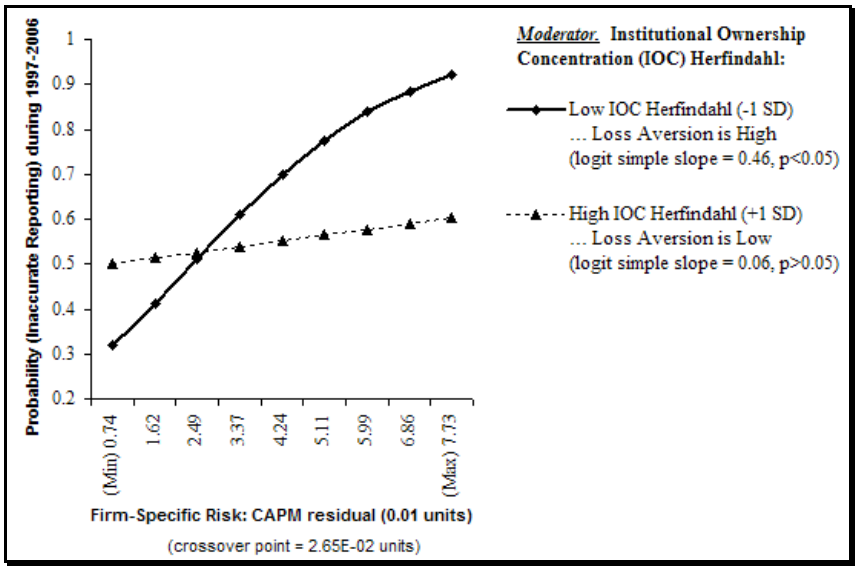


Figure 7. Interaction plot for hypothesis 2b (logistic regression, primary measures): Institutional ownership concentration (herfindahl proxy) moderates the association between firm-specific risk (CAPM residual) and probability of inaccurate reporting during 1997-2006

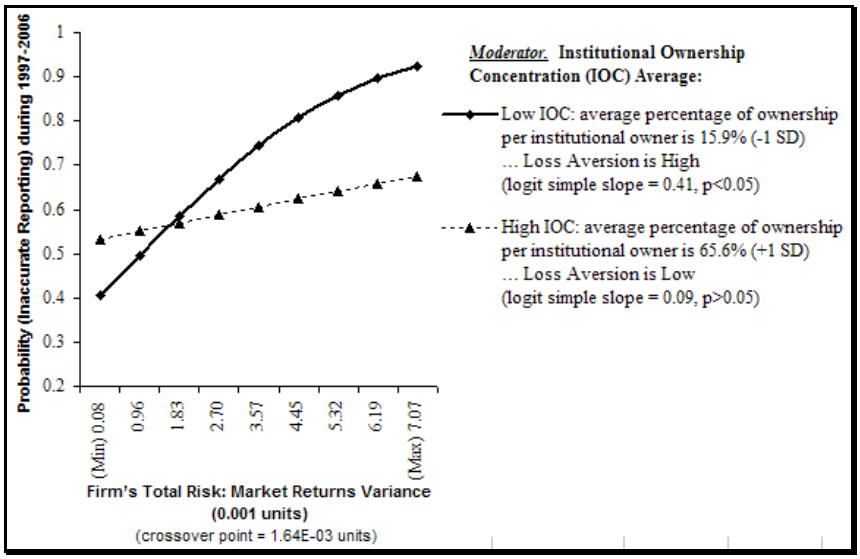


Figure 8. Interaction plot for hypothesis 2b (logistic regression, alternative measures): Institutional ownership concentration (average proxy) moderates the association between firm's total risk (market returns variance) and probability of inaccurate reporting during 1997-2006

For *severity* of reporting inaccuracy as the DV, the main effects of measures of firm-specific risk were significant (steps B2 and B5 of Table 3, and steps C2 and C5 of Table 4). However, the interactions with institutional ownership concentration give mixed results: non-significant in three cases (β = -0.36 with $p>0.10$ in step B4 of Table 3, β = -0.20 with $p>0.10$ in step C4 of Table 4, and β = -0.96 and $p>0.10$ in step C7 of Table 4), but significant in one case (β = 1.08 and $p<0.05$ in step B7 of Table 3, versus). This significant interaction is plotted in Figure 9. It is disordinal with a crossing point of firm's total risk (market returns variance) = 3.96e-03 units. In firms with total risk (market returns variance) > 2.65e-02 units, a firm's total risk will be associated with a higher *probability* of inaccurate reporting when institutional ownership concentration is lower rather than higher (that is, when loss aversion is higher rather than lower). However, in firms with total risk (market returns variance) < 3.96e-03 units, a firm's total risk will be associated with a higher *probability* of inaccurate reporting when institutional ownership concentration is higher rather than lower (that is, when loss aversion is lower rather than higher).

Hence, results suggest that for *probability* of inaccurate reporting as the DV, Hypothesis 2b finds support at firm-specific risk values that are that are greater than a certain crossover value. However, for *severity* of reporting inaccuracy as the DV, this hypothesis finds mixed support (supported only for certain proxies of firm specific risk and IOC, at firm-specific risk values that are greater than a certain crossover value).

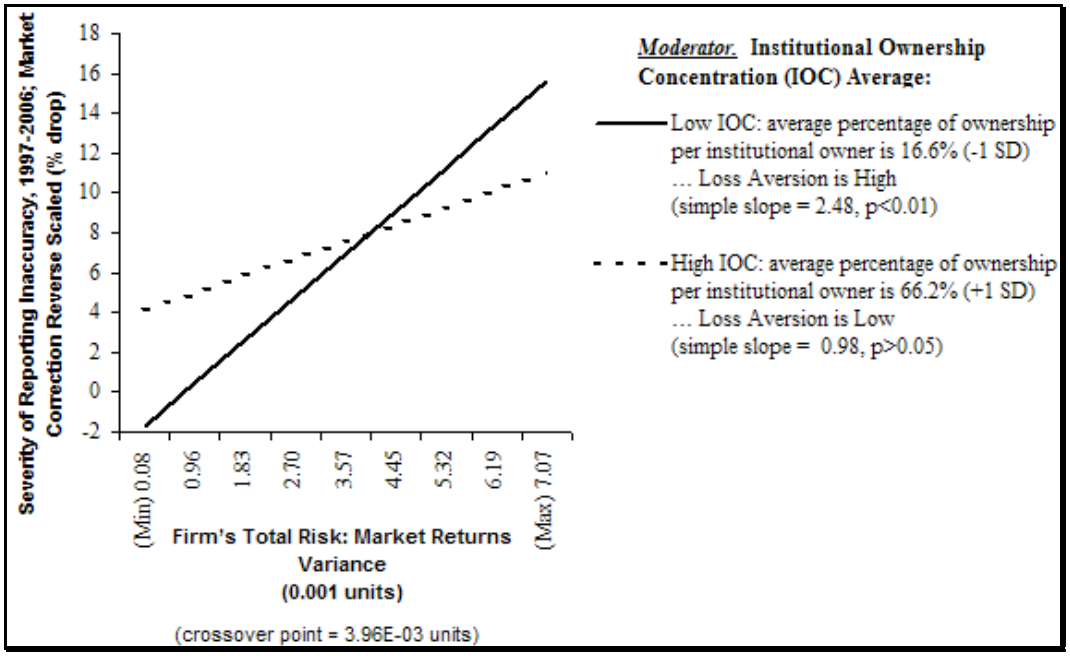


Figure 9. Interaction plot for hypothesis 2b (OLS regression, alternative measures): Institutional ownership concentration (average proxy) moderates the association between firm's total risk (market returns variance) and severity of reporting inaccuracy during 1997-2006

Main effect: Influence of Default Risk

Hypothesis 3a (influence of default risk, 1964-69 period). Hypothesis 3a suggested that default risk has a positive influence on attempts to create information asymmetry through inconsistent reporting (in the 1960s). Though default risk measured as debt-to-cash ratio does not have a significant influence ($\beta = 0.13$, $p>0.10$ in step B5 of Table 2) on *severity* of reporting inconsistency in the Tobin regression, all other equivalent effects show significance. For instance, default risk measured as debt-to-cash ratio has a significantly positive influence on *probability* of inconsistent reporting in the logistic regression ($e^{\beta} = 1.13$, $p<0.01$ in step A5 of Table 2). Further, default risk measured as the reverse scale of Altman Z score has a significantly positive influence on

both the *probability* of inconsistent reporting logistic regression (e^{β} = 1.20, $p<0.10$ in step A2 of Table 2) and the *severity* of reporting inconsistency in the Tobin regression (β = 2.19, $p<0.05$ in step B2 of Table 2).

In sum, results suggest that Hypothesis 3a is supported for *probability* of inconsistent reporting as the DV. However, for *severity* of reporting inconsistency as the DV, this hypothesis finds mixed support (that is, supported only for certain proxies of default risk). Overall, there is reasonable support for the argument of Hypothesis 3a, which states that default risk has a positive influence on attempts to create information asymmetry through inconsistent reporting. Perhaps, this influence would be even stronger in the presence of a loss aversion moderator, which is currently absent due to lack of relevant data for the 1960s

Hypothesis 3b (influence of default risk, 1997-2006 period). Hypothesis 3b suggested that default risk has a positive influence on attempts to create information asymmetry through inaccurate reporting (in the 1990s-2000s). The default risk main effects are statistically non-significant in both logistic regressions (e^{β} = 0.96 with $p>0.10$ in step A2 of Table 3, and e^{β} = 1.14 with $p>0.10$ in step A5 of Table 3) and OLS regressions (β = 0.00 with $p>0.10$ in step B2 of Table 3, β = 0.87 with $p>0.10$ in step B5 of Table 3, β = 0.04 with $p>0.10$ in step C2 of Table 4, β = 0.65 with $p>0.10$ in step C5 of Table 4). Hence, results suggest that Hypothesis 3b is neither supported for *probability* of inaccurate reporting as the DV, nor supported for *severity* of reporting inaccuracy as the DV.

Interaction: Influence of Default Risk Moderated by In-the-Money Stock Options to Salary Ratio

Hypothesis 4 (influence of default risk moderated by institutional ownership concentration, 1997-2006 period). Hypothesis 4 suggested that the extent of top executive's in-the-money stock options to salary ratio (as an indicator of aversion to loss in personal wealth) moderates the association between default risk and inaccurate reporting in the 1990-2000s, such that the association is more positive when top executive's in-the-money stock options to salary ratio is higher than when it is lower.

As noted earlier, the default risk main effects are statistically non-significant in both logistic regressions (steps A2 and A5 of Table 3) and OLS regressions (steps B2 and B5 of Table 3, and steps C2 and C5 of Table 4). However, for *probability* of inaccurate reporting as the DV, all the interactions between default risk and in-the-money-options to salary ratio are statistically significant ($e^{\beta} = 1.05$, $p<0.05$ in step A4 of Table 3, and $e^{\beta} = 1.19$, $p<0.01$ in step A7 of Table 3). The results are mixed for *severity* of reporting inaccuracy as the DV. Some of the interactions with in-the-money-options to salary ratio are statistically significant ($\beta = 0.78$ with $p<0.01$ in step B4 of Table 3, and $\beta = 0.49$, $p<0.10$ in step C4 of Table 4), and some others are statistically non-significant ($\beta = 0.33$ with $p>0.10$ in step B7 of Table 3, and $\beta = 0.25$ with $p>0.10$ in step C7 of Table 4).

Figure 10, Figure 11, and Figure 12 are interaction plots that illustrate the reason why the main effects of default risk are statistically non-significant but its interaction effects with in-the-money stock options to salary ratio are statistically significant. When

in-the-money-options to salary ratio is low, default risk tends to have a negative influence on both probability and severity of inaccurate reporting. However, when in-the-money-options to salary ratio is high, default risk tends to have a statistically significant and positive influence on both probability and severity of inaccurate reporting. Hence, at moderate values of in-the-money-options to salary ratio, the effect of default risk tends to be weak.

The interactions are also disordinal. Figure 10 suggests a crossing point of default risk (reverse scaled Altman Z) = 5.52. In firms with *higher* default risk (that is, Altman Z score < 5.52, because it is reverse scaled), a firm's default risk will be associated with a higher *probability* of inaccurate reporting when in-the-money stock options to salary ratio (that is, loss aversion) is higher rather than lower. In firms with *lower* default risk (that is, Altman Z score > 5.52), a firm's default risk will be associated with a higher *probability* of inaccurate reporting when in-the-money stock options to salary ratio (that is, loss aversion) is lower rather than higher. Figure 10 can be similarly interpreted with *severity* of inaccurate reporting as the DV.

Figure 11 can also be similarly interpreted. Figure 10 suggests a crossing point of default risk (debt-to-cash ratio) = 0.45. In firms with *higher* default risk (that is, debt-to-cash ratio > 0.45), a firm's default risk will be associated with a higher *probability* of inaccurate reporting when in-the-money stock options to salary ratio (an indication of loss aversion) is higher rather than lower. In firms with *lower* default risk (that is, debt-to-cash ratio < 0.45), a firm's default risk will be associated with a higher *probability* of

inaccurate reporting when in-the-money stock options to salary ratio (an indication of loss aversion) is lower rather than higher.

Hence, results suggest that for *probability* of inaccurate reporting as the DV, Hypothesis 4 finds support at default risk values that are greater than a certain crossover value. However, this hypothesis finds mixed support for *severity* of reporting inaccuracy as the DV.

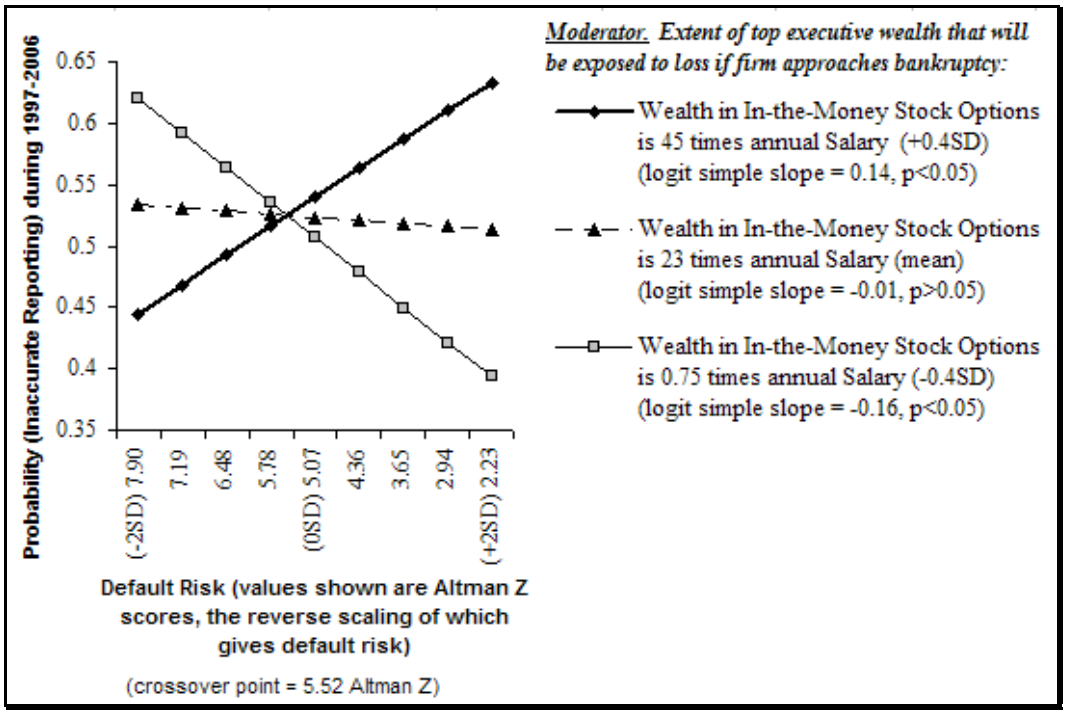


Figure 10. Interaction plot for hypothesis 4 (logistic regression, primary measures): In-the-money stock options to salary ratio moderates the association between default risk (reverse scaled Altman Z score) and probability of inaccurate reporting during 1997-2006

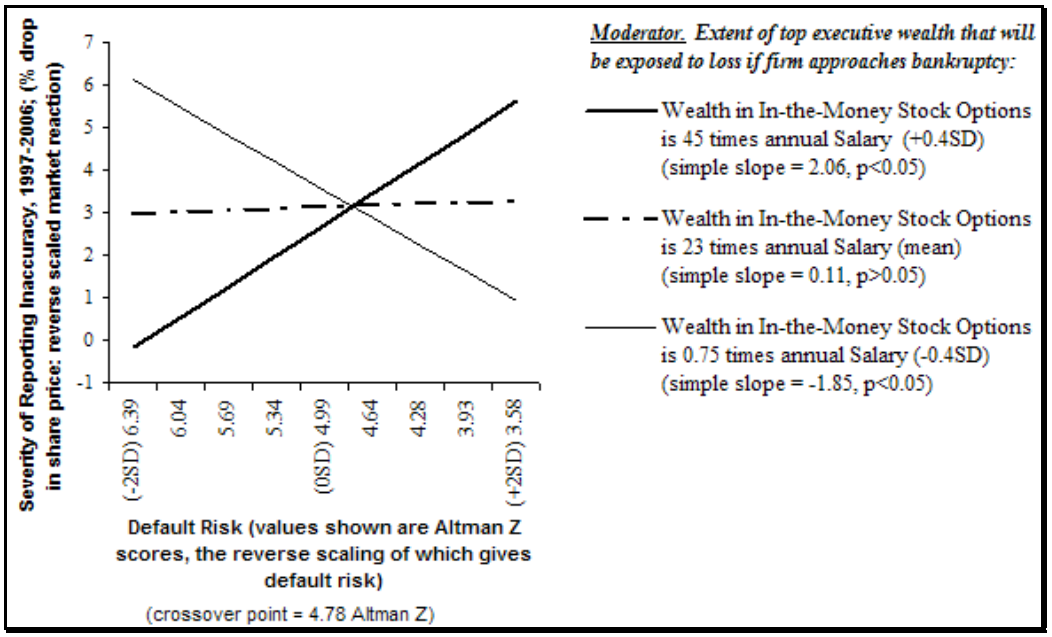


Figure 11. Interaction plot for hypothesis 4 (OLS regression, primary measures): In-the-money stock options to salary ratio moderates the association between default risk (reverse scaled Altman Z score) and severity of reporting inaccuracy during 1997-2006

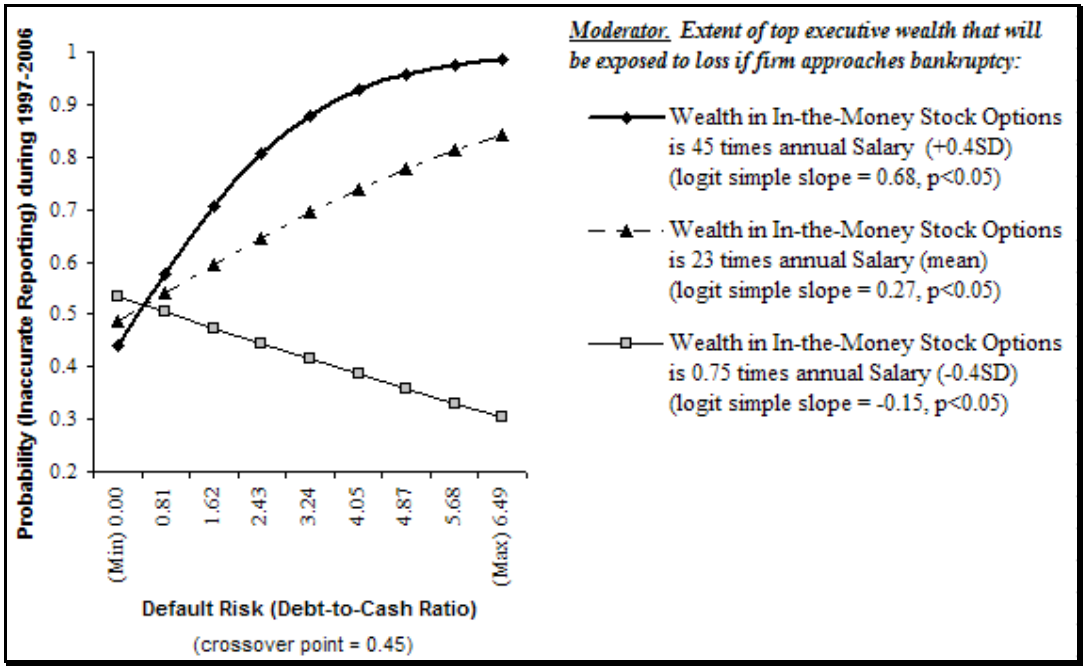


Figure 12. Interaction plot for hypothesis 4 (logistic regression, alternative measures): In-the-money stock options to salary ratio moderates the association between default risk (debt to cash ratio) and probability of inaccurate reporting during 1997-2006

CHAPTER VI

DISCUSSION AND CONCLUSION

While it is well known that top executives in the 1990s-2000s attempted to create information asymmetry through inaccurate reporting, it is important to note that top executives in the 1960s also attempted to create information asymmetry by simply not following the consistent quarterly reporting norm. In general, the findings of this study support the key argument that a firm's risk can turn counterproductive by creating a fear of reporting bad news to capital market stakeholders, especially when loss aversion is high. The coming sections discuss the findings, suggest theoretical implications, suggest implications for practice, and suggest other possible avenues for future research.

Discussion of Findings

Table 5 provides a summary of the hypotheses and results. Results from logistic regressions suggest that the hypothesized predictors (indicating firm's risk) and moderators (indicating loss aversion) can significantly predict the *probability* of corporate reporting manipulation in both eras (that is, for predicting the probability of inconsistent reporting in the 1960s and inaccurate reporting in the 1990s-2000s). However, the results from Tobin/OLS regressions suggest that the hypothesized predictors and moderators are not as helpful in predicting the *severity* of corporate reporting manipulation.

Table 5. Summary of hypotheses and results

#	Hypothesis Statement	Support for hypothesis (at $p < 0.05$, two tailed) dependent variable (DV) = information asymmetry through corporate reporting manipulation	
		DV = *probability* (Logistic regressions)	**DV = *severity* (Tobin/OLS regressions)**
	Main effect: Influence of firm-specific risk		
1a	Firm-specific risk has a positive influence on attempts to create information asymmetry through inconsistent reporting (in the 1960s).	Supported	Supported
1b	Firm-specific risk has a positive influence attempts to create information asymmetry through inaccurate reporting (in the 1990s-2000s)	Supported	Supported
	Interaction: Influence of firm-specific risk moderated by institutional ownership concentration		
2a	The extent of institutional ownership concentration (as an indicator of resistance to loss aversion) moderates the association between firm-specific risk and inconsistent reporting in the 1960s, such that the association is more positive when institutional ownership concentration is lower than when it is higher.	Supported for firm-specific risk values that are greater than a certain crossover value	Not supported
2b	The extent of institutional ownership concentration (as an indicator of resistance to loss aversion) moderates the association between firm-specific risk and inaccurate reporting in the 1990-2000s, such that the association is more positive when institutional ownership concentration is lower than when it is higher.	Supported for firm-specific risk values that are greater than a certain crossover value	Mixed support (that is, it depends on which proxy measure is used), and only for firm-specific risk values that are greater than a certain crossover value
	Main effect: Influence of default risk		
3a	Default risk has a positive influence on attempts to create information asymmetry through inconsistent reporting (in the 1960s).	Supported	Mixed support (that is, it depends on which proxy measure is used)
3b	Default risk has a positive influence on attempts to create information asymmetry through inaccurate reporting (in the 1990s-2000s).	Not supported	Not supported
	Interaction: Influence of default risk moderated by in-the-money stock options to salary ratio		
4	The extent of top executive's in-the-money stock options to salary ratio (as an indicator of aversion to loss in personal wealth) moderates the association between default risk and inaccurate reporting in the 1990-2000s, such that the association is more positive when top executive's in-the-money stock options to salary ratio is higher than when it is lower.	Supported, for default risk values that are greater than a certain crossover value	Mixed support (that is, it depends on which proxy measure is used), and only for firm-specific risk values that are greater than a certain crossover value

Influence of firm-specific risk, and moderation by institutional ownership concentration. In both the 1960s and 1990s-2000s, firm-specific risk in the stock market significantly influences both the probability and severity of corporate reporting manipulation. Further, the influence of firm-specific risk on probability of corporate reporting manipulation tends to be more positive when (i) institutional ownership concentration is low (that is, loss aversion is high), and (ii) the firm-specific risk value is higher than a certain critical (crossover) value. The crossover values in the interaction plots suggest that the interaction between higher firm-specific risk and lower institutional ownership concentration will lead to greater corporate reporting manipulation only after a critical value of firm-specific risk has been exceeded.

For *probability* of corporate reporting manipulation as the DV (in logistic regressions), the moderating effect of institutional ownership concentration is always significant (for both 1960s and 1990s-2000s). However, for *severity* of corporate reporting manipulation as the DV (in Tobin/OLS regressions), the moderating effect of institutional ownership concentration is mixed (non-significant for the 1960s, and mixed results for the 1990s-2000s based on which measure is used).

Hence, institutional ownership concentration plays an important moderating role in the influence of firm-specific risk on *probability* of corporate reporting manipulation, but plays a less important role in the influence of firm-specific risk on *severity* of corporate reporting manipulation. The *severity* seems to be primarily determined by the main effect of firm-specific risk. That is, while institutional ownership concentration plays a role in whether or not an executive in a firm (with high firm-specific risk) will

attempt to create information asymmetry through corporate reporting manipulation, it plays a lesser role the actually determining the severity with which the executive engages in corporate reporting manipulation.

Influence of default risk, and moderation by in-the-money stock option to salary ratio. In the 1960s, default risk in the debt market had a direct effect on the *probability* of inaccurate reporting. However, the results for the influence of default risk on the *severity* of reporting inaccuracy are mixed (that is, it depends on the proxy used for measuring default risk). As per theoretical arguments presented in this paper, the influence of default risk could have been stronger in the presence of a loss aversion moderator. However, such an interaction test is not feasible for the 1960s due to the lack of compensation data needed to operationalize an executive's aversion to loss in personal wealth as his/her firm approaches bankruptcy (as noted earlier, executive stock options were non existent in the 1960s).

In the 1990s-2000s, default risk in the debt market did not have direct effects on the probability and severity of reporting inaccuracy. Importantly however, default risk interacts with the variable 'in-the-money stock option to salary ratio' (which is an indicator of personal wealth that is exposed to loss in firms approaching bankruptcy) to influence the *probability* of inaccurate reporting. The influence of default risk on *probability* of inaccurate reporting in the 1990s-2000s tends to be more positive when (i) in-the-money stock option to salary ratio is high (that is, loss aversion is high), and (ii) the default risk value is higher than a certain critical (crossover) value. The crossover values in the interaction plots suggest that default risk and in-the-money stock option to

salary ratio will have a positive interaction effect on inaccurate reporting only after a critical value of default risk has been exceeded.

Though the moderating effect of in-the-money stock option to salary ratio is significant for *probability* of inaccurate reporting as the DV (in logistic regressions), the results are mixed for *severity* of corporate reporting manipulation as the DV (in OLS regression). Hence, in-the-money stock option to salary ratio plays an important moderating role in the influence of default risk on *probability* of inaccurate reporting, but plays a less important role in moderating the influence of default risk on *severity* of reporting inaccuracy.

The theoretical implications of these findings are as follows.

Theoretical Implications

The findings suggests that there are shortcomings in agency theory, and that there is a need to integrate agency theory with prospect theory.

Shortcomings in agency theory. It is well known that early work on agency theory is based on the "relationship between the manager (i.e., agent) of the firm and the outside equity and debt holders (i.e., principals)" (Jensen & Meckling, 1976: 310). Agency theory arguments assume that top executives attempt to create information asymmetry because of their own opportunistic self-interest. The theory argues that mechanisms that can control and prevent any such divergent behavior should be adopted (Dalton et al., 2007; Eisenhardt, 1989). That is, there should be "efforts on the part of the principal to control the behavior of the agent through budget restrictions, compensation policies, operating rules etc." (Jensen & Meckling, 1976: 308). Agency theory suggests

that by using such controlling mechanisms, principals should encourage greater firm-specific risk for potentially greater returns on the stock market, and encourage higher debt as a way to ensure managerial efficiency (Dalton et al., 2007; Eisenhardt, 1989; Jensen & Meckling, 1976). While the agency theory prescriptions are well established, this study suggests that such demands for greater firm-specific risk and higher debt might turn counterproductive by creating a fear of reporting bad news to capital market stakeholders.

First, agency theory suggests that shareholders should demand greater firm-specific risk for potentially greater returns on the stock market. For this, shareholders are encouraged to control top executives through "budget restrictions, and the establishment of incentive compensation systems" that will "serve to more closely identify the manager's interests with those of the outside equity holders" and encourage executives to assume greater firm-specific risk for greater stock market returns (Jensen & Meckling, 1976: 323). However, this can be counterproductive. Top executives complain that they fear reporting bad news because of the cognitive bias of myopic loss aversion in stock market investors (Haigh & List, 2005; Laverty, 1996; Thaler et al., 1997). That is, "when executives destroy the value they are supposed to be creating, they almost always claim that stock market pressure made them do it" (Rappaport, 2006: 66). Top executives blame shareholders, who in their quest for greater stock returns had adopted various means to push top executives to change from "caretakers into risk takers" but got highly dissatisfied when the risk yielded losses rather than gains (Brownstein & Panner, 1992: 35). Given a choice, top executives often prefer that their firms should become private

by delisting from stock exchanges and "point out just how important the absence of stock market pressures is for their ability to take a long-term perspective" (Mintzberg, 1996: 76). Hence, when shareholders have high loss aversion, agency theory based recommendations that encourage greater firm-specific risk for greater returns might turn counterproductive by creating a fear of reporting bad news.

Second, the agency theory arguments suggest that higher debt is a way to ensure greater managerial efficiency, because outside debt holders will demand regular and assured payments. The argument has been that the "threat caused by failure to make debt service payments serves as an effective motivating force to make such organizations more efficient" (Jensen, 1986: 324). However, the threat of bankruptcy from higher debt can turn counterproductive. Top executives metaphorically equate the looming "threat of bankruptcy" from higher debt to a mortal fear of being "hanged in a fortnight" (Augustine, 1997: 93). The higher the default risk, the greater the fear in top executives that reporting bad news will push the firm toward bankruptcy and result in loss of personal reputation and loss of personal wealth. That is, agency theory based recommendations that encourage greater debt for greater managerial efficiency might turn counterproductive by creating a fear of reporting bad news.

In sum, a paradox is that while traditional agency theory suggested that capital market stakeholders (that is, principals - outside equity and debt holders) should enforce controlling mechanisms that align the interests of top executives with that of the capital market stakeholders, it is surprising that the same mechanisms are now being blamed for misalignments (Ghoshal, 2005). In recent times, even agency theorists have expressed

concern that current budgeting and compensation systems are turning otherwise "honest managers into schemers," who feel pressured to "conceal information," "game the system," and "manage the numbers to influence the perceptions" of various demanding stakeholders (Jensen, 2001: 95-97; 2003). In contrast to agency theory arguments, this study provides an alternative theoretical explanation for why top executives create information asymmetry. Attempts to create information asymmetry may be a manifestation of the fear of reporting bad news to capital market stakeholders, and not just a result of self-serving interest as suggested by the agency theory literature. Risk, by definition, implies that both positive and negative outcomes are possible. However, top executives fear reporting negative information because (as argued by prospect theory's loss aversion axiom) they worry that the capital market stakeholders will give more weight to negative information and get easily dissatisfied. When cognitive bias of loss aversion is high, both firm-specific risk in the stock market and default risk in debt market can turn counterproductive by creating a fear of reporting bad news. This fear of reporting bad news to capital market stakeholders is manifested as attempts to create information asymmetry.

The need to integrate agency theory and prospect theory. Do the results of this study change the theoretical prescriptions and notions or our understanding of agency theory? Yes, it does. Agency theory literature can be traced back to the work of Berle & Means (1932) on the separation of ownership and management. While such separation has its benefits, it can also lead to agency problems arising from the divergent and risk-averse behavior of agents. As a solution, Jensen & Meckling (1976) suggested that

compensation systems of top executives (agents) should be linked to firm performance in order to avoid agency problems and encourage risk-taking. While this might be a good way to resolve agency problems, this study shows that the encouragement of risk-taking might have inadvertently contributed to a fear of reporting bad news (manifested in attempts to create information asymmetry through corporate reporting manipulation). Hence, there is an unintentional negative repercussion for what was originally a well-intentioned recommendation by agency theorists.

Do agency theory and prospect theory need to be integrated in order to truly understand executive behavior and to guide them to perform in the way we desire? The answer is yes. Future research needs to integrate agency theory and prospect theory. Agency theory was based on a rational assumption that people would love to gain as much as they would hate to lose. It assumed that the consequences of high risk-taking, that is either large gains or large losses, would balance out in the long term because of its underlying assumption that people would love to gain as much as they would hate to lose.

However, prospect theory highlighted that at a subconscious level "losses loom larger than corresponding gains," and that on average, the dissatisfaction from a loss is more than twice the satisfaction from an equivalent amount of gain (Tversky & Kahneman, 1991: 1039). As noted earlier, people on average need to be compensated a bit more than $200 to fully overcome a dissatisfaction of losing $100 because they "feel the $100 loss more than the $200 gain," that is, "the disutility of losing $100 is roughly twice the utility of gaining $100" (Thaler et al., 1997: 648-649). This implies that even if

disclosed amounts of positive information and negative information are technically equal, top executives might be unfairly assessed as mediocre because stakeholders give approximately twice the weight to negative information and become easily dissatisfied (Benartzi & Thaler, 1995; Kahneman, 2003).

Hence, there is a need to integrate agency theory and prospect theory. Encouragement for risk-taking and the design of compensation systems should be based on a fundamental assumption that people hate to lose more than they love to gain. This is important because encouraging executive risk-taking and designing executive compensation systems without factoring in the strong distaste for losses in humans (in executives, capital market stakeholders, and possibly other types of stakeholders) can tempt the executives to create information asymmetry through corporate reporting manipulation. The coming section describes how this can be implemented in practice.

Implications for Practice

The theoretical implications suggested a need to integrate agency theory and prospect theory. A corresponding implication for strategic management practice is that the design of compensation systems should incorporate both agency theory and prospect theory. Further, there are implications for public policy. Apart from institutional regulations on the monitoring of excessive risk taking and fraudulent behavior, policy makers need to acknowledge that humans tend to have a strong distaste for losses and design institutional regulations accordingly.

Designing compensation systems that integrate agency theory and prospect theory. Recent research has made considerable progress, finding that such attempts by

top executives to create information asymmetry through corporate reporting manipulation have been motivated by compensation incentive mechanisms such as stock options (Burns & Kedia, 2006; Efendi et al., 2007; O'Connor et al., 2006; Zhang et al., 2008). In contrast, the main focus of this study was on the direct effect of 'risk', and the moderation of this direct effect by loss aversion. This findings of this study highlights the need to design compensation systems that gives due consideration to both agency theory and prospect theory. Two solutions are suggested below.

1) Reward More, Punish Less. One solution (that integrates agency theory and prospect theory) might be to give a greater degree of rewards to executives for improved firm performance, but give lesser degree of punishment for poor performance. For example, prospect theory suggests dissatisfaction from a loss is more than twice the satisfaction from an equivalent amount of gain. Hence, it might appropriate to design compensation systems where the punishment for a loss is less than half of the rewards for an equivalent amount of gain.

2) Long term moving average. Another solution might be to pay executives based on the basis of a long-term 'moving average' of firm performance as opposed to short-term firm performance. Lawler (1990: 22) gives the example of 3M (Minnesota Mining and Manufacturing) as "an organization that protects and rewards its risk-takers". He explains their compensation system as follows.

> "…individuals are rewarded based on their long-term track record rather than on the immediate success or failure of their most recent venture. This approach, which has allowed 3M to retain many of its better managers in entrepreneurial

> ventures and activities, is quite different from what all too happens in large corporations…" (Lawler, 1990: 22)

On similar lines, top executives can be rewarded based on long-term performance rather than on the successes or failures of their most recent risky activity. This would encourage top executives to take up more risky activities, with lesser fear of losses.

Institutional regulations. The US government has been taking many actions in response to the concerns highlighted in this study. The Sarbanes-Oxley Act was enacted in July 2002, in response to such corporate scandals. This has made it harder for firms to hide information through inaccurate reporting, and led to more cases of inaccurate reporting being revealed. Further, the current US administration is already moving in a direction that addresses some of the concerns highlighted in this study. President Obama has suggested various regulatory changes where "part of that has to do with the effects of regulation that will inhibit some of the massive leveraging and the massive risk-taking that had become so common" (Obama, 2009).

These initiatives by the US government are important. Nonetheless, an issue that deserves a revisit by the policy makers is that of quarterly reporting. The 1970 SEC institutional regulation mandating consistent quarterly reporting ended the legal choice that US firms had for withholding information. This seems to have contributed to short-termism, that is, a myopic view where firm strategies have become focused more on the short-term rather than the long-term (Laverty, 1996; Thaler et al., 1997). Earlier sections had described the theoretical arguments that favor greater flexibility toward allowing firms to extend the gap between reporting events. The literature notes that top executives

might prefer a flexible legal option that allows them to temporarily withhold or delay the reporting of their quarterly financials (Alford et al., 1993; Bhojraj & Libby, 2005). This would be especially important when executives have private information that they do not want to disclose to the public at that particular point of time. Stock analysts and shareholders who like frequent and timely information may resist this suggestion, but they too might appreciate its benefits when faced with a choice between 'timely but inaccurate' versus 'accurate but delayed' reports. It gives executives the flexibility to stay honest, and not fall prey to the temptation of fudging the numbers. Metaphorically speaking, it offers a choice between the lesser of two evils. If executives have some flexibility on the timing of disclosure, it will reduce their temptation to release an inaccurate report, and will allow them to release a delayed but accurate report. \

Limitations

No study in our field is perfect, and this study has its share of limitations too. Some of the possible limitations are listed below.

Coarse-grained proxies. A limitation of this study is that it does not capture the exact extent of psychological loss aversion in an executive. This is possible in experimental conditions, and most research on prospect theory has been done in experimental conditions. In contrast, this is not a experimental study and it uses firm-level proxies derived from archival data. Correspondingly, a possible limitation is that the firm-level proxies are rather coarse-grained, that is, they might not fully capture the behavioral underpinnings of the arguments put forth in this study.

Data availability. Another limitation is that of insufficient data for the 1960s. For example, compensation data is needed to empirically operationalize a top executive's aversion to loss in personal wealth. However, compensation data is not available for the 1960s (moreover, stock options were non-existent before 1973, and started becoming a substantial component of executive compensation only the mid 1980s). Further, due to a lack of sufficient data that goes back to the 1960s, the 'Herfindahl' measure of institutional ownership concentration could not be calculated for the 1964-69 period. The minimal data that is available from the 1964-69 period allowed the calculation of only the 'average' measure of institutional ownership concentration.

Matched sampling and lack of independence. A key assumption of regression analysis is that of independence of observations, that is, data for variables is sampled randomly and that the observations are independent of each other. Independence means that the observations should not be correlated with or dependent on each other. The empirical method of matched sampling suffers from the limitation of a possible lack of independence (Austin, 2008; Cram, Karan, & Stuart, 2007; Hill, 2008; Rubin, 2006).

This study's matched sampling procedure is consistent with those that have been widely used in the literature on corporate reporting manipulation (Arthaud Day et al., 2006; Butler et al., 2007; Cram et al., 2007; Efendi et al., 2007). The procedure involved selecting (or pairing) a distinct control firm that matches each focal firm exactly in year, 4-digit SIC industry code, and stock exchange, and is the closest match in total assets.

An advantage of this procedure is that the matched firms will be more similar to the focal firms than unmatched firms (in terms of the matching variables), thereby

providing the researcher with a set of comparable firms. The literature notes that "although a matched-pair sampling design has limitations, it is generally considered an appropriate way to study phenomena with a low base rate of occurrence" (Arthaud Day et al., 2006: 1125). A disadvantage is that matching induces dependence between the focal and matched control groups. There is a lack of independence because the observations in matched control group are dependent on the observations in the focal group. This might result in standard errors that are overly conservative (Hill, 2008).

Other Avenues for Future Research

Earlier sections on the implications of this study suggested that future research should consider integrating agency theory and prospect theory and design compensation systems accordingly. This section discusses other potential avenues for future research: CEO turnover and succession, the current economic crisis, and the need to extend institutional theory.

CEO turnover and succession. Recent research suggests that CEOs are more likely to be fired if it is found that the firm had disclosed inaccurate financial reports (Arthaud Day et al., 2006). An avenue for future research is to investigate the dynamics of risk-taking and loss-aversion when a CEO is fired due to corporate reporting manipulation and is replaced by a successor.

The likelihood of a CEO being fired due to corporate reporting manipulation might be contingent upon the extent of loss aversion among its stakeholders. It seems that loss-averse stakeholders would be the most displeased with the negative news regarding inaccurate reporting, and would refuse to give the CEO any benefit of doubt.

Furthermore, some questions about CEO succession are relevant. Who is selected to succeed the fired CEO and why? Will the firm's owners prefer the new CEO to be an insider or outsider? While an 'untainted' outsider might be preferred as CEO in order to send a positive signal to the market, it would be harder for the owners to attract an outsider to a firm whose reputation has already been stigmatized. Hence, a new CEO might demand a relatively much higher compensation for him/her to consider leading the stigmatized firm.

The current economic crisis. The US economy and much of the world economy has entered into a sudden and severe crisis in late 2008 and 2009, and this offers another avenue for future research. Although the future will judge the severity of this crisis, some believe that the crisis may be the most severe since the great depression. Given the shocking speed with which this crisis arrived, it is not surprising that there is a lack of clarity about the origins and dynamics of this crisis, with numerous theories floating around in the media and among researchers. Nonetheless, there seem to be two sides to the coin when one analyzes the causes of this crisis.

On the one hand, some firms were able to take on high debt in the past because of easy availability of credit and/or by hiding negative information about their own financial health from creditors. Such firms started defaulting on their debt payments when faced with a tough economy. It seems that there was a downward spiral, whereby firms (debtors) chose to continue hiding negative information about their financial health from the creditors in order to either obtain more credit or avoid being declared bankrupt (Graham et al., 2008).

On the other hand, some creditors (banks) took on high firm-specific risk by providing easy loans to customers who had insufficient resources to cover their debts. This firm-specific risk by creditors backfired when their debtors defaulted on their payments. Interestingly, it seems that the creditors kept this negative information about their toxic assets hidden for quite some time (before it blew out of proportion and resulted in the sudden crisis). Given the findings of this study, it would be interesting to check the extent to which and for how long the creditors kept this negative information hidden. Further, it is possible that executives of these creditor firms feared reporting bad news about toxic assets in order to either avoid displeasing shareholders or avoid a fall in personal wealth.

In sum, this crisis seems to be the result of a rather peculiar scenario where both creditors and debtors took on high risk. That is, creditor firms (banks) took on high firm-specific risk by providing easy loans, and debtors took on high default risk by accepting the easy loans. Further, both creditor firms and debtor firms seemed to have hidden negative information in order to keep their avoid displeasing each other. At some point in late 2008 the bubble burst, all the previously hidden negative news came pouring out from both sides, and the economy collapsed at shocking speed. Hence, the arguments offered in this study can help future researchers to theoretically and empirically analyze the crisis in coming years.

Institutional theory, competitive advantage, and moral dilemma. Another avenue for future research is to extend institutional theory on the dynamics of conflict between institutional demands and a firm's pursuit of competitive advantage, and the

associated moral dilemma. This would also offer an alternative explanation for many of the arguments presented in this study. It was discussed earlier that though quarterly reporting had become an institutional norm by the early 1960s, some listed firms resisted the norm and chose to not report quarterly, or at least not do so on a consistent basis. Because there was no mandatory regulation/law against this practice, these few firms made use of their legal right to hide information (by not following the consistent quarterly reporting norm) (Butler et al., 2007; Taylor, 1965). Despite the legality of these actions in the 1960s, the actions were not necessarily legitimate in terms of the prevailing social norm of consistent quarterly reporting. *Informal legitimacy* requires that actions be in conformance with institutionally constructed system of non-mandatory social *norms* (Suchman, 1995: 574). In contrast, *legality (formal legitimacy)* requires that actions be in conformance with the institutionally constructed system of mandatory *laws* (Webb, Tihanyi, Ireland, & Sirmon, 2009).

An institution often demands that firms that come under its purview should conform to it, and the institutional demands can be in the form of either (non-mandatory) norms or (mandatory) laws. Sometimes these demands are in conflict with a firm's strategic initiatives. A firm's ability to differentiate itself from other firms might suffer if it conforms to the conflicting institutional demands. This is illustrated in Figure 13.

If neither norms nor laws are created by an institution, then it gives firms the freedom to aggressively differentiate themselves (from other firms) in pursuit of competitive advantage. However, if there are institutional norms in place, then firms face pressure to forego any strategic initiatives that run counter to the norms. This leads to a

fair amount of moral dilemma - disobeying the norms might help in maintaining or improving competitive advantage, but it would be considered as socially illegitimate behavior (though it would be legal). Disobeying the laws will not hurt the firms legally, but it might expose the firms to a loss in informal legitimacy. The literature suggests that some firms do choose to pursue their competitive advantage by disregarding the social legitimacy aspect; for example, the inconsistency in following quarterly reporting norms by some firms in the 1960s, and the continued existence of firms in the tobacco industry in more modern times.

Finally, if mandatory institutional laws are imposed, then firms face pressures to forego any strategic initiatives that might run counter to the laws. This leads to the greatest amount of moral dilemma - disobeying the laws might help in maintaining or improving competitive advantage, but it would be considered as illegal behavior. For a firm to overcome this moral dilemma in a positive manner, they would have to sacrifice the conflicting strategic initiatives in favor of obeying the laws. However, if a firm succumbs to this moral dilemma in a negative manner, then it might imply either one of the following. One possibility is that the firm has chosen to act illegally in an explicit manner (a rather extreme example would be illicit drug cartels). The other possibility is that the firm has chosen to hide its illegal behavior by putting on a fake show of conformance to institutional laws (example, inaccurate reporting by firms in the 1990s-2000s, and various other cases of fraud in recent times). Either way, it is likely that those who choose such paths of immoral behavior will have to bear the consequences of disobeying the law.

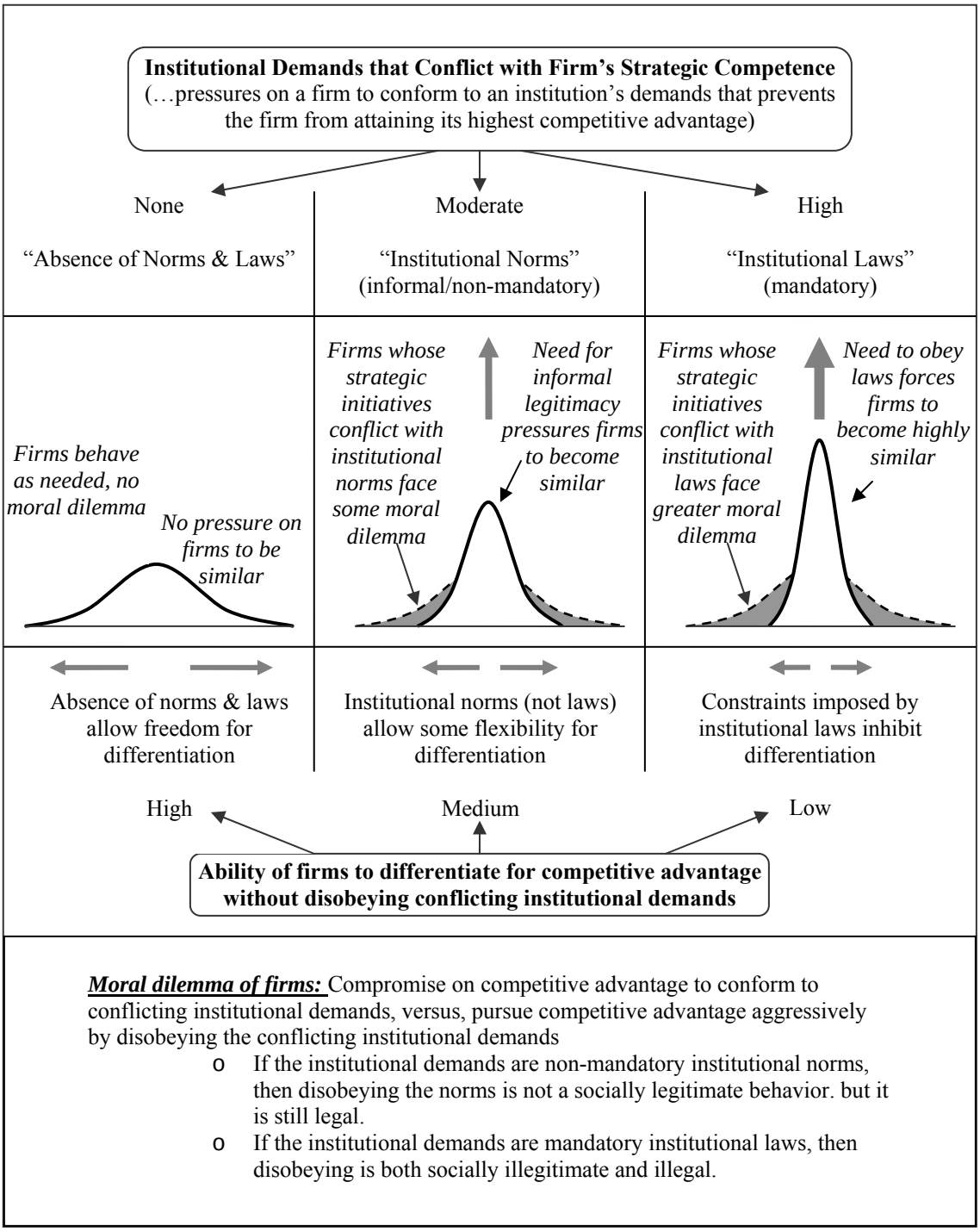


Figure 13. Other avenues for future research: Institutional theory, competitive advantage, and moral dilemma

Conclusion

Top executives fear that capital market stakeholders will cognitively weigh negative information more strongly than equivalent positive information, tempting them to avoid reporting negative information as a result. Top executives have attempted to create information asymmetry in the 1960s by not following the consistent quarterly reporting norm and in the 1990s-2000s through inaccurate reporting. This study suggests that both firm-specific risk (firm's unsystematic risk as assessed by stock market) and default risk (difficulty faced by firm in meeting its debt market obligations) influenced attempts to create information asymmetry in both eras (1960s and 1990s-2000s). Moreover, the extent of loss aversion moderates the influence of risk: (i) institutional ownership concentration (as an indicator of shareholder resistance to loss aversion) negatively moderates the influence of firm-specific risk in both the 1960s and 1990s-2000s, and (ii) CEO in-the-money stock options to salary ratio (as an indicator of personal wealth that is exposed to loss if firm approaches bankruptcy) positively moderates the influence of default risk in the 1990s-2000s. Overall, when loss aversion is high, a firm's risk can turn counterproductive by creating a fear of reporting bad news to capital market stakeholders.

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