Can Governance Mitigate Real Earnings Management?[1]

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Abstract

This study investigates whether corporate governance can mitigate real earnings management. In recent years, firms have been switching from accrual-based to real earnings management, and the incidence of real earnings management has increased. The role of corporate governance to reduce accrual-based earnings management is well documented in the literature; however, there is no firm evidence regarding the role of corporate governance to constrain real earnings management. To fill the gap in the literature, this paper examines whether corporate governance can play any role to reduce real earnings management. In this study, I find the evidence that firms may engage in real earnings management either to avoid reporting losses or to meet analysts' forecasts. The cross-sectional analysis reveals that these activities are less prevalent for the firms that have larger institutional investors; however, no evidence regarding the role of the board to prevent real earnings management is indicated.

Keywords: corporate governance, real earnings management, board, institutional investors.

1.0 Introduction

This study investigates whether corporate governance helps to constrain real earnings management. Corporate governance is an important tool to align the interests of managers with the interests of the stakeholders and to enhance the reliability and integrity of the financial reporting process (Watts and Zimmerman, 1986). Extant literature has documented the role of corporate governance and has provided some inherent links between corporate governance and earnings management. Though previous studies mostly focus on accrual-based earnings management, it is not the only way to manipulate earnings. Managers can also manipulate earnings by altering firms' real activities, such as timing investment and financing decisions, structuring operating activities, etc. These types of purposeful opportunistic actions taken by the managers to alter the reported income are known as real earnings management (Schipper, 1989). While there is extensive literature on the impact of corporate governance on opportunistic accrual-based earnings management, the impact of corporate governance on real earnings management has rarely been explored to date. This paper attempts to fill the void in the literature by investigating the role of corporate governance in mitigating the value destroying real earnings management.

In recent years real earnings manipulation has increased significantly, and firms are switching from accrual-based earnings management to real earnings management (Cohen et al., 2007; Osma & Young, 2009; Gunny, 2010). The nature, cost, and consequences related to accrual-based and real earnings management are largely different. Accrual-based earnings management can be viewed as an ex-post form, whereas real earnings management usually takes place over a period of time. Detection of real earnings management is more difficult than the detection of accrual-based earnings management, so the impact of corporate governance on real earnings management may not be same as its impact on accrual-based earnings management.

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This study has two objectives. The first objective is to test whether managers engage in any earnings manipulation by altering real economic activities in order to achieve certain earnings benchmarks. To investigate this query, I focus on two groups of firms. The first group consists of the firms that report zero or small positive earnings. The second group is comprised of the firms that just meet or beat analysts' earnings forecasts. I investigate whether these suspect groups of firms abnormally cut discretionary spending (R&D expenditures and SG&A expenses) or make abnormal gains on sale of assets to avoid negative earnings or negative earnings surprises. The second objective of this paper is to investigate the role of corporate governance in preventing these types of real earnings manipulations. I consider two major types of corporate governance dimensions: board structure (board size, board independence and CEO duality) and ownership structure (institutional ownership).

This study uses a sample of 7,852 fiscal quarters of publicly-traded U.S. firms to find evidence that managers manipulate real activities to avoid both negative earnings and negative earnings surprises. Real earnings manipulation appears more profound in avoiding a report of loss than meeting or beating analysts' earnings forecasts. After controlling firm-specific factors, I found evidence that real earnings manipulations to avoid loss or negative earnings surprises is less pronounced when firms have sophisticated larger institutional investors; however, the study failed to find evidence regarding the role of the board in preventing real earnings manipulations. The overall findings imply that all dimensions of corporate governance may not play significant roles in preventing real earnings management.

The rest of the paper is organized as follows. Section 2 briefly discusses the corporate governance literature and different dimensions of governance that might have impact on earnings management. Section 3 reviews the concept of earnings management and details different measures

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of real earnings management that relate to this study. Section 4 develops hypotheses that are tested in this study. Section 5 presents an overview of the data and methodology and the empirical models used in this paper. Section 6 shows empirical findings and contains concluding remarks and some limitations of the study.

2.0 Corporate governance mechanism

Corporate governance mitigates the inappropriate expropriation of resources by the manager and encompasses all the provisions needed to guarantee that the assets of the firm are efficiently managed in order to protect the fund provider's best interests (Shleifer & Vishny, 1997). The corporate governance structure is considered to be a major way to guarantee the accuracy and reliability of corporate disclosure. Several studies have documented the role of corporate governance in reducing earnings management and fraudulent reporting (Beasley, 1996; Dechow et al., 1996; Jiambalvo, 1996). The role of corporate governance is to comply with the reporting requirements and to maintain the credibility of financial statements (Dechow et al., 1995). Different dimensions of corporate governance affect managerial behavior and a firm's performance. The dimensions of corporate governance include ownership structure, board composition, audit committee effectiveness, internal and external auditing, etc. Most of the corporate governance-related studies classify the governance dimensions into two major categories: board composition and ownership structure (Denis & McConnell, 2003; Garcia-Meca & Ballesta, 2009).

2.1 Board

The board plays a fundamental role in corporate governance of a firm as it is the center of decision-making and control systems (Fama & Jensen, 1983). An effective board should ascertain the validity of accounting choices made by the management (NYSE, 2002), and the effectiveness of a

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board depends on board composition and its other criteria. This study focuses on three important criteria of a board: board size, board independence, and CEO duality.

2.1.1. Board size

Board size is considered as an important factor in a board's ability to monitor the management. If board size increases, it makes the board less effective due to coordination problems. Jensen (1993) argues that small boards are more effective in monitoring process. Yermack (1996) and Eisenberg et al. (1998) also document that smaller boards are associated with better performance. However, it is also likely that larger boards have more diversified and more experienced members who can monitor managerial activities more effectively.

2.1.2. Board independence

The effective monitoring mechanism of board depends on its independence from the management (Beasley, 1996; Dechow et al., 1996). Regulatory authorities always highly emphasize board independence. To ensure the board's independence , the SEC regulations 14A (6b) mentions that board of directors with the following criteria must be disclosed in a proxy statement: (1) employed by the company or an affiliation within last five years; (2) family relationship closer than second cousin; (3) affiliation within last two years with a concern that has had a customer, supplier, banker, or creditor relationship with the firm; (4) affiliation with an investment banker who has worked for the company within the last two years or will do so within one year; (5) holding control of corporate stock; and (6) association with a law firm engaged by the corporation. As per fiduciary duties, board members try to ensure the transparency and integrity in the reporting process. A board member who is independent is expected to provide the greatest service to monitor managers and to protect shareholders' interests (Baysinger & Butler, 1985). Researchers find that a firm's performance

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improves with board independence (Byrd & Hickman, 1992; Brickley et al., 1994; Subrahmanyan et al., 1997; Rosenstein & Wyatt, 1990).

2.1.3. *CEO duality*

Another important criterion of the board is the separation of the role of the CEO and the role of the chairperson of the board. Statistics shows that majority of U.S. companies have the same person who performs the role of CEO and the role of the chairperson of the board (Brickley et al., 1997; Cornett et al., 2008). If a CEO also acts as the chairman, the power of the CEO increases, and consequently, the CEO influences the other board members and controls the board. Thus, the board's ability to perform the role of monitoring is weakened by CEO duality (Cadbury Committee, 1992). However, many researchers do not find any adverse effects of CEO duality on a board's monitoring ability (Bugshan, 2005; Cornett et al., 2006; Davidson et al., 2005).

2.2 Ownership structure

Ownership structure of a company has significant impact on both a firm's performance and governance system. Monitoring by the owners mitigates the agency conflict and improves the quality of managerial decisions. The ability of managers to manage earnings opportunistically can be constrained by the effectiveness of external monitoring by sophisticated stockholders such as institutional investors (Chung et al., 2002). Institutional owners have the ability and resources to monitor, to discipline, and to influence managers (Monks & Minow, 1995); thus, they play a significant role as an effective corporate governance tool. Several studies reported how ownership pattern, specifically institutional investors, positively impacts the monitoring system and improves earnings quality (McConnell & Servaes, 1990; Del Guercio & Hawkins, 1999; Gadhoum, 2000).

3.0 Earnings management

According to the SEC (1999) final rule, earnings management is defined as "the practice of distorting the true financial performance of a firm." Schipper (1989) and Healy and Wahlen (1999) state that earnings management is the alternation of a firm's reported economic performance by the insider either to "mislead the stakeholders" or to "influence contractual outcome." Earnings management has drawn a lot of attention due to the financial crisis. It is well documented that managers of public companies have several incentives to manipulate earnings (Kellog & Kellog, 1994; Ronen & Sadan, 1981). Early research on earnings management focused on manipulation of bonus income by using accruals (Healy, 1985; Healy et al., 1987; Gaver et al., 1995). Later on, researchers documented how earnings management was used to affect stock prices (Sloan, 1996; Teoh et al. 1998; Beneish & Vargues, 2002).

To achieve desired levels of earnings, managers usually practice earnings management into two ways: (1) accrual earnings management and (2) real earnings management. Researchers mostly use accounting accruals as a proxy to measure earnings management. Accruals are the principal product of GAAP choices. If earnings are managed, it is more likely that the earnings management occurs on the accrual component than on the cash flow part of earnings. Under accrual-based earnings management, managers use different accounting choices under GAAP to alter earnings. Another form of earnings management, which the managers have preferred in recent years, is real earnings management (Graham, 2005; Cohen, 2005). Real earnings management alters earnings by changing the firm's underlying operations or by changing investment or financing decisions. This study particularly focuses on real earnings management and investigates the impacts of corporate governance on firms' real earnings management practice.

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3.1 Real earnings management

Though accounting literature has not focused as much on real earnings management as it does with accrual-based earnings management, in recent years, several researchers have studied real earnings management. Schipper (1989) first identified real earnings management as "a purposeful intervention in the external financial reporting process, with the intention of obtaining some private gain... a minor extension to this definition would encompass 'real' earnings management, accomplished by timing investment or financing decision to alter reported earnings or some subset of it." Roychowdhuty (2006) has defined real earnings management as "departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations." Managers alter real activities to meet their short-term goals that do not necessarily increase the firms' value in future. In a study, Graham et al. (2005) surveyed 401 executives (CFO or CEO) and reported that around 78% of respondents prefer real earnings management to accrual-based earnings management to achieve financial reporting objectives. Cohen et al. (2008) document that, in the post-SOX era, managers shifted from accrual-based earnings manipulation to real earnings management.

There are several reasons why managers prefer earnings management through real activities manipulations. First, accrual-based earnings management is at greater risk because it draws auditor litigations, regulatory investigations, and class action litigations. On the other hand, it is difficult for the stockholders and the outsiders of a firm to identify and to investigate real activity manipulations. Second, firms may have limited options and flexibility to manipulate accruals by altering accounting choices, but firms have several operating, investing, and financing activities that can be altered within a broader range of flexibility. Third, accrual earnings management usually takes place as an ex-post form, whereas managers can alter reported earnings anytime throughout the year at their convenience.

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Therefore, it is assumed that firms that have several incentives to engage in earnings management by doing real activity manipulations rather than by using accrual-based earnings manipulations.

3.2 Different types of real earnings manipulations

In a study, Xu et al. (2007) reviewed real earnings management literature and classified the empirical evidence into two major categories. The first category is related to operating and investing activities, which include managing discretionary expenditures (abnormal reduction in R&D expenses, SG&A expenditures, advertising expenses, maintenance costs, labor costs, employee health care cost, etc.), altering productions and sales decisions (overproduction, managing COGS or other fixed costs, temporary increase in sales by increasing sales discount or price reduction specially in last quarter, etc.), delaying investments, the timing of the sale of long term assets that affect abnormal gain or losses, etc. The second category includes financing activities, which involve repurchasing stocks to manipulate earnings per share, the timing of using stock options for executive compensation, using derivatives to reduce earnings volatility, etc. All of these are a manager's decisions to alter a current period's earnings to achieve temporary goals that may adversely affect the firm's long-term value maximization objective. Although all three types of activities (operating, investing, and financing) can be used for earnings manipulation, researchers mainly focus on operating and investing activities. This study focuses on three types of real activity manipulations: abnormal reduction in R&D expenses, abnormal reduction in SG&A expenditure, and abnormal gain on sales of fixed assets.

3.2.1. R&D expenditure

Managers always feel pressure to meet certain earnings targets, such as last quarter's or last year's earnings, analysts' earnings forecasts, positive earnings, etc. These pressures induce the managers to shave different discretionary expenses to inflate short-term earnings artificially. Among those discretionary expenses, managers frequently use R&D expenditures to alter earnings. Under the current conservative reporting rules, R&D expenditures are charged as expenses since the benefits associated with this spending are uncertain (SFAS No. 2, October 1974). Moreover, R&D expenditures do not generate immediate revenue and income. Therefore, managers are interested in cutting R&D expenditures to boost a current period's income. If managers reduce R&D expenses discretionarily, income statements report an abnormal level of R&D expenditures. In extant literature, most studies use the abnormal R&D expenditure as a proxy for real activity manipulations. Researchers document that managers frequently use discretionary R&D expenditures to increase short-term earnings and to meet different earnings benchmarks (Dechow & Sloan, 1991; Bushee 1998; Baber et al. 1991; Bange & DeBondt 1994; Cheng 2003).

3.2.2. SG&A expenses

Purposeful reduction of SG&A expenses is another example of real earnings manipulation (Cohen et al., 2010; Roychowdhury, 2006). SG&A costs are immediately expensed under GAAP. GAAP does not recognize intangible assets such as customer loyalty, human resources, technology, and brand value, but all of these are created by SG&A expenses (Gunny, 2010). Thus, managers find it easier to adjust SG&A expenses to achieve different earnings targets, such as reporting profit, smoothing income, or meeting analyst's forecasts. One advantage of using SG&A expenses to manage earnings is that it can be done throughout the year.

3.2.3 Sale of fixed assets

Timing of sales of fixed assets is another way to shape earnings and to achieve managerial opportunistic goals. Selling fixed assets or delaying the purchase of assets can help firms to manipulate the reporting of gains or losses that ultimately impacts bottom line earnings of the firm. Researchers show that managers choose the timing of asset sales to control the reported earnings, especially in the last quarters (Bartov, 1993; Black et al., 1998).

4.0 Hypothesis development

Hypothesis 1: Meet or beat earnings benchmarks

This study focuses on two suspect groups of firms that have high incentives to manage earnings. In first group, the firms are those that report zero or small positive earnings. In the second group, the firms are those that just meet or beat analysts' earnings forecasts. Prior researchers document that there is a discontinuity in earnings distribution around zero (Hayn, 1995; Burgstahler & Dichev, 1997; Degeorge, Patel, & Zeckhauser, 1999; Jacob & Jorgensen, 2007). More specifically, there is a remarkable upward shift in the frequency of earnings going from the left of zero to just the right of zero, and it is interpreted as evidence of earnings management to avoid reporting negative earnings. It is also documented that small positive earnings surprises are more common than small negative earnings surprises and that a zero earnings surprise is relatively high in earnings surprise distribution (Dreman & Barry, 1995; Brown, 1997). It is more likely that firms engage in earnings manipulation when reporting earnings that meet or beat analysts' earnings forecasts (Matsumoto, 2002; Payne & Robb, 2000).

H₁: Firms that report zero or small positive earnings or firms that just meet or beat analysts' earnings forecasts are more likely to engage in real earnings manipulations.

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Hypothesis 2: Board size

Several studies focus on board size and its effectiveness to reduce earnings management. Some researchers argue that board size is positively associated with earnings management (Dalton et al., 1999; Chin, 2006). Some authors find negative (Xie et al., 2003) or no association (Bradburyet al., 2006) between earnings management and board size. Though all of these studies focus on accrual-based earnings management, the association between board size and real earnings management has not been investigated. It can be assumed that, to identify and to mitigate real earnings management, board members should have diversified expertise and experience. It is more likely that a larger board may have more directors with diversified knowledge, experience, and expertise to perform more intense monitoring that could reduce real earnings management (Xie et al., 2003). If so, real earnings management should reduce with board size.

H_2: Real earnings management is negatively associated with the size of the board.

Hypothesis 3: Board independence

Evidence shows that boards dominated by independent outside directors are in a better position to control earnings management (Dunn, 1987; Vance, 1983). Better monitoring and control performed by the board improves the firm's performance governance system, and effective corporate governance, in turn, reduces earnings manipulations (Brickley et al., 1994; Byrd & Hickman, 1992; Dechow et al., 1996; Beasley, 1996; Klien, 2002; Peasnell et al., 2005; Cornett et al. 2009). Although previous studies have focused on accrual earnings management, it can be assumed that an independent board is in a better position to reduce real earnings management as well. Managers report all periodical budgets and major changes in planning and spending to the board. An independent board should be more enthusiastic to investigate whether managers are focusing on short-term goals by

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manipulating real activities; however, any lack of experience and expertise of the independent board members may limit their ability to prevent real earnings management.

H₃: Real earnings management is negatively related with the independence of the board member.

Hypothesis 4: CEO duality

Since the dual role (CEO and board chair) of a CEO empowers him/her to control the board, CEO duality is a threat to the board's independence and monitoring ability (Jensen, 1993). It is more likely that managers will be induced to practice earnings manipulations when the CEO also acts as the chair, so if the roles of CEO and board chair are separated, there is less possibility for the managers to engage in real earnings management.

H₄: Real earnings management is negatively associated with the separation of the role of the CEO and the chairperson of the board.

Hypothesis 5: Institutional investors

Large shareholdings by institutional investors monitor and discourage managers to take any decision that focuses on short-term goals or that helps managers to manage reported earnings opportunistically. Bushee (1998) argues that institutions are sophisticated investors who search for long-term value rather than myopically focus on the near-term profits. Bange and De Bondt (1998) find that there is less earnings management practiced through altering R&D expenditures when institutional shareholdings are high. Institutional investors are capable of spending more time and effort to monitor managers and to prevent them from engaging in any opportunistic real activity manipulation. Therefore, I predict that firms with more institutional investors are less likely to exhibit the evidence of real earnings management.

H₅: Real earnings management is negatively associated with institutional ownership.

5.0 Methodology

5.1 Measures of real earnings management

To test the association between real earnings management and corporate governance, I have developed three models that measure the normal level of activities in a business. These models are used in an estimation period to measure the normal levels of R&D expenditures, SG&A expenses, and gains on asset sales. Next, abnormal reductions in these discretionary expenditures (R&D and SG&A) and abnormal levels of gain on the sale of assets are measured in a test period by using the residuals from the model that predicts normal levels of activities.

The normal level of R&D expenses

Based on prior literature (e.g., Rowchowdhury, 2006; Gunny, 2010), I have developed the following model to measure the normal level of R&D expenses (*R&D*). This equation is estimated for an estimation period in every quarter and two-digit SIC codes. Independent variables are selected to reflect the factors that usually influence the normal level of R&D expenses in a firm. Anatural log of market value of equity (MV) is used to control the firm's size effect, and Tobin's Q (*Q*) is used to control growth prospects. Internal fund availability (*INT*) is used to predict a firms' ability to spend on R&D, and last year's R&D expense is another way to predict a firm's R&D opportunity set.[2] All the variables are scaled by total assets at the beginning of the year.

$$\frac{R\&D_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{t-1}} + \beta_4 \frac{R\&D_{t-1}}{A_{t-1}} + \varepsilon_t^{R\&D} \qquad (1)$$

The normal level of SG&A expenses

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[2] A detailed list of variable definitions is given in Appendix A

The normal level of SG&A expenses (*SG&*A) is estimated by using the following equation. This equation is also estimated for an estimation period in every industry (two-digit SIC) and every quarter. Market value of equity (*MV*), Tobin's Q (*Q*), and internal fund availability (*INT*) are included to control a firm's specific effects, such as firm size, growth prospects, and ability to spend on SG&A expenses, respectively. Sticky cost behavior (Anderson et al., 2003) is incorporated by following Gunny (2010), where ΔS measures changes in total sales and *DD* is indicator variable 1 when the total sales decreases from the previous year, 0 otherwise.

$$\frac{SG\&A_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{t-1}} + \beta_4 \frac{\Delta S_t}{A_{t-1}} + \beta_4 \frac{\Delta S_t}{A_{t-1}} * DD + \varepsilon_t^{SG\&A} \qquad (2)$$

The normal level of gain on assets sale

By following Herrmann et al. (2003) and Gunny (2010), I use the following equation to measure the normal level of gain on asset sales (*GainA*). This equation includes market value of equity (*MV*) to control firm size, Tobin's Q (*Q*) to control growth, and internal funds (*INT*) to control reduced funds availability. It also controls the amount of fixed assets and investment sales. The equation is estimated for two-digit SIC codes and firm fiscal quarters.

$$\frac{GainA_t}{A_{t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{t-1}} + \beta_1 MV_t + \beta_2 Q_t + \beta_3 \frac{INT_t}{A_{t-1}} + \beta_4 \frac{ASales_t}{A_{t-1}} + \beta_4 \frac{Isales_t}{A_{t-1}} + \varepsilon_t^{GainA} \qquad (3)$$

5.2 Data and sample

The investigation of this study is divided into two periods. One is the estimation period to develop models that predict normal level of R&D expenditures, SG&A expenses and gain on assets sales. The other is the test period for investigations of the hypotheses. To estimate the parameters for

measuring normal level of discretionary expenditures and gains on sale of assets, I use data for publicly listed U.S. firms from the 1996-2007 fiscal quarters. Financial statements' data are collected from COMPUSTAT. The initial sample consists of 559,892 fiscal quarters. Sample selection is restricted to non-financial and non-regulated industries since the financial (SIC 6000-7000) and the regulated (SIC 4400-5000) industries are operated with different regulations and different accounting rules. Firm quarters that do not have sufficient information to calculate the proxies for real earnings management are excluded from the sample. Observations are also excluded if the two-digit SIC industry code for per fiscal quarter has fewer than six observations. This leads to a final sample of 97,602 fiscal quarters for the estimation period to determine the parameters of the normal level of R&D expenditure, SG&A expenses, and gain on sale of assets. To test the hypotheses, I use a sample of all firms with available financial information from COMPUSTAT for the fiscal quarters in 2008-2010.

[Insert Table 1]

Table 1 summarizes the sample selection procedure for the test period. The initial sample consists of 121,841 fiscal quarters. Firms in the financial (SIC 6000-7000) and regulated (SIC 4400-5000) industries are excluded, reducing the data set to 64,158 fiscal-quarters. I collect the quarterly analyst's forecasts data from I/B/E/S (The Institutional Brokers' Estimate System) database for the suspect groups of firms that just meet or beat analysts' forecasts. I exclude the firm quarters that have no forecast data in the I/B/E/S database. This exclusion reduces the sample size to 34,021 fiscal quarters. Firm quarters that have fewer than three individual analyst forecasts are also excluded from the sample. Governance-related information is collected from two sources. Board composition and director information (board size, independent members, and CEO duality) are collected from Risk Metrics. Institutional ownership data are collected from Thomson Financial 13f filings. Due to

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unavailability of corporate governance data, a large number of firm quarters are excluded from the sample. The final sample becomes 7,852 fiscal quarters.

5.3 Selection of suspect firm quarters

I target two suspect groups of firms. The first group consists of the firm quarters that reports zero or small positive earnings. The second suspect group consists of the firms that just meet or beat analysts' forecasts. To identify the first group, I scaled firms' quarterly net income by the total assets at the beginning of that quarter. Next, I construct groups by the scaled earnings for widths of 0.01. I suspect that firm-quarters that have the scaled earnings between 0 and 0.01 are more likely to engage in earnings manipulations.

[Insert Figure 1]

Figure 1 shows the firm quarters in intervals based on net income scaled by total assets at the beginning of the quarters. The histogram of scaled earnings is constructed with widths of 0.02. The histogram in Figure 1 is similar to that which was documented by prior researchers. There is sharp upward shift in the frequency of firm quarters right after zero. Researchers argue that firm quarters that have earnings right after zero are more likely to involve earnings management to avoid reporting losses. My analysis concentrate on the firm quarters in the interval immediately right of zero as the suspect firm quarters that show zero or small profits because it is more likely that this group has more incentives to manage earnings by real earnings manipulations.

[Insert Figure 2]

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Figure 2 represents the distribution of quarterly earnings surprises in intervals based on the difference between actual earnings per share and the mean forecasts of earnings per share. The histogram of quarterly earnings surprises has been constructed with widths of 0.03. This figure shows relatively few small negative earnings surprises and relatively many zero and small positive surprises. This finding is consistent with the findings from previous literature. The sharp upward shift in the frequency of quarterly earnings surprises right after zero indicates that firms have a tendency to meet or beat analysts' forecasts. Researchers argue that firm quarters that have zero or very small earnings surprises are more likely to involve in earnings manipulations. This study concentrates on the firm quarters in the interval immediately right of zero (0 to 0.01) as the second suspect group. This group has more incentives to engage in earnings management, and there is more possibility that firms in this group can also choose income-increasing real activity manipulations to avoid negative earnings surprises.

5.4 Empirical model

5.4.1 Association between real earnings management and beating earnings benchmarks

By using the equations 1, 2, and 3, I measure the coefficient parameters to predict the normal level of R&D expenditure, SG&A expenses, and gain on assets sale. Next, the estimated parameters are used to measure normal level of activities for the test period, and the residuals from the models are considered as the abnormal levels of R&D expenditures, SG&A expenses, and abnormal gains on sales. To make consistencies among the proxies for real earnings management, both abnormal R&D expenditures and abnormal SG&A expenses are multiplied by -1, resulting in higher values for more income increasing manipulations (more reductions in discretionary expenses).

Next, to test the association between real earnings management and firms' intention to meet or beat earnings benchmarks, I estimate the following regression model:

$$REM_{i,t} = \alpha_0 + \alpha_1\, Meet\_Beat\,/Meet\_Zero_t + \delta_1\, MV_t + \delta_2\, Q_t + \delta_3\, Leverage_t + \delta_4\, ROA_t + \varepsilon_t \quad (4)$$

In this model, *REM* is one of the three measures of real earnings management. *Meat_ Beat/Meat_Zero* is a dummy variable for indicating one of the two suspect groups of firms. *Meat_Beat* equals 1 when firm quarters have zero or small positive earnings surprises, and *Meat_Zero* equals 1 when firm quarters show zero or small positive earnings, 0 otherwise. The model includes *MV* (natural log of market value of equity) and *Q* (Tobin's Q) to control firms' size effects and growth prospects, respectively. It also includes *Leverage* (long term debt scaled by lagged total assets) for controlling other incentives to increase income due to the debt obligations and *ROA* (income before extraordinary items divided by lagged total assets) for addressing the concern that earnings manipulation is related with performance. According to hypothesis 1, I expect a positive sign for the coefficient α_1.

5.4.2 Association between real earnings management and corporate governance

To test the association between real earnings management and corporate governance, I estimate the following equation (5) which is an extension of equation (4):

$$REM_{i,t} = \alpha_0 + \alpha_1\, Meet\_Beat\,/Meet\_Zero_t + \beta_1\, Board\_Size_t + \beta_2\, Ind\_Dir_t + \beta_3\, CEO\_Dual_t +$$
$$\beta_4\, Inst\_Own_t + \gamma_1\, Meet\_Beat/Zero * Board\_Size_t + \gamma_2\, Meet\_Beat/Zero * Ind\_Dir_t + \gamma_3 Meet\_Beat/Zero *$$
$$CEO\_Dual_t + \gamma_4 Meet\_beat\,/Zero * Inst\_Own_t + \delta_1\, MV_t + \delta_2\, Q_t + \delta_3\, Leverage_t + \delta_4\, ROA_t + \varepsilon_t \quad (5)$$

Equation (5) includes three corporate governance variables: *Board_Size* (natural logarithm of number of directors), *Ind_Dir* (percentage of independent director in the board), *CEO_Dual* (dummy variable

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equals to 1 if CEO are the chairman of the board are two different perosns, 0 otherwise), and *Inst_Own* (percentage of institutional investors). These governance variables are interacted with suspect firm quarters (*Meet_Beat/Meet_Zero*) to test the effects of firms' corporate governance mechanisms on real earnings management when firms attempt to achieve some earnings benchmarks opportunistically. Interest centers on the coefficients of the interaction terms of the model. According to hypothesis 2, 3 4, and 5, I predicted negative signs for the coefficients γ_1, γ_2, γ_3 and γ_4. The model also controls firms' specific effects on real earnings management by including other variables, such as *MV, Q, Leverage*, and *ROA*.

6.0 Results

6.1 Descriptive statistics

Table 2 compares the descriptive statistics of the variables between suspect groups and the rest of the firm quarters. It also shows the mean difference with level of significance between these two groups. In panel A, the suspect group consists of the firms that show zero or very small positive earnings. In panel B, the suspect group consists of the firms that just meet or beat analysts' forecasts. In each panel, variables are divided into three groups: firms' specific variables, governance related variables, and real earnings management measures. To limit the influence of outliers, continuous variables are truncated at 1% of each tail.

[Insert Table 2]

As shown in panel A, for firm-specific variables, suspect groups significantly differ from the rest of the sample in terms of firm size, Tobin's Q, net income, income before extraordinary items, R&D expenditure, and SG&A expenses. In terms of total assets, long-term debt, and gains on assets sale, there are no significant differences between suspect groups and non-suspect groups of firms.

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Discretionary expenses are lower for suspect groups of firms. In panel B, there is no significant difference between suspect groups and non-suspect groups of firms in terms of income items, but firm size, Tobin Q, R&D expenses, and SG&A expenses of suspect groups significantly differ from those in the non-suspect group. The non-suspect firms show more diversity in terms of firm-specific criteria since those variables have higher standard deviations than the suspect group. For governance related variables, except for percentage of institutional investors and CEO duality, other variables show no significant differences between suspect firms and non-suspect firms. The average board size is around 8 for the entire sample. Almost 80% of the directors are independent for the whole sample, and there is no significant difference between suspect firm quarters and the rest of the sample. However, suspect firms have a lower percentage of institutional investors than non-suspect ones, and for both panels, this difference is significant. Both of the suspect groups have more CEO duality than the rest of the samples. In both panels, suspect groups of firm quarters show more reduction in discretionary expenses (R&D and SG&A) than the rest of the sample, but in panel B, there is no significant difference for abnormal gains on sales between suspect and non-suspect groups.

6.2 Correlation matrix

Table 3 shows the correlation among governance variables, firm specific variables, and real earnings management measures. The lower triangle of the table reports the Pearson correlation, and the upper triangle shows the Spearman correlation. The correlation matrix reveals that R&D residual is negatively correlated with governance-related variables (independent directors, board size, institutional investors) and negatively correlated with firm specific variables (size, earnings).

[Insert Table 3]

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The indicator variables (*Meet_zero* and *Meet_beat*) for suspect firm quarters also show a significant positive association with all real earnings management measures (abnormal reduction in R&D and SG&A expenses and abnormal gains on assets sale). These univariate associations give initial support for the first hypothesis. Abnormal R&D expenditures and abnormal SG&A expenses have a significant negative association with most of the corporate governance-related variables and firm-specific variables. All corporate governance-related variables and firm-specific variables have a significant negative association with abnormal gains on assets sales as well. However, the magnitude of the association between real earnings management measures and corporate governance variables is low for abnormal R&D and abnormal SG&A expenses, but it is moderate to high for abnormal gains on assets sales. Net income and earnings before extraordinary items show a positive association with corporate governance variables. Abnormal R&D and SG&A expenses show a negative association with abnormal gains on sales, suggesting that managers engaged in R&D or SG&A expense manipulation may not choose gain on sale simultaneously to manipulate earnings.

6.3 Regression results

6.3.1 Association between real earnings management and beating earnings benchmarks

To test the association between real earnings management and firms' meeting or beating earnings benchmarks, I estimate equation (4). Table 4 reports the result of the equation (4).

[Insert Table 4]

Table 4 (a), which relates real earnings management with firm quarters that report zero or very small profits, supports the first hypothesis. All real earnings management measures are positively associated with the firms' attempts to avoid reporting loss. Abnormal R&D and abnormal SG&A expenses are positively associated with firm quarters that just meet or beat zero earnings benchmarks (coefficients

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are 0.0061 and 0.0024, respectively, and both p-values are < 0.05). The coefficient on *Meet_Zero*, when the dependent variable is abnormal gain on sales, is significantly positive (0.0189 and p-vapue < 0.10). The results from this table suggest that firms can engage in real earnings management by abnormally cutting R&D or SG&A expenses or by making abnormal gain on assets sales for achieving certain earnings benchmarks.

Table 4(b) reports the association between different earnings management measures and firm-quarters that just meet or beat analysts' forecasts. The coefficients on *Meet_Beat* are 0.0021 (p-value < 0.10) and 0.0054 (p-value < 0.05) when dependent variables are abnormal R&D and abnormal SG&A expenses, respectively, but the coefficient on *Meet_Beat* is not significant when the dependent variable is abnormal gain on sales, implying that firms may not engage in real earnings management by making abnormal gain on sales to meet or beat the analysts' forecast. I also estimate equation (4) by considering last quarters' information only. I find similar results, not tabulated here, regarding real earnings management and the firms' attempt to meet earnings benchmarks.

6.3.2 Association between real earnings management and corporate governance

6.3.2.1 Suspect firm-quarters – zero or small profits (*Meet_Zero*)

Table 5 (a) represents the regression result of equation (5). It shows the association between three different real earnings management measures with suspect firm quarters that report zero or small profits and corporate governance variables. Using all quarters' data, the first column of the table shows the results in which the dependent variable is abnormal R&D expenses.

[Insert Table 5]

The coefficient of the interaction term *Meet_Zero*Board_size* of -0.0023 is significant (p-value <10%), which supports H2. The firms engaging in real earnings management (by abnormally

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reducing R&D expenditure) are less likely to avoid reporting loss when they have larger boards. But the findings from Table 5 (a) do not support H3 (independent director) and H4 (CEO duality). Regarding H5, the coefficient of *Meet_Zero*Inst_Owner* shows a negative sign and also is significant (p-value < 5%). This finding implies that firms that attempt to avoid loss or to report small positive earnings have less abnormal reduction in R&D expenditure when they have larger institutional ownership. In second column, the real earnings management measure is abnormal SG&A expenditures. The coefficients of the interaction terms *Meet_Zero*CEO_Duality* and *Meet_Zero*Inst_Owner* are significant with a negative sign, supporting H4 and H5. This result implies that firms with different persons serving as CEO and chairman of the board and firms with larger institutional investors are less likely to engage in abnormal SG&A reduction when they attempt to report small or zero profit. The findings from column two do not support H2 (board size) and H3 (independent director). In the last column, the proxy for real earnings management is abnormal gain on assets sales. The findings from this column support only H5 because the sign for the coefficient *Meet_Zero*Inst_Owner* coefficient is significantly negative. It indicates that firms with larger institutional ownership are less likely to make abnormal gains on asset sales to avoid reporting losses. Column three of Table 5 (a) does not support H2, H3, and H4.

Table 5 (b) also reports the regression results of equation (5), but it uses only last quarter information. The findings support only H5 in all three columns, though the overall significance level of the coefficient *Meet_Zero*Inst_Owner* in Table 5 (b) is lower than the significance level reported in Table 5 (b). This result means that firms may engage in real earnings manipulations in earlier quarters but that in last quarter firms may choose other earnings management alternatives (such as accruals management) rather than real activity manipulation. In the last quarter analysis, the results do not support H2 (board size), H3 (independent directors), and H4 (CEO duality).

6.3.2.2 Suspect firm-quarter – *Meet_Beat* analysts' forecasts

Table 6 (a) represents the regression results of equation (5), in which the suspect firm quarters are those that have zero or small positive earnings surprises. In column one, the dependent variable is abnormal R&D expenses. The first column for all quarters' data supports H5. The coefficient of *Meet_Beat*Inst_Owner* is significantly negative. It indicates that firms with larger institutional investors have fewer real activity manipulations (less R&D reduction) to meet or beat analysts' forecasts. However, the coefficients of the other three interaction terms are not significant. In the second column, the measure of real earnings management is abnormal SG&A expenses, and in third column, the measure is abnormal gain on assets sales. In columns two and three, the coefficients of *Meet_Beat*Inst_Owner* are significant, and according to the prediction, the sign is also negative, supporting H5. The results imply that institutional investors play an important role in protecting real earnings management for the firms that attempt to meet or beat analysts' forecasts. The coefficients of the rest of the interest variables are not significant.

[Insert Table 6]

Table 6 (b) shows the regression results of equation (5), but it considers only last quarters' data. Only the first column, in which the dependent variable is abnormal R&D expenditures, supports for H5. No other hypothesis is supported in Table 6 (b). The findings of Table (6) are relatively weaker than the findings of Table (5), implying that the evidence of real activity manipulation and the role of governance (mainly institutional investors) to mitigate it are relatively stronger when the purpose of earnings management is to avoid loss or to report small profit and relatively weaker when the purpose of earnings management is to meet or beat analysts' forecasts. The reason is that, unlike accrual manipulations, real earnings management usually takes place either during the earlier part of the fiscal

year or before the end of the fiscal year. Managers do not know about the latest earnings forecasts that will be made by the analysts before actual earnings announcements. Therefore, they may prefer accrual manipulations to real earnings manipulations to beat or meet analyst's forecasts.

7.0 Concluding remarks

This study investigated how the corporate governance mechanism helps to constrain real earnings management. It fills the void in earnings management and corporate governance literature since the role of corporate governance to prevent real earnings management is not documented yet. In this study, I use three measures of real earnings management (abnormal R&D expenditure, abnormal SG&A expenses, and abnormal gain on sales) and two suspect groups of firms (firms that report zero or small profit and firms that just meet or beat analyst's forecasts). By using a large sample of U.S. public limited companies, I find that firms alter reported earnings by doing real activity manipulations in order to avoid loss or negative earnings surprises. I also find that real earnings manipulation is more prevalent in the case of achieving zero or small profit than in the case of avoiding negative surprises. In addition, I find that the presence of larger institutional investors can mitigate real earnings manipulation through their effective monitoring mechanisms. However, the board may not play significant role to prevent income-increasing real earnings management. Therefore, the overall findings of this study suggest that all dimensions of corporate governance may not play a similar role to identify and to mitigate real earnings management as they do for accrual-based earnings management. Board independence and expertise of board members may be able to investigate and to protect GAAP or accrual-based earnings management, but it may not be possible for the board to investigate real activity manipulations in time. On the other hand, institutional

investors are sophisticated investors who typically fulfill the monitoring role in reducing earnings management by proper monitoring and by gathering quality information in time.

This study is subject to several limitations, most of which suggest a need for more extensive research. The first limitation is the difficulty related to the identifications and measurements of real earnings management. Though the measures used in this study are the conventional measures used the literature, it is difficult to distinguish the incentives of managers' opportunistic behaviors and the purpose of firms' value maximization strategic decisions behind the abnormal levels of operational and investing activities. Thus, the findings from this analysis may be the results of some omitted variables or may be capturing factors other than intentional manipulations. The second limitation of this study is related to the measurement and data availability of governance mechanisms. More refined and informative measures of corporate governance might make the findings more reliable and valid. Third, the sample is biased towards large firms since the corporate governance-related data for mid-sized and small firms are not available in the Risk Metrics database. Fourth, classification of the firm-quarter observations into the suspect groups also has its drawbacks. There might be other factors rather than earnings management that influence firms' earnings levels that make them fall into the suspect categories. Additionally, firms can increase income through real earnings manipulations but may not fall into the narrow range immediately to the right of zero earnings or zero earnings surprises. Finally, the findings cannot be interpreted as a causal relation between governance and real earnings measures because of the endogeneity problem (Xie et al. 2003; Hermalin & Weissbach, 2000). The level of real earnings management may influence the proportion of institutional investors or the subsequent selection of the board.

Though this study has several limitations, the findings of this study have important implications to the regulators and policymakers regarding improvement of monitoring mechanisms in limiting real earnings management. To improve the reliability of financial statements, a regulatory body always emphasizes board composition and board effectiveness, a focus which may limit accrual-based earnings manipulations, but an effective board may not be able to prevent value-destroying real earnings manipulations. Therefore, regulators should think of other means of governance to mitigate real earnings manipulations.

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Appendix A: Variable Definition

Variable	Definition	COMPUSTAT code
Panel A: COMPUSTAT Variable		
R&D	R&D expenses	XRD
A	Total assets	AT
MV / Firm size	Natural logarithm of market value of equity	log(PRCC_F*CSHO)
Q	Tobin's Q	{(PRCC_F*CSHO) + PSTK + DLTT + DLC} / AT
INT	Internal fund	IB + XRD + DP
SGA	SG&A expenses	XSGA
S	Total sales	SALE
GainA	Gain / income from asset sale	SPPIV *(-1)[3]
Asales	Long lived asset sales	SPPE
Isales	Long lived investment sales	SIV
DD	Indicator variable is 1 when total assets decreases from previous year, 0 otherwise	
IB	Income before extraordinary items	IB
DLTT	Long term debt	DLTT
Leverage	long term debt scaled by beginning total assets	DLTT / Beginning AT

Panel B: Real earnings management and governance variable		
REM	Abnormal R&D / Abnormal SG&A / Abnormal Gain	
Meat_Beat	Dummy variable equal to 1 if firm-quarter shows zero or small earnings surprises, 0 otherwise	
Meat_Zero	Dummy variable equal to 1 if firm-quarter shows zero or small positive profit, 0 otherwise	
Board_Size	Natural logarithm of number of directors in the board	
Ind_Dir	Percentage of independent director in the board	
CEO_Dual	Dummy variable equal to 1 if CEO is also the chairman, 0 otherwise	
Inst_Own	Natural logarithm of number of institutional investors / percentage of institutional investors	

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[3] This item is coded negative for gains and positive for losses by COMPUSTAT.

Figure 1

Frequency distribution of firm quarters by earnings intervals
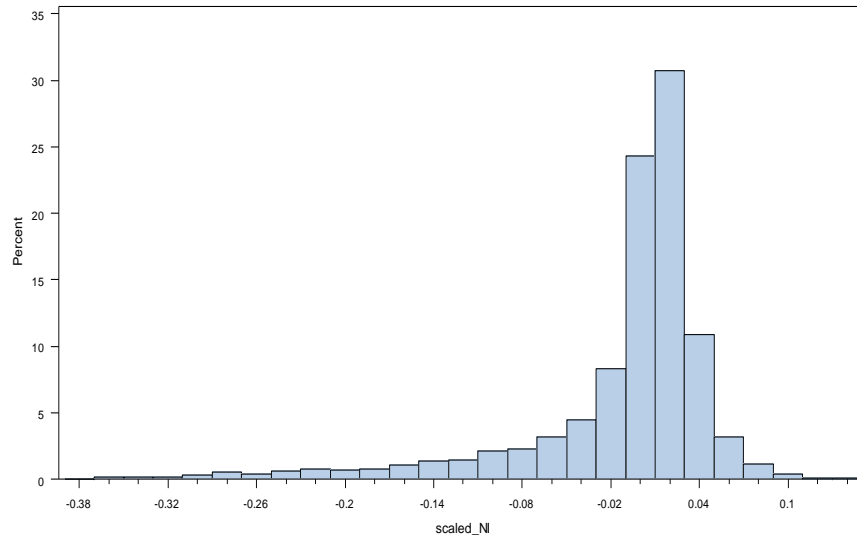
Figure 1 shows the firm quarters in intervals based on earnings intervals for 34,021 fiscal quarters in 2008- 2010. The histogram of scaled earnings is constructed with widths of 0.02. *Earnings* can be defined as the net income scaled by the total assets at the beginning of the quarters. The figure is truncated at the two ends.

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Figure 2

Frequency distribution of firm quarters by earnings surprises
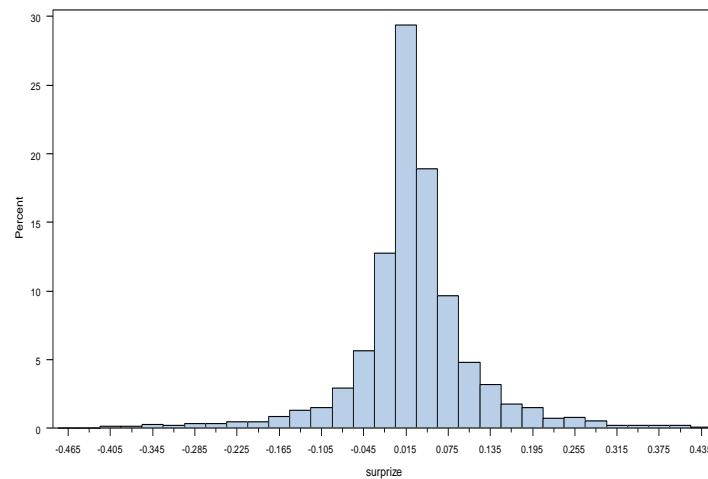
Figure 2 represents the distribution of quarterly earnings surprises in intervals for 34,021 fiscal quarters in 2008-2010. The histogram of quarterly earnings surprises has been constructed with widths of 0.03. Earnings surprise is defined as the difference between actual earnings per share and the mean forecasts of earnings per share. The figure is truncated at both ends.

Table 1

Sample selection procedures

Number of firm quarters collected from *COMPUSTAT* for fiscal quarters 2008 -2010	121,841
Less,	
Financial (SIC 6000-7000) and regulated industry (4400-5000)	(57,683)
Firms quarters without analyst forecasts in *I/B/E/S*	(30,137)
Missing governance related data in *Risk Matrix*	(20,472)
Missing ownership related data in *Thomson Financial 13 f*	(5,697)
Final sample (in firm quarters)	**7,852**

Table 2, Panel A: **Descriptive statistics** (Suspect firm-quarters: zero or small positive earnings)

(i) **Firm specific variables**

	Suspect firm-quarters			Rest of the sample			Mean difference
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	(t -stat)
Firm size	6.46	6.43	1.77	6.23	6.06	2.01	0.23
							(2.47)**
Tobin's Q	2.21	1.03	1.27	1.89	1.46	1.37	0.32
							(14.53)***
Total assets	4147.98	619.05	10923.76	3173.67	304.56	9435.02	974.31
							(1.24)
Net income	42.34	3.25	74.28	45.97	1.84	282.92	-3.63
							(-2.41)**
Income before extraordinary items	39.49	3.29	172.09	43.77	1.86	263.07	-4.28
							(-3.23)***
Long term debt	980.07	31.08	270.06	564.79	30.06	187.59	415.28
							(0.22)
R&D expenses	41.45	7.04	171.54	43.9	6.84	181.02	-2.45
							(-2.95)***
SG&A expenses	152.65	34.95	370.04	165.86	27.16	464.87	-13.21
							(-1.89)*
Gain on sale	2.75	0	17.74	1.89	0	34.73	0.86
							(0.91)
R&D expenses / Assets	0.016	0.011	0.017	0.014	0.024	0.057	0.002
							(-12.76)***
SG&A expenses Assets	0.033	0.058	0.046	0.091	0.076	0.095	-0.058
							(-9.65)***
Gain on sale / Assets	0.001	0	0.007	0.003	0	0.025	-0.002
							(0.49)

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(ii) <u>**Governance variables**</u>

	Suspect firm-quarters			Rest of the sample			Mean difference
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	(t -stat)
Board size	8.84	9	2.08	8.83	8	3.01	0.01
							(2.20)**
Number of independent directors	7.05	7	2.34	6.98	7	2.16	0.07
							(1.57)
Percentage of independent directors	0.782	0.832	0.11	0.728	0.825	0.16	0.054
							(0.43)
Percentage of institutional owners	0.711	0.777	0.25	0.789	0.765	0.27	-0.078
							(-2.94)***
CEO duality	0.21	1	0.58	0.25	1	0.32	-0.04
							(-2.19)**

(iii) <u>**REM Variables**</u>

	Suspect firm-quarters			Rest of the sample			Mean difference
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	(t -stat)
Abnormal R&D expenditure	-0.0031	-0.0026	0.0108	-0.0043	-0.0021	0.0159	0.0012
							(3.26)***
Abnormal SG&A expenses	0.0079	-0.0119	0.0643	0.0047	-0.0026	0.0529	0.0126
							(6.52)***
Abnormal Gain on assets sales	0.0056	0.0032	0.0014	-0.0143	0	0.0059	0.0199
							(1.67)*
Number of firm-quarters		1,370			6,127		

Table 2, Panel B: **Descriptive statistics** (Suspect firm-quarters - meet or beat analyst forecasts)

(i) <u>**Firm specific variables**</u>

	Suspect firm-quarters			Rest of the sample			Mean difference
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	(t -stat)
Firm size	6.55	6.37	1.96	6.51	6.4	1.84	0.04
							(1.71)*
Tobin's Q	1.89	1.44	1.34	1.67	1.31	1.19	0.22
							(5.06)***
Total assets	3753.64	373.69	9607.08	3552.07	479.25	9720.07	201.57
							(0.34)
Net income	52.58	3.6	292.71	62.29	3.54	271.26	-9.71
							(-1.08)
Income before extraordinary items	51.39	3.65	292.03	60.71	3.56	245.05	-9.32
							(-1.38)
Long term debt	656.49	8.45	183.9	707.29	10.68	218.3	-50.8
							(0.80)
R&D expenses	46.01	7.68	268.04	51.89	8.67	191.62	-5.88
							(-1.93)*
SG&A expenses	146.13	30.37	485.91	156.46	34.79	425.43	-10.33
							(-2.89)**
Gain on sale	3.43	0	41.28	2.45	0	36.45	0.98
							(0.72)
R&D expenses / Assets	0.031	0.012	0.042	0.047	0.017	0.045	-0.016
							(-6.42)**
SG&A expenses Assets	0.002	0.057	0.059	0.08	0.068	0.086	-0.078
							(-1.75)*
Gain on sale / Assets	0.002	0	0.012	0.001	0	0.013	0.001*
							(1.71)

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(ii) Governance variables

	Suspect firm-quarters			Rest of the sample			Mean difference
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	(t -stat)
Board size	8.62	8	2.16	8.69	8	2.06	-0.07
							(-0.52)
Number of independent directors	5.87	7	2.13	6.94	7	2.92	-1.07
							(-0.58)
Percentage of independent directors	0.792	0.822	0.11	0.793	0.812	0.13	-0.001
							(-0.19)
Percentage of institutional owners	0.681	0.758	0.28	0.791	0.746	0.26	-0.11
							(-1.18)*
CEO duality	0.23	1	0.48	0.32	1	0.42	-0.09
							(-3.65)***

(ii)   REM Variables

	Suspect firm-quarters			Rest of the sample			Mean difference
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	(t -stat)
Abnormal R&D expenditure	0.0028	-0.0013	0.014	-0.0015	-0.0022	0.015	0.0043
							(2.08)**
Abnormal SG&A expenses	0.0059	-0.0071	0.055	0.0061	-0.0051	0.053	0.0002
							(2.45)**
Abnormal Gain on assets sales	0	0.0003	0.019	-0.0157	-0.0043	0.069	0.0157
							(1.13)
Number of firm-quarters	1,133			4,679			

Notes: Financial statements data are collected from Compustat for fiscal quarters 2008 to 2010. Detailed list of variable definitions are given in Appendix A. Governance related variables are collected from Risk Metrics. Institutional ownership related data are collected from Thomson Financial database on 13f filings. REM variables are the residuals that are estimated by using equation 1, 2 and 3. *, **, *** represents two-tailed significance at 10%, 5% and 1% levels.

Table 3 Correlation matrix

	Abnorm_RD	Abnorm_SGA	Abnorm_Gain	meet_zero	meet_beat	Ind_direct	board_size	CEO_dualty	no_inst_invest	AT	NI	DLTT	IB	MV	Q
Abnorm_RD		0.41***	-0.47**	0.04***	0.01***	-0.18***	-0.17***	0.02	-0.10***	-0.14***	-0.12***	-0.20***	-0.12***	-0.10***	0.07***
Abnorm_SGA	0.25**		-0.12*	0.09***	0.04**	-0.08***	-0.10***	-0.01	-0.04***	-0.16***	-0.06***	-0.15***	-0.06***	-0.04***	0.26***
Abnorm_Gain	-0.14***	-0.32*		0.16**	0.18*	-0.71***	-0.55*	-0.13*	-0.68***	-0.45*	-0.54***	-0.35*	-0.54**	-0.44*	0.02
meet_zero	0.04***	0.09**	0.34**		0.03*	0.04	0.06	0.04*	0.01	0.07*	0.05	0.07**	0.05	0.00	-0.21***
meet_beat	0.03***	0.03*	0.27*	0.03*		-0.02***	-0.02***	0.07	0.02	-0.03**	0.02	-0.07*	0.02	0.00	0.06**
Ind_direct	-0.16***	-0.03***	-0.60*	0.03	-0.01*		0.89***	0.11**	0.58***	0.65***	0.41**	0.54***	0.41***	0.55***	-0.15***
board_size	-0.15***	-0.03***	-0.38**	0.04	-0.02*	0.89***		0.08***	0.58***	0.68**	0.42**	0.57***	0.42***	0.57***	-0.16***
CEO_dualty	0.03	-0.02*	-0.24*	-0.04*	0.07	0.12**	0.07*		0.10	0.09*	0.20***	0.09***	0.19*	0.13*	0.08**
no_inst_invest	-0.06**	-0.07***	-0.77*	-0.01	0.00	0.60***	0.58**	0.11*		0.90**	0.63*	0.54***	0.64***	0.94***	0.17***
AT	-0.07***	-0.06***	-0.43*	0.02	0.02	0.51*	0.47*	0.09*	0.54**		0.61**	0.67***	0.62*	0.91*	-0.09***
NI	-0.04**	0.01**	-0.58***	-0.05*	0.01	0.34***	0.30**	0.13*	0.36**	0.58**		0.38**	0.99***	0.67***	0.20***
DLTT	-0.08*	-0.06**	-0.27*	0.06**	-0.01*	0.47**	0.43**	0.09**	0.42***	0.85***	0.36**		0.38*	0.53***	-0.18***
IB	-0.04***	0.01***	-0.50**	-0.05***	0.01	0.34***	0.30*	0.13***	0.36***	0.58***	.93**	0.36**		0.68***	0.20***
MV	-0.05***	-0.07**	-0.43*	-0.01*	0.01	0.57***	0.58***	0.13*	0.91***	0.61**	0.42***	0.47***	0.42***		0.27***
Q	0.08**	0.20**	-0.18*	-0.19**	0.07*	-0.16**	-0.16***	0.06**	0.08**	-0.09***	0.08***	-0.11***	0.08*	0.18**	

Note: The lower triangle of the table shows Pearson correlation and upper triangle reports Spearman correlation among the variables. *,** and *** indicate significance levels at 10%, 5% and 10% respectively. Please see Appendix A for variable definitions.

Table 4 (a) Cross-sectional regressions relating real earnings management and firm-quarters with zero or small profit

The model: $REM_{i,t} = \alpha_0 + \alpha_1\ Meet\_Zero_t + \delta_1\ MV_t + \delta_2\ Q_t + \delta_3\ Leverage_t + \delta_4\ ROA_t + \varepsilon_t$

Dependent variable	Abnormal R&D	Abnormal SG&A	Abnormal gain on Sales
Intercept	0.0017	0.0031	0.0002
	(1.18)	(1.04)	(0.73)
Meet_Zero	0.0061	0.0024	0.0189
	(2.34)**	(2.01)**	(1.69)*
MV	0.0001	-0.0028	0.0021
	(1.26)	(-1.84)*	(0.43)
Q	-0.0025	0.0037	0.0058
	(-1.76)*	(0.27)	(1.71)*
Leverage	-0.0041	0.0064	-0.0036
	(-1.78)*	(0.05)	(-1.04)
ROA	-0.0059	0.0041	0.0001
	(-3.49)***	(1.72)*	(0.64)
N	14,273	18,336	9,754
Adjusted R^2	1.54%	1.85%	0.91%

Table 4 (b) Cross-sectional regressions relating real earnings management and firm-quarters with zero or small earnings surprises

The model: $REM_{i,t} = \alpha_0 + \alpha_1\ Meet\_Beat_t + \delta_1\ MV_t + \delta_2\ Q_t + \delta_3\ Leverage_t + \delta_4\ ROA_t + \varepsilon_t$

Dependent variable	Abnormal R&D	Abnormal SG&A	Abnormal gain on Sales
Intercept	0.0013	0.0003	0.0025
	(1.18)	(0.29)	(0.06)
Meet_Beat	0.0021	0.0054	-0.0119
	(1.73)*	(2.13)**	(-1.09)
MV	-0.0024	0.0473	0.0071
	(1.29)	(0.49)	(1.01)
Q	0.0034	0.0187	0.0027
	(1.67)*	(1.79)*	(0.14)
Leverage	-0.0032	0.0691	-0.0041
	(-1.18)	(1.40)	(-1.69)*
ROA	0.0002	0.0047	0.0028
	(0.09)	(1.03)	(1.59)
N	11,273	12,756	8,451
Adjusted R^2	1.03%	0.95%	0.81%

This table reports the results of cross-sectional regression for the fiscal quarters in 2008-2010. *, **, and *** indicate 10%, 5%, and 1% levels of significance for two-tailed tests. T-statistics are reported in the parentheses. See Appendix A for variable definitions.

Table 5 (a) Cross-sectional regressions relating real earnings management to firm-quarters that reports zero or small profits (*Meet_zero*) and governance variables [all quarters' data]

The model:

$$REM_{i,t} = \alpha_0 + \alpha_1\, Meet\_Zero_t + \beta_1\, Board\_Size_t + \beta_2\, Ind\_Dir_t + \beta_3\, CEO\_Dual_t + \beta_4\, Inst\_Own_t + \gamma_1\, Meet\_Beat/Zero$$
$$* Board\_Size_t + \gamma_2\, Meet\_Beat/Zero * Ind\_Dir_t + \gamma_3 Meet\_Beat/Zero * CEO\_Dual_t$$
$$+ \gamma_4 Meet\_beat /Zero * Inst\_Own_t + \delta_1\, MV_t + \delta_2\, Q_t + \delta_3\, Leverage_t + +\delta_4\, ROA_t + \varepsilon_t$$

Dependent variable	Abnormal R&D expenses	Abnormal SG&A expenses	*Abnormal gain on asset sales*
Intercept	0.0087	0.0174	0.0521
	(1.98)**	(0.93)	(0.64)
Meet_Zero	-0.0126	-0.0465	0.0812
	(-2.37)**	(-1.87)*	(1.06)
Board Size	-0.0049	-0.0582	0.0314
	(-2.48)**	(-2.08)*	(1.18)
Indep_Director	-0.005	-0.0345	-0.9817
	(-1.68)*	(-2.28)**	(-1.72)*
CEO Dualty	-0.0025	-0.0124	-0.0193
	(-3.32)***	(-2.32)**	(-0.52)
Inst_Owner	-0.0027	-0.0861	-0.3441
	(-1.87)*	(-2.40)**	(-2.02)*
Meet_Zero*Board_Size	-0.0023	-0.0014	0.3038
	(-1.91)*	(-0.35)	(1.25)
Meet_Zero*Indep_Director	-0.0044	-0.0518	-0.0447
	(-0.54)	(-0.12)	(-0.74)
Meet_Zero*CEO_Dualty	0.0023	-0.0134	0.0159
	(0.71)	(-1.84)*	(0.25)
Meet_Zero*Inst_Owner	-0.0119	-0.0571	-0.0448
	(-2.01)**	(-2.31)**	(-1.67)*
MV	0.0001	0.0211	-0.0176
	(0.24)	(0.72)	(-1.91)*
Q	0.0015	0.0013	0.1582
	(1.66)*	(0.65)	(0.63)
Leverage	-0.0041	-0.0541	0.0238
	(-1.78)*	(-1.88)*	(0.56)
ROA	0.0045	0.0026	0.0034
	(0.04)	(0.07)	(1.05)
N	6,173	7,852	3,712
Adjusted R^2	4.48%	3.38%	3.46%

This table reports the results of cross-sectional regression for the fiscal quarters in 2008-2010. *, **, and *** indicate 10%, 5%, and 1% levels of significance for two-tailed tests. T-statistics are reported in the parentheses. See Appendix A for variable definitions.

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Table 5 (b) Cross-sectional regressions relating real earnings management to firm-quarters that reports zero or small profits (*Meet_zero*) and governance variables [only last quarters' data]

The model:

$$REM_{i,t} = \alpha_0 + \alpha_1\ Meet\_Zero_t + \beta_1\ Board\_Size_t + \beta_2\ Ind\_Dir_t + \beta_3\ CEO\_Dual_t + \beta_4\ Inst\_Own_t$$
$$+ \gamma_1\ Meet\_Beat/Zero * Board\_Size_t + \gamma_2\ Meet\_Beat/Zero * Ind\_Dir_t + \gamma_3 Meet\_Beat/Zero$$
$$* CEO\_Dual_t + \gamma_4 Meet\_beat\ /Zero * Inst\_Own_t + \delta_1\ MV_t + \delta_2\ Q_t + \delta_3\ Leverage_t$$
$$+ + \delta_4\ ROA_t + \varepsilon_t$$

Dependent variable	Abnormal R&D expenses	Abnormal SG&A expenses	*Abnormal gain on asset sales*
Intercept	0.0053	-0.0318	0.0321
	(0.89)	(-2.09)**	(1.29)
Meet_Zero	-0.0189	-0.0132	0.1147
	(-1.69)*	(-1.76)*	(1.43)
Board Size	-0.0099	-0.0165	-0.0437
	(-3.82)***	(-2.45)**	(-0.37)
Indep_Director	-0.0039	-0.0041	-0.7542
	(-1.95)*	(-1.34)	(-1.92)*
CEO Dualty	-0.0014	-0.0013	0.0828
	(-1.68)*	(-0.43)	(1.25)
Inst_Owner	-0.0008	-0.0221	-0.2169
	(-1.69)*	(-1.75)*	(-1.49)
Meet_Zero*Board_Size	0.0413	0.0019	0.1842
	(0.51)	(0.17)	(1.17)
Meet_Zero*Indep_Director	-0.0152	-0.0195	0.7305
	(-0.74)	(-0.67)	(0.61)
Meet_Zero*CEO_Dualty	0.0014	-0.0042	0.0082
	(0.46)	(-0.54)	(0.09)
Meet_Zero*Inst_Owner	-0.0182	-0.0251	-0.0271
	(-1.67)*	(-2.26)**	(-1.81)*
MV	0.0021	0.0011	-0.0504
	(5.43)***	(1.13)	(-0.72)
Q	0.0018	0.0021	0.4479
	(1.71)*	(1.70)*	(1.08)
Leverage	-0.0041	-0.0182	-0.0493
	(-1.29)	(-2.33)**	(-0.24)
ROA	0.0019	0.0073	-0.0091
	1.13	(1.39)	(-0.06)
N	1,238	1,579	873
Adjusted R^2	3.01%	3.18%	2.43%

This table reports the results of cross-sectional regression for the fiscal quarters in 2008-2010. *, **, and *** indicate 10%, 5%, and 1% levels of significance for two-tailed tests. T-statistics are reported in the parentheses. See Appendix A for variable definitions.

Table 6 (a) Cross-sectional regressions relating real earnings management to firm-quarters that reports zero or small earnings surprises (*Meet_beat*) and governance variables [all quarters' data]

The model:

$$REM_{i,t} = \alpha_0 + \alpha_1 \, Meet\_Beat_t + \beta_1 \, Board\_Size_t + \beta_2 \, Ind\_Dir_{\,t} + \beta_3 \, CEO\_Dual_t + \beta_4 \, Inst\_Own_t$$
$$+ \gamma_1 \, Meet\_Beat/Zero * Board\_Size_t \; + \gamma_2 \, Meet\_Beat/Zero * Ind\_Dir_{\,t} + \gamma_3 Meet\_Beat/Zero$$
$$* CEO\_Dual_t \; + \gamma_4 Meet\_beat \, /Zero * Inst\_Own_t \; + \delta_1 \, MV_t \; + \delta_2 \, Q_t \; + \delta_3 \, Leverage_t$$
$$+ \; + \delta_4 \, ROA_t \; + \varepsilon_t$$

Dependent variable	Abnormal R&D expenses	Abnormal SG&A expenses	*Abnormal gain on asset sales*
Intercept	0.0081	0.0041	0.0341
	(1.85)*	(0.23)	(0.07)
Meet_Zero	-0.0144	-0.0301	0.0761
	(-1.83)*	(-1.74)*	(1.67)*
Board Size	-0.0056	-0.0092	0.0015
	(-2.81)***	(-1.85)*	(0.86)
Indep_Director	-0.0048	-0.0032	-0.0258
	(-1.60)*	(-1.71)*	(-1.74)*
CEO Dualty	-0.00196	-0.0021	-0.1951
	(-2.59)***	(-0.67)	(-0.24)
Inst_Owner	-1.08	-0.0145	-0.0182
	(-2.01)**	(-1.81)*	(-1.87)*
Meet_Beat*Board_Size	-0.0001	0.0163	0.2941
	(-0.25)	(1.22)	(0.96)
Meet_Beat*Indep_Director	-0.0024	-0.0226	-0.0039
	(-0.31)	(-0.73)	(-1.24)
Meet_Beat *CEO_Dualty	-0.0003	0.0001	0.1193
	(-0.18)	(0.13)	(0.35)
Meet_Beat *Inst_Owner	-0.0109	-0.0036	-0.0106
	(-2.23)**	(-1.68)*	(-1.98)*
MV	0.0012	0.00171	0.2479
	(0.64)	(1.39)	(0.19)
Q	0.0062	0.0079	0.0325
	(1.77)*	(5.95)***	(2.43)**
Leverage	-0.0041	-0.0011	-0.0241
	(-1.84)*	(-0.11)	(-1.19)
ROA	0.0092	-0.009	0.0038
	(1.04)	(-0.04)	(0.07)
N	7,497	7,852	3,521
Adjusted R^2	3.46%	3.38%	2.48%

This table reports the results of cross-sectional regression for the fiscal quarters in 2008-2010. *, **, and *** indicate 10%, 5%, and 1% levels of significance for two-tailed tests. T-statistics are reported in the parentheses. See Appendix A for variable definitions.

Table 6 (b) Cross-sectional regressions relating real earnings management to firm-quarters that reports zero or small earnings surprises (*Meet_beat*) and governance variables [only last quarters' data]

The model:

$REM_{i,t} = \alpha_0 + \alpha_1\,Meet\_Beat_t + \beta_1\,Board\_Size_t + \beta_2\,Ind\_Dir_t + \beta_3\,CEO\_Dual_t + \beta_4\,Inst\_Own_t$
$\qquad\quad + \gamma_1\,Meet\_Beat/Zero * Board\_Size_t + \gamma_2\,Meet\_Beat/Zero * Ind\_Dir_t + \gamma_3 Meet\_Beat/Zero$
$\qquad\quad * CEO\_Dual_t + \gamma_4 Meet\_beat\,/Zero * Inst\_Own_t + \delta_1\,MV_t + \delta_2\,Q_t + \delta_3\,Leverage_t$
$\qquad\quad + +\delta_4\,ROA_t + \varepsilon_t$

Dependent variable	Abnormal R&D expenses	Abnormal SG&A expenses	*Abnormal gain on asset sales*
Intercept	0.004	0.0052	0.7622
	(0.52)	(0.67)	(1.11)
Meet_Zero	-0.0175	-0.0176	0.0739
	(-0.83)	(-0.84)	(0.49)
Board Size	-0.0087	-0.0083	-0.0562
	(-1.87)*	(-2.26)**	(-1.79)*
Indep_Director	-0.0042	-0.0038	-0.0267
	(-0.60)	(-1.04)	(-1.31)
CEO Dualty	-0.0023	-0.0026	-0.0452
	(-1.93)*	(-1.97)*	(-1.02)
Inst_Owner	0.0034	-0.0034	0.0627
	(0.73)	(-1.97)*	(0.84)
Meet_Beat *Board_Size	0.0002	-0.0012	-0.0293
	(0.09)	(-0.13)	(-1.06)
Meet_Beat*Indep_Director	-0.0008	-0.0031	0.1094
	(-0.06)	(-0.09)	(0.75)
Meet_Beat *CEO_Dualty	-0.0002	-0.0004	0.0372
	(-0.08)	(-0.08)	(1.49)
Meet_Beat *Inst_Owner	-0.0171	0.0183	-0.0021
	(-1.75)*	(1.15)	(-0.68)
MV	0.0018	-0.0015	-0.0492
	(3.06)**	(-2.72)**	(-1.22)
Q	0.0011	0.0011	0.0056
	(1.88)*	(1.91)*	(0.16)
Leverage	-0.0026	-0.0017	-0.0932
	(-0.67)	(-0.40)	(-1.51)
ROA	0.0006	0.0021	0.0019
	(1.61)	(1.09)	(1.37)
N	1,514	1,638	763
Adjusted R^2	3.25%	2.78%	1.97%

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This table reports the results of cross-sectional regression for the fiscal quarters in 2008-2010. *, **, and *** indicate 10%, 5%, and 1% levels of significance for two-tailed tests. T-statistics are reported in the parentheses. See Appendix A for variable definitions.