Corporate Governance and the Value of Cash Holdings: Evidence from Enterprise Risk Management and Internal Control Weakness

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Abstract

This study investigates how the effectiveness of enterprise risk management (ERM) and the existence of internal control weakness (ICW) impact on the value of cash holdings. Moreover, the use of cash holdings on future operating performance is studied when the factors of the effectiveness of ERM and internal control weakness are taken into account. It is noted that the value of cash holdings for the firms with an ICW is lowered by around $0.5 dollars Compared with these without an ICW. Furthermore, the value of cash holdings in firms with an effective ERM is increased by about 14%. Finally, the analysis also reveals that the effectiveness of ERM along with/without an ICW will tend to increase/decrease the efficient use of excess cash holdings. And hence, the associated companies will result in good/poor, future operating performance.

Keywords: Enterprise Risk Management; Internal Control Weakness,; Value of Cash Holdings; Operating Performance; Corporate Governance

I. Introduction

This paper investigates the effectiveness of enterprise risk management (hereafter ERM) and the existence of internal control weakness (hereafter ICW) in terms of the value of cash holdings. In addition, the use of excess cash for future operating performance is studied in order to consider the effectiveness of ERM and the existence of ICW. Similar research, including the most recent study of Gao and Jia (2013), investigates the effect of an ICW on the value of cash holdings and the use of excess cash onto the future operating performance. Their findings indicate that the value of cash holdings for firms with an ICW is 40%-65% lower compared with their counterparts (without an ICW). Moreover, firms with an ICW may exhibit lower operating performance. This study follows this stream of the effect of corporate governance onto the value of cash holdings (Dittmar and Mahrt-Smith, 2007). However, in contrast to the research conducted by Dittmar and Mahrt-Smith (2007) and Gao and Jia (2013), this study expands this subject area by including the effectiveness of ERM systems and an ICW.

ERM systems and internal control processes were proposed in the mid-1990s as potential control mechanisms and became widely accepted after the Sarbanes–Oxley Act was passed[1].

[1] The requirement of Sarbanes-Oxley Act 404 required U.S. publicly traded companies to use a control

However, since these two control mechanisms were developed by different managers with a rather distinct objective in mind, the question of whether they can benefit the shareholders remains to be unaddressed and moreover, their ability to increase the reliability of financial reporting is rarely reported in prior accounting and financial research[2]. Prior research by Dittmar and Mahrt-Smith (2007) investigates how corporate governance impacts onto the value of cash holdings and how it can be used to examine the use of excess cash reserves in well- or poorly- governed firms. Their study shows that well-governed firms can approximately double the value of the cash holdings compared with a poorly-governed firm. Moreover, poorly-governed firms lose cash quickly, which may result in a poor, future operating performance. Following this finding, and based on the empirical model proposed by Dittmar and Mahrt-Smith (2007), this study conducts two inter-temporal tests with the first one to evaluate whether, in one hand, effective ERM systems can increase the value of cash holdings to shareholders, and whether, in the other hand, firms with an ICW may have cash holdings with a less value to shareholders. The 2nd test will be performed to assess whether, on one hand, firms with an effective ERM system can hold onto cash for a longer period and by doing so to increase their future operating performance, and, on the other hand, firms with an ICW may lose cash quickly and consequently decrease their future operating performance.

Similar to the study of Dittmar and Mahrt-Smith (2007), two different empirical models are developed to explore the impact of an effective ERM system or ICW onto the value of cash holdings. The first model is based on the study of Faulkender and Wang (2006); and the second is according to the study of Fama and French (1998). According to Dittmar and Mahrt-Smith (2007) the first model is a straight-forward one developed to detect the relationship between a change in cash holdings and a corresponding adjustment in the firm value and unfortunately this model cannot be used to explain the value of excess cash reserves. The second model is employed to examine the impact of corporate governance on the value of excess cash reserves. In this study, Dittmar and Mahrt-Smith's model (2007) is followed. Our observations were collected from Compustat, CRSP and Audit Analytics databases between 2004 and 2011.[3] In specific, a sample of 6,169 for Faulkender and Wang's model (2006) and 4,712 for Fama and French's model (1998) were collected accordingly. As

framework in their internal control assessment. PCAOB issue the new guide on top-down risk assessment and specific requirement auditor to perform a fraud risk assessment(PCAOB Auditing Standard No 5). Similar, the corporate governance rules of NYSE (New York Stock Exchange) requires the Audit Committees of its listed companies to discuss policies with respect to risk assessment and risk management (NYSE Listing Standards Part 7d).

[2] Prior research like Gordon, Loeb and Tseng (2010)、McShane, Nair and Rustambekov (2011) focus on the relationship between ERM systems and firm performance. On the other hand, Beasley, Clune and Hermanson (2005) focus on factors that associated with the stage of ERM implementation. O'Donnell (2005) focus on how systems-thinking provide a framework to identify events when should be considered during risk assessment.

[3] The model based on Fama and French's study (1998) requires financial data from 2002 to 2012.

expected, the results of the test based on Faulkender and Wang's model (2006) indicate that firms with an ICW significantly decrease the value of their cash holdings; and in fact, the marginal value is decreased by around 0.5 dollars compared with these without an ICW. However, it is surprising to note that the effect of ERM onto an increase in the value of cash holdings cannot be observed. It is authors' speculation that this result is due to the fact that the investor cannot directly justify the effectiveness of ERM. This result remains to be robust even after we control it with the introduction of financial constraints (e.g. bond rating and payout policies) or financial crises later. On the other hand, the results of the test based on Fama and French's model (1998) show that those firms with an effective ERM tend to increase the value of excess cash holdings. Moreover, these results indicate that firms with an effective ERM may use excess cash more efficiently and consequently, exhibit a better, future operating performance. These results remain consistent after implementing an additional evaluation of excess cash.

Several contributions are provided by this study. First, this study contributes to this subject area by analyzing and investigating the relationship existed between corporate governance and the value of cash holdings. Similar to other corporate governance mechanisms available, ERM systems and internal controls are critical factors to be considered within an organization and in fact, the effectiveness of ERM and internal controls can increase the firm value. However, whether these mechanisms make cash reserves accessible to managers is rarely investigated in the prior research. To bridge the gap, we use two different empirical models to find out whether the effectiveness of ERM systems and internal controls can increase the value of cash holdings.

We also contribute to the current literature by, first, identifying the stream of determinants onto the level of corporate cash reserves (Opler, Pinkowitz, Stulz and Williamson, 1999; Kim, Mauer and Sherman, 1998; Dittmar and Mahrt-Smith, 2007) and, secondly, investigating the impact of the effectiveness of ERM systems and the existence of ICW on the value and use of excess cash holdings. Our empirical results indicate that the firms with effective ERM systems can use excess cash holdings more efficiently, which may result in a better, operating performance, and on the contrary, that firms with an ICW may lose excess cash quickly and in turn, have a poorer, future operating performance.

Finally, we contribute to the literature on ERM systems by investigating the impact of an effective ERM onto the value of cash holdings. An ERM index is built based on the achievement of strategy objectives, operating objectives, reporting objectives and compliance objectives, which are all reported in COSO (2004) and it indicates that the effective ERM systems can increase shareholder's wealth as well as the efficiency with which excess cash is

used. This result supports the proposition made by COSO (2004) that the implementation of ERM can help management to achieve the entity's performance and profitability targets as well as prevent the loss of resources.

The rest of this paper is organized as follows. Section II presents the literature review after the introduction section. Section III mainly explains the empirical methodology, including the research design, research periods, sampling criteria and variable definitions; and proposes the empirical models. Section IV summarizes the findings and the conclusion with implications is provided in Section V.

II. Literature Review

The role of enterprise risk management

Corporate governance has been seen not only as a control mechanism between principals and agents but also as a mechanism to improve the firm performance (Gompers et al. 2003). After numerous corporate scandals (e.g. Enron and Worldcom) the SEC implemented major reforms in order to strengthen investor confidence in the U.S capital market, such as the passage of Sarbanes Oxley Act (SOX; Li, Pincus and Rego, 2008). These reforms included enhancing corporate governance and auditor independence and also increasing the responsibilities of the board director. Since then, ERM systems reinforcement and internal control assessment also began to play an important role in the resulting corporate governance mechanisms.

Risk management received greater attention from enterprises in the mid-1990s and came to maturity post the introduction of SOX. The emergence of risk management was mainly due to a change in the competitive environment, based on a rational economics perspective that resulted in the turbulence and complexity in future, operational circumstances (Arena, Arnaboldi and Azzone, 2010) and this situation gave managers the needed capability of coordinating risk management activities and also maximizing firm value. In specific, the proposal of an integrated risk management provides a brand-new concept in the field of risk management. The implementation of integrated risk management differs from the traditional soil-based risk management. Meulbroek (2002) indicates that integrated risk management is a firm-wide strategy used to manage risks that are collected from the identification & assessment process and affect firm value. Furthermore, the introduction of COSO (2004) enables managers to align enterprise risk with a strategy that relates to setting the firm objectives to manage and supervise related risks.

COSO (2004) defines an ERM system as

"a process, effected by an entity's board of directors, management and other personnel, applied in a strategy setting and across the enterprise, designed to

identify potential events that may affect the entity, and manage risks, to provide reasonable assurance regarding the achievement of entity objectives."

Moreover, COSO (2004) believes that an ERM system should work towards achieving an entity's objectives which encompass the following items.

1. strategy: high-level goals, aligned with and supporting its mission;
2. operations: the effective and efficient use of resources;
3. reporting: the reliability of reporting; and
4. compliance: compliance with applicable laws and regulations.

Overall, it reflects a fundamental concept that allows managers to manage risks. Simultaneously, it implies that manager are able to adopt systematic and consistent processes to ensure that potential risks to firm value have been detected thereby lowering the firm's risk of failure and hence, increasing firm value (Gordon, Loeb and Tseng 2009).

The role of internal control

Internal control is also a part of corporate governance, and the sub-structure of the ERM system. After the Enron scandal, the US Congress enacted the Sarbanes–Oxley Act to improve the quality of financial reporting and restore investor's confidence in the reliability of financial reporting. In specific Sections 302 and 404 require managers to provide an assessment of the scope and adequacy of their internal control structures and attest to the effectiveness of internal control by disclosing this information in annual reports. The principal objective behind this requirement is the belief that effective internal control can ensure a reliable financial reporting and thus, avoid the occurrence of corporate scandals such as Enron's (Kalelkar and Nwaeze, 2011; Goh and Li, 2013).

COSO (2013) describes the new framework of internal control and incorporates some other important terms of reporting (e.g. transparency and accountability) and dynamic business and operation environments (e.g. complex, technologically driven or global). Furthermore, COSO defines internal control as

"a process, affected by an entity's board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of objectives relating to operations, reporting, and compliance."

Internal control excludes strategy from the ERM system and focuses on three categories: operations, reporting, and compliance. *Operations* actually pertain to the effectiveness and efficiency of the entity's operations, including operational and financial performance goals, and safeguarding assets against loss. *Reporting* pertains to internal and external financial and

non-financial reporting and can encompass reliability, timeliness, transparency, or other terms as set forth by regulators, recognized standard setters, or the entity's policies; while *compliance* pertains to adherence to the laws and regulations to which the entity is subject. In contrast to COSO's (1992) original definition of objectives, the recent definition of objective comprises an explicit point of view. For example, the reporting objective not only centers on reliability but also extends to transparency and timeliness, and in addition, the subject of reporting is expanded to include non-financial reporting. The principal objective of this revision is to assist managers in adequately designing and developing internal control systems and then, enhancing the ability of organizations to adapt to rapidly changing operation environments.

Hypotheses Development

Since the passage of SOX, the costs and benefits of the ERM and internal control systems have sparked an intense debate. The most fundamental goal of the ERM system is to maximize shareholder value (Meulbroek, 2002). The Casualty Actuarial Society (CAS, 2003) indicates that the purpose of the ERM system is to increase the firm's short- and long-term value by disciplining managers in terms of the industry assets, controls, exploits, and finances, and monitoring the risks from all other sources. Similarly, COSO (2004) indicates that the rapid change and growing uncertainty of the world economy implies both opportunity and crisis, and that the capabilities of the ERM system may enable managers to handle uncertainty effectively, achieve the performance targets and also prevent the loss of resources. Gordon, Loeb and Tseng (2009) examine the effectiveness of ERM on firm performance and indicate that the implementation of an ERM system can improve organization performance. Hoyt and Liebenberg (2011) study the value of ERM in the insurance industry and note that the use of ERM can increase a firm's value. From the above discussion, we expect that an effective ERM system is able to protect the interests of shareholders and improve organizational performance, thereby increasing firm value in terms of the value of cash holdings.

H1: Firms with effective ERM systems increase the value of their cash holdings.

On the other hand, with regards to internal control systems, prior research has shown that the effective internal control can benefit stakeholders by reducing the probability of fraud and enhancing the reliability of financial reporting (Ashbaugh-Skaife et al., 2008; Doyle et al., 2007). Bargeron, Lehn and Zutter (2010) investigate the disclosure role of internal control on manager risk-taking decisions, and justify that several provisions of SOX (e.g. internal control and the liability of directors) are likely to discourage managerial risk-taking behavior, such as capital investments and R&D expenditures. Similarly, Mitra, Jaggi and Hossain (2013) study the relationship between internal control weaknesses and accounting conservatism, and

prove that firms with internal control weaknesses have significantly increased their conservative practices from the pre-SOX to the post-SOX periods. In terms of changes to managerial behavior, Goh and Li (2013) examine the disciplining effect of internal control provisions onto the governance structures and indicate that, in comparison with these firms that do not disclose material weaknesses in internal control, firm audit committee members and outside directors are more likely to leave firms that disclose material weaknesses in internal control, leading to a loss of external directorship. Furthermore, firms that disclose material weaknesses in internal control exhibit significantly improved government structures after attesting to these weaknesses and thereby earning positive market reactions. Overall, internal control systems restrict managerial opportunism and risk taking behaviors and consequently strengthen their governance structures. As a result, we expect that effective internal control protects the interests of shareholders and improves organizational performance, thereby increasing firm value and the value of cash holdings, and vice versa.

H2: Firms with internal control weaknesses exhibit a decrease in the value of cash holdings.

Dittmar and Mahrt-Smith (2007) extend previous research and examine the impact of governance on the use of excess cash holdings after confirming that good corporate governance can improve the value of cash holdings. Their approach is based on that of Jensen (1986) and verifies that firms might invest their excess cash inefficiently when they have poor corporate governance. Moreover, the same study indicates that poorly governed firms may invest excess cash in low return investments, which results in a lower operating performance. From the above discussion, we expect that firms with an effective ERM system are able to increase the efficiency with which they can use excess cash holdings, which in turn results in a higher operating performance. On the contrary, we expect that firms with internal control weaknesses may use excess cash holdings inefficiently, which results in a poorer operating performance.

H3a: Firms with effective ERM systems use excess cash holdings efficiently, which results in higher operating performance.

H3b: Firms with internal control weaknesses use excess cash holdings inefficiently, which results in poorer operating performance.

III. Research Method and Sample Selection

Primary empirical models

In order to more thoroughly test whether ERM systems and internal control processes significantly affect the value of cash holdings, we follow the study of Dittmar and Mahrt-Smith (2007) and use two different regression equations to measure the impact of

ERM systems and internal control onto the value of cash holdings. The first equation model is based on Faulkender and Wang (2006) and uses change regression to examine whether a change in cash holdings leads to a change in firm value. The second equation model is based on Fama and French (1998) and a modification of the study from Dittmar and Mahrt-Smith (2007) and uses firm level regression to examine whether corporate governance increases the value of excess cash holdings.

Therefore our first regression of ERM systems on the value of cash holdings is provided below.

$$R_{it} - R^{B}_{it} = a_0 + b_1 \frac{\Delta CashHoldings_{it}}{MV_{it-1}} + b_2 \frac{\Delta Earnings_{it}}{MV_{it-1}} + b_3 \frac{\Delta NetAssets_{it}}{MV_{it-1}} + b_4 \frac{\Delta R\ \&\ D_{it}}{MV_{it-1}}$$
$$+ b_5 \frac{\Delta InterestExp_{it}}{MV_{it-1}} + b_6 \frac{\Delta DivD_{it}}{MV_{it-1}} + b_7 \frac{CashHoldings_{it-1}}{MV_{it-1}} + b_8 Leve_{it} + b_9 \frac{NetFin_{it-1}}{MV_{it-1}}$$
$$+ b_{10} \frac{CashHoldings_{it-1}}{MV_{it-1}} * \frac{\Delta CashHoldings_{it}}{MV_{it-1}} + b_{11} Leve_{it} * \frac{\Delta CashHoldings_{it}}{MV_{it-1}} + b_{12} ERMI_{it}$$
$$+ b_{13} ERMI_{it} * \frac{\Delta CashHoldings_{it}}{MV_{it-1}} + e_{it} \quad (1)$$

where ΔX_{it} indicates a change in the variable X from year t−1 to t of firm i; R_{it} = the stock returns for firm i during the fiscal year t; R^{B}_{it} = the benchmark return, based on the study of Fama and French (1993), 25 size and BM matched portfolio for firm i during the fiscal year t; MV_{it-1} = the market value of equity in year t-1 computed as price (199) multiplied by outstanding shares (25); $CashHoldings_{it-1}$ = cash and marketable securities (1) for firm i in year t-1; Earnings = earnings before extraordinary items plus interest, deferred tax credits, and investment tax credits (18+5+50+51); Net Assets = net assets computed as total assets (6) minus cash and marketable securities (1); R&D = R&D expenses (46, if missing set to zero); InterestExp = interest expenses (15); DivD = common dividends (21); $Leve_{it}$ = market leverage for firm i in year t (9+34)/(9+34+(199*25)); $NetFin_{it-1}$ = new financing for firm i in year t-1, computed as net new equity issues plus net new debt issues (108-115+111-114); and $ERMI_{it}$ = enterprise risk management index for firm i in year t.

Similar to Faulkender and Wang (2006) and Dittmar and Mahrt-Smith (2007) we also control for firm's specific characteristics (e.g. profitability, investment and financing) that may affect excess returns and cash holdings. We expect that the coefficient of ERMI is significantly positive with the excess returns.

Along with Dittmar and Mahrt-Smith (2007), our second specific regression applies a

non-straight forward technique, based on the total amount of cash, in order to study the relationship between ERM systems and the value of excess cash holdings. Jensen (1986) argues that managers may waste free cash flow when firms have entrenchment effects or poorly monitored mechanisms. Moreover, Dittmar and Mahrt-Smith (2007) indicate that total cash does not account for the fact that managers may be less likely to waste cash resources needed for handling daily operations (p615). For this reason, we follow the stream of excess cash reserves and examine the relevance of excess cash on firm value and also the impact of ERM systems on this value. The specific regression is introduced as follows.

$$\frac{MV_{it}}{NA_{it}} = \beta_0 + \beta_1 \frac{E_{it}}{NA_{it}} + \beta_2 \frac{dE_{it}}{NA_{it}} + \beta_3 \frac{dE_{it+2}}{NA_{it}} + \beta_4 \frac{RD_{it}}{NA_{it}} + \beta_5 \frac{dRD_{it}}{NA_{it}}$$
$$+ \beta_6 \frac{dRD_{it+2}}{NA_{it}} + \beta_7 \frac{D_{it}}{NA_{it}} + \beta_8 \frac{dD_{it}}{NA_{it}} + \beta_9 \frac{dD_{it+2}}{NA_{it}} + \beta_{10} \frac{I_{it}}{NA_{it}} + \beta_{11} \frac{dI_{it}}{NA_{it}}$$
$$+ \beta_{12} \frac{dI_{it+2}}{NA_{it}} + \beta_{13} \frac{dNA_{it}}{NA_{it}} + \beta_{14} \frac{dNA_{it+2}}{NA_{it}} + \beta_{15} \frac{dMV_{it+2}}{NA_{it}} + \beta_{15} ERMI_{it}$$
$$+ \beta_{16} \frac{ECASH_{it}}{NA_{it}} + \beta_{17} ERMI_{it} * \frac{ECASH_{it}}{NA_{it}} + YearDummies + FirmFixedEffects + \varepsilon_{it} \quad (2)$$

Where, dX_{it} indicates a change in the variable X from year t−2 to t of firm i; MV_{it} = the market value of equity for firm i in year t, computed as price (199) multiplied by shares outstanding (25) plus total liabilities (181); NA_{it} = net assets for firm i in year t, computed as total assets (6) minus cash and marketable securities (1); E_{it} = earnings before extraordinary items plus interest, deferred tax credits, and investment tax credits for firm i in year t (18+5+50+51); RD_{it} = R&D expenses for firm i in year t (46, if missing set to zero); D_{it} = common dividends (21) for firm i in year t; I_{it} = interest expenses (15) for firm i in year t; $ERMI_{it}$ = enterprise risk management index for firm i in year t; and $ECASH_{it}$= optimal cash for firm i in year t.

Finally, in order to examine whether the impact of effective ERM systems on the use of excess cash holdings can increase the value of cash holdings, we use the following regression to detect the impact and expect that δ_3 is significantly positively related with firm performance.

$$Performance_{it} = \delta_0 + \delta_1 \frac{ECASH_{it-1}}{NA_{it-1}} + \delta_2 ERMI_{it-1} + \delta_3 \frac{ECASH_{it-1}}{NA_{it-1}} * ERMI_{it-1}$$
$$+ \delta_4 Ln(NA_{it}) + \delta_5 \frac{PPE_{it}}{NA_{it}} + \delta_6 Performance_{it-1} + YearDummies + FirmFixedEffects$$
$$+ \varepsilon_{it} \quad (3)$$

where Performance $_{it}$ = operating performance for firm i in year t, computed as operating income (13) divided by net assets (6-1); $ECASH_{it-1}$= optimal cash for firm i in year t-1; NA_{it-1} = net assets for firm i in year t-1, computed as total assets (6) minus cash and marketable securities (1); $ERMI_{it-1}$ = enterprise risk management index for firm i in year t-1; NA_{it} = net assets for firm i in year t; and PPE_{it} = property, plant, and equipment (8) for firm i in year t.

In addition, in order to test the specific regression of internal control on the value of cash holdings, we change ERMI into ICW in equations 1-3. ICW is a dummy variable and the value will be different if a firm discloses ineffective internal control then the variable is equal to 1, otherwise it is equal to 0. We expect that the coefficient of ICW interacts with cash holdings and that excess cash is significantly negatively related with excess returns and firm value. We also expect that the coefficient of ICW interacts with excess cash and is negatively related to firm performance.

Sample selection

The sample for this study consists of all US publicly traded firms and is derived from COMPUSTAT, CRSP and Audit Analytics. We exclude the financial industry (SIC code between 6000 and 6999) and the utility industry (SIC code between 4900 and 4999) over the period 2004-2011.The sample selection process can be divided into three parts; the first sample selection process is based on the model of Faulkender and Wang (2006), the second selection process is based on the model of Fama and French (1998), and the final sample selection process is based on the impact of an ERM system or ICW onto the use of excess cash holdings and firm performance. As Panel A provided in Table 1 shows, after calculating ERMI, and matching excess returns with available financial data, the final sample used in the analysis is 6,169 in Faulkender and Wang's model (2006). As Panel B included in Table 1 shows, we imposed restrictions on the model of Fama and French (1998); we require a t+2 and t-2 time period on financial data results in the ERMI, covering a time period of 2004-2010. Moreover, we exclude negative excess cash, resulting in a final sample of 4,086 to use in the analysis based on the model of Fama and French (1998). Finally, in order to examine how ERM systems or internal control process impacts on the use of excess cash holdings and firm performance, we first collect the ERMI and ICW sample base as provided in Panel B, then match excess cash and available financial data and restrict the sample by positive excess cash at time period t-1 and negative change in excess cash at time period t, such that the final sample used to detect the effects of ERMI or ICW on firm performance is 4,712.

Refer Table 1

IV. Research Results

Summary statistics

The summary statistics results are presented in Table 2. Panel A in Table 2 presents the summary statistics of Faulkender and Wang's model (2006). The mean (median) of excess return (Exces_Ret) is 0.083 (-0.04), which shows that the distribution of abnormal returns is right-skewed. The mean (median) of the cash holdings level is equivalent to 17.2% (9.9%) of the market equity value at the beginning of the fiscal year and is consistent with Faulkender and Wang (2006). Further, on average, we also find that the mean (median) of change in earnings is positive, which indicates that profitability has been increasing over the period of 2004-2011.Finally, the mean of internal control weakness is 0.057, which indicates that the proportion of firms with internal control weakness in our sample based on the selection of Faulkender and Wang (2006) is 5.7%.

Refer Table 2

Panel B in Table 2 presents the summary statistics of Fama and French's model (1998), which is based on level regression. We find that the market value is 4.651 (2.003) in the mean (median), which is right-skewed. The mean and median of excess cash, at 1.624 and 1.578, are relatively symmetric. Finally, the mean of internal control weakness is 0.065, indicating that the proportion of firms that have internal control weakness in our sample based on the selection of Fama and French (1998) is 6.5%.

Results of ERMI and ICW on the value of cash holdings

Faulkender and Wang's model (2006)

In this section, stock returns are used to examine the impact of an ERM system and internal control on the value of cash holdings. Further the results of the impact of change in cash holdings and ERMI or ICW on excess returns are provided in Table 3. Model A shows that the results of regressing excess returns with different firm's characters. This result indicates that the marginal value of cash holdings of firms with no cash and no leverage is 1.939. Moreover, by taking the effects of both leverage and level of cash holdings into consideration, this study obtains the marginal value of cash holdings as 1.6025.[4] As we compare our result with that of Faulkender and Wang (2006), it is notable that the marginal value of cash holdings to shareholders increases in the post SOX period, with a probable, overall increase of 0.56725.[5] We also find that the effect of cash holdings level on excess returns decreases at around 75%[6] as compared with Faulkender and Wang (2006). In a prior study, Bargeron, Lehn and Zutter (2010) argue that the provisions of SOX are likely to discourage managerial

[4] 1.6025=1.939+$0.172*-0.183 +$0.193*-1.580
[5] This average value is calculated as [(1.939-1.467)+(1.6025-0.94)]/2
[6] 0.75=(0.738-0.183)/0.738

risk-taking (e.g. capital expenditure or R&D expenditure); and in addition, the US firms have reduced investments and increased cash holdings[7] if US firms are compared with their non-US counterparts. Our result proves to be consistent with that of Bargeron, Lehn and Zutter (2010).

Furthermore, models B and C present the effects of ERM systems or internal controls when they interact with change in cash holdings on excess returns. We find that the marginal value of cash holding to shareholders is 1.095[8] when firms disclose an ICW. This implies that the value of cash holdings in firms that disclose an ICW is lower than firms without an ICW by approximately 0.5 dollars. However, the effectiveness of ERMI with change in cash holdings on excess returns is found to be positive but not significant. In comparison with an ICW scenario, investors cannot directly observe or measure the effectiveness of ERM, which may weaken the impact of ERMI on excess returns.

Refer Table 3

Robustness Test

Faulkender and Wang (2006) indicate that cash reserves are more valuable to firms that have the financial constraints. Consistent with the studies done by Faulkender and Wang (2006), Dittmar and Mahrt-Smith (2007), and Tong (2011), we consider two measures of financial constraint and they are bond rating and payouts. Faulkender and Wang (2006) indicate that firms are able to raise funds from a source of capital if they have a bond rating. To this end, we judge financially unconstrained firms to be those firms with an investment grade bond rating, and vice versa (Dittmar and Mahrt-Smith, 2007). Fazzari et al. (1988) indicate that financially constrained firms have significantly lower payout ratios. A payout ratio is measured as total dividends scaled by total assets (Tong, 2011). In contradict, we consider financially unconstrained firms with payout ratios lower than the median (Dittmar and Mahrt-Smith, 2007). Tables 4 and 5 present the financial constraint effects based on bond ratings and payouts on the value of cash holdings.

Refer Tables 4 and 5

Tables 4 and 5 present the results by dividing the sample into financially constrained and unconstrained firms according to bond ratings and payouts, respectively. We compare firms that are financially constrained with these that are unconstrained, according to bond ratings and payouts and note that the value of a dollar in financially constrained firms with no cash and no leverage is higher than these financially unconstrained ones, which is consistent with

[7] They measure cash holding as the end level of cash and short-term investments divided by average assets.
[8] 1.095=2.014+$0.172*-0.198 +$0.193*-1.596+1*-0.577

the inference made from the study of Faulkender and Wang (2006). Moreover, we find that the coefficients of ICW interacting with change in cash holdings are negative and significant in financially constrained firms. The marginal value of cash holdings, while considering the financially constrained, is 1.091 (1.032) for the ICW firms and 1.6757 (1.624) for firms without an ICW. Overall, the marginal value of cash holdings is worth $1.6 to the non-ICW firms and $1.0 to the ICW firms, reflecting a $0.6 difference in cash value. This result is again, consistent with our prediction that firms with an ICW experience a decrease in the value of cash holdings.

Refer Table 6

Finally, let's consider another scenario that the structural change effect is caused by the global financial crisis. We divide our sample into a pure SOX period and a Post Financial Crisis period (hereafter PFC). By comparing these two distinct periods we find that an extra dollar is only valued by shareholders in firms with no cash and no leverage (Model A). In addition, it is notable that the marginal value of cash holdings is $2.311 in the pure SOX period and $1.877 in the PFC. There is a difference of $0.434 in cash value between these two periods. Moreover, considering the value of cash holdings, the following case, identical firms that hold similar cash holdings of 10% of equity between these two periods, is taken into account. The marginal value of the decrease in cash holdings in the PFC period is 0.0168; however the decrease in the pure SOX period is 0.1235. This finding reflects the value of cash holdings post the financial crisis. Moreover, we find a consistent evidence of this aforementioned fact in those firms with a financial leverage. It is authors' belief that this phenomenon is the result of liquidity risks in the financial system that may cause firms to retrench bank loans. Furthermore, we show that internal control weakness significantly decreases the value of cash holdings in the PFC period, but not in the pure SOX period, and also that the marginal value decrease is higher by $0.672 for firms that disclose an ICW, which are all consistent with our prediction.

Fama and French's model (1998)

Table 7 presents the results of estimating Fama and French's model (1998). We find that the coefficient of the interactional term between ERMI and excess cash holdings is both positive and significant, which implies that ERMI significantly increases the value of cash holdings by approximately 14%. In order to interpret this coefficient, just consider a firm that has one dollar of excess cash and if the firm has an effective ERM system then the value of this cash holding increases. Similarly, the aim of corporate governance is to maximize the firm value. Our result is consistent with Dittmar and Mahrt-Smith (2007) who support that good governance may increase the value of excess cash holdings. However, it is odd that an ICW does not appear to have a negative effect on the value of excess cash holdings.

Refer Table 7

Comparing the models of Faulkender and Wang (2006) and Fama and French (1998), we find that the effect of ICW decreases the value of cash holdings in Faulkender and Wang's model (2006) but that an effective ERM system tends to increase the value of cash holdings in Fama and French's model (1998). Dittmar and Mahrt-Smith (2007) indicate that the level regression model is not a straight–forward way to interpret a change in excess cash onto the firm value, and this aforementioned finding may be the reason to cause our results to be inconsistent. Since the passage of SOX requires managers to disclose the effectiveness of implementing internal controls in their annual reports, the effectiveness of internal controls becomes materialized information that can be immediately observed by stakeholders, which means that the negative effect of an ICW may be directly reflected in the capital market. On the contrary, SOX does not require managers to disclose the effectiveness of ERM systems and consequently, these results cannot be immediately observed by stakeholders. Even if effective ERM systems do in fact benefit shareholders in terms of maximizing the firm value, stakeholders may often ignore the existence of effective ERM systems. Overall, our results reveal the different effects of these two different types of indicators on the value of cash holdings. In the next section, we investigate how an effective ERM system or internal control may affect the use of excess cash, and also study the effect of efficient excess cash use onto the firm performance.

The impact of efficient excess cash use on firm performance

In this section we report the impact of an ERM system or internal control on the efficient use of excess cash and the specific results are presented in Table 8. In Model A, we describe the impact of an effective ERM system onto the future operating performance. Obviously, lagged excess cash may result in a poorer future operating performance; however, the negative effect reverses in the coefficient that interacts with an effective ERM system. This implies that firms that have an effective ERM system may drive managers toward achieving objectives to maximize the firm value and so use excess cash more efficiently. On the other hand, Model B presents the effect of internal control onto the future operating performance. Similar to Model A, lagged excess cash may result in a poorer future operating performance and the coefficient interaction with ICW shows a statistically significant negative effect on the future operating performance. This implies that if a firm has a weaker internal control, then they will lose cash. Furthermore, firms that have an ICW are also deemed to be the firms with poor corporate governance. Dittmar and Mahrt-Smith (2007) indicate that poor corporate governance will prompt managers to invest excess cash in the low return investments or make managers lazy in terms of controlling costs, and our results are consistent with this reference.

Refer Table 8

Robustness Test

Dittmar and Mahrt-Smith (2007) indicate that in order to avoid the logarithm going on to be infinity, they set observations with zero cash/assets into the sample minimum. Furthermore, using a natural logarithm of (1+ cash/assets) may be another way to deal with zero cash realizations. For a comparison purpose, Dittmar and Mahrt-Smith's approach is followed to estimate equations (2) and (3) again. The results are reported in Tables 9 and 10 accordingly. The results and economic implications are similar to those discussed above.

Refer Tables 9 and 10

V. Conclusions

Research summary and contributions

In this study, we explore the effectiveness of ERM and internal control on the value of cash holdings, and further study whether the effectiveness of ERM or internal control increases the efficient use of excess cash and subsequently the firm performance. Essentially, ERM and internal control assists managers to exercise and prevent the unauthorized use of cash assets. Furthermore, the role of control mechanisms restricts managers from wasting free cash flow and thereby may mitigate some possible, agency problems. Based on the sample collected from Compustat, CRSP and Audit Analytics, we find that a negative relationship exists between ICW and the value of cash holdings. Consistent with our prediction; the change regression model shows that the value of cash holdings for ICW firms is lower by 0.5 dollars than these non-ICW firms. This inference remains to be consistent after considering both financial constraints and structural changes. Moreover, the level regression model presents a positive relationship existed between the effectiveness of ERM systems and the value of excess cash holdings. We infer that this difference may be the result of whether the effectiveness of ERM or internal control can be observed by the stakeholders. Finally, we also find that while the effectiveness of an ERM system can mitigate the waste of excess cash assets and further increasing the operating performance, these results may prove to be reverse with an ICW.

This finding contributes to our understanding of both the role of ERM or internal control and cash policies. A large and growing number of literature and studies indicates that corporate governance may increase firm value. However, very few researches have placed a focus on investigating how the effectiveness of ERM and internal control may enhance the firm value. To this end, a fresh perspective may be introduced from this research by linking the effectiveness of ERM and ICW with the value of cash holdings. Moreover, it is noted that operating performance is negatively associated with excess cash holdings but that these negative effects are mitigated by increasing the effectiveness of an ERM system. On the other hand, another important contribution may be that operating performance is negatively

associated with excess cash holdings and that these negative effects become worse when the firms have a weak internal control.

Research implications

In this research it is uncovered that ERM systems and internal controls assist managers to use cash assets efficiently and thereby increase the firm's operating performance. Therefore, in terms of practical implications, when a manager uses cash assets in investment the possible projects, s/he should consider to implement/adopt a managerial mechanism such as an ERM system or internal control. Moreover, the ERM index is built based on COSOs (2004) framework and it provides useful information about the effectiveness of ERM system for managers in terms of evaluating the ERM systems. Managers should use this information as a mechanism or an instrument to reduce information asymmetry and disseminate this information to stakeholders.

Furthermore, in terms of research implications, textbooks always indicate that an effective ERM system or internal control can assist the managers to increase firm value, but very rarely discuss the process by which they can increase the firm value. In this research, we find that protecting and using cash assets efficiently is one possible and feasible way in which managers can increase the firm value.

Research limitations

However, as with all empirical studies in the social sciences, there are some limitations to our study. Firstly, the ERM index used in this research is based on the level of achievement of an organization's objectives; therefore future research should diversify these indicators related to ERM and thus, provide more insights to the existing literature in a different manner. Secondly, the sample selection in our research excludes both the financial and insurance industries. Therefore, to generalize the findings of our studies by expanding to encompass more industries turns to be a future research direction in this subject field. It is authors' belief that the results of this study may provide an important insight into the relationship existed between an effective ERM or internal control and the value of cash holdings. Essentially, these results support the proposed claim that an effective ERM increases the value of cash holdings and weak internal control decreases the value of cash holdings. Moreover, an effective ERM can enhance the efficient use of excess cash holdings and vice versa in terms of weak internal controls.

Appendix

Measuring ERMI

The enterprise risk management index (ERMI) used in this paper follows the study of Gordon et al. (2009) who develop an index of the effectiveness of an organization's ERM system based on the organization's ability to achieve its objectives. Each objective is measured in terms of two indicators and hence, the ERMI is constructed by summing up all eight indicators.[9] The ERMI equation is introduced as follows.

$$ERMI = \sum_{K=1}^{2} Strategy_k + \sum_{K=1}^{2} Operation_k + \sum_{K=1}^{2} Reporting_k + \sum_{K=1}^{2} Compliance_k \quad (A1)$$

The "strategy" objective refers to how the firm has positioned itself in the market relative to its competitors. We measure whether or not a strategy is successful by capturing the organization's sale opportunities in a market as well as its ability to reduce system risk (Gordon et al., 2009). The measure of the strategy objective is provided below.

$$Strategy = \frac{Sale_{ijt} - \mu_{Salejt}}{\sigma_{Salejt}} + \frac{\Delta\beta_{it} - \mu_{\Delta\beta jt}}{\sigma_{\Delta\beta jt}} \quad (A2)$$

where $Sale_{ijt}$ = the sales for firm i in j industry in year t. (12); μ_{salejt} = the average number of sales of industry j in year t; σ_{salejt} = the standard deviation of all sales of industry j in year t; $\Delta\beta_{it}$ = the change in the Beta from year t–1 to t of firm i times negative one; $\mu_{\Delta\beta jt}$ = the average of the change in the Beta of industry j in year t; and $\sigma_{\Delta\beta jt}$ = the standard deviation of the change in the Beta of industry j in year t.

The "operation" objective refers to the operating efficiency of the firm. Given this, the turnover of assets and operating ratio is measured (Gordon et al., 2009). The measure is shown below.

$$Operation = \frac{Sale_{it}}{Assets_{it}} + \frac{Sale_{it}}{NoEmp_{it}} \quad (A3)$$

where $Sale_{it}$ = Sales for firm i in year t (12); $Assets_{it}$ = Assets of firm i in year t (6); and $NoEmp_{it}$ = The number of employees of firm i in year t (29);

The "reporting" objective refers to the reliability of the firm's financial reporting, and is

[9] Each indicator is standardized before it is combined in Equation (2).

constructed as two different categories and they are 1) readily observed and 2) magnitude of earnings non-manipulation (Gordon et al., 2009). The readily observed variable is made up of three variables including material weakness, qualified auditor opinion, and restatement. If a firm discloses any material weakness in their annual report, then the variable is set as -1 and otherwise it is set as 0. If a firm does not disclose an unqualified auditor opinion, then the variable is set as -1 and otherwise it is set as 0. Finally, if a firm has a restated financial statement, then this variable is set as -1, otherwise it is set as 0.The range of readily observed variables falls between -3 and 0. The magnitude of earnings non-manipulation is the proportion of absolute value of normal accruals[10] over the absolute value of total accruals.

The "compliance" objective refers to whether a firm lowers their risk of failure by increasing their compliance with relevant laws and regulations, which results in an increase in both firm performance and value (Gordon et al., 2009). Given this, we measure this objective in terms of audit fees and settlement net gains (loss).The measure is provided below.

$$\text{Compliance} = \frac{\text{AuditFee}_{it}}{\text{Assets}_{it}} + \frac{\text{SettlementNetGL}_{it}}{\text{Assets}_{it}} \quad \text{(A4)}$$

Where AuditFee_{it} = Audit fees for firm i in year t[11]; Settlement NetGL_{it}= Settlement net gain or loss for firm i in year t (372); and Assets_{it} = Firm i's assets in year t (6).

Measuring Excess Cash (ECASH)

In terms of measuring excess cash holdings, the study of Dittmar and Mahrt-Smith (2007) is followed. Dittmar and Mahrt-Smith (2007) define excess cash holdings as the difference between actual and normal cash. In other words, excess cash holdings refer to the residual of the cash levels regression. According to this aforementioned study, the cash levels regression is modeled as follows.

$$\text{Ln}\left(\frac{\text{Cash}_{it}}{\text{NA}_{it}}\right) = \beta_0 + \beta_1 \text{Ln}\left(\text{NA}_{it}\right) + \beta_2 \frac{\text{FCF}_{it}}{\text{NA}_{it}} + \beta_3 \frac{\text{NEC}_{it}}{\text{NA}_{it}} + \beta_4 (\text{IndSigma})_{it}$$
$$+ \beta_5 \frac{\text{MV}_{it}}{\text{NA}_{it}} + \beta_6 \frac{\text{RD}_{it}}{\text{NA}_{it}} + \text{YearDummies} + \text{FirmFixedEff} + \varepsilon_{it} \quad \text{(A5)}$$

Where, CASH_{it}= the cash and marketable securities (1) for firm i in year t; NA_{it} = the net assets of firm i in year t, computed as total assets minus cash and marketable securities (6-1); FCF_{it}= the free cash flow of firm i in year t, computed as operating income (13) minus interest (15) minus taxes (16); NWC_{it} = the net working capital of firm i in year t,

[10] According to Gordon et al. (2009), normal accruals are computed as total accruals minus abnormal accruals. The abnormal accruals are estimated using cross-section Jones (1991) accrual model.

[11] The audit fee is incorporated with audit fees, audit related fees, tax fees and other fees related to compliance with regulation.

computed as current assets minus current liabilities minus cash and marketable securities (1); IndSigma = the industry average of the prior 10 years standard deviation of FCF/NA; MV_{it} = the market value of equity for firm i in year t, computed as price (199) times shares outstanding (25) plus total liabilities (181); and RD_{it}= the R&D expenses (46) of firm i in year t, if none then the variable is set at 0.

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Table 1 Sample Selection Process

Panel A Faulkender and Wang (2006) Model Sample selection	
Calculate ERMI_ICW process:	
ERMI_ICW total sample	15,228
Calculate Excess Return process:	
Excess Return total sample	25,736
Available Financial Data	
Financial data total sample	23,826
Match process:	
Match firms that have the data of ERMI, ICW, Excess Return and Financial data sample:	6,169
Final sample used in analysis	6,169
Panel B Dittmar and Mahrt-Smith (2007) Model Sample selection	
Calculate ERMI_ICW process:	
ERMI_ICW total sample	12,772
Calculate Excess Cash process:	
Excess Cash total sample	43,210
Available Financial Data	
Financial data total sample	18,650
Match process:	
Match firms that have data for ERMI, ICW, Excess Cash and Financial data sample:	5,623
Exclude Negative excess cash	(1,537)
Final sample used in analysis	4,086
Panel C Performance Measure Sample selection	
Calculate ERMI_ICW process:	
ERMI_ICW total sample	12,772
Calculate Excess Cash process:	
Excess Cash total sample	43,210
Available Financial Data	
Financial data total sample	45,621
Match process:	
Match firms that have data for ERMI, ICW, Excess Cash and Financial data sample:	11,522
Exclude excess cash that is negative at time t-1 and change excess cash that is positive at time t	(6,810)
Final sample used in analysis	4,712

Table 2 Summary statistics

Panel A					
	P25	**P 50**	**P 75**	**Mean**	**Stand. Dev.**
Exces_Ret	-0.270	-0.040	0.230	0.083	0.744
D_C	-0.021	0.004	0.042	0.021	0.243
D_E	-0.020	0.007	0.035	0.039	0.530
D_NA	-0.019	0.032	0.120	0.057	0.577
D_RD	0.000	0.000	0.001	0.000	0.051
D_I	-0.001	0.000	0.002	0.002	0.094
D_D	0.000	0.000	0.001	0.000	0.056
C_L	0.039	0.099	0.212	0.172	0.287
Lev	0.011	0.126	0.298	0.193	0.211
NF	-0.039	-0.001	0.027	0.022	0.307
ERMI	-1.176	-0.199	0.952	-0.081	2.707
ICW	0.000	0.000	0.000	0.057	0.231
Panel B					
	P 25	**P 50**	**P 75**	**Mean**	**Stand. Dev.**
MV	1.423	2.003	3.275	4.651	26.285
E	0.018	0.078	0.135	-0.190	3.318
RD	0.000	0.000	0.068	0.205	1.646
D	0.000	0.000	0.020	0.023	0.092
I	0.002	0.010	0.021	0.021	0.105
XCash	0.905	1.578	2.261	1.624	0.936
ERMI	-1.207	-0.173	1.053	-0.040	2.798
ICW	0.000	0.000	0.000	0.065	0.247

Variable definition: Exces_Ret is excess stock returns, which is calculated as the annual stock returns of firm i at time t minus benchmark portfolio return at time t. D_C is the one year change in cash holding. D_E is the one year change in earnings before extraordinary items. D_NA is the one year change in net assets. D_RD is the one year change in R&D expenses. D_I is the one year change in interest expenses. D_D is the one year change in common dividends. C_L is lagged cash holdings. Lev is the ratio of debt to market value. NF is defined as new financing calculated as net equity issues plus net debt issues. MV is the market value. E is earnings before extraordinary items. RD is R&D expenses. D is the common dividends. I is the interest expenses. Xcash is the Excess cash holdings. ERMI is the indicator of enterprise risk management of firm i at time t. ICW is the dummy variable; if the firm discloses internal control weakness then it is equal to 1 and 0 otherwise.

Table 3 The impact of ERMI and ICW on the value of cash

	Model A	Model B	Model C
D_C	1.939	1.941	2.014
	(0.000)	(0.000)	(0.000)
D_E	0.293	0.291	0.289
	(0.000)	(0.000)	(0.000)
D_NA	0.145	0.144	0.146
	(0.000)	(0.000)	(0.000)
D_RD	-0.567	-0.525	-0.503
	(0.144)	(0.170)	(0.194)
D_I	-1.013	-1.083	-1.037
	(0.000)	(0.000)	(0.000)
D_D	0.297	0.286	0.261
	(0.120)	(0.132)	(0.119)
C_L	0.727	0.728	0.725
	(0.000)	(0.000)	(0.000)
Lev	-0.272	-0.276	-0.270
	(0.000)	(0.000)	(0.000)
NF	-0.239	-0.232	-0.232
	(0.016)	(0.018)	(0.017)
CL_DC	-0.183	-0.194	-0.198
	(0.000)	(0.000)	(0.000)
L_DC	-1.580	-1.505	-1.596
	(0.000)	(0.000)	(0.000)
ERMI		0.003	
		(0.609)	
ERMI_DC		0.028	
		(0.321)	
ICW			-0.072
			(0.044)
ICW_DC			**-0.577**
			(**0.054**)
Cons	-0.039	-0.038	-0.035
	(0.059)	(0.069)	(0.078)
F-Value	72.52	71.5	73.01
P-Value	0.000	0.000	0.000
R-squared	0.367	0.368	0.37
Number of obs	6,169	6,169	6,169

a. Variable definition: Exces_Ret is excess stock returns, which is calculated as the annual stock returns of firm i at time t minus benchmark portfolio return at time t. D_C is the one year change in cash holdings. D_E is the one year change in earnings before extraordinary items. D_NA is the one year change in net assets. D_RD is the one year change in R&D expenses. D_I is the one year change in interest expenses. D_D is the one year change in common dividends. C_L is lagged cash holdings. Lev is the ratio of debt to market value. NF is defined as new financing calculated as net equity issues plus net debt issues. ERMI is the indicator of enterprise risk management of firm i at time t. ICW is the dummy variable; if a firm discloses an internal control weakness then the variable is equal to 1 and 0 otherwise.
b. P value based on robust standard errors is in brackets.

Table 4 Return regressions result of bond rating constraint

	constrain	unconstrain	constrain	unconstrain
D_C	1.949	1.827	2.023	1.886
	(0.000)	(0.001)	(0.000)	(0.000)
D_E	0.290	0.275	0.288	0.277
	(0.000)	(0.356)	(0.000)	(0.352)
D_NA	0.143	0.297	0.145	0.294
	(0.000)	(0.019	(0.000)	(0.021
D_RD	-0.511	-1.683)	-0.486	-1.718
	(0.188)	(0.188	(0.215)	(0.176)
D_I	-1.085	-4.707	-1.042	-4.892
	(0.000)	(0.193)	(0.000)	(0.177)
D_D	0.304	-0.487	0.279	-0.480
	(0.112)	(0.366)	(0.096)	(0.376)
C_L	0.738	0.122	0.735	0.127
	(0.000)	(0.219)	(0.000)	(0.199)
Lev	-0.261	-0.479	-0.254	-0.462
	(0.000)	(0.000)	(0.000)	(0.000)
NF	-0.232	-0.257	-0.232	-0.237
	(0.021)	(0.166)	(0.020)	(0.200)
CL_DC	-0.194	-1.982	-0.199	-1.958
	(0.000)	(0.051)	(0.000)	(0.035)
L_DC	-1.497	-2.006	-1.584	-2.195
	(0.000)	(0.231)	(0.000)	(0.129)
ERMI	0.004	-0.008		
	(0.479)	(0.021)		
ERMI_DC	0.027	0.024		
	(0.363)	(0.702)		
ICW			-0.077	0.003
			(0.038)	(0.964)
ICW_DC			**-0.585**	-1.643
			(**0.052**)	(0.515)
Cons	-0.042	0.058	-0.040	0.047
	(0.067)	(0.007)	(0.085)	(0.025)
F-Value	69.83	8.5	71.35	8.18
P-Value	0.000	0.000	0.000	0.000
R-squared	0.375	0.145	0.377	0.142
Number of obs	5136	1033	5136	1033

a.Variable definition: Exces_Ret is excess stock returns, which is calculated as the annual stock returns of firm i at time t minus benchmark portfolio return at time t. D_C is the one year change in cash holdings. D_E is the one year change in earnings before extraordinary items. D_NA is the one year change in net assets. D_RD is the one year change in R&D expenses. D_I is the one year change in interest expenses. D_D is the one year change in common dividends. C_L is lagged cash holdings. Lev is the ratio of debt to market value. NF is defined as new financing calculated as net equity issues plus net debt issues. ERMI is the indicator of enterprise risk management of firm i at time t. ICW is the dummy variable; if a firm discloses an internal control weakness then the variable is equal to 1 and 0 otherwise.

b. P value based on robust standard errors is in brackets.

Table 5 Return regressions result of payouts

	constrain	unconstrain	constrain	unconstrain
excess return	**Coef.**	**Coef.**	**Coef.**	**Coef.**
D_C	1.952	1.072	2.031	1.058
	(0.000)	(0.000)	(0.000)	(0.000)
D_E	0.283	0.184	0.286	0.184
	(0.000)	(0.144)	(0.000)	(0.144)
D_NA	0.144	0.169	0.152	0.164
	(0.001)	(0.043)	(0.001)	(0.046)
D_RD	-0.370	-0.769	-0.450	-0.794
	(0.356)	(0.627)	(0.271)	(0.613)
D_I	-1.319	-2.357	-1.062	-2.345
	(0.000)	(0.107)	(0.000)	(0.106)
D_D	0.100	0.837	0.103	0.873
	(0.566)	(0.003)	(0.547)	(0.001)
C_L	0.745	0.203	0.764	0.217
	(0.000)	(0.014)	(0.000)	(0.008)
Lev	-0.351	-0.272	-0.342	-0.267
	(0.000)	(0.000)	(0.000)	(0.000)
NF	-0.212	-0.200	-0.250	-0.195
	(0.046)	(0.424)	(0.020)	(0.414)
CL_DC	-0.221	-0.101	-0.196	-0.100
	(0.000)	(0.655)	(0.000)	(0.589)
L_DC	-1.471	0.015	-1.637	0.008
	(0.002)	(0.982)	(0.002)	(0.989)
ERMI	0.016	-0.004		
	(0.019)	(0.217)		
ERMI_DC	**0.100**	0.004		
	(**0.062**)	(0.719)		
ICW			-0.094	-0.048
			(0.064)	(0.278)
ICW_DC			**-0.592**	0.253
			(**0.068**)	(0.698)
Cons	0.011	-0.001	0.004	-0.002
	(0.713)	(0.953)	(0.884)	(0.879)
F-Value	75.02	64.81	69.12	60.43
P-Value	0.000	0.000	0.000	0.000
R-squared	0.408	0.175	0.406	0.175
Number of obs	3084	3085	3084	3085

a.Variable definition: Exces_Ret is excess stock returns, which is calculated as the annual stock returns of firm i at time t minus benchmark portfolio return at time t. D_C is the one year change in cash holdings. D_E is the one year change in earnings before extraordinary items. D_NA is the one year change in net assets. D_RD is the one year change in R&D expenses. D_I is the one year change in interest expenses. D_D is the one year change in common dividends. C_L is lagged cash holdings. Lev is the ratio of debt to market value. NF is defined as new financing calculated as net equity issues plus net debt issues. ERMI is the indicator of enterprise risk management of firm i at time t. ICW is the dummy variable; if a firm discloses an internal control weakness then this variable is equal to 1 and 0 otherwise.

b. P value based on robust standard errors is in brackets.

Table 6 Return regressions result of structure changes

	Model A		Model B		Model C	
	SOX	**Post Fin Cris**	**SOX**	**Post Fin Cris**	**SOX**	**Post Fin Cris**
D_C	2.311	1.877	2.322	1.880	2.230	1.964
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_E	0.994	0.288	0.990	0.285	0.990	0.283
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
D_NA	0.253	0.139	0.253	0.138	0.241	0.141
	(0.034)	(0.001)	(0.037)	(0.001)	(0.045)	(0.001)
D_RD	-0.338	-0.560	-0.390	-0.514	-0.366	-0.484
	(0.732)	(0.173)	(0.692)	(0.207)	(0.704)	(0.239)
D_I	-6.186	-0.967	-6.209	-1.042	-6.060	-0.996
	(0.005)	(0.000)	(0.006)	(0.000)	(0.006)	(0.000)
D_D	0.585	0.265	0.552	0.255	0.468	0.218
	(0.002)	(0.176)	(0.005)	(0.189)	(0.024)	(0.187)
C_L	0.242	0.766	0.259	0.766	0.257	0.764
	(0.002)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
Lev	0.039	-0.326	0.046	-0.332	0.042	-0.326
	(0.690)	(0.000)	(0.643)	(0.000)	(0.668)	(0.000)
NF	-0.068	-0.247	-0.063	-0.239	-0.055	-0.240
	(0.674)	(0.020)	(0.702)	(0.022)	(0.733)	(0.021)
CL_DC	-1.235	-0.168	-1.293	-0.179	-1.266	-0.185
	(0.070)	(0.000)	(0.053)	(0.000)	(0.073)	(0.000)
L_DC	-2.036	-1.491	-2.013	-1.412	-2.033	-1.512
	(0.021)	(0.000)	(0.022)	(0.000)	(0.024)	(0.000)
ERMI			0.007	0.002		
			(0.092)	(0.789)		
ERMI_DC			-0.009	0.029		
			(0.913)	(0.296)		
ICW					-0.111	-0.030
					(0.000)	(0.590)
ICW_DC					0.624	**-0.672**
					(0.179)	(**0.024**)
Cons	-0.075	-0.026	-0.079	-0.025	-0.066	-0.025
	(0.000)	(0.286)	(0.000)	(0.313)	(0.000)	(0.294)
F-Value	16.68	67.34	14.26	68.25	16.16	69.62
P-Value	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.246	0.384	0.247	0.385	0.252	0.386
obs	1482	4687	1482	4687	1482	4687

a.Variable definition: Exces_Ret is excess stock return, which is calculated as the annual stock returns of firm i at time t minus benchmark portfolio return at time t. D_C is the one year change in cash holding. D_E is the one year change in earnings before extraordinary items. D_NA is the one year change in net assets. D_RD is the one year change in R&D expenses. D_I is the one year change in interest expenses. D_D is the one year change in common dividends. C_L is lagged cash holdings. Lev is the ratio of debt to market value. NF is defined as new financing calculated as net equity issues plus net debt issues. ERMI is the indicator of enterprise risk management of firm i at time t. ICW is the dummy variable; if a firm discloses an internal control weakness then this variable is equal to 1 and 0 otherwise.
b. P value based on robust standard errors is in brackets.

Table 7 Firm level cash value

	Model A		Model B	
	Coef.	**P-Value**	**Coef.**	**P-Value**
E	-4.143	0.000	-4.189	0.000
dE	2.338	0.000	2.447	0.000
dE 2	1.970	0.000	1.984	0.000
RD	4.799	0.000	4.878	0.000
dRD	2.840	0.000	2.965	0.000
dRD2	5.066	0.000	5.035	0.000
D	1.435	0.793	1.876	0.734
dD	1.167	0.828	0.355	0.948
dD2	1.739	0.706	1.311	0.778
I	-13.888	0.005	-13.659	0.006
dI	11.057	0.000	11.003	0.000
dI2	5.811	0.027	5.954	0.024
dNA	-2.936	0.000	-2.522	0.000
dNA 2	0.066	0.015	0.067	0.014
dMV2	-0.138	0.000	-0.141	0.000
XCash	2.206	0.000	2.343	0.000
ERMI	-0.829	0.000		
ERMI_ XCash	**0.317**	**0.000**		
ICW			-0.953	0.510
ICW_ XCash			0.665	0.402
Cons	0.036	0.957	-0.093	0.892
F-Value	579.76		570.37	
P-Value	0		0	
R-squared	0.835		0.8328	
Number of obs	4086		4086	

a.Variable definition: dX is defined as a change from time t-2 to t. dX2 is defined as a change from time t-2 to t at time t+2. X is defined as a financial variable, which has earnings before extraordinary items (E); R&D expenses (RD); common dividends (D); interest expenses (I); net assets (NA); market value (MV). Xcash is defined as the difference between cash holdings and optimal cash holdings. ERMI is the indicator of enterprise risk management of firm i at time t. ICW is the dummy variable; if a firm discloses an internal control weakness then this variable is equal to 1 and is 0 otherwise.
b. P value based on robust standard errors.

Table 8 Firm level cash value and firm performance

	Model A		Model B	
	Coef.	**P-Value**	**Coef.**	**P-Value**
XCash	-0.117	0.006	-0.121	0.005
ERMI_L1	0.003	0.897		
ERMI _ XCash	**0.022**	**0.021**		
ICW_ L 1			0.241	0.176
ICW _ XCash			**-0.182**	**0.043**
LNNA	0.641	0.000	0.633	0.000
PPE	-1.617	0.000	-1.618	0.000
ROA_L1	0.051	0.000	0.051	0.000
Cons	-3.691	0.000	-3.641	0.000
F-Value	30.08		28.1	
P-Value	0.000		0.000	
R-squared	0.120		0.113	
Number of obs	4712		4712	

a.Variable definition: Xcash is defined as the difference between cash holdings and optimal cash holdings. ERMI_L1 is the indicator of enterprise risk management of firm i at time t-1. ICW_L1 is the dummy variable; if a firm discloses an internal control weakness at time t-1 then this variable is equal to 1 and is 0 otherwise. LNNA is defined as natural logarithm of net assets.PPE is defined as property, Plant, and Equipment of firm i at time t. ROA_L1 is defined as the return on assets of firm i at time t-1.
b. P value based on robust standard errors.

Table 9 Firm level cash value_Robust

mv	Coef.	P-Value	Coef.	P-Value
E	-5.376	0.000	-5.347	0.000
dE	2.406	0.000	2.403	0.000
dE 2	1.838	0.000	1.806	0.000
RD	1.571	0.000	1.669	0.000
dRD	2.750	0.000	2.799	0.000
dRD2	3.911	0.000	3.967	0.000
D	0.234	0.964	0.480	0.926
dD	1.295	0.794	0.932	0.851
dD2	3.834	0.385	3.452	0.435
I	-3.073	0.519	-2.772	0.561
dI	2.687	0.285	3.017	0.231
dI2	4.085	0.066	4.794	0.031
dNA	-4.177	0.000	-4.250	0.000
dNA 2	0.030	0.184	0.026	0.257
dMV2	-0.094	0.000	-0.096	0.000
XCash	19.263	0.000	18.459	0.000
ERMI	-0.309	0.005		
ERMI_ XCash	**0.857**	**0.000**		
ICW			0.360	0.709
ICW_ XCash			-1.419	0.483
Cons	-4.619	0.000	-4.196	0.000
F-Value	878.85		872.86	
P-Value	0.000		0.000	
R-squared	0.882		0.881	
Number of obs	4032		4032	

a.Variable definition: dX is defined as a change from time t-2 to t. dX2 is defined as a change from time t-2 to t at time t+2. X is defined as a financial variable, which has earnings before extraordinary items (E); R&D expenses (RD); common dividends (D); interest expenses (I); net assets (NA); market value (MV). Xcash is defined as the difference between cash holdings and optimal cash holdings. ERMI is the indicator of enterprise risk management of firm i at time t. ICW is the dummy variable; if a firm discloses an internal control weakness then this variable is equal to 1, and is 0 otherwise.
b. P value based on robust standard errors.

Table 10 Firm level cash value and firm performance_Robust

	Coef.	P-Value	Coef.	P-Value
XCash_robust	-0.797	0.000	-0.871	0.000
ERMI_l1	-0.064	0.000		
ERMI _ XCash	**0.220**	**0.000**		
ICW_l1			0.248	0.046
ICW _ XCash			**-0.742**	**0.001**
LNNA	0.597	0.000	0.606	0.000
PPE	-0.977	0.001	-1.023	0.000
ROAL	0.042	0.000	0.044	0.000
Cons	-3.687	0.000	-3.688	0.000
F-Value	38.87		30.52	
P-Value	0.000		0.000	
R-squared	0.159		0.129	
Number of obs	4282		4282	

a.Variable definition: Xcash is defined as the difference between cash holdings and optimal cash holdings. ERMI_L1 is the indicator of enterprise risk management of firm i at time t-1. ICW_L1 is the dummy variable; if a firm discloses an internal control weakness at time t-1 then this variable is equal to 1 and is 0 otherwise. LNNA is defined as natural logarithm of net assets.PPE is defined as property, Plant, and Equipment of firm i at time t. ROA_L1 is defined as the return on assets of firm i at time t-1.
b. P value based on robust standard errors.

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