On the Determinants of Enterprise Risk Management Implementation

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ABSTRACT

Corporate governance failures and new legislation and recommendations have emphasized the importance of control and risk management in reducing agency costs and preventing fraudulent reporting. The objective of this paper is to investigate how a company's board characteristics influence the decision to invest in enterprise risk management. This paper contributes mainly to field of corporate governance research by providing new evidence on the relationship between board characteristics and enterprise risk management. In addition we also suggest a measure to test the quality of enterprise risk management derived from the COSO theoretical paper on enterprise risk management. The main results of this research is that board independence alone does not induce higher enterprise risk management quality, while boards with a separation of CEO and chairman, boards with both an independent board and a separation of CEO and chairman are more likely to adopt ERM.

1. INTRODUCTION

The Enron failure, together with other high profile corporate collapses, has led to a debate concerning the efficiency and the role of corporate governance. These corporate governance failures culminated in the passage of the Sarbanes Oxley Act (SOX) on July 30, 2002, which have emphasized the importance of control and risk management in preventing fraudulent reporting. While strong theoretical arguments exist as to why a firm should employ enterprise risk management (hereafter referred to as ERM), the main drivers for the implementation have been new corporate governance codes.

The purpose of this paper is to investigate how a company's board characteristics influence the decision to invest in enterprise risk management. This paper contributes mainly to field of corporate governance research by first providing new evidence on the relationship between board characteristics and enterprise risk management. In addition we also suggest a measure to test the quality of enterprise risk management derived from the COSO theoretical paper on enterprise risk management.

The main results of this research is that board independence alone has no significant relationship with the enterprise risk management quality, while the separation of CEO and chairman, or the combination an independent board combined with a separation are more likely to adopt ERM. In what follows, we discuss the background and motivation. Then the focus is on the research method that will be used. Finally, we describe in more detail the results.

2. BACKGROUND AND MOTIVATION

Since the corporate scandals and the creation of new corporate governance codes, enterprise risk management has been considered as a valuable element of the corporate governance structure. Since there is a separation between ownership and control, and managers' objectives are not necessarily aligned with those of the organization, managers may have incentives to behave opportunistic (Jensen and Meckling 1976; Watts and Zimmerman 1983). Existing agency theory proposes a series of mechanisms that seek to reconcile the interests of shareholders and managers, including the utilization of internal control mechanisms such as monitoring by non-executive directors (Fama and Jensen, 1983), monitoring by large shareholders (Shleifer and Vishny, 1986), the incentive effects of executive share ownership (Jensen and Meckling, 1976) and the implementation of internal controls (Matsumura and Tucker, 1992). An additional instrument of shareholder monitoring is the statutory audit whereby independent auditors report annually to shareholders on the appropriateness of the financial statements prepared by management (Watts and Zimmerman, 1983). The clear implication for corporate governance from an agency theory perspective is that adequate monitoring or control mechanisms need to be established to protect shareholders from management's conflict of interest – the so-called agency costs of modern capitalism (Fama and Jensen, 1983).

COSO-ERM (2004) defines enterprise risk management as a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risks to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.

In the hypothetical Modigliani and Miller world of corporate finance, risk management does not add value. However, in the non-frictionless environment of the real world, risk management by the firm can create value in one or more of the following ways (Meulbroek, 2002). Risk management can create value: (1) in ways that investors cannot duplicate for themselves; (2) facilitate the risk management efforts of the firm's equity holders; (3) decrease financial distress costs; (4) lower the risk faced by important non-diversified investors (such as managers and employees); (5) reduce taxes; (6) reduce the firm's capital costs through better performance evaluation and reduced monitoring costs; and (7) provide internal funding for investment projects and facilitate capital planning.

While strong theoretical arguments exist as to why a firm should employ enterprise risk management, the main drivers for the implementation have been reports of best practice such as the Joint Australian/New Zealand Standard for Risk Management, Committee of Sponsoring Organizations of the Treadway Commission (COSO) in the U.S. (arising out of control breakdowns in the Savings and Loan industry), CoCo (the Criteria of Control model developed by the Canadian Institute of Chartered Accountants), the Toronto Stock Exchange Dey Report in Canada following major bankruptcies, and the Cadbury report in the United Kingdom.

The purpose of this paper is to investigate how a company's board characteristics influence the decision to invest in enterprise risk management. If enterprise risk management reduces agency costs and improves governance structure, board of directors should be pushing the implementation of enterprise risk management. Two characteristics of the board of directors stand out in the literature as being of the greatest interest for effective corporate governance: independence of the board members and the duality of CEO and Chairman (Willekens and Sercu, 2005).

3. HYPOTHESIS DEVELOPMENT

We consider the relationship between two board characteristics, independence and separation of CEO and chairman and the degree of implementation of enterprise risk management.

Board of Directors

Fama and Jensen (1983) theorize that the board of directors is the highest internal control mechanism responsible for monitoring the actions of top management. Furthermore, Kleffner et al. (2003) investigate the impact of corporate governance recommendations about risk management on the implementation of enterprise risk management amongst Canadian firms. They find that 31 percent of their sample had implemented enterprise risk management (ERM), while 29 percent where at the moment investigating it. The participating companies indicated as most important driving forces behind the implementation the encouragements from the board of directors and the concern for directors' and officers' liability. The study indicates the importance of the demand for effective control and risk

management practices.

Board Independence

In their respective reports on corporate governance, both Cadbury (1992) and Hampel (1998) emphasize the value of increased non-executive representation on boards' suggesting that non-executives are capable of bringing greater independence and impartiality to board decisions. Consistently, Beasley (1996) finds an inverse relation between the percentage of outside directors on the board and the incidence of fraudulent financial reporting. Similarly, Firms with a majority of inside directors are found to be more likely to engage earnings management compared to a control sample matched by industry and size (Peasnell, et al., 2000). Furthermore, non-executives are expected to favor more extensive risk management and (internal or external) auditing in order to complement their own monitoring responsibilities, since they have the objective of identifying and rectifying reporting errors deliberately or otherwise made by managers. In a similar context, O'Sullivan (1997) finds that companies with a higher proportion of non-executive directors are more likely to purchase the monitoring of directors' and officers' insurance compared to boards with a lower proportion of non-executives. This suggests that companies with greater non-executive representation may favor a more comprehensive control, risk management and (internal or external) audit. The incentive of outside directors to prevent and detect such opportunistic reporting behavior by management potentially is driven by three factors:

First, the directors may seek to protect their reputations as experts in monitoring because the market for directors punishes those associated with corporate disasters or poor performance (see Fama and Jensen 1983; Gilson 1989). Second, from a legal liability perspective, directors who fail to exercise reasonable care in discharging their monitoring responsibilities may be subject to severe sanctions (see Gilson 1989). Third, shareholders often suffer significant losses in the wake of financial reporting problems (Beasley et al. 1999), so directors seeking to protect shareholder wealth may seek higher quality controls, risk management and (internal or external) audit.

In order to reduce the likelihood of fraudulent reporting, and opportunistic behavior in general, board could demand investments in higher quality control and risk management practices and/or purchase of higher quality audit services. Numerous studies have reported a positive relationship between the independence of the board and the demand for external audit quality, as measured by the audit fees (O'Sullivan, 2000; Carcello et al., 2002; Hay and Knechel, 2004). Therefore, one may view outside directors as more concerned with the quality of the financial and non-financial reports than are management directors, who face greater conflicts of interest.

HYPOTHESIS 1: *There is a positive relation between the percentage of outside directors on the board and enterprise risk management.*

Separation of CEO and Chairman

The UK Code of Best Practice (Cadbury Committee, 1992) recommends that the positions of chair and CEO should be held by different individuals. In addition, Jensen (1993) points out that when the CEO also holds the position of the chairman of the board, internal control systems may fail, as the board cannot effectively perform its functions including those of evaluating and firing CEOs. Similarly, Fama and Jensen (1983) argue that concentration of decision management and decision control in one individual reduces a board's effectiveness in monitoring top management. There is some evidence in the literature that firms perform better when the CEO and chairman function are separated. Pi and Timme (1993), Baliga et al. (1996) find that firms combining the CEO-chairman titles perform worse than firms that do not combine them.

HYPOTHESIS 2: *There is a positive relation between the separation of CEO and chairman and enterprise risk management.*

HYPOTHESIS 3: *There is a joint positive relation between enterprise risk management on the one hand and board independence and the separation of CEO and chairman on the other hand.*

4. SAMPLE SELECTION

We focus our study on one particular industry to maximize statistical power and because different industries may have different framework and different needs. The sample is composed entirely of firms from SIC code 2834-Pharmaceutical preparations. This industry has been used in previous research (Vanstraelen et al., 2003; Robb et al., 2001). Firms in this particular industry are faced with a wide array of risks and appear to display a sufficient amount of variation in enterprise risk management practices. The pharmaceutical industry is a competitive industry with pressure to perform, generating incentives to cut corners if results are not satisfactory. In addition, the SEC enforcement list contains several pharmaceutical companies that manipulated numbers in response of bad results. Therefore, we believe that focusing on this sector will allow us to study the impact of board characteristics on enterprise risk management. We selected randomly 100 firms, however because of missing data we only retained 75 firms. The data we collect is related to the fiscal year 2003. To assess the quality of enterprise risk management, we use publicly available data, such as 10-K's, proxy statements related to fiscal year 2003 and the company website. All other data is electronically collected via Datastream.

5. RESEARCH METHOD AND DEFINITION OF VARIABLES

We propose an Ordinary Least Squares to test our hypotheses. We test the quality of the ERM against the board characteristics, board independence and separation of CEO and chairman position, firm size, free float, leverage, beta and the auditor.

$$ERM = f(BODI, SIZE, BETA, LEV, DT, EY, KPMG, PWC) \quad (1)$$

$$ERM = f(CEOC, SIZE, BETA, LEV, DT, EY, KPMG, PWC) \quad (2)$$

$$ERM = f(BODI, CEOC, BODICEOC, SIZE, BETA, LEV, DT, EY, KPMG, PWC) \quad (3)$$

Quality of Enterprise Risk Management

We use the COSO (1992, 2004) framework and prior work by Knechel (2002) to define relevant control and risk management procedures and derive an aggregate enterprise risk management measure. We use control and risk management measures which reflect the organization's own assessment of control and risk management efforts. For each company, the annual report was evaluated for information about specific types of controls and risk and related enterprise risk management practices. We consider 7 aspects of ERM, similar to COSO-ERM framework (2004). Similar to Knechel (2002), we expect that the disclosure of control and risk management practises indicates that the organization is very sensitive to the need to identify and manage those specific risks. The measure of enterprise risk management we use is composed out of 91 questions, scoring 1 or 0. The total average score is about 32%, which means that on average firms provide information on 32% of enterprise risk management issues included in our framework.

Independent Variables

A number of typical measures of the quality of the board were included in the model. Consistent with this previous research (e.g. Carcello *et al*., 2002), we examine the following measures of the quality of the board of directors.

- BODI: Percentage of the Board of Directors that are considered to be independent.
- CEOC: Dummy = 0 if the CEO is also the Chairperson of the Board of Directors, 1 otherwise. We attach a positive value to the separation of CEO and chairman.
- BODICEO: Dummy = 1 if both the board is independent and the CEO and Chairman different persons.

Control Variables

- ***Agency costs.*** Agency costs arise from both equity and debt financing. We include free float (FF) to control for agency costs of equity, and leverage (LEV), measured as long-term debt over total assets, as a proxy for the agency costs between a company and its outside debtholders (Watts and Zimmer-

man 1986). Milgrom and Roberts (1992) argue that larger shareholders are possibly more willing and able to play an active monitoring role. Therefore, the agency cost of equity will be higher for firms with high public ownership and hence more need for enterprise risk management.

- ***Size.*** We include firm size, measured by total assets. Company size is associated with both internal and external agency costs (Adbel-Khalik, 1993).
- ***Beta.*** We include a measure for the perceived amount of risk by investors. We hypothesise that firms with high beta risk are perceived to be more risky. This may be because a firm is operating in a more volatile environment.
- ***Audit Firm.*** We believe that audit firms may have an impact on the implementation of enterprise risk measurements. This variable can take 5 different values: Non-Big 4, KPMG, E&Y, D&L and PwC. We take as reference category the non-Big 4 auditors.

6. RESULTS

We first discuss the descriptive statistics. In figure 1, we present and interpret the most important descriptive information for the dependent variable. We observe that firms score well on objective setting and risk identification, while they score weakly on control activities score and monitoring. In addition, we see a large variation in the total enterprise risk management scores between the minimum total score of 2 and a maximum of 75, with 67% of the observations between 17 and 41.

Next, we present descriptive statistics for the test and control variables. On average the pharmaceutical firms have large boards (an average of 8 members). The average board independence is around 73% and in the majority of the cases the CEO occupies the seat of the chairman of the board (contrary to corporate governance recommendations).

The pharmaceutical firms are on average relatively large, with a mean of 6802 million dollars of assets. Furthermore, the average firm has more than 50% of its shares are publicly traded. The average market risk (beta) is 1,57 time higher compared to the overall stock exchange and on average 18% of the total assets consist of long term debt.

High correlation amongst independent variables could affect the significance level of the variables. We checked for multicollinearity and found no problem (value of VIF of 2,34). We first test the relationship between ERM implementation and board independence, subsequently the relationship between ERM and separation of CEO and chairman and finally the relationship between ERM the combination of independence with separation as test variable. We depict the results in figure 3.

We see that our proposed models are all significant and explain between 30% and 38% of the variance in the dependent variable. The first model, with board independence as test variable is strongly significant, but board independence does not help to explain the variance in the dependent variable significantly. Therefore we can not reject hypothesis 1. Besides, we conclude from the first model that all control variables show the expected sign, except the leverage. We expected a positive relationship rather than a negative. Leverage and the beta risk are weakly significant, while firm size and the KPMG auditor are highly significant. Free float, Deloitte, Ernst & Young and PwC show a non-significant relationship.

In the second model, we introduce the separation of CEO and chairman as test variable. We predicted a positive sign, given that it takes 0 if there is no separation and 1 if there is separation. The model now explains more of the variance in the dependent variable, with an adjusted R^2 of 28% and is highly significant ($p < 0,00$). The test variable is highly significant ($p < 0,00$) and positive, indicating a positive relationship between enterprise risk management practices and the separation of the CEO and chairman. In contrast to board independence, the separation of CEO and chairman has a positive influence on the adoption of ERM practices. It may be that the board independence shows no results because the board operates differently when the CEO is also the chairman. Jensen (1993) points out that when the CEO also holds the position of the chairman of the board, internal control systems fail, as the board cannot effectively perform its key functions including those of evaluating and firing CEOs. Similarly, Fama and Jensen (1983) argue that concentration of decision management and decision control in one individual reduces a board's effectiveness in monitoring top management.

Furthermore, we investigate the influence of an independent board with a separation of CEO and chairman on the adoption of internal control measures. We obtain a slightly improved model, compared to model 2. The test variable is highly significant. From the results above we conclude that the separation of CEO and Chairman plays an important role in the adoption of enterprise risk management. In addition, model 3 tests whether there is an interaction effect between the separation of the CEO and chairman and an independent board work even better.

Figure 1. Descriptive statistics of enterprise risk management scores

	average	max score	median	min	Max	st dev	average %
Internal environment	5,12	17,00	5,00	0,00	14,00	3,21	0,32
Objective setting	2,64	6,00	3,00	0,00	6,00	1,21	0,44
Risk identification	11,75	25,00	11,00	0,00	23,00	3,86	0,47
Risk response	6,50	25,00	6,00	0,00	21,00	4,13	0,26
Control activities	1,53	9,00	1,00	0,00	7,00	1,65	0,17
Information and communications	0,84	3,00	1,00	0,00	3,00	0,69	0,28
Monitoring	0,65	5,00	0,00	0,00	3,00	0,85	0,13
Total score	29,03	91,00	23,50	2,00	75,00	11,65	0,32

Figure 2. Descriptive statistics of test and control variables

	Var	mean	median	st dev	min	max
Board size		8,47	8,00	2,80	5,00	20,00
Number of independent member in the board		6,24	6,00	2,68	1,00	18,00
Board independence (%)	BOD-I	72,6%	76,4%	16,8%	0,0%	100%
Number of executives in the board		1,79	1,00	1,17	0,00	7,00
Percentage of executives in the board		21,9%	16,7%	13,6%	0,0%	70,0%
CEO = CHAIR	CEOCHR	54,3%				
Total assets (in million $)	TA 2003	6801,92	229,898	17,74	2,179	117000
Free float	FF	57,5%	52,0%	21,4%	13,0%	99,0%
Beta	BETA	1,57	1,27	1,08	0,43	3,22
Leverage	LEV	18,3%	7,3%	23,6%	0,0%	87,9%

Figure 3. Regression results: ERM explained by board characteristics

		Model 1	Model 2	Model 3
C		-4,45 (-.442)	-14,693 (-1,54)	-9,563 (-1,43)
BOD-I	+	1,47 (,158)		-8,27 (-.950)
CEOCHR	+		7,911*** (2,72)	-5,301 (0,22)
BOD-I CEOC	+			26,552*** (2,997)
FF	+	2,402 (,268)	6,246 (1,000)	6,146 (1,047)
LEV	+	-9,941* (-1,748)	-9,102* (-1,699)	-8,434 (-1,645)
SIZE	+	1,765*** (3,105)	2,278*** (4,118)	2,227*** (4,172)
BETA	+	1,500* (1,047)	1,366* (1,795)	1,393* (1,799)
D&T	?	3,804 (1,134)	2,230 (,788)	2,006 (,745)
E&Y	?	4,011 (1,505)	3,315 (1,127)	2,990 (1,034)
KPMG	?	11,641*** (2,876)	13,06*** (3,66)	14,29*** (3,889)
PwC	?	-1,472 (-.351)	-4,812 (-1,16)	-3,435 (-.814)
R^2		,296	,360	,394
adj R^2		,198	,280	,298
Prob(F-stat)		,004	,000	,000

We observe that the board independence and separation of CEO and chairman become insignificant, while the interaction term is highly significant. It seems that it is important to combine a separation of CEO and chairman with an independent board to stimulate enterprise risk management adoption. Our results are in line with the results from Kleffner et al. (2003) which indicates the importance of the board in stimulating the adoption of control and risk management measures. We repeated the analysis using an equally weighted measure for enterprise risk management quality and obtain very similar results.

7. CONCLUSION

The paper analyses how board characteristics are related to the adoption of enterprise risk management. We found that board independence alone has no significant relationship with the ERM quality. The separation of the CEO and the chairman and the combination of an independent board with a separation of CEO and chairman, however are significantly related to the adoption of ERM. Firms with a separation of CEO and chairman, or firm with an independent board combined with a separation are more likely to adopt ERM. Given that board members have incentives to promote ERM in order to reduce own responsibility, our results indicate the importance of the separation of CEO and chairman in the adoption of enterprise risk management.

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