



## **Assessing the Effects of Corporate Governance on Enterprise Risk Management and Firm Value: Malaysian Evidence**

ENNY NURDIN SUTAN MARUHUN<sup>a\*</sup>, WAN RAZAZILA WAN ABDULLAH<sup>b</sup>  
AND RUHAYA ATAN<sup>b</sup>

<sup>a</sup>*Faculty of Accountancy, Universiti Teknologi MARA , Perak Branch, Tapah Campus, Malaysia*

<sup>b</sup>*Accounting Research Institute, Universiti Teknologi MARA, Shah Alam, Malaysia*

### **ABSTRACT**

Corporate governance has been the subject of increasing interest following the 2008 global financial crisis. As a response to the crisis, Enterprise risk management (ERM) was introduced globally. Despite the claim that ERM is the solution for corporate governance deficiency, particularly in risk management practices, the number of empirical research studying this new field is still limited. Therefore, the current study has four research objectives that are; (i) to assess the extent of ERM practices, (ii) to identify corporate governance characteristics that influence ERM implementation (iii) to examine the association between ERM and firm value and (iv) to propose and develop the dimensions that can effectively measure ERM implementation. Eighty-one usable questionnaires were successfully collected and analysed using Partial Least Squares structural equation modeling method (PLS-SEM). The results of this study support that corporate governance characteristics (board size and board expertise) have a positive and significant association with ERM implementation. However, there is no significant evidence on the association between ERM and firm value. Therefore, the findings of this study will enable companies to have better understanding on corporate governance characteristics that influence ERM implementation and its effect towards firm value. The ERM index developed in this study will help companies and regulators to formulate better corporate governance and ERM practices.

**JEL Classification:** M30, M41,

**Keywords:** Corporate governance; Enterprise risk management; Firm value; Partial Least Squares; Structural Equation Modeling

---

*Article history:*

Received: 21 June 2018

Accepted: 21 November 2018

---

## INTRODUCTION

The 2008 global financial crisis has intensified and refocused interest on risk and the environment of systems that operate to manage those risks. Risk is an event that managers need to face in order to gain profit and avoiding risk means giving up the opportunity to gain profit. Thus, manager needs to manage factors that stimulate risk so that they can pursue strategic advantage and opportunity arises from the risks (Miccolis and Shah, 2000). Corporate risk management is a vital activity to ensure business sustainability, which in the era of globalization, organizations have to encounter a myriad of risks that sometimes is beyond their control. Therefore, an effective risk management system is imperative for organization to be successful and sustained in today's challenging business world.

The financial crisis has increased the pressure on the board of directors and top management in improving corporate governance practices such as enhancing effectiveness of internal control systems particularly emphasizing on the importance of risk management to achieve effective governance and control (Sutton, 2006; Desender, 2007). Many critics blamed weak corporate governance as one of the factors that causes major failure in risk management and as a contributing factor to the collapse of many major corporations in the fiasco. Recuperating from the effects of corporate debacles, policymakers and stakeholders are demanding greater oversight from organizations especially from the board of directors (BODs) and top management for managing key risks that are facing the business. Senior managers need to take more responsibility in managing corporate risks.

Active involvement of the BODs and top management in managing corporate risks is important to ensure the shareholders' value that was diminished during the crisis is preserved and enhanced. Among the well stated goal of the board's is to maximize the firm's value (Blanchard and Dionne, 2003). Therefore, corporation needs to transform its risk management technique from silo-based approach to holistic approach. Enterprise risk management (ERM) was introduced as a response to an increasing pressure received by firms to manage risks comprehensively (Lundqvist, 2014). ERM has been proposed as a new mechanism in predicting risks and helping companies achieve their goals (Arena et al., 2011).

Despite the claim that ERM is the solution for corporate governance deficiency particularly in risk management practices and its potential of value creation, the number of empirical research studying this new field is still limited. Empirical research describing the extent of ERM implementation, firm's characteristics that influence the implementation and its association with firm value is still lacking (Kleffner et al., 2003; Liebenberg and Hoyt, 2003). Pagach and Warr (2011) argue that little effort has been put in investigating firm's characteristics that influence the firm's decision in implementing ERM. Beasley et al. (2005) highlight that academics need to provide insights into firm's characteristics that influence some companies to response to the changing risk profiles by embracing ERM while others are not. Furthermore, the review of literature has identified that difficulty in measuring ERM implementation and lack of an efficient and robust measurement of ERM is the main deterrent to research in this area (Beasley et al., 2008; Gordon et al., 2009; Liebenberg and Hoyt, 2003; McShane et al., 2011).

Therefore, the current study has four research objectives that are; (i) to assess the extent of ERM practices, (ii) to identify corporate governance characteristics that influence ERM implementation (iii) to examine the association between ERM and firm value and (iv) to propose and develop the dimensions that can effectively measure ERM implementation. This study focused on ERM practices by Malaysian public-listed companies (PLCs).

The data obtained was analysed by using the Partial Least Squares Structural Equation Modeling method (PLS-SEM). Using data of 81 firms that implementing ERM, this study reveals that a majority of the companies surveyed have ERM in place at the moderate level. The results indicate that board size and board expertise are the significant determinants of corporate governance that influence ERM implementation among Malaysian PLCs. Empirical results show that the two variables are positively and significantly related to ERM practices by the firms. However, no significant association between ERM and firm value were observed. Overall, results of this study, demonstrate that corporate governance is an important determinant of ERM implementation. However, the data failed to support the hypothesis that firms, which practice ERM would have a higher firm value.

The findings of this study provides an additional empirical evidence regarding the extent of ERM practices, association between ERM practices and firm value and factors that influence the adoption of ERM by Malaysian

public-listed firms. This study proposed and developed Enterprise Risk Management Index (ERMDi) as a comprehensive measurement of ERM implementation. The ERMDi developed in this study could help practitioners to understand the benefits of managing risks holistically. Academics may use ERMDi as an ERM construct measurement in their empirical research.

## REVIEW OF LITERATURE

### Risk Management and Enterprise Risk Management

Risk management is a continuous process which is practised across a series of the activities where firms systematically deal with risk attaching to their activities in order to minimize the negative impact of the risks and thus, achieve firm objectives (Collier et al., 2006; Knechel, 2002). Traditionally, risk management programs focus on eliminating downside exposures and a system to reduce the potential adverse effects of risk phenomena (Andersen, 2008). However, there has been a paradigm shift in risk management discipline due to new challenges and sophistication in the types of risks that have arisen which require firms to enhance its risk management practices. Inevitably, organizations need to change their risk management approach from silo based to holistic based perspective.

This new risk management technique is known as Enterprise Risk Management (ERM). ERM, which is an evolving concept of risk management has various definitions. The most cited ERM definition in the literature is by the Committee of Sponsoring Organisations of the Treadway Commission (COSO). In 2004, COSO issued the ERM-Integrated Framework as a guideline for firms when implementing ERM. COSO (2004) defines ERM 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” (p.8).*

Three fundamental concepts highlighted in COSO’s definitions are: (i) ERM is a process which affects people at all levels of a firm, (ii) it is directly related to the firm’s strategy in order to achieve its objectives and, (iii) ERM is a value-creating process (Frigo and Anderson, 2014). The main premise of ERM is focusing on achieving firm’s objectives through a holistic approach of risk management and its ultimate goal is to increase stakeholders’ value.

### Corporate Governance and Risk Management

An increasing trend of high profile corporate failures has led to the debate concerning the effectiveness of corporate governance function in helping organizations to survive a myriad of risks that they are facing. The rising expectations from the stakeholders have put pressure on corporations to assess the quality of their corporate governance and the overall response to business risk (Tonello, 2007). Due to this development, the awareness on risk is growing and organizational practices have increasingly become organized around risk.

The theoretical foundation governing corporate governance is agency theory proposed by Jensen and Meckling (1976), that describe a firm as “a nexus of contracting relationships” between one agent (the CEO) and multiple principals (shareholders, creditors, employees, clients) and refer to the corporate governance problem as a “common agency problem” that involves the contracting parties. In order to reduce corporate governance problems, firms need to implement an effective corporate governance mechanism. The main objective of having corporate governance mechanism is to ensure that managers will strive to achieve outcomes that are in the shareholders' interests (Shleifer and Vishny, 1997). These mechanisms help to reduce agency problem and bring the interests of the managers in line with the shareholders. Other mechanisms that can alleviate corporate governance problem is an efficient risk management system (Walsh and Seward, 1990).

Corporate governance and risk management are linked together to assist how organizations can better understand the risks, improve and deliver its objectives and mitigate, assess, and manage risk in an appropriate manner (Zahiruddin and Norlida, 2013). Risk management is an important mechanism in achieving organization’s objectives and monitoring agent performance (Demidenko and McNutt, 2010). Therefore, ERM

is an important mechanism in the firm governance framework that can be used as a monitoring or controlling mechanism in aligning the principal-agent relationship to reduce agency problem.

Malaysian government has been the key driver in fostering good corporate governance in Malaysia. Among initial action taken to overcome the limitations in good governance practices was introducing the Malaysian Code on Corporate Governance (MCCG) in year 2000. Since its initial release, MCCG has been revised several times; the first revision was released in 2007 as a response to changing stakeholder expectations and as a way to enhance the corporate governance systems in Malaysia. The second revision of the Code was released in year 2012, which focused on strengthening board structure and its composition in recognising the role of directors as active and responsible fiduciaries. The MCCG 2012 starts focusing on risk management practices by firms. Principle 6, Recommendation 6.1 of the MCCG 2012 clearly stated that the board should establish a sound framework to manage risks (MCCG 2012). MCCG 2012 is a major improvement for risk management practices in Malaysian PLCs because now risk management is considered as an important activity that is monitored at board level. Therefore, this study will assess the practices of ERM by Malaysian PLCs after the issuance of the MCCG 2012.

### **Issues on ERM Dimension**

Past empirical researches have yielded inconclusive findings regarding the value creation potential of ERM. Lundqvist (2014) argues that the main cause of the mixed findings is partly due to flaws and inconsistencies in the method used to measure the ERM construct. The lack of a suitable and comprehensive dimension available to measure ERM construct is one of the obstacles in researching in this area (Beasley et al., 2008; Gordon et al., 2009; Liebenberg and Hoyt, 2003; McShane et al., 2011; Pagach and Warr, 2010). Inconclusive findings in ERM research are mainly due to different dimension used in measuring ERM and therefore, it is important to have a robust measurement that can measure ERM construct comprehensively. Firms rarely publish comprehensive information about their current risk management practices (Gatzert and Martin, 2015). The reason why firms do not disclose the information on their risk management practices to the public is due to the sensitivity and competitive value of the information.

Currently, firms only disclose minimal information on risk management which focus on the discussion as it relates to specific risks. Under these circumstances, it is difficult for researchers to assess the level of ERM implementation by evaluating firms' reports. As a result, many of the previous empirical studies have only used the appointment of a Chief Risk Officer (CRO) as a signal of ERM adoption (see, e.g. Golshan and Siti Zaleha Abdul Rasid, 2012; Liebenberg and Hoyt, 2003; Pagach and Warr, 2011). However, CRO appointment as a dimension of ERM has received many criticisms from scholars and the key limitation of this proxy is that it fails to measure comprehensively the extent to which a firm actually embraces ERM. Using a simple proxy such as a CRO appointment is not suitable since hiring a CRO is not a true and robust measurement that accurately represents a well-implemented and effective ERM system. Therefore, to measure the extent of ERM practices by Malaysian PLCs, this study proposed and developed a comprehensive and efficient measurement of ERM, which is named as Enterprise Risk Management Dimension Index (ERMDi).

## **HYPOTHESES DEVELOPMENT**

### **Theoretical Framework**

Figure 1 illustrates the theoretical framework of this research. The theoretical framework is developed based on the agency theory as one of the main theories that relates to corporate governance practices and encourages ERM implementation (Fama and Jensen, 1983; Jensen and Meckling, 1976; Subramaniam, 2006).

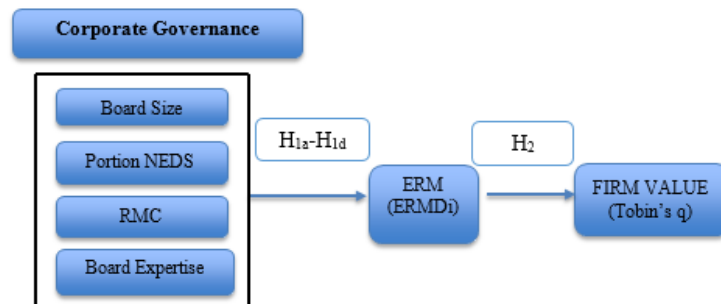


Figure 1 Theoretical Framework

### Agency Theory and ERM

Agency theory is the theory underpinning the relationship between corporate governance, ERM and value creation. In general, agency theory aligns the relationship between the agent and the principal because in the modern corporation, in which share ownership is widely held, managerial actions depart from those required to maximize the shareholders' returns (Donaldson and Davis, 1991). Agency theory specifies mechanisms which reduce agency (Eisenhardt, 1989). These include incentive schemes for managers, which reward them financially for maximizing shareholder interests. To mitigate agency problem, Subramaniam (2006) states that the principal needs to take several strategies that involve either monitoring the agent's behaviour or providing incentives that align the agent's behaviour with the principal's interests. These strategies are important because according to Jensen and Meckling (1976), managers will not act to maximize the returns to the shareholders unless appropriate governance structures are implemented to safeguard the interests of shareholders.

Donaldson and Davis (1991) argue that a major structural mechanism to curtail managerial "opportunism" is the corporate function, which is the board of directors. The board of directors is usually considered as one of the most important mechanisms that provide a monitoring of managerial actions on behalf of the shareholders. The principal role of a board of directors is to represent the interests of the firm's stockholders and the board's goal is to maximize the firm's value (Blanchard and Dionne, 2003). Corporate governance and ERM are two interrelated and interdependent components in an organization. The stability and the improvements of the company's performance are highly depended on the effective roles of both components (Norlida et al., 2010). Bowling and Rieger (2005) argue that ERM could provide a solid foundation upon which firms can enhance corporate governance and deliver greater shareholder value.

### Corporate Governance Characteristics

The second research objective of this study aims to determine corporate governance characteristics that can influence firm's decision to implement ERM. The board of directors is one of the most important governance mechanism ensuring that managers pursue the interests of shareholders. Thus, four corporate governance attributes specifically board characteristics that are board size, proportion of non-executive directors (NEDs), Risk Management Committee (RMC) and board expertise are examined as the possible determinant of ERM implementation.

### Board Size

Board size is claimed as one of the corporate governance characteristics that influences ERM implementation. Larger board size is believed to enhance the institutional and governance functions of the board. It is argued that expanding the size of the board increases expertise and resources in the organization. Board size can have both positive and negative effects on board performance. Larger boards are more difficult to coordinate and may experience problem with communication and organization (Norhayate et al., 2011). However, it has been suggested that larger boards can enhance corporate governance by reducing CEO domination.

Large boards are likely to resist managerial domination and present shareholders interest and more actively involved in monitoring and evaluating CEO and company performance (Ling et al., 2014). Kleffner et al. (2003) examined characteristics of Canadian companies and their ERM adoption status. They found that companies adopting ERM claimed that boards' encouragement as one of the important driver of ERM implementation. In

this context, the size of boards might influence the level of ERM adoption. Therefore, this study posited that large boards can encourage firms' decision on ERM implementation. As such, below hypothesis is proposed:

*H1a: There is a positive relationship between the board size and the extent of ERM implementation.*

### **Non-Executive Directors**

Corporate governance report issued by OECD (2004) emphasize the importance of having increased number of non-executive representation on boards' suggesting that non-executives are capable of bringing greater independence and objectivity to board decisions. Non-executive directors (NEDs) are independent directors and their main responsibility is monitoring the actions of the CEO and executive directors (Weir and Laing, 2006). According to agency theory, there is possibility that management may undertake actions that will favour their own interests instead of the shareholders, therefore, the presence of NEDs on the board will ensure that there would not be any divergence of interests between the two parties (Hairul and Hafiz, 2015). Thus, this study hypothesized that the board with a large proportion of NEDs is likely to implement ERM programme because of its link to firm value.

*H1b: There is a positive relationship between the proportions of non-executive directors (NEDs) and the extent of ERM implementation.*

### **Risk Management Committee**

The role of board of directors in risk oversight has begun to catch the attention of market participants and it is suggested that the role of the board should be broadened to include monitoring risk management policies, practices, and performance. Risk Management Committee (RMC) is a board level committee that is set up to take the responsibility as risk management oversight in an organization (Brown et al., 2009). RMC plays a key role in developing firm's ERM, cultivating a risk culture such as evaluating risk associated with corporate strategies, defining risk appetite of the company, and ensuring that appropriate resources are devoted to risk identification, avoidance, and mitigation (Harner, 2010; Yatim, 2010).

Hines and Peters (2015) describe RMC as a governance mechanism designed to manage various risks within a firm's risk appetite and to identify potential events that may negatively impact the firm. The establishment of RMC would provide the board with direct contact with ERM at the group management level, thus giving director's detailed insight into the business and its associated risks as well as the risk management strategies employed (Brown et al., 2009). It is argued that the boards that establish a RMC demonstrate their commitment to strengthen corporate governance and internal control environment of their firms. As such, RMC may influence the extent of ERM implementation by firms. It is expected that companies that have established RMC more likely to support the implementation of ERM. The discussion above leads to the following hypothesis:

*H1c: There is a positive relationship between the formations of Risk Management Committee (RMC) and the extent of ERM implementation.*

### **Board Expertise**

One of the key responsibilities of the board is to ensure the soundness of risk management and to determine the firm's overall risk tolerance and risk policies. In order to fulfil their responsibilities, boards should comprise members with diverse background and skills, who as a group provide an appropriate balance and diversity of skills, experience, gender and knowledge of the company (OECD, 2014). Board expertise is important in assuring that the oversight role of the board of directors is effectively discharged. Therefore, board expertise is claimed to be a determinant of ERM. Outside directors ensure their reputational capital is secured as the board of directors is committed to strengthening the overall governance and control environment of the firms (Yatim, 2010).

Board of directors with specific expertise such as in accounting or finance would have the skills to identify, analyse and communicate management information for planning, controlling, measuring performance and making decisions and should, therefore, be able to help in developing the techniques for ERM implementation (Siti Zaleha et al., 2011). Therefore, it is expected that boards with greater board expertise are likely to be more

supportive of the implementation of ERM. Thus, based the above arguments the following hypothesis is posited:

*H1d: There is a positive relationship between the board expertise and the extent of ERM implementation.*

### **ERM and Value Creation**

Beasley et al. (2008) assert that albeit the significant rise in the number of organizations implementing ERM, little is understood about the relation between ERM and value creation. The main goal of ERM is to create value, which will essentially increase the firm and shareholder value. ERM increases the firm value by reducing inefficiencies inherent from the traditional risk management (TRM) practices, improving capital efficiency, stabilizing earnings and reducing costs of capital for external funding (Liebenberg and Hoyt, 2003). Nowadays, corporations have realized that risks are no longer merely hazards to be avoided but, in many cases, opportunities to be embraced. It is argued that risks create opportunities and opportunities create value, which ultimately creates shareholders' wealth. However, the most important matter is how to manage risks in order to derive the value (KPMG LLP, 2001).

The paradigm shift in risk management practices has resulted in the progress of ERM which as a result has shown evidence in the shift of focus on risk management research. Nowadays, scholars are concentrating on examining the holistic risk management practices, as well as ERM and its value creating capability. Gordon et al. (2009) argue that the relation between ERM and firm performance is contingent upon the appropriate match between ERM and the specific factors affecting a firm that are environmental uncertainty, industry competition, firm size, firm complexity, and board of directors' monitoring. Hoyt and Liebenberg (2011) examined the extent of ERM practices and value implications of the program among insurer companies. Using Tobin's Q as a proxy of firm value, they have found a positive association between ERM and firm value.

Meanwhile, Pagach and Warr (2010) studied the effect of ERM adoption on firms' long-term performance. The findings show that some firms that are adopting ERM experienced a reduction in earnings volatility. However, in general the study failed to find support for the notion that ERM is value creating. Izah and Ahmad Rizal (2011) are amongst the pioneer researchers who have assessed ERM practices in the Malaysian scenario. However, this study does not find support for the hypothesis that firms practicing ERM have a higher value than firms that do not. The findings from previous studies have led to the following hypothesis:

*H2: There is a positive relationship between the extent of ERM implementation and firm value.*

## **RESEARCH METHODOLOGY**

This study is concentrated on assessing the extent of ERM implementation, identifying factors or determinants that influence the level of ERM implementation and examining the association between ERM and firm value. The extent of ERM implementation was measured using Enterprise Risk Management Index (ERMDi) that was developed in this study. ERMDi was developed due to limitation or issues highlighted in previous studies with regard to ERM measurement. Therefore, it is vital to develop an effective and comprehensive dimension of ERM before following steps can be undertaken.

### **ERMDi Development Process**

The instrument development process is an intensive, theoretical and empirical process, which is employed to generate a reliable and valid set of instrument items for a given construct of interest. The objective of an instrument development process is to produce a set of instrument items that is conceptually sound, reliable, and valid when used to measure the intended construct. ERMDi is proposed as an instrument that can measure ERM implementation comprehensively.

The instrument development process in this study followed a step-by-step guidelines recommended by Mackenzie et al. (2011) and Lewis et al. (2005). Lewis et al. (2005) argue that an instrument development is a critical process particularly in a new research area where the existence of validated instruments is limited. The instrument development process began with an extensive literature review, followed by content adequacy

assessments to ensure that a valid and reliable instrument items are produced. The process started with a clear theoretical specification of the ERM construct which included defining the construct, and specifying its premise (purpose) and theoretical domain, as well as the dimensions.

The propose dimension was operationalized by incorporating the important elements and effectiveness of risk management practices as specified in literatures, specifically in COSO's ERM-Integrated Framework (2004) and ISO 31000:2009. ERMDi consists of eight principal dimensions that are measured initially through 44 items deemed important and relevant in assessing the extent of ERM implementation. The eight interrelated dimensions of ERM are namely, (i) internal environment, (ii) objective setting, (iii) event identification, (iv) risk assessment, (v) risk response, (vi) control activities, (vii) information and communication, and (viii) monitoring.

Four critical processes were undertaken to develop ERMDi that are; Stage 1: Conceptualization of the Construct; Stage 2: Development of Measures; Stage 3: Model Specification; and Stage 4: Pilot Test. The objective of conducting pilot test in this study is to assess the effectiveness of ERMDi as measurement of ERM implementation before the tool is used in the final data collection process. The effectiveness of ERMDi as measurement of ERM is tested using a survey questionnaire. Statistical results of the pilot test established that 41 indicators that measuring eight principal components of ERM shows a satisfactory result of reliability and validity thus the 41 indicators are used in the final data collection process. Table 1 presents the description of eight principal dimensions included in ERMDi and the initial 44 items measuring each of the dimension.

Table 1 Description of ERMDi Dimensions and Number of Items

No	Dimension	Description	Item
1.	Internal Environment	How risk is viewed and addressed by the entity's people, including risk management philosophy, integrity, ethical values and the environment in which they operate.	7
2.	Objective Setting	ERM ensures that objectives are set at the strategy level and the chosen objectives support, align with the entity's mission and vision, and are consistent with firm's risk appetite.	5
3.	Event Identification	Internal and external events affecting achievement of an organization's objectives are identified and distinguished between risks and opportunities.	5
4.	Risk Assessment	Risks are assessed from two perspectives which have the likelihood for risks to occur and impact on the firm, should risk takes place, as a basis for determining how it should be managed.	5
5.	Risk Response	Having assessed relevant risks, firms determine how they will respond. Responses include risk avoidance, reduction, sharing and acceptance.	5
6.	Control Activities	Policies and procedures are established and implemented to ensure the risk responses are effectively carried out.	5
7.	Information and Communication	Significant information is identified, captured, and communicated in a form and time frame that enables people to carry out their responsibilities.	6
8.	Monitoring	ERM process is monitored by assessing the presence and functions of its components over time.	6
<b>Total</b>			<b>44</b>

### Measurement of the Variables

Theoretical framework of this study shows that firm value serves as a dependent variable (endogenous) variable and firm value is measured using Tobin's Q. Endogenous variables are variables that serve as dependent variables or both independent and dependent variables in a structural model; hence, in this study ERM is an endogenous variable (Hair et al., 2017). In the structural equation modeling, ERM serves as both endogenous exogenous variables. ERM implementation acts as an endogenous variable where the extent of ERM implementation is influenced by exogenous variables, i.e. board size, RMC, non-executive directors and board expertise. On the other hand, ERM act as an exogenous variable where the extent of ERM implementation influenced firm value. Table 2 depicts detail of variables measurements used in this study.



Table 2 Summary of Variables, Measurement, and Sources

Variable Name	Proxy/Measurement	Sources
<b>Endogenous Variable</b>		
Firm Value	Tobin's Q = (MVE + Preference Shares + Debt) / TA	Adapted from Chung and Pruitt (1994)
<b>Exogenous/ Endogenous Variable</b>		
ERM Implementation	Ordinal variable based on degree of agreement/disagreement on ERM implementation. Measured using ERMDi	COSO (2004) ISO 31000:2009 Kleffner et al., (2003) Beasley et al., (2005)
<b>Corporate Governance Variables :</b>		
• Risk Management Committee (RMC)	RMC measured using a dichotomous variable coded as 1 = the existence of a RMC and 0 = no RMC.	Subramaniam et al., (2009)
• Proportion of non-executive directors	Measured as the number of non-executive directors divided by the total number of directors on the board.	Beasley et al., (2005)
• Board size	Measured as the total number of directors in the board.	Subramaniam et al., (2009)
• Board expertise	Measured as the number of directors that has expertise in accounting or finance divided by the total number of directors on the board.	Huang et al., (2008)

### Sample

The sample used for testing the hypotheses in this study consists of Malaysian PLCs with financial year ended by December 2012. This sample was chosen because in 2012, the Malaysian Code on Corporate Governance (MCCG) was revised, focusing on risk management practices by firms. The first batch of firms that would be required to report its extent of compliance with the MCCG 2012 were those with financial year ending 31 December 2012. The Code is incorporated into the Bursa Listing Requirements and it is applied to all PLCs in Malaysia. As such, this study wants to assess the extent of ERM implementation by Malaysian PLCs after the revamped of MCCG in year 2012.

The sample population is limited to publicly traded companies because they are typically large companies that have large operations and are more likely to implement ERM programmes. The population of this study was chosen following the suggestion by Beasley et al. (2005). They state that the size of the company is associated with the extent of ERM adoption because, given the resources required to embark on an ERM journey, publicly traded companies are more likely to make this investment. Samples were selected from the population using simple random sampling method and the final sample comprises of 201 Malaysian PLCs companies from seven industries.

### Data Collection

This study employed two types of data, which are primary data; collected through survey questionnaire and secondary data that is obtained from company's annual reports. The main objective of collecting primary data is to assess the extent of ERM implementation among Malaysian PLCs. On the other hand, secondary data was used to operationalize the variables that are RMC, proportion of non-executive directors, board size, board expertise and firm value. The secondary data was gathered from companies' published annual reports. Survey questionnaires are constructed according to ERMDi developed earlier where the dimensions have been transformed into questions that would assess the level of ERM implementation of each dimension based on a seven-point Likert scale ranging from one (strongly disagree) to seven (strongly agree).

The structured questionnaire was administered through a web-based survey software package. Data-collection phase for survey commenced in July 2013 and ran for a period of 4 months. The survey was sent to personnel responsible for risk management activities in the organization that are chief risk officer (CRO), accountant, management accountant, and internal audit officers. At the end of the data collection period one hundred and five responses were received. However, twenty-four were rejected and removed from the sample because the respondents left a substantial number of questions unanswered. Therefore, the final usable sample consists of eighty-one respondents. Upon completion of primary data collection, the next process was collecting secondary data from companies' annual reports. Secondary data was collected only for those companies that responded to the survey. This is to ensure the consistency of data collected i.e. primary and secondary data were came from the same companies.

## RESULTS AND DISCUSSION

### Data Screening

Prior to an advanced data analysis, exploratory data analysis has been conducted to ensure that data are complete and ready for use in further analysis process. Among important procedure undertaken in data screening process is checking for outliers and normality of data. This study uses Kolmogorov-Smirnova and Shapiro-Wilks tests for data normality test. The Kolmogorov-Smirnova and Shapiro-Wilks tests are designed to test normality by comparing the data to a normal distribution with the same mean and standard deviation as in the sample Hair et al. (2014). A non-significant result of Kolmogorov-Smirnova and Shapiro-Wilks (Sig. value of more than .05) indicates normality (Pallant 2011). Table 3 shows normality test results.

Table 3 Results of Normality Test

Variable's Name	Kolmogorov-Smirnova (Sig.)	Shapiro-Wilks (Sig.)
Tobin's Q	.001	.000
ERM	.005	.000
Board Size	.000	.004
Portion of NEDs	.000	.000
RMC	.013	.022
Board Expertise	.000	.000

Kolmogorov-Smirnova and Shapiro-Wilks tests show significant values for all the variables that signify non-normal data distribution. Therefore, this study employed PLS-SEM as a method of analysing data because PLS-SEM is a nonparametric statistical method that does not require the data to be normally distributed.

### Analysis on the Extent of ERM Implementation

To examine the depth of ERM practices penetration among the sample firms, this study analysed the frequency distribution of mean scores for the summated scales of eight dimensions of the ERM implementation intensity metric provided by the firms through questionnaires. The extent of ERM implementation was measured by descriptive statistics (means and standard deviations) computed based on the data collected from the questionnaire by using seven-point Likert scale of 1=strongly disagree to 7=strongly agree.

The respondents are rated into three categories that are (i) high extent of ERM implementation, (ii) moderate extent of ERM implementation, and (iii) low extent of ERM implementation. Respondents are classified using semantic scale adapting from the scale used in Lai and Fazilah (2010). Respondents that have the mean scores ranging between 6 to 7 are categorized as high extent, the scale ranging 4 to 6 is categorized at moderate extent and the scale ranging from 1 to 3 is categorized a low extent of ERM implementation. Table 4 summarizes the result of frequencies analysis of the extent of ERM implementation among the companies.

Table 4 Extent of ERM Implementation among Malaysian PLCs

No	Extent of ERM	Scale	Frequency	%
1.	High Extent	6.0 – 7.0	21	26
2.	Moderate Extent	4.0 – < 6.0	58	72
3.	Low Extent	<4.0	2	2
		Total	81	100

Furthermore, Table 5 demonstrates the statistical distribution of the scores of the extent of ERM implementation for the whole sample. The mean scores represent the average of the scores of the whole sample (81 participants) on every scale in the questionnaire. The results show that the mean score of the extent of ERM implementation for the whole sample is 5.64.

Table 5 Descriptive statistics of the extent of ERM implementation as a whole sample

Variables	Min	Max	Mean	S.D
ERM Implementation	2.77	6.72	5.64	.63

The result reveals that of the firms being surveyed, a majority of them have ERM in place; however, the extent of implementation varies among the firms. They either have an extensive ERM in place or a moderate ERM in place. Looking into the detailed analysis of ERM implementation, from 81 respondents, 21 firms (26%)

have high extent of ERM implementation in their operation, while a majority of them, i.e. 58 firms (72 %), fall under moderate level of ERM use and a small portion, i.e. two of the firms, are implementing ERM at a minimum level. The average mean score that gauged the overall intensity of ERM implementation yields results of 5.64 on the 7-point Likert's scale. This value falls within the semantic scale of 'moderate'.

This finding shows an improvement on ERM practices among Malaysian PLCs as compared to previous studies that examined ERM implementation in Malaysia (see, Izah and Ahmad Rizal, 2011; Wan Norhayate et al., 2010). In general, the findings indicate that the sample firms have moved towards ERM, a holistic approach of managing corporate risks. Thus, the overall ERM penetration level among the Malaysian PLCs has been improved. The movement in ERM implementation among Malaysian PLCs is consistent with other countries with evidence showing that a large number of companies have now started to use ERM as a strategic management tool (Pagach and Warr, 2010).

The increasing trend in the usage of ERM among Malaysian PLCs indicates that ERM has gained more attention among Malaysian companies and among the reasons for the positive trend is the amendment of Malaysian Code on Corporate Governance (MCCG) in 2012. Thus, an increasing level of ERM adoption by Malaysian firms could be due to the recommendations made in Principle 6 of MCCG 2012. This finding is in consistence with previous studies (see, Kleffner et al., 2003; Paape and Spekle 2012) that found a positive association between the extent of ERM implementation and regulatory pressure. This study shows that regulatory pressure is among the motivations of ERM implementation and the important reasons for an increasing level of ERM adoption by Malaysia firms.

### **Model Estimation using PLS-SEM**

PLS-SEM analysis was conducted to achieve the second and third objective of this study that is identifying corporate governance characteristics that influence ERM implementation and examining whether ERM creates value to Malaysian PLCs. PLS-SEM is a component-based estimation method. PLS-SEM path models are formally defined by two sets of linear equations: (i) the measurement model (outer model) and (ii) the structural model (inner model). The measurement model specifies the relations between a construct and its observed indicators also known as manifest variables, whereas the structural model specifies the relationships between the constructs (Henseler et al., 2016). PLS-SEM model estimation procedures are empirical measures of the relationship between the indicators and the constructs (measurement model) as well as between the constructs (structural model).

One of the main motivations for PLS-SEM being used in this study is that it can be utilised with small sample sizes even when the models are highly complex. Sarstedt et al. (2014) state that PLS-SEM works efficiently when small samples are used to estimate path models comprising many constructs, normally more than five, with several structural path relationships and many indicators per construct.

Hair et al. (2017) suggested that if the sample size is relatively low, PLS-SEM should be the most appropriate method of data analysis. Furthermore, they stated that the suggested rule of thumb for a minimum sample size for PLS-SEM is ten times the largest number of formative indicators used to measure a single construct, or ten times the largest number of structural path directed at a particular construct in the structural model. The largest number of path relationship pointing to one construct in this study is three where board size, RMC dan board expertise are pointing to ERM construct. Therefore, 81 sample is sufficient for PLS-SEM to be conducted.

### **Assessment of the measurement model**

Prior to structural model examinations that test the hypotheses of this study, it is important to ensure the reliability and validity of the measurement model (outer model). This assessment established whether the instrument items that were used to gather the data actually measured what they were intended to measure. ERM construct and corporate governance are reflectively measured constructs. The reflectively measured constructs assume that the indicators are caused by the underlying construct and therefore, need to be evaluated with regards to its reliability and validity.

The first inspection of the reflective measurement model was the assessment of the composite reliability and convergent validity of the constructs. The composite reliability assesses the construct internal consistency means that the construct is internally consistent due to the consistency of measures used meanwhile, convergent validity is assessed by evaluating the reliability of each item used to measure the constructs. Convergent validity

was evaluated using three analyses: (i) items reliability, (ii) composite reliability and (iii) average variance extracted (AVE) (Hair et al. 2017). An established rule of thumb states that a construct should explain a significant part of each indicator's variance means that an indicator's loading should be above 0.708. However, according to Hair et al. (2017) indicators with loading below the threshold of 0.708 but above 0.40 should only be considered for removal from the scale when deleting the indicator's results in an increase in the composite reliability or AVE.

The second measure to support the existence of convergent validity is the composite reliability (CR) of each construct. Hair et al. (2014) suggest that for reflectively measured measurement model the convergent validity was evaluated from the CR test results because CR provides a more conservative measure of internal consistency reliability. As a rule of thumb, 0.708 is suggested as a minimum benchmark for acceptable construct reliability Hair et al. (2017). The third evaluation of convergent validity is examining the average variance extracted (AVE) values. An AVE value of 0.50 or higher indicates that on average the construct explains more than half of the variance of its indicators.

Table 6 displays the results of the convergent validity analyses of ERM construct and corporate governance characteristics that are Board Size, Board Expertise, Non-executive Directors and RMC. As shown on Table 6, each dimension of the ERM construct had a satisfactory range of factor loadings. Following Hair et al. (2017) suggestion, this study does not remove dimension's items with outer loadings below the threshold 0.70 but above 0.40 because deletion of the items does cause an increase in AVE.

Each of ERM dimension was measured by a group of indicators and from the composite reliability (CR) value, which explains the degree to which the construct indicators indicate the latent construct, ranges from 0.863 and 0.929 well above the threshold value of 0.708 (Hair et al. 2017) that signifies that all the items have integrated into one dimension. The AVE values for the eight dimensions of ERM construct all exceeding the threshold value of 0.50 (Hair et al. 2014), with the lowest AVE value 0.560 and the highest 0.694. Thus, it can be concluded that ERM dimensions have a high level of reliability and convergent validity that demonstrates ERMDi as an efficient measurement of ERM construct.

As for corporate governance constructs; board size, board expertise and RMC yield item loadings are above the threshold value of 0.7, which are 0.806, 0.755 and 0.757 respectively however, a proportion of the NEDs produced very low loading of 0.109. The finding shows that a proportion of the NEDs is at a weak dimension of the corporate governance therefore, this variable was dropped as dimension of corporate governance. Thus, board size, board expertise, and RMC are good dimensions of corporate governance.

Table 6 Results of the convergent validity of measurement model

Construct	Indicator Code	Outer Loadings	Composite Reliability (CR)	AVE
Internal Environment (IE)	IE1	0.789	0.877	0.590
	IE2	0.606		
	IE3	0.814		
	IE4	0.789		
	IE5	0.720		
Objective Setting (OS)	OS1	0.818	0.863	0.560
	OS2	0.787		
	OS3	0.667		
	OS4	0.644		
	OS5	0.808		
Event Identification (EI)	EI1	0.683	0.877	0.590
	EI2	0.768		
	EI3	0.842		
	EI4	0.824		
	EI5	0.711		
Risk Assessment (RA)	RA1	0.763	0.904	0.613
	RA2	0.788		
	RA3	0.728		
	RA4	0.857		
	RA5	0.877		
Risk Response (RR)	RR1	0.834	0.901	0.694
	RR2	0.863		
	RR3	0.815		
	RR4	0.819		

Table 6 Cont.

Controls Activities (CA)	CA1	0.905	0.894	0.630
	CA2	0.742		
	CA3	0.877		
	CA4	0.668		
	CA5	0.751		
Information and Communication (IC)	IC1	0.825	0.884	0.561
	IC2	0.663		
	IC3	0.760		
	IC4	0.760		
	IC5	0.811		
	IC6	0.659		
Monitoring (MO)	MO1	0.831	0.929	0.687
	MO2	0.810		
	MO3	0.862		
	MO4	0.846		
	MO5	0.748		
	MO6	0.871		
Corporate Governance	Board Size	0.806	0.775	0.633
	Expertise	0.755		
	Portion NEDs	*0.109		
	RMC	0.757		
Firm Value	Tobin's Q	1.000	1.000	

Note: \*Variable in italics has been removed due to low loading and Firm Value is a single-item variable.

### Assessment of Structural Model

Once the measurement model had a satisfactory level of validity and reliability, then the second part of the model estimation was conducted, which was to analyse the structural model of the path modeling. In general, the structural model describes the interrelationships among the constructs where the hypothesised relationships within the structural (inner) model were assessed. Assessment of the structural model is important to determine how well the empirical data supports the theory and thus, to decide if the theory has been empirically confirmed. The structural model was assessed using two criteria that are (i) the level of the R square ( $R^2$ ) values, and (ii) the significance of the path coefficients. PLS-SEM determines path coefficient using the bootstrapping (resampling) procedures. In order to measure the statistical significance of the path coefficients, t-values and significance levels were obtained by applying a nonparametric bootstrapping routine of 500 resamples (Chin, 1998) which is the standard method used to test the significance of PLS path modeling results (Henseler et al. 2009).

The  $R^2$  values of both dependent variables can be considered at moderate level; ERM (0.321) and firm value (0.252). The results highlight that the corporate governance construct explained 32.1 % of the total variance of ERM implementation. Meanwhile, ERM explained 25.2 % of the total variance of the firm value. Figure 2 presents the results of the PLS analysis of the structural model.

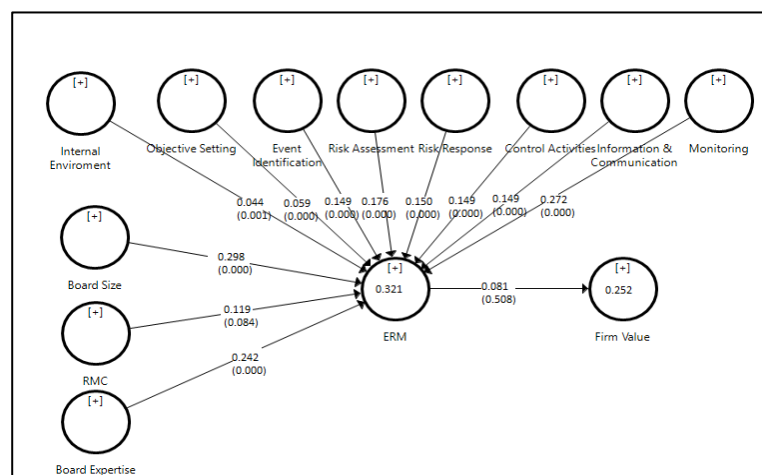


Figure 2 The structural model results of relationship among corporate governance, ERM and firm value

The structural model analyses confirmed that the eight dimensions of ERM was significantly related to the construct, the co-efficient ( $\beta$ ) are ranged from 0.044 to 0.272 and are all significant,  $p < 0.001$ . Table 7 shows the results of the structural model of ERM dimensions.

Table 7 Path Co-Efficient of ERM Dimensions

Path	Co-efficient ( $\beta$ )	t-value	p-value	Significance Levels
Internal Environment $\rightarrow$ ERM	0.044	3.261	0.001	**
Objective Setting $\rightarrow$ ERM	0.059	3.895	0.000	**
Event Identification $\rightarrow$ ERM	0.149	7.375	0.000	**
Risk Assessment $\rightarrow$ ERM	0.176	10.336	0.000	**
Risk Response $\rightarrow$ ERM	0.150	7.713	0.000	**
Control Activities $\rightarrow$ ERM	0.149	4.888	0.000	**
Info and Communication $\rightarrow$ ERM	0.149	7.471	0.000	**
Monitoring $\rightarrow$ ERM	0.272	10.616	0.000	**

Notes: \*\* $p < 0.01$

As for hypotheses testing (Table 8), the results are mixed. The findings show that board size ( $\beta=0.278$ ,  $p < 0.01$ ) and board expertise ( $\beta=0.242$ ,  $p < 0.01$ ) have significant relationship to ERM. The findings substantiated that  $H_{1a}$  and  $H_{1d}$  by stating that the corporate governance characteristics in particular board size and board expertise are significant determinants of ERM implementation among Malaysian PLCs. This study therefore, demonstrated the significant role of the corporate governance as a driving force to ensure that a company practices a comprehensive and effective risk management technique such as ERM. However, the result does not find support of association between ERM and firm value ( $\beta=0.081$ ,  $p < 0.508$ ), thus  $H_2$  is not supported.

Table 8 Path co-efficient and Hypothesis Testing

Relationship	Hypothesis	Co-efficient ( $\beta$ )	t-value	p-value	Support
Board Size $\rightarrow$ ERM	* $H_{1a}$	0.298	3.953	0.000	Yes
RMC $\rightarrow$ ERM	$H_{1b}$	0.119	0.876	0.084	No
Board Expertise $\rightarrow$ ERM	* $H_{1d}$	0.242	3.838	0.000	Yes
ERM $\rightarrow$ Firm Value	$H_2$	0.081	0.663	0.508	No

Notes: \* $p < 0.01$

This study found that board size and board expertise are important determinants of ERM implementation among Malaysian PLCs. Majority of sample firms have more than seven members, mean (median) board size is 7.420 (7), which is considered as large board. This finding substantiated that large board is more supportive for ERM implementation. Large boards would consist diverse background, knowledge and experience in order to contribute for better governance and ERM implementation. Next, for board expertise, this study found that mean (median) for board expertise is 0.401 (0.420) which is on average majority of the sample firms have one board member with accounting and financial expertise. Specific expertise especially in accounting and finance is an essential skill in developing and managing the good governance and technique for ERM implementation.

The current study's analysis is consistent with the findings of previous studies, which do not lend support for the supposed influence of ERM to firm value although a majority of the firms in the sample have moderately implemented ERM. A potential explanation could be that ERM is a new concept in Malaysia that requires expertise and high costs of implementation. Since the phase of ERM implementation in Malaysia is still at a moderate level, the effect of ERM to firm value is positive but not significant. The significant positive effect of ERM on firm's value would take a longer time because a majority of the Malaysian firms surveyed are either at an early stage or at a moderate stage of ERM implementation. This findings consistent with other studies examining ERM implementation among Malaysian companies such as study conducted by Izah and Ahmad Rizal (2011) that indicate a positive but not significant relationship between ERM and firm value. They claimed that Malaysian PLCs knowledge on the benefits of practicing ERM is still limited; therefore, the practice of ERM is still at a minimal level and the program is yet to add value to the firm. Furthermore, Norlida and Zahiruddin (2013) also found that ERM was not the main factor that led to value creation among Malaysia PLCs.

Another possible reason for this finding should be discussed from market perspective. Firm value is measured using Tobin's Q. Lindenberg and Ross (1981) argue that Tobin's Q is a preferred measurement of firm value because Tobin's Q reflects market expectations and is relatively free from managerial manipulation. Thus, it is important to discuss finding of this study from finance perspectives. According to finance theory,

risk management activities does not add or create value to a firm and are perceived as negative NPV activities (Pagach and Warr, 2010).

Finance theory suggests that risk management activities are irrelevant because shareholders can reduce risk by diversifying their investment, which is less costly compared to risk management programs assume by firm. As such, findings of this study is consistent with the theory which reveals Malaysian PLCs shareholders are yet to support the paradigm shift in corporate risk management practices which change towards a holistic and comprehensive practices. Market is still reluctant to accept ERM, this could be due to high starting cost of the program and lack of expertise in the company that can implement ERM system. Since majority of the companies are at the moderate level of ERM implementation, firms spent a great amount of resources to increase staff knowledge and expertise on ERM. At the same time management must ensure the facilities, both physical and human expertise are ready for ERM. Due to this reason, shareholders are reluctant to implement ERM and therefore the association between ERM and firm value among Malaysian PLCs is yet to observe.

## CONCLUSION

This study has four important objectives that are; (i) to assess the extent of ERM practices, (ii) to identify corporate governance characteristics that influence ERM implementation (iii) to examine the association between ERM and firm value and (iv) to propose and develop the dimensions that can effectively measure ERM implementation. Enterprise Risk Management Dimension Index (ERMDi) is developed and proposed in this study as a comprehensive measurement of ERM implementation. The ERMDi is a tool used to measure the extent of ERM implementation among sample companies. The result reveals that a majority of the companies surveyed have ERM in place at the moderate level. Findings of the current study confirmed that corporate governance is the important determinants of ERM implementation. Two corporate governance attributes; (i) board size and (ii) board expertise are significant determinants of ERM implementation in Malaysian PLCs. However, results of this study do not find evidence on the value creation of ERM.

The current study contributes to the body of knowledge in two important ways. First, this study provides evidence regarding the relation between ERM implementation and firm value and factors that influence the adoption of ERM. Second, ERMDi is a valuable tool to manage risk effectively and solution that may help company in achieving their stated goals. In addition, ERMDi contributes to the body of knowledge by helping academics in their empirical research where this index can be used by researchers to assess the extent of ERM implementation in organisations. Therefore, the findings of this study and the ERM index developed will enable academics, companies and regulators to have better understanding on corporate governance characteristics that may influence ERM implementation and its effect towards firm value.

## REFERENCES

- Andersen, T.J. (2008) The performance relationship of effective risk management: exploring the firm-specific investment rationale. *Long Range Planning*. 41(2), pp. 155–176.
- Arena, M., Arnaboldi, M. and Azzone, G. (2011) Is enterprise risk management real?. *Journal of Risk Research*. 14, pp. 779–797.
- Beasley, M., Pagach, D. and Warr, R. (2008) Information conveyed in hiring announcements of senior executives overseeing enterprise-wide risk management processes. *Journal of Accounting, Auditing and Finance*. 23(3), pp. 311–333.
- Beasley, M.S., Clune, R. and Hermanson, D.R. (2005) Enterprise risk management: An empirical analysis of factors associated with the extent of implementation. *Journal of Accounting and Public Policy*. 24(6), pp. 521–531.
- Blanchard, D. and Dionne, G. (2003) Risk management and corporate governance. (Working paper No. 03-04). Retrieved from <http://www.ssrn.com>.
- Bowling, B.D.M. and Rieger, L. (2005) Success factors for implementing enterprise risk management. *Bank Accounting & Finance*. pp.21–27.

- Brown, I., Steen, A. and Foreman, J. (2009) Risk management in corporate governance: a review and proposal. *Corporate Governance: An International Review*. 17(5), pp. 546–558.
- Chin, W.W. (1998) The partial least squares approach to structural equation modeling. In G. A. Marcoulides, ed. *Modern Methods For Business Research*. Lawrence Erlbaum Associates, Mahwah, pp. 295–358.
- Collier, P., Berry, A. and Burke, G., (2006) Risk and management accounting: Best practice guidelines for enterprise-wide internal control procedures. *Research Executive Summaries Series*. 2(11), pp. 1–7.
- COSO (2004) Enterprise risk management-integrated framework. Committee of Sponsoring Organizations of the the Treadway Commission. Retrieved from [http://www.mastercca.cnam.fr/PDF/SUPPORT\\_DE\\_COURS/CCG 206-207/CCG207-APPLYING-COSO.pdf](http://www.mastercca.cnam.fr/PDF/SUPPORT_DE_COURS/CCG_206-207/CCG207-APPLYING-COSO.pdf)
- Demidenko, E. and McNutt, P. (2010) The ethics of enterprise risk management as a key component of corporate governance. *International Journal of Social Economics*. 37(10), pp. 802–815.
- Donaldson, L. and Davis, J.H. (1991) Stewardship theory or agency theory: CEO governance and shareholder returns. *Australian Journal of Management*. 16(1), pp. 49–65.
- Eisenhardt, K.M. (1989) Agency theory: An assessment and review. *The Academy of Management Review*. 14(1), pp. 57-74.
- Fama, E.F. and Jensen, M.C. (1983) Separation of ownership and control. *Journal of Law and Economics*. 26(2), pp. 301–325.
- Frigo, B.M.L. and Anderson, R.J. (2014) Risk management frameworks : Adapt, don't adopt. *Strategic Finance*, (January). pp. 49–54.
- Gatzert, N. and Martin, M. (2015) Determinants and value of enterprise risk management : Empirical evidence from the literature. *Risk Management and Insurance Review*. 18(1), pp. 29–53.
- Golshan, N.M. and Siti Zaleha Abdul Rasid (2012) Determinants of enterprise risk management adoption : An empirical analysis of Malaysian public listed firms. *World Academy of Science, Engineering and Technology*. 62, pp. 15–22.
- Gordon, L.a., Loeb, M.P. and Tseng, C.Y. (2009) Enterprise risk management and firm performance: A contingency perspective. *Journal of Accounting and Public Policy*. 28(4), pp. 301–327.
- Hair, J.F., Hult, G.T.M., Ringle, and C.M., Sarstedt, M. (2017) A primer on partial least squares structural equation modeling (PLS-SEM), second edition, SAGE Publications.
- Hair, J.F. Sarstedt, M., Ringle, C.M. and Mena, J.A. (2011) An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*. 40 (3), pp. 414–433.
- Hair, J.F., Sarstedt, M., Hopkins, L. and Kuppelwieser, V.G. (2014) Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*. 26 (2), pp. 106–121.
- Hairul, A.A. and Hafiz, M.A.R. (2015) An investigation of the control role and effectiveness of independent non-executive directors in Malaysian public listed companies. *Managerial Auditing Journal*. 30(6/7), pp. 582–609.
- Harner, M.M. (2010) Ignoring the writing on the wall : The role of enterprise risk management in the economic crisis. *J. Bus. & Tech. L.* 5(1), pp. 45–58.
- Henseler, J., Hubona, G. and Ray, P.A. (2016) Using PLS path modeling in new technology research: updated guidelines. *Industrial Management & Data Systems*. 116 (1), pp. 2-20.
- Henseler, J., Ringle, C.M. and Sinkovics, R.R. (2009) The use of partial least squares path modeling in international marketing. *Advances in International Marketing*. 20, pp. 277–319.
- Hines, C.S. and Peters, G.F. (2015) Voluntary risk management committee formation: Determinants and short-term outcomes. *Journal of Accounting and Public Policy*. 34, pp. 267–290.
- Hoyt, R.E. and Liebenberg, A.P. (2011) The value of enterprise risk management. *Journal of Risk and Insurance*. 78(4), pp. 795–822.
- Huang, H. et al. (2008) Does the appointment of an outside director increase firm value? Evidence from Taiwan. *Emerging Markets Finance & Trade*. 44(3), pp. 66–80.



- Izah, M.T. and Ahmad Rizal, R. (2011) The relationship between enterprise risk management (ERM) and firm value: Evidence from Malaysian public listed companies. *International Journal of Economics and Management Sciences*. 1(2), pp. 32–41.
- Jensen, M.C. and Meckling, W.H. (1976) Theory of the Firm : Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*. 3(4), pp. 305-360.
- Kleffner, A.E., Lee, R.B. and McGannon, B. (2003) The Effect of corporate governance on the use of enterprise risk management: Evidence from Canada. *Risk Management and Insurance Review*. 6(1), pp. 53–73.
- Knechel, W.R. (2002) The role of the independent accountant in effective risk management. *Review of Business and Economics*. 47(1), pp. 65–86.
- KPMG International (2001) *Understanding enterprise risk management: An emerging model for building shareholder value*.
- Lai, F. and Fazilah, A.S. (2010) Enterprise risk management framework and the empirical determinants of its implementation. *Risk*. 6(7).
- Lewis, B.R., Templeton, G.F. and Byrd, T.A. (2005) A methodology for construct development in MIS research. *European Journal of Information Systems*. 14, pp. 388–400.
- Liebenberg, A.P. and Hoyt, R.E. (2003) The determinants of enterprise risk management: Evidence from the appointment of chief risk officers. *Risk Management and Insurance Review*. 6(1), pp. 37–52.
- Lindenberg, E.B. and Ross, S.A. (1981) Tobin's q ratio and industrial organization. *The Journal of Business*. 54(1), pp. 1–32.
- Ling, L.C., Mazlina, M.Z. and Nahariah, J. (2014) Determinants of risk management committee formation: An analysis of publicly-held firms. *Academy of Accounting and Financial Studies Journal*. 18(1), pp. 37–48.
- Lundqvist, S.A. (2014) An exploratory study of enterprise risk management : Pillars of ERM. *Journal of Accounting, Auditing, and Finance*. 29(3), pp. 393–429.
- Mackenzie, S.B., Podsakoff, P.M. and Podsakoff, N.P. (2011) Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS quarterly*. 35(2), pp. 293–334.
- MCCG (2012) *Malaysian Code on Corporate Governance 2012*.
- McShane, M.K., Nair, A. and Rustambekov, E. (2011) Does enterprise risk management increase firm value. *Journal of Accounting, Auditing, and Finance*. 26(4), pp. 641–658.
- Miccolis, J. and Shah, S. (2000) *Enterprise risk management: An analytic approach*. Tillinghast-Towers Perrin.
- Norhayate, W.D., Hasnah, H. and Ibrahim, N. (2011) The role of quality board of directors in enterprise risk management (ERM) practices: Evidence from binary logistic regression. *International Journal of Business and Management*. 6(12), pp. 205–212.
- Norlida, A.M., Isahak, K. and Mohd Rasid, H. (2010) Enterprise-wide risk management (EWRM) practices: Between corporate governance compliance and value. *International Reviews of Business Research Papers*. 6(2), pp. 239–252.
- OECD (2004) *OECD Principles of corporate governance*, OECD Publishing.
- OECD (2014) *Risk management and corporate governance*, OECD Publishing.
- Paape, L. and Spekle, R.F. (2012) The adoption and design of enterprise risk management practices : An empirical study. *European Accounting Review*. 21(3), pp. 533–564.
- Pagach, D. and Warr, R. (2011) The characteristics of firms that hire chief risk officers. *Journal of Risk and Insurance*. 78(1), pp. 185–211.
- Pagach, D. and Warr, R. (2010) *The effects of enterprise risk management on firm performance*, Available at: [http://www.garp.org/media/51855/firm performance and the implementation of erm - warr.pdf](http://www.garp.org/media/51855/firm_performance_and_the_implementation_of_erm_-_warr.pdf) [Accessed February 17, 2014].
- Pallant, J.F. (2011) *SPSS survival manual*, Allen and Unwin.

- Sarstedt, M. et al. (2014) Partial least squares structural equation modeling ( PLS-SEM ): A useful tool for family business researchers. *Journal of Family Business Strategy*. 5(1), pp. 105–115.
- Shleifer, A. and Vishny, R.W. (1997) A survey of corporate governance. *The Journal of Finance*. 52(2), pp. 737–783.
- Siti Zaleha, A.R., Abdul Rahim, A.R. and Wan Khairuzzaman, W.I. (2011) Management accounting and risk management in Malaysian financial institutions: An exploratory study. *Managerial Auditing Journal*. 26(7), pp. 566–585.
- Subramaniam, N. (2006) Agency theory and accounting research: An overview of some conceptual and empirical issues. In *Methodological issues in accounting research: Theories and methods*. Spiramus Press Ltd, pp. 55–77.
- Sutton, S.G. (2006) Extended-enterprise systems' impact on enterprise risk management. *Journal of Enterprise Information Management*. 19(1), pp. 97–114.
- Tonello, M. (2007) *Emerging governance practices in enterprise risk management*, Available at: <http://www.ssrn.com/abstract=963221>.
- Walsh, J.P. and Seward, J.K. (1990) On the efficiency of internal and external corporate control mechanisms. *Academy of Management Review*. 15(3), pp. 421–458.
- Wan Norhayate, W.D., Ahmad Shukri, Y. and Mohd Rasid, H. (2010) The effect of chief risk officer (CRO) on enterprise risk management (ERM) practices: Evidence from Malaysia. *International Business & Economics Research Journal*. 9(11), pp. 55–64.
- Weir, C. and Laing, D. (2006) Governance structures, director independence and corporate performance in the UK. *European Business Review*. 13(2), pp. 86–95.
- Yatim, P. (2010) Board structures and the establishment of a risk management committee by Malaysian listed firms. *Journal of Management and Governance*. 14(1), pp. 17–36.
- Zahiruddin, G. and Norlida, A.M. (2013) Enterprise risk management and value creation: Initial findings amongst non-financial public listed companies in Malaysian Bourse. *Asian Economic and Financial Review*. 3(7), pp. 913–922.