THE IMPACT OF ENTERPRISE RISK MANAGEMENT (ERM) ADOPTION ON FIRM PERFORMANCE OF THAI LISTED COMPANIES IN STOCK EXCHANGE OF THAILAND

BY

MRS. KAMOLTHIP SANGCHANT

AN INDEPENDENT STUDY SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ACCOUNTING FACULTY OF COMMERCE AND ACCOUNTANCY THAMMASAT UNIVERSITY ACADEMIC YEAR 2018 COPYRIGHT OF THAMMASAT UNIVERSITY
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INDEPENDENT STUDY

BY

MS. KAMOLTHIP SANGCHANT

ENTITLED

THE IMPACT OF ENTERPRISE RISK MANAGEMENT (ERM) ADOPTION ON FIRM PERFORMANCE OF THAI LISTED COMPANIES IN STOCK EXCHANGE OF THAILAND

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ABSTRACT

Majority of researches in Western context support enterprise risk management (ERM) theory that ERM adoption helps increasing firm value while only some of them indicate the contradictory findings. This study aims to find out whether such ERM theory is hold in Thai context by exploring the influence of 2017 COSO ERM adoption on the financial performance of Thai publicly listed firms in SET100 from 2015 to 2017. Following the technique used in previous studies, ordinary least squares (OLS) regression is selected to test the expected relationship. However, this study finding is that ERM adoption decreases firm value instead of increasing it. The recommendations for future research are either to use a time series approach or to compare ERM adoption and value of firms including measures of institutional strength and other market factors in different markets.

Keywords: COSO enterprise risk management, Enterprise risk management theory, Ordinary least squares regression
ACKNOWLEDGEMENTS

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Mrs. Kamolthip Sangchant
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CHAPTER 1
INTRODUCTION

1.1 Background and Rationale

The proposed study examines the influence of enterprise risk management (ERM) on the financial performance of Thai firms. ERM is described as a systematic practice of risk management in the organization which treats risk as a concern for the entire organization (Nocco & Stultz, 2006). ERM is a relatively new organizational management practice which draws on a body of theoretical and empirical organizational research and practice in 1940s and 1950s (Dickinson, 2001). The main impetus for adoption of ERM is the emerging focus on shareholder value during the 1990s which leads to the increasing demand for risk management (Dickinson, 2001; Nocco & Stultz, 2006).

According to contingency theories of ERM, the structure and practice of ERM depend on the conditions that the firm operates within its organization (Mikes & Kaplan, 2015). There are five conditions to affect how to implement ERM within the firm (Gordon, Loeb, & Tseng, 2009). They include industrial competition, environmental uncertainties, firm size, firm complexity, and monitoring by the board of directors (Gordon, et al., 2009). These conditions are unique for each firm and create differences in the appropriate implementation of ERM. Thus, ERM is a set of strategies, goals and related processes that help meet various objectives.

Although ERM is routinely recommended or even required by regulatory authorities as an operating condition for firms, there has been relatively little research into the practice from the management perspective (Bromiley, McShane, Nair, & Rustambekov, 2015). It is acknowledged that ERM positively influences firm value if it is fully implemented (Hoyt & Liebenberg, 2011). Hoyt and Liebenberg (2011) discovered that firms in US insurance industry that deployed ERM as part of their organizational processes had firm values of approximately 20% more than non-deploying companies. However, there has been less recent research into ERM in non-
Western contexts. This research will investigate ERM from a Thai perspective to help resolve this gap.

1.2 Aim and Objectives

This research aims to explore the influence of enterprise risk management (ERM) adoption on the financial performance of Thai publicly listed firms with the following objectives:

1. Establishing a theoretical model explaining the expected relationships;
2. Testing this model in a sample of Thai firms; and

1.3 Scope of the Study

This research takes place at the firm level and draws on a population of publicly listed firms on the Stock Exchange of Thailand (SET100) for 3 years (2015 – 2017). The study employs a quantitative analysis technique and draws on publicly available firm performance data to test a conceptual framework developed from the theoretical and empirical literature on ERM adoption (Section 2.5 in the literature review). This study also focuses on COSO ERM version 2017 as a measurement for ERM adoption. The study is limited in scope to cover firms listed in SET100 only and it is conducted in a cross-sectional time horizon. Therefore, autocorrelation effects from prior performance are not considered. The study carries out only the test of firm size, institutional ownership, and leverage (control variables), which have been recognized previously in influencing ERM adoption and firm performance. These limitations do not reduce the study’s reliability but could affect generalization.

1.4 Research Contributions

This research makes academic and practical contributions to the literature on ERM adoption. The academic contribution is an empirical test of the
influence of ERM adoption on firm performance. This test adds to the literature on ERM adoption in terms of broadening the empirical understanding of the role of ERM adoption in different markets and operating climates which has not been studied previously. For firms that are establishing an ERM adoption program or those that want to improve the effect of their existing ERM program, this research has practical contributions to the comprehension of the interaction of ERM adoption and firm characteristics in Thailand. In summary, the research supports both practical and academic applications of the findings by offering the updated evidence about today’s market conditions from publicly available data (2015-2017).

1.5 Research Structure

This chapter has established the background information and identified the research gap that justifies the study. It has also outlined key factors including the study’s aims, objectives, scope and contributions. Chapter 2 details the literature review, which explains and critiques the theoretical models and empirical evidence used to support the research. It closes with a statement of the conceptual framework and hypotheses of the study which establish the relationships under investigation. Chapter 3 explains the research methodology used and justifies the choices made for the research. The study’s findings are presented in Chapter 4. The second half of Chapter 4 also includes the analysis of the findings and comparison to the literature review. Chapter 5 ends up with the summary of findings, suggestions, and limitations of the research.
1.6 Definition of Terms

Risk. The potential for loss from unexpected occurrences (Yilmaz & Flouris, 2017).

Traditional risk management (TRM). The organizational practices and policies intend to identity and control (mitigate or eliminate) risks associated with the firm’s operations (Yilmaz & Flouris, 2017).

Enterprise risk management (ERM) adoption. The set of practices created to manage all types of risk at the organizational level which generate the firm’s potential gain on competitive advantage (Bromiley, et al., 2015). ERM is distinguished from TRM by its inclusion of strategic risks and its organization-level activities (Bromiley, et al., 2015).

COSO ERM version 2017. It is employed to evaluate the enterprise risk management and the necessity of organizations to upgrade their approach to manage the relevant risks to cope with the changing business environment (COSO, 2019).
CHAPTER 2
REVIEW OF LITERATURE

The literature review is conducted to construct the theoretical and empirical background of the study and to develop a theoretical framework to be tested in the primary research. The literature review draws mainly on academic sources such as journal articles and books.

The literature review begins with an overview of the concept, history, major frameworks, and goals of enterprise risk management (ERM). The chapter addresses several antecedents of ERM adoption in firms and examines the influences of firm size, institutional ownership, leverage and ERM adoption on firm performance respectively. The conceptual framework is presented and concluded with chapter summary.

2.1 The Concept of Enterprise Risk Management (ERM)

This research focuses on enterprise risk management (ERM). ERM emerges as an organizational practice during the mid-1990s, responding to the increased pressure for shareholder value in strategic planning and a growing awareness of the cost of risk to the organization (Dickinson, 2001). There have been multiple definitions of ERM demonstrated in the literature review which mostly focus on organization-wide management of risk (Bromiley, et al., 2015). Bromiley, et al. (2015) identified various consensus characteristics in these definitions of ERM. For example, it is more efficient and less expensive to manage risk at the firm level. ERM can manage both traditional and strategic risks and be used to gain competitive advantage. The definition of ERM used in this study is a set of practices designed to manage all types of risk at the organizational level, from which the firm can potentially gain competitive advantage (Bromiley, et al., 2015).

Based on several previous studies’ findings, ERM varies in its implementation depending on the organization’s goals, resources and needs (Arena,
Arnaboldi, & Azzone, 2011; Mikes & Kaplan, 2013). Mikes and Kaplan (2013) pointed out that the limitations of organization’s needs and design determined the factors or “ERM mix” adopted by organizations. They termed this as a contingency theory of ERM adoption (Mikes & Kaplan, 2013). Arena, et al. (2011) identified three different ways that organizations used ERM as responsive, discursive, and prospective uses. Each of these different uses of ERM contributes something distinct to the organization. For example, a discursive ERM implementation is mainly intended to give the firm tools to talk about risk. The COSO (2017) model of ERM identifies several components of ERM (although the specifics of implementation vary depending on the organization). These components include the internal environment (such as leadership views and organizational culture), setting objectives, identifying events, assessing risks, responding to risks, implementing control activities, communication and information flows, and monitoring processes (COSO, 2004; COSO, 2017). Following the contingency model of ERM, the specific processes and policies will depend on the internal and external conditions of the firm (Mikes & Kaplan, 2013).

### 2.2 Antecedents of ERM adoption

Many studies have identified antecedents of firm adoption. The most commonly identified positive factors have included firm size and institutional ownership (Gatzert & Martin, 2015; Hoyt & Liebenberg, 2011; Senol & Karaka, 2017). Negative factors have included leverage, asset opacity, and reinsurance use (Hoyt & Liebenberg, 2011) as well as industry competition, firm size, and monitoring by board of directors (Gordon, Loeb, & Tseng, 2009). Firm size, institutional ownership and leverage are three factors identified most frequently.

#### 2.2.1 Firm size and ERM adoption

Gordon, et al. (2009) argued that ERM adoption and performance were dependent on firm size. This relationship has been upheld in empirical tests. According to the literature review of Gatzert, et al. (2015), many previous studies...
indicated that firm size positively affected ERM adoption. Hoyt and Liebenberg (2011) and Senol and Karaca (2017) also discovered a positive influence of firm size on ERM adoption. Another study in SMEs and large firms supported the positive interaction of firm size and degree of ERM adoption (Paape & Speklé, 2012). Other authors also described that firm size crucially and positively influenced ERM adoption (Desender, 2011; Pağach & Warr, 2007). Overall, the evidence on firm size and ERM adoption strongly supports a positive effect. Therefore, Hypothesis 1 is stated as:

H1: Firm size positively affects ERM adoption.

2.2.2 Institutional ownership and ERM adoption

Institutional ownership is also widely discovered to have a critical influence on ERM adoption, although there are some mixed findings (Mikes & Kaplan, 2013). Gatzert, et al. (2015) found that almost every study they reviewed showed a significant, positive influence of institutional ownership on firm adoption of ERM. Such impact was also found by Hoyt and Liebenberg (2011). The ownership structure of firms, including institutional ownership, is also found to be a factor in both ERM adoption and ERM design choices (Paape & Speklé, 2012). However, there is some conflicting evidence. For example, another adoption study finds that institutional ownership is not a significant factor (Pağach & Warr, 2007).

In summary, most evidence on institutional ownership suggests a positive effect, although there is some conflicting evidence and the position of institutional ownership is less certain than firm size. Based on these findings, Hypothesis 2 can be stated as follows:

H2: Institutional ownership positively affects ERM adoption.

2.2.3 Leverage and ERM adoption

Leverage is the least certain factor out of three factors considered in this research. It is generally supposed that firms with high leverage (indicating high risk or potential financial distress) would be more likely to adopt ERM (Mikes & Kaplan, 2013). However, the correctness of this supposition is unclear. There were mixed findings in Gatzert, et al.’s (2015) literature review on leverage and ERM adoption because both positive effect and negative effect were equally likely found in many studies while some studies indicated no significant effect. Pağach and Warr
(2007) showed a positive influence on ERM adoption. Hoyt and Liebenberg (2011) and Lechner and Gatzert (2018) discovered a negative impact while Desender’s (2011) finding did not demonstrate a crucial influence. Therefore, the role of leverage is unclear.

Given the slightly more predominant finding in the previous studies, this research supposes a negative effect. Therefore, Hypothesis 3 is stated:

H3: Leverage negatively affects ERM adoption.

2.3 Firm Size, Institutional Ownership and Leverage on Firm Value

Following the identification of common factors in ERM adoption, the same three factors are considered for their effects on firm value.

2.3.1 Firm size and firm value

The size of the firm has commonly been employed as a control variable in studies of ERM and value of the firm. For example, Gordon, et al. (2009) discovered that firm size had a positive and critical influence on firm performance. Another finding demonstrates that firm size slightly and positively impacts firm value (Grace, Leverty, Phillips, & Shimpi, 2015). Several researches which explore the influence of ERM on firm value have also identified firm size as a control variable and most of them find the significant and positive effect (Andersen, 2008; Florio & Leoni, 2017; Lechner & Gatzert, 2018; Lin, et al., 2012; Mackay & Moeller, 2007; Pagach & Warr, 2010; Wu, Marshall, Chipulu, Li & Ojiako, 2014). Only two studies demonstrate that firm size negatively influences firm value (Baxter, Beddard, Hoitash, & Yezegel, 2013; McShane, et al., 2011). The general interaction of firm size and firm value is a positive impact. Therefore, Hypothesis 4 states:

H4: Firm size positively affects firm value.

2.3.2 Institutional ownership and firm value

Institutional ownership is believed to affect both ERM adoption and firm value due to the fact that institutional investors are more participated in the firm’s management and they demand better risk oversight and risk management
compared to other classes of investors (Krause & Tse, 2016). This factor has been tested less than other control variables such as firm size and leverage. There is mixed evidence on the interaction of institutional ownership and firm value. Hoyt and Liebenberg (2011) discovered a positive influence of institutional ownership on firm value under some conditions of ERM implementation. However, other studies have not demonstrated the crucial interaction of institutional ownership and firm value (Baxter, et al., 2013; Wu, et al., 2014). Therefore, the contribution of institutional ownership to firm value is unclear. The general trend of previous findings is a positive effect. Hypothesis 5 argues that:

H5: Institutional ownership positively affects firm value.

2.3.3 Leverage and firm value

The third factor investigated is leverage. Firm leverage positively impacts firm value but this contribution becomes contradictory when the risk-adjusted measures of firm value are used (Cheng & Tzeng, 2011; Fang, Noe, & Tice, 2009). Firms with low leverage retain a high degree of investment flexibility so they can vastly increase their investments when such investments are required (Marchica & Mura, 2010). Therefore, the negative impact that leverage contributes to firm value is demonstrated in almost all ERM researches (Andersen, 2008; Baxter, et al. 2013; Bertinetti, Cavezzali, & Gardenal, 2013; Florio & Leoni, 2017; Hoyt & Liebenberg, 2011; Lechner & Gatzert, 2018; Lin, et al., 2012; Mackay & Moeller, 2007; McShane, et al., 2011). Only one study finds a contradictory positive effect (Wu, et al., 2014). Therefore, this research expects the negative effect indicated by these previous studies, as expressed in Hypothesis 6:

H6: Leverage negatively affects firm value.

2.4 ERM Adoption on Firm Value

The final relationship studied is the contribution of ERM adoption to firm value. According to many studies, ERM adoption positively impacts firm value (Gates, Nicolas, & Walker, 2012; Nocco & Stolz, 2006) and the correctness of such effect becomes the main question of this research.
Most studies reviewed for this research support the positive influence of ERM on firm value. Andersen (2008) demonstrated the positive contribution of ERM to firm performance, especially in knowledge-intensive industries with high innovation expenditures. Baxter, et al. (2013) pointed out a critical and positive impact of ERM implementation on performance in both ROA (operational performance) and Tobin’s q (market performance). Bertinetti, et al. (2013) identified a critical and positive contribution of ERM to firm performance in European stock market. Florio and Leoni (2017) discovered the impact that the degree of ERM implementation contributes to both market performance and financial performance of Italian firms. Gordon, et al. (2009) supported this positive relationship between ERM and firm value in their study of American insurance firms. Grace, et al. (2015) also identified a positive interaction of ERM implementation and market value which was higher in firms with more extensive ERM implementations. Hoyt and Liebenberg (2011) estimated an ERM premium of 16.5% on firm value derived from Tobin’s q but Mackay and Moeller (2007) estimated an ERM premium of only 2% to 3% in the oil industry. Similar positive findings were found by a study in European markets (Lechner & Gatzert, 2018). For all researches reviewed, it could be highlighted that the impact of ERM implementation was not the strongest (nor the weakest) factor in the model which included several additional firm performance factors as control variables. The coefficients typically ranged between .100 and .200 indicating the small effect of ERM. However, there were a few exceptions because the effect of ERM implementation was stronger (Lechner & Gatzert, 2018).

Lin, et al. (2011) identified the contradictory finding on ERM discount of 11.5% in Tobin’s q. McShane, et al. (2011) supported traditional risk management (TRM) rather than ERM because of TRM’s association with the risk management premium while Wu, et al. (2014) found an insignificant contribution of ERM to firm value. The general trend demonstrated in the literature supports a positive influence of ERM implementation on firm value, the seventh and final hypothesis is proposed as follows:

H7: ERM adoption positively affects firm value.
2.5 Conceptual Framework and Hypotheses

The studies above allow for the formulation of a conceptual framework which covered all seven hypotheses expressed.

The first step in the conceptual framework is the antecedents of ERM adoption measured by 2017 COSO ERM. Although there are several different potential antecedents identified, the most frequently identified factors include size, institutional ownership, and financial leverage (Pagach & Warr, 2007; Gordon, et al., 2009; Desender, 2011; Hoyt & Liebenberg, 2011; Paape & Speklé, 2012; Mikes & Kaplan, 2013; Gatzert, et al., 2015; Senol & Karaca, 2017; Lechner & Gatzert, 2018). Therefore, the first three hypotheses state:

H1: Firm size positively affects ERM adoption.
H2: Institutional ownership positively affects ERM adoption.
H3: Leverage negatively affects ERM adoption.

The second step is the firm-specific factors in firm value and the same three factors of size, institutional ownership, and financial leverage have been identified as significant (Mackay & Moeller, 2007; Andersen, 2008; Gordon, et al., 2009; Pagach & Warr, 2010; McShane, et al., 2011; Hoyt & Liebenberg, 2011; Lin, et al., 2012; Baxter, et al., 2013; Bertinetti, et al., 2013; Wu, et al., 2014; Grace, et al., 2015; Florio & Leoni, 2017; Lechner & Gatzert, 2018). This allows for the formation of the next stage of the conceptual framework:

H4: Firm size positively affects firm value
H5: Institutional ownership positively affects firm value
H6: Leverage negatively affects firm value.

The final relationship is the effect of ERM adoption on firm value, which is positive in most researches (Mackay & Moeller, 2007; Andersen, 2008; Gordon, et al., 2009; Hoyt & Liebenberg, 2011; Baxter, et al., 2013; Bertinetti, et al., 2013; Grace, et al., 2015; Lechner & Gatzert, 2018). Therefore, the conceptual framework concludes with the following:

H7: ERM adoption positively affects firm value.
2.6 Chapter Summary

This chapter describes several findings demonstrated in the literature review of this study. It explains ERM as an organizational practice emerged during the 1990s in response to the increased awareness of organizational risk and pushed to protect shareholder value in public firms. ERM is initially limited to financial firms and others with high financial risk and spread to other organizations. The literature indicates that although there are a wide range of potential firm determinants of ERM adoption, the most commonly identified determinants are firm size, leverage, and institutional ownership. The literature also shows that all firm size, leverage, institutional ownership, and ERM adoption have effects on firm value. This leads to the statement of a conceptual framework and seven hypotheses examined in the research. In Chapter 3, the approach as well as research methodology designed to test these relationships are explained.
CHAPTER 3  
RESEARCH METHODOLOGY 

This chapter details the research methodology selected to test the conceptual framework developed and presented in Chapter 2. It starts with an overview of the research method which is a quantitative analysis based on publicly available financial data. It then explains the approach to population, sampling, data collection, measurement of variables including their operationalization and analysis methods.

3.1 Research Method

The research methodology is a quantitative analysis employing publicly available data. Quantitative analysis is preferred for this research because it supports a reliable and robust test of the hypotheses as they have been proposed, which cannot be delivered in qualitative organizational research (Peterson, Leung, Jackson, MacIntosh, & O’Gorman, 2016).

The use of publicly available data is intended to protect the research reliability and validity. It is also required in financial market analysis because firms are unlikely to release private financial data to researchers (and may be legally constrained from doing so) because of the need for shareholder protection and disclosure requirements (Tricker, 2015). Furthermore, financial data on the Stock Exchange of Thailand (SET) is presented in standard format which provides a common ground for comparison between countries. Thus, this approach is appropriate from both a sample protection perspective and a research reliability perspective.
3.2 Population, Sampling and Data Collection

The population of interest is publicly traded companies in Thailand. While there is some precedent for investigation of ERM adoption of companies in the literature (Krause & Tse, 2016), this is ruled out for the current study because of the lack of publicly available financial information and potentially incommensurate reporting regimes.

There are 772 firms recently listed on the Stock Exchange of Thailand (SET) (SET, 2018). This research draws its sample from the SET100, which represents the 100 largest firms listed on the SET by market value (SET, 2019). All firms included in the SET100 index in the years 2015-2017 are included in the dataset which leads to a total sample size of n = 300 firm-years. This study uses a cross-sectional rather than time series approach and data is collected from annual statements (Form 56-1), which are required to be made publicly available under the terms of SET listing.

3.3 Measurement of Variables

The variable measurement approach is adapted from previous studies that have investigated the same relationships examined in this study. These variables have standard measures that can be calculated from information in financial statements or extracted directly from these financial statements. The biggest measurement variance is that some studies use a stepped measure or an aggregate index for degree of ERM adoption, rather than a binary variable (Andersen, 2008; McShane, et al., 2011; Florio & Leoni, 2017; Gordon, et al., 2009). This research uses the similar aggregate index. The ERM adoption measure is based on the 2017 COSO Framework for ERM (COSO, 2017). The COSO framework includes 20 distinct components across five areas of the firm’s governance and culture, strategy and objective-setting, performance, review and revision, and information, communication, and reporting. Each of these items is measured using a binary variable (0 = does not meet condition, 1 = meets condition) with scores aggregated. A score of 20 would indicate 100% ERM adoption while a score of 0 indicates no attempt at ERM.
adoption. However, for the first principle about exercising board risk oversight, the board meeting practice from IOD New Zealand (2014) is adopted.

Table 1 summarizes the operationalization and measurement of variables used in the research, including the sources from which the measurements are adapted.

Table 1
Summary of operational variable definitions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Sources</th>
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<tr>
<td>Firm Size (SIZE)</td>
<td>Ln (Total Assets)</td>
<td>Andersen (2008)</td>
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<td></td>
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<td>Baxter, et al. (2013)</td>
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<td></td>
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<td>Bertinetti, et al. (2013)</td>
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<td>Gordon, et al. (2009)</td>
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<td>Hoyt &amp; Liebenberg (2011)</td>
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<td>Lechner &amp; Gatzert (2018)</td>
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<td></td>
<td>Senol &amp; Karaka (2017)</td>
</tr>
<tr>
<td>Institutional</td>
<td>% institutional ownership (interest</td>
<td>Baxter, et al. (2013)</td>
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<tr>
<td>Ownership (INST)</td>
<td>of the first top 10 shareholders)</td>
<td>Bertinetti, et al. (2013)</td>
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<td>Hoyt &amp; Liebenberg (2011)</td>
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<td>Leverage (LEV)</td>
<td>Total debt/Total equity</td>
<td>Andersen (2008)</td>
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<td>Baxter, et al. (2013)</td>
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<td></td>
<td></td>
<td>Lechner &amp; Gatzert (2018)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Senol &amp; Karaka (2017)</td>
</tr>
</tbody>
</table>
Table 1

Summary of operational variable definitions (cont.)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERM Adoption (ERM)</td>
<td>2017 COSO principle (20 items)</td>
<td>COSO (2017)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IOD New Zealand (2014)</td>
</tr>
</tbody>
</table>
| Firm Value (VALUE)         | Tobin’s q: \[
|                            | \( \frac{\text{Market Value + Short Term Liabilities + Long Term Liabilities}}{\text{Total Assets}} \) \] | Baxter, et al. (2013)                     |
|                            |                                                 | Bertinetti, et al. (2013)                    |
|                            |                                                 | Florio & Leoni (2017)                       |
|                            |                                                 | Hoyt & Liebenberg (2011)                    |
|                            |                                                 | Lechner & Gatzert (2018)                    |
|                            |                                                 | Mackay & Moeller (2007)                     |
|                            |                                                 | McShane, et al. (2011)                      |
|                            |                                                 | Senol & Karaka (2017)                       |

3.4 Data Analysis

Data analysis is performed in SPSS. Preliminary analysis includes descriptive statistics for all variables (mean, median, and normality testing). The descriptive statistics are not used to test the data but they are used to investigate the characteristics of individual variable and to examine the extent to which the variables are normally distributed (Denis, 2019).

Following the technique used in previous studies, ordinary least squares (OLS) regression is used to test the expected interactions. OLS regression is a linear regression technique that minimizes the sum of squares of the estimators, thereby producing unbiased estimates under conditions where all assumptions are met (Wooldridge, 2013). The OLS regression equation follows a slope-intercept form:

\[ y_i = \alpha + \beta * x_i + \varepsilon_i \]

Where \( \alpha \) is the intercept, \( \beta \) is the coefficient of the estimators \( x \), and \( \varepsilon \) is the error term (Wooldridge, 2013). The advantage of OLS regression for this analysis is that it provides the most unbiased estimate for the effects of different variables within the
regression. OLS which is a cross-sectional approach focuses on the existing effects of ERM adoption in the current year rather than looking at time-varying effects (which would demand a time series analysis) or a combination of time-varying and firm-specific effects (which would require a panel data analysis) (Wooldridge, 2013).

OLS regression has some assumptions that must be tested to determine the extent to which it can deliver an unbiased estimator (Wooldridge, 2013). If these assumptions are broken, they do not make the estimate useless but may exaggerate small effects. The OLS regressions and testing approaches include linearity of data in parameters (tested by observation of the observed vs. predicted values graph), homoscedasticity (tested using the Breusch-Pagan test), normality of errors (tested using the Shapiro-Wilk test) and no multicollinearity (tested using the variance inflation factor or VIF) (Wooldridge, 2013). These tests determine the extent to which the OLS regression could be considered the best linear unbiased estimator (Wooldridge, 2013). Correlation is also used to identify general relationships between variables.
CHAPTER 4
RESULTS AND DISCUSSION

This chapter describes the findings resulting from the analysis explained previously. It starts with the results which include the descriptive statistics, correlations, assumption tests and hypothesis test and ends up with the analysis of hypothesis outcomes and comparison to the literature review. These findings support the conclusion of the research which is presented in the next chapter.

4.1 Results

Data is drawn from the firms included on the SET100 index (2015 to 2017) which represent a potential 300 firm-years. However, a total of 298 firm-years is included in the data with two firm-years excluded because of the incomplete data availability. There is also some turnover in the firms included in the study because SET100 is recalculated periodically.

4.1.1 Descriptive statistics and normal distribution

Table 2 summarizes the descriptive statistics for the variables. Skewness and kurtosis values indicate that the VALUE variable is not normally distributed (with both values > 3). A visual inspection of the distribution of VALUE confirms that it is not normally distributed (see Figure 2). In fact, as this figure shows, all variables display non-normal distributions. However, these variables do not have significant outliers in general, but they were typically either leptokurtic or platykurtic and left-skewed (except for ERM which is left-skewed). Following recommendations about dealing with non-normal distribution of data (Wooldridge, 2013), log transforms are calculated to determine its appropriateness with the result of no concern. The analysis is continued with the non-normal distribution of the data with the acknowledgement that this could make the estimates generated by the OLS process too high (Wooldridge, 2013).
Table 2

*Descriptive statistics*

<table>
<thead>
<tr>
<th></th>
<th>SIZE</th>
<th>INST</th>
<th>ERM</th>
<th>LEV</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>11.0</td>
<td>0.435</td>
<td>0.570</td>
<td>2.01</td>
<td>2.20</td>
</tr>
<tr>
<td>Median</td>
<td>10.9</td>
<td>0.420</td>
<td>0.600</td>
<td>1.14</td>
<td>1.39</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>1.61</td>
<td>0.265</td>
<td>0.171</td>
<td>2.25</td>
<td>2.44</td>
</tr>
<tr>
<td>Minimum</td>
<td>7.31</td>
<td>0.00</td>
<td>0.120</td>
<td>0.0854</td>
<td>0.638</td>
</tr>
<tr>
<td>Maximum</td>
<td>14.9</td>
<td>0.925</td>
<td>0.900</td>
<td>10.2</td>
<td>27.0</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.449</td>
<td>0.0426</td>
<td>-0.509</td>
<td>1.96</td>
<td>5.79</td>
</tr>
<tr>
<td>Std. error skewness</td>
<td>0.141</td>
<td>0.141</td>
<td>0.141</td>
<td>0.141</td>
<td>0.141</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>0.0530</td>
<td>-1.38</td>
<td>-0.408</td>
<td>2.98</td>
<td>47.0</td>
</tr>
<tr>
<td>Std. error kurtosis</td>
<td>0.281</td>
<td>0.281</td>
<td>0.281</td>
<td>0.281</td>
<td>0.281</td>
</tr>
<tr>
<td>Shapiro-Wilk p</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
</tr>
</tbody>
</table>

The correlation matrix (Table 3) indicates that there are significant and negative correlations between VALUE and SIZE, ERM and LEV but the critical correlation between VALUE and INST is not discovered. The crucial correlations between the internal variables tested in the model are demonstrated but most of these correlations are relatively weak. Only correlations between SIZE and the rest of the variables could be described as moderate (r > .400). In addition, given the fact that they are related (for example, larger firms can be expected to have higher institutional ownership), their correlations are not unexpected.
Table 3

Correlation matrix

<table>
<thead>
<tr>
<th></th>
<th>SIZE</th>
<th>INST</th>
<th>ERM</th>
<th>LEV</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>—</td>
<td>0.537 ***</td>
<td>0.505 ***</td>
<td>0.596 ***</td>
<td>-0.445 ***</td>
</tr>
<tr>
<td>p-value</td>
<td>—</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>INST</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>—</td>
<td></td>
<td>0.242 ***</td>
<td>0.227 ***</td>
<td>-0.075</td>
</tr>
<tr>
<td>p-value</td>
<td>—</td>
<td></td>
<td>&lt; .001</td>
<td>&lt; .001</td>
<td>0.198</td>
</tr>
<tr>
<td>ERM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>—</td>
<td></td>
<td></td>
<td>0.322 ***</td>
<td>-0.232 ***</td>
</tr>
<tr>
<td>p-value</td>
<td>—</td>
<td></td>
<td></td>
<td>&lt; .001</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>LEV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>—</td>
<td></td>
<td></td>
<td>-0.222 ***</td>
<td></td>
</tr>
<tr>
<td>p-value</td>
<td>—</td>
<td></td>
<td></td>
<td>&lt; .001</td>
<td></td>
</tr>
<tr>
<td>VALUE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>r</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p-value</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. * p < .05, ** p < .01, *** p < .001

The Shapiro-Wilk test is used to evaluate the normality of errors for all four variables (Table 4). This test confirms that all variables involved in the model do not display normality of error (which would be indicated by p > .05, as normal distribution of error is the null hypothesis of the Shapiro-Wilk test (Wooldridge, 2013).
4.1.2 Hypothesis testing results

Hypotheses are tested in two groups of ERM adoption factors (Hypotheses 1 through 3) and firm value factors (Hypotheses 4 through 7). The outcomes of the assumption tests and OLS regression tests are summarized in the following sections with an overall summary of hypothesis tests at the end of the section.

4.1.2.1 Hypotheses 1 through 3: ERM Adoption Factors

Hypotheses 1 through 3 are tested together. These hypotheses state that:

H1: Firm size positively affects ERM adoption.
H2: Institutional ownership positively affects ERM adoption.
H3: Leverage negatively affects ERM adoption.

Model assumptions and regression results are discussed below.

Model assumptions. The assumptions of the model are tested. Given the fact that the variables do not have a normal distribution as shown in the descriptive statistics, the robust test of standard errors named Breusch-Pagan test is used to determine the potential problem. The outcome of this Breusch-Pagan test (conducted with the Koenker variant because of the non-normal distribution) is significant ($\chi^2(3) = 14.580, p = .002$) which indicates the rejection of the null hypothesis of homoscedasticity. SIZE is the only variable that displays a critical
contribution to the variance. Omitting the SIZE variable leads to a non-significant test ($\chi^2(2) = .233, p = .890$). It can be stated that SIZE has a significantly different distribution of the variance from the other two variables of INST and LEV. All significant effects are due to SIZE. Given the occurrence of heteroscedasticity, SIZE is eliminated from the analysis and the test for ERM adoption is continued with only INST and LEV. Figure 2 shows the actual versus predicted values which indicates that there is not a clear linear distribution between actual ERM and predicted ERM. Finally, the outcome of VIF (Table 5) indicates that there is no evidence of collinearity within the model (VIF < 10).

In summary, the assumption of homoscedasticity could be met by removing the SIZE variable. The assumptions of normal distribution and linear parameters are not fully met. These assumptions are flexible and indicate the possibility of optimistic estimation of squared errors rather than the inaccurate modelling (Wooldridge, 2013).

Figure 2 Actual versus fitted observations for ERM (Hypotheses 1 through 3)
Table 5

Variance inflation factor (VIF) (multicollinearity) for Hypotheses 1 through 3

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>INST</td>
<td>1.056</td>
</tr>
<tr>
<td>LEV</td>
<td>1.054</td>
</tr>
</tbody>
</table>

Regression outcomes. Table 6 summarizes the regression outcomes generated for this regression test. The outcomes show that both INST and LEV have significant and positive effects on ERM adoption, but INST has a stronger effect than LEV. Even though the test result is significant (p(F) < .001), this model is relatively poorly fitted (Adjusted R-square = .128) because it explains only 12.8% of the variance in ERM. This is also reflected in the graph in Figure 2. As a result of this outcome, Hypothesis 1 is rejected because SIZE must be removed from the model due to heteroscedasticity. Hypothesis 2 is accepted but hypothesis 3 is rejected. LEV has a weak but significant and positive effect on ERM adoption.

Table 6

Hypotheses 1 through 3 regression outcomes

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>S.E.</th>
<th>t</th>
<th>p(t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>0.477</td>
<td>0.019</td>
<td>24.80</td>
</tr>
<tr>
<td>INST</td>
<td>0.115</td>
<td>0.036</td>
<td>3.173</td>
</tr>
<tr>
<td>LEV</td>
<td>0.021</td>
<td>0.004</td>
<td>4.588</td>
</tr>
</tbody>
</table>

Sum squared residuals 7.502

R-Squared 0.143

Adj. R-Squared 0.128

F (2, 295) 19.283

p(F) <.001

Note. * p < .05, ** p < .01, *** p < .001
4.1.2.2 Hypotheses 4 through 7: Firm Value

Hypotheses 4 through 7 state the following:

H4: Firm size positively affects firm value.
H5: Institutional ownership positively affects firm value.
H6: Leverage negatively affects firm value.
H7: ERM adoption positively affects firm value.

These hypotheses are also tested by using OLS regression explained above. The assumption testing outcomes, regression results and hypothesis testing summary are explained.

**Assumption testing.** The first assumption of OLS is linearity of the model in parameters which is tested by using a graph of the observed versus predicted values (Figure 3). This shows that the bulk of the observed values follow the expected line of the prediction, although there are some outlying values. However, these outliers are not in a position that affects the slope of the prediction line and the investigation of individual points indicates that they appear to be legitimate (although extreme) values. As a result, the analysis is continued with all points in place.

![Observed versus predicted values](image)

*Figure 3* Observed versus predicted values (test of linear parameters) for Hypotheses 4 through 7
The Breusch-Pagan test is used to evaluate homoscedasticity (or homogeneity of variance). Because the data is not normally distributed, the Koenker variant test is used. The outcome ($\chi^2(4) = 13.269, p = .008$) demonstrated the rejection of the null hypothesis of homoscedasticity. SIZE is the only variable that has a significant effect. Upon the removal of SIZE variable from the model, the Breusch-Pagan test indicates the acceptance of the null hypothesis of homoscedasticity ($\chi^2(4) = 5.828, p = .120$). As a result, this variable is removed from the model.

The variance inflation factor (VIF) is utilized to estimate the collinearity of all independent variables in the model (Table 7). These statistics display adequate independence (VIF < 10) therefore the model is acceptable.

Table 7

<table>
<thead>
<tr>
<th>Variable</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>INST</td>
<td>.1091</td>
</tr>
<tr>
<td>LEV</td>
<td>1.146</td>
</tr>
<tr>
<td>ERM</td>
<td>1.155</td>
</tr>
</tbody>
</table>

In summary, the testing of the hypotheses indicates some problems in meeting the assumptions of OLS and some adaptations could be made to account for these problems. The data shows an approximate linear distribution of the parameters, although there are some outliers. There are some problems with the normal distribution of the variables, which could not be corrected through the log transform or other mechanisms such as removal of outliers (mainly because these outliers are legitimate). However, the problem of heteroscedasticity could be solved by eliminating the SIZE variable from the regression equation. Although the assumptions of normal distribution are not met, the linear distribution of the parameters and homoscedasticity are met. The OLS regression technique can be used with non-normally distributed data. It must be noted that this may skew the
standard error of the estimate, therefore it may not provide the fully unbiased model (Wooldridge, 2013). Even though there is some concern on non-normality, the analysis is continued because the OLS technique can still be used.

**Regression outcomes.** The outcomes in Table 8 indicates that the model is significant ($p(F) < .001$), although the regression model is weak with only 6.8% of VALUE predicted by the variables. The results show that INST is non-significant for VALUE but both LEV and ERM significantly and negatively influence VALUE. The contribution of ERM is stronger than that of LEV.

Given these results, Hypothesis 4 is rejected because SIZE variable is removed from the model due to heteroscedasticity. Hypothesis 5 is rejected because INST is not significant for firm value. Hypothesis 6 is accepted because LEV critically and negatively influence firm value. However, Hypothesis 7 is rejected because ERM has a crucial and negative contribution to VALUE rather than a positive impact.

Table 8

Hypotheses 4 through 7 regression outcomes

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>S.E.</th>
<th>t</th>
<th>p(t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Const</td>
<td>4.003</td>
<td>0.492</td>
<td>8.131</td>
<td>&lt;.001***</td>
</tr>
<tr>
<td>INST</td>
<td>0.057</td>
<td>0.538</td>
<td>0.106</td>
<td>0.916</td>
</tr>
<tr>
<td>LEV</td>
<td>-0.179</td>
<td>0.065</td>
<td>-2.758</td>
<td>&lt;.006***</td>
</tr>
<tr>
<td>ERM</td>
<td>-2.577</td>
<td>0.859</td>
<td>-2.999</td>
<td>0.003**</td>
</tr>
<tr>
<td>Sum squared residuals</td>
<td>1629.40</td>
<td>S.E. of Regression</td>
<td>2.353</td>
<td></td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.078</td>
<td>Adj. R-Squared</td>
<td>0.068</td>
<td></td>
</tr>
<tr>
<td>F(2, 295)</td>
<td>8.309</td>
<td>p(F)</td>
<td>&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>

Note. * $p < .05$, ** $p < .01$, *** $p < .001$
4.1.2.3 Hypothesis testing summary

Table 9 summarizes the hypothesis outcomes. Hypotheses 1 and 4 are rejected because SIZE variable is eliminated from the model due to heteroscedasticity during the assumption check. Most of the remaining hypotheses are rejected due to directionality rather than non-significance. These results are detailed in the next section.

Table 9  
Summary of hypothesis test outcomes

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Independent</th>
<th>Dependent</th>
<th>Outcome</th>
<th>Accepted?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SIZE</td>
<td>ERM</td>
<td>Eliminated</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>INST</td>
<td>ERM</td>
<td>$\beta = .115$</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>LEV</td>
<td>ERM</td>
<td>$\beta = .021$</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>SIZE</td>
<td>VALUE</td>
<td>Eliminated</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>INST</td>
<td>VALUE</td>
<td>Non-significant</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>LEV</td>
<td>VALUE</td>
<td>$\beta = -.179$</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>ERM</td>
<td>VALUE</td>
<td>$\beta = -2.577$</td>
<td>No</td>
</tr>
</tbody>
</table>

4.2 Discussion

The hypothesis testing indicates that institutional ownership and leverage significantly and positively influence ERM adoption while leverage and ERM adoption crucially and negatively affect firm value. Institutional ownership is not significant for f value of the firm but it was significant for ERM adoption. Firm size must be eliminated due to heteroscedasticity. Some of these findings are different from what are expected in the literature review, therefore some discussion to explain these findings should be made.

Firm size. Firm size is eliminated from the main models because of heteroscedasticity but it is tested separately as an individual factor. The correlation tests indicate a significant and moderate correlation of SIZE with both ERM (positive)
and VALUE (negative) as shown in Table 3. This correlation suggests that the findings of previous researches identifying SIZE as a critical factor in ERM adoption could also be possible for the SET100 data if the dataset are large enough to approach a normal distribution for size (Gordon, et al., 2009; Desender, 2011; Gatzert, et al., 2015; Hoyt & Liebenberg, 2011; Paape & Speklé, 2012; Pagach & Warr, 2007) Senol & Karaca, 2017). The finding on the SIZE-VALUE relationship is consistent with only two researches in the literature review (McShane, et al., 2011; Baxter, et al., 2013). It is possible that the SIZE-VALUE relationship of SET100 data in this study may be different from other markets.

**Institutional ownership effects.** Institutional ownership significantly and positively affects ERM adoption, but it does not influence firm value. The findings of several previous studies have confirmed that institutional ownership influences ERM adoption (Paape & Speklé, 2012; Gatzert, et al., 2015; Mikes & Kaplan, 2015) and only one study has the opposite finding (Pagach & Warr, 2007). The rationale for this effect is clear because institutional owners can advocate or force the organization to adopt ERM either through informal pressure or through presence on the board (Gatzert, et al., 2015). Thus, this finding is consistent with what is expected. The research does not support the INST-VALUE effect. However, this effect is much less certain than others because some studies reject it (Wu, et al., 2014; Baxter, et al., 2013) while others support it (Hoyt & Liebenberg, 2011). The contribution of institutional ownership to firm value is studied less than others (Krause & Tse, 2016) so the findings could be inconsistent. This research has contributed to the literature by investigating this relationship, even though there is a negative finding, it should not be considered as non-productive.

**Leverage effects.** The effect of leverage is consistent with what is expected for the firm value (large and negative) but it is different from what is expected for ERM adoption (small but positive). This is one of the most interesting findings due to such inconsistent evidence on the LEV-ERM adoption relationship. In theory, the highly leveraged firms would be expected to be more likely to adopt ERM because they require protection against a higher level of risk exposure than firms that are less highly leveraged (Mikes & Kaplan, 2013). In this study, leverage
slightly but critically and positively influence ERM adoption. The evidence on this relationship is very mixed because the findings of some studies have positive effects (Pagach & Warr, 2007), other findings have negative effects (Hoyt & Liebenberg, 2011; Lechner & Gatzert, 2018) and others have no significant effect (Desender, 2011). This research is beneficial to the literature in terms of demonstrating the significant effect of leverage on ERM adoption based on the SET100 data. The confirmation of Mikes and Kaplan (2013) that highly leveraged companies are more likely to utilize ERM as a risk mitigation measure appears to hold here. Several researches firmly support the negative contribution of leverage to firm value (utilizing a risk-adjusted measure such as Tobin’s q) (Andersen, 2008; Baxter, et al. 2013; Bertinetti, et al. 2013; Cheng & Tzeng, 2011; Fang, et al., 2009; Florio & Leoni, 2017; Hoyt & Liebenberg, 2011; Lechner & Gatzert, 2018; Lin, et al., 2012; Mackay & Moeller, 2007; McShane, et al., 2011). Therefore, this finding is consistent with the expectation indicated in the body of literature.

**ERM and firm value.** ERM adoption has a negative influence on firm value rather than the positive impact which is surprising because in theory, ERM adoption should increase firm value (Gates, et al., 2012; Nocco & Stolz, 2006) and such effects are demonstrated in many previous researches (Anderson, 2008; Baxter, et al., 2013; Bertinetti, et al., 2013; Florio & Leoni, 2017; Gordon, et al., 2009; Grace, et al., 2015; Hoyt & Liebenberg, 2011; Lechner & Gatzert, 2018). Only a few studies have contradicted this finding (Lin, et al., 2011; McShane, et al., 2011; Wu, et al., 2014). Thus, the finding in this study contradicts most of the body of literature which gives the reason for the observation of this finding. Given the positive relationship of leverage and ERM implementation, along with the negative relationship of leverage and firm value, one probable reason is that firms with greater risk exposure because of their high leverage may be more potential to utilize ERM measures either as a serious effort to control their risk exposure or as a signal to investors on their awareness of their increased risk and their effort to mitigate it (or both). This could indicate that highly leveraged companies may be more potential to utilize ERM which leads to a negative effect to value.
CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

This research investigates the effect of enterprise risk management (ERM) adoption on the performance of the firm with the following objectives:

1. Establishing a theoretical model explaining the expected relationships;
2. Testing this model in a sample of Thai firms; and

The literature review allows for development of a theoretical model for the study (Chapter 2). This theoretical model proposes that firm size, institutional ownership and leverage affect the firm’s ERM adoption. Size, institutional ownership, leverage and ERM adoption are proposed to influence the firm’s market value.

The sample of publicly listed firms in SET100 index which is the 100 largest firms in the Stock Exchange of Thailand (SET) is selected to test the model. The sample includes the data in the period of 2015 to 2017 which leads to 298 firm-years of data. (Two firms are excluded due to their non-filing in 2015). ERM adoption is measured using the 2017 COSO ERM framework while market value is derived from Tobin’s q.

The analysis indicates that firm size positively affects ERM adoption but negatively firm value and this could not be tested directly because of high homogeneity of variance. In the first regression test, both institutional ownership and leverage positively affect ERM adoption. In the second regression test, firm leverage and ERM adoption negatively effect firm value. These findings may result from the positive relationship of leverage and ERM adoption which suggests that firms with high risk exposure (as indicated by high leverage) may use ERM adoption either as a market signal or as a mechanism to reduce risk exposure. However, this may not be effective, so it results in lower market value.
In conclusion, this research supports a relationship between 2017 COSO ERM adoption and firm performance, although this relationship may be more complicated in Thai firms than others. ERM is possibly used as a risk management technique by firms with high risk exposure due to high operating leverage. This suggests that ERM may be a tool for risk reduction, but it does not indicate that the firm is performing well. The implication of these findings is discussed below.

5.2 Research Implications

This research has academic and practical implications. The main academic implication is that researchers need to reconsider the theoretical basis of ERM and how it is used within firm. This research suggests that ERM and high leverage may co-occur, implying that ERM is used when the firm has already been under stress rather than as a preventative measure. This possibility has been brought up by other researchers and it is worth considering as a possible factor in the use of ERM.

There are also implications for shareholders and managers in these findings. One of these implications is that neither shareholders nor managers should view ERM adoption as a panacea for risk management. The findings show that firms deploying ERM strategies may still be under some significant risk because of their high leverage which affects the firm’s market value. This means that ERM cannot be considered as a substitute for useful risk management and it cannot influence the firm performance as strongly as it is expected given the positive theory of ERM as a risk reduction method. This should be kept in mind by the investors when they assess the investment risks.
5.3 Research Limitations

There are several limitations to this research. One of these limitations is the ERM adoption index which is calculated by the researcher based on the COSO model of ERM 2017. This ERM adoption index is used because there is no standard or consensus measure of ERM adoption and because many of the indicators of ERM are not visible in public information. Therefore, this measure is a proxy measure for ERM adoption rather than a conclusive measure. However, there is no other measure that can be more effective, so it is difficult to eliminate this limitation to the study at the present time. Another limitation is that the research only includes a limited time period (2015 to 2017) which makes the exogenous changes such as effects of institutional change not reflected in the study and there is a limited sample size.

5.4 Recommendations for Future Research

There are some recommendations for future research that can be identified from this study. One of these recommendations is to use a broader view of ERM to understand variances in adoption and effects between different markets. Because this study and most previous studies have only included firms in a single market, it is possible that other factors such as regulatory oversight or investor protections could impact the interaction of ERM adoption and firm performance. Therefore, comparing firms in different markets in terms of ERM adoption and firm value, and including measures of institutional strength and other market factors that could influence the relationship, could help identify the influence of these factors. Another opportunity for additional research is the investigation of ERM adoption on future performance of the firm using a time series approach. This type of research could help determine whether ERM adoption contributes to firm performance in future periods.
REFERENCES


IOD New Zealand (2014). Board meeting practice guide: Good decision making through effective meetings.


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