THE ANALYSIS OF ENTERPRISE RISK MANAGEMENT (ERM) IMPLEMENTATION IN INDONESIA AND SINGAPORE BANKING INDUSTRY

By

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014201500151

A Skripsi presented to the Faculty of Business President University in partial fulfillment of the requirements for Bachelor Degree in Management

January 2019
PANEL OF EXAMINERS
APPROVAL SHEET

The Panel of Examiners declares that the skripsi entitled “THE ANALYSIS OF ENTERPRISE RISK MANAGEMENT (ERM) IMPLEMENTATION IN INDONESIA AND SINGAPORE BANKING INDUSTRY” that was submitted by Dorothea Deviani Halim majoring in Management from the Faculty of Business was assessed and approved to have passed the Oral Examinations on January 9, 2019.

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Christina Liem, S.T., M.Comm.
Examiner 2
DECLARATION OF ORIGINALITY

I declare that this skripsi, entitled "THE ANALYSIS OF ENTERPRISE RISK MANAGEMENT (ERM) IMPLEMENTATION IN INDONESIA AND SINGAPORE BANKING INDUSTRY" is, to the best of my knowledge and belief, an original piece of work that has not been submitted, either in whole or in part, to another university to obtain a degree.

Cikarang, Indonesia, January 18, 2019

Dorothea Deviani Halim
01420150015
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First of all, I would like to thank God for without Him, I would not be able to finish this skripsi. I would also like to express my sincere gratitude to people who assist and guide me during the period of the completion of this skripsi.

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Cikarang, January 18, 2019
Dorothea Deviani Halim
PLAGIARISM REPORT

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ABSTRACT

The purpose of this study is to analyse the implementation of Enterprise Risk Management (ERM) in Indonesian and Singaporean banking industry with emphasise on ERM Dimension and ERM Index to analyse its implementation. The sample is 6 (six) local banks with the biggest total assets in 2017 from both Indonesia and Singapore. The result of this study confirms that Internal Environment, Objective Setting, Financial Risk, Compliance Risk, Technology Risk, Economical Risk, Reputational Risk, Risk Response, Control Activities, and Monitoring have significant influence toward ERM Index. Nevertheless, each dimension has different positive and negative influence. This finding shows that ERM Dimension could be used to create an ERM format that fits with banking industry. In addition, this study encourage banks to focus more on ERM Dimension to improve financial performance.

Keywords: Enterprise Risk Management (ERM); ERM Implementation; ERM Index; ERM Dimension; Banking Industry.
CHAPTER I
INTRODUCTION

1.1 Background

*Enterprise Risk Management in Banking Industry*

Enterprise Risk Management (ERM) holds a crucial part in banking industry, especially after the 2007-2009 financial crisis (McKinsey, 2015; CIMA, 2017). According to Sahiti et al (2017), ERM is essential for banks to continue to exist and to grow well in the long term. Banks that have huge profits are proven to implement ERM (Sahiti et al, 2017). Unfortunately, a scientific discussion about ERM in banking industry is still rare (Arena & Arnaboldi, 2014; Liem, 2018).

*Banking Industry in Indonesia and Singapore*

Banking Industry in Southeast Asia is now growing rapidly, supported by an increasing population which can afford bank services. However, only 5 (five) ASEAN countries, known as ASEAN 5, including Indonesia and Singapore, have relatively advanced and strong banking industry (Rogers, 2018).

Figure 1.1: ASEAN Banking Sector Size (in billion USD)

![Graph showing ASEAN Banking Sector Size](source: ANZ International & Institutional Banking, 2015)
Indonesia has the biggest population in ASEAN\(^1\) and as stated before, the growth of banking industry in ASEAN is fuelled by more people who are able to afford bank services. As a country with biggest population in ASEAN, Indonesia is expected to contribute to this development. It is also the largest country in ASEAN\(^2\). Meanwhile, Singapore is the smallest country in ASEAN\(^3\). Regardless of its size, Singapore is considered as one of successful developed country and has the largest banking sector in ASEAN. According to Renzi (2015), Singapore is one of the High Income Economies country in ASEAN with strong regulatory environment and skilful human resources.

![Figure 1.2: ASEAN Countries’ Land Area (in sqkm)](image)

Source: ASEAN, 2018

1.1.1 Need for Study
According to Liem (2018), the conceptual framework of ERM originally focuses on non-financial institution. Consequently, there is very few academic literature addressing ERM especially in banking industry (Arena & Arnaboldi, 2014; Liem, 2018). In spite of this fact, the practice for ERM has been extensively implemented and proven to be effective and crucial. Thus, this study is urgently

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\(^1\) ASEAN Statistical Leaflet 2018 (October, 2018). Indonesia has 261,890,900 populaces.
\(^2\) ASEAN Statistical Leaflet 2018 (October, 2018). Indonesia is 1,916,862.2 sqkm.
\(^3\) ASEAN Statistical Leaflet 2018 (October, 2018). Singapore is 719.9 sqkm.
needed to support the academic literature for ERM implementation in banking industry.

1.2 Problem Statement
This study focuses on finding the influence of ERM Dimension toward ERM Index.

1.3 Research Questions
From the problem statement above, the research question that will be analyzed in this study:

_Is there any influence of ERM Dimension toward ERM Index in Banking Industry?_

In order to answer this research question above, this study employs 10 (ten) companion research questions as follows:

a. Is there any influence of Internal Environment toward ERM Index in banking industry?

b. Is there any influence of Objective Setting toward ERM Index in banking industry?

c. Is there any influence of Financial Risk toward ERM Index in banking industry?

d. Is there any influence of Compliance Risk toward ERM Index in banking industry?

e. Is there any influence of Technology Risk toward ERM Index in banking industry?

f. Is there any influence of Economical Risk toward ERM Index in banking industry?

gh. Is there any influence of Reputation Risk toward ERM Index in banking industry?

h. Is there any influence of Risk Response toward ERM Index in banking industry?
i. Is there any influence of Control Activities toward ERM Index in banking industry?

j. Is there any influence of Monitoring toward ERM Index in banking industry?

1.4 Research Objectives
This study is dedicated to find out whether there is influence of ERM Dimension toward ERM Index. In order to achieve this objective, this study employs 10 (ten) companion research objectives as follows:

a. To find out whether there is influence of Internal Environment toward ERM Index in banking industry.

b. To find out whether there is influence of Objective Setting toward ERM Index in banking industry.

c. To find out whether there is influence of Financial Risk toward ERM Index in banking industry.

d. To find out whether there is influence of Compliance Risk toward ERM Index in banking industry.

e. To find out whether there is influence of Technology Risk toward ERM Index in banking industry.

f. To find out whether there is influence of Economical Risk toward ERM Index in banking industry.

g. To find out whether there is influence of Reputation Risk toward ERM Index in banking industry.

h. To find out whether there is influence of Risk Response toward ERM Index in banking industry.

i. To find out whether there is influence of Control Activities toward ERM Index in banking industry.

j. To find out whether there is influence of Monitoring toward ERM Index in banking industry.
1.5 Significance of Study
This study contributes to provide better understanding and knowledge on influence of ERM Dimension toward ERM Index in banking industry. Therefore, this study is expected to bring benefits for:

a. Academic Purposes
This study could be used for academic purposes, especially the one focusing in banking and risk management studies. It also contributes to the scientific discussion and academic literature about ERM in banking industry.

b. Banking Industry
This study could help banks understand how ERM Dimension affects ERM Index, and find out how to improve their performance in respect to risk management.

1.6 Limitations
This study has several limitations as follows:

1. The subject of this study is 3 banks from Indonesia, which are BNI, BRI, and Mandiri, and 3 banks from Singapore, which are DBS, OCBC, and UOB. These six banks are chosen based on criteria as follows: (1) local commercial banks of respective countries (2) the third biggest bank based on Total Asset in 2017.

2. The data used in this study are taken from Annual Report 2016 and 2017 of respective banks.

1.7 Thesis Organization
This study will be organized into 5 (five) chapters.

CHAPTER I. INTRODUCTION
This chapter provides the background of this study, including the need for this study. It also contains the research problem, the research questions and the research objectives, as well as the significance of the study and the limitations on the study.
CHAPTER II. LITERATURE REVIEW
Chapter II provides the theoretical foundations, i.e. the grand theory of the study and the supporting theories including concepts and definitions. This chapter also includes some previous researches and the gap between those researches and this study.

CHAPTER III. RESEARCH METHODOLOGY
This chapter provides the variables of this study presented in a framework, the hypothesis of this study, and the operational definition of the variables. It also provides the research design of this study which includes type of data, statistical analysis method and instrument, data behavior, data sampling, and data collection method.

CHAPTER IV. RESULTS AND DISCUSSION
This chapter provides the unit of analysis and the results of both descriptive and statistical analysis. Chapter IV also shows the finding of this study as well as the supporting literatures which supports the study.

CHAPTER V. CONCLUSION AND RECOMMENDATION
The last chapter provides the conclusion of this study in accordance with the research objectives. This chapter also presents recommendation for further research and banking industry.

1.8 Definition of Terms

1. ERM
ERM is an abbreviation of Enterprise Risk Management. It is defined by COSO (2004) 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 risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.”

2. ERM Index
ERM Index is an index developed by Gordon, Loeb, and Tseng in 2009. Gordon et al (2009) defined ERM Index as “an index of the effectiveness of an organization’s ERM based on its ability to achieve its objectives relative to strategy, operations, reporting, and compliance.”

3. ERM Dimension
ERM Dimension is the components of ERM. These components is the representation of what needs to be achieved in order to have ERM. The components are Internal Environment, Objective Setting, Financial Risk, Compliance Risk, Technology Risk, Economical Risk, Reputational Risk, Risk Response, Control Activities, and Monitoring (COSO, 2004).
CHAPTER II
LITERATURE REVIEW

2.1 Review of Literature

Defining Risk

Risk refers to the consequences of future events and the future events themselves (Aven & Renn, 2009; Šotić & Rajić, 2015). Hence, Šotić & Rajić (2015) stated that the meaning of risk differs within various situations and human perception. Nevertheless, there are some key definitions of the risk we know today. According to Rosa (1998), risk is a situation or circumstances where humans and something that they value are placed at stake and there is no certain outcome. In 2009, ISO reformulated its previous risk definition from 2002 and stated that risk is the consequence of uncertainty on objectives.

History of Risk Management

Risk evolves over time to be what we know today, and the history of the modern risk management dates back to 1955-1964 (Crockford, 1982; Dionne, 2013). The first academic book about risk management is published in 1963 by Mehr and Hedges, and the second is published in 1964 by Williams and Heins. However, these books only cover pure risk management, which means they do not include corporate financial risk (Dionne, 2013).

Financial institutions began to develop internal risk management models and capital calculation formulas to protect them from risks in 1980s when risk is regulated internationally. At that time, risk management governance becomes very important. This leads to the introduction of integrated risk management and the creation of chief risk officer position (Dionne, 2013). Unfortunately, the implementation and utilization are inefficient. The regulations are not enough to keep the financial crisis from happening in 2007.

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4 Pure risk involves only the opportunity for loss and no opportunity for gain, such as fire loss
The Basel III and Risk Management in Banking Industry

At the beginning of the 2007-2009 financial crisis, banking industry is having too much leverage and inadequate liquidity buffers. This condition is worsen by poor governance, risk management, and incentive structure. As a response to the financial crisis, the Basel Committee\(^5\) announced the Basel III as they feel the need to strengthen the Basel II framework (BCBS, 2018).

The main objectives of Basel III are (i) strengthening regulations about capital and liquidity for global banking industry in order to have a more resilient banking experience; and (ii) improving bank’s capability to endure financial crisis by minimizing circulating market risk (BCBS, 2018; Laurens, 2012; Mawutor, 2014). According to Laurens (2012), even though the utilization of Basel III framework is considered very challenging considering that it does not hold any power to enforce strict supervision, this framework has the capability to make the future market risk related with banking less severe.

2.1.1 Grand Theory: Enterprise Risk Management (ERM)

Enterprise Risk Management (ERM) is a holistic approach toward managing an organization’s risk (Gordon et al, 2009). Traditionally, risk management is managed from a silo-based perspective. Each departments treat different risks separately (Kapse, 2016). ERM is a composition of traditional risk management, in which risk is managed from a silo-based perspective, and risk governance\(^6\) (Lundqvist, 2015).

The fundamental premise of ERM is that every parties happens to provide value for stakeholders. These parties come up against uncertainty, and it’s a challenge for management to decide the extent of uncertainty to be accepted as the firm try to grow value for stakeholder. This value is increased when objectives and strategy are established for achieving optimal balance among growth, return goals,

---

\(^5\) The Basel Committee was established at the end of 1974 to improve banking supervision quality worldwide

\(^6\) Risk governance is the architecture for a firm to manage risks, in other words it defines the way a firm undertakes risk management. Risk governance provides guidance for decision-making and resources allocation effectiveness
the risks, and resources redistributions effectiveness and efficiency (COSO, 2004).

According to COSO (2004), ERM includes aligning risk appetite and strategy, enhancing risk response decisions, reducing operational surprises and losses, identifying and managing multiple cross-enterprise risks, seizing opportunities, and improving deployment of capital.

In recent years, ERM has been more and more popular. This is proven by the increasing number of organizations that implement or consider ERM programs, the establishment of specialized ERM units in consulting firms, the consideration of ERM within the rating process in rating agencies, as well as the development of ERM-related courses and research centers in universities (Hoyt & Liebenberg, 2011).

An essential feature of ERM is that the higher level management acquires a complete view on the risk situation of the entire firm. By understanding better, the upper management level could enhance efficiency by more proper strategic decision making (Bohnert et al, 2017). There are five particular factors which are considered to have influence on ERM – firm performance relation. These factors are environmental uncertainty, industry competition, firm complexity, firm size, and board of directors’ monitoring (Gordon et al, 2009).

The implementation of ERM in a firm is measured by appointment of chief risk officer (Waweru & Kisaka, 2011; Aebi et al, 2012; Lundqvist, 2015; Liem, 2018), and ERM Index (Gordon et al, 2009).
2.1.2 Dependent Variable: ERM Index
ERM Index was developed based on an organization’s ability to achieve its objective in connection with its strategy, operations, reporting, and compliance (Gordon et al, 2009). It is measured by the equation as follows (Liem, 2018):

\[
\text{ERM Index} = \bar{z} \text{ Strategy} + \bar{z} \text{ Operating} + \bar{z} \text{ Reporting} + \bar{z} \text{ Compliance}
\]

**Strategy**
Strategy refers to the way a firm places itself in the market place comparative to its competition (Porter, 2008).

For banking industry, Strategy of a firm is measured by this equation below (Liem, 2018):

\[
\text{Strategy} = \frac{(\text{Interest Income} - \text{Average Commercial Banks Interest Income})}{\sigma \text{ Interest Income}}
\]

A firm will develop a competitive advantage, which supports its missions and goals, when carrying out its strategy. This will increase firm’s performance and value, and minimize its risk (COSO, 2004; Porter, 2008; Gordon et al, 2009).

**Operating**
Operating refers to effectivity and efficiency of resources usage. This is measured as input-output relation within a firm’s operation process (Banker et al, 1989).

For banking industry, Operating of a firm is measured by this equation below (Liem, 2018):

\[
\text{Operating} = \frac{\text{Interest Income}}{\text{Total Assets}}
\]
Higher operation efficiency and productivity will increase firm’s performance and value, and minimize its risk (Banker et al, 1989; COSO, 2004; Gordon et al, 2009).

**Reporting**

Reporting refers to reporting reliability. Poor reporting reliability is shown by illegal earnings management, financial restatements, and financial fraud. Poorer reporting reliability will increase firm’s overall risk and consequently decrease its performance and value (Cohen et al, 2004; COSO, 2004; Gordon et al, 2009).

For banking industry, Reporting of a firm is measured by this equation below (Liem, 2018):

\[
\text{Reporting} = (\text{Material Weakness}) + (\text{Auditor Opinion}) + (\text{Restatement})
\]

Where:

- **Material Weakness**: It is set to (-1) if the Bank disclose any material weakness, otherwise is set to (0).
- **Auditor Opinion**: It is set to (0) if the Bank has unqualified auditor opinion (other than Big 5 Public Accountant), otherwise is set to (1).
- **Restatement**: It is set to (-1) if the Bank announces restatement, otherwise is set to (0)

**Compliance**

Compliance refers to firm’s obedience with laws and regulations (COSO, 2004). Therefore, compliance is measured by the proportion of auditor’s fee to total assets (Liem, 2018) with detail equation as follows:

\[
\text{Compliance} = \frac{\text{External Auditor Fees}}{\text{Total Assets}}
\]
Better compliance will minimize firm’s risk and increase its performance and value. Compliance increases alongside with audit fees (COSO, 2004; Gordon et al, 2009).

2.1.3 ERM Dimension
ERM Dimension is the key elements of ERM. These dimensions serve as tools in conducting evaluation of banks’ enterprise risk management.

Internal Environment
Internal environment covers the condition of a firm, and determines the bases for its people to view and address risk, as well as philosophy of risk management and risk appetite, integrity and ethical values, and operating environment (COSO, 2004).

Internal Environment is measured by answering these question as follows:
Is there a charter of the board?
Information on the code of conduct/ethics?
Information on how compensation policies align interest of managers with shareholders?
Information on individual performance targets?
Information on procedures for hiring and firing of board member and management?
Information on remuneration policy of board members and management?
Information on training, coaching and educational programs?
Information on training in ethical values?
Information on board responsibility?
Information on audit committee responsibility?
Information on CEO responsibilities?
Information on senior executive responsible for risk management?
Information on supervisory and managerial oversight?
Objective Setting

Setting objectives is important for a firm because it will guide its management to recognize prospective events that affect its achievement. The existence of ERM within a firm guarantees the management a process to set objectives which are coherent with the risk appetite and supporting its missions (COSO, 2004).

Objective Setting is measured by answering these question as follows:

Information on company's mission?
Information on company's strategy?
Information on company's business objectives?
Information on adopted benchmarks to evaluate results?
Information on approval of the strategy by the board?
Information on the link between strategy, objectives, and shareholder value?

Financial Risk

Financial risk could be identified by understanding potential of loss as a result of price change and by estimating the possibility of such phenomenon to hold event. Financial risk rises from changes in financial market prices, such as liquidity risk, interest rate risk, foreign exchange rate risk, credit risk, equity price risk, and commodity price risk (Horcher, 2011).

Financial Risk is measured by answering these question as follows:

Information on the extent of liquidity?
Information on the interest rate?
Information on the foreign exchange rate?
Information on the cost of capital?
Information on the access to the capital market?
Information on the long-term debt instruments?
Information on default risk?
Information on solvency risk?
Information on equity price risk?
Information on commodity risk?

**Compliance Risk**

Compliance risk is one of the most important matters for a firm’s management. As global regulations increase rapidly, firms are threatened to higher compliance risk. Nowadays, it technology risk in banking is more than just a legal function (Kaminski & Robu, 2016). It encompasses how regulatory requirements, laws, codes of conduct, and organizational standards of practice are adapted into a practical set of actions (Deloitte, 2015).

Compliance Risk is measured by answering these question as follows:

*Information on litigation issues?*
*Information on compliance with regulation?*
*Information on compliance with industry codes?*
*Information on compliance with voluntary codes?*
*Information on compliance with recommendation of Corporate Governance?*

**Technology Risk**

Technology is considerably affecting the business process in banking industry, especially to business productivity and innovations. Consequently, if the management of a firm fails to identify any possible risks, such as clients’ privacy information leakage and breach of database security, the impact will be severe for not only the firm but also the economy at large (Svatá & Fleischmann, 2011).

Technology Risk is measured by answering these question as follows:

*Information on data management?*
*Information on computer systems?*
*Information on the privacy of information held on customers?*
*Information on software security?*
**Economical Risk**

Economic risks focuses on macro-economic events that may cause critical loss for a firm. This risks includes inflation, changes in government regulations, and other actions which unfavorably influence profit (Lexis Nexis, 2018).

Economical Risk is measured by answering these question as follows:

- Information on the nature of competition?
- Information on the macro-economic events that could affect the company?

**Reputational Risk**

Reputation risk refers to possibility of negative publicity of a firm, regardless it is true or not, to damage its worthiness in public’s eyes. (Bonime-Blanc & Ponzi, 2016; The Fed, 2018)

Reputational Risk is measured by answering these question as follows:

- Information on environmental issues?
- Information on ethical issues?
- Information on health and safety issues?
- Information on lower/higher stock or credit rating?

**Risk Response**

Response to risks could vary from accepting, sharing, reducing to avoiding completely. A set of actions that a firm choose in responding to risks depends on its risk tolerance and risk appetite (COSO, 2004).

Risk Response is measured by answering these question as follows:

- General description of processes for determining how risk should be managed?
- Information on written guidelines about how risk should be managed?
- Response to the liquidity risk?
- Response to the interest rate risk?
- Response to the foreign exchange rate risk?
- Response to the risk related to cost of capital?
Response to the access to the capital market?
Response to of long-term debt instruments?
Response to litigation risk?
Response to default risk?
Response to solvency risk?
Response to equity price risk?
Response to commodity risk?
Response to compliance with regulation?
Response to compliance with industry codes?
Response to compliance with voluntary codes?
Response to compliance with recommendation of Corporate Governance?
Response to data risk?
Response to computer systems risk?
Response to the privacy of information held on customers?
Response to risk of software security?
Response to the risk of competition?
Response to environmental risk?
Response to ethical risk?
Response to health and safety risk?
Response to risk of lower/higher stock or credit rating?

**Control Activities**

Control activities refers to the creation of policies and procedures as well as the application of those policies and procedures to support the set of actions a firm chooses to accomplish. Control is also meant to guarantee the effectiveness of the set of actions (COSO, 2004).

Control Activities is measured by answering these question as follows:
Information on sales control?
Information on review of the functioning and effectiveness of controls?
Information on authorization issues?
Information on documents and record as control?
Information on independent verification procedures?
Information on physical controls?
Information on process control?

**Monitoring**

Monitoring is carried out alongside with management activities as well as separate evaluations. It is meant to see the comprehensive implementation of ERM within a firm, and to decide whether it needs adjustments (COSO, 2004).

Monitoring is measured by answering these question as follows:

**Information on how processes are monitored?**

**Information about internal audit?**

### 2.2 Previous Studies

<table>
<thead>
<tr>
<th>No</th>
<th>Title</th>
<th>Author(s)</th>
<th>Year</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Enterprise risk management: An empirical analysis of factors associated with the extent of implementation</td>
<td>Mark S. Beasley, Richard Clune, Dana R. Hermanson</td>
<td>2005</td>
<td>The study is done in United States of America. It examines 123 US and international organizations to find out the factors associated with the stage of ERM implementation. It is found that the stage of ERM implementation is positively related to the presence of a chief risk officer, board independence, CEO and CFO apparent support</td>
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<td>Year</td>
<td>Study Title</td>
<td>Author(s)</td>
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<tr>
<td>2006</td>
<td>The Impact of Enterprise Risk Management on the Internal Audit Function</td>
<td>Mark S. Beasley, Richard Clune, Dana R. Hermanson</td>
<td>This study is conducted in United States of America. It examines 112 organizations world-wide to find factors associated with the overall impact of enterprise risk management (ERM) on the internal audit function’s activities. It finds that in banking industry, ERM will impacts internal audit activities if the process of ERM is complete, there is deeper internal audit activities initiated by CFO, the Audit Executives hold the job for a long time, and the internal audit activities embrace ERM leadership.</td>
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<tr>
<td>2009</td>
<td>Enterprise risk management and firm performance: A contingency perspective</td>
<td>Lawrence A. Gordon</td>
<td>This study is done in United States of America. It examines 112 US firms in order to see whether the relation between ERM and firm performance is contingent upon the appropriate match between ERM and the following five factors affecting a</td>
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<td>Author(s)</td>
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<tr>
<td>Martin P. Loeb</td>
<td>Firm: environmental uncertainty, industry competition, firm size, firm complexity, and board of directors’ monitoring.</td>
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<tr>
<td>Chih-Yang Tseng</td>
<td>It is found that the relation between ERM and firm performance is contingent upon the appropriate match between ERM and the following five factors affecting a firm.</td>
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<td></td>
<td>This study also developed a model called ERM Index, which is to score organization’s ability to achieve its objective in connection with its strategy, operations, reporting, and compliance.</td>
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<tr>
<td>The Influence of Board Composition, Audit Fees and Ownership Concentration on Enterprise Risk Management</td>
<td>Kurt A. Desender</td>
<td>2009</td>
<td>This study focuses on pharmaceutical industry, and uses 97 firms as its sample. The main purpose of this study is to explore how the board composition, the audit fee and the ownership structure are related to the degree of enterprise risk management.</td>
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<td></td>
<td>It reveals that the board independence, the audit scope</td>
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<td>Title</td>
<td>Authors</td>
<td>Year</td>
<td>Summary</td>
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<tr>
<td>5</td>
<td>On the Determinants of Enterprise Risk Management Implementation</td>
<td>Kurt Desender</td>
<td>2011</td>
<td>This study focuses on 75 firms in pharmaceutical industry. The objective of this study is to investigate how a company’s board characteristics influence the decision to invest in enterprise risk management. This study finds that board independence alone does not induce higher enterprise risk management quality. Instead, boards with a separation of CEO and chairman, boards with both an independent board and a separation of CEO and chairman are more likely to adopt ERM.</td>
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<tr>
<td>6</td>
<td>The Effect of Enterprise Risk Management</td>
<td>Beatrice Karimi Nyagah</td>
<td>2014</td>
<td>This study is conducted in Kenya and focuses on 11 Pension Fund Management Firms. It aims to determine the level of ERM.</td>
</tr>
<tr>
<td>Title</td>
<td>Authors</td>
<td>Year</td>
<td>Details</td>
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<tr>
<td>An Exploratory Study of Enterprise Risk Management: Pillars of ERM</td>
<td>Sara A. Lundqvist</td>
<td>2014</td>
<td>This is a study aiming to determine the integral components of ERM based on how firms actually implement ERM dimensions. The sample for this study are firms listed on two major Nordic stock exchanges, either NASDAQ OMX or Oslo Bo’rsen, and with headquarters in a Nordic country (Sweden, Norway, Finland, or Denmark).</td>
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<tr>
<td>Implementation of Enterprise Risk Management by Pension Fund Management Firms in Kenya</td>
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<td></td>
<td>This study finds that event identification, risk assessment, objective setting, and information communication had negative effects; while risk response, internal environment, and control activities had positive effects on the financial performance of pension fund management firms in Kenya. This study also finds the effects of event identification and risk response on financial performance were insignificant.</td>
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<tr>
<td>Page</td>
<td>Study Title</td>
<td>Author(s)</td>
<td>Year</td>
<td>Abstract</td>
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<tr>
<td>8</td>
<td>Does Enterprise risk management enhance operating performance?</td>
<td>Carolyn Callahan</td>
<td>2017</td>
<td>The study aims to prove that firms with mature ERM processes should achieve greater operational performance than those with less mature risk management processes. It samples 162 firms throughout the U.S. and other countries. It is proven that firms with higher levels of ERM process maturity are characterized by higher operating performance than their industry peers utilizing performance metrics closely related to the earnings process.</td>
</tr>
<tr>
<td>9</td>
<td>The Impact of Enterprise Risk Management</td>
<td>Kingsley Karunaratne Alawattegama</td>
<td>2018</td>
<td>This study is conducted in Sri Lanka. It examines 45 banking and finance companies which are...</td>
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</tbody>
</table>
This study finds none of the eight key ERM functions suggested by the COSO’s ERM integrated framework has a significant impact on firm performance. Event identifications, risk assessment, risk response and information & communication indicate a positive impact on firm performance. On the contrary, objective setting; event identification, control activities and monitoring of ERM functions have a negative impact on firm.

This study is done in Indonesia. It examines ERM implementation in 4 (four) state-owned commercial banks in Indonesia during the early stage of the ERM implementation regulation in Indonesian, especially its impact towards bank performance and vice versa.
This study founds:
ERM Index has positive significant impact toward Return on Average Asset and vice versa;
ERM Index has positive but insignificant impact toward Net Interest Margin and vice versa;
and
ERM index has positive but insignificant impact toward Equity Multiplier.

<table>
<thead>
<tr>
<th>11</th>
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<tbody>
<tr>
<td>Enterprise Risk Management and Default Risk: Evidence from the Banking Industry</td>
</tr>
<tr>
<td>Sara A. Lundqvist, Anders Vilhelmsson</td>
</tr>
<tr>
<td>2018</td>
</tr>
<tr>
<td>This study investigates the relationship between the degree of ERM implementation and default risk in 78 largest banks in the world. It is found that the degree of ERM implementation is not a significant determinant of credit ratings when controls for corporate governance are included.</td>
</tr>
</tbody>
</table>

### 2.3 Research Gap

This study analyzes the implementation of ERM in banking industry. It attempts to find out whether there is influence of ERM Dimension toward ERM Index in Indonesia and Singapore banking industry with focus on 3 (three) Indonesian local commercial banks and 3 (three) Singaporean local commercial banks. The gap from previous researches varies from variables to results.
This study consists of Internal Environment, Objective Setting, Financial Risk, Compliance Risk, Technology Risk, Economical Risk, Reputational Risk, Risk Response, Control Activities, Monitoring, which are ERM Dimension, and ERM Index. It concerns about the influence of ERM Dimension toward ERM Index. While Nyagah (2014) measures the level of implementation of ERM using Internal Environment, Objective Setting, Event Identification, Risk Assessment, Risk Response Information & Communication, and Control Activities to see the effect toward firm’s financial performance. Alawattekama (2018) uses Objective Setting, Event Identification, Risk Assessment, Risk Response, Information & Communication, Control Activities and Monitoring to measure the implementation of ERM and to explore the impact on firm’s performance. Both previous researches have different concern with Gordon et al (2009) and Liem (2018) who focus on ERM Index to measure ERM Implementation and to find out the impact on firm performance.

The sample used in this study is 3 (three) banks from Indonesia and 3 (three) banks from Singapore. Meanwhile, Liem (2018) focuses on 4 (four) state-owned banks in Indonesia. This study and Liem’s previous research are in contract with the other previous researches: Gordon et al (2009) focuses on 112 US firms, Nyagah (2014) focuses on 11 pension fund management firms in Kenya, and Alawattekama (2018) examines 45 banking and finance companies listed in Colombo Stock Exchange in Sri Lanka. Furthermore, most of the previous researches do not focus specifically on banking industry, except Liem (2018). These being said, this study is motivated to analyze ERM in banking industry as its concern.
CHAPTER III
RESEARCH METHODOLOGY

3.1 Theoretical Framework
This study employs 1 (one) dependent variable and 10 (ten) independent variables. The dependent variable is ERM Index, and the independent variables are Internal Environment, Objective Setting, Financial Risk, Compliance Risk, Technology Risk, Economical Risk, Reputation Risk, Risk Response, Control Activities, and Monitoring.

Figure 3.1: Theoretical Framework

Source: Researcher, 2018
3.2 Hypothesis
The following hypothesis are developed from the theoretical framework:

- **h1**: Internal Environment has significant influence toward ERM Index
- **h2**: Objective Setting has significant influence toward ERM Index
- **h3**: Financial Risk has significant influence toward ERM Index
- **h4**: Compliance Risk has significant influence toward ERM Index
- **h5**: Technology Risk has significant influence toward ERM Index
- **h6**: Economical Risk has significant influence toward ERM Index
- **h7**: Reputation Risk has significant influence toward ERM Index
- **h8**: Risk Response has significant influence toward ERM Index
- **h9**: Control Activities has significant influence toward ERM Index
- **h10**: Monitoring has significant influence toward ERM Index

3.3 Operational Definitions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operational Definition</th>
<th>Level of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variable (y)</strong></td>
<td></td>
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<tr>
<td>ERM Index</td>
<td>Score of ERM implementation, calculated by: ERM Index = χ Strategy + χ Operating + χ Reporting + χ Compliance</td>
<td>Ratio Data</td>
</tr>
<tr>
<td><strong>Independent Variable (x)</strong></td>
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<tr>
<td>Internal Environment</td>
<td>The condition of the bank which determines the basis for its people to view and address risk.</td>
<td>Ratio Data</td>
</tr>
<tr>
<td>Objective Setting</td>
<td>The existence of objectives which align with the strategy and missions of the bank</td>
<td>Ratio Data</td>
</tr>
<tr>
<td>Financial Risk</td>
<td>Risk which rises from changes in financial market prices, such as liquidity risk, interest rate risk, foreign exchange rate risk, credit risk, equity price risk, and commodity price risk.</td>
<td>Ratio Data</td>
</tr>
</tbody>
</table>
Compliance Risk (COSO, 2004; Deloitte, 2015; Kaminski & Robu, 2016) | Risk of failing to comply with the government regulations and general standard of practice. | Ratio Data
---|---|---
Technology Risk (COSO, 2004; Svatá & Fleischmann, 2011) | Risk which relates with the usage of technology within the banking operation. | Ratio Data
Economical Risk (COSO, 2004; Lexis Nexis, 2018) | Systematic risk which affects the bank’s performance. | Ratio Data
Risk Response (COSO, 2004) | Bank’s actions in regards to the identified risks. | Ratio Data
Control Activities (COSO, 2004) | Bank’s action to ensure the response to risks is effective. | Ratio Data
Monitoring (COSO, 2004) | The activity of overseeing the implementation of ERM within the bank. | Ratio Data

Source: Researcher, 2018

### 3.4 Research Design
The type of research used in this study is fundamental quantitative research. It is based on quantity measurement and applicable only to phenomena which can be expressed in terms of quantity (Kothari, 2004). This study collects data in numerical form and analyze it using statistic model. The result of this study will be provided in numerical form as well.

### 3.4.1 Panel Data
Panel data sets, also called cross sectional time-series data or longitudinal data, is introduced by Lazarsfeld and Fiske in 1938 (Frees, 2004; Seetaram & Petit, 2012). Panel data sets observes data which are taken in equally-spaced time sequence (Seetaram & Petit, 2012).

This study uses panel data analysis: 6 (six) banks and 2 (two) years. This data will be run using General Least Square (GLS) Regression Model.
3.4.2 Random Effect Models
Random effect models is also called mixed or multilevel models. It is more
efficient than fixed effect models (Clarke et al, 2010). This study uses random
effect models which means the findings of this study are applicable not only to the
sample of this study but also to the population.

3.4.3 Research Instrument
This study collects data from published sources, i.e. Annual Report, journals,
books, and websites. To organize the data before running it statistically, this study
uses Microsoft Excel. The statistic software used in this study is STATA.

3.5 Data Sampling
Sample is a part of a population. Population could refer to number of people, as
well as total quantity of the objects or cases that is used as the subject of study.
This study uses convenience sampling, which is a part of nonprobability
sampling. Nonprobability sampling selects a sample from population
intentionally. Randomization is important in nonprobability sampling (Etikan et
al, 2016).

Convenience sampling, is also known as Haphazard Sampling or Accidental
Sampling. The target population for convenience sampling generally has certain
practical criteria, such as easy accessibility, geographical proximity, availability at
a given time, or the willingness to participate are included for the purpose
of the study (Etikan et al, 2016).

The population for this study is banking industry. The sample is 3 (three) local
commercial banks from Indonesia, which are BNI, BRI, Mandiri, and 3 (three)
local commercial banks from Singapore, which are DBS, OCBC, and UOB. 3
(three) local banks from Indonesia is chosen because Singapore only has 3 (three)
local banks. These 6 (six) banks are the 3 (three) largest local commercial banks
in each country.
The observation unit, 2 (two) years 2016-2017, is selected because ERM in banking has just been implemented in 2014, and this study would like to know the current implementation of ERM.

3.5.1 Data Collection Method
This study utilizes secondary data. The data are collected from Annual Report of the banks which has been published on their official website. The data is annually and taken for 2 (two) years; 2016-2017.
CHAPTER IV
RESULTS AND DISCUSSION

4.1 Bank Profile
This study focuses to analyze ERM implementation at 3 commercial banks in Indonesia and Singapore, with detail information as follows:

3 Commercial Banks in Indonesia:

Bank Negara Indonesia (BNI)

BNI is originally established in 1946 as a Central Bank under the Government Regulation in Lieu of Law No.2 of 1946. Afterward, in 1968 under the Law No. 17, its name becomes “Bank Negara Indonesia 1946” and its status becomes State-owned Commercial Bank. The role of BNI is also confirmed by the law, which is to improve people’s economy and participate in national development (BNI, 2017).

The legal status of BNI becomes a limited liability company in 1992 based on Government Regulation No. 19. Following this event, BNI becomes the first State-owned Enterprise to be a public company in 1996, after listing its shares on the Jakarta Stock Exchange and the Surabaya Stock Exchange. Currently, 60% of its shares is owned by Indonesian Government, and the rest 40% is owned by public. BNI is one of the largest national bank in Indonesia (BNI, 2017), with the size of USD 52,358,124,452.99 by 2017 (BNI, 2017).

Bank Rakyat Indonesia (BRI)

BRI is incorporated in 1895 in Purwokerto, Central Java by the name of De Poerwokertosche Hulp en Spaarbank der Inlandsche Hoofden, which means Help and Savings Bank of the Aristocrats of Purwokerto. It is a financial institution that served native
Indonesians. After the Independence of Indonesia, BRI is acknowledged as the first state-owned bank in Indonesia under the Government Regulation No.1/1946 Article 1. In 1948, BRI ceases its activities temporarily due to war of defending the independence of Indonesia, and in 1949, when it resumes its activities, its name changes to Bank Rakyat Indonesia Serikat (BRI, 2017).

In 1992, the status of BRI becomes a limited liabilities company under the Banking Law No. 7 and Regulation of the Government of the Republic of Indonesia No. 21. In 2003, it officially becomes public company after releasing 30% of its shares to public (BRI, 2017). By 2017, the size of BRI was USD 83,132,298,012.11 (BRI, 2017).

**Bank Mandiri (Mandiri)**

Mandiri is established in 1998 as part of the Government of Indonesia’s bank restructuring program. Four state-owned banks – Bank Bumi Daya, Bank Dagang Negara, Bank Exim and Bapindo – are merged into Mandiri (Bank Mandiri, 2017).

In 2005, Mandiri commits to a 2 stages 5-year transformation program. At the first stage (2005 – 2009), Mandiri focuses on four key areas which are culture, sales, alliances, and NPL controls. As a result, Mandiri becomes a dominant Domestic Multispecialist Bank. Mandiri starts its second stage in 2010. The focus on stage 2 are wholesale transactions, retail deposits & payments, and retail financing. Mandiri aims to be in the Top 3 banks in ASEAN by 2020 (Bank Mandiri, 2017). As of December 2017, Mandiri’s size is USD 83,018,097,246.15 (Bank Mandiri, 2017).
3 Commercial Banks in Singapore:

**Development Bank of Singapore (DBS)**

DBS is established in 1968 with 49% of ownership by the government, 25% of ownership by commercial banks and other financial institutions, and the rest 26% was owned by other companies and the public. Throughout its development, DBS has opened branches not only in Singapore, but also other in countries such as Taiwan (1983). It also has acquired several financial institutions including POSB (1998), Dao Heng Bank (2001), and Bowa Bank (2008). DBS leads the initial public offering of several Singapore’s companies including Singapore Airlines (1985) and Singtel (1993) (DBS, 2018).

DBS launches its very first internet banking facility in 1997, and in 2016, it claims the title of World’s Best Digital Bank. In 2016, DBS launches digibank in India, and in Indonesia in 2017 (DBS, 2018). As of December 2017, the size of DBS was USD 387,334,281,011.52 (DBS, 2017).

**Oversea-Chinese Banking Corporation (OCBC)**

OCBC is formed in 1932 from the merger of three local banks, which are the Chinese Commercial Bank Limited, the Ho Hong Bank Limited, and the Oversea-Chinese Bank Limited, out of the Great Depression. Understanding the challenges of the great depression, OCBC supports community through its financial solutions for personal and business needs. This initiative then helps Singapore to bit by bit rebuild its collapsed economy from war after 1945 (OCBC Group, 2018).

In 1972, OCBC acquires Four Seas Communication Bank. Great Eastern Holdings also becomes OCBC’s after OCBC increases its investment from 48.8% to 81.1% in 2004, 86.9% in 2006, and 87.1% in 2008. Furthermore, it completes the acquisition of ING Asia Private Bank in 2010, and Wing Hang Bank in 2014. Currently, OCBC is the second largest financial services group in Southeast Asia.
by assets of USD 340,369,594,493.49 at the end of 2017 (OCBC, 2017; OCBC Group, 2018)

**United Overseas Bank (UOB)**

UOB is originally incorporated by the name of the United Chinese Bank in 1935 in the middle of economic uncertainties after the Great Depression. In the early years of its incorporation, UOB accommodates generally to merchant community by providing banking services. The name United Overseas Bank is effectively used in 1965 and after (UOB Group, 2015).

UOB opens its first overseas branch in Hong Kong in 1965. Following this, UOB keeps expanding its existence and opens branches in more countries including Tokyo, Japan (1971), London, United Kingdom (1975), Shanghai, China (1998), Mumbai, India (2009), and Yangon, Myanmar (2015). Along with its growth, UOB acquires many financial institution both in and outside Singapore such as Chung Khiaw Bank in 1971, Lee Wah Bank in 1973, Far Eastern Bank in 1984, Overseas Union Bank in 2001, and PT Bank Buana in Indonesia in 2005. Having more than 500 branches and offices around the globe (UOB Group, 2015), UOB has USD 268,286,697,590.90 assets as of December 2017 (UOB, 2017).

**4.2 Descriptive Analysis**

**4.2.1 ERM Index**

ERM Index was developed based on an organization’s ability to achieve its objective in connection with its strategy, operations, reporting, and compliance (Gordon et al, 2009).

**Strategy**

The score of strategy shows how successful a bank is to achieve its objective in the point of view of increasing shareholder value. It is assessed by dividing the
result of subtracting average income of country’s banks each year from the bank’s interest income with the country’s interest income range of divergence.

In 2016, BRI ranks first in Indonesia with the score 3.81. However, compared to Singaporean banks, BRI still far from getting close. UOB which is ranked third in Singapore score 8.49.

**Figure 4.1 & Table 4.1: ERM Index – Strategy (2016)**

<table>
<thead>
<tr>
<th>Bank</th>
<th>2016 Score</th>
<th>Rank</th>
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<tr>
<td>Indonesia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNI</td>
<td>1.70</td>
<td>3</td>
</tr>
<tr>
<td>BRI</td>
<td>3.81</td>
<td>1</td>
</tr>
<tr>
<td>Mandiri</td>
<td>2.96</td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>2.82</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBS</td>
<td>10.03</td>
<td>1</td>
</tr>
<tr>
<td>OCBC</td>
<td>8.58</td>
<td>2</td>
</tr>
<tr>
<td>UOB</td>
<td>8.49</td>
<td>3</td>
</tr>
<tr>
<td>Average</td>
<td>9.03</td>
<td></td>
</tr>
</tbody>
</table>

Source: Annual Report, 2016

This result shows that Indonesia, compared to Singapore, is still lacking in enhancing shareholder value.

In 2017, all banks in both countries are getting better in implementing their strategy.

(Figure 4.2 & Table 4.2 are presented on the next page)
Figure 4.2 & Table 4.2: ERM Index – Strategy (2017)

<table>
<thead>
<tr>
<th>Bank</th>
<th>2017 Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNI</td>
<td>1.87</td>
<td>3</td>
</tr>
<tr>
<td>BRI</td>
<td>4.18</td>
<td>1</td>
</tr>
<tr>
<td>Mandiri</td>
<td>3.06</td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>3.04</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBS</td>
<td>11.36</td>
<td>1</td>
</tr>
<tr>
<td>OCBC</td>
<td>9.55</td>
<td>2</td>
</tr>
<tr>
<td>UOB</td>
<td>9.51</td>
<td>3</td>
</tr>
<tr>
<td>Average</td>
<td>10.14</td>
<td></td>
</tr>
</tbody>
</table>

Source: Annual Report, 2017

For Indonesian banking industry, BRI still leads in Indonesian banking industry with the score of 4.18, and for Singaporean banking industry, DBS leads with 11.36. To sum up, BRI has the most mature implementation of their strategy, followed by Mandiri and BNI. However, Indonesia is still fallen behind Singapore.

Figure 4.3 & Table 4.3: ERM Index – Strategy (Average)

<table>
<thead>
<tr>
<th>Bank</th>
<th>Average Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNI</td>
<td>1.78</td>
<td>3</td>
</tr>
<tr>
<td>BRI</td>
<td>4.00</td>
<td>1</td>
</tr>
<tr>
<td>Mandiri</td>
<td>3.01</td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>2.93</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBS</td>
<td>10.70</td>
<td>1</td>
</tr>
<tr>
<td>OCBC</td>
<td>9.06</td>
<td>2</td>
</tr>
<tr>
<td>UOB</td>
<td>9.00</td>
<td>3</td>
</tr>
<tr>
<td>Average</td>
<td>9.59</td>
<td></td>
</tr>
</tbody>
</table>

Source: Annual Report, 2016 & 2017

Singaporean banks have an even primer strategy implementation, led by DBS and followed by OCBC and UOB respectively.
Operating score shows how effective and efficient bank uses its assets to generate interest income.

BRI is the most effective and efficient bank to use its assets to generate interest income in Indonesia and Singapore in 2016. BRI left the two other banks, BNI and Mandiri in a tie with the score 0.07. While Indonesia has a leading bank, all three Singaporean banks are having the same score of 0.02.

![Figure 4.4 & Table 4.4: ERM Index – Operating (2016)](image)

<table>
<thead>
<tr>
<th>Bank</th>
<th>Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNI</td>
<td>0.07</td>
<td>2</td>
</tr>
<tr>
<td>BRI</td>
<td>0.09</td>
<td>1</td>
</tr>
<tr>
<td>Mandiri</td>
<td>0.07</td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBS</td>
<td>0.02</td>
<td>1</td>
</tr>
<tr>
<td>OCBC</td>
<td>0.02</td>
<td>1</td>
</tr>
<tr>
<td>UOB</td>
<td>0.02</td>
<td>1</td>
</tr>
<tr>
<td>Average</td>
<td>0.02</td>
<td></td>
</tr>
</tbody>
</table>

Source: Annual Report, 2016

This shows that the performance of all three banks are equivalent. Nevertheless, Singaporean banks are far behind Indonesian banks in utilizing their assets to generate interest income as the score are quite far off.

2017 shows a little bit of score changes. As BRI still leads with 0.09, BNI falls 0.01 score from the previous year and lands on the third position. While Indonesian bank shows a little setback, UOB from Singapore shows its advancement of assets usage to generate interest income by scoring 0.01 higher than the previous year and becoming the leading bank in Singapore.

(Figure 4.5 & Table 4.5 are presented on the next page)
Despite of this fluctuation, Singapore still far less effective and efficient compared to Indonesia.

Clearly, Indonesian banks are better in utilizing their assets to generate interest income than Singaporean banks.

*Reporting*

Contradictory with the other indexes, lower score of reporting shows better reliability.
In 2016, BRI leads by 1 point, and the rest of banks from both countries have the same score. This makes Indonesia better in reporting for 2016.

Figure 4.7 & Table 4.7: ERM Index – Reporting (2016)

<table>
<thead>
<tr>
<th>Bank</th>
<th>Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNI</td>
<td>(1.00)</td>
<td>2</td>
</tr>
<tr>
<td>BRI</td>
<td>(2.00)</td>
<td>1</td>
</tr>
<tr>
<td>Mandiri</td>
<td>(1.00)</td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>(1.33)</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBS</td>
<td>(1.00)</td>
<td>1</td>
</tr>
<tr>
<td>OCBC</td>
<td>(1.00)</td>
<td>2</td>
</tr>
<tr>
<td>UOB</td>
<td>(2.00)</td>
<td>1</td>
</tr>
<tr>
<td>Average</td>
<td>(1.00)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Annual Report, 2016

In 2017, the reporting performance of Indonesia remains the same, while Singapore has improvement. UOB improve by 1 point in 2017.

Figure 4.8 & Table 4.8: ERM Index – Reporting (2017)

<table>
<thead>
<tr>
<th>Bank</th>
<th>Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BNI</td>
<td>(1.00)</td>
<td>2</td>
</tr>
<tr>
<td>BRI</td>
<td>(2.00)</td>
<td>1</td>
</tr>
<tr>
<td>Mandiri</td>
<td>(1.00)</td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>(1.33)</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBS</td>
<td>(1.00)</td>
<td>2</td>
</tr>
<tr>
<td>OCBC</td>
<td>(1.00)</td>
<td>2</td>
</tr>
<tr>
<td>UOB</td>
<td>(2.00)</td>
<td>1</td>
</tr>
<tr>
<td>Average</td>
<td>(1.33)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Annual Report, 2017

This means both Indonesia and Singapore are equivalent in their reporting activities.
To sum up, Singapore shows improvement in 2017, however Indonesia is a little bit better than Singapore in terms of reporting activities.

**Compliance**

The score of compliance is determined by dividing external auditor fee with the bank’s total assets. Higher score shows better performance of complying with laws and regulations.

For Indonesian banking industry, instead of always being leading, BRI has poor ranked in compliance. In 2016, BNI leads in complying with laws and regulations. In Singapore, UOB leads. The scoring margin between Indonesia and Singapore is pretty far which means Singapore is better in complying with their respective laws and regulations.

(Figure 4.10 & Table 4.10 are presented on the next page)
In 2017, BNI still leads and BRI still on the last. Change happens in Singapore, as DBS rises to being first in complying with laws and regulations, putting UOB on the second.

Comparing Indonesia and Singapore, Indonesia scores lower than the previous year while Singapore scores better.

BNI has been identified to be leading in complying with laws and regulations. However, Singapore scored-lowest bank, OCBC, still complies better than BNI.
This shows Singaporean banks are more obedience than Indonesian banks.

4.2.2 ERM Dimensions
ERM Dimensions are the key elements of ERM. These dimensions serve as tolls in conducting evaluation of banks’ enterprise risk management.

**Internal Environment**
Internal environment impacts bank’s implementation and function of enterprise risk management continuously.

Figure 4.13 & Table 4.13: ERM Dimension – Internal Environment (2016)
In 2016, Indonesia scores lower than Singapore in internal environment. This means that Singapore is better in creating banks culture in which enterprise risk management can sustain.

In 2016, Indonesia scores lower than Singapore in internal environment. This means that Singapore is better in creating banks culture in which enterprise risk management can sustain.

In 2017, both Indonesia and Singapore are having lower score than previous year. Nevertheless, Singapore still has better score than Indonesia.

**Objective Setting**

Objective setting are set based on bank’s risk appetite. This impacts how bank manages its enterprise risk management.
In 2016, all Indonesian banks score the same. This shows that all three banks have the same level of objective setting. As for Singapore, DBS shows better score than UOB and OCBC, however the average of the three banks are 5. Generally, Indonesia and Singapore are equivalent in setting their objectives.
In 2017, Mandiri from Indonesia and OCBC from Singapore shows improvement in setting its objectives by scoring 1 point higher than the previous year, while the rest of the banks from both countries remain the same. This improvement increase both countries’ average objective setting score evenly.

**Financial Risk**

Financial risk focuses on risks that relate with how company finance their activities.

In 2016, all Indonesian banks score 7. This shows that all three banks have the same level of identifying financial risk. As for Singapore, UOB shows better score.
than OCBC and DBS, however the average of the three banks are 7. Generally, Indonesia and Singapore are equivalent in identifying their financial risk.

**Figure 4.18 & Table 4.18: ERM Dimension – Financial Risk (2017)**

In 2017, BNI and BRI show worse performance in identifying financial risk by scoring 1 point less than 2016. The same case happens to UOB as well; it scores 1 point less than the previous year. Nevertheless, only 1 Singaporean bank happens to experience this, while there are 2 Indonesian banks. This makes the average score of Singaporean banks slightly higher than Indonesian banks.

**Compliance Risk**

Compliance risk encompasses risks related to obeying laws and regulations of specific industry in the country where the company runs.

(Figure 4.19 & Table 4.19 are presented on the next page)
Figure 4.19 & Table 4.19: ERM Dimension – Compliance Risk (2016)

![Bar chart showing Compliance Risk (2016)]

<table>
<thead>
<tr>
<th>Year</th>
<th>Indonesia</th>
<th>Singapore</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BNI</td>
<td>BRI</td>
</tr>
<tr>
<td>2016</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Annual Report, 2016

Indonesian banks perform better in identifying compliance risk in 2016. All three banks score 5 points, while Singaporean banks score 1.67 in average. This shows that Singaporean banks are still lacking in identifying their compliance risk.

Figure 4.20 & Table 4.20: ERM Dimension – Compliance Risk (2017)

![Bar chart showing Compliance Risk (2017)]
### Compliance Risk

<table>
<thead>
<tr>
<th>Year</th>
<th>Indonesia</th>
<th>Singapore</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BNI</td>
<td>BRI</td>
<td>Mandiri</td>
<td>Average</td>
<td>DBS</td>
<td>OCBC</td>
<td>UOB</td>
</tr>
<tr>
<td>2017</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Annual Report, 2017

In 2017, Indonesian banks are consistent with their performance and score 5 points. As for Singapore, DBS scores 1 point more than the previous year, indicating better performance in identifying compliance risk. However, OCBC shows worse by scoring 1 point less than 2016. This makes Singapore average score remain the same with the previous year.

### Technology Risk

In this era when digitalization and technological advancement are rapidly growing, risks in regards to these are also starting to exist.

Figure 4.21 & Table 4.21: ERM Dimension – Technology Risk (2016)

<table>
<thead>
<tr>
<th>Year</th>
<th>Indonesia</th>
<th>Singapore</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BNI</td>
<td>BRI</td>
<td>Mandiri</td>
<td>Average</td>
<td>DBS</td>
<td>OCBC</td>
<td>UOB</td>
</tr>
<tr>
<td>2016</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Annual Report, 2016
In 2016, Indonesian banks do not show any identification of technology risk. In contrast, all Singaporean banks performs constantly by scoring 3 points. This shows that Indonesian banks are still unaware of risk in technology, while Singaporean banks are showing awareness.

Figure 4.22 & Table 4.22: ERM Dimension – Technology Risk (2017)

<table>
<thead>
<tr>
<th>Year</th>
<th>Indonesia</th>
<th>Singapore</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BNI</td>
<td>BRI</td>
</tr>
<tr>
<td>2017</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Annual Report, 2017

Nothing changes for Indonesian banks in 2017. All three banks are still showing no performance in identifying technology risk. Unfortunately, Singaporean banks are performing far worse than the previous year. DBS and UOB shows no performance in technology risk identification, and OCBC performs worse by scoring 1 point less. Nonetheless, Singapore still performs better compared to Indonesia in identifying technology risk.

**Economical Risk**

Economical risk is systematic risk which happens to the market at large.

(Figure 4.23 & Table 4.23 are presented on the next page)
In identifying economical risk, all Indonesian banks perform perfectly by scoring 2 points. DBS from Singapore also score the perfect 2 points. However, OCBC and UOB score only 1 point. This indicates that Indonesian banks are more aware to economical risk than Singaporean banks.
### Economical Risk

<table>
<thead>
<tr>
<th>Year</th>
<th>Indonesia</th>
<th>Singapore</th>
<th>Average</th>
<th>DBS</th>
<th>OCBC</th>
<th>UOB</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0.66667</td>
</tr>
</tbody>
</table>

Source: Annual Report, 2017

In 2017, however, Mandiri, DBS, and UOB scores 1 point less. This makes Indonesian banks score 1.67 in average, and Singaporean banks score 0.67 in average. This shows Indonesian banks are still better in identifying economical risk than Singaporean banks.

### Reputational Risk

Reputational risk is the risk of how people perceive the company. Of course every company would desire a good reputation in public’s opinion, thus it is important for it to be aware of this risk.

Figure 4.25 & Table 4.25: ERM Dimension – Reputational Risk (2016)

<table>
<thead>
<tr>
<th>Year</th>
<th>Indonesia</th>
<th>Singapore</th>
<th>Average</th>
<th>DBS</th>
<th>OCBC</th>
<th>UOB</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Annual Report, 2016
In 2016, Indonesian banks constantly score 2. On the other hand, DBS and UOB from Singapore score 3, while OCBC scores 0. Regardless of the inconsistency, Singaporean banks also score 2 in average. This shows that generally both Indonesian and Singaporean banks are aware of reputational risk.

Figure 4.26 & Table 4.26: ERM Dimension – Reputational Risk (2017)

<table>
<thead>
<tr>
<th>Year</th>
<th>Indonesian</th>
<th></th>
<th></th>
<th>Singapore</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BNI</td>
<td>BRI</td>
<td>Mandiri</td>
<td>Average</td>
<td>DBS</td>
<td>OCBC</td>
<td>UOB</td>
</tr>
<tr>
<td>2017</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Annual Report, 2017

In 2017, all banks performs constantly as the previous year, except OCBC. OCBC improves its performance in identifying reputational risk by scoring 3 points more than the previous year. This makes Singaporean banks average score 1 point higher than Indonesian average score. It shows that Singapore are better than Indonesia in identifying reputational risk.

Risk Response

Risk response answers to event identification of risks.

(Figure 4.27 & Table 4.27 are presented on the next page)
In 2016, Indonesia, led by BRI with 16 point, shows better performance in responding to risks by scoring higher than Singapore. This indicates that Singaporean banks needs to improve their performance in responding to risk.

Source: Annual Report, 2016
### Risk Response

<table>
<thead>
<tr>
<th>Year</th>
<th>Indonesia</th>
<th>Singapore</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BNI</td>
<td>BRI</td>
</tr>
<tr>
<td>2017</td>
<td>14</td>
<td>16</td>
</tr>
</tbody>
</table>

Source: Annual Report, 2017

In 2017, Indonesia and Singapore are showing improvement on their risk response. However, Singaporean banks average score is still lower than Indonesian by several points. It shows that Indonesia is more prepared and well-planned in responding to risk.

### Control Activities

Control activities are done to support risk responses and as a risk response.

Figure 4.29 & Table 4.29: ERM Dimension – Control Activities (2016)

<table>
<thead>
<tr>
<th>Year</th>
<th>Indonesia</th>
<th>Singapore</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BNI</td>
<td>BRI</td>
</tr>
<tr>
<td>2016</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Source: Annual Report, 2016

In 2016, all Indonesian banks score the same. This shows that all three banks have the same level of control activities. Meanwhile in Singapore, OCBC shows better
score than DBS and UOB, however the average of the three banks are also 4. Generally, Indonesia and Singapore are equivalent in controlling their activities.

Figure 4.30 & Table 4.30: ERM Dimension – Control Activities (2017)

<table>
<thead>
<tr>
<th>Control Activities</th>
<th>Year</th>
<th>Indonesia</th>
<th>Singapore</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>BNI</td>
<td>BRI</td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Source: Annual Report, 2017

In 2017, Indonesian banks performance of control remain the same with the previous year. Conversely, OCBC and DBS in Singapore show setback by losing 1 point each. This impacts the average score of Singapore’s control activities. In 2017, Indonesia do better control than Singapore.

This shows Indonesia is more stable in controlling their banking activities, while Singapore may face challenge in maintaining their control.

**Monitoring**

Monitoring assesses the effectiveness of enterprise risk management.

(Figure 4.31 & Table 4.31 are presented on the next page)
In 2016, all Indonesian banks score 1. This means that Indonesian banks are monitoring their activities in the same level. Meanwhile in Singapore, OCBC does better than DBS and UOB by scoring 1 point higher than the rest. This makes Singapore generally better than Indonesia.

Source: Annual Report, 2016
### Monitoring

<table>
<thead>
<tr>
<th>Year</th>
<th>Indonesia</th>
<th>Singapore</th>
<th>Average</th>
<th>DBS</th>
<th>OCBC</th>
<th>UOB</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>BNI 1</td>
<td>BRI 1</td>
<td>Mandiri 2</td>
<td>1.33333</td>
<td>2</td>
<td>1</td>
<td>1.33333</td>
</tr>
</tbody>
</table>

Source: Annual Report, 2017

In 2017, Mandiri shows improvement by scoring 1 point higher than the previous year. This helps Indonesia’s average score to increase. Meanwhile in Singapore, OCBC shows worse monitoring than previous year by scoring 1 point less. Nevertheless, DBS improves by 1 point, making the average of Singapore remains the same as previous year. This makes Indonesia and Singapore have the same level of monitoring.

By doing better in 2017, Indonesia shows improvement and be equivalent with Singapore. This means both countries are doing the monitoring activities in the same level.

### 4.3 Statistics Results and Discussion

This study has 1 main research question, which is: ‘Is there any influence of ERM Dimension toward ERM Index?’ In order to answer the main research question, this study employs 10 hypotheses, with detail regression results as follows:

\[
y_1 = 1.758233 + 0.9474984.x_1* - 3.716614.x_2* - 1.214713.x_3* - 1.167545.x_4* - 0.3434262.x_5* + 2.8881.x_6* + 4.536168.x_7* - 0.3290711.x_8* + 1.430131.x_9* + 7.391567.x_{10}* + e
\]

Legend:
* = Significant in Confident Level 95%

\( y_1 \) = ERM Index

\( x_1 \) = Internal Environment

\( x_2 \) = Objective Setting
The result above shows that ERM Dimensions do have influence toward ERM Index. Moreover, the $R^2$ Overall is 99.99% with data behavior: random effect.

This study employs 10 (ten) hypotheses as follows:

$h_1$: *Internal Environment has significant influence toward ERM Index*

- $h_1$ accepted, because Internal Environment has positive and significant influence toward ERM Index.
  It means when Internal Environment goes up by 1 point, ERM Index will goes up by 0.9474984 point.

$h_2$: *Objective Setting has significant influence toward ERM Index*

- $h_2$ accepted, because Objective Setting has negative and significant influence toward ERM Index.
  It means when Objective Setting goes up by 1 point, ERM Index will goes down by 3.716614 point.

$h_3$: *Financial Risk has significant influence toward ERM Index*

- $h_3$ accepted, because Financial Risk has negative and significant influence toward ERM Index.
It means when Financial Risk goes up by 1 point, ERM Index will goes down by 1.214713 point.

$h_4$: Compliance Risk has significant influence toward ERM Index

**$h_4$ accepted**, because Compliance Risk has negative and significant influence toward ERM Index.

It means when Compliance Risk goes up by 1 point, ERM Index will goes down by 1.167545 point.

$h_5$: Technology Risk has significant influence toward ERM Index

**$h_5$ accepted**, because Technology Risk has negative and significant influence toward ERM Index.

It means when Technology Risk goes up by 1 point, ERM Index will goes down by 0.3434262 point.

$h_6$: Economical Risk has significant influence toward ERM Index

**$h_6$ accepted**, because Economical Risk has positive and significant influence toward ERM Index.

It means when Economical Risk goes up by 1 point, ERM Index will goes up by 2.8881 point.

$h_7$: Reputation Risk has significant influence toward ERM Index

**$h_7$ accepted**, because Reputation Risk has positive and significant influence toward ERM Index.

It means when Economical Risk goes up by 1 point, ERM Index will goes up by 4.536168 point.

$h_8$: Risk Response has significant influence toward ERM Index

**$h_8$ accepted**, because Risk Response has negative and significant influence toward ERM Index.

It means when Economical Risk goes up by 1 point, ERM Index will goes down by 0.3290711 point.
\[ h_9: \text{Control Activities has significant influence toward ERM Index} \]

\[ h_9 \text{ accepted}, \] because Control Activities has positive and significant influence toward ERM Index.

It means when Economical Risk goes up by 1 point, ERM Index will go up by 1.430131 point.

\[ h_{10}: \text{Monitoring has significant influence toward ERM Index} \]

\[ h_{10} \text{ accepted}, \] because Monitoring has positive and significant influence toward ERM Index.

It means when Economical Risk goes up by 1 point, ERM Index will go up by 7.391567 point.

This study indicates that ERM Dimension have significant influence toward ERM Index. The variable which gives the most significant impact is Monitoring. This is understandable since monitoring is the crucial part of ERM as a whole. It observes how ERM is being implemented, sees how suitable it is for the firm, and determines whether it needs to be adjusted for the firm.

Nonetheless, each dimension has different relation toward ERM Index. Internal Environment, Economical Risk, Reputation Risk, Control Activities, and Monitoring are proven to have positive influence toward ERM Index. Internal Environment has positive influence because being aware of the internal condition, such as risk appetite and ethical values of the firm, will help to determine how to respond to the risks faced by the firm more effectively. This finding is supported by Beasley et al (2005, 2006), Desender & Laufente (2009), Desender (2011), and Nyagah (2014). Furthermore, Economical Risk influence ERM Index positively because it is a risk that any firms could not diversify as it affect all firms within the same country. Being aware of this risk may alert the firm to have better preparation for the occurrence of this macro-economic events. Moreover, Reputation risk has positive influence toward ERM Index because if a firm
recognize any possibilities of negative publicity, it could take action to prevent and to create chances for positive publicity. In addition, both control activities and monitoring also have positive influence toward ERM Index. It is justifiable because the existence of control activities and monitoring will improve the effectiveness of actions taken by the firm as it oversees how policies and procedures that are created are suitably applied to the firm. This finding is supported by Nyagah (2014), and contradictory with a study conducted by Alawattegama (2018). It may differ because Alawattegama studies both banking industry and financial institution, and the sample is taken from different geographical area, which may have different culture.

On the contrary, Objective Setting, Financial Risk, Compliance Risk, Technology Risk, and Risk Response are indicated to have negative influence toward ERM Index. Objective Setting influences ERM Index negatively because the objectives set are frequently not in line with the risk appetite. This finding is supported by Nyagah (2014) and Alawattegama (2018). Moreover, Financial Risk, Compliance Risk, and Technology Risk have negative influence toward ERM Index. It is because the identification of these risks could expose the firm to other risks. This finding is supported by Nyagah (2014), Alawattegama (2018), and Lunqvist & Vilhelmsson (2018). Furthermore, Risk Response influences ERM Index negatively. This finding contradicts a study conducted by Nyagah (2014) and Alawattegama (2018). It is different because Nyagah focuses on different industry, which is pension fund management firms in Kenya; while Alawattegama studies not only banking industry but also financial institution from a different area which has different culture.
CHAPTER V
CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The main research question of this study is: “Is there any influence of ERM Dimension toward ERM Index in Banking Industry?” In order to answer the question, this study analyzes the influence of ERM Dimension toward ERM Index. The result of this study as follows:

a. Internal Environment has positive and significant influence toward ERM Index. This study finds that ERM Index will be higher when banks pay attention to their internal environment. This concludes that the increasing of internal environment leads to the increasing of ERM Index.

b. Objective Setting has negative and significant influence toward ERM Index. The result shows that ERM Index will be lower if the score of Objective Setting is higher. It concludes that the increasing of Objective Setting will lead to the decreasing of ERM Index.

c. Financial Risk has negative and significant influence toward ERM Index. The result shows that ERM Index will be lower if Financial Risk scored higher. It concludes that the increasing of Financial Risk will lead to the decreasing of ERM Index.

d. Compliance Risk has negative and significant influence toward ERM Index. The result shows that ERM Index will be lower if the score of Compliance Risk is higher. This shows that the increasing of Compliance Risk will lead to the decreasing of ERM Index.

e. Technology Risk has negative and significant influence toward ERM Index. The result shows that if the score of Technology Risk is higher, ERM Index will be lower. It concludes that the increasing of Technology Risk will leads to the decreasing of ERM Index.
f. Economical Risk has positive and significant influence toward ERM Index. This study finds that ERM Index will be higher when banks are aware of Economical Risk. This shows that the increasing of Economical Risk leads to the increasing of ERM Index.

g. Reputational Risk has positive and significant influence toward ERM Index. This study finds that if Reputational Risk scored higher, ERM Index also will be higher. This says that the increasing of Reputational Risk leads to the increasing of ERM Index.

h. Risk Response has negative and significant influence toward ERM Index. The result shows that if Risk Response scored higher, ERM Index will be lower. This shows that the increasing of Risk Response will leads to the decreasing of ERM Index.

i. Control Activities has positive and significant influence toward ERM Index. This study finds that ERM Index will be higher when banks have higher Control Activities. This concludes that the increasing of Control Activities leads to the increasing of ERM Index.

j. Monitoring has positive and significant influence toward ERM Index. This study finds that ERM Index will be higher when banks do better Monitoring. This shows that the increasing of Monitoring leads to the increasing of ERM Index.

ERM Dimension is proven to have significant influence toward ERM Index. However, each dimension has different positive and negative influence toward ERM Index. This finding shows that ERM Dimension could be used to create ERM format that fits with banking industry, since it is known that ERM Index has positive influence toward company’s profitability.

5.2 Recommendation

This study encourages academicians and researchers to analyze the relation between ERM Dimension and ERM Index deeper. Academicians and researchers would not need to add more variables for further research because this study has
99.99% $R^2$-Overall, which means the independent variables have represented the dependent variable for 99.99%. If academicians and researchers added more variables, the $R^2$-Overall could surpass 100%.

Furthermore, this study also encourages banks to pay attention to ERM Dimension as it would help improving ERM as a whole. Especially for Indonesian banks, this study encourages to focus more on technology risk management.
REFERENCES

Annual Report

Book & Book Chapter

Journal Article & Research Paper


Aven, T., & Renn, O. (2009). On risk defined as an event where the outcome is uncertain. *Journal of risk research, 12*(1), 1-11.


Deloitte, 2015. Compliance risk assessments - The third ingredient in a world-class ethics and compliance program. Deloitte Development LLC.


The Association of Southeast Asian Nations (ASEAN), 2018. ASEAN Statistical Leaflet 2018. ASEAN


**Website**


### Statistics Result – Multiple Regression

```
. xtreg Y1 X1 X2 X3 X4 X5 X6 X7 X8 X9 X10, re

Random-effects GLS regression                   Number of obs      =       12
Group variable: Bank                               Number of groups   =       6

R-sq:                                                obs per group:
   within = 0.9931             min =   2
   between = 1.0000            avg =   2.0
   overall = 0.9999            max =   2

Wald chi2(10)  =  14703.57                        Prob > chi2         =   0.0000

corr(u_i, X)  =  0 (assumed)

|      | Coef.  | Std. Err. |      z | Pr(|z|) | 95% Conf. Interval |
|------|--------|-----------|--------|--------|--------------------|
| Y1   |        |           |        |        |                    |
| X1   | 0.947 | 0.0699 | 13.65  | 0.000  | 0.8147 | 1.0835 |  |
| X2   | -3.76 | 0.437  | -8.50  | 0.000  | -4.573 | -2.859 |  |
| X3   | -1.22 | 0.131  | -9.25  | 0.000  | -1.472 | -0.957 |  |
| X4   | -1.17 | 0.264 | -4.41  | 0.000  | -1.687 | -1.648 |  |
| X5   | -0.34 | 0.157 | -2.18  | 0.029  | -0.652 | -0.034 |  |
| X6   | 2.89  | 0.281 | 10.27  | 0.000  | 2.337 | 3.439 |  |
| X7   | 4.53  | 0.470 | 9.63   | 0.000  | 3.613 | 5.459 |  |
| X8   | -0.32 | 0.033 | -9.98  | 0.000  | -0.393 | -0.264 |  |
| X9   | 1.43  | 0.219 | 6.52   | 0.000  | 1.000 | 1.859 |  |
| X10  | 7.39  | 0.295 | 25.06  | 0.000  | 6.813 | 7.969 |  |
| _cons| 1.758 | 1.104 | 1.59   | 0.111  | -0.406 | 3.923 |  |

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