# Implementing Enterprise Risk Management (ERM) Under Contingency and Institutional Theory: Preliminary study of Listed Companies in Thailand

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## Abstract

Globalization makes an integrated world by generating advanced information and technology, timeless connection, shorted time transportation, and so on while its pitfall is about to incline the number of uncertainty-risk-. Hence, public management, currently, needs to aware to manage risk under the organizational appetite. However, the maturity level in Enterprise Risk Management (ERM) in Thailand is low; therefore, ERM knowledge will be indispensable to incline its maturity level. The first aim in this studying was about to educate ERM performance in Thai-listed companies as a preliminary study. Based on empirical data, analysis of ERM maturity came across that there were some distinctive levels of ERM maturity across industries in which financial, industrial, resources and service sectors were better performed compared to technology, consumer product and agro. The significant aim of this study, next, is about to studying determinate of ERM in listed companies. Even there is a distinction between public and private management (Hatch and Cunlife, 2006), under open system, the best way to manage both public and private organizations is about ability to adapt themselves with the turbulence of internal and external environment (Scott, 2003). From the contingency and institutional theory, embedded ERM should rest upon many factors; yet it significantly divides into **internal and external factors** (Galbraith, 1973). Based on empirical analysis, with structure equation modelling (SEM) encapsulated with qualitative senior management in-depth interview, the findings concluded that even listed companies initially embed ERM as one of the compulsory function due to uncertainty and volatility-external factors-, successful implementing ERM significantly depended on **internal factors**: leader's role, organizational context and ERM resources. The most determinant in ERM was about leadership style and followed by organizational characteristics. Ultimately, to research implication, this paper also proposed ERM prototypes for public organizations.

**Keywords**: Enterprise Risk Management; Determinant, Public and Private Management, Structure Equation Modelling

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# Introduction

Globalization is not a panacea (Nye and Donahue, 2000). While it composes of many benefits, some pitfalls of globalization still exist. Localization tries to utilize its benefit to make integrated world rather than that of isolation, to reduce operation and transportation cost with the adoption of technology, to make a shorten time of communication by generating advanced information and communication technology, to encounter global sourcing and so on. Such mentioned benefits of globalization lead localization to operating business with boundless nation. Proprietorship today will then vanish and transform themselves as a corporation. However, globalization itself produces inter-dependency to all. The negative events in one country, one organization are spread to others. For example, according to the tragedy in World War II, it displayed that the effect in one nation was spread to other nations. By this it means that one hazard of globalization is about to incline uncertainty events-risks-.

Risk is a multidimensional meaning and varying interpretation (Davidson, 2003). Risks, normally, defines as a negative event that leads organization deviated from goals. Even, in modernism, theories try to define risk as a positive, as the limited maturity level of risk management system in Asia, risk is defined as unexpected-events.

In organization level, the concept of risk has become a buzzword after the scandal of well-known organization, these are, Worldcom and Enron. To be as corporation or listed companies, they need to disclose the financial statement in order to show the ability of generating income and deduce to a new shareholder. At that time, the Worldcom demand stock was sharply inclined due to the attractive financial statement but management was constructed it up by reported underreporting line costs and corporate unallocated revenue accounts. Next a very few days, after this phenomenon disclosed to the shareholder, they constantly sold stock until company having a lack of liquidity and running till bankruptcy later. To prevent such tragedy, U. S. Congress in 2002 enacted Sarbanes-Oxley Act of 2002 (SOX) to force listed companies to verify their accounting and financial statement with external auditors- third parties- to protect investors right from the possibility of fraudulent accounting activities by corporations. Furthermore, apart from financial statement, capital, organization, committee structure as well as risk factors are all the disclosure.

In the context of Thai-listed companies, Thai Securities and Exchange Commission (SEC.) aligns with the global standard by forcing listed companies to disclose both financial statement and risk factors to shareholder. SEC intentionally protect shareholder's right by endorsing them to posit risk factors before encountering to be company's equity. However, in the issue of risk, it is inadequate to disclose only risk factors but it should in fact disclose how to manage such risk effectively too.

From above rationale of scandal of global listed companies as well as the alignment of regulatory, it concludes that at least, Thai-listed companies are aware of risk issue; however, how to manage risk appropriately is also a questionable. Based on document analysis throughout reliable disclosure documents, listed-companies most often disclose key risks but do not comprehend on

how to manage them. With this importance, the first objective in this research is about to empirically study the performance of ERM across 8 industries composing of agro& food, consumer products, financials, industrials, property & construction, resources, services and technology to perceive on the maturity level of ERM. Indeed, performance of ERM could be identified from how to identify, assess, mitigate and monitoring risks (Deloach, 2000).

While nowadays Thai listed companies employ well-known international standards: COSO (Committee of Sponsoring Organizations of the Treadway Commission), ISO and so on, such standards are plentiful putting forward of process of embedded ERM but leaving on how to successful implement ERM system (Yaraghi and Roland, 2011: 552). Significantly, even studying ERM determinants is not new, there are two problematic. Firstly, studying ERM determinants based on previous article was limited industrial type and most often located in financial and construction sectors (Xiabbo, 2013). It is having a lack of generalization process across industries. Secondly, it is a concerning of how to come up with such ERM determinants as they did not reveal particularly relating theories. With this limitation, this paper, secondly, aims to empirically analyze ERM determinants with the convergence of ERM theory and management theories (contingency and institutional theory).

Ultimately, Thai Institute of Directors (IOD.) disclosed that there are marginal portions of successful implementation of ERM, this paper then could be somehow inclined ERM maturity model in Thai-listed companies when organizations need to embed them as a compulsory system. Moreover, next, the important contribution in this preliminary research is to propose empirical way on how to embed ERM successfully to public organizations as they also need to educate ERM but having a lack of knowledge on it. Finally, there is a theoretical contribution to converge between ERM standards and theory with management theories.

# Review Literature, Theories Construction and Conceptual Framework

Studying ERM determinants was a lack of backing-up theories; therefore, in this part the author intentionally integrated the concepts of risk management with organizational and management theories: contingency and institutional theory. Next, the author explained how paradigms of ERM have been shifted from Traditional Risk Management (TRM) to Enterprise Risk Management (ERM). Lastly, analysis Thai-listed companies in ERM was proposed.

### Convergence between Management and Risk Theory

The concept of risk management has become a buzz-word in open system (Scott, 2003). To open system, organizations can not solely interact only internal environment while external environment is also indispensable. Therefore, close system cannot support how to implement successfully of ERM. However, as the linkage between risk management and management theories, it is a lack of the integration between them.

As mentioned, studying about ERM determinants-critical success factors (CFS)- is not new; nevertheless, the problems concerning are about the lack of the supportive of theories as well as unsystematic manner. Based on previous researches, Gordon , Loeb and Tseng (2009) concluded that there were some common mentioned determinants of ERM accounting for: leadership, risk management resources, risk culture, risk standard, organizational size, sectors, readiness of corporate strategies, and so on; nonetheless, how such factors came from and in which theories supported such the mentioned factors that are skeptical.

To rectify, the author intentionally ended up that if risk management perceives as one of the importance system for organizations, it should converse to some management theories in open system: these are, contingencies and institutional theories.

First and foremost, to **contingency theory**, the concept of contingency is about " no one best way" to embed particular system in organization (Galbraith, 1973). The best way to embed any system will then rely on the internal and external context to organization. Based on the previous study of ERM determinants, internal environment related to embed ERM accounted for leader role, scale of organization, strategic plan, risk awareness culture, selected renowned ERM standard, robustness of ERM process as well as invested in ERM resources (Garvey, 2008). On the centrality, external environment, the obviously critical success factors accounted for industrial competition. According to the prior studying, researchers hypothesized that intensified competitors leaded more robust system of ERM.

Indeed, to external environment, **institutional theory** is somehow incorporated to explain the phenomenon of ERM (DigMaggio and Powell, 1983). Institutional environment perceives as one of the vitally external factors in which lead the very different level of ERM maturity level across business industries. Institutional environment composed of isomorphism, institutionalization process, volatility across business types as well as the intensifying of regulators. To be precise, institutional environment displays the level of intensified of implementation of ERM why posits differently across sectors. For instance, financial and industry sectors have more high maturity of ERM that those of other sectors. Consequently, the author then hypothesized that the numbers or level of regulators will be correlated with the maturity level of embed ERM.

From such two mentioned theories: contingency and institutional theory, the author incorporated two latent variables: internal and external environment, into the proposed conceptual framework. For the former, there are leader role, organizational context and ERM resources. For the latter, there are competitiveness, senstivity and institutional environment.

**Enterprise Risk Management (ERM) Theory**

The concept of risk management became a buzz-word after world-war II (Crockford, 1982) even the risk concepts have studied for several decades initially in insurance industry. As the long time journey of risk management (RM), there are many defined definitions of risks. While there are

many definitions of risk, there might be possible to have some common characteristics that we can mention (Spikin, 2013):

- Risk has an equal meaning to expected loss.
- Risk has an equal meaning to expected disutility.
- Risk is the probability of an adverse outcome.
- Risk accounts for the combination of probability of an event and its consequence.
- Risk can be referred to the fact that a decision is made under conditions of known probabilities.
- Risk means to uncertainty of outcome of actions and events.

Indeed, there are several paradigm of RM accounting for: the birth of RM (1738), early beginning (1995-1960), Risk Management in Quantitative Analysis Predominants-1980s, Traditional Risk Management (TRM)-1990s and currently, Enterprise Risk Management (ERM) (Merna and Al-Thani, 2008). The objective of current paradigm is trying to rectify the pitfall of the former one.

Although there was a long term of the development of risk management system, the most two importance is about TRM and ERM as the researchers most often mentioned them. TRM's approach concerns the disaggregated methods, in which it composes of identifying, assessing, mitigating and monitoring risks different units of firms (Liebenberg & Hoyt, 2003). The problem of TRM concerns when the mitigating risks somehow needs to across business functions. With the limitation of TRM, ERM tries to rectify such mentioned pitfall of TRM. To be precise, ERM emphasizes comprehensive risk management throughout the process of risk across entities and functions-integrated methodology-. COSO (2014) defined ERM as…

*" 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"* .

From above definitions, ERM involves to every level of staff in organization and posited as an integrated methodology. Moreover, importantly, ERM considers precondition of ERM before sophisticated implementing ERM process through way of identifying, assessing, mitigating and monitoring risk is adopted. Precondition of ERM can define as an infrastructure of ERM relating to risk appetite, policy and procedure, Risk Management Committee (RMC), for example,.

Ultimately, in order to quantify the concepts of ERM, there are relating variables of ERM implementation as table 1.

**Table 1**: Variables of ERM Implementation

| Concept | Variables | Detail |
|---|---|---|
| ERM Infrastructure | 1. ERM Philosophy<br>2. ERM Governance | ▪ How to set up risk management governance, its policy and risk appetite<br>▪ Put-in-place of risk management committee |
| ERM Process | 1. Risk Identification | ▪ Identifying comprehensive internal and external events that affect corporate goals |
| | 2. Risk Assessment | ▪ Both quantitative and qualitative assessment are both indispensable<br>▪ Assessed risk by corporate likelihood and impact |
| | 3. Risk Mitigation | ▪ Alternative risk management strategies: treat, transfer, terminate and tolerate are ready to employ |
| | 4. Risk Monitoring | ▪ Dynamic of risk management system<br>▪ Monitoring risk with key risk indicators (KRIs)<br>▪ Regular and ongoing risks follow-up |

**Risk in Thai-listed companies**

The definitions of risk are multifaceted term as the difference of text book defines it as distinctive ways. To simplify, risk has two dimensions (Segal, 2011: 18-24). First and the foremost, risk is uncertainty. By this it means that risks have whether to occur or not yet if it is happened, it will somehow impact to organizational goals. Secondly, risk includes upside volatility.

Besides the diversity of defined risks, its type has a debatable. COSO defines four types of risk: strategic, operational, financial reporting and compliance. On the contrary, Marchetti (2012: 30) inserted that apart from such four types of risk, there are others these are external and information risk.

To rectify, the authors displays the types of risk factors across business under the context of listed company. According to the Thai listed companies association, some importance of risk factors we should significantly consider accounting for: shareholder, business, reputation and macro level of risk, respectively. Throughout the literature review, some of the best practice organizations report their risks to the shareholder across business sector as the following (figure1).

| Shared Risks | Agro &Food | Consumer Product | Finance | Industrial | Property and Construct | Resource | Service | Technology |
|---|---|---|---|---|---|---|---|---|
| **Shareholder Risk** | 1. Dependency of Influential Shareholder (Control over Management)<br>2. Unexpected investment result to shareholder<br>3. Withdrawal from shareholder due to business performance<br>4. Control of Dilution | | | | | | | |
| **Macro Level of Risk** | 1. Natural Disaster<br>2. Spread of Disease<br>3. Instability of economics and politics<br>4. Proactive encounter with the opening of AEC<br>5. government regulation change<br>5. The fluctuation of material price and demand<br>6. Business Disruption due to severe incidence | | | | | | | |
| **Business Risk** | Intensified competition | | | | | | | |
| **Reputation Risk** | loss of goodwill | | | | | | | |
| **Financial Risk** | 1. The fluctuation of interest rate<br>2. The fluctuation of exchange rate<br>3. Liquidity Management<br>4. Credit Risk<br>5. Market Risk<br>6. Funding Risk | | | | | | | |

| Shared &Distinctive Risks | Agro &Food | Consumer Product | Finance | Industrial | Property and Construct | Resource | Service | Technology |
|---|---|---|---|---|---|---|---|---|
| **Compliance Risk** | 1. Risk from not complied with sectors laws, regulatory, or even standard<br>2. Legal disputes | | | | | | | |
| | | Trademark termination | | | | | Trademark termination | Risks from the concession agreement |
| **Strategic Risk** | 1. Low probability to achieve corporate strategies (Strategic Execution Risk)<br>2. Unrealistic corporate strategies (Strategic Content Risk)<br>3. Lacking of human capital in aspect of maintaining core competency | | | | | | | |
| | Proactive reaction to change of customer behavior | | | | | | Supportive projects are having unexpected result | Rapid Change of technology |
| | | Customer Diversificatio n Risk | | | Customer Diversification Risk | | | |

**Figure 1**: Risk Factors across Industries in Thai Listed Companies

From the above data, it can be concluded that there are some risk factors in which it shares to all sectors those are shareholder, macro level, business, reputation and financial risk. However, on the contrary, operational and compliance risks are distinctive (highlight red color) across sectors. This rationale leads the author to study the critical success factors across business as the previous

articles focus on with the very limited business types. We can be found out such study in financial and construction sector. Lastly, mentioned disclosure documentation from Thai-listed companies, it only reveals risk factors by leaving how to manage such key risk effectively. To rectify, this empirical result then describe ERM performance in section 4.

**Proposed Path Conceptual Framework and Research Hypotheses**

Bases on above theories, figure 2 below was about this research conceptual framework. There are four following research hypotheses as the following.

- Internal Environment having a positive correlation to ERM infrastructure
- Internal environment having a positive correlation to ERM to ERM process
- External Environment having a positive correlation to ERM infrastructure
- External Environment having a positive correlation to ERM process
- ERM infrastructure having a positive effect to ERM process

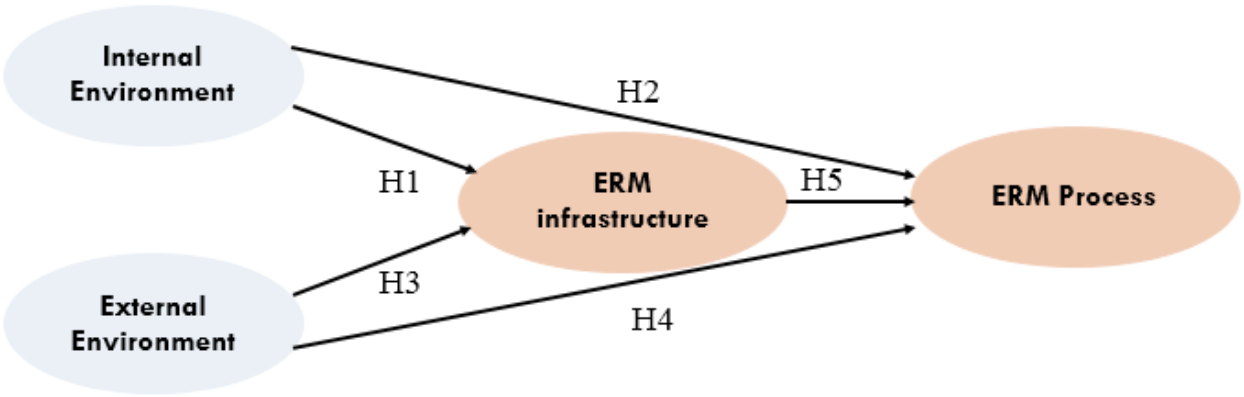



**Figure 2**: Path Conceptual Framework

# Research Methodology

This preliminary study employed mixed method. For quantitative methodology, survey throughout questionnaire instrument was adopted as this research aims to gather people attitude and preference of ERM and its determinants. For qualitative analysis, real situation throughout in-depth interview from best practice organizations of ERM in Thailand was employed in data collection process.

## Quantitative Analysis

### *Unit of analysis and Sampling*

The unit of analysis in this research accounted for organization level given Thai-listed companies approximately 700 organization as below.

**Table 2**: Population

| **Industry** | **Numbers** |
|---|---|
| Argo and Food Industry | 58 |
| Consumer Products | 50 |
| Financials | 65 |
| Industrials | 121 |
| Property and Construction | 170 |
| Resources | 54 |
| Services | 136 |
| Technology | 50 |
| total | 704 |

As the limitation of the amount of population, the author then selected all population to the empirical process. With mail and internet based survey, it was possible to receive a few return; therefore, employing all population can sure the adequacy of sample.

### *Operationalization and Measurement*

From figure 3, in this section, it illustrated on how to measure such concept throughout variables and measurement items. To survey method under questionnaire construction, testing reliability and validity of instrument are indispensable as shown in table 3.

**Table 3**: Variables, Items and Measurement of Instrument.

| Latent Variables | Observed Variables | Items | Reliability ( Cronbach's alpha value) | Construct Validity |
|---|---|---|---|---|
| **Internal Environment** | | | | **0.84**** |
| | Leader role | ▪ Degree of involvement<br>▪ Communication | 0.91 | |
| | Organizational context | ▪ Size<br>▪ Level of risk culture<br>▪ readiness of corporate strategies | 0.88 | |
| | ERM resources | ▪ Determined ERM mandate<br>▪ The level of resources to ERM | 0.79 | |
| **External Environment** | | | | **0.85**** |
| | Competitiveness | ▪ The degree of industrial competition<br>▪ The degree of new entry coming to business | 0.86 | |
| | Sensitivity | ▪ Global and Local of uncertainty events | 0.86 | |
| | Institutional environment | ▪ Regulatory level<br>▪ Isomorphism | 0.84 | |
| **ERM infrastructure** | | | | **0.92**** |
| | ERM Philosophy | Mentioned in table 1 | 0.91 | |
| | ERM governance | | 0.89 | |
| **ERM Process** | | | | **0.96**** |
| | Risk identify | Mentioned in table 1 | 0.85 | |
| | Risk assess | | 0.86 | |
| | Risk mitigate | | 0.86 | |
| | Risk monitor | | 0.87 | |

### *Statistical Analysis*

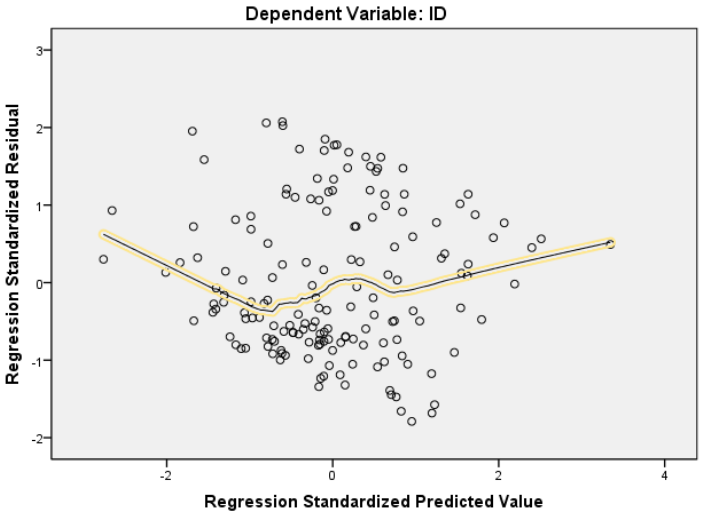
Foster, Brakus and Yavorsky (2006) stated that there are two types of statistical tools: descriptive and inferential statistics. This paper adopted both such techniques. For the former, frequency, centrality and data dispersion was employed to analysis the nature of respondents and manage its form appropriately. For the latter, compare mean technique and causality analysis throughway of multivariate analysis is used.

ANOVA (Analysis of Variance) is employed to test the equal mean of ERM performance across industries. The author needed to perceive that how the difference between ERM performance across industries. In order to fix five research hypotheses, multivariate analysis through way of structural equation modelling (SEM) was used. To SEM, it is a suitable tool as this research rested upon both latent and observed variables and SEM also allows the author to empirically analyze dependency techniques among multiple relationship. With the adoption of SEM, the result will later display two relating models: measurement and structural model, respectively.

### *Data Preparing and Management*

With multivariate analysis, it is possible in the occurrence of the data violation (Hair, 2010). Therefore the author tried to rectify and tested it before sophisticated analysis will later be adopted. Generally, testing outlier and missing value were examined till the sample reached to 164. Also, to adopt SEM, number of adequacy sample size is important. Theoretically, a simple formulation that is prevalent an adequacy sample size accounting for $k(k+1)/2$ where k is the number of variables in the model. Consequently, 164 of sample size is satisfied.

**Table 4**: Data Violation Testing

| Assumption | Result |
|---|---|
| Normality: | Based on Skewness and Kurtosis, the range of it accounted for -1.22 to 1.93 these are in the acceptable range. Therefore, the data distribution is normality. |
| Homoscedasticity: | It is about the test of the variance of error. If it has a pattern of error, it is possible to have the problematic heteroscedasticity. However, based on figure 3, the error has no pattern; consequently, there is no problem of data violation.   **Figure 3**: The plot between Residual and Dependent Variables |
| Multicollinearity | Variance Inflation Factor (VIF) should less than 10 to not having the problem of independent high correlation themselves. The result of VIF ranged between 1.70 to 6.2; therefore, data is not violated the multivariate assumptions. |

### Qualitative Analysis

Qualitative analysis through way of in-depth interview 9 executive management across industries from best practice organization in ERM was employed for two stages in this research. For the first stage, such executive management was verified above conceptual framework in which it encapsulates from ERM and management theories. Qualitative method itself could be possible to support and against to the above framework (Cheswell, 2014). For the second stage, in-depth interview the experts related to the performance of ERM in which it composed of emerging risks for next decade, what are the ERM determinants to their views, respectively.

# Findings

### *Emerging Risks in Thai-Listed Companies*

Based on review literature part, disclosed documents illustrated only current risks across industries; nonetheless, adopted ERM as a preventive tool as well as creating ERM knowledge to both public and private sector, positing next decade risk factors are indispensable. From nine interviewees, emerging risks have a high impact to them as described below.

**Table 5: Emerging Risks**

| Types | Emerging Risks |
|---|---|
| **Globalization Risks** | ▪ Lack of Labor due to the Convergence of Aging Society (Consumer Product)<br>▪ Maintaining Technology Perception to the differencing aging society (Technology) |
| **Macro Level of Risks** | ▪ Inclining Natural Disaster and Hazard (Agro & Food)<br>▪ Water Crisis and Climate Change (Industrial)<br>▪ Global Economy System Change (Finance) |
| **Technology Risks** | ▪ Inclining of Fraud due to technology disruption (Technology)<br>▪ Obsoleted some Business Areas due to Technology Disruption (Finance, Property & Construction ) |
| **Strategic Risks** | ▪ Ability to adapt in new business areas (Resources)<br>▪ Business Expansion (Service) |

### *Characteristics of the Respondents*

Approximately, respondents rate accounted for 23.4% (164/700). Most of the respondents is responded for either risk management committee or risk management department. Noticeable, even the majority portions of the respondents are now manager level, member of Board of Directors (BOD.) and top management were both answering the instrument accounting for: 12 and 27 percent, respectively.

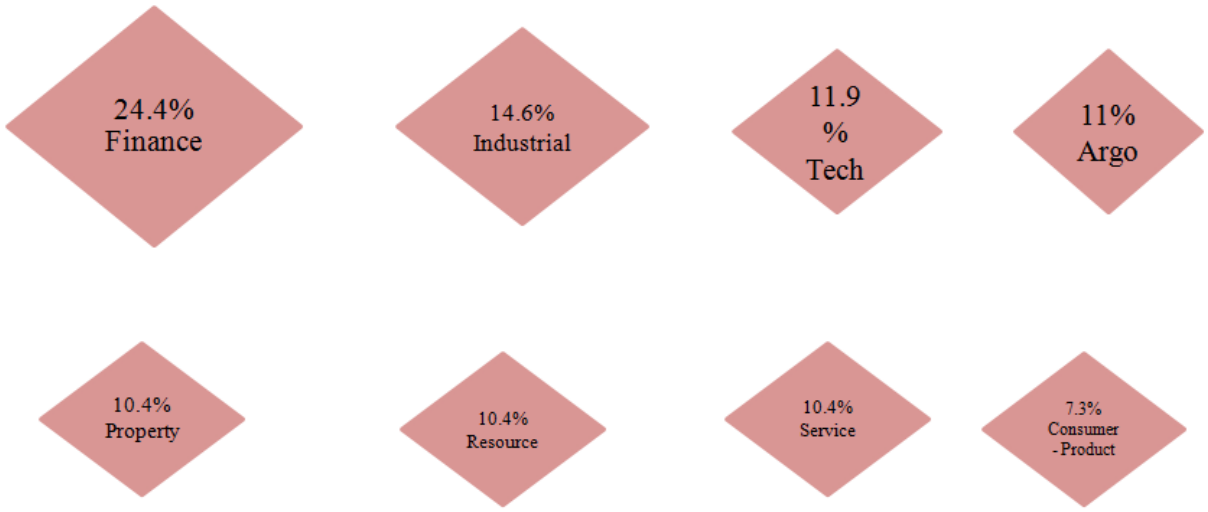



**Figure 4**: Respondents Rate Across Industries

As respondents varying across industries, financial sectors are the majority portions (24.4%), followed by industrial sector (14.6%). The rests were all the same portions ranged from 7-10 %. From 164 organizations, 111 organizations are adopted ERM standards with COSO the most approximately 90 organizations.

***ERM Maturity Level in Thai-listed companies***

By industries, based on figure 5, financial, service, resources and industrial sectors are better performance than the rests. Significantly, from ANAVA (Analysis of Variance), it could be summed up that there are some distinctive levels of ERM across industries. To be precise, P value of ERM Governance, risk assessment and monitoring are less than 0.05; therefore, across industries, there are some different of ERM performance in which financial, service and industrial sectors are better performed.

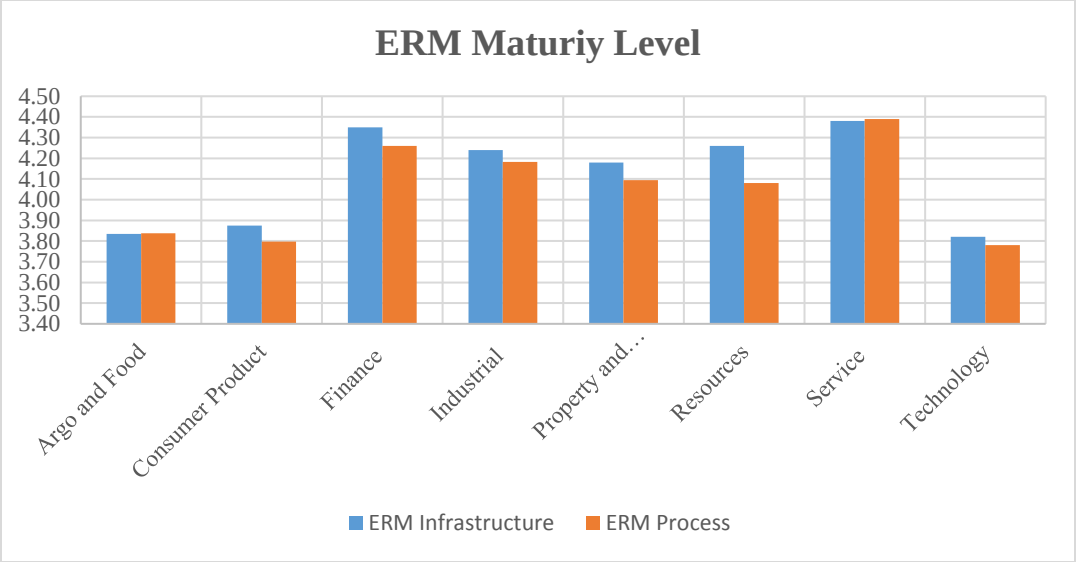



**Figure 5**: ERM Maturity Level across Industries

**Table 6**: ANOVA Testing for Comparing ERM Performance across Industries

| ERM Phase | F Test | P-value |
|---|---|---|
| ERM Philosophy | 2.034 | .054 |
| ERM Governance | 2.178 | 0.039 |
| Risk Identification | 1.676 | .119 |
| Risk Assessment | 2.274 | 0.031 |
| Risk Mitigation | 1.706 | .111 |
| Risk Monitoring | 2.443 | 0.021 |

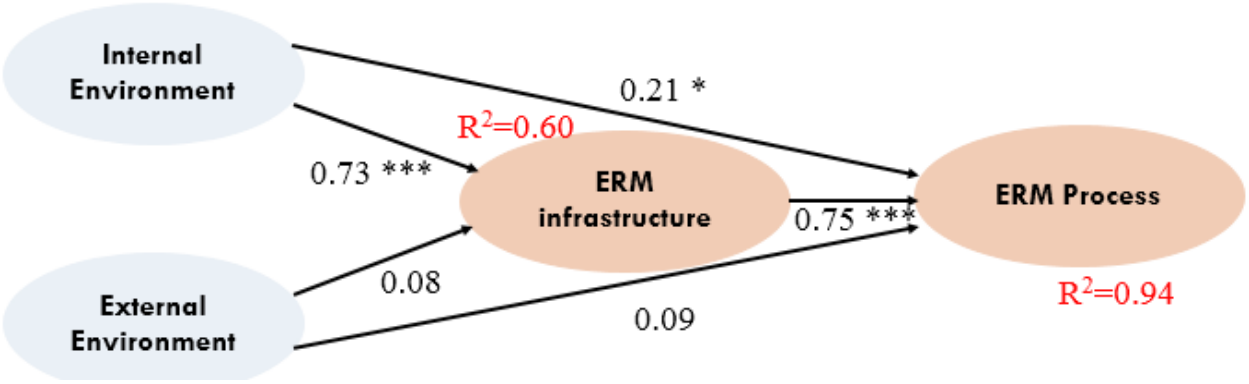
***ERM Determinants Result***

Based on qualitative interviews. initially, 7 out of 9 experts in ERM across industries ended up that internal environment is more relevant to ERM compared to external environment.

To quantitative methodology, there are two relating models given Structural Equation Modelling (SEM.): measurement and structural model. For the former, its aim is about to find the causality between observed and latent variables. It measures the validity between observed and latent variables. Based on appendix a), the proposed all observed variables under latent variables quite fitted well as GFI, CFI above 0.90, RMSEA between 0.05-0.08, CMIN/DF<=5 in which it all

located in acceptable range. Accordingly, confirmatory factors analysis (CFA) of all concepts throughout latent variables were significantly theorized to cover of each all measured variables. Furthermore, standardized regression weight of each observed variables were quite high range between 0.60-0.94. It means that high correlation between observed and latent variables.

Indeed, based on structural model, the quantitative analysis result, model indices were all located in acceptable range (figure 6). To research hypotheses, 3 out of 5 were supported the proposed hypothesis. To be precise, standardized regression weigh in all internal factors were found to be significantly correlated to ERM infrastructure and process, respectively. Also, standardized regression weigh of ERM infrastructure and ERM process were having each relationship. Finally, explanatory power of endogenous (ERM infrastructure and process) from exogenous (internal and external environment) variables are quite high (multiple R squares 0.6, 0.94).




Chisquare= 101.470 df= 48 p= 0.0

CMIN/df= 2.114 , GFI= 0.917, CFI= 0.959 and RMSEA= 0.08

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

**Figure 6**: Assessing Structural Model

# Conclusion

With mixed method, the author employed both qualitative and quantitative tools to analysis ERM environment across industries as well as EMR determinants in Thai listed companies. Initially, based on expert's view, even in the past, the most concerning in risk factor was about how to implement corporate strategies-strategic risk-, next few decades, globalization risks are the most concerning driven from convergence of aging society: lack of labor and maintaining technology perception to the differencing aging society. Next, macro level of risks are still continue concerning, for example, natural disaster and hazard, water crisis as well as climate change. All emerging risks are from external factors.

Secondly, analyzing of ERM performance in which it composes of ERM infrastructure and process across industries were illustrated. To ERM infrastructure, it accounts for the appropriate internal environment. However, ERM process can define as the identification, assessment, mitigation and monitoring risks. Based on descriptive and inferential statistics, the maturity level of ERM is having the difference across industries. To be precise, the performance of how to indicate, assess, mitigate and monitoring risks are distinctive from each sectors. The financial, service, resources and industrial sectors are better performance than the rests for especially ERM Governance, risk assessment and monitoring.

Indeed, analysis critical success factors (CSFs) of ERM were conducted throughout both qualitative and quantitative. Based on such two methodologies, they were all converged to the same result that internal factors: leader role, organizational context and ERM resources were found to be significantly correlated with implementing ERM while external factors were having less effect.

Ultimately, the empirical analysis also displayed that ERM infrastructure in which it composes of ERM policy, risk tolerant, the readiness and autonomy level of risk management committee (RMC) were all important before sophisticated of ERM process will be adopted. Prior, traditional risk management (TRM) did not mention much about appropriate internal environment while well-known ERM standard: COSO, ISO stated crystal clear that internal environment is indispensable to prepare before implementing end-to-end ERM.

# Policy Recommendation and Future Research

## Policy Recommendation

As the low level of ERM maturity from agro and food, consumer product and technology sectors as well as public organizations, this research produced some practical and theoretical contributions in policy level as the following.

- Low level of ERM maturity from agro and food, consumer product and technology sectors as well as public organizations should learn how to implement successfully of ERM from financial, industrial, service and resources in Thai listed companies.
- Moreover, in order to incline maturity level of ERM, it would be possible to conduct ERM as an end-to-end process. Based on empirical result, Thai-listed companies less pay attention to mitigate and monitor risk yet doing very well on identification and assessing risks. The author will hence recommend Thai-list companies to embed ERM in end-to-end process: ERM infrastructural and ERM process (identification, assessment, mitigation and monitoring)
- Indeed, as standardized regression weight between ERM infrastructure and ERM process having significantly high, companies should settle appropriately internal environment throughout the enactment of enterprise risk management (ERM) infrastructure which composes of the readiness of setting organizational risk appetite, ERM policy, putting in place of risk management committee (RMC), who is a decision maker in risk before ERM process initially kicks off.
- Ultimately, even ERM prior adopted from past with uncertain events outsider-external environment: competition, volatility and well as institution, to implement successfully in ERM totally rests upon internal factors: role of leader, organizational context which composing of risk culture, size, readiness of corporate strategy and ERM resource. Therefore, if organization needs to embed ERM successfully, suitable internal environment driven by leader is the most crucial factor due to the highest regression weight. To be precise, leader who totally understand tangible benefits of ERM will directly stimulate actively RMC, risk awareness culture as well as ERM resources throughout the setting up ERM department together with the hiring expert consult in ERM.

## Future Research

This paper perceived as a preliminary study. Its role accounted for the ERM prototype for Thai-listed companies as well as public organization. To make a research contribution, future researchers will conduct a comparative studying of ERM determinants of public and private organizations in order to study how difference in ERM determinants under the distinctive types of organization.

There are many management theories apart from contingency and institutional theories. Next researchers could be possible to incorporate other theories to conform the conceptual framework.

Ultimately, in order to incline the maturity performance in ERM, understanding of its tangible benefits of ERM for especially leader are important. Prior, studying value of ERM mostly came across as protective loss tools (Mu, Peng and MacLachlan, 2009) or just even to conduct risk management plan for the institutional alignment. To incline ERM maturity as well as level of cooperative, future researches should hypothesize between embed ERM and the value of ERM in term of incline organizational performance as a top-down view. As from this research, leader's role is the vital factor; consequently, understanding top-down benefits of ERM can deduce management views of ERM and stimulate ERM maturity level later on.

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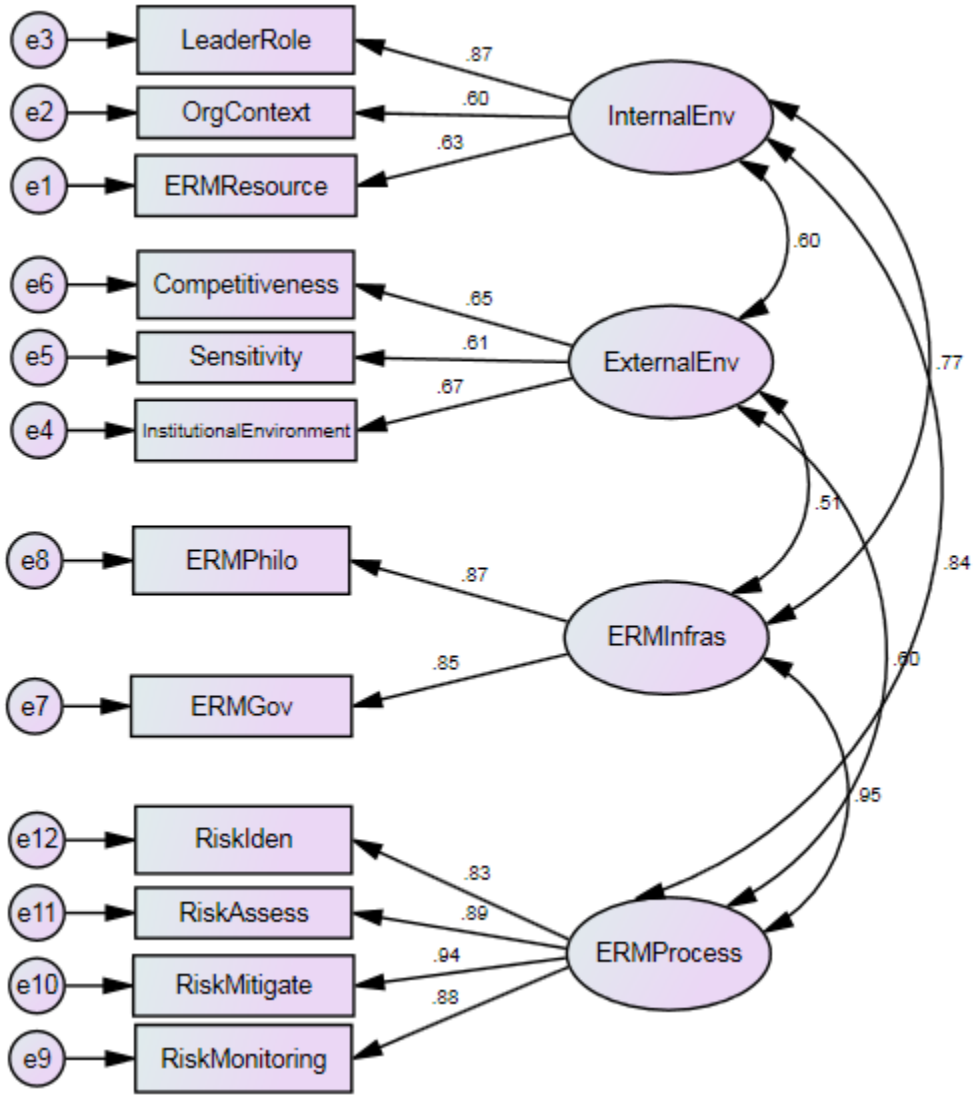
# Appendix

A) Measurement Model




Chisquare= 101.470 df= 48 p= 0.0

CMIN/df= 2.114 , GFI= 0.917, CFI= 0.959 and RMSEA= 0.08

B) Structural Model