The Association between Risk Management Committee and Stock Investment Risk*

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ABSTRACT

This empirical research investigates the association between the establishment and characteristics of risk management committee (RMC) and stock investment risk (i.e., idiosyncratic and total risks) of Thai listed firms. The study also examines characteristics of RMC members and stock investment risk. The characteristics of RMC members under study include the number of independent directors, the frequency of committee meeting, finance background, and committee tenure. The multiple regression analysis results revealed no significant relationship between the establishment of RMC and stock investment risk. However, committee tenure was negatively associated with both idiosyncratic and total risks, while other RMC characteristics were statistically insignificant. In essence, committee's longer tenure contributes to lower stock investment risk, suggesting that investors attach importance to committee's tenure and perceived investment risks, while no significant association exists between the establishment of RMC and stock investment risk. Importantly, this research is the first to explore the relationship between RMC and stock investment risk.

Keywords: Risk Management Committee, Stock Investment Risk, Idiosyncratic Risk, Corporate Governance

ความสัมพันธ์ระหว่างคณะกรรมการบริหารความเสี่ยง กับความเสี่ยงจากการลงทุนในหลักทรัพย์

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บทคัดย่อ

งานวิจัยนี้ศึกษาความสัมพันธ์ระหว่างการจัดตั้งคณะกรรมการบริหารความเสี่ยง กับความเสี่ยงจากการลงทุนในหลักทรัพย์ อันได้แก่ ความเสี่ยงที่ไม่เป็นระบบและความเสี่ยงรวมของบริษัทจดทะเบียนในตลาดหลักทรัพย์แห่งประเทศไทย งานวิจัยนี้ยังได้การศึกษาความสัมพันธ์ระหว่างคุณลักษณะของคณะกรรมการบริหารความเสี่ยงกับความเสี่ยงจากการลงทุนในหลักทรัพย์ คุณลักษณะของคณะกรรมการบริหารความเสี่ยงในการศึกษานี้ ประกอบด้วยจำนวนคณะกรรมการอิสระ จำนวนครั้งในการประชุม ความเชี่ยวชาญพิเศษทางด้านการเงิน และระยะเวลาของการดำรงตำแหน่ง ผลการวิเคราะห์โดยสมการถดถอยเชิงพหุไม่พบความสัมพันธ์ระหว่างการจัดตั้งคณะกรรมการบริหารความเสี่ยงกับความเสี่ยงจากการลงทุนในหลักทรัพย์ อย่างไรก็ตาม ระยะเวลาของการดำรงตำแหน่งมีความสัมพันธ์เชิงลบกับความเสี่ยงที่ไม่เป็นระบบและความเสี่ยงรวม ในขณะที่คุณลักษณะอื่นไม่มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติ คณะกรรมการบริหารความเสี่ยงที่ดำรงตำแหน่งนานขึ้นจะช่วยลดความเสี่ยงจากการลงทุนในหลักทรัพย์ แสดงให้เห็นว่านักลงทุนให้ความสำคัญกับระยะเวลาการดำรงตำแหน่งของคณะกรรมการบริหารความเสี่ยงและให้ค่าความเสี่ยงจากการลงทุนในหลักทรัพย์ลดลง ในขณะที่ไม่พบความสัมพันธ์ระหว่างการจัดตั้งคณะกรรมการบริหารความเสี่ยงกับความเสี่ยงจากการลงทุนในหลักทรัพย์ งานวิจัยนี้เป็นงานแรกที่ศึกษาความสัมพันธ์ระหว่างคณะกรรมการบริหารความเสี่ยงกับความเสี่ยงจากการลงทุนในหลักทรัพย์

คำสำคัญ : คณะกรรมการบริหารความเสี่ยง ความเสี่ยงจากการลงทุนในหลักทรัพย์ ความเสี่ยงที่ไม่เป็นระบบ การกำกับดูแลกิจการ

1. INTRODUCTION

Today's disruptive business environment presents companies with diverse challenges and risks and thereby underscores the significance of risk management (Ng, Chong, & Ismail, 2012). Risk management lowers business risks while improving corporate financial performance (Tao & Hutchinson, 2013). According to Al-Hadi, Hasan, and Habib (2016), establishing a separate risk management committee (RMC) improves firm efficiency as the board of directors are afforded with more time to focus on crucial tasks. RMC promotes corporate governance and consequently leads to improved firm performance (Tao & Hutchinson, 2013), transparent market risk disclosure (Al-Hadi et al., 2016), lower underwriting loss (Ng et al., 2012), and better non-performing loan loss protections (Moufida, 2018). However, Hoque, Islam, and Azam (2013) found no significant relationship between RMC and corporate performance. Furthermore, the characteristics of risk committee play a role in the nature and extent of risk management. Specifically, risk committee size and expertise were significantly positively associated with market risk disclosure while committee independence was not (Al-Hadi et al., 2016). Essentially, the relationship between RMC and financial performance is inconclusive.

In Thailand, research on the characteristics of risk committee was restricted by limited availability of data. The Stock Exchange of Thailand (SET) does not require listed companies to establish a risk management committee nor to disclose risk management policy (apart from disclosures on risk factors in Section 3 Part I of Form 56-1). However, the SET issued a guideline on risk management policy for listed firms (SET, 2013a). Suvichano (2017) documented that 42% of SET-listed firms provided details of risk committee in Form 56-1. Despite non-compulsory, almost half the listed firms established an RMC and disclosed it. Linsley and Shrives (2006) studied risk disclosures in annual reports of UK firms and noted that risk reporting provided investors with information on the entity. In reference to signaling theory (Spence, 1973) and aforementioned studies, this research holds the view that there is a financial gain inherent in such voluntary disclosure.

Suvichano (2017) investigated the relationship between risk management committee and members' characteristics (i.e., size, independence, and expertise) and financial performance, including return on assets (ROA), return of equity (ROE), and Tobin's Q. The findings indicated a weak relationship between the risk committee characteristics and ROA and ROE, and no relation for Tobin's Q. However, the study encounters two limitations. First, it excluded financial institutions (the financial sector) from the sample. In fact, prior studies in other countries (e.g. Ng et al., 2012; Tao & Hutchinson, 2013) found a significant relationship between risk management committee and performance of the financial institutions. Second, according to Hoque et al. (2013), there exists no significant relationship between risk committee and ROA and ROE in Australian firms. This could be attributed to the accounting-based nature of ROA and ROE.

In light of the limitations, this research focuses on the relationship between risk management committee (disclosed in Form 56-1) and a market-based measure, i.e., stock investment risk (idiosyncratic and total risks), rather than traditional accounting-based measures (ROA and ROE). Ferreira and Laux (2007), using an integrated corporate governance index, found a relationship between corporate governance and idiosyncratic risk. In addition, this research expected that voluntary risk management disclosure results in financial gains. According to Roll (1988), idiosyncratic price changes primarily reflect private information rather than public information. Idiosyncratic volatility is an adequate measure of information flow, particularly private information about firms (Ferreira & Laux, 2007). Therefore, this research also examines the relationship between risk management disclosure and stock investment risk. The research samples represent listed firms in all sectors, including the financial sector, to increase the generalizability of research results. The results are also expected to provide regulators and management with empirical evidence on the economic gain of risk management committee.

2. LITERATURE REVIEW

2.1 Theoretical Background

Agency Theory

The agency theory states that a separation between ownership and control leads to conflicts of interest between principals and agent (Jensen & Meckling, 1976), and corporate governance is a mechanism that firms employ to monitor management (the agent). In addition to external auditors, board of directors, and audit committees, risk management committee (RMC) is another corporate governance tool that could mitigate risks, boost financial performance, and improve company reputations (Nava, Lisa, & Jiani, 2009; Wu, Kweh, Lu, & Azizan, 2016).

Signaling Theory

This research, following Certo (2003), used signaling theory (Spence, 1973) to rationalize the listed companies' voluntary disclosure. Firms disclose constructive corporate governance practices, including committee information, to create favorable images among investors, which in turn enhances firm's valuation. Based on signaling theory, firms are incentivized to disclose risk management policy even though it is not compulsory. Dobler (2008) documented that risk reporting was largely attributable to management incentives rather than regulation. This research thus holds the view that firms disclose risk management policy to lower the cost of capital or enhance firm's value.

Risk Committee

The Institute of Internal Auditors (IIA, 2016) defined risk as "the possibility of an event occurring that will have an impact on the achievement of objectives, and risk is measured in terms of likelihood and impact". Meanwhile, a risk management system is an integral part of business to reduce the likelihood and impact of the risk. In addition, a risk management system is part of corporate governance mechanism to maximize shareholders' wealth (COSO, 2017).

Section 5 of the Principles of Good Corporate Governance of the Stock Exchange of Thailand (2013b, p. 97) stipulates that "board of directors should establish a risk management policy to cover all activities of the company, assign management to implement the policy, and request a report from management regularly. The board should review the risk management system or assess the effectiveness of risk management at least annually with the disclosure of risks in the annual report, and whether there is change in risk level. The board should also focus on early warning signs and unusual transactions". Risk management system is crucial for an organization to achieve objectives and minimize unexpected events (SET, 2013a). Specifically, this research focuses on policy-level risk management; in other words, on whether firms establish a risk management committee.

Tao and Hutchinson (2013) reported that RMC improved corporate governance, lowered systematic risk, and enhanced corporate financial performance. Ng et al. (2012) documented that RMC size and independence were inversely correlated to underwriting risk and that the frequency of RMC meeting was statistically insignificant. Wu et al. (2016) found that, except meeting frequency, RMC size, independence, and prestige (characteristics of RMC members) were significantly positively associated with the operational efficiency of insurance companies. On the other hand, Hines and Peters (2015) found no relationship between risk committee and operational and performance improvements (profitability). In Thailand, Suvichano (2017) found that expertise of risk committee members and ROA were positively correlated, while RMC size was inversely correlated to ROA and ROE. As a result, the advantages of RMC are still inconclusive.

Business risk management is a relatively new concept in Thailand, (SET, 2013a, 2013b). Since a majority of Thai firms are family-owned (Claessens & Fan, 2002), little importance is attached to risk management policy. As a result, previous studies in other countries are less applicable to the Thai setting. Besides, there exists no publication on the relationship between risk management policy and stock prices specific to the Thai setting. Thus, this research aims to explore the association between risk management policy of SET-listed firms in Thailand and investors' decisions on stock prices, given that idiosyncratic volatilities are observed when firms voluntarily disclose risk management policy.

Stock Investment Risk and Corporate Governance

In this research, stock investment risk refers to idiosyncratic risk and total risk. Idiosyncratic risk plays an important role in investment decisions (Bali, Cakici, & Levy, 2008; Rubin & Smith, 2011) and increases in significance, especially in emerging markets (Li, Morck, Yang, & Yeung, 2004).

According to Roll (1988), firms' private information is typically factored into firm-specific price movements. Gompers, Ishii, and Metrick (2003) and Cremers and Nair (2005) reported that corporate governance mechanisms influence equity prices. Ferreira and Laux (2007) found that idiosyncratic volatility is lower in firms with stronger corporate governance.

Since risk management is part of corporate governance mechanism (COSO, 2017) and risk management committee contributes positively to corporate governance (Tao & Hutchinson, 2013), this research anticipates that firms with RMC have better corporate governance and lower idiosyncratic volatility. An association between risk management committee and idiosyncratic risk could thus be observed.

2.2 Hypothesis Development

Since policy on risk committee is reflective of good corporate governance (SET, 2013b) and prior research indicated a relationship between corporate governance and stock investment risk, this research thus hypothesizes that a relationship exists between RMC and stock investment risk. The proposed hypotheses are as follows:

Establishment of RMC

The agency theory states that firms implement corporate governance to reduce agency costs (Jensen & Meckling, 1976). Specifically, previous studies found a relationship between RMC and lower agency cost (e.g. Moufida, 2018; Ng et al., 2012), while others reported otherwise (e.g. Hoque et al., 2013).

Meanwhile, a separate risk management committee is more effective than integrating risk management as part of audit committee's or board of directors' responsibilities (Tao & Hutchinson, 2013). Given the negative relationship between RMC and stock investment risk, it is thus hypothesized that:

H1: Firms with RMC have a lower stock investment risk.

RMC Independence

Committee independence is important in corporate governance. However, the correlation between independent directors and financial performance is inconclusive (Ng et al., 2012). Moreover, the majority of shares of Thai firms were family-owned (Claessens & Fan, 2002), subsequently undermining the independence of directors and corporate governance. As such, this research incorporates the RMC independence in the analysis.

Ng et al. (2012) reported that Malaysian insurance firms with more independent directors experienced lower underwriting loss, which is the difference between premiums collected on insurance policies and expenses issued and claimed paid out. This research expects a negative relationship between the number of independent directors and stock investment risk. It is thus hypothesized that:

H2: Firms with more independent committee members have a lower stock investment risk.

Frequency of Meetings

Meeting frequency signals committed members' activeness and the effectiveness of committee (Abbott & Parker, 2000; Abbott, Parker, & Peters, 2004). Theoretically, regular meetings give rise to a continuous monitoring of risk and subsequent lower risk. However, empirical studies found no significant impact of committee meeting frequency on underwriting risk (Ng et al., 2012), financial performance (Hoque et al., 2013), and corporate efficiency (Wu et al., 2016). In Thailand, the SET requires that audit committee meet at least four times a year (SET, 1999). Logically, the higher the meeting frequency, the more effective the committee, thereby mitigating the company risk. As a result, this research expects a negative relationship between meeting frequency and stock investment risk. It is subsequently hypothesized that:

H3: Firm with higher frequency of committee meeting have a lower stock investment risk.

Expertise

A risk committee whose members' backgrounds are accounting and finance would be more capable of dealing with risk management issues (Al-Hadi et al., 2016). This research anticipates that firms with more committee members with accounting and/or finance background could manage risks more efficiently, resulting in lower stock return volatility. Thus, it is hypothesized that:

H4: Firms with higher proportion of committee members with accounting/finance background have a lower stock investment risk.

Tenure

Experienced risk committee members could manage risks more efficiently. According to Zgarni and Halioui (2016), audit committee tenure is inversely correlated to earnings management. In other words, the longer the committee tenure, the lower the likelihood of material misstatements. Such could also be the case with the tenure of RMC members because experienced committee members (long tenure) have developed a good understanding of the business and would thus manage risks more effectively. As a result, a negative relationship is expected between RMC members' tenure and stock investment risk. It is thus hypothesized that:

H5: Firms with experienced committee members (long tenure) have a lower stock investment risk.

3. RESEARCH METHODOLOGY

3.1 Research Sample

The research population was companies listed on the Stock Exchange of Thailand (SET). There were 733 listed firms at the start of this research in July 2017. However, mai (Market for Alternative Investment) firms were excluded from the analysis because of significantly smaller equity size and incomparable equity prices. In addition, property funds and real estate investment trusts (REITs) and firms under rehabilitation were excluded as they are subjected to different governance policies. Furthermore, observations with missing data were excluded before deriving the final sample.

Number of listed firms at the start of data collection	733	firms
Less mai firms	139	firms
Property funds and REITs	81	firms
Firms under rehabilitation	9	firms
Remaining firms	522	firms
Multiply by 3 years (2014–2016)	3	years
Total	1,566	firm-years
Less Observations with missing data	346	firm-years
Extreme outliers		
(3&2 firm-years for SMPC and MALEE)	5	firm-years
Final sample	1,215	firm-years

Interestingly, five firm-year observations were further excluded due to extreme outlier values of idiosyncratic risks, which violates the assumption of normal distribution. The final sample size was 406 firms with 1,215 firm-year observations. Table 1 tabulates the 406 firms by industry.

Table 1: Distribution of the sampled firms by industry

Industry	Number of Listed Firms	Number of Sampled Firms	% of the Industry	Number of Sampled Firm-years
Agro & Food Industry	50	36	72%	106
Consumer Products	41	33	80%	99
Financials	59	48	81%	144
Industrials	88	65	74%	195
Property & Construction	94	86	91%	257
Resources	46	26	57%	78
Services	104	77	74%	231
Technology	40	35	88%	105
Total	522	406	78%	1,215

The 1,215 firm-year observations represented every industry, accounting for 78% of SET-listed companies. Besides, the number of sampled firms of each industry was in excess of 70% of their respective industries, except the resources industry (57%).

3.2 Data

The data belong to the years 2014–2016. The year 2014 was the year that the Thai military staged a coup and seized power from a civilian government, and at present the country is still under military rule. Therefore, to mitigate the pre- and post-coup macroeconomic effects, the data period was restricted to three years (2014–2016) because stock investment returns/risks are subject to a country's macroeconomic conditions.

Specifically, data on risk management committee and corporate governance scores were manually collected from Form 56-1 and Thailand's Securities and Exchange Commission website, respectively. The corporate governance (CG) scores were based on a 5-point (star) scale, where 1 denotes poor and 5 excellent. In practice, the rating agency lists only the names of firms earning a minimum of three

stars, resulting in there being only CG3, CG4, and CG5 in the analysis. Meanwhile, financial data were retrieved from DataStream.

Given the voluntary nature of RMC disclosure, this research assumed that firms disclosed information on RMC. In practice, firms with RMC might not disclose RMC activity while those who disclosed never engage in such activity. However, it is problematic, if not impossible, to differentiate given the nature of available data (i.e., secondary data).

3.3 Variable Measurement

Dependent Variable

In this research, the dependent variable is stock investment risk, measured by idiosyncratic risk and total risk.

According to Markowitz (1952); Sharpe (1963), idiosyncratic and systematic risks constitute the variance of securities returns. Idiosyncratic risk is avoidable through portfolio diversification, while systematic risk is subject to market-wide events and thus unavoidable. Measures of stock investment risk (return variance) are derived from the market model, equation (1), and expressed in (2).

$$R_{jt} \quad = \quad \alpha_j + \beta_j R_{mt} + e_{jt} \tag{1}$$

$$Var(R_{jt}) \quad = \quad Var(\alpha_j + \beta_j R_{mt} + e_{jt})$$

$$= \quad Var(\beta_j R_{mt}) + Var(e_{jt})$$

$$Var(R_{jt}) \quad = \quad \beta_j^2 Var(R_{mt}) + Var(e_{jt}) \tag{2}$$

The variance of returns is used to measure the stock investment risk. $\beta_j^2 Var(R_{mt})$ is the systematic risk, where β_j is computed as

$$\beta_j \quad = \quad \frac{Cov(R_{jt}, R_{mt})}{Var(R_m)}$$

Meanwhile, $Var(e_{jt})$, is a measure of idiosyncratic risk.

$$Var(e_{jt}) \quad = \quad \frac{\sum\limits_{t=1}^{n}[R_{jt} - (\alpha_j + \beta_j R_{mt})^2]}{n-1}$$

Total risk then is

$$Var(R_j) \quad = \quad \frac{\sum\limits_{t=1}^{n}(R_{jt} - \overline{R}_{jt})^2}{n-1}$$

where n is the number of monthly returns of securities j requiring a minimum of 24 observations and a maximum of 60 observations over the current year and the four previous years (Issarawornrawanich & Jaikengkit, 2015).

Idiosyncratic risk is accounted for in stock investment risk because beta lacks explanatory power but a stock's idiosyncratic risk has a strong positive correlation with returns (Fama & French, 1992; Malkiel & Yexiao, 1997). Besides, Li et al. (2004) documented a substantial increase in idiosyncratic risk in emerging markets. Ferreira and Laux (2007) used idiosyncratic risk to quantitatively characterize advantages of corporate governance and investor protections. Meanwhile, this current research utilizes both idiosyncratic risk and total risk in establishing the relationship between RMC and stock investment risk.

Independent Variables

Establishment of RMC

The establishment of RMC is a dummy variable coded 1 if firms specify the existence of RMC in Form 56-1 and 0 otherwise. In addition, data of the number of RMC members were collected.

RMC Independence

RMC independence is the ratio of independent directors to total RMC members. Details of independent directors are typically provided in Form 56-1. The score of 0 was assigned to firms with RMC but no information on independent directors was provided.

Frequency of Meetings

Regular meeting is closely associated with a continuous monitoring of risk and thus the committee effectiveness. The frequency of meetings is the number of RMC meetings per year, which is disclosed in Form 56.1.

RMC Expertise

An RMC whose members possess accounting and finance background would be more proficient at risk management. Specifically, RMC expertise is the ratio of RMC members with accounting and/or finance background to total RMC members.

Tenure

Committee members with many years of experience contribute positively to firm's performance. In this research, tenure is the ratio of all members' total years of experience to the number of members.

Control Variables

Leverage ratio

Leverage ratio influences the level of risk-taking (Ng et al., 2012). In addition, Ferreira and Laux (2007) reported a significant, positive association between leverage level and idiosyncratic risk. Therefore, this research controls the leverage ratio and expects a positive relationship between leverage ratio and stock investment risk of the SET-listed firms.

Firm Size

According to Tao and Hutchinson (2013), larger companies were likely to take greater risk. However, Ferreira and Laux (2007) found that firm size was negatively associated with idiosyncratic risk. Firm size was thus controlled and this research expects a negative relationship between firm size and stock investment risk. A natural logarithm of total assets was used in this research (Bronson, Carcello, Hollingsworth, & Neal, 2009; Ng et al., 2012).

Corporate Governance (CG)

Ferreira and Laux (2007) reported that CG had a significant impact on idiosyncratic risk. In Thailand, listed firms are given a score (star) for their corporate governance practices and effectiveness by the Thai Institute of Directors Association (IOD). The CG scores signify the effectiveness and success of corporate governance of the listed firms (IOD, 2017). This research expects that firms with high CG scores have lower stock investment risks.

Cash Fow

According to Ashbaugh-Skaife, Collins, Kinney, and LaFond (2009), firms with higher operating cash flow experienced lower idiosyncratic and systematic risks. This research thus controls the operating cash flow and expects a negative relationship between operating cash flow and stock investment risk. In this research, the operating cash flow is the ratio of cash flow from operations to total assets at the beginning of the period.

Standard Deviation of Operating Cash Flow

According to Ashbaugh-Skaife et al. (2009) and Beaver, Kettler, and Scholes (1970), the standard deviation (SD) of operating cash flow was positively correlated to idiosyncratic and systematic risks. This is because SD of operating cash flow captures the volatility of operations (Ashbaugh-Skaife et al., 2009). In this research, the SD of operating cash flow is defined as the five-year SD of cash flow from operations divided by total assets (three consecutive years of data are required as a minimum) and treated as control variable.

Book-to-Market Ratio

Book-to-market ratio reflects investors' perceptions of a firm. Ashbaugh-Skaife et al. (2009) found a negative relationship between book-to-market ratio and stock investment risk. This research thus incorporates book-to-market ratio into the model and expects a negative correlation between the ratio and stock investment risk. The book to market ratio is the ratio of book value to market value of equity.

Dividend Payment

Dividend-paying firms are less risky than non-dividend-paying ones (Beaver et al., 1970). According to Ashbaugh-Skaife et al. (2009), dividend-paying firms have lower idiosyncratic and systematic risks. Therefore, dividend payment was incorporated into the model and treated as dummy variable coded 1 for dividend-paying firms and 0 otherwise.

Covariance of Firm's Cash Fows and Industry Beta

These two control variables were incorporated into the total investment risk model (Ashbaugh-Skaife et al. (2009). The covariance between firm's cash flow and market cash flow is a proxy for risk factor and is related to systematic risk (e.g. Beaver et al., 1970). In principle, the more volatile firms' cash flows, the riskier the firms are. Thus, in measuring total risk, which includes systematic risk, the covariance of firm's cash flows should be accounted for. The covariance of firm's cash flows is calculated by dividing five-year quarterly operating cash flows (the current year and prior four years) by firm's total assets relative to the market; and multiplied by 1000 to make it comparable with other variables.

Moreover, industry beta was incorporated into the model to control the industry effect. Firms in high-risk industry are expected to experience greater market risk. Therefore, a positive relationship is expected between industry beta and total risk. The industry beta is the coefficient b1 in the regression model:

$$INDRET = a + b_1 RMRF + \varepsilon$$

where INDRET is the industry return, measured by the monthly value-weighted return on a portfolio of firms in the same industry minus the risk free rate, and RMRF is the excess return on the market.

Year Dummies

Year dummies were included in the model to control the time effect.

3.4 Data Analysis

Descriptive statistics were used to examine the distribution of data. Inferential statistics were utilized to test the research hypotheses, including t-test, Pearson's correlation, and multiple linear regression models.

Multiple Regression Models

To test the hypotheses, multiple linear regression models were proposed.

Model 1 The establishment of RMC and idiosyncratic risk:

$$IRISK_{i,t} = a + b_1 RMC_{i,t} + b_2 LEV_{i,t} + b_3 SIZE_{i,t} + b_4 CFO_{i,t} + b_5 STDCFO_{i,t} + b_6 BM_{i,t} + b_7 DIV_{i,t} + \sum_{S=1}^{3} \beta_S CGS_{i \in S,t} + \sum_{Y=1}^{2} \beta_Y YEAR_{i \in Y,t} + \varepsilon_{i,t}$$

Model 2 The establishment of RMC and total risk:

$$TRISK_{i,t} = a + b_1 RMC_{i,t} + b_2 LEV_{i,t} + b_3 SIZE_{i,t} + b_4 CFO_{i,t} + b_5 STDCFO_{i,t} + b_6 BM_{i,t} + b_7 DIV_{i,t} + b_8 COVCFO_{i,t} + b_9 INDBETA_{i,t} + \sum_{S=1}^{3} \beta_S CGS_{i \in S,t} + \sum_{Y=1}^{2} \beta_Y YEAR_{i \in Y,t} + \varepsilon_{i,t}$$

Model 3 Characteristics of RMC members and idiosyncratic risk:

$$IRISK_{i,t} = a + c_1 IND_{i,t} + c_2 MEET_{i,t} + c_3 FIN_{i,t} + c_4 TEN_{i,t} + c_5 LEV_{i,t} + c_6 SIZE_{i,t} + c_7 CFO_{i,t} + c_8 STDCFO_{i,t} + c_9 BM_{i,t} + c_{10} DIV_{i,t} + \sum_{S=1}^{3} \delta_S CGS_{i \in S,t} + \sum_{Y=1}^{2} \delta_Y YEAR_{i \in Y,t} + \varepsilon_{i,t}$$

Model 4 Characteristics of RMC members and total risk:

$$TRISK_{i,t} = a + c_1 IND_{i,t} + c_2 MEET_{i,t} + c_3 FIN_{i,t} + c_4 TEN_{i,t} + c_5 LEV_{i,t} + c_6 SIZE_{i,t} + c_7 CFO_{i,t} + c_8 STDCFO_{i,t} + c_9 BM_{i,t} + c_{10} DIV_{i,t} + c_{11} COVCFO_{i,t} + c_{12} INDBETA_{i,t} + \sum_{S=1}^{3} \delta_S CGS_{i \in S,t} + \sum_{Y=1}^{2} \delta_Y YEAR_{i \in Y,t} + \varepsilon_{i,t}$$

where

IRISK is the idiosyncratic risk (the first measure of stock investment risk).

TRISK is the total risk (the second measure of stock investment risk).

RMC is risk management committee coded 1 for firms with RMC and 0 otherwise.

IND is the ratio of independent directors on RMC to total RMC members.

MEET is the number of RMC meetings per year.

FIN is the ratio of RMC members with background in accounting and/or finance to total RMC members.

TEN is years of work experience on average (tenure) of RMC

LEV is the ratio of total liabilities to total assets.

SIZE is the natural logarithm of total assets.

CFO is the cash flow from operations divided by total assets at the beginning of the fiscal year.

STDCFO is the five-year standard deviation of cash flow from operations divided by total assets, requiring a minimum of three years of data.

BM is the book value of equity divided by market value of equity.

DIV is the dividend payout coded 1 for dividend-paying firms and 0 otherwise.

COVCFO is the quarterly cash flows from operations divided by the firm relative to the market (in total risk model).

INDBETA is the coefficient of excess return on the market in the industry-return regression (in total risk model).

CGS is an array of three corporate governance dummies, where each firm falls into one of three categories: 3 stars (CG3), 4 stars (CG4), and 5 stars (CG5). Firms earning below three stars are excluded to avoid perfect multicollinearity.

Year dummies are an array of fiscal year dummies, where each firm's fiscal year falls into one of two categories (2015 or 2016). The year 2014 is excluded to avoid perfect multicollinearity.

The data were analyzed cross-sectionally. Standard errors were clustered by firm to control any serial dependence in the data, and year dummies added to correct the year effect (Petersen, 2009).

4. RESULTS AND DISCUSSION

Table 2 tabulates the RMC characteristics of the sampled firms.

In Panel A of Table 2, 817 firm-years (67%) belong to firms without RMC and 398 firm-years (33%) to those with RMC which is lower than the 42% in Suvichano (2017). This could be attributed to the exclusion of observation with missing data of this research.

Table 2: RMC characteristics of the sampled firms

Panel A: Existence of RMC (n = 1,215)	Firm-years	Percentage
Firms without RMC	817	67%
Firms with RMC	398	33%
Total	1,215	100%

Table 2: RMC characteristics of the sampled firms (Cont.)

Panel B: RMC characteristics of firms with RMC (n = 398)	Mean	Median	Minimum	Maximum
Number of RMC members	5.32	5	2	13
Number of independent directors	0.98	1	0	5
Number of meetings per year	3.33	3	0	25
Number of members with accounting or finance background	1.26	1	0	5
Average years of experience	3.80	3	1	14.875

Panel B of Table 2 presents the descriptive statistics of RMC characteristics of firms with RMC (398 firm-year observations). On average, an RMC comprises five members, with some firms having as many as 13 members. The average number of independent directors is about one person. The frequency of meetings is between 0–25, with an average of three meetings a year. In Thailand, it is required that audit committee meet at least four times a year (SET, 1999), while no such requirement exists for RMC meeting. The finding suggested that some firms with RMC never convened a meeting or there were meetings but never publicly disclosed in Form 56-1. In addition, RMC has one or two members with accounting and finance background, and the average work experience is 3.8 years.

The value assigned to a given RMC characteristic was as-is, and 0 for undisclosed RMC characteristics. This is because there were firms that disclosed the existence of RMS but failed to provide the specifics of RMC in Form 56-1, such as frequency of RMC meeting, committee tenure, or financial expertise. Therefore, in Panel B of Table 2, some variables have a zero as the minimum.

Table 3 tabulates the descriptive statistics of all variables including continuous variables (Panel A) and dummy variables (Panel B).

In Panel A, the average idiosyncratic risk (IRISK) and total risk (TRISK) were 0.01677 and 0.01919, respectively. The ratio of independent directors to total risk committee members (IND) was 0.07624 (or 7:100) on average. Interestingly, there were firms where all committee members were independent directors (indicated by a maximum of 1). The average RMC meeting (MEET) was 1.09 per year and the maximum was 25. The average ratio of committee with background in accounting and/or finance (FIN) was 0.084. The average years of work experience (TEN) was 1.24, with some committee members having almost 15 years work experience. The median of RMC-characteristic variables (IND, MEET, FIN, and TEN) are zero because firms without RMC were also included in the data.

Table 3: Descriptive statistics of the sampled SET-listed firms

Panel A: Continuous Variables					n = 1,215
Variable	Mean	Median	Std. Dev.	Min	Max
IRISK	0.01677	0.00853	0.04696	0.00041	0.62562
TRISK	0.01919	0.01044	0.04763	0.00046	0.62817
IND	0.07624	0	0.19727	0	1
MEET	1.09300	0	2.41605	0	25
FIN	0.08401	0	0.17593	0	1
TEN	1.24353	0	2.33381	0	14.875
LEV	0.27150	0.24110	0.20103	0	1.0835
SIZE	15.77284	15	1.73426	12	22
CFO	0.06656	0.06974	0.16446	−3.43120	0.57020
STDCFO	44.34476	32.60326	39.40992	2.62809	366.04170
BM	0.78539	0.68330	0.53743	0.01720	7.05520
COVCFO	9.50889	4.80100	31.31950	−84.84839	285.75890
INDBETA	0.98176	1.02496	0.18205	0.48630	1.24787
Panel B: Dummy Variables					n = 1,215
Variable		Proportion	Std. Dev.	Min	Max
RMC		0.32757	0.46952	0	1
DIV		0.78683	0.40971	0	1
CG5		0.12016	0.32529	0	1
CG4		0.26996	0.44412	0	1
CG3		0.27901	0.44870	0	1

In Panel B, the proportion of firms with RMC to total samples (RMC) was 32.757%. In addition, over three-quarters of the sampled firms (78.68%) paid dividend (DIV). As for the corporate governance scores (CG), 12% of the samples received five stars, 27% four stars, and 28% three stars.

Table 4 compares the average idiosyncratic risk (IRISK) and total risk (TRISK) between firms with and without RMC. The finding showed that, by comparison, both risks were lower for firms with RMC. However, the difference was statistically insignificant.

Table 4: Mean differences between firms with and without RMC

Dependent Variable	RMC		Difference	t-stat	p-value
	YES (n = 398)	NO (n = 817)			
IRISK	0.0147042	0.0177695	−0.00307	−1.0679	0.2858
TRISK	0.0173232	0.0200943	−0.00277	−0.9518	0.3414

Table 5 tabulates the correlation coefficients between variables. The correlation between stock investment risk (IRISK and TRISK) and the frequency of meeting (MEET) was inversely correlated ($p < 0.05$). Committee tenure (TEN) was negatively associated with IRISK ($p < 0.05$) and TRISK ($p < 0.10$), with expected negative sign. All the control variables, except CG3 and INDBETA, were significantly correlated to stock investment risk ($p < 0.05$). Nevertheless, the coefficient of leverage ratio (LEV) is negative, contrary to the expectation.

Table 5: Correlation Coefficients Between Variables

	TRISK	IRISK	RMC	IND	MEET	FIN	TEN	LEV	SIZE	CFO	STDCFO	BM	DIV	CG5	CG4	CG3	COVCFO	INDBETA
TRISK	1																	
IRISK	0.9988***	1																
RMC	-0.0273	-0.0306	1															
IND	0.0481*	0.0468	0.554	1														
MEET	-0.0609**	-0.0615**	0.6484***	0.4079***	1													
FIN	0.0092	0.0066	0.6845***	0.5248***	0.4808***	1												
TEN	-0.054*	-0.0563**	0.7637***	0.4149***	0.5192***	0.549***	1											
LEV	-0.0768***	-0.0807***	0.0107	-0.0099	-0.0084	0.0214	-0.034	1										
SIZE	-0.1716***	-0.1807***	0.0702**	0.0778**	0.0868***	0.0294	0.0329	0.2305***	1									
CFO	-0.2076***	-0.2011***	0.0692**	0.0219	0.0734	0.0325	0.0546*	-0.1576***	0.0328	1								
STDCFO	0.35***	0.3471***	0.0114	-0.045	-0.0305	0.0193	-0.007	-0.0335	-0.1466***	-0.1667***	1							
BM	-0.063**	-0.064**	-0.0668	0.0193	-0.066**	-0.0853***	-0.0655**	-0.047	-0.0346	-0.1382***	-0.0658**	1						
DIV	-0.2779***	-0.2702***	0.0507*	0.0333	0.0933***	0.0694	0.0433	-0.0318	0.2402***	0.2722***	-0.1113***	-0.1076***	1					
CG5	-0.083***	-0.0835***	0.152***	0.1119***	0.1702***	0.0872***	0.115***	0.0374	0.4514***	0.0688**	-0.1029***	-0.1044***	0.1553***	1				
CG4	-0.0863***	-0.0872***	0.2432***	0.1397***	0.2284***	0.1813***	0.2194***	0.0174	0.0808***	0.1002***	0.0082	-0.0941***	0.1581***	-0.2247***	1			
CG3	-0.0446	-0.0457	-0.0549*	-0.0822**	-0.0733**	-0.0613**	-0.0444	0.0428	-0.1101***	0.0159	0.021	-0.0008	-0.0078	-0.2299***	-0.3783***	1		
COVCFO	0.2177***	0.2181***	0.0194	0.0236	0.0043	0.0044	0.0271	-0.041	-0.1049***	-0.0726*	0.4364***	0.0048	0.0016	-0.0855***	0.0049	0.0284	1	
INDBETA	-0.0427	-0.0537*	-0.0698***	-0.0556*	-0.1563***	-0.0625**	-0.1271***	0.0865***	0.0959***	-0.0495*	0.0159	-0.0056	-0.0089	0.0137	-0.1254***	0.0322	-0.0142	1

Notes: ***, **, and * respectively denote $p < 0.01$, $p < 0.05$, and $p < 0.1$

Table 6 presents the regression results, where Model 1 examines the establishment of RMC and idiosyncratic risk (IRISK); and Model 2 the RMC establishment and total risk (TRISK). Both models are related to Hypothesis 1 (H1).

Table 6: Regression analysis between RMC establishment and stock investment risk

Independent Variable	Hypothesis	Expected Sign	Model 1 Coeffficient (Std.Error) IRISK	VIF	Model 2 Coeffficient (Std.Error) TRISK	VIF
RMC	H1	–	0.000881 (0.004)	1.15	0.00086 (0.004)	1.15
LEV			−0.0183* (0.010)	1.11	−0.0175* (0.010)	1.11
SIZE			−0.00153*** (0.001)	1.48	−0.000886* (0.001)	1.50
CFO			−0.0323 (0.030)	1.17	−0.034 (0.029)	1.17
STDCFO			0.000344* (0.000)	1.07	0.000306* (0.000)	1.30
BM			−0.00903*** (0.003)	1.09	−0.00957*** (0.004)	1.09
DIV			−0.0210*** (0.007)	1.20	−0.0231*** (0.007)	1.20
COVCFO					0.000138 (0.000)	1.25
INDBETA					−0.0141 (0.014)	1.04
CG5			−0.00764** (0.004)	1.82	−0.00853** (0.004)	1.83
CG4			−0.0116** (0.005)	1.71	−0.0125** (0.005)	1.75
CG3			−0.0111** (0.005)	1.42	−0.0113** (0.005)	1.42
y2015			0.00223* (0.001)	1.39	0.00236* (0.001)	1.39

Table 6: Regression analysis between RMC establishment and stock investment risk (Cont.)

Independent Variable	Hypothesis	Expected Sign	Model 1 Coeffficient (Std.Error) IRISK	VIF	Model 2 Coeffficient (Std.Error) TRISK	VIF
y2016			0.00240* (0.001)	1.40	0.00254* (0.002)	1.40
Constant			0.0617*** (0.013)		0.0705*** (0.019)	
Observations			1,215		1,215	
Number of clusters (firms)			406		406	
R-squared			0.2138		0.2273	
Statistics for F-test			3.50		3.18	
Model degrees of freedom			12		14	
Residual degrees of freedom			405		405	
p-value for F-test			0.0001		0.0001	
Durbin-Watson d statistic			1.9860		1.9981	

Note: Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

In Table 6, the F-test and p-value indicate the fitness of both models ($p < 0.05$). For multicollinearity, all variance inflation factors (VIFs) are below 2, given the VIF threshold of 10. Thus, no multicollinearity exists in this study. Furthermore, the Durbin-Watson d statistics are close to the center of distribution ($d = 2.0$) and above the upper bound (1.801), indicating no autocorrelation.

The results for Models 1 and 2 indicated no statistically significant association between RMC and the risk measures (IRISK and TRISK), thus rejecting hypothesis 1 (H1). The phenomenon could be attributed to the low proportion of firms with RMC in the final sample (33%). However, the finding is in line with previous studies in other countries (i.e., the establishment of RMC is not significantly correlated to corporate financial performance), including Turkey (Şenol & Karaca, 2017), Italy (Florio & Leoni, 2017), and Malaysia (Bangaan Abdullah, Janor, Hamid, & Yatim, 2017).

The control variables, except CFO, COVCFO, and INDBETA, were significantly associated with stock investment risk. Specifically, several control variables were negatively associated with the risks (IRISK and TRISK), including SIZE, BM, DIV, CG3-CG5, with expected sign at the 5% significance level ($p < 0.05$). In other words, the stock investment risk declined for larger firms (SIZE), firms with high

book-to-market ratio (BM), dividend-paying firms (DIV), and those with effective corporate governance practices (CG5-CG5).

In Table 7, the regression results associated with Models 3 and 4 are related to Hypotheses 2-5 (H2–H5). The models are statistically fit, given that the p-value for F-test is below 0.05. In addition, all VIFs are below 2, indicating no multicollinearity. Moreover, the Durbin-Watson d statistics are close to the center of distribution ($d = 2.0$) and above the upper bound (1.834), suggesting no autocorrelation.

Table 7: Regression analysis between RMC characteristics and stock investment risk

Independent Variable	Hypothesis	Expected Sign	Model 3 Coeffficient (Std.Error) IRISK	VIF	Model 4 Coeffficient (Std.Error) TRISK	VIF
IND	H2	–	0.0276 (0.022)	1.49	0.0267 (0.022)	1.49
MEET	H3	–	−0.000493 (0.001)	1.59	−0.000687 (0.001)	1.61
FIN	H4	–	0.00472 (0.009)	1.79	0.00768 (0.008)	1.79
TEN	H5	–	−0.00143** (0.001)	1.70	−0.00156** (0.001)	1.71
LEV			−0.0186* (0.010)	1.11	−0.0178* (0.010)	1.12
SIZE			−0.00169*** (0.001)	1.48	−0.00103* (0.001)	1.50
CFO			−0.0319 (0.030)	1.17	−0.0335 (0.029)	1.17
STDCFO			0.000347* (0.000)	1.07	0.000310* (0.000)	1.31
BM			−0.00959*** (0.004)	1.10	−0.0101*** (0.004)	1.10
DIV			−0.0211*** (0.007)	1.20	−0.0232*** (0.007)	1.21
COVCFO					0.000134 (0.000)	1.26
INDBETA					−0.0158 (0.014)	1.06

Table 7: Regression analysis between RMC characteristics and stock investment risk (Cont.)

Independent Variable	Hypothesis	Expected Sign	Model 3 Coeffficient (Std.Error) IRISK	VIF	Model 4 Coeffficient (Std.Error) TRISK	VIF
CG5			−0.00688** (0.003)	1.83	−0.00742** (0.003)	1.84
CG4			−0.0107*** (0.004)	1.73	−0.0114** (0.004)	1.75
CG3			−0.0102** (0.004)	1.42	−0.0103** (0.004)	1.42
y2015			0.00242* (0.001)	1.39	0.00255* (0.001)	1.39
y2016			0.00271* (0.001)	1.40	0.00287* (0.002)	1.40
Constant			0.0640*** (0.015)		0.0743*** (0.021)	
Observations			1,215		1,215	
Number of clusters (firms)			406		406	
R-squared			0.2260		0.2398	
Statistics for F-test			2.98		2.90	
Model degrees of freedom			15		17	
Residual degrees of freedom			405		405	
p-value for F-test			0.0002		0.0001	
Durbin-Watson d statistic			1.9759		1.9895	

In Models 3 and 4, there was a significant, negative relationship between committee tenure (TEN) and the risk measures (IRISK and TRISK). Specifically, the longer tenure the committee members have, the lower the idiosyncratic and total risks, supporting hypothesis 5 (H5). This finding is agreeable with Zgarni and Halioui (2016), who focused on audit committee and reported a significant negative relationship between audit committee tenure and earnings management. The findings of this study and Zgarni and Halioui (2016) confirm that a committee's longer tenure leads to lower stock investment risk (this study) and earnings management (Zgarni & Halioui, 2016). Nevertheless, no significant relationship exists between other RMC characteristics (IND, MEET, FIN) and the risks (IRISK and TRISK), thus rejecting

H2, H3, and H4. Interestingly, the control variables in Models 3 and 4 that are statistically significant are consistent with those in Models 1 and 2 in Table 6 (i.e., SIZE, BM, DIV, CG3-CG5).

5. CONCLUSION

This research empirically investigated the relationship between the establishment and characteristics of risk management committee (RMC) and stock investment risk (idiosyncratic and total risks) of 406 Thai listed firms (1,215 firm-year observations). The findings revealed that the idiosyncratic and total risks of firms with RMC were insignificantly lower than those without RMC. The multiple regression analysis also indicated that the establishment of RMC had no significant impact on stock investment risk. Of the four RMC characteristics (i.e., committee independence, frequency of meeting, expertise, and tenure), only committee tenure exhibited a significant, negative relationship with stock investment risk ($p < 0.05$).

Despite the inconclusive relationship between RMC and stock investment risk, the findings, in a sense, imply that other variables play an influencing role in stock return volatility, especially private information (Roll, 1988). Notwithstanding, this research has discovered that importance was attached to committee's work experience (tenure) in equity risk evaluation. In other words, the financial gain associated with the establishment of RMC is tied to years of work experience of the RMC members. Moreover, since the research samples represented listed firms in all industries, the generalizability of the findings is manifold.

To financial regulators, the findings indicated that 33% of SET-listed firms had an RMC in place. In addition, the RMC characteristics are in line with the SET's guideline for audit committee (SET, 1999), such as appointment of at least one board member with accounting and/or finance background, regular meeting. However, this research found mixed evidence on the association between RMC and idiosyncratic risk. Therefore, future research should measure return volatility using different sets of variables, or utilize content analysis based on risk reporting (Linsley and Shrives, 2006).

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