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Financial Performance of the Firms and the Enterprise Risk Management: A Sri Lankan Perspective

HP Rozairo[1] and SMRK Samarakoon[2]

[1]Department of Accountancy, Faculty of Business Studies and Finance, Wayamba University of Sri Lanka, Sri Lanka. E-mail: hrozairo@gmail.com
[2]Department of Accountancy, Faculty of Business Studies and Finance, Wayamba University of Sri Lanka, Sri Lanka. E-mail: kithsiri@wyb.ac.lk

Abstract: In recent decades, risk management and financial performance in organizations have become increasingly important in research, and the topic is still hotly debated around the world today.

The tendency is to look at risk management from a broad perspective rather than from a specific perspective. The term "Corporate Risk Management" refers to this comprehensive approach to risk management. Studies on the relationship between corporate risk management and financial performance in organizations have lacked in-depth. An organization's performance can be improved by using the concept of corporate risk management, according to numerous studies. Furthermore, it is imperative that corporate risk management is properly aligned with the company factors, such as industry competition and the size of the company. The board of directors is also an important component of this study. This study identifies the impact of corporate risk management on financial performances of Banks, Diversified Financials, Insurance, Energy, and Retailing sectors in the Colombo Stock Exchange, which include 86 companies, were considered as the population and supported a sample of 60 firms. The research began with a search for companies that indicated they were utilizing the corporate risk management concept in their annual reports covering their fiscal year 2018. The findings indicate that firms should consider the implementation of a corporate risk management system following structural variables affecting the firm. These findings will be interesting to the policymakers, future researchers, and any third party who are keen on corporate risk and financial performance of Banks, Diversified Financials, Insurance, Energy, and Retailing sectors in Sri Lanka.

Keywords: Colombo Stock Exchange, Enterprise Risk Management, Financial Performance, Sri Lanka

1. INTRODUCTION

Corporate risk management and financial performance have been very important in terms of research over the past few decades and are still widely discussed in the world today. One of the most important developments in

the financial vision over the past few decades is the ability to communicate risk in an unrestricted way. There are clear research difficulties in these studies of the link between risk and financial performance in systems. Otherwise, greater corporate governance could contribute to the rapid collapse of many organizations, especially those whose main concern is a risk. Therefore, risk management should be at the center of organizational performance through risk management mechanisms, particularly in processes, structures, and the renewal of all communications. This requires processes such as identifying and analyzing those risks and developing risk management strategies, procedures, and monitoring of those risks that are set to reduce the risk impact on the organization's financial performance. Owing to global competition, globalization, downsizing, and technical innovation, the business environment is becoming more complex. Corporate risk management has become a prominent part of the business process within this dynamic setting. No business is being profit-making if these risks are not appropriately managed.

Risk is a key factor in attracting financial behavior. Without risk, the financial system will be simplified. However, the danger lies in the whole world. Financial Institutions, and other sectors, therefore, must manage risk to survive in this uncertain world. Undoubtedly the long-term rests in risk management. Only those with a risk management system survive within the market over time.

Risk management is critical in today's world. Even so, there has been a fundamental shift in the way risk management is approached in recent years. Rather than looking at risk management in silos, the trend is to look at risk management as a whole. Management of a company's risk is commonly known as "corporate risk management" (CRM). Sri Lankan banks, insurance companies, energy, and retail businesses will benefit from the study's findings, which will help them to improve their risk management systems and adopt better methodologies for enhancing their performance. Decades ago, from the Sri Lankan point of view, the empirical evidence supporting this relationship between CRM and performance was very limited. Therefore, further research is needed to look at the link between corporate risk management implementation and firm performance.

The main objective instigated during this study is that the relationship between corporate risk management (CRM) and firm performance (P) depends on the proper match between CRM and, therefore the firm factors: namely, industry competition, firm complexity, firm size, and monitoring by board of directors.

The analysis presented in this paper is based on an empirical study of 60 firms in CSE that disclose their CRM activities in their annual reports for 2018 with the Securities Exchange Commission (SEC) of Sri Lanka.

The results of this study provide solid proof that there is a favorable relationship between CRM and organizational performance, but this relationship depends on a proper match between the organization's CRM system and the above five elements.

2. REVIEW OF LITERATURE

Many studies have examined the financial performance of organizations and linked their performance to risk management. There is no doubt that evaluating financial performance is a critical issue for managers, investors, and shareholders. It improves the stability and performance of the organizations. Many prior studies have measured the financial performance of companies (e.g., Ghosh, 2006; Jackling and Johl, 2009; Rourkela and Kharagpur, 2012, Withisuphakorn, 2018, Al-Homaidi *et al.*, 2019; Chawla and Manrai, 2019).

A growing number of experts view Corporate Risk Management as a basic paradigm for the portfolio management of risk-taking organizations. Behind this practice is the belief that corporate risk management provides an organization with a much broader approach to risk management than the common view of risk management. By applying an organized and logical approach to managing all the risks an organization is exposed to, corporate risk management reduces the risk of corporate failure, thereby improving the organization's financial performance and value.

On the impact of risk management on a company's performance, there is a wide range of opinions. Scholars have conducted extensive studies on this substance and found mixed results; while some found that risk management had a positive impact on firm performance, some found negative relationships, and others suggested that other factors, apart from risk management, affected firm performance. With Hoyt and Liebenberg (2009); Stulz (1996 and 2003); Barton *et al.* (2002); Nocco and Stulz, (2006); Lam, (2003) empirical evidence that a firm's risk management system will ultimately improve its performance (Gordon *et al.*,2009).

The findings of Gates and Hexter, 2005, show that many companies have adopted risk management as a way to improve their business performance. Determining the key factors in the contingency relationship between a firm's CRM system and its performance is far from an exact science. There is no standard framework or model capable of predicting

key factors that affect the relationship between corporate risk management and its financial performance. However, there seems to be a good set of four critical factors to understand the relationship between corporate risk management and strong financial performance. These four factors are industry competition, firm size, firm complexity, and board of directors' monitoring (following Gordon *et al.*, 2009). The rationale underlying the selection of each of these factors is developed below.

2.1. Factors Affecting Corporate Risk Management-Financial Performance Relation

2.1.1. Industry Competition

Industry competition is the most important thing in all firms. At the end of the spectrum, many firms within the industry produce and sell similar products and services. In that case, the products and services of one company are proximity to another. Competitive competition for this type of industry is often in flames, which, in turn, means that firms in the industry face a high risk of not achieving a sustainable profit margin. On the other hand, there is only one company in the industry that manufactures and sells products and services. To the extent that the number of company products and services is available in the sector, a company's risk of not receiving a fixed profit rate is low.

Given this, it seems reasonable to assume that the level of competition a company faces must be consistent with the company's risk management needs. Also, the competitive point sold in an industry or sector must be the enterprise risk management system of the company in that industry. Therefore, there is a balance between the competition of industry-oriented organizations and the need for risk management across the enterprise. It can be argued that the correlation between CRM demand and the level of competition is better seen as an inverse U (that is, CRM system demand grows slowly as competition increases and eventually Decreased due to extreme levels of competition). This study assumes that there are no cases involving competition.

In this study, researchers also found that the relationship between a company's risk management is related to the relevant response (e.g. Coordination) between the levels of industrial competition the company faces and the company's risk management system.

2.1.2. Firm Size

The size of a company has a variety of effects on its financial performance. It's a proven fact that large corporations can take advantage of economies

of scale and scope, making them more efficient than small ones. However, small businesses may not be as powerful as their larger rivals. Because of this, the financial performance of companies can suffer as they grow. Because of this, the theory's relationship between size and performance is ambiguous (Majumdar, 1997).

Previous research has examined the relationship between company size and other variables, such as Abbas *et al.* (2013), Alanazi *et al.* (2011), Al-Homaidi *et al.* (2019), Almajali *et al.* (2012), Athanasoglou *et al.* (2008), Burca and Batrinca (2014), Olowokure *et al.* (2016), Olson and Zoubi (2017), Efobi and Bwala (2013), Fredriksson and Moro (2014), Nawaz and Haniffa, (2017), Omondi and Muturi (2013), Rashid and Jabeen (2016) and Sing (2015). Further, previous research shows that a bank's profit margins are strongly influenced by its size (Almajali *et al.*, 2012; Efobi and Bwala, 2013; Mandiefe, 2016; Nawaz and Haniffa, 2017; Oliveira *et al.*, 2011; Omondi and Muturi, 2013). That size does have a positive effect on financial performance, but that effect is not significant (Alanazi *et al.*, 2011; Olowokure *et al.*, 2016). According to Athanasoglou *et al.* (2008), an increase in the size of the bank improves the bank's performance. Companies of any size, Deitiana, and Habibuw (2015) found, perform equally well financially regardless of their size.

In the literature on organizational theory, the relationship between firm size and organizational structure has been a central issue for some time (Lawrence and Lorsch, 1967). When it comes to designing and implementing risk management systems, accounting researchers have found that firm size is an important consideration as well (e.g., Haka *et al.*, 1985; Myers *et al.*, 1991; Shields, 1995). As far as the implementation of a risk management system is concerned, the size of the company appears to be directly related to it (Beasley *et al.*, 2005; Hoyt and Liebenberg, 2009). From 2006 to 2012, Almajali *et al.* (2012) examined how 29 Kenyan publicly-traded firms' financial performance was influenced by various factors. There is a significant and negative impact on a company's financial performance when it comes to its size and its age, according to their findings. The size of a company has been shown to have a positive and statistically significant impact on profitability in studies by Omondi and Muturi (2013), Mokni and Rachdi (2014), and Issn *et al.* (2017).

Alanazi *et al.* (2011) and Omondi and Muturi (2013) claim that the age of a company has a positive and significant impact on its financial performance. A study by Olowokure *et al.* (2016) found a strong link between the quality of financial reporting and a company's age, size, and leverage ratio. Twenty-five Jordanian insurance companies that were publicly traded

on the Amman Stock Exchange (ASE) from 2002 to 2007 were studied by Almajali *et al.* (2012). There was a statistically significant impact on the Jordanian listed firm's performance from the leverage ratio, liquidity ratio, size, and management capability index in the multiple regression model. Investigators found that the market reaction to the adoption of risk management plans was related to the size of the company and that the adoption of risk management plans was undertaken by the appointment of risk managers. As mentioned above, the literature suggests that there should be a favorable link between the size of an organization and the need for risk management in a company.

2.1.3. Firm Complexity

The increase of firm complexity (variability of business transactions) may result in lesser data integration and complexity in organizational control management systems. Ge and Mc Vay (2005) and Doyle *et al.* (2007) found material weaknesses in internal control (which is an important part of risk management systems) are more likely in more complex companies. Regarding the risk management system's direct consideration, Hoyt and Liebenberg (2009) found that severity was related to the use of risk management.

The above-mentioned literature suggests that there must be a positive relationship between the complexity of the company in need and its need for a risk management system. In this study, researchers also assume that the relationship between a company's risk management depends on the proper alignment (eg, consistency) between the company's complexity and that company's risk management system

2.1.4. Board of Director's Monitoring

127 non-financial Indian listed companies were studied by Ghosh (2006), who found a correlation between financial performance and the board of directors. The study found that larger boards have a greater impact on a company's financial results. It was discovered that the CEO's salary has a significant effect on the company's performance. CEO compensation has a significant impact on the company's overall performance, as evidenced by the results of the study. According to Jackling and Johl (2009), larger board sizes have a positive impact on a company's performance. Many studies have focused on the board of directors and how it affects a company's financial performance (e.g., Samra- Fredericks, 2000; Erhardt, Werbel & Shrader, 2003; Essayed, 2007). Many researchers have also found that good corporate governance has a significant impact on how well a company performs. Mahadeo *et al.* (2012) investigated the link between the

composition of the board of directors and the performance of the company. Companies from Canada were included in the study. Using cross-sectional regression analyses, researchers found that team size, team tenure, moderate age variation, and high levels of experience are all associated with better performance in the workplace. The Indian hotel industry was the focus of a study by Yameen, Farhan, and Tabash (2019) looking at the effect of board composition on firm performance.

Analysis of the financial data for 39 Indian hotels from 2014 to 2016 found that the composition of the board of directors had a negative impact on their financial performance. Sobel and Reding (2004) state that an effective risk management system depends on active participation by its board of directors. Kleffner *et al.* (2003) found that adopting a risk management plan was related to the recommendation from the Board of Directors. Beasley *et al.* (2005) found that the size of independent board members is closely related to the acquisition stage of risk management. Besides, the New York Co-operative Governance Act (NYSE, 2003) Regulations include specific requirements for NYSE registrars' committees to hold certain obligations relating to '' risk assessment and risk management, "including a higher risk of financial reporting.

The above-mentioned documents indicate that there should be a positive relationship between the monitoring by the board of directors and its implementation of the risk management system. In addition, germane in this study, the researcher assumes that the relationship between corporate risk management financial performances will depend on the appropriate match (e.g. alignment) between the monitoring by the board of directors and its Corporate Risk Management system.

The previous discussion states that, from a financial performance perspective, the rigorous choice of the risk management system should be well aligned with a few factors related to resilience.

The relationship between a firm's corporate risk management and its financial performance depends on the right balance between a firm's corporate risk management and the following firm-related variables: industrial competition, firm size, firm complexity, and monitoring by the board of directors.

3. METHODOLOGY

The research outline provides the system looking for in the collection of information and its experiments, Bryman and Bell (2007), or can be defined as the experimental relay's design and structure to find answers to research

questions, Cooper and Emory, (1995). This means that it provides access to data that is expected to take care of exploration issues.

As in the literature, a quantitative approach has been used to successfully analyze the relationship between the bank's corporate risk and financial performance, diversified financial, insurance, energy, and retail firms in Sri Lanka.
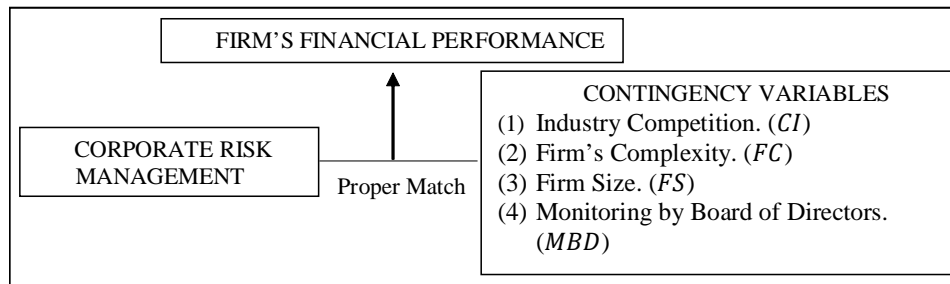

Figure 1: Research Design *(Source: Gordon et al., 2009)*

Eq. (1) and Eq. (3) below can be used to test this study's main objective. When calculating the coefficients for Equation (1), the best-performing companies' performance is taken into consideration. In Eq. (3), the relationship between firm performance (P) and the proper match between firm factors is taken into account, and the absolute values of residuals (ARES) are regressed on firm performance (P) from Eq. (1).

$$CRM = \beta_0 + \beta_1 CI + \beta_2 FS + \beta_3 FC + \beta_4 MBD + \varepsilon \text{ (Gordon et al., 2009)} \quad (1)$$

Table 1: Measuring the Variables

Variable	Acronym	Measurement of variable
Firm Performance	P	Firm performance is calculated by the shareholders' one-year excess stock market return for 2018, $P_i = R_i - (R_f + \beta_i (R_m - R_f))$ Where, P_i = Firm performance, R_i = Firm i return, R_m = Market return, R_f = Risk-free rate of return, β_i = Beta for firm i. (Gordon and Smith, 1992, Kolodny *et al.*, 1989)
Industry Competition	CI	$(1 - HHI)$, One minus the Herfindahl – Hirschman Index is used to measure the industry competition. The total of the squared market shares of all companies in the same industry is used to derive *HHI*. (Casualty Actuarial Society, 2003)

contd. table 1

Variable	Acronym	Measurement of variable
Firm Complexity	FC	This is measured by the number of operating segments for each firm. (Doyle *et al.*, and Ge, McVay (2005),
Firm Size	FS	Firm size is measured as the natural logarithm of average total assets. (Ge and McVay, 2005; Francis *et al.*, 2004).
Monitoring by Board of Directors	MBD	Board of directors monitoring is measured by dividing the number of directors for each company by the natural logarithm of sales.(Larcker *et al.*, 2007).

$$CRMI = \Sigma_{k=1}^{2} Strategy_k + \Sigma_{k=1}^{2} Operation_k + \Sigma_{k=1}^{2} Reporting_k + \Sigma_{k=1}^{2} Compliance_k$$

$$(Gordon\,et\,al., 2009) \qquad Eq.(2)$$

Table 2: Measuring the independent variable CRMI

Variable	Measurement of variable
Strategy 1	$Strategy_1 = \dfrac{Sales_i - \mu_{Sales}}{\sigma_{Sales}}$ Where, $Sales_i$ = Sales of firm i in 2018, μ_{Sales} = Average industry sales in 2018, σ_{Sales} = Standard deviation of sales of all firms in the same industry. (Porter, 2008)
Strategy 2	$Strategy_2 = \dfrac{\Delta\beta_i - \mu_{\Delta\beta}}{\sigma_{\Delta\beta}}$ Where, $\Delta\beta_i = (\beta_i$ in 2018 - in 2017), β_i = Firm i's beta (Data from CSE), $\mu_{\Delta\beta}$ = Average industry $\Delta\beta$ in 2018, $\sigma\Delta\beta$ = Standard deviation of $\Delta\beta$'s of all firms in the same industry. (Nocco and Stulz, 2006)
Operation 1	$Operation_1 = \dfrac{Sales}{Total\ Assets}$ (Kiymaz, 2006)
Operation 2	$Operation_2 = \dfrac{Sales}{Number\ of\ Employees}$ (Banker *et al.*, 1989)
Reporting 1	*Reporting₁ = (Material Weaknesses) + (Auditor Opinion) + (Restatement)* (Cohen. 2004)

Reporting 2	$Reporting_2 = \dfrac{\lvert Normal\,Accruals \rvert}{\lvert Normal\,Accruals \rvert + \lvert Abnormal\,Accruals \rvert}$
	(Johnson *et al.*, 2002)
Compliance 1	$Compliance_1 = \dfrac{Auditor\,Fees}{Total\,Assets}$
	(O'keefe *et al.* 1994)
Compliance 2	$Compliance_2 = \dfrac{Settlement\,Net\,Gain\,(Loss)}{Total\,Assets}$
	(Shavell 1982)

$$P = \beta_0 + \beta_1\,ARES + \varepsilon \qquad\qquad \textit{(Gordon et al., 2009)} \qquad\qquad \textbf{Eq. (3)}$$

Where, *P* = Firm performance, *ARES* = The Absolute value of residual from Eq. (1), β_i = various parameters, *i* = 0 to 3, ε = error term

The residuals are derived from Eq. (1), which underlines the basic concept that the residual analysis model shows the 'lack of fit' within the corporate risk management and proper match among firm factors.

3.1. Population and Sample

The Colombo Stock Exchange (CSE) has 290 companies representing 20 GICS industry groups as of 20th January 2020. Out of the 290 companies representing 20 industry groups listed in Colombo Stock Exchange bank, diversified financials, insurance, energy, and retailing sectors, which include 86 companies, were considered as the population.

The sample used in this study was taken from the Colombo Stock Exchange Database. The study began with a search for companies that have indicated they are using the concept in their annual reports covering their 2018 financial year.

Besides, the data were collected through annual reports published by the listed public companies. All required annual reports have been obtained through the CSE website. The analyses presented in this research are based on an empirical study of 60 firms that disclose their activities in their annual reports for 2018 with the Sri Lankan Securities Exchange Commission (SEC). Although the sample is only available from 2018, Lam (2003) shows that the implementation is often a continuous and multi-year initiative. This means that the sample identified in this study has a high probability of progression over the next few years.

Table 3: Sector distribution of the sample

Sector	Total Companies in the sector	Number of observations
Banks	12	12
Diversified Financials	49	30
Insurance	10	8
Energy	2	2
Retailing	13	8
Total	**86**	**60**

3.2. Data Analysis

Initially, the researcher performed a descriptive statistics analysis, and the strategies for this are; mean and standard deviation. This mean and the standard deviation are done under the full sample and dismantling for the high-performing firms and the other firms. High-performing firms are defined as those with a one-year excess return of more than 2%, and the other firms are those that are not high performers. A test of differences in means was also performed under descriptive statistics. Eventually, the statistical techniques used to analyze the data are correlation analysis and regression analysis. Finally, the researcher also tries other cut-offs of excess returns for the high-performing firms.

As discussed, the relation between CRM and a firm's performance (P) is considered to be contingent on the proper match between a CRM of a firm and its industry competition (CI), firm size (FS), firm complexity (FC), and the board of directors' monitoring (MBD). Thus, following Gordon and Smith (1992), the researcher finds an effective relationship between the four contingency factors for high-performing firms. There are 26 companies under high-performing firms in total. The coefficients for the four contingency factors are derived from high-performance firms. In other words, high-performance firms are used as the 'best practice' (or benchmark) group of firms to find the relationship between the four contingency variables.

4. DATA PRESENTATION AND ANALYSIS

4.1. Descriptive Statistics

As the initial step, the researcher has performed a descriptive analysis to provide an overall interpretation of the database. Descriptive statistics are useful to make general conclusions about collecting data. In this regard, the researcher has built up a table to represent necessary measures, namely,

the mean and standard deviation of high-performing firms and the other firms and the test of differences in means of these two groups.

Descriptive statistics for the total sample and the breakdown for the high-performing firms and the other firms are provided in Table 4.

4.1.1. Total Sample

The total sample in the descriptive statistics tables shows the mean and the standard deviation of the total sample under the firm performance (P), corporate risk management index (CRMI), and the other four contingency variables namely, industry competition (CI), firm complexity (FC), firm size (FS), and monitoring by board of directors (MBD). The total sample is subdivided into two groups: the high-performing firms and the other firms based on the 2% one-year excess return. There are 26 high-performing firms and 34 other firms that are not high performers. The average CRMI of the total sample is 3.244.

4.1.2. High Performing Firms

The average CRMI for the high-performing group is 4.675. That means the high-performing firms pay more attention to the proposed match between CRMI and contingency variables.

4.1.3. Other Firms

The average CRMI for this group is 2.150, which is lower than the high-performing group. Therefore this implies, the high perming firms pay more attention to their CRMI than the other firms.

4.1.4. Test of Differences in Means

As per Table 4, the test of difference in means shows that the high-performing firms and the other firms are not statistically different in their CRMI (test of difference in means shows p-value 0.198). Besides, the means for all four contingency variables of the high-performing group of firms are not statistically different from the means of the other firms. These results indicate that CRMI and the four contingency variables, by themselves, do not account for high performance.

4.2. Correlation Analysis

Table 5 provides a correlation analysis for all 60 firms. The correlation coefficient of Industry competition (CI) shows -0.588 with a p-value of 0.000. This means CI negatively affects the CRMI, and it is very much significant

Table 4: Descriptive Statistics

Variables	Total Sample		High performing firms (excess return > 2%)		The other firms (excess return ≤ 2%)		Test of difference in means	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Difference	p-Value
P	0.009	0.083	0.085	0.054	-0.049	0.047	0.134	<0.001
CRMI	3.244	7.484	4.675	11.016	2.150	2.316	2.525	0.198
CI	0.848	0.140	0.813	0.188	0.874	0.082	-0.060	0.100
FC	3.433	2.302	3.384	2.192	3.471	2.415	-0.087	0.888
FS	23.835	1.729	24.292	2.108	23.486	1.299	0.805	0.073
MBD	0.377	0.090	0.357	0.089	0.393	0.089	-0.036	0.124
Number of observations	60		26		34			

at the significance level of 0.05. Firm completion (FC) shows a correlation coefficient of -0.042 with a p-value of 0.752, which implies that FC is also negatively correlated with CRMI, and it is insignificant. Similarly, Monitoring by the board of directors (MBD) also negatively correlates with CRMI, and it is also insignificant at the significance level of 0.05. However, the only variable which is positively correlated with CRMI is Firm size (FS). This indicates, the FS is positively correlated with CRMI in the Sri Lankan context. It shows a correlation coefficient of 0.130 with a p-value of 0.323.

As per Table 5, FC is strongly correlated with the FS (Correlation coefficient 0.455 with a p-value <0.001). This strong correlation suggests the possibility of multicollinearity in model estimates (6). For this reason, the researcher also looks at the Variance inflation Factor (or VIF) and Tolerance, along with the analysis of the model (6).

Correlation analysis was performed, considering only two variables at a time. Therefore, correlation alone cannot provide a conclusion on a multivariate basis. To further analyze the relationship between corporate risk management and financial performance, regression analysis was also performed. Regression analysis is superior to correlation analysis as it allows using more independent variables at a time.

4.3. Regression Analysis

As per Table 6 Panel A, for the group of high performing firms, industry competition (CI), firm complexity (FC), and firm size (FS) have a significant impact on the effectiveness of the CRMI (their p-values are 0.001, 0.097,

Table 5: Sample Correlation coefficients ($N = 60$)

Correlation	P	CRMI	CI	FC	FS	MBD
P	1					
CRMI	0.166					
	(0.206)	1				
CI	-0.113	-0.588				
	(0.392)	(0.000)	1			
FC	-0.044	-0.042	-0.079			
	(0.737)	(0.752)	(0.560)	1		
FS	0.165	0.130	0.015	0.455		
	(0.207)	(0.323)	(0.912)	(0.000)	1	
MBD	-0.111	-0.167	0.061	0.292	0.276	
	(0.397)	(0.203)	(0.642)	(0.023)	(0.033)	1

and 0.080, respectively at the significance level of 0.05 d" p < 0.1). The one contingency variable that is not causing a significant effect on the is the monitoring of the board of directors (MBD) (p-value of 0.149).

As per Table 6 Panel A, for the firms which are not the high performers, the same two contingency variables show a significant effect on the CRMI. They are industry competition (CI) (p-value of 0.034) and firm size (FS) (p-value of 0.019). Since contextual factors are usually exogenous variables, the outcomes indicate that the high-performing firms are taking the contingency variables more seriously than the other firms in their implementation of CRM.

The other findings shown in Table 6, Panel A, is that the VIFs (tolerances) are the lowest (highest) for all repressors. For high-performing firms, the largest VIF is 1.531 which is much lower than 10, estimated to have multicollinearity. Thus, multicollinearity does not present a problem in the regression analysis. Values of VIF exceeding 10 and tolerance less than 0.1 are often viewed as indicative of multicollinearity (Ayyangar, 2007, p.5)

Table 6, Panel A, High performing firms show an F-statistic of 5.602 with a p-value of 0.003, which is much lower than the significance level, provide sufficient evidence to conclude that the regression model fits the data better than the model with no independent variables. In spite, the other firms show an F-statistic 4.212 with a p-value of 0.008, which is just a bit lower than the high-performing group. Owing to this, the researcher can say, the high-performing firm's concern about their proposed match between CRMI and contingency variables than the other firms which are not high performers.

Table 6, Panel A, shows the high-performing firms with an R2 of 0.516 reveal that the relationship between CRMI and CI, FC, FS, MBD accounts for 52% of the variation. Whereas the other firms with an R2 of 0.367 reveal that 37% of data fit the regression model.

In sum, F-Statistic and R2 measures show sound effects in the regression analysis, Table 6, Panel A, which reveals that, In the Sri Lankan context, the high performing firms are more concerned on the proper match between their CRMI and four contingency variables than the other firms which are not high performers.

The main hypothesis is that if all companies choose a "best practice" match between CRM and contingency variables, the chances of high-performance increase. The reason for this expectation is that ARES measures deviations from "best practices" or best fits in terms of an organization's CRM and its suitability for four contingent variables.

The results of this residual analysis are shown in Panel B of Table 6. As expected, the ARES (-0.001) factor is negative and the p-value is 0.701, well above the significance level.

Therefore, the results in Panel B of Table 6 support the main argument that proper agreement between CRM and contingent variables is an important driver of corporate performance. The results in Table 4 show the importance of this proper match with the company's performance, where neither the CRMI nor the contingency variables by themselves show a significant difference between the high-performing group of firms and the lower performing firms.

Besides, the F-statistic of Panel B of Table 6and 0.149 with a p-value of 0.701 and R2 of 0.003 reveals that 0.3% of independent variables affect the variance of the dependent variable.

In brief, Table 6, Panel B concludes that the Sri Lankan firms should maintain CRMI, and if a firm deviates from practicing CRMI, it badly affects the firm performance (P). The coefficient of ARES (-0.001) is negative, and it is not significant. In other words, ARES has a negative relationship with corporate performance, but it is not so significant in the Sri Lankan context. To put it another way, there may be so many other variables that affect the firm performance higher than the CRMI.

4.4. Different Cut-Off for High Performing Firms

The regression analysis of this study selected a cutoff of a one-year, 2% excess return for high-performing firms (adopted from Gordon and Smith,

Table 6: Regression Analysis

Number of observations	Total Sample		High performing firms (excess return >2%)		The other firms (excess return ≤2%)	
	60		26		34	
Variables	Coefficients (p-value)	VIF (Tolerance)	Coefficients (p-value)	VIF (Tolerance)	Coefficients (p-value)	VIF (Tolerance)

Panel A. Regression of CRMI on contingent variables: $CRMI_i = \beta_0 + \beta_1 CI_1 + \beta_2 FC_1 + \beta_3 FS_i + \beta_4 MBD_i + \varepsilon_i$

Variables	Coefficients (p-value)	VIF (Tolerance)	Coefficients (p-value)	VIF (Tolerance)	Coefficients (p-value)	VIF (Tolerance)
β_0 (Intercept)	11.490 (0.357)	N/A (N/A)	6.739 (0.756)	N/A (N/A)	-7.779 (0.325)	N/A (N/A)
β_1 (CI)	-30.697 (0.001)	1.013 (0.987)	-36.251 (0.001)	1.025 (0.975)	-9.686 (0.034)	1.081 (0.925)
β_2 (FC)	-0.490 (0.213)	1.324 (0.755)	-1.488 (0.097)	1.265 (0.791)	0.104 (0.565)	1.591 (0.628)
β_3 (FS)	1.034 (0.048)	1.299 (0.770)	1.808 (0.080)	1.531 (0.653)	0.789 (0.019)	1.448 (0.690)
β_4 (MBD)	-13.156 (0.157)	1.131 (0.884)	-32.099 (0.149)	1.310 (0.763)	-1.276 (0.758)	1.142 (0.876)
F-Statistic (p-value)	9.421 (<0.001)		5.602 (0.003)		4.212 (0.008)	
R^2	0.407		0.516		0.367	

Variable	Coefficients (p-value)

Panel B. Residual analysis (all 60 CRM firms): $P_i = \beta_0 + \beta_1 ARES_i + \varepsilon_i$

Variable	Coefficients (p-value)
Intercept	0.010 (0.361)
ARES	-0.001 (0.701)
F-Statistic (p-value)	0.149 (0.701)
R^2	0.003

P (firm performance) is measured by the one-year excess stock market return at the year-end of 2018 as $P_i = R_i - (R_f + \beta_f(R_m - R_f))$. $CRMI = \Sigma^2_{k=1} Strategy_k + \Sigma^2_{k=1} Operation_k + \Sigma^2_{k=1} Reporting_k + \Sigma^2_{k=1} Compliance_k$. CI (Industry Competition) is measure as $(1 - HHI)$, where HHI represents the sum of squared market shares of all firms in the market, and market share is each firm's sales divided by the total sales of the industry. FC (Firm Complexity) is measure by the number of business segments for each firm. FS (Firm Size) is measure as the natural logarithm of average total assets. MBD (Monitoring by Board of Directors) is measure by the numbers of directors for each firm divided by the natural logarithm of sales, where the number of directors was collected from the 2018 annual reports of firms. $\widehat{CRMI}_i = 6.739 - 36.251 CI_i - 1.488FC_i + 1.808FS_i - 32.099 MBD_i$. $ARES_i = |CRMI_i - \widehat{CRMI}_i|$

Table 7
Different cutoffs of high-performing firms

Number of high performers	High performing firms are firms with one-year excess return >										
	0% 31	1% 28	2% 26	3% 23	4% 18	5% 16	6% 15	7% 15	8% 14	9% 12	10% 8
Variables	Coef(p-value)	Coef(p-value)	Coef(p-value)	Coef(p-value)	Coef(p-value)	Coef(p-value)	Coef(p-value)	Coef(p-value)	Coef(p-value)	Coef(p-value)	Coef(p-value)

Panel A. Regression of CRMI on contingent variables: $CRMI_i = \beta_0 + \beta_1 CI_i + \beta_2 FC_i + \beta_3 FS_i + \beta_4 MBD_i + \varepsilon_i$

Variables	0% 31	1% 28	2% 26	3% 23	4% 18	5% 16	6% 15	7% 15	8% 14	9% 12	10% 8
β_0 (Intercept)	9.698 (0.607)	0.584 (0.978)	6.739 (0.756)	12.928 (0.573)	46.987 (0.049)	45.938 (0.100)	46.280 (0.109)	46.280 (0.109)	44.160 (0.175)	51.043 (0.150)	-14.392 (0.005)
β_1 (CI)	-34.450 (<0.001)	-35.262 (<0.001)	-36.251 (0.001)	-35.087 (0.001)	-65.475 (<0.001)	-66.940 (<0.001)	-65.682 (0.001)	-65.682 (0.001)	-66.195 (0.001)	-64.506 (0.003)	7.466 (0.005)
β_2 (FC)	-1.364 (0.092)	-1.461 (0.082)	-1.488 (0.097)	-2.242 (0.048)	-0.075 (0.958)	0.102 (0.950)	-0.142 (0.934)	-0.142 (0.934)	-0.037 (0.984)	-1.516 (0.556)	1.949 (0.001)
β_3 (FS)	1.565 (0.073)	2.060 (0.042)	1.808 (0.080)	1.739 (0.106)	0.930 (0.320)	0.938 (0.399)	0.972 (0.398)	0.972 (0.398)	1.041 (0.415)	1.009 (0.471)	-0.084 (0.273)
β_4 (MBD)	-27.091 (0.119)	-33.654 (0.092)	-32.099 (0.149)	-39.105 (0.104)	-26.953 (0.119)	-22.574 (0.396)	-25.895 (0.357)	-25.895 (0.357)	-23.926 (0.448)	-33.294 (0.328)	21.226 (0.002)
F-Statistic (p-value)	6.404 (0.001)	6.420 (0.001)	5.602 (0.003)	5.557 (0.004)	13.378 (<0.001)	11.406 (0.001)	10.811 (0.001)	10.811 (0.001)	9.713 (0.003)	10.407 (0.005)	79.332 (0.002)
R^2	0.496	0.528	0.516	0.553	0.805	0.806	0.812	0.812	0.812	0.856	0.991

Panel B. Residual analysis (all 60 CRM firms): $P_i = \beta_0 + \beta_1 ARES_i + \varepsilon_i$

	0% 31	1% 28	2% 26	3% 23	4% 18	5% 16	6% 15	7% 15	8% 14	9% 12	10% 8
Intercept	0.010 (0.383)	0.011 (0.344)	0.010 (0.361)	0.010 (0.355)	0.010 (0.380)	0.010 (0.385)	0.009 (0.387)	0.009 (0.387)	0.009 (0.395)	0.010 (.354)	0.011 (0.293)
ARES	-0.000 (0.793)	-0.001 (0.601)	-0.001 (0.701)	-0.001 (0.622)	-0.001 (0.671)	-0.001 (0.701)	-0.001 (0.662)	-0.001 (0.662)	-0.001 (0.665)	-0.001 (0.545)	0.001 (0.172)
F-Statistic (p-value)	0.069 (0.793)	0.277 (0.601)	0.149 (0.701)	0.246 (0.622)	0.182 (0.671)	0.149 (0.701)	0.193 (0.662)	0.193 (0.662)	0.189 (0.665)	0.371 (0.545)	1.913 (0.172)
R^2	0.001	0.005	0.003	0.004	0.003	0.003	0.003	0.003	0.003	0.006	0.032

P (firm performance) is measured by the one-year excess stock market return at the year-end of 2018

as $P_i = R_i - (R_f + \beta_i(R_m - R_f))$. $CRMI = \Sigma^2_{k=1} Strategy_k + \Sigma^2_{k=1} Operation_k + \Sigma^2_{k=1} Reporting_k + \Sigma^2_{k=1} Compliance_k$. CI (Industry Competition) is measure

as $(1 - HHI)$, where HHI represents the sum of squared market shares of all firms in the market, and market share is each firm's sales divided by the total sales of the industry. FC (Firm Complexity) is measure by the number of business segments for each firm. FS (Firm Size) is measure as the natural logarithm of average total assets. MBD (Monitoring by Board of Directors) is measure by the numbers of directors for each firm divided by the natural logarithm of sales, where the number of directors was collected

from the 2018 annual reports of firms. $\widetilde{CRMI}_l = \widetilde{\beta_0} + \widetilde{\beta_1}CI_i + \widetilde{\beta_2}FC_i + \widetilde{\beta_3}FS_i + \widetilde{\beta_4}MBD_i$, $ARES_i = |CRMI_i - \widetilde{CRMI}_l|$

1992 and Gordon *et al.*, 2009). The researcher has also selected different cutoffs for high-performing companies to address these concerns, as the analysis may be sensitive to changes in the cutoffs for high-performing companies. Specifically, the researcher considers a one-year excess return cutoff from 0% to 10% (in increments of 1%). The considered low cutoff is a 0% one-year excess return. This is because it doesn't make sense to define a company with negative excess returns as a high performer. The highest cutoff the researcher test is a 10% one-year excess return because, beyond 10%, the number of high-performing firms is reduced to less than 10, which would result in a statistical test of low power.

Table 7 shows the results under the different cutoffs of high-performing firms (following Gordon *et al.*,2009). The coefficient for Industry competition (CI) is always significant. However, the significance of the other three contingency variables gets dwindle as the researcher increases the excess return percentage for the cutoff.

Owing to these measures, it implies that high-performing firms concern their CRMI at each one-year excess return percentage. And ARES is also negative at each excess return implying, if a firm deviates from its CRMI it will badly affect the firm performance (P). However, ARES is negative, and it is not significant at each excess return. This reveals though the deviation from CRMI will badly affect the firm performance (P), it is not significant in the Sri Lankan context. Or rather, there may be more variables that affect the firm performance more significantly than the CRMI in the Sri Lankan context.

Corporate Risk in the companies is becoming a vital part of banks, diversified financials, insurance, energy, and retailing sectors in Sri Lanka. The companies expend more time and money on identifying corporate risks and overcoming those risks. This study is about the relationship between corporate risk management and the financial performance of the sectors mentioned above. Different entities face different types of corporate risks, which may differ based on the industry. This topic becomes one of the major topics after the financial crisis, which was happened before. When an entity's environment is highly changing, they need to identify and manage their corporate risk. Previous researchers have concentrated so much on credit risk. Previous researchers have concentrated so much on credit risk how it affects financial performance, but they did not concentrate on other risks.

The main aim of the research was to analyze the corporate risk management-firm performance relationship in the Sri Lankan context. The aim was achieved through the research objective of identifying the corporate

Table 8: Comparison with International Literature

International Literature	Current Study
Lawrence and Lorsch, 1967: The relationship between firm size and organizational structure has been a fundamental consideration in literature in organizational theory for some time.	The existence of statistical significance of firm size, when accompanied by the positive sign carried by its correlation analysis and the regression analyses (following Gordon et al.,2009), provided the international literature support that firm size had a positive impact on its need for corporate risk management in the Sri Lankan context.
Beasley et al. (2005) and Hoyt and Liebenberg (2009): The company's size was closely linked to the adoption of a risk management plan.	
The above literature suggests that there should be a positive link between the size of an organization and the need for risk management across the enterprise.	
Doyle et al. (2007), and Ge and Mc Vay (2005): The material weaknesses in internal control (which is an important part of risk management systems) are more likely in more complex companies.	According to the current study, The negative sign attached to the coefficient implied that the firm complexity has a negative impact on the need for a risk management system in the Sri Lankan context.
The above-mentioned literature suggests that there should be a positive relationship between the complexity of the company in need and its need for a risk management system.	
Sobel and Reding (2004): An effective risk management system depends on active participation by the organization's board of directors.	In line with the current study, the coefficient of monitoring by the board of directors implied that it has a negative relationship with the need for a risk management system in the Sri Lankan context.
Kleffner et al. (2003): Found that the adoption of a risk management plan was related to the recommendation from the Board of Directors.	
The above-mentioned documents indicate that there should be a positive relationship between the monitoring by the board of directors and its implementation of the risk management system.	

risk management-firm performance relation in the Banks, Diversified Financials, Insurance, Energy, and Retailing sectors in Sri Lanka, and given below is the summarized conclusion of the study regarding the research objective based on the research findings mentioned above.

As a consequence, This study identifies the corporate risk management-firm performance relationship under appropriate match between a firm's

corporate risk management system and several key four firm-specific factors, namely, industry competition, firm complexity, firm size, and board of directors monitoring. To analyze this information, annual reports of organizations in selected sectors are examined as secondary data for the year 2018.

To identify the overall interpretation of the database, at first, descriptive analysis was adopted utilizing frequency analysis and correlation analysis. Eventually, the study employed panel data regression analysis to explore the association between a firm's corporate risk management and financial performance, which was measured through the four contingency variables. Multiple regression analysis on a panel data basis was decided as appropriate as the sample contained data collected from 60 companies (26 companies considered as high performing firms and 34 companies considered as the other firms based on the 2% of one-year excess return) in 2018. Finally, the researcher chooses different cutoffs for high-performing firms.

The findings from the analyses suggest the corporate risk management–firm performance relationship is contingent on the proper match between corporate risk management and the following four firm factors; industry competition, firm size, firm complexity, and monitoring by board of directors. Besides, the findings from the analyses suggest that the CRM Index (CRMI) is a reasonable measure of the effectiveness of CRM from the Sri Lankan perspective.

Based on the research findings, it was concluded that, since context factors are usually exogenous variables, the results suggest that high-performing companies take contingent variables more seriously than others when implementing CRM. Furthermore, if a firm deviates from practicing CRMI, it badly affects firm performance, and however, it is not significant. It means that there may be other variables that affect the firm performance higher than the CRMI from the Sri Lankan perspective.

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