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

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Abstract

Risk management and financial performances in organizations had been of mounting importance when it comes to the research arena during the past few decades and is still heavily discussed globally nowadays. The tendency is to take an all-risk encompassing overview of risk management instead of considering risk management from a narrow-based overview. This all-risk encompassing approach to risk management is usually mentioned as Corporate Risk Management. A noticeable dearth of research is there in the studies that have been done on the relationship between corporate risk management and financial performance in organizations. There are so many shreds of evidence for the statement that organizations will enhance their performance by using the corporate risk management concept. The main objective instigated during this study is that the proper match between corporate risk management and, therefore, the firm factors: namely, industry competition, firm size, firm complexity, and monitoring by the board of directors and the relationship among corporate risk management and firm performance. 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, as well as to the general public 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: contingency theory, corporate risk management index, firm performance, Sri Lanka

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 such as developing risk management strategies, procedures, and monitoring of those risks that are set to reduce the risk impact on the organization's financial performance.

In today's world, risk management is an important matter. In late years, even so, there has been a standard change within the manner the risk management is considered. Instead of viewing risk management from a silo-based approach, the tendency is to require a holistic view of risk management. This approach that uses to managing the risk of a firm is usually mentioned as corporate risk management (CRM). The study will empower the banks, diversified financials, insurance, energy, and retailing firms in Sri Lanka to reinforce their risk management system and embrace better methodologies to reinforce the performance of firms through the risk management strategies.

Decades ago, the empirical evidence confirming this relationship between CRM and firm performance was quite limited in the Sri Lankan perspective. 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.

This study's findings provide strong evidence that there is a positive relationship between CRM and firm performance, but that this relationship is contingent upon the appropriate match between a firm's CRM system and the five factors noted above.

REVIEW OF LITERATURE

There are debates and controversies on the effect of risk management on the performance of firms. Comprehensive studies on this substance are administrated by scholars and produced 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, aside from risk management, affected firm performance. Consistent with Hoyt and Liebenberg, 2009; Stulz, 1996, 2003; Barton et al., 2002; Nocco and Stulz, 2006; Lam, 2003, provide empirical shreds evidence that the risk management system of a firm will enhance the performance of that firm eventually. The findings by Gates and Hexter, 2005 present the very fact that a lot of firms have adopted risk management to positively impact the performance of firms.

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. The rationale underlying the selection of each of these factors is developed below.

Factors Affecting Corporate Risk Management-Financial Performance Relation

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 not receiving a fixed profit rate is low. Given this, it seems reasonable to assume that the level of competition facing the company should be in line with the need for corporate risk management. Therefore, there should be a positive relationship between the industry competition and their need for corporate risk management.

Firm Size:

The relationship between firm size and organizational structure has been a fundamental consideration in organizational theory literature for some time (Lawrence and Lorsch, 1967). In accounting, researchers have also found that firm size is an important factor when considering the design and implementation of risk management systems (e.g., Haka et al., 1985; Myers et al., 1991; Shields, 1995). Regarding the risk management system, Beasley et al. (2005) and Hoyt and Liebenberg (2009) found that the size of the company was closely linked to the adoption of a risk management plan.

Investigators found that the market's response to adopting a risk management plan was related to firm size, with the adoption of a risk management plan signed by the appointment of a Risk Officer. As mentioned above, the literature suggests that there should be a positive relationship between the size of the firm and its need for corporate risk management.

Firm Complexity:

The greater firm complexity (variability of business transactions) may result in less data integration and complexity in organizational control management systems. Doyle et al. (2007) and Ge and Mc Vay (2005) 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.

As mentioned earlier, the 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.

Board of Director’s monitoring:

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 independent board members' size is closely linked to the risk management acquisition phase. 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.

It indicates that there should be a positive relationship between the monitoring by the board of directors and its implementation of the risk management system.

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.

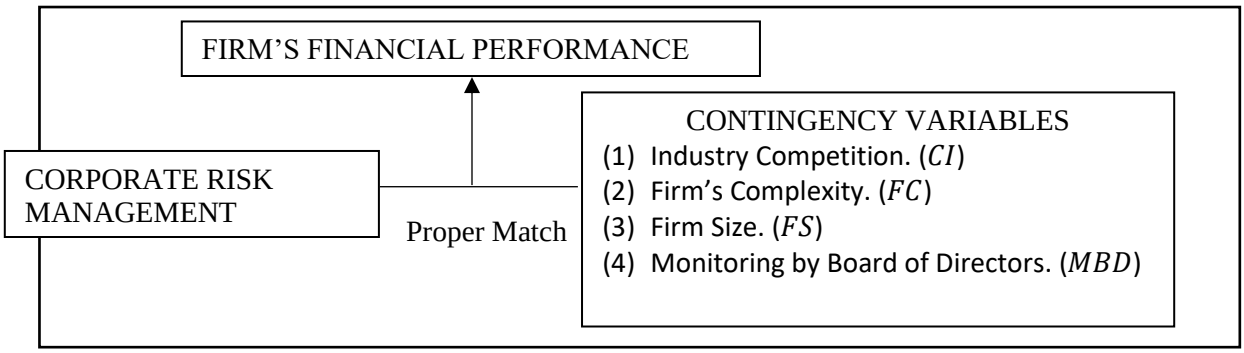

Fig. 1. Research Design

This study's main objective can be tested by using Eq. (1), and Eq. (3) stated below. The high-performing firms are used to derive the coefficients for Eq. (1), and it describes the proper match between CRM and firm factors, as mentioned above. The connection among firm performance (P) and proper match between firm factors are considered in Eq. (3) to obtain values for this Eq. (3), the absolute values of residuals (ARES) are regressed on firm performance (P) from Eq. (1).

$$\boldsymbol{CRM = \beta_0 + \beta_1 CI + \beta_2 FS + \beta_3 FC + \beta_4 MBD + \varepsilon} \qquad \textbf{Eq. (1)}$$

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, $P_i = R_i - \left(R_f + \beta_i(R_m - R_f)\right)$ 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)
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).

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

Eq. (2)

Table 2: Measuring the independent variable CRMI

Variable	Measurement of variable
Strategy 1	$Strategy_1 = \frac{Sales_i - \mu_{Sales}}{\sigma_{Sales}}$ 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	$Strategy_2 = \frac{\Delta\beta_i - \mu_{\Delta\beta}}{\sigma_{\Delta\beta}}$ Where, $\Delta\beta_i$=(β_i in 2018 - β_i 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	$Operation_1 = \frac{Sales}{Total\ Assets}$ (Kiymaz, 2006)
Operation 2	$Operation_2 = \frac{Sales}{Number\ of\ Employees}$

	(Banker et al., 1989)
Reporting 1	$Reporting_1 = (Material\ Weaknesses) + (Auditor\ Opinion) + (Restatement)$ (Cohen. 2004)
Reporting 2	$Reporting_2 = \frac{\lvert Normal\ Accruals \rvert}{\lvert Normal\ Accruals \rvert + \lvert Abnormal\ Accruals \rvert}$ (Johnson et al., 2002)
Compliance 1	$Compliance_1 = \frac{Auditor\ Fees}{Total\ Assets}$ (O'keefe et al. 1994)
Compliance 2	$Compliance_2 = \frac{Settlement\ Net\ Gain\ (Loss)}{Total\ Assets}$ (Shavell 1982)

$$\boldsymbol{P = \beta_0 + \beta_1 ARES + \varepsilon} \qquad \textbf{Eq. (3)}$$

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

The residuals are derived from Eq. (1), 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.

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 CRM 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 CRM 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 CRM implementation is often a continuous and multiyear initiative. This means that the CRM sample identified in this study has a high probability of CRM 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

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 who 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 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 $CRMI$ and 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 CRM and the four contingency variables.

DATA PRESENTATION AND ANALYSIS

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 break-down for the high performing firms and the other firms, are provided in Table 4.

Total Sample:

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.

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.

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.

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.

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			

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 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.

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

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, and 0.080, respectively at the significance level of $0.05 \leq p < 0.1$). The one contingency variable is not causing a significant effect on the $CRMI$ is the monitoring 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) is the lowest (highest) for all repressors. For high performing firms, the largest VIF is 1.531 for FS, 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 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 just a bit lower than the high-performing group. Owing to this, the researcher can say, the high-performing firms' concern about

their proposed match between $CRMI$ and contingency variables than the other firms which are not the high performers.

Table 6, Panel A, shows the high performing firms with an R^2 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 R^2 of 0.367 reveal that 37% of data fit the regression model.

In sum, F-Statistic and R^2 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.

According to the main hypothesis, if all firms choose the ‘‘best practice” match between their CRM and the contingency variables, they will improve their chances of high performance. The reason for this expectation is that $ARES$ measures the deviation from the “best practice” or best fit in terms of matching the firm’s CRM and its four contingency variables.

The results of this residual analysis are shown in Panel B of Table 6. As hypothesized, the coefficient of $ARES$ (-0.001) is negative, and the p-value is 0.701, which is profoundly higher than the significance level.

Accordingly, the results in Panel B of Table 6 support the main argument that the proper match between CRM and the contingency variables is an essential driver of firm performance. The importance of this proper match for firm performance is strengthened by the results in Table 4, 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 R^2 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. That is to say, although $ARES$ is negatively associated with firm performance, 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 $CRMI$.

Table 6: Regression Analysis

Number of observations	Total Sample 60		High performing firms (excess return >2%) 26		The other firms (excess return ≤ 2%) 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: $CRMI_i = \beta_0 + \beta_1 CI_1 + \beta_2 FC_i + \beta_3 FS_i + \beta_4 MBD_i + \varepsilon_i$						
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): $P_i = \beta_0 + \beta_1 ARES_i + \varepsilon_i$						
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 $P_i = R_i - \left(R_f + \beta_i(R_m - R_f)\right)$. $CRMI = \sum_{k=1}^{2} Strategy_k + \sum_{k=1}^{2} Operation_k + \sum_{k=1}^{2} Reporting_k + \sum_{k=1}^{2} Compliance_k$. 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. $\widehat{CRMI}_i = 6.739 - 36.251CI_i - 1.488FC_i + 1.808FS_i - 32.099MBD_i$. $ARES_i = |CRMI_i - \widehat{CRMI}_i|$

Different Cut-Off for High Performing Firms:

This study's regression analysis selected a cutoff of a one-year, 2% excess return for high-performing firms (following Gordon and Smith, 1992). As the analysis can be sensitive to the cutoff change for high performing firms, the researcher also selected different cutoffs for high performing firms to address this concern. 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 because it makes no sense to define firms with negative excess returns as high performers. 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. The coefficient for Industry competition (CI) is always significant. However, the significance of the other three contingency variables getting 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.

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: $CRMI_i = \beta_0 + \beta_1 CI_1 + \beta_2 FC_i + \beta_3 FS_i + \beta_4 MBD_i + \varepsilon_i$											
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): $P_1 = \beta_0 + \beta_1 ARES_1 + \varepsilon_1$											
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 $P_i = R_i - \left(R_f + \beta_i\left(R_m - R_f\right)\right)$. $CRMI = \sum_{k=1}^{2} Strategy_k + \sum_{k=1}^{2} Operation_k + \sum_{k=1}^{2} Reporting_k + \sum_{k=1}^{2} Compliance_k$. 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. $\widehat{CRMI_i} = \widehat{\beta_0} + \widehat{\beta_1} CI_i + \widehat{\beta_2} FC_i + \widehat{\beta_3} FS_i + \widehat{\beta_4} MBD_i$. $ARES_i = \left|CRMI_i - \widehat{CRMI_i}\right|$

CONCLUSION

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 risk 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 entities 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.

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. 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 literature as mentioned above suggests that there should be a positive relationship between the size of the firm and its need for corporate risk management.	The existence of statistical significance of firm size, when accompanied by the positive sign carried by its correlation analysis and the regression analyses, provided the international literature support that firm size had a positive impact on its need for corporate risk management in the Sri Lankan context.
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. The above-mentioned literature suggests that there should be a positive	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.

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. 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.	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.

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 identifies the corporate 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 by means of 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 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 in the Sri Lankan perspective.

Based on the research findings, it was concluded that, since contextual factors are usually exogenous variables, the results suggest high-performing firms are taking contingency variables more seriously than the other firms in their implementation of 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 $CRMI$ in the Sri Lankan perspective.

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