

## The Effect of Risk Management Reporting on Financial Efficiency

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### Info Articles

### Abstract

#### Keywords:

*Financial Efficiency, Risk Management Reporting, Risk Management Committee, Liquidity Risk, Market Risk, Equity Price Risk.*

**Purpose:** The main objective of this study is to investigate the relationship between risk management reporting and financial efficiency.

**Design/Methodology/Approach:** Risk management reporting is measured by a score indicating whether companies report on risk management in their annual reports. Efficiency is measured by the total asset turnover, which is the ratio of net revenue on total assets. This study applied a panel research design and data are collected from 138 companies listed on Bursa Malaysia in the product and service industries from 2018 to 2020.

**Findings:** The result of this study shows that there is a significant relationship between risk management reporting and efficiency in Malaysia. The result of this study also shows between all available risk management reporting features in Malaysian companies' annual reports cyber risk, equity risk, inventory risk, market risk, and regulatory risk, have significant relationships with financial efficiency.

**Practical Implications:** The outcomes of this study may be useful for companies that have not prepared risk management reporting to understand the impact on their financial efficiency. The findings may also provide important suggestions for the boards of directors of these companies considering the preparation of such a report.

**Originality/Value:** The study contributes to the scientific literature by conducting an extensive analysis on the results of risk management reporting from the perspective of financial efficiency. The significant relationship between risk management reporting and efficiency provides evidence that risk management is an important determinant of financial efficiency and, ultimately, of improving company's performance.

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## INTRODUCTION

At the outset of any business activity, there are a number of risks to which companies may be directly or indirectly exposed. These risks can impact a company's vision, mission, and opportunities. However, these risks can also be a company's greatest strength. Companies can easily overcome the risks they face in the future or the risks they currently face. Financial accounting can be influenced by risk management reporting. Several authors have examined the link between financial accounting and risk management from different perspectives. However, to the best of knowledge, there are limited studies that have done on the relationship between risk management and efficiency.

Risk disclosure is important to improve the efficiency of the market because it helps investors estimate the size and timing of the company's future cash flows, as well as their ability to extrapolate and predict stock returns, which affects the efficiency of investment decisions. Thomas J. Catalano (2021) found that risk management reporting may help companies to improve their financial flexibility, which reduces investors' need for additional information by lowering information asymmetry and agency costs, so that less cash and other funds are held for hedging purposes. Risk management reporting also may help to improve risk management methods and the efficiency with which managers handle them, thereby increasing the likelihood that the company will achieve its investment objectives. Despite the importance of risk disclosure as a means of increasing the transparency of information in financial reporting and enhancing confidence in the company's financial position, it does not receive enough attention because there is no accounting standard that regulates the various aspects of the company's risk disclosure and sets the minimum level of financial disclosure and non-financial threats. This may be reflected in the volatility and low level of risk disclosure in the financial reporting and affect the efficiency of the company's investment.

The Malaysian Accounting Standard Board (MASB) requires all companies listed on Bursa Malaysia to comply with accounting standards in disclosing their financial position and operations to help shareholders and investors evaluate their performance and make better decisions. In addition to these requirements, Bursa Malaysia lists some other specific disclosures that listed companies must include in their annual reports, such as a statement on the status of internal control, risk control and risk management. Risk management is a proactive decision-making process aimed at mitigating and managing risks in the most effective and appropriate manner. However, most Malaysian companies do not apply formal risk management to their annual reports. Low level of transparency in disclosing information by the companies, high level of information asymmetry and agency problem are some of the reasons to the financial crises and companies' low financial efficiency (Nejad et al., 2020; Yousefinejad et al., 2022). These problems have taken attention to the requirement of risk management disclosure, increase transparency of the company's reporting, and reattracted the investors' attention to investment. Therefore, the main objective of this study is to determine the impact of risk management reporting by listed companies in the products and services industry in order to assess the impact on the financial efficiency, taking into account the different features of risk management reported by the companies.

In this study, data was collected from 134 companies listed on Bursa Malaysia in the products and services sector. It was found that the importance given to the effective preparation of risk management reports is not taken too seriously as some of the listed companies have not submitted their risk management report since their inception. This happened because risk management reporting is not mandatory in Malaysia. There are different types of indicators identified in this study such as liquidity risk, market risk, foreign exchange risk, and others. Risk management played an important role in conducting this study. The results of this study can be helpful to encourage all the companies in Malaysia to report their risk management to improve their efficiency to cover their obligation using their assets and help investors to make better decisions. It is crucial to complete the risk management reporting in an efficient way so that can quickly take remedial actions and find a workable solution. It can also help to face future risks and impacts with a prudent mindset and prior planning. Therefore, this study attempts to find out whether risk management reporting affects efficiency.

## LITERATURE REVIEW

The Malaysian Code on Corporate Governance stated a principle that the board of directors should maintain a sound system of internal control. The Statement on Risk Management and Internal Control: Guidelines for Directors of Listed Issuers (DLI) was introduced to reflect the changing regulatory environment and evolving approaches to corporate governance issues that have made disclosure an important regulatory tool (Ahmad et al., 2015). The Guidelines highlight the necessity for appropriate risk management, which is a crucial component of internal control. Additionally, risk management reporting by boards of directors under internal control in a company, has become an essential part of corporate

governance disclosure requirements. The DLI is proposed to guide companies' board of directors in risk management disclosure under internal control in their annual reports. The DLI has considered risk management reporting as one of the listing requirements. Therefore, a public listed company is required to address issues related to internal controls and provide risk management reporting. With risk management reporting, the board of directors will be able to clarify the company's level of risk tolerance and actively identify, evaluate, and screen important business risks to protect shareholders' investments and the company's assets or company's efficiency.

There are several previous studies that have looked at risk management reporting. However, in terms of the impact of risk management reporting and all its features on financial efficiency, previous studies are inconclusive and limited. Pastor (2010) examined why risk management is necessary for the energy industry of 2598 companies from 1988 to 1994. The study observations consist of 1144 observations from French commercial banks, 387 Italian, 524 Spanish, and 543 German. The study found the most effective way to increase the effectiveness of risk management in the company is to develop it as a process within the company's support processes and to designate a process owner who is responsible for managing and promoting risk in the company and guiding business managers in this area. Onalapo A. R. (2012) examined the relationship between credit risk management efficiency and financial health in a sample of Nigerian banks over a six-year period before and after the Nigerian banking sector consolidation initiative. The data collection is secondary and covers a six-year period from 2003 to 2008. The study found the operational activities of a typical Nigerian commercial bank are not sufficiently streamlined to maximize returns from lending, loans, and advances, which explains why the high incidence of non-performing loans and the rising cost of credit reduce the income from interest on loans. Afriyie (2013) studied the impact of credit risk management on the profitability of rural and community banks in Ghana's Brong Ahafo region by examining the financial statements of eleven rural banks from 2006 to 2010. The study found nonperforming loans reduce rural banks' profits, however, when nonperforming loans increase in proportion to profitability, it suggests that rural banks lack effective institutional measures to deal with credit risk management and that banks pass on the cost of loan defaults to other customers in the form of higher lending rates. The researchers found that all of the indicators are negatively related to bank financial performance and indicated rural banks do not have sound and effective credit risk management.

Ariffin & Kassim, (2013) analyzed the relationship between liquidity risks and disclosure as and financial performance based on selected Islamic banks in Malaysia from 2006 to 2008. The study found positive effect of liquidity risk on financial performance in Malaysian Islamic banks. Ismail et al., (2013) examined the effect of financial crises on risk management disclosure by all 17 Islamic financial institutions in Malaysia from 2006 to 2009, to check mandatory and voluntary items developed to measure the level of risk disclosure. Analysis for a four-year period revealed that the risk disclosure has improved before and after the crisis indicating that Islamic Financial Institutions have taken the necessary steps to improve their disclosure. Shamsuddin (2018) examined the relationship between risk management disclosure and company characteristics in Malaysian Public Listed companies. The study found the size of the company and leverage have significant relationships with risk management disclosure. Ogboi & Okaro (2013) and Mwangi (2012) examined the impact of credit risk management and capital adequacy on the financial performance of banks in Nigeria to obtain more empirical data on how credit risk management practices and capital requirements affect bank profitability in Nigeria. The study used six banks with complete data for the period 2005-2009 while Mwangi, (2012) looked at the data for a period of four years for 26 banks from 2008 to 2011. Ogboi & Okaro, (2013) demonstrated effective credit risk management and adequate capitalization have a favorable impact on banks' financial performance except for loans which had a negative impact on banks' profitability. However, Mwangi, (2012) failed to demonstrate a clear relationship between credit risk management and financial performance. In addition, Bayyoud & Sayyad, (2015) extracted data from banks published financial statements for a period of 5 years from 2010 to 2014 and found credit risk has no effect on the profitability of Palestinian commercial and investment banks.

Stanley Isanzu (2017) examined the impact of credit risk on the financial performance of Chinese banks using data collected from the country's five largest commercial banks over a seven-year period, from 2008 to 2014. The study found non-performing loans and capital adequacy as credit risk indicators have a significant impact on financial performance. Based on annual reports for a 7-year period (2008-2015) provided by the Albanian Banking Association, Hallunovi & Berdo (2018) determined whether credit risk management affects the profitability. The study found credit risk is still the biggest risk for commercial banks, so proper valuation and credit risk management are crucial. Akhanolu et al. (2020) determined the primary influences on bank performance in Nigeria, credit management and macroeconomic variables based on available statistics due to the extremely high level of bad debts in deposit-taking institutions that adversely affect performance. The sample of this study is from Nigeria over a period of 11 years, from 2000 until 2010. Five banks were selected for 11 years at a cross-sectional level. The authors found deposit

money banks with a higher proportion of adequate capital tend to lend more and absorb loan losses when they occur, resulting in better financial products for asset.

Dias et al. (2020) examined how an automotive manufacturer identifies and manages risk factors in its supply chain by conducting structured interviews. The analytical hierarchy process was applied to rank the risk factors, resulting in a risk matrix that can be used as a decision-making tool for the company under study. The focus was on companies in the automotive industry in Japan during the period from January 2006 to December 2012. The authors found considering the attributes of a risk (frequency and severity), it is possible to establish a workflow in companies to analyze and measure risks. Ahmed & Huma (2021) examined the actual evidence of the effectiveness of lean and agile supply chain strategies on risk management in terms of creating a strong and resilient supply chain. Data were collected from 140 supply chain professionals in the manufacturing industry to test the hypotheses using structural equation modelling. The authors found market orientation as an external force has a greater impact on agile strategy than lean strategy, but that quality management system as an internal force is strongly associated with the creation of lean supply chain strategies.

In the study conducted by Journal & Ibrahim (2021), 84 Egyptian companies on the Egyptian Stock Exchange are examined to determine how risk disclosure affects investment efficiency. The authors found risk disclosure can improve investment efficiency mainly by reducing unproductive investment behavior. Kuo et al., (2021) examined the relationship between risk management and corporate social responsibility (CSR) and how this relationship is affected by managerial confidence and real activities earnings management. The findings show that companies with more effective risk management are more willing to engage in CSR behaviors. The study also found when companies with more confident CEOs who engage in real activities manipulation are higher, their CSR inputs are larger. The study found that confident CEOs with higher shareholdings have a stronger coherence to companies, and therefore, they are more likely to increase CSR activities to enhance company's reputation through risk management.

Nustini & Mohd Suffian (2021) examined the factors that influence the practice of corporate risk disclosure, profitability, leverage, auditor reputation, managerial ownership, and risk committee in the context of the pharmaceutical industry in Indonesia and Malaysia from the year 2015 to 2019. The study found insignificant results in profitability, leverage, and managerial ownership. Noja et al., (2021) examined the role played by board characteristics in supporting risk management disclosure and shaping the financial performance of European companies in 2020 of 25 countries. The study risk management reporting improves profitability of companies. Geresem & Michael, (2021) examined credit risk management using data from several rural banks, suggesting that non-performing loans and capital adequacy as indicators of credit risk have a significant impact on financial performance. The authors also found except for liquidity risk for investment banks, which has been shown to have a significant relationship with financial performance, it was found that there are negligible correlations between capital risk, liquidity risk, and foreign exchange risk and financial performance. Omesi & Appah (2022) investigated the relationship between risk management and audit committees on audit pricing of listed consumer goods manufacturing companies in Nigeria at year-end 2020. The results showed that risk management positively and significantly affect audit fees in Nigeria.

Geresem & Michael, (2021) applied agency theory to examine the relationship between capital structure, credit risk management and financial performance of microfinance institutions (MFIs) in Uganda. The researchers identified a sample size of 70 MFIs from a population of 85 registered MFIs in Uganda. The authors found credit risk management contributes significantly to sound financial performance. Salem Oudat et al. (2021) examined the financial risks and financial performance of commercial and investment banks listed on the Bahrain Stock Exchange from 2015 to 2019. The authors found there are insignificant relationships between capital risk, liquidity risk, and foreign exchange risk and financial performance, except for liquidity risk for investment banks, where a significant relationship was found with financial performance. Sonny Eli Zaluchu, (2021) established a relationship between risk management and profitability of commercial banks in Kenya and Hosna et al, (2009) described the impact of credit risk management on profitability in four commercial banks in Sweden for the period between 2014 and 2018. Sonny Eli Zaluchu, (2021) stated financial institutions are determined by several factors, one of which is the ability of a financial institution to convert its deposit liabilities into revenue generating assets. While Hosna et al, (2009) stated that the positive impact of credit risk management on profitability.

As a conclusion of the literature review, previous studies show the effectiveness of risk management in the companies, the creation of a process within the company's support processes and the appointment of a process owner responsible for managing and facilitating risk in the companies, as well as supporting business managers in this area. However, as far as this study knows, there is no study in the literature that examined the effect of risk management reporting on financial efficiency. Moreover, to the best of knowledge, there is no study in the literature that considers all available features of risk management reporting in Malaysian companies' annual reports at the same time.

Agency theory is probably the best theory to explain the agency costs that arise and the phenomenon of disclosure. According to agency theory, agency costs arise when one party (the company) has additional information compared to another party (the shareholders), so that the shareholders are in an unfavorable position in this situation (Jensen & Meckling, 1976). Voluntary disclosure is one of the possible initiatives that the company should take to reduce agency costs (Barako, Hancock, & Izan, 2006) because it has a signaling effect to the market (Watson, Shrivies, & Marston, 2002). In order to improve the information asymmetry, the board of directors can expand its functions and promote the disclosure of risk information. Therefore, based on the above discussion and the assertion of agency theory, this study hypothesizes that there is a significant relationship between risk management reporting and financial efficiency. Figure 1 shows the research framework of this study. As you can see, risk management reporting is the independent variable and efficiency is the dependent variable.

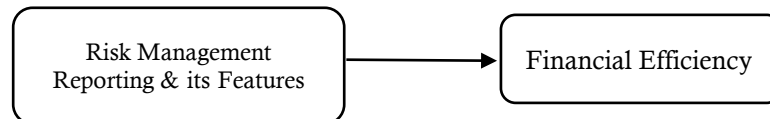


Figure 1: Research Framework

## METHODOLOGY AND DATA

In order to obtain generalizable information on the impact of risk management reporting on efficiency, a quantitative study was conducted by this study. This study collects data from annual reports of companies in a specific industry, namely the products and services industry in Malaysia for the period from 2018 to 2020. Risk management in Malaysia is fast becoming an important issue for all companies. It is a comprehensive strategy for managers to identify risks and choose appropriate solutions based on the company's risk appetite. This was the main purpose why Malaysia was selected to conduct this study, and it aims to determine the extent of risk management implementation in Malaysian companies in the products and services industry. Apart from this, it is important to note that risk management reporting is not mandatory in Malaysia, but most companies in the selected industries submit their risk management reports continuously every year.

The reason why the product and service industry were chosen for this study is that they are exposed to risks of loss or a series of events that can lead to losses (Karine Tremblay 2012). Although the losses may never occur, the company must plan for the risk that they will. Risk management means addressing loss risks in a cost-effective way to protect the business from unexpected losses. Managers of service companies can use this to discover and analyze loss risks, select, and implement treatment methods, and track the results of their efforts. In most countries, the services sector contributes significantly to GDP through the provision of jobs, inputs, and public services. Trade in services has the potential to boost economic performance while providing a variety of conventional and new export opportunities. Although the focus is on the services sector and many of the risk management concepts that apply to other industries are not considered. The reason why 2018, 2019 and 2020 were selected is that it is important to identify the risk conclusion in the last year of annual reporting. So, this is a period when the Malaysian economy and political state experienced a decline due to some drastic reasons such as the Covid 19 pandemic attack. These are the country, period and industry that were selected to conduct this research. The data collection was completed by analyzing the annual reports and collecting the risk management reports of all companies, a total of 138 companies indicating the sample size of the study, in the products and services industry of Malaysia for the three years mentioned above.

### Research Design

The research design of the study is panel data, which is a clear observation of the company in the product and service industry and the year that was 2018, 2019 and 2020. Panel data consists of repeated observations over time on the same group of cross-sectional units. This research study was conducted using the quantitative method. Quantitative methods emphasize objective measurement and the statistical, mathematical, or numerical analysis of data collected through surveys, questionnaires, and polls or through the manipulation of existing statistical data using computer techniques. Quantitative research focuses on collecting numerical data and generalizing it about groups of people or explaining a particular phenomenon.

**Data Collection**

The sources for data collection were the website of Bursa Malaysia, companies listed in products and services as the main industry. This study obtained 414 companies-year observations. In the annual reports of the companies, this study recorded the risk management reporting, which was the independent variable for the three years 2018, 2019, and 2020, as well as the other data to complete the efficiency measurement.

Basically, the measurement of efficiency as the dependent variable of this study is measured by a formula that divides total revenue or sales of the company by total assets. In addition, this study captures the equity ratio, size, profitability, and return on equity of each company, which were defined as control variables of the study. In terms of the annual report, the variables mentioned above are considered as market capitalization, which can be defined as the value of a listed company calculated by multiplying the total number of shares by the current share price. In addition, the equity ratio is the ratio between a company's equity and total assets. Also, profitability, which defines a company's ability to generate a return based on its resources, and return on equity (ROE), a measure of financial performance calculated by return on assets multiplied by financial leverage multiplier.

**Research Models**

This study follows the following two research models. The difference between the two models is that the first model includes risk management reporting with all the available risk management reporting features in companies' annual reports, while the second model only consists of all the features.

$$Eff_{i,t} = \beta_0 + \beta_1RMR_{i,t} + \beta_2RM_{i,t} + \beta_3CAP_{i,t} + \beta_4COM_{i,t} + \beta_5CRE_{i,t} + \beta_6CYB_{i,t} + \beta_7EQU_{i,t} + \beta_8FOR_{i,t} + \beta_9INT_{i,t} + \beta_{10}INV_{i,t} + \beta_{11}MAR_{i,t} + \beta_{12}REG_{i,t} + \beta_{13}REP_{i,t} + \beta_{14}STRA_{i,t} + \beta_{15}SUP_{i,t} + \beta_{16}EPS_{i,t} + \beta_{17}LEV_{i,t} + \beta_{18}SIZ_{i,t} + \beta_{19}PRO_{i,t} + \beta_{20}ROE_{i,t} + \varepsilon_{i,t} \tag{1}$$

$$Eff_{i,t} = \beta_0 + \beta_1RM_{i,t} + \beta_2CAP_{i,t} + \beta_3COM_{i,t} + \beta_4CRE_{i,t} + \beta_5CYB_{i,t} + \beta_6EQU_{i,t} + \beta_7FOR_{i,t} + \beta_8INT_{i,t} + \beta_9INV_{i,t} + \beta_{10}MAR_{i,t} + \beta_{11}REG_{i,t} + \beta_{12}REP_{i,t} + \beta_{13}STR_{i,t} + \beta_{14}SUP_{i,t} + \beta_{15}EPS_{i,t} + \beta_{16}LEV_{i,t} + \beta_{17}SIZ_{i,t} + \beta_{18}PRO_{i,t} + \beta_{19}ROE_{i,t} + \varepsilon_{i,t} \tag{2}$$

**Variables' Measurements**

As mentioned before independent variable of this study is risk management reporting, and all the available features for risk management in annual reports of companies. Dependent variable of this study is financial efficiency. This study also employs some control variables, Earnings Per Share (EPS), leverage, size, Return on Equity (ROE) and profitability. Table 1 illustrates the summary of the variables with their measurements and data collection sources.

Table 1: Variables Measurements and data collection sources

Variables	Measurements	Sources
<i>EFF</i>	is financial efficiency measured by total asset turnover (revenue on total assets)	Annual reports, DataStream
<i>RMR</i>	is risk management reporting measured by dummy variable (if the company provided risk management report 1 otherwise 0)	Annual Reports
<i>Rco</i>	is risk management committee measured by dummy variable (if the company have risk management committee 1 otherwise 0)	Annual Reports
<i>Cap</i>	is capital risk measured by dummy variable (if the Company reported capital risk 1 otherwise 0), risk management feature	Annual Reports
<i>Com</i>	is compliance risk measured by dummy variable (if the company reported compliance risk 1 otherwise 0), risk management feature	Annual Reports
<i>Cre</i>	is credit risk measured by dummy variable (if the company reported credit risk 1 otherwise 0), risk management feature	Annual Reports

<i>Cyb</i>	is cyber risk measured by dummy variable (if the company reported cyber risk 1 otherwise 0), risk management feature	Annual Reports
<i>Equ</i>	is equity risk measured by dummy variable (if the company reported equity risk 1 otherwise 0), risk management feature	Annual Reports
<i>For</i>	is foreign currency risk measured by dummy variable (if the company reported foreign currency risk 1 otherwise 0), risk management feature	Annual Reports
<i>Int</i>	is interest rate risk measured by dummy variable (if the company reported interest rate risk 1 otherwise 0), risk management feature	Annual Reports
<i>Inv</i>	is inventory risk measured by dummy variable (if the company reported inventory risk 1 otherwise 0), risk management feature	Annual Reports
<i>Mar</i>	is market risk measured by dummy variable (if the company reported market risk 1 otherwise 0), risk management feature	Annual Reports
<i>Reg</i>	is regulatory risk measured by dummy variable (if the company reported regulatory risk 1 otherwise 0), risk management feature	Annual Reports
<i>Rep</i>	is reputational risk measured by dummy variable (if the company reported reputational risk 1 otherwise 0), risk management feature	Annual Reports
<i>Stra</i>	is strategic risk measured by dummy variable (if the company reported strategic risk 1 otherwise 0), risk management feature	Annual Reports
<i>Sup</i>	is supply change risk measured by dummy variable (if the company reported supply change risk 1 otherwise 0), risk management feature	Annual Reports
<i>EPS</i>	is basic earnings per share reported in comprehensive income statement below net income	Annual reports, DataStream
<i>LEV</i>	is leverage measured by equity ratio (total equity on total assets)	Annual reports, DataStream
<i>SIZ</i>	is size measured by natural logarithm of total assets	Annual reports, DataStream
<i>PRO</i>	is profitability measured by net profit margin	Annual reports, DataStream
<i>ROE</i>	is return on equity ratio (return on assets multiplied by financial leverage multiplier)	Annual reports, DataStream

## RESULTS AND DISCUSSION

### Descriptive Statistic

Descriptive statistics provide a quantitative description of the data with the goal of summarizing the variables. Table 2 provides descriptive statistics for all variables used in this study and presents the mean, median, maximum, and minimum values for all variables. The assumption behind the descriptive statistics is that the data are normally distributed, and a regression model based on those variables is valid. The total sample of the study consists of 414 company-year observations (138 companies listed in bursa Malaysia and from 2018 until 2020). Table 2 shows total number of observations after outlier treatment which is 399.

### Correlation Matrix

Multicollinearity is a statistical phenomenon in which two or more predictor variables are highly correlated in a multiple regression model. According to Gujarati (2003), the presence of multicollinearity can affect the accuracy of multiple regression analysis by making estimates of regression coefficients unreliable. A correlation value of less than 0.8 indicates that there is no collinearity problem between

variables (Gujarati 2003). Table 3 shows the correlation matrix between variables in this study. From Table 3, it can be concluded that there is multicollinearity problem between liquidity risk and interest rate risk and credit risk. At the same time, there is a multicollinearity problem between reputational risk and operational risk. Therefore, in this study, these four variables are removed from the main analysis.



Table 2: Descriptive Statistic

	Eff	RMR	Rco	Cap	Com	Cre	Cyb	Equ	For	Int	Inv	Mar	Reg	Rep	Stra	Sup	EPS	LEV	SIZ	PRO	ROE
Mean	0.71	0.89	0.37	0.00	0.01	0.82	0.01	0.03	0.51	0.74	0.03	0.36	0.01	0.07	0.10	0.00	0.07	0.81	5.12	-1.88	-0.76
Med	0.64	1.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.57	5.06	1.58	1.96
Max	2.41	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.69	8.87	7.87	53.99	55.86
Min	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	4.00	-77.36	-78.43
Obs	399	399	399	399	399	399	399	399	399	399	399	399	399	399	399	399	399	399	399	399	399

*Eff* is financial efficiency measured by total asset turnover (revenue on total assets), *RMR* is risk management reporting measured by dummy variable (if the company provided risk management report 1 otherwise 0), *Rco* is risk management committee measured by dummy variable (if the company have risk management committee 1 otherwise 0), *Cap* is capital risk measured by dummy variable (if the company reported capital risk 1 otherwise 0), *Com* is compliance risk measured by dummy variable (if the company reported compliance risk 1 otherwise 0), *Cre* is credit risk measured by dummy variable (if the company reported credit risk 1 otherwise 0), *Cyb* is cyber risk measured by dummy variable (if the company reported cyber risk 1 otherwise 0), *Equ* is equity risk measured by dummy variable (if the company reported equity risk 1 otherwise 0), *For* is foreign currency risk measured by dummy variable (if the company reported foreign currency risk 1 otherwise 0), *Int* is interest rate risk measured by dummy variable (if the company reported interest rate risk 1 otherwise 0), *Inv* is inventory risk measured by dummy variable (if the company reported inventory risk 1 otherwise 0), *Mar* is market risk measured by dummy variable (if the company reported market risk 1 otherwise 0), *Reg* is regulatory risk measured by dummy variable (if the company reported regulatory risk 1 otherwise 0), *Rep* is reputational risk measured by dummy variable (if the company reported reputational risk 1 otherwise 0), *Stra* is strategic risk measured by dummy variable (if the company reported strategic risk 1 otherwise 0), *Sup* is supply change risk measured by dummy variable (if the company reported supply change risk 1 otherwise 0), *EPS* is basic earnings per share reported in comprehensive income statement below net income, *Lev* is leverage measured by equity ratio (total equity on total assets), *SIZ* is size measured by natural logarithm of total assets, *Pro* is profitability measured by net profit margin, *ROE* is return on equity ratio (return on assets multiplied by financial leverage multiplier)

Table 3: Correlation matrix between variables (Multicollinearity)

	EF	Cap	Co	Cre	Cyb	Equ	For	Int	Inv	Liq	Mar	Ope	Reg	Rep	Rm	Stra	Sup	EPS	Lev	Pro	RM	RO	Siz
	F		m	d																T	E	e	
EFF	1.00																						



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RO	0.17	-	0.02	0.05	0.00	-	-	0.09	-	0.06	-	0.07	0.01	0.02	0.04	0.08	-	0.17	-	0.6	0.05	1.00
E	0.01	0.01	0.02	0.05	0.00	0.13	0.01	0.09	0.14	0.06	0.03	0.07	0.01	0.02	0.04	0.08	0.01	0.17	0.38	4	0.05	1.00
Size	-	-	-	0.02	-	-	0.00	0.04	-	0.03	0.08	0.06	-	0.06	-	0.05	-	0.25	-	0.0	-	1.0
	0.07	0.01	0.01	0.02	0.01	0.02	0.00	0.04	0.02	0.03	0.08	0.06	0.01	0.06	0.02	0.05	0.01	0.25	0.02	7	0.01	0.05

**Regression Analysis Results**

This study applied Panel Least Square (PLS) to analyse the relationship between variables. In order to select the appropriate PLS between pooled, fixed effect and random effect models, this study run the 'Redundant Fixed Effect- Likelihood Ratio' to compare between pooled and fixed effect models, and the 'Hausman' test is carried out to compare between fixed and random effect models. According to the results of Redundant and Hausman tests, the fixed effect model was found to be more appropriate for two specified regression models. Table 4 illustrate the results of Redundant and Hausman tests.

Table 4: Comparison between Pooled, Fixed and Random effect models

Redundant Fixed Effects Tests			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	35.256	-135.000	0.000***
Cross-section Chi-square	128.394	135.000	0.000***
Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	32.610	21.000	0.050**

This study analyses the relationship between variables using fixed effect model and runs two regression models while considering White's heteroscedasticity consistent standard error and covariance to solve the heteroscedasticity problem. Table 5 shows the regression results of first model which indicates the relationship between risk management reporting and efficiency.

Table 5: The regression results of relationship between risk management reporting and efficiency

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<i>RMR</i>	0.056	0.018	3.172	0.002***
<i>RM</i>	-0.019	0.022	-0.848	0.397
<i>Cap</i>	0.018	0.086	0.216	0.830
<i>Com</i>	0.037	0.071	0.523	0.602
<i>Cyb</i>	0.296	0.035	8.469	0.000***
<i>Equ</i>	-0.104	0.025	-4.135	0.000***
<i>For</i>	0.017	0.016	1.064	0.289
<i>Inv</i>	-0.082	0.038	-2.127	0.035**
<i>Mar</i>	0.024	0.005	4.706	0.000***
<i>Reg</i>	0.237	0.052	4.594	0.000***
<i>Stra</i>	0.070	0.046	1.542	0.124
<i>Sup</i>	-0.103	0.151	-0.684	0.495
<i>EPS</i>	0.181	0.219	0.828	0.408
<i>LEV</i>	-0.054	0.012	-4.302	0.000***
<i>SIZ</i>	-0.007	0.012	-0.587	0.558
<i>PRO</i>	0.002	0.000	24.933	0.000***
<i>ROE</i>	-0.003	0.006	-0.604	0.546
Adj R <sup>2</sup>	0.930			
F-statistic	34.910***			
Durbin-Watson	2.046			

$$Eff_{i,t} = \beta_0 + \beta_1 RMR_{i,t} + \beta_2 RM_{i,t} + \beta_3 CAP_{i,t} + \beta_4 COM_{i,t} + \beta_5 CRE_{i,t} + \beta_6 CYB_{i,t} + \beta_7 EQU_{i,t} + \beta_8 FOR_{i,t} + \beta_9 INT_{i,t} + \beta_{10} INV_{i,t} + \beta_{11} MAR_{i,t} + \beta_{12} REG_{i,t} + \beta_{13} REP_{i,t} + \beta_{14} STRA_{i,t} + \beta_{15} SUP_{i,t} + \beta_{16} EPS_{i,t} + \beta_{17} LEV_{i,t} + \beta_{18} SIZ_{i,t} + \beta_{19} PRO_{i,t} + \beta_{20} ROE_{i,t} + \varepsilon_{i,t}$$

\* Significance at the 0.10 level. \*\* Significance at the 0.05 level. \*\*\* Significance at the 0.01 level

Eff is financial efficiency measured by total asset turnover (revenue on total assets), RMR is risk management reporting measured by dummy variable (if the company provided risk management report 1 otherwise 0), Rco is risk management committee measured by dummy variable (if the company have risk

management committee 1 otherwise 0), Cap is capital risk measured by dummy variable (if the company reported capital risk 1 otherwise 0), Com is compliance risk measured by dummy variable (if the company reported compliance risk 1 otherwise 0), Cre is credit risk measured by dummy variable (if the company reported credit risk 1 otherwise 0), Cyb is cyber risk measured by dummy variable (if the company reported cyber risk 1 otherwise 0), Equ is equity risk measured by dummy variable (if the company reported equity risk 1 otherwise 0), For is foreign currency risk measured by dummy variable (if the company reported foreign currency risk 1 otherwise 0), Int is interest rate risk measured by dummy variable (if the company reported interest rate risk 1 otherwise 0), Inv is inventory risk measured by dummy variable (if the company reported inventory risk 1 otherwise 0), Mar is market risk measured by dummy variable (if the company reported market risk 1 otherwise 0), Reg is regulatory risk measured by dummy variable (if the company reported regulatory risk 1 otherwise 0), Rep is reputational risk measured by dummy variable (if the company reported reputational risk 1 otherwise 0), Stra is strategic risk measured by dummy variable (if the company reported strategic risk 1 otherwise 0), Sup is supply change risk measured by dummy variable (if the company reported supply change risk 1 otherwise 0), EPS is basic earnings per share reported in comprehensive income statement below net income, Lev is leverage measured by equity ratio (total equity on total assets), SIZ is size measured by natural logarithm of total assets, Pro is profitability measured by net profit margin, ROE is return on equity ratio (return on assets multiplied by financial leverage multiplier).

Based on the regression results of the relationship between risk management reporting and financial efficiency using the 1st regression model, the results provided in above table show there is a positive and significant relationship between risk management reporting and financial efficiency at the 1% level. Also, the findings show significant relationship between cyber risk, equity risk and financial efficiency at 1% level. Table 5 also shows, the relationship between inventory risk and efficiency is significant at the 5% level. Market risk and regulatory risk show a similar result, both significantly are related to efficiency at the 1% level. In terms of control variables, there is no relationship between earnings per share and efficiency, while leverage has a negative and significant relationship with efficiency at the 1% level. There is also no relationship between size, and efficiency while profitability has a positive and significant relationship with efficiency at the 1% level.

Table 6 shows the regression results of the 2nd regression model indicating the relationship between all available risk management reporting features in companies reported annual reports and financial efficiency, excluding risk management reporting as a whole.

Table 6: The regression results of relationship between risk management reporting features and efficiency

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<i>Cap</i>	0.029	0.084	0.339	0.735
<i>Com</i>	0.021	0.075	0.277	0.782
<i>Cyb</i>	0.254	0.036	6.969	0.000***
<i>Equ</i>	-0.093	0.026	-3.611	0.000***
<i>For</i>	0.008	0.016	0.524	0.601
<i>Inv</i>	-0.094	0.030	-3.146	0.002***
<i>Reg</i>	0.190	0.052	3.689	0.000***
<i>Rm</i>	-0.011	0.026	-0.429	0.669
<i>Stra</i>	0.053	0.049	1.076	0.283
<i>Sup</i>	-0.048	0.161	-0.301	0.764
<i>Mar</i>	0.023	0.008	2.730	0.007***
<i>Eps</i>	0.189	0.215	0.879	0.380
<i>Lev</i>	-0.049	0.011	-4.354	0.000***
<i>Siz</i>	-0.006	0.012	-0.506	0.614
<i>Pro</i>	0.002	0.001	3.014	0.003***
<i>ROE</i>	-0.006	0.005	-1.029	0.304

<i>Adj R<sup>2</sup></i>	0.930
<i>F-statistic</i>	35.103***
<i>Durbin-Watson</i>	2.546
$Eff_{i,t} = \beta_0 + \beta_1 RM_{i,t} + \beta_2 CAP_{i,t} + \beta_3 COM_{i,t} + \beta_4 CRE_{i,t} + \beta_5 CYB_{i,t} + \beta_6 EQU_{i,t} + \beta_7 FOR_{i,t} + \beta_8 INT_{i,t} + \beta_9 INV_{i,t} + \beta_{10} MAR_{i,t} + \beta_{11} REG_{i,t} + \beta_{12} REP_{i,t} + \beta_{13} STR_{i,t} + \beta_{14} SUP_{i,t} + \beta_{15} EPS_{i,t} + \beta_{16} LEV_{i,t} + \beta_{17} SIZ_{i,t} + \beta_{18} PRO_{i,t} + \beta_{19} ROE_{i,t} + \varepsilon_{i,t}$	

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\* Significance at the 0.10 level. \*\* Significance at the 0.05 level. \*\*\* Significance at the 0.01 level  
 Eff is financial efficiency measured by total asset turnover (revenue on total assets), Rco is risk management committee measured by dummy variable (if the company have risk management committee 1 otherwise 0), Cap is capital risk measured by dummy variable (if the company reported capital risk 1 otherwise 0), Com is compliance risk measured by dummy variable (if the company reported compliance risk 1 otherwise 0), Cre is credit risk measured by dummy variable (if the company reported credit risk 1 otherwise 0), Cyb is cyber risk measured by dummy variable (if the company reported cyber risk 1 otherwise 0), Equ is equity risk measured by dummy variable (if the company reported equity risk 1 otherwise 0), For is foreign currency risk measured by dummy variable (if the company reported foreign currency risk 1 otherwise 0), Int is interest rate risk measured by dummy variable (if the company reported interest rate risk 1 otherwise 0), Inv is inventory risk measured by dummy variable (if the company reported inventory risk 1 otherwise 0), Mar is market risk measured by dummy variable (if the company reported market risk 1 otherwise 0), Reg is regulatory risk measured by dummy variable (if the company reported regulatory risk 1 otherwise 0), Rep is reputational risk measured by dummy variable (if the company reported reputational risk 1 otherwise 0), Stra is strategic risk measured by dummy variable (if the company reported strategic risk 1 otherwise 0), Sup is supply change risk measured by dummy variable (if the company reported supply change risk 1 otherwise 0), EPS is basic earnings per share reported in comprehensive income statement below net income, Lev is leverage measured by equity ratio (total equity on total assets), SIZ is size measured by natural logarithm of total assets, Pro is profitability measured by net profit margin, ROE is return on equity ratio (return on assets multiplied by financial leverage multiplier).

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Based on the regression results of above table, there is a significant relationship between cyber risk, equity risk and efficiency at 1% level. The relationship between inventory risk and efficiency is significant at the 1% level. Market risk also has a positive and significant relationship with efficiency at the 1% level, same with regulatory risk that has a positive and significant relationship with efficiency at the 1% level. In terms of control variables, there is a no relationship between earnings per share and efficiency, while leverage has a negative and significant relationship with efficiency at the 1% level. There is also a positive and significant relationship between profitability and efficiency at the 1% level. Adjusted R2 of both 1st and 2nd regression models are 93%, this means that 93% percent of the changes in financial efficiency can be explained by the applied explanatory variables. Although this adjusted R2 value appears to be high, however, this result is consistent with findings of previous studies in this area. The Durbin-Watson is the number which indicates the autocorrelation of the residuals from a statistical regression analysis and values of less than 1 and greater than 3 pose a cause for concern. Based on the results of tables 6 and 7, the problem of serial autocorrelation can be neglected in both regression models.

**CONCLUSION**

This study concludes there is a meaningful relationship between risk management reporting, risk management reporting features, and financial efficiency in Malaysia. There is a significant relationship between risk management reporting and financial efficiency at a 1% level. Cyber risk and equity risk, also have significant relationship with financial efficiency. Additionally, the relationship between inventory risk, market risk and regulatory risk and financial efficiency are significant. This study provides evidence on the results of risk management reporting from the perspective of financial efficiency. Therefore, the outcomes of this study may be valuable for companies that have not prepared risk management reporting to realize its impact on their financial efficiency. The findings may also provide valuable suggestions for the boards of directors of these companies considering the preparation of such a report. The significant relationship between risk management reporting and financial efficiency provides evidence that risk management is an important determinant of financial efficiency and, ultimately, of improving company’s performance. As discussed before, this study aimed to find out the relationship between risk management reporting and financial efficiency. Even though this study achieved its goal, it was conducted with a limited amount of information that only helped to find out the results. Therefore, in the future, the study

could be conducted with a larger sample and with a different method of data collection, such as interviewing several companies to report on risk management in their respective companies. Other than that, this study focuses more on identifying the types of risks that occurred in each company. Future research could also investigate the solutions and preliminary plans that have been made to deal with the consequences that the companies face regarding the risks that affect the profitability of the company.

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