

## The Effect of Risk Management on the Financial Performance of Insurance Companies in Indonesia

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### ABSTRACT

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*The purpose of this study is to analyze various types of financial risks on the performance of insurance companies in Indonesia by including control variables such as leverage, age of the firm, size of the firm, and an additional variable, namely board size. The risks analyzed include credit, market, operational, liquidity, underwriting, and solvency risks. This study uses a quantitative method with secondary data from 32 conventional insurance companies for the period 2020–2024. The focus on conventional insurance was chosen because it has better data completeness, consistent reporting standards, and a significant role in the national insurance market to provide a clear picture of financial risk patterns in the industry. In addition, this sector is interesting to study because it has a complex business structure, broad risk exposure, and high sensitivity to changes in economic conditions. The analysis was conducted using panel data regression, and the fixed effects model was determined to be the most appropriate model. The novelty of this study lies in the addition of board size to assess the supervisory role in the relationship between financial risk and profitability. The results of the study show that credit risk has a positive impact on performance, while other variables such as market risk, operational risk, leverage, and age of the firm have a negative impact. Meanwhile, liquidity risk, underwriting risk, solvency risk, size of the firm, and board size do not show a significant effect, emphasizing the importance of effective risk management and operational efficiency.*

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## INTRODUCTION

Company's financial performance serves as a fundamental indicator for evaluating its ability to generate profits, utilize resources efficiently, and sustain long-term financial stability. In the insurance sector, various financial risks such as credit, market, operational, liquidity, underwriting, and solvency risks play a crucial role in determining profitability and the sustainability of operations (Sharif et al., 2024). As institutions that transfer and mitigate risk, insurance companies collect premiums to help customers reduce potential losses. To ensure this function operates effectively, insurers must implement sound risk management practices, including investment diversification, hedging strategies, and operational efficiency improvements (Takon et al., 2022).

Several scholars have analyzed how different financial risks affect company profitability. (Wambui, 2022) found that liquidity, market, and operational risks negatively impact the profitability of insurance firms. (Mutua & Wamugo, 2023) also revealed that credit and solvency risks tend to lower financial performance. Conversely, (Budiman & Margaretha, 2024) identified a positive relationship between market risk and company income. These contrasting results demonstrate a research gap regarding the relationship between financial risk and performance, particularly within Indonesia's insurance industry, which faces economic fluctuations and strict regulatory oversight.

Given these dynamics, this study focuses on conventional insurance companies as research objects. Over the past decade, conventional insurance has shown more substantial growth than Islamic insurance. (Azizah et al., 2023) explain that conventional insurance firms have operated longer, are more widely recognized by the public, and have achieved faster development and greater market participation. This creates a competitive environment with more complete and consistent data, suitable for empirical quantitative analysis. Conventional insurers also tend to have broader exposure to risks due to diverse products, investment portfolios, and financial instruments sensitive to market changes making them appropriate for analyzing the effect of financial risk on company performance.

Beyond financial risks, company-specific characteristics also play a role in determining financial outcomes. Leverage, firm size, and firm age are key factors in evaluating a company's financial condition (Msomi & Nzama, 2023). Firms with high leverage generally face greater interest burdens that may reduce profitability. In contrast, larger companies tend to be more stable because they possess stronger access to funding, higher bargaining power, and more established operational systems. Furthermore, corporate governance factors especially board size are vital for strengthening oversight and improving the quality of strategic decision-making (Ajoqwu Charles Ugwu, 2025).

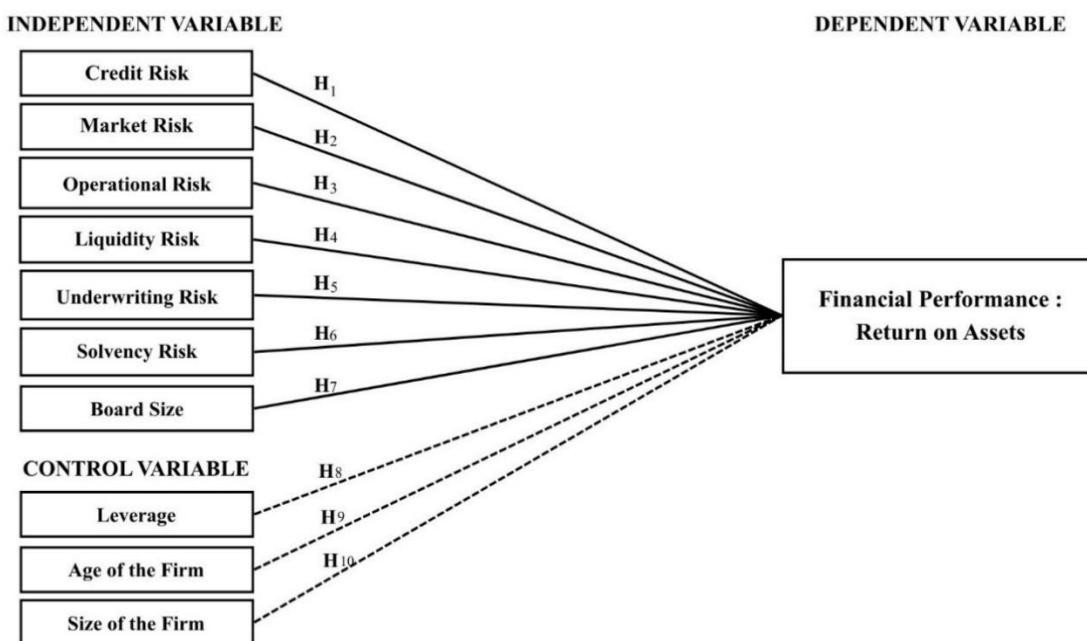
The relationship between financial risk and performance can be explained through the risk return trade off theory, which posits that higher risk can lead to higher returns when managed effectively. Poor risk management, however, may weaken performance and diminish profitability (Kiptoo et al., 2021). Control variables such as leverage, firm age, and firm size

can either amplify or moderate this relationship. In addition, board size reflects the company's managerial capacity, influencing how financial risks are monitored and mitigated.

This study aims to enrich theoretical perspectives and provide empirical evidence regarding financial risk management in the insurance sector. It also offers practical implications for managers and investors seeking to enhance financial efficiency and organizational resilience. The novelty of this research lies in incorporating the board size variable as part of corporate governance, allowing for a more comprehensive analysis of how oversight structures influence the relationship between financial risk and financial performance.

The main objective of this study is to analyze the effects of credit, market, operational, liquidity, underwriting, and solvency risks on the financial performance of Indonesian insurance companies, measured by return on assets (ROA). Leverage, firm size, and firm age serve as control variables, while board size functions as a moderating or novelty variable. The research model (**Figure 1**) illustrates how financial risks may either enhance or reduce profitability depending on the effectiveness of risk management (Sharif et al., 2024).

Previous research has not yet integrated all major types of financial risks with board size and firm characteristics in one comprehensive model. Although many studies have explored correlations between specific financial risks and profitability, the findings remain inconsistent, particularly concerning credit, market, and operational risks. Furthermore, company characteristics such as leverage, firm age, and firm size have typically been examined separately rather than within an integrated framework.



**Figure 1. Research Model**

Source: Data Processed (2025)

Therefore, this research seeks to fill that gap by combining multiple financial risk dimensions and company characteristics to better understand their collective influence on performance. Through this approach, the study is expected to contribute both theoretically and practically providing insight into how financial risk management, corporate governance, and firm-specific attributes interact to determine financial performance within Indonesia's conventional insurance industry.

## RESEARCH METHODS

This study uses hypothesis testing to examine how independent variables, including credit risk, market risk, operational risk, liquidity risk, underwriting risk, solvency risk, and board size, impact the dependent variable, namely return on assets (ROA), which is an indicator of a company's financial performance. In addition, leverage, age of the firm, and size of the firm are other control variables used in this study. This research analyzes 32 insurance companies listed on the Indonesia Stock Exchange and the Indonesian Life Insurance Association (AAJI) over a five-year period (2020–2024). This study uses panel data regression as an analytical tool and the Eviews 0.9 program. Figure 2 below shows the measurement system for each variable:

Type of Variable	Proxy	Symbol	Formula	Source
Dependent Variable	Return on Assets	ROA	$\frac{\text{Net Income}}{\text{Total Assets}}$	(Elamer & Benyazid, 2018)
Independent Variable	Credit Risk	CR	$\frac{\text{Premium Debtors} + \text{Due from reinsurance} + \text{Other Receivables}}{\text{Net Assets}}$	(Wani & Dar, 2015)(Daniel, 2017)
	Market Risk	MR	$\frac{\text{Investment Income}}{\text{Average Investments}}$	(Pavic Kramaric et al., 2017)
	Operational Risk	OR	$\frac{\text{Net Earned Premiums}}{\text{Total Assets}}$	(Sharif et al., 2024)
	Liquidity Risk	LR	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	(Daniel, 2017)(Wani & Dar, 2015)
	Underwriting Risk	UR	$\frac{\text{Benefits Paid}}{\text{Net Premiums}}$	(Wani & Dar, 2015)
	Solvency Risk	SR	$\frac{\text{Net Income}}{\text{Total Liabilities}}$	(Mukino, 2018)
	Board Size	BS	The logarithm of total number of board members	(Collins et al., 2021)
Control Variable	Leverage	LEV	$\frac{\text{Total Liabilities}}{\text{Total Assets}}$	(Fali et al., 2020)
	Age of the Firm	AGE	$\ln(\text{Target Year} - \text{Year of incorporation})$	(Hunjra et al., 2022)
	Size of the Firm	SIZE	$\ln(\text{Total Aset})$	(Wani & Dar, 2015)

Figure 2. Variable Measurement

Source: Data Processed (2025)

**Research Regression Model.** The panel data regression version utilized in previous research (Sharif et al., 2024) may be written as follow:

$$\text{ROA} = \beta_0 + \beta_1 \text{CR} + \beta_2 \text{MR} + \beta_3 \text{OR} + \beta_4 \text{LR} + \beta_5 \text{UR} + \beta_6 \text{SR} + \beta_7 \text{LEV} + \beta_8 \text{AGE} + \beta_9 \text{SIZE} + \beta_{10} \text{BS} + \varepsilon$$

Description:

- ROA : Return on Assets
- CR : Credit Risk
- MR : Market Risk
- OR : Operational Risk
- LR : Liquidity Risk
- UR : Underwriting Risk
- SR : Solvency Risk
- LEV : Leverage
- AGE : Age of the Firm
- SIZE : Size of the Firm
- BS : Board Size
- $\varepsilon$  : *error term*

**Sampling Method.** This study applied a purposive sampling technique based on a number of specific criteria that each company had to meet. The criteria used are listed as follows, with the selection being strictly directed at operational characteristics and financial conditions relevant to the needs of this research analysis.

**Table 1. Sampling Criteria**

Description	Amount
Conventional insurance companies operating in Indonesia and not including sharia business units (period 2020-2024)	60
Companies that do not have complete financial statements for the period 2020–2024	(28)
Total number of companies in the research sample	32
Total observation data (32 companies $\times$ 5 years of research)	160

Source: Data Processed (2025)

## RESULTS & DISCUSSION

**Model Testing Steps in this Study: Chow Test.** The Chow test is used to determine whether the appropriate model in panel data regression analysis is the common effect model (CEM) or the fixed effect model (FEM). The common effect model (CEM) assumes that all observation units have uniform parameters, while the fixed effect model (FEM) considers the diversity of characteristics between units, so that the specific differences of each entity can be reflected in the model estimation. This test assesses the null hypothesis ( $H_0$ ) which states that CEM is more appropriate to use, as opposed to the alternative hypothesis ( $H_a$ ) which states that FEM is more appropriate to apply.

Based on the chi-square value of 0.0000 and the probability  $f$  of 0.0000, which are below the threshold of 0.05, the test results indicate that the appropriate model to choose is the fixed effect model (FEM). This finding indicates that there are differences in characteristics between entities that form their own analytical patterns and need to be included in the modeling structure to produce more accurate estimates.

**Hausman test.** After conducting the Chow test, the Hausman test was performed to compare the fixed effect model (FEM) with the random effect model (REM). In the random effect approach (REM), it is assumed that the variation between entities occurs randomly and has no relationship with the independent variable, so that the error component is seen as a representation of random differences between observation units. Conversely, in the fixed effect (FEM) model, it is assumed that each entity has unique characteristics that are fixed and can affect the independent variable, so that differences between units are considered to be correlated with the dependent variable.

Based on the results of the Hausman test, the Cross-section Random Probability is  $0.000 < 0.05$ , so  $H_0$  is rejected and  $H_a$  is accepted. Therefore, it can be concluded that the most appropriate model to use is the fixed effect model (FEM). From these results, the LM test is no longer necessary

**Determination coefficient test (Adj.R2).** The test aims to see how well the independent variables relate to the dependent variables in a model. The results show an Adj.R2 value of 0.919482, which indicates that the variation of the independent variables can explain 91.4% of the dependent variable, while the remaining 84.04% shows the variation of other independent variables on ROA but is not included in the model. An adjusted R2 value close to 1 indicates that the model explains most of the variation in the dependent variable using the independent variables. Conversely, a value close to 1 indicates that the model does not fully capture the variation in the dependent variable.

**Simultaneous Test (F Test).** The test was conducted to evaluate whether the independent variables had an impact on the dependent variable. If the significance value of the F test was  $< 0.05$ , it indicated that the independent variables had a significant effect on the dependent variable. Conversely, if the significance value was  $> 0.05$ , it could be concluded that the independent variables had no effect on the dependent variable.

Based on the results of the F test, the p-value is  $0.000000 < 0.05$ , indicating that  $H_0$  is rejected. Thus, it can be concluded that there is one independent variable that has a significant effect on the dependent variable.

**Descriptive Statistics Results.** Based on these results for the variables of return on assets (ROA), credit risk, market risk, operational risk, liquidity risk, collateral risk, solvency risk, board size, leverage, age of the firm, and size of the firm, it can be seen that all variables show very diverse financial characteristics among insurance companies. The differences in the maximum, minimum, mean, and standard deviation values of each variable reflect the variation in financial conditions and risk levels faced by insurance companies in the research sample. In the context of this study, these results indicate that each company has a different risk profile and performance, which can affect the relationship between financial risk, control variables, and financial performance as measured by ROA.

**Table 2. Descriptive Statistic**

Variable	Mean	Median	Maximum	Minimum	Std. Dev
ROA	0.015024	0.017150	0.277900	-0.194800	0.046725
Credit Risk	0.304521	0.170500	2.539200	-0.021500	0.418678
Market Risk	1.063123	0.984700	8.604100	-0.516600	0.748748
Operational Risk	0.481305	0.224850	5.876200	0.000000	0.896185
Liquidity Risk	75.45599	2.932650	3333.724	0.065200	426.7113
Underwriting Risk	0.556654	0.722600	2.756400	-3.910400	0.755279
Solvency Risk	1.945227	0.023000	297.9247	-0.351500	23.54879
Board Size	7.906250	8.000000	13.00000	3.000000	2.262066
Leverage	0.845302	0.687000	12.12800	0.066200	1.465379
Age of the Firm	3.380901	3.624250	4.654000	1.098600	0.812220
Size of the Firm	29.19274	28.73015	33.18030	26.21610	1.641888

Source: Data Processed (2025)

**Individual Test (T-test).** This test is conducted to assess whether each independent variable has a significant effect on the dependent variable. The selection criteria are as follows: if the significance level is less than 0.05,  $H_0$  is rejected, which states that the independent variable affects the dependent variable. Conversely, if the significance has a value greater than 0.05,  $H_0$  is accepted, which indicates that the independent variable does not affect the dependent variable. In practice, a larger R-squared value indicates a better fit between the model and the existing data.

**H1: Credit Risk Affects Financial Performance.** Based on the results of the analysis, the probability value of credit risk on financial performance (ROA) is 0.0436, which is less than 0.05. The estimated coefficient value is 0.010971, which has a positive correlation with ROA,

so it can be concluded that credit risk has a significant positive effect on ROA. This conclusion is consistent with the research (Sharif et al., 2024), which found that credit risk has a significant positive effect on financial performance as measured by ROA, indicating that good credit risk management can increase company profitability.

**H2: Market Risk Affects Financial Performance.** Based on the results of the analysis of market risk variables on financial performance (ROA), the estimated coefficient value is 0.006628 with a probability value of 0.0001, which is  $< 0.0$ . These findings indicate that market risk has a negative effect on ROA. This study is consistent with (Sharif et al., 2024), which shows that market risk has a significant negative effect on financial performance. These results find that an increase in market risk, such as fluctuations in interest rates and exchange rates, can reduce the profitability of insurance companies.

**H3: Operational Risk Affects Financial Performance.** Based on the results of the analysis of the influence of operational risk variables on financial performance (ROA), the coefficient for ROA is negative at -0.006237 and has a probability value of 0.0013, which is less than the threshold of 0.05. These results indicate that operational risk has a significant negative effect on financial performance. This finding is inconsistent with the study by (Sharif et al., 2024), which found that operational risk has a significant positive impact on financial performance, proxied by ROA, indicating that effective operational risk management can drive an increase in insurance company profitability. However, these results support the hypothesis tested by previous researchers (Ubul & Kithandi, 2025), who found that operational risk has a significant negative effect on profitability, indicating that an increase in operational risk will suppress financial performance (ROA).

**H4: Liquidity Risk Does Not Affect Financial Performance.** Based on the results of the analysis of the effect of liquidity risk variables on financial performance (ROA), the estimated coefficient value is 3.600006 with a probability value of 0.4551, which exceeds the threshold of 0.05, indicating that liquidity risk is not affected by financial performance (ROA). This finding is not significantly consistent with the study (Sharif et al., 2024), which states that liquidity risk has a significant negative effect on financial performance as proxied by ROA. Therefore, these findings are consistent with (Sig, 2020), which states that liquidity risk is not statistically significant to financial performance (ROA) and that liquidity risk does not have a significant effect on the financial performance of insurance companies.

**H5: Underwriting Risk Does Not Affect Financial Performance.** Based on the results of the analysis of the effect of guarantee risk variables on financial performance (ROA), the coefficient value is -0.001255 with a probability of  $0.5919 > 0.05$ , so it can be concluded that underwriting risk has no effect on ROA. The results are inconsistent with the study (Sharif et al., 2024), which found that underwriting risk has a significant positive effect on financial performance as measured by ROA. Therefore, it can be concluded that effective underwriting risk management can increase the profitability of insurance companies. However, the results of this study support the findings of (Mukino, 2018), (Kiptoo et al., 2021), (Ningsih & Leon, 2024), all of which indicate that underwriting risk tends to reduce the profitability of insurance

companies because high claims and premiums that are not commensurate with the risk cause revenues to be unable to cover the costs incurred, thereby depressing company profits.

**H6: Solvency Risk Does Not Affect Financial Performance.** Based on the results of the analysis of the solvency risk variable on financial performance (ROA), the estimated coefficient value is 7.940006, which is negative for ROA with a probability of 0.9099, which is greater than 0.05. Thus, these results indicate that solvency risk has no effect on financial performance (ROA). This is inconsistent with the research (Sharif et al., 2024), which states that solvency risk has a significant positive effect on financial performance on ROA. This result shows that good solvency risk management through maintaining an adequate capital adequacy ratio can improve the stability and profitability of a company. In line with this (Mutua & Wamugo, 2023) shows that solvency risk has a significant negative effect on the financial performance of insurance companies.

**H7: Board Size Does Not Affect Financial Performance.** Based on the results of the analysis of the board size variable on financial performance (ROA), the estimated coefficient value is -0.000214 with a probability value of 0.7409 > 0.05. Based on the findings, board size does not significantly affect ROA. This result is inconsistent with the study by (Ajoqwu Charles Ugwu, 2025), which shows that the size of the board of directors has a positive effect on financial performance, as proxied by ROA. However, the results of this study are consistent with (Ofori et al., 2025), which found that the size of the board of directors does not have a statistically significant effect on financial performance (ROA), although it does affect operational risk.

**H8: Leverage Affects Financial Performance.** Based on the results of the analysis of the leverage variable on financial performance (ROA), the coefficient is negative at -0.014357 with a probability value of 0.0000, which is below the threshold of 0.05. These results indicate that leverage has a significant negative effect. This is consistent with the research by (Sharif et al., 2024), which shows that leverage acts as a control variable that indicates the extent to which a company utilizes debt in its funding structure, which is generally measured by total debt to total assets.

**H9: Age of The Firm Affects Financial Performance.** Based on the results of the analysis of the effect of age of the firm on financial performance (ROA), the estimated coefficient value is -0.024724 with a probability of 0.0015 < 0.05. In other words, these results indicate that age of the firm has a significant negative effect on ROA. The results of this study contradict previous findings (Sharif et al., 2024), which show that age of the firm is used as a control variable that reflects the length of time a company has been operating in an industry. However, the results of this study are consistent with the findings (Sinebe, 2023), which found that age of the firm has a significant negative effect (ROA). This shows that the longer the age of the company, it is not always followed by an increase in profitability. Companies that have been operating for a long time tend to face challenges such as complex organizational structures, decreased efficiency, and limited innovation, which can reduce the return on assets (ROA).

**H10: Size of The Firm Affects Financial Performance.** Based on the results of the analysis of the effect of size firm on financial performance (ROA), the estimated coefficient is 0.005453 with a probability of  $0.1184 > 0.05$ , indicating that company size does not have a significant effect on ROA. In other words, these results are inconsistent with the findings (Sharif et al., 2024) which show that size of the firm functions as a control variable that reflects the total assets and financial capacity of the company. However, the results of this study are consistent with (Nworie & Mba, 2022), which found that size of the firm has no significant effect on financial performance (ROA). This shows that even though companies with larger asset sizes have the potential to increase profitability through economies of scale, large assets are not always followed by increased efficiency in their utilization.

Overall, the results of this study indicate that effective risk management, improved operational efficiency, and appropriate capital structure are key factors in maintaining the financial performance of insurance companies. The findings also illustrate that conventional insurance companies in Indonesia still face significant pressures, particularly from market risk, operational risk, leverage, and age of the firm, which have been shown to reduce profitability. Furthermore, this study shows variations in the influence of different types of risk, where liquidity risk, underwriting risk, solvency risk, size of the firm, and board of directors size do not have a significant impact on ROA. Thus, this study provides a clearer picture of the risk dynamics faced by the insurance industry and can help companies understand the factors that most influence the stability of their performance.

**Table 3. Panel Data Regression Analysis Result – Fixed Effect Model**

Dependen Variable: Return on Assets (ROA)			
	Coefficient	Probability	Conclusion
Credit Risk	0.010971	0.0436	Significantly positive impact on ROA
Market Risk	-0.006628	0.0001	Significantly negative impact on ROA
Operational Risk	-0.006237	0.0013	Significantly negative impact on ROA
Liquidity Risk	3.600006	0.4551	Not significant to ROA
Underwriting Risk	-0.001255	0.5919	Not significant to ROA
Solvency Risk	7.9400006	0.9099	Not significant to ROA
Board Size	-0.000214	0.7409	Not significant to ROA
Leverage	-0.014357	0.0000	Significantly negative impact on ROA
Age of the Firm	-0.024724	0.0015	Significantly negative impact on ROA
Size of the Firm	-0.005453	0.1184	Not significant to ROA

Source: Data Processed (2025)

## CONCLUSION & SUGGESTION

This study concludes that not all financial risk variables have a significant impact on the financial performance of conventional insurance companies in Indonesia. Several variables, namely liquidity risk, underwriting risk, solvency risk, size of the firm, and board size, were not found to affect return on assets (ROA). This insignificance indicates that these factors did not exert direct pressure on profitability during the study period, or that their impact may be long-term in nature and therefore not strongly reflected in annual data.

Conversely, a number of variables were found to significantly affect financial performance. Credit risk had a positive impact on ROA, indicating that effective management of premium receivables and credit policies can increase company profits. Market risk and operational risk had a negative impact, indicating that economic fluctuations and internal process inefficiencies can reduce profitability. In addition, leverage and age of the firm also have a negative impact, meaning that a heavy debt structure and increasing company age can hamper flexibility and efficiency, thereby reducing financial performance. Overall, these findings emphasize that operational stability, prudence in managing market risk, and sound capital structure management are important aspects in maintaining the long-term profitability of conventional insurance companies.

Further research should expand the scope of the sector or use a longer observation period in order to capture risk dynamics more accurately. Follow-up studies could also include additional variables such as macroeconomic factors or other governance indicators to examine effects that may not have been revealed in this study. In addition, the use of more complex analytical models could provide a deeper understanding of the interaction between financial risk and financial performance.

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