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RISK-BASED CAPITAL AND RETURN ON ASSETS: THE MEDIATING ROLE OF THE DEBT-TO-EQUITY RATIO IN LISTED INSURANCE COMPANIES

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ABSTRACT

This study aims to analyze the effect of Risk-Based Capital (RBC) on Return on Assets (ROA), mediated by the Debt-to-Equity Ratio (DER), among insurance companies listed on the Indonesia Stock Exchange during the 2020–2024 period. The independent variable in this study is RBC, the mediating variable is DER, and the dependent variable is ROA. This is a quantitative study. The data used are secondary data from the financial statements of insurance companies during the aforementioned period. The sample in this study was obtained using purposive sampling; based on this technique, 12 companies that met the criteria were selected as the research sample. The analytical methods used are path analysis and the Sobel mediation test to determine direct and indirect effects. The results of the study indicate that RBC has a positive and significant effect on ROA, DER has a negative and significant effect on ROA, and RBC has a negative and significant effect on DER. Additionally, DER mediates the relationship between RBC and ROA. This study contributes to corporate management and investors regarding the relationship between Risk-Based Capital (RBC), Debt-to-Equity Ratio (DER), and Return on Assets (ROA) in insurance companies, thereby enhancing investment decision-making and financial risk management.

Keywords: risk based capital, debt to equity ratio, return on assets, insurance

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1. INTRODUCTION

Financial performance is a fundamental aspect that reflects a company's ability to conduct operations effectively and efficiently and to generate sustainable profits (Hutabarat, 2021). Financial performance indicates a company's success in managing its operations, which is typically reflected in financial statements. Information from financial statements serves as a tool for management accountability (Inayah, 2022). In the insurance industry, measuring financial performance is more complex than in other sectors because insurance companies face long-term risks, fluctuating policy liabilities, and regulatory requirements regarding capital adequacy. One of the primary indicators for assessing the effectiveness of a company's asset management is Return on Assets (ROA), a ratio that reflects a company's ability to generate net profit from its assets (Akbar et al., 2024).

For insurance companies, ROA serves as an indicator of operational efficiency and the company's ability to utilize its total assets to generate profits. However, data shows that insurance companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period experienced fluctuations and a downward trend in ROA. As shown in Table 1, some companies even recorded ROA below the healthy benchmark (>2%).

Table 1. Return on Assets of Insurance Companies
Listed on the Indonesia Stock Exchange for the 2020–2024 Period

No.	Company	ROA (Y)				
		2020	2021	2022	2023	2024
1.	Bina Arta Insurance, Tbk	5.58%	6.30%	3.67%	3.17%	2.91%

2.	Asuransi Harta Aman Pratama, Tbk	1.82%	2.31%	0.80%	0.50%	0.64%
3.	Bintang Insurance, Tbk	2.71%	1.73%	0.52%	0.60%	1.10%
4.	Dayin Mitra Insurance, Tbk	3.12%	2.46%	2.09%	2.14%	2.78%
5.	Jaya Tania Insurance, Tbk	2.12%	0.07	0.12%	0.81%	0.83%

Source: www.idx.co.id processed data (2024)

Asuransi Harta Aman Pratama, Tbk recorded an ROA of 0.80% (2022) and 0.50% (2023). Asuransi Bintang, Tbk dropped to 0.52% (2022) from 2.71% (2020). Asuransi Jaya Tania, Tbk even recorded the lowest ROA of 0.07% (2021). This phenomenon of declining ROA indicates inefficiency in the utilization of the companies' assets, making it important to identify the factors influencing it.

One factor believed to influence ROA is Risk-Based Capital (RBC). RBC is an indicator of an insurance company's ability to meet all of its policyholder obligations. Based on Regulation of the Minister of Finance of the Republic of Indonesia Number 53/PMK.010/2012 Article 2 paragraph 1 regarding the Financial Health of Insurance and Reinsurance Companies, this regulation requires insurance companies to have a minimum RBC value of 120% (Prahasti, 2020). The RBC data in Table 2 shows that all companies in the sample have met this requirement, even far exceeding the minimum threshold. However, a high RBC does not always correlate with an increase in ROA.

Table 2. Risk-Based Capital of Insurance Companies
Listed on the Indonesia Stock Exchange for the 2020–2024 Period

No.	Company	RBC (X)				
		2020	2021	2022	2023	2024
1.	Bina Arta Insurance, Tbk	532.25%	634.15%	727.69%	701.40%	682.32%
2.	Asuransi Harta Aman Pratama, Tbk	149.29%	253.32%	286.83%	197.59%	256.03%
3.	Bintang Insurance, Tbk	139.01%	145.78%	150.28%	141.98%	150.58%
4.	Dayin Mitra Insurance, Tbk	378.72%	407.70%	331.99%	398.15%	317.60%
5.	Jaya Tania Insurance, Tbk	258.51%	599.84%	652.06%	647.61%	681.37%

Source: www.idx.co.id processed data (2024)

Asuransi Harta Aman Pratama, Tbk has an RBC of 286.83 (2022) but an ROA of only 0.80%. Asuransi Bintang, Tbk, with an RBC of 150.28% (2022), recorded an ROA of 0.52%. Asuransi Jaya Tania, Tbk has a very high RBC of 599.84% (2021) but its ROA has dropped to 0.07%. This situation indicates that while a high RBC reflects a company's financial health, excess capital that is not managed productively can actually suppress profitability levels.

Another factor that influences ROA is the Debt-to-Equity Ratio (DER), which measures the proportion of debt relative to equity (Indriastuti & Ruslim, 2020). A high DER reflects a company's reliance on external financing, which can increase financial risk and interest expenses, thereby leading to a decline in profits. A financially healthy company is indicated by a DER ratio below 1 or below 100%, meaning that its debt or liabilities are greater than its net equity (Purba & Marendra, 2024). The data in Table 3 shows varying DER values across companies:

Table 3. Debt-to-Equity Ratios of Insurance Companies
Listed on the Indonesia Stock Exchange for the Period 2020–2024

No.	Company	DER (Z)				
		2020	2021	2022	2023	2024

1.	Bina Arta Insurance, Tbk	78.61%	65.06%	64.21%	72.03%	76.51%
2.	Asuransi Harta Aman Pratama, Tbk	447.27%	446.03%	344.28%	361.85%	379.66%
3.	Bintang Insurance, Tbk	177.84%	165.83%	165.91%	148.17%	113.98%
4.	Dayin Mitra Insurance, Tbk	144.49%	127.47%	143.47%	164.43%	171.68%
5.	Jaya Tania Insurance, Tbk	74.56%	71.13%	57.01%	53.75%	75.31%

Source: www.idx.co.id data processed (2024)

Asuransi Harta Aman Pratama, Tbk has a very high DER of 447.2% (2020), and although it has decreased, it remains at a high level of 379.66% (2024). Asuransi Bintang, Tbk shows a decline in its DER from 177.84% (2020) to 113.98% (2024). Asuransi Jaya Tania, Tbk, on the other hand, is among the companies with a low DER, at just 53.75% (2023).

The relationship between RBC and DER is also of interest because both play a role in determining a company's financial health. With sound risk management through RBC, a company can adjust its DER to create a balance between equity and debt that supports an increase in ROA. Therefore, RBC, through its influence on DER, can contribute to improved financial performance, as measured by ROA. Theoretically, an increase in RBC should reduce a company's reliance on debt. However, empirical research indicates that some companies maintain a high DER despite a substantial RBC, suggesting a potential mismatch between capital adequacy and financing policies. This inconsistency in empirical research is reinforced by previous studies yielding varying conclusions regarding the impact of RBC and DER on ROA. Some studies found a significant positive effect, while others showed a negative and insignificant effect. These differing results indicate a research gap that needs to be re-examined in the current context, particularly in the post-pandemic period, which has brought significant changes to the insurance industry in Indonesia.

Based on empirical observations and gaps in previous research, this study aims to analyze the effect of Risk-Based Capital (RBC) on Return on Assets (ROA), the effect of the Debt-to-Equity Ratio (DER) on Return on Assets (ROA), and the effect of Risk-Based Capital (RBC) on the Debt-to-Equity Ratio (DER). This study also examines the role of the Debt-to-Equity Ratio (DER) as a mediating variable in the relationship between Risk-Based Capital (RBC) and Return on Assets (ROA) for insurance companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period.

2. LITERATURE AND HYPOTHESES

Signaling Theory

Signaling theory was first developed by Spence (1973) as cited in Ghozali (2020), where this theory explains the attitudes of two parties when they process differing information. Signaling theory describes how management sends signals or cues regarding the company's internal conditions through various methods of financial information disclosure, such as financial statements, which can be interpreted as signals by investors. In relation to the research conducted, signaling theory was chosen because the researcher will measure the level of financial health in insurance companies and its effect on Return On Assets; thus, information such as Risk-Based Capital results and the Debt-to-Equity Ratio will serve as signals conveyed to potential investors as a basis for investment decisions and to potential customers in selecting an appropriate insurance company.

Pecking Order Theory

The Pecking Order Theory was developed by Myers and Maljuf in 1984. According to Myers and Maljuf, as cited in Hertanti (2022), the Pecking Order Theory establishes a policy for securing funding to meet operational and investment needs, prioritizing internal company capital first. If this is deemed insufficient,

external financing—such as loans or bonds—is sought. This consideration is based on identifying the source perceived to carry the lowest risk. Consequently, the company will be more inclined to use funds from internal sources rather than external ones to finance its operations. In reality, this theory does not set a target for the debt ratio, but rather addresses the hierarchy of funding sources preferred by the company. It is also noted that profitable companies typically use minimal debt (Hertanti et al., 2022). This does not imply that profitable companies are exclusively those with low debt ratios. However, they do require only minimal external financing.

Return on Assets (ROA)

Return on Assets is a ratio that shows the relationship between profit and total assets. This ratio indicates how efficiently a company uses its assets to generate profit (Akbar et al., 2024). The formula for calculating Return on Assets is as follows:

$$\text{Return on Assets (ROA)} = \frac{\text{net profit after tax}}{\text{total aset}} \times 100\%$$

Calculating the ROA formula is useful for investors in understanding how management utilizes assets to generate revenue; a high ROA indicates that the company has high profitability.

Risk-Based Capital

Risk-Based Capital is a tool for measuring the financial health and performance of an insurance company based on its capital capacity to fund unforeseen risks that could result in losses, which would significantly impact the company's financial health and performance (Potalangi et al., 2022). The formula for calculating Risk-Based Capital is as follows:

$$\text{Risk-Based Capital (RBC)} = \frac{\text{total solvabilitas}}{\text{batas tingkat solvabilitas minimum}} \text{ x } 100\%$$

Debt-to-Equity Ratio

The Debt-to-Equity Ratio (DER) is used to calculate the proportion of debt relative to available equity. This ratio helps determine the extent to which funds come from company owners compared to funds from creditors (Agustin et al., 2022). The formula for the Debt-to-Equity Ratio (DER) is as follows:

$$\text{Debt-to-Equity Ratio (DER)} = \frac{\text{total hutang}}{\text{total modal}} \text{ x } 100\%$$

Hypothesis

The Effect of Risk-Based Capital (RBC) on Return on Assets (ROA)

Risk-Based Capital is a tool for measuring and assessing the financial health of an insurance company using solvency ratios to address unexpected and sudden adverse risks resulting from deviations in the management of assets and liabilities. Every insurance company aims to achieve the government-mandated Risk-Based Capital level of 120% while maintaining a high level of profitability (ROA) to serve the interests of the company and its shareholders. An ROA is considered good if it is > 2%. If Risk-Based Capital remains stable, the insurance company avoids taking on excessively high risks, and insurance coverage is limited by the amount of capital held; consequently, the risks assumed decrease, and the capital is utilized to enhance the insurance company's profitability (ROA) (Satria & Meifari, 2024). Research on the relationship between Risk-Based Capital and Return on Assets conducted by Soniati et al., (2020); Nurhayati et al., (2020); Nurrosis & Rahayu (2020); William & Colline (2022); Ritha (2023); and Martana & Karim (2024) , with the results showing that Risk-Based Capital has a positive and significant effect on Return on Assets. This means that an increase in the value of Risk-Based Capital will increase the value of Return on Assets. In contrast, research conducted by Suyekti et al. (2020) showed that Risk-Based Capital has a negative and insignificant effect on profitability (ROA). This means that when there is an increase in the value of Risk-Based Capital, the value of Return on Assets will decrease. These findings

align with the research by Maulana & Mulyana (2020). Based on the previous studies, the following hypothesis can be formulated:

H1: Risk-Based Capital (RBC) has a positive effect on Return on Assets (ROA) in insurance companies listed on the Indonesia Stock Exchange.

The effect of the Debt-to-Equity Ratio (DER) on Return on Assets (ROA)

The Debt-to-Equity Ratio is a ratio that compares the total liabilities to the total equity in a company's financing. Return on Assets is a ratio used to measure a company's ability to generate net income based on its assets. A high Debt-to-Equity Ratio has a negative impact on a company's performance because as debt levels rise, interest expenses increase, which reduces profitability (ROA). Conversely, a low Debt-to-Equity Ratio indicates improved company performance, as higher return rates can boost profits, thereby positively influencing Return on Assets (ROA) (Indriastuti & Ruslim, 2020). Research on the relationship between the Debt-to-Equity Ratio (DER) and Return on Assets (ROA) conducted by Sari and Dwirandra (2019) and Syafi'I & Haryono (2021) revealed that ROA is positively and significantly influenced by DER. This means that when there is an increase in DER, profitability increases. In contrast, the findings of Solihin (2019); Maulana & Mulyana (2020); Chandra et al. (2020); and Situmorang (2023) indicate that the Debt-to-Equity Ratio has a negative and significant effect on Return on Assets. The DER has a significant negative impact on ROA. This implies that as a company's DER increases, the net profit margin (ROA) it achieves decreases. Based on previous research, the following hypotheses can be formulated:

H2: The Debt-to-Equity Ratio (DER) has a negative effect on Return on Assets (ROA) in insurance companies listed on the Indonesia Stock Exchange.

The Effect of Risk-Based Capital (RBC) on the Debt-to-Equity Ratio (DER)

Risk-Based Capital (RBC) is used to measure the financial health of an insurance company and ensure that the company has sufficient capital to cover claims risks. A high RBC indicates that the company has the capacity to cover greater risks. The Debt-to-Equity Ratio (DER) measures the proportion of a company's debt relative to its equity. A high DER indicates that the company relies more on debt than equity, which can increase financial risk. RBC and DER are interrelated in assessing an insurance company's financial performance. Companies with a high RBC tend to have a lower DER, which can reduce financial risk and improve financial performance (Maulana & Mulyana, 2020). Research conducted by ; Maulana & Mulyana (2020); Hery et al. (2023); and Khosasi et al. (2024) on factors influencing the profitability of insurance companies indicates that Risk-Based Capital has a negative and significant effect on the Debt-to-Equity Ratio. This implies that the larger the company's capital, the lower the Debt-to-Equity Ratio (DER) will logically become. Meanwhile, research by Rahmadianti & Yuliandi (2020) indicates that Risk-Based Capital has a positive and significant effect on the Debt-to-Equity Ratio. This implies that higher business risk and substantial debt usage can make it more difficult for a company to repay its debts. Based on the previous research, the following hypotheses can be concluded:

H3: Risk-Based Capital (RBC) has a negative effect on the Debt-to-Equity Ratio (DER) in insurance companies listed on the Indonesia Stock Exchange.

The effect of Risk-Based Capital (RBC) on Return on Assets (ROA) through the Debt-to-Equity Ratio (DER)

The Debt-to-Equity Ratio (DER) reflects the extent to which a company uses debt to finance its assets. This capital structure affects the company's financial risk and cost of capital. Theoretically, a high Risk-Based Capital (RBC) ratio can influence a company's capital structure, as reflected in the DER. For example, a company with sufficient RBC may tend to have a more balanced capital structure (optimal DER), thereby minimizing excessive financial risk. The DER then impacts ROA, as a healthy capital structure (optimal DER) allows the company to use its assets more efficiently and generate higher profitability. Risk-Based Capital (RBC) measures the adequacy of risk-based capital that protects insurance companies from losses, while the DER indicates the proportion of debt to equity. If RBC is high, the company is more capital-stable, so the DER can act as a mediator influencing profitability (ROA). The DER, as a mediator, helps explain the extent to which capital and debt risks affect a company's asset

performance (Maulana & Mulyana, 2020). Research conducted by Maulana and Mulyana (2020) on factors influencing insurance company profitability states that Risk-Based Capital, through the Debt-to-Equity Ratio, has a negative and significant effect on Return on Assets. This means that the DER neither strengthens nor weakens the influence of RBC on ROA. Meanwhile, research conducted by Akpan et al. (2021) states that RBC has a significant positive effect on ROA through the DER. This implies that during that period, insurance companies were only able to generate higher asset returns and earnings per share for investors. Based on the previous research, the following hypothesis can be concluded:

H4: Risk-Based Capital (RBC) has a significant effect on Return on Assets (ROA) through the Debt-to-Equity Ratio (DER) in insurance companies listed on the Indonesia Stock Exchange.

3. RESEARCH METHODS

This study was conducted on insurance companies listed on the Indonesia Stock Exchange (IDX) for the 2020–2024 period, using data accessed from the IDX websites: , www.idx.co.id, and . The research objective is to examine the effect of Risk-Based Capital (RBC) on Return on Assets (ROA), with the mediated by the Debt-to-Equity Ratio (DER), in insurance companies listed on the Indonesia Stock Exchange (IDX) for the 2020–2024 period. This is a quantitative study. The data used consists of secondary data from the financial statements of insurance companies during that period. The sample in this study was obtained using purposive sampling; based on this technique, 12 companies that met the criteria were selected as the research sample. The data analysis techniques used were Descriptive Statistical Tests, Classical Assumption Tests, Path Analysis, Sobel Test, Coefficient of Determination (adjusted R^2), and Partial Tests (t-tests).

4. RESULTS AND DISCUSSION

Descriptive Statistical Test

Table 4. Results of Descriptive Statistical Tests

Variable	N	Minimum	Maximum	Mean	Standard Deviation
RBC	60	79.62	727.69	346.4242	192.13252
DER	60	48.21	447.27	161.6850	93.69570
ROA	60	-8.93	6.30	1.6448	2.74053

Source: Processed data, 2025

Based on the results of the descriptive statistical test in Table 4, it is known that the number of observations in the study (N) is 60, and the following are the results of the descriptive statistical test of these observations.

a. Risk-Based Capital (RBC) Variable

The results of the descriptive statistical test on Risk-Based Capital (RBC) for insurance companies listed on the Indonesia Stock Exchange (IDX) from 2020 to 2024 show a minimum value of 79.62 and a maximum value of 727.69, with the mean and standard deviation of Risk-Based Capital being 346.4242 and 192.13252, respectively.

b. Debt-to-Equity Ratio (DER) Variable

The results of the descriptive statistical analysis of the Debt-to-Equity Ratio (DER) for insurance companies listed on the Indonesia Stock Exchange (IDX) from 2020 to 2024 show a minimum value of 48.21 and a maximum value of 447.27, with the mean and standard deviation of the Debt to Equity Ratio being 161.6850 and 93.69570, respectively.

c. Return on Assets (ROA) Variable

The results of the descriptive statistical test on Return on Assets (ROA) for insurance companies listed on the Indonesia Stock Exchange (IDX) from 2020 to 2024 show a minimum value of -8.93 and a maximum

value of 6.30, with the mean and standard deviation of Return on Assets at 1.6448 and 2.74053, respectively.

Classical Assumptions Test

a. Normality Test

Table 5. Results of the Normality Test

	Unstandardized Residual
N	53
Asymp. Sig. (2-tailed)	0.200

Source: Processed data, 2025

Table 5 shows that the Asymp. Sig. (2-tailed) value is 0.200. This value is greater than 0.05, which means that the variable in question can be said to be normally distributed.

b. Autocorrelation Test

Table 6. Autocorrelation Test Results

Model	R	R-Square	Adjusted R-Square	Standard Error of the Estimate	Durbin-Watson
1	0.897	0.773	0.731	2.27297	1.858

Source: Processed data, 2025

As seen in Table 6, the Durbin-Watson value is 1.858, whereas from the Durbin-Watson statistical table with a significance level of 0.05 and a sample size (n) = 60, k (number of independent variables) = 2, dL = 1.5144, and dU = 1.6518. Therefore, the value of (4 - dU) = 2.3482. It can be seen that the Durbin-Watson value falls within the range 1.6518 < 1.858 < 2.3482, which means there is no autocorrelation in the data.

c. Multicollinearity Test

Table 7. Multicollinearity Test Results

Variable	Collinearity Statistics	
	Tolerance	VIF
RBC	0.868	1.153
DER	0.868	1.153

Source: Processed data, 2025

Based on Table 7, it is known that the VIF value of the RBC and DER variables is 1.153 < 10 and the Tolerance Value is 0.868 > 0.1, so there is no multicollinearity in the data.

d. Heteroscedasticity Test

Table 8. Heteroscedasticity Test Results

Independent Variables	Sig.
RBC	0.086
DER	0.174

Source: Processed data, 2025

The results of the heteroscedasticity test using the Glejser method in Table 8 show that the significance values of the Risk-Based Capital (RBC) and Debt-to-Equity Ratio (DER) variables are each above or > 0.05; therefore, the data do not exhibit heteroscedasticity.

Data Analysis Results

a. Path Analysis Results

1) Path Equation 1

Table 9. Path Model Summary 1

Model	R	R-Square	Adjusted R-Square	Standard Error of the Estimate	Durbin-Watson
1	0.808	0.653	0.621	79.86008	1.821

Source: Processed data, 2025

Table 10. Path Coefficient Test Results 1

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	248,052	20,679		11,995	0.001
	RBC	-0.246	0.051	-0.535	-4.818	0.001

Source: Processed data, 2025

The regression test results indicate that RBC has a significant effect on DER of 0.001 with an R-squared value of 0.653, indicating that RBC contributes 65.3% to DER, while the remaining 34.7% is influenced by other factors. The e1 value is obtained by calculating R-squared using the formula $\sqrt{(1-0{,}653)} = 0{,}589$.

2) Path Equation 2

Table 11. Model Summary for Path 2

Model	R	R-Square	Adjusted R-Square	Standard Error of the Estimate
1	0.879	0.773	0.731	2.27297

Source: Processed data, 2025

Table 12. Results of Path Coefficient Test 2

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.769	0.594		1.294	0.201
	RBC	0.003	0.001	0.285	2.459	0.017
	DER	-0.001	0.000	-0.411	-3.546	0.001

Source: Processed data, 2025

The regression test results indicate that RBC has a significant effect on ROA of 0.017 and DER has a significant effect on ROA of 0.001, with an R-squared value of 0.773, indicating that RBC contributes 77.3% to ROA and the remaining 22.7% is influenced by other factors. The e1 value is obtained through the R-Square calculation using the formula $\sqrt{(1-0{,}773)} = 0{,}476$.

Conclusion:

1) The results of the regression analysis of RBC on DER were found to be significant at 0.001 < 0.05, indicating that there is a direct effect of RBC on DER.
2) The results of the regression analysis of RBC on ROA were significant at 0.017 < 0.05, indicating that there is a direct influence of RBC on ROA.
3) The results of the regression analysis of DER on ROA were significant at 0.001 < 0.05, indicating that there is a direct effect of DER on ROA.
4) The results of the analysis of the effect of RBC on ROA through DER show that the effect of X on Y (beta) is 0.285. To determine the indirect effect of variables X and Y through Z, use the formula: the product of the beta value of X on Z and the beta value of Z on Y = -0.535 × -0.411 = 0.219. Therefore, the total effect of X on Y is the sum of the direct and indirect effects: -0.411 + 0.219 = -0.192. Based on these results, it can be concluded that the direct effect of RBC on ROA is 0.285 and the indirect effect of RBC on ROA through DER is 0.219. This indicates that the direct effect of RBC on ROA is

higher than the indirect effect of RBC on ROA through DER. The hypothesis based on this data suggests that RBC does not indirectly affect ROA through DER as a mediating variable.

b. Sobel Test

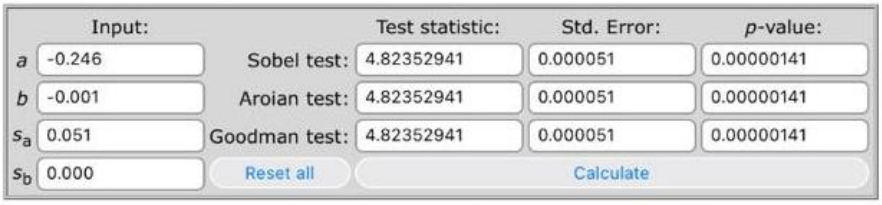

Figure 1.Sobel Test Results

Based on the results of the Sobel test of the indirect effect of RBC on ROA through DER as a mediating variable, it is known that the Sobel test statistic value of 4.82352941 > 1.96 with a two-tailed probability value of 0.000 < 0.05, proving that the DER variable is a variable capable of mediating the effect of RBC on ROA.

c. Coefficient of Determination

Table 13. Results of the Determination Analysis

Model	R	R-Square	Adjusted R-Square	Standard Error of the Estimate
1	0.879	0.773	0.731	2.27297

Source: Processed data, 2025

Table 13 shows that the value of the R^2 is 0.773. This means that 77.3% of Return on Assets (ROA) is explained by Risk-Based Capital (RBC) and the Debt-to-Equity Ratio (DER), while 22.7% is explained by other factors outside the scope of this study.

d. Partial Test (T-Test)

Based on the analysis results in Tables 10 and 12 above, the following conclusions can be drawn:

1) The Effect of Risk-Based Capital (RBC) on Return on Assets (ROA)
   The test results show that the Risk-Based Capital (RBC) variable has a calculated t-value of 2.459 > 2.002 and a significance level of 0.017 < 0.05, indicating that the Risk-Based Capital (RBC) variable has a significant positive effect on the Return on Assets (ROA) variable in the t-test. This means that Risk-Based Capital (RBC) has a significant positive effect on Return on Assets (ROA). Therefore, hypothesis H1 in this study is accepted.
2) The Effect of the Debt-to-Equity Ratio (DER) on Return on Assets (ROA)
   The test results show that the Debt to Equity Ratio (DER) variable has a calculated t-value of -3.546 < 2.002 and a significance level of 0.001 < 0.05, indicating that the Debt to Equity Ratio (DER) variable has a significant negative effect on the Return On Assets (ROA) variable in the t-test. This means that the Debt-to-Equity Ratio (DER) has a significant negative direction on Return on Assets (ROA). Therefore, hypothesis H2 in this study is accepted.
3) The Effect of Risk-Based Capital (RBC) on the Debt-to-Equity Ratio (DER)
   The test results show that the Risk-Based Capital (RBC) variable has a calculated t-value of -4.818 < 2.002 and a significance level of 0.001 < 0.05, indicating that the Risk-Based Capital (RBC) variable has a significant negative effect on the Debt-to-Equity Ratio (DER) in the t-test. This means that Risk-Based Capital (RBC) has a significant negative direction on the Debt-to-Equity Ratio (DER). Therefore, hypothesis H3 in this study is accepted.
4) The effect of Risk-Based Capital (RBC) on Return on Assets (ROA) through the Debt-to-Equity Ratio (DER)

The test results show that the relationship between Risk-Based Capital (RBC) and Return on Assets (ROA) via the Debt-to-Equity Ratio (DER) has a calculated t-value of 4.82352941 > 2.002 and a significance level of 0.000 < 0.05, indicating a significant positive effect in the t-test. This means that Risk-Based Capital (RBC) on Return on Assets (ROA) through the Debt-to-Equity Ratio (DER) has a significant positive direction. Therefore, hypothesis H4 in this study is accepted.

Discussion

The Effect of Risk-Based Capital (RBC) on Return on Assets (ROA)

The effect of Risk-Based Capital (RBC) on Return on Assets (ROA) is indicated by a regression coefficient of 0.003, with a positive direction and a t-significance value of 0.017 < 0.05, meaning that Risk-Based Capital (RBC) has a positive and significant effect on Return on Assets (ROA). Based on this, it can be concluded that H1, which states the effect of Risk-Based Capital (RBC) on Return on Assets (ROA), is accepted. This implies that an increase in RBC is followed by an increase in ROA, reflecting that the better the RBC level relative to a company's risk, the higher the ROA or the company's ability to generate profit from its assets. Conversely, the lower a company's RBC level relative to its risk, the lower its ROA or the company's ability to generate profits from its assets. In other words, sound Risk-Based Capital reflects healthy risk and capital management that can enhance a company's profitability, as measured by ROA. The results of this study are consistent with research conducted by Soniati et al., (2020); Nurhayati et al., (2020); Nurrosis & Rahayu (2020); William & Colline (2022); Ritha (2023); and Martana & Karim (2024), indicating that Risk-Based Capital has a positive and significant effect on the financial performance (ROA) of insurance companies.

The Effect of the Debt-to-Equity Ratio (DER) on Return on Assets (ROA)

The effect of the Debt-to-Equity Ratio (DER) on Return on Assets (ROA) is indicated by a regression coefficient of -0.001, with a negative direction and a t-significance value of 0.001 < 0.05, meaning that the Debt-to-Equity Ratio (DER) has a negative and significant effect on Return on Assets (ROA). Based on this, it can be concluded that H2, which states the effect of the Debt-to-Equity Ratio (DER) on Return on Assets (ROA), is accepted. This means that the higher the DER—or the greater the proportion of debt relative to equity used by the company—the lower the ROA, or the company's ability to generate profit from its assets, tends to be. Conversely, the lower the DER or the smaller the proportion of debt relative to equity used by the company, the higher the ROA or the company's ability to generate profit from its assets tends to be. These findings align with studies conducted by Olihin (2019); Maulana & Mulyana (2020); Chandra et al. (2020); and Situmorang (2023), which concluded that there is a negative and significant relationship between the Debt-to-Equity Ratio (DER) and Return on Assets (ROA).

The Effect of Risk-Based Capital (RBC) on the Debt-to-Equity Ratio (DER)

The effect of Risk-Based Capital (RBC) on the Debt-to-Equity Ratio (DER) is indicated by a regression coefficient of -0.246, with a negative direction and a t-significance value of 0.001 < 0.05, which means that Risk-Based Capital (RBC) has a negative and significant effect on the Debt-to-Equity Ratio (DER). Based on this, it can be concluded that H3, which states the effect of Risk-Based Capital (RBC) on the Debt-to-Equity Ratio (DER), is accepted. This means that the higher the RBC, the lower the DER tends to be. Conversely, the lower the RBC, the higher the DER tends to be. These results imply that companies with higher RBC levels tend to use less debt relative to equity, causing the DER to decrease. Conversely, companies with lower RBC levels tend to use more debt relative to equity, causing the DER to increase. In this context, RBC—as a measure of capital adequacy ( )—indicates that companies possess strong financial capacity, so they do not need to rely on debt as heavily as companies with lower RBC levels. The results of this study are consistent with research conducted by Maulana & Mulyana (2020) and Hery et al. (2023), which concluded that there is a significant negative relationship between Risk-Based Capital (RBC) and the Debt-to-Equity Ratio (DER).

The effect of Risk-Based Capital (RBC) on Return on Assets (ROA) through the Debt-to-Equity Ratio (DER)

The effect of Risk-Based Capital (RBC) on Return on Assets (ROA) through the Debt-to-Equity Ratio (DER) is indicated by a regression coefficient of 4.823 with a positive direction and a significance value of 0.000 < 0.05, which means that Risk-Based Capital (RBC) has a positive and significant effect on Return on Assets (ROA) through the Debt-to-Equity Ratio (DER). Based on this, it can be concluded that H4, which states that Risk-Based Capital (RBC) has a significant effect on Return on Assets (ROA) through the Debt-to-Equity Ratio (DER), is accepted. This means that every increase in the DER, influenced by RBC, will tend to also increase ROA. Conversely, every decrease in the DER, influenced by RBC, will tend to also decrease ROA. The positive direction indicates a direct relationship, meaning that an increase in RBC through an increase in DER will increase ROA. Conversely, a decrease in RBC through a decrease in DER will decrease ROA. These results indicate that insurance companies capable of maintaining RBC and optimizing DER will increase ROA. These findings align with the research conducted by Akpan et al. (2021), which states that RBC has a significant positive effect on ROA through DER.

5. CONCLUSIONS AND LIMITATIONS

Based on the results of the study, the following conclusions be drawn: Risk-Based Capital (RBC) has a positive and significant effect on Return on Assets (ROA) for insurance companies listed on the Indonesia Stock Exchange. This implies that an increase in RBC is followed by an increase in ROA, reflecting that the higher the RBC level, the higher the ROA level. Conversely, the lower the RBC level, the lower the ROA level. The Debt-to-Equity Ratio (DER) has a negative and significant effect on Return on Assets (ROA) for insurance companies listed on the Indonesia Stock Exchange. This implies that as the DER increases, ROA tends to decrease. Conversely, as the DER decreases, ROA tends to increase. Risk-Based Capital (RBC) has a negative and significant effect on the Debt-to-Equity Ratio (DER) for insurance companies listed on the Indonesia Stock Exchange. This means that as RBC increases, DER tends to decrease. Conversely, as RBC decreases, DER tends to increase. Risk-Based Capital (RBC) has a significant effect on Return on Assets (ROA) through the Debt-to-Equity Ratio (DER) for insurance companies listed on the Indonesia Stock Exchange. This implies that any increase in the DER, influenced by RBC, tends to also increase ROA. Conversely, any decrease in the DER, influenced by RBC, tends to also decrease ROA.

Based on the coefficient of determination, Risk-Based Capital (RBC) and the Debt-to-Equity Ratio (DER) contribute 77.3% to Return on Assets (ROA). The remaining 22.7% of the is influenced by other factors; thus, it can be concluded that the independent variables used in this study do not yet encompass all factors affecting Return On Assets (ROA) in insurance companies listed on the Indonesia Stock Exchange (IDX). Furthermore, this study is limited to the insurance sector listed on the Indonesia Stock Exchange (IDX) only, so it cannot yet be generalized to other sectors. For future researchers, it is recommended to include additional variables suspected of influencing Return on Assets (ROA), such as the underwriting ratio, claims expense, and others. Future research can be conducted in other sectors, such as the manufacturing sector. With this diversity, it is hoped that the results obtained can be generalized to an even broader scope.

Declarations

Author Contributions: All authors contributed to the development and completion of this research. The first author was responsible for research implementation, secondary data collection, data processing, statistical analysis, and preparation of the initial manuscript. The second author contributed to the development of the research framework, methodological direction, and interpretation of financial analysis results. The third author provided academic supervision, critical review, and final improvement of the manuscript. All authors have reviewed and approved the final version of the article. **Funding:** This research was conducted independently without receiving financial support from government institutions, private organizations, companies, or external research funding agencies. **Conflict of Interest:** The authors declare that there is no conflict of interest related to the research objectives, data analysis, interpretation of findings, authorship, or publication of this article. **Data Availability:** The data used in this study were obtained from publicly available secondary sources, including financial reports of insurance companies listed on the Indonesia Stock Exchange during the 2020–2024 period. The data can be accessed through

official public disclosures and relevant financial reporting platforms. **Generative AI Disclosure:** The authors declare that generative artificial intelligence tools were not used to generate research data, conduct statistical analysis, interpret empirical findings, or replace the authors' intellectual contribution in preparing this manuscript.

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