



The Effect of Premiums, Investments, Claims, and Underwriting on RBC: Moderating Profitability in Insurance on the IDX 2020–2025

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Abstract

This study examines the effects of premium income, investment returns, claim expenses, and underwriting results on risk-based capital (RBC), with profitability as a moderating variable, in insurance companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2025 period. This study employs a quantitative approach using secondary data obtained from the companies' annual reports. The research population comprises 12 insurance companies listed on the IDX. A purposive sampling technique was applied, resulting in 72 observations from 12 companies. The data were analyzed using multiple linear regression and Moderated Regression Analysis (MRA). The findings indicate that premium income has no significant effect on risk-based capital. Investment returns have a positive and significant effect on risk-based capital, whereas claim expenses have a negative and significant effect. Underwriting results also have a negative and significant effect on risk-based capital. Furthermore, profitability does not moderate the relationship between premium income, investment returns, claim expenses, or underwriting results and risk-based capital. These findings suggest that profitability does not strengthen or weaken the effects of the examined financial factors on the solvency level of insurance companies.

Keywords: *Premium Income, Investment Returns, Claim Expenses, Underwriting Results, Profitability, Risk-Based Capital (RBC).*

Introduction

The insurance industry plays a strategic role in maintaining financial stability by transferring risks from individuals and business entities to insurance companies. Through this mechanism, policyholders obtain protection against uncertain events, while insurers collect premiums and manage the accumulated funds to meet future obligations. Insurance companies also act as

financial intermediaries because a substantial portion of premium funds is invested in deposits, bonds, shares, government securities, and other financial instruments. Consequently, their financial soundness is important for policyholders, investors, regulators, and the broader financial system (Renaldo et al., 2021; Prayogi et al., 2023).



Insurance operations are nevertheless exposed to considerable uncertainty. Companies must balance premium income, investment performance, claim payments, underwriting activities, technical reserves, operating expenses, and capital requirements. Failure to manage these components effectively may weaken profitability and solvency. This issue became particularly relevant during 2020–2025, a period covering the COVID-19 pandemic and the subsequent economic recovery, both of which affected premium collection, investment performance, claim patterns, and insurers' financial resilience (Handriani & Arif, 2022; Hasan & Tampubolon, 2025).

Risk-Based Capital (RBC) is a major indicator of an insurance company's solvency and financial soundness. It reflects the adequacy of available capital relative to risks arising from assets, liabilities, insurance operations, and other activities. In Indonesia, insurance companies are required to maintain a minimum RBC ratio of 120%. A ratio above this threshold indicates sufficient capacity to absorb potential losses and meet policyholder obligations, whereas a low ratio signals greater financial vulnerability. Although the industry generally reports RBC levels above the regulatory minimum, variations across companies indicate that capital adequacy remains uneven (Sari et al., 2025).

Several operational and financial factors may explain these variations. Premium income is the primary source of revenue for insurers. Higher premium income may provide additional funds for claims, reserve formation, operations, and capital strengthening. However, premium growth does not automatically increase RBC because a larger portfolio may be accompanied by higher insured risks, technical reserves,

commissions, and future claims. Alamsyah and Wiratno (2017), Wijaya and Juwita (2023), and Herawati and Haikal (2024) reported a positive relationship between premium income and solvency, whereas Djayadi et al. (2018) and Albastiah and Isnaen (2021) found no significant effect.

Investment returns are another important source of income because insurers manage substantial policyholder funds over long periods. Effective investment management can increase assets, generate profits, and strengthen internal capital. Tansen and Tundjung (2021), Wijaya and Juwita (2023), and Hery et al. (2023) found positive effects of investment returns or assets on solvency. Conversely, Ambarwati and Fadhilah Hasib (2018) and Handayani (2023) reported insignificant effects. These differences suggest that the contribution of investment performance to RBC may depend on portfolio quality, market conditions, and the allocation of investment income.

Claim expenses represent the realisation of insured risks and directly reduce available financial resources. Increasing claims may weaken profitability and capital when they are not supported by sufficient premiums, reserves, and investment income. Wijaya and Juwita (2023) and Herawati and Haikal (2024) documented a negative effect of claims on solvency. In contrast, Anggraini and Aminah (2023) found a positive effect, while Djayadi et al. (2018) reported no significant relationship. This inconsistency suggests that the effect of claims may depend on reserve adequacy, reinsurance, risk selection, and overall financial capacity.

Underwriting results reflect the quality of an insurer's core operations. They represent the difference between underwriting income and expenses, particularly claims and



commissions. A positive result indicates effective risk selection, appropriate premium pricing, and claim-cost control. Such a surplus should increase profits and strengthen capital, whereas an underwriting deficit may weaken solvency. Tarigan and Mahfud (2015), Nurwidyaningsih (2018), and Anisesh Nur et al. (2019) found that underwriting risk or performance affected solvency. However, other evidence indicates that underwriting factors do not always significantly explain capital adequacy. Thus, the relationship between underwriting results and RBC remains unresolved.

These relationships can be explained through signalling theory. Financial information disclosed by management provides signals to external stakeholders regarding the company's condition and prospects. High premium income, favourable investment returns, positive underwriting results, strong profitability, and a high RBC ratio may be perceived as positive signals. Conversely, excessive claim expenses and declining capital adequacy may indicate financial pressure. Nevertheless, these implications depend on the company's ability to convert operational performance into profits and capital (Sinaga & Indrawati, 2022; Hasan & Tampubolon, 2025).

Profitability is therefore considered a potential moderating factor. It reflects the efficiency of a company in generating earnings from its assets and may strengthen internal capital through retained earnings. A highly profitable insurer may convert premium income, investment returns, and underwriting surpluses into additional capital more effectively. Profitability may also serve as a financial buffer that reduces the adverse effect of claim expenses on RBC. In companies with low profitability, revenue increases may instead be absorbed by

operating costs, losses, or other obligations (Handriani & Arif, 2022).

Previous studies have generally treated profitability as a direct determinant of solvency. Renaldo et al. (2021), Natasya and Mahardika (2019), and Anggraini and Aminah (2023) found that profitability was related to RBC or solvency, while Tarigan and Mahfud (2015), Albastiah and Isnaen (2021), and Handayani (2023) reported insignificant effects. Limited research has examined whether profitability changes the relationships between premium income, investment returns, claim expenses, underwriting results, and RBC. Moreover, many previous studies examined only selected variables, used pre-pandemic periods, or did not focus on publicly listed insurers.

This study addresses these gaps by integrating premium income, investment returns, claim expenses, and underwriting results into a single model and positioning profitability as a moderating variable. Its novelty lies in examining both the direct and conditional effects of these factors among insurance companies listed on the Indonesia Stock Exchange during 2020–2025. This period provides a relevant setting for evaluating solvency during pandemic-related disruption and economic recovery.

Accordingly, this study aims to examine the effects of premium income, investment returns, claim expenses, and underwriting results on RBC and to determine whether profitability moderates these relationships. The findings are expected to enrich the insurance solvency literature, provide management with insights into capital and risk management, and assist investors, regulators, and policyholders in evaluating

the financial resilience of listed insurance companies.

Literature Review and Hypothesis

Development

Signalling Theory and Risk-Based Capital

Signalling theory explains that management communicates financial information to reduce information asymmetry between companies and external stakeholders (Spence, 1973). In insurance companies, premium income, investment returns, claim expenses, underwriting results, profitability, and Risk-Based Capital (RBC) provide signals regarding financial performance and risk-management capacity. A high RBC ratio is generally interpreted as a positive signal because it indicates that the insurer has adequate capital to absorb potential losses and fulfil its obligations to policyholders (Prayogi et al., 2023)

Premium Income and Risk-Based Capital

Premium income is the principal source of operating revenue for insurance companies. Premiums are used to pay claims, establish technical reserves, finance operating activities, and support capital formation. When premium income increases and is managed efficiently, the company has more financial resources to strengthen its solvency position. Alamsyah and Wiratno (2017) found that premium income positively affected RBC, while Wijaya and Juwita (2023) showed that premium income significantly improved insurance company solvency. Herawati and Haikal (2024) also reported a positive relationship between premiums and RBC. These findings indicate that premium growth may improve capital adequacy when it exceeds the associated claims and operating expenses.

H1: Premium income has a positive effect on Risk-Based Capital.

Investment Returns and Risk-Based Capital

Insurance companies invest accumulated premium funds in deposits, bonds, shares, and other financial instruments to generate additional income. Higher investment returns increase assets and earnings that can be retained as internal capital. Investment income can also help insurers meet claim obligations without substantially reducing available capital. Tansen and Tundjung (2021) demonstrated that investment returns positively affected solvency, while Wijaya and Juwita (2023) found a positive and significant effect on insurance company solvency. Hery et al. (2023) further showed that investment assets strengthened RBC. Therefore, effective investment management is expected to enhance capital adequacy.

H2: Investment returns have a positive effect on Risk-Based Capital.

Claim Expenses and Risk-Based Capital

Claim expenses represent the financial obligations paid by insurers when insured events occur. Higher claim expenses reduce cash, assets, earnings, and the capital available to absorb risks. When claims increase without sufficient support from premiums, technical reserves, and investment income, the insurer's solvency position may deteriorate. Vaughan and Vaughan (2014) argue that excessive claims can reduce profitability and weaken financial stability. Wijaya and Juwita (2023) found that claim expenses negatively affected solvency, while Herawati and Haikal (2024) reported a significant negative relationship between claims and RBC. These findings suggest that rising claim expenses place pressure on capital adequacy.

H3: Claim expenses have a negative effect on Risk-Based Capital.

Underwriting Results and Risk-Based Capital

Underwriting results are obtained from the difference between underwriting income and related expenses, including claim and commission expenses. A positive underwriting result indicates that the company has effectively selected risks, determined appropriate premiums, and controlled claims. An underwriting surplus increases earnings and provides internal funds that may be retained to strengthen capital. Sastri et al. (2017) explain that better underwriting performance increases the profits available for investment and capital formation. Tarigan and Mahfud (2015) and Nurwidyaningsih (2018) also found that underwriting risk significantly affected insurance company solvency. Therefore, favourable underwriting results are expected to improve RBC.

H4: Underwriting results have a positive effect on Risk-Based Capital.

Profitability as a Moderating Variable

Profitability reflects the company's ability to generate earnings from its assets. Higher profitability increases retained earnings and provides an internal financial buffer that may strengthen capital adequacy. Therefore, profitability is expected to influence the strength of the relationships between the operational factors and RBC.

Premium income does not automatically increase RBC because part of the premiums must be allocated to claims, commissions, technical reserves, and operating costs. When profitability is high, the company is more capable of converting premium income into net earnings and additional capital. Maharani and Puwanto (2025) indicate that premium income contributes to financial performance when it is managed efficiently. Thus,

profitability is expected to strengthen the contribution of premium income to RBC.

H5: Profitability strengthens the positive effect of premium income on Risk-Based Capital.

Investment returns may strengthen capital only when the income generated is not fully absorbed by operating losses or other obligations. Vaughan and Vaughan (2014) explain that investment income supports insurers' earnings and financial capacity. Companies with high profitability can retain a greater proportion of investment income as additional capital. Therefore, the positive relationship between investment returns and RBC is expected to be stronger when profitability is high.

H6: Profitability strengthens the positive effect of investment returns on Risk-Based Capital.

High claim expenses normally reduce assets and capital. However, profitable insurers possess additional earnings that can absorb claim-related pressures. Wahyono et al. (2021) and Sinaga et al. (2023) suggest that adequate profitability provides financial resilience when companies face increasing insurance obligations. Thus, profitability is expected to reduce the adverse effect of claim expenses on capital adequacy.

H7: Profitability weakens the negative effect of claim expenses on Risk-Based Capital.

A positive underwriting result contributes to earnings from the insurer's core business activities. However, its effect on RBC may depend on whether the company can convert the underwriting surplus into net profit and retained capital. Cummins et al. (1995) explain that underwriting performance and capital adequacy are closely related to insurers' ability to absorb risks. Krache et al.



(2024) also indicate that underwriting surplus and profitability contribute to a stronger capital structure. Therefore, profitability is expected to reinforce the contribution of underwriting results to RBC.

H8: Profitability strengthens the positive effect of underwriting results on Risk-Based Capital.

Research methods

This study employed a quantitative approach with secondary data obtained from the financial statements and annual reports of insurance companies listed on the Indonesia Stock Exchange during the 2020–2025 period. The study population consisted of 18 insurance companies, while the sample was determined using a purposive sampling technique based on the criteria of companies listed consecutively, publishing complete annual financial reports, and providing all required data. Based on these criteria, 12 companies were selected over a six-year observation period, resulting in 72 observations.

Risk-Based Capital (RBC) was measured by dividing the available solvency margin by the minimum required risk-based capital and multiplying the result by 100%. Premium income, investment returns, and claim expenses were measured using the respective total amounts reported in the annual financial statements and transformed into natural logarithms. Underwriting results were measured as the difference between underwriting income and underwriting expenses and were retained in their original values because some observations were negative. Profitability, as the moderating variable, was proxied by return on assets

(ROA), calculated as net income after tax divided by total assets. All data were obtained from the annual reports available on the Indonesia Stock Exchange website and the respective companies' official websites.

Data analysis was conducted using descriptive statistics, classical assumption tests including normality, multicollinearity, autocorrelation, and heteroscedasticity tests, and multiple linear regression analysis to examine the effect of premium income, investment returns, claim expenses, and underwriting results on RBC. The role of profitability as a moderating variable was tested using Moderated Regression Analysis (MRA) by entering the primary variable of profitability and the interaction between profitability and each independent variable into the regression model. Hypothesis testing was conducted using an F-test to assess model feasibility and the simultaneous influence of variables, a t-test to examine partial influence and moderating effects, and a coefficient of determination to measure the model's ability to explain variations in RBC. The hypothesis testing decision was set at a 5 percent significance level.

Results and Discussion

Descriptive Statistics

This study uses data from insurance companies listed on the Indonesia Stock Exchange for the period 2020–2025. Descriptive statistics were calculated based on 72 observations from 12 companies over six years of observation. After data transformation and autocorrelation correction using the Cochrane–Orcutt method, the final regression analysis used 69 observations. The

results of the descriptive statistics are presented in Table 1.

Table 1. Descriptive Statistics

Variable	N	Min	Max	Mean	St. Dev.
Premium Income	72	23.44	29.83	27.01	1.43
Investment Returns	72	22.03	27.67	24.49	1.43
Claim Expenses	72	23.34	29.74	26.38	1.63
Underwriting Results	72	-116.55	1,023.71	199.17	215.33
Risk-Based Capital	72	139.01	2,011.51	457.61	379.60
Profitability	72	-0.03	0.06	0.02	0.01

Source: Processed data, 2026.

The descriptive statistics show that the average risk-based capital ratio of insurance companies was 457.61%, higher than the minimum solvency threshold of 120%. This indicates that, in general, the insurance companies in the sample have adequate capacity to meet their obligations. However, the relatively high standard deviation of RBC indicates significant differences in solvency levels between companies. Underwriting results also exhibit high variation and a negative minimum value, indicating that some companies experienced underwriting losses during certain periods. Meanwhile, the average profitability, proxied by return on assets, of 0.0214 or 2.14%, indicates that companies' ability to generate profits from their assets remains relatively low.

Classical Assumption Test

Initial normality test results showed a Kolmogorov–Smirnov significance value of 0.000, indicating that the residuals were not normally distributed. After transforming the premium income and risk-based capital variables, the significance value increased to 0.200, indicating that the residuals were

normally distributed. Multicollinearity test results showed that all variables had tolerance values greater than 0.10 and variance inflation factors less than 10. Therefore, the model did not experience multicollinearity.

Initial Durbin–Watson test results showed a value of 2.385, requiring correction using the Cochrane–Orcutt method. After correction, the Durbin–Watson value was 2.101, falling between the dU value of 1.768 and the 4–dU value of 2.232. These results indicate that the model does not experience autocorrelation. Furthermore, scatterplot test results showed that the residual points were randomly distributed above and below zero and did not form a specific pattern. Therefore, the regression model is declared free from heteroscedasticity and meets the classical assumptions.

Multiple Linear Regression Analysis Results

Multiple linear regression analysis was used to test the effect of premium income, investment returns, claims expenses, underwriting returns, and profitability on risk-based capital. The test results are presented in Table 2.

Based on the analysis results, the research regression equation can be formulated as follows:

$$RBC = 2,391 - 0,316PP + 0,381HI - 0,192BK - 0,001HU + 0,562PB + e$$

The test results show that premium income has a coefficient of -0.316 with a significance value of 0.614.

Table 2. Results of Multiple Linear Regression Analysis

Variable	Coeff (B)	t-statistic	p-value	Conclusion
Constant	2.391	0.669	0.506	—
Premium Income	-0.316	-0.507	0.614	Not sign.
Investment Returns	0.381	5.492	0.001	Positive and sign.
Claim Expenses	-0.192	-1.994	0.051	Negative and not sign.
Underwriting Results	-0.001	-2.756	0.008	Negative and sign.
Profitability	0.562	0.142	0.887	Not sign.

Source: Processed data, 2026.

Thus, premium income does not significantly influence risk-based capital. This indicates that changes in premium income do not directly affect the capital adequacy level of insurance companies.

Investment returns have a coefficient of 0.381 with a significance value of 0.000. These results indicate that investment returns have a positive and significant effect on risk-based capital. Therefore, increasing investment returns can strengthen a company's ability to maintain solvency and risk-based capital adequacy.

Claims expense has a coefficient of -0.192 with a significance value of 0.051. The negative coefficient indicates that increasing claims expense tends to decrease risk-based capital. However, because the significance value is greater than 0.05, this effect is not statistically significant. Meanwhile, underwriting results have a coefficient of -0.001 with a significance value of 0.008, thus having a negative and significant effect on risk-based capital. These findings indicate that the increase in underwriting results during the study period was actually associated with a decrease in RBC, which could be caused by increased risk exposure or capital requirements associated with the company's underwriting activities.

Profitability has a coefficient of 0.562 with a significance value of 0.887. These results indicate that profitability does not significantly influence risk-based capital. Therefore, the amount of profit generated from asset utilization does not directly determine the level of risk-based capital adequacy of an insurance company.

Model Feasibility and Coefficient of Determination

The F-test results showed an F-statistic of 7.317 with a significance value of 0.000. A significance value less than 0.05 indicates that the regression model is suitable for explaining the relationship between premium income, investment returns, claims expenses, underwriting results, profitability, and risk-based capital.

The adjusted R-square value of 0.317 indicates that premium income, investment returns, claims expenses, underwriting results, and profitability can explain 31.7% of the variation in risk-based capital. Meanwhile, 68.3% of the variation in RBC is explained by other factors not included in the research model, such as company size, liquidity, loss ratio, capital structure, own retention ratio, and risk management quality.

Moderation Test Results

Moderation testing was conducted using Moderated Regression Analysis to determine the ability of profitability to strengthen or weaken the influence of premium income, investment returns, claims expenses, and underwriting results on risk-based capital. The results of the interaction test are presented in Table 3.

The test results show that the interaction of premium income with profitability has a significance value of 0.965, while the

Table 3. Moderation Test Results

Interaction Variable	Coeff. (B)	t- statistic	p- value	Conclusion
Premium Income & Profitability Interaction	-0.868	-0.044	0.965	Does not moderate
Investment Returns & Profitability Interaction	6.873	1.638	0.107	Does not moderate
Claim Expenses & Profitability Interaction	-6.207	-1.709	0.093	Does not moderate
Underwriting Results & Profitability Interaction	-0.012	-0.452	0.653	Does not moderate

Source: Processed data, 2026.

interaction of investment returns with profitability has a significance value of 0.107.

The test results show that the interaction of premium income with profitability has a significance value of 0.965, while the interaction of investment returns with profitability has a significance value of 0.107. The interaction of claims expense with profitability has a significance value of 0.093 and the interaction of underwriting results with profitability has a significance value of 0.653. All significance values are greater than 0.05. Thus, profitability is unable to moderate the influence of premium income, investment returns, claims expenses, or underwriting results on risk-based capital.

The results of the F test on the moderation model show a value of 5.050 with a significance of 0.000, so that the moderation model as a whole is declared feasible. The adjusted R-square value of the moderation model is 0.323, indicating that the model is able to explain variations in risk based capital of 32.3%, while 67.7% is explained by other factors outside the model. Compared with the model without interaction, the adjusted R-square value only increased from 0.317 to 0.323. This relatively small increase, accompanied by the insignificance of all interaction coefficients, strengthens the

conclusion that profitability does not play a role as a moderating variable in this research.

Discussions

The Effect of Premium Income on Risk-Based Capital

The results show that premium income has a negative but statistically insignificant effect on Risk-Based Capital, with a coefficient of -0.316 and a significance value of 0.614. Therefore, H1 is not supported. This finding indicates that an increase in premium income does not automatically improve the capital adequacy of insurance companies. Although premiums constitute the primary source of operating revenue, the funds received cannot be treated entirely as additional capital because they must also be allocated to claim payments, commissions, operating expenses, and technical reserves. Moreover, an increase in premium income may be accompanied by an expansion of insurance coverage and greater risk exposure, which simultaneously increases the company's required risk-based capital.

From the perspective of signalling theory, high premium income may initially provide a positive signal concerning market confidence and the company's ability to attract policyholders. However, premium income does not necessarily signal stronger solvency when it is accompanied by increasing liabilities and insurance risks. This finding is consistent with Djayadi et al. (2018), who reported that premium income did not significantly affect RBC, and Albastiah and Isnaen (2021), who found that net premiums did not significantly influence insurance company solvency. However, the result differs from Alamsyah and Wiratno (2017), Wijaya and Juwita (2023), and Herawati and Haikal (2024), who found positive effects. These differences suggest that the effect of premium income depends on the efficiency of



premium management, risk selection, reserves, and claim control.

The Effect of Investment Returns on Risk-Based Capital

Investment returns have a positive and significant effect on RBC, as indicated by a coefficient of 0.381 and a significance value below 0.001. Accordingly, H2 is supported. This result demonstrates that higher investment returns strengthen the solvency position of insurance companies. Investment income increases company assets and provides additional financial resources that may be used to fulfil claim obligations, establish reserves, and strengthen internal capital. Effective investment management also reduces the company's dependence on premium income as the sole source of funds. Therefore, insurers that generate higher investment returns are generally more capable of maintaining capital above the minimum risk-based solvency requirement.

This finding supports signalling theory because strong investment performance provides a positive signal regarding management's ability to manage policyholder funds efficiently and prudently. Favourable investment returns demonstrate that the company can generate additional income while maintaining sufficient liquidity and capital. The result is consistent with Tansen and Tundjung (2021), who found that investment returns positively affected solvency, as well as Wijaya and Juwita (2023), who documented a positive and significant relationship between investment returns and insurance company solvency. Hery et al. (2023) similarly reported that investment assets strengthened RBC. Thus, investment performance represents an important determinant of capital adequacy, particularly when investment portfolios are

managed according to risk, liquidity, and liability-matching considerations.

The Effect of Claim Expenses on Risk-Based Capital

Claim expenses have a negative but statistically insignificant effect on RBC, with a coefficient of -0.192 and a significance value of 0.051. Therefore, H3 is not supported at the 5% significance level. The negative coefficient is consistent with the theoretical expectation that increasing claims reduce cash, assets, earnings, and capital available to cover risks. Nevertheless, the insignificant result indicates that changes in claim expenses were not sufficiently strong to explain variations in RBC among the sampled companies. This may occur because insurance companies establish technical reserves, use reinsurance protection, and maintain investment income to absorb claim payments. Consequently, claim expenses do not always directly reduce the capital used in the RBC calculation.

From a signalling perspective, high claim expenses may constitute a negative signal because they can indicate increasing insurance risk or weaknesses in risk selection. However, when a company has adequate reserves and effective reinsurance arrangements, stakeholders may not interpret increasing claims as an immediate threat to solvency. This finding is consistent with Djayadi et al. (2018), who reported that claims did not significantly affect RBC, and with studies indicating that claims may not determine solvency independently. However, it differs from Wijaya and Juwita (2023) and Herawati and Haikal (2024), who found that claims negatively and significantly affected solvency. These differences indicate that the impact of claims depends on reserve adequacy, reinsurance, liquidity, investment income, and overall risk-management quality.

The Effect of Underwriting Results on Risk-Based Capital

Underwriting results have a negative and significant effect on RBC, with a coefficient of -0.001 and a significance value of 0.008 . Although the effect is significant, its negative direction contradicts the positive relationship proposed in H4. Therefore, H4 is not supported. This result suggests that higher underwriting results do not necessarily improve capital adequacy. Companies generating higher underwriting income may also expand their insurance portfolios and assume greater levels of risk. As their underwriting activities increase, the required risk-based capital may rise more rapidly than the available capital, resulting in a lower RBC ratio. In addition, underwriting surpluses may be allocated to technical reserves, business expansion, liabilities, or dividend payments rather than retained entirely as capital.

Under signalling theory, a positive underwriting result should theoretically provide a favourable signal regarding risk selection, premium pricing, and claim management. However, the present result shows that underwriting growth may convey an ambiguous signal when it is accompanied by greater insurance exposure. The finding is consistent with Nasution and Nanda (2020), who found a negative relationship involving underwriting results, and with Veronica et al. (2024), who emphasised that underwriting performance must be supported by effective risk and capital management. However, it differs from Tarigan and Mahfud (2015) and Nurwidyaningsih (2018), who found that underwriting performance or risk significantly strengthened solvency. The negative result therefore highlights the importance of balancing underwriting

expansion with capital accumulation and prudent risk selection.

The Moderating Effect of Profitability on the Relationship Between Premium Income and Risk-Based Capital

The interaction between premium income and profitability has a negative and statistically insignificant coefficient of -0.868 , with a significance value of 0.965 . Therefore, H5 is not supported. Profitability does not strengthen or weaken the relationship between premium income and RBC. This finding indicates that companies with higher profitability are not necessarily more capable of converting increasing premium income into additional risk-based capital. Premium revenue may continue to be absorbed by claim payments, technical reserves, acquisition costs, and other operating expenses regardless of the company's level of profitability. Furthermore, profitability may originate from investment or non-underwriting activities rather than from the premiums collected.

Theoretically, profitability was expected to improve the contribution of premium income to capital because higher earnings can increase retained earnings. However, the result indicates that profitability does not change the effect of premiums on RBC. This finding is consistent with Albastiah and Isnaen (2021), who reported that premiums and profitability did not significantly influence solvency, and with Handriani and Arif (2022), who suggested that insurance profitability is affected by several financial components and may not strengthen the effects of individual revenue sources. From a signalling perspective, high premiums and profitability may both provide positive signals, but their interaction does not necessarily represent stronger solvency because RBC is also determined by liabilities,

reserves, risk exposure, and regulatory capital requirements.

The Moderating Effect of Profitability on the Relationship Between Investment Returns and Risk-Based Capital

The interaction between investment returns and profitability has a positive coefficient of 6.873 but is statistically insignificant, with a significance value of 0.107. Therefore, H6 is not supported. This finding shows that profitability does not strengthen the positive effect of investment returns on RBC. Although investment returns directly improve RBC, their contribution to solvency appears to occur independently of the company's overall profitability. Investment income may directly increase financial assets and liquidity even when the return on total assets remains relatively low. Conversely, a company may report high profitability while allocating investment income to dividends, operating expansion, or other purposes rather than retaining it as capital.

Theoretically, higher profitability was expected to enable companies to retain more investment income and strengthen capital accumulation. However, the insignificant interaction indicates that investment returns are more directly related to RBC than to the combined condition of investment performance and profitability. This result can be associated with Handayani (2023), who found that profitability and investment returns did not always significantly influence solvency, and Ambarwati and Fadhilah Hasib (2018), who reported that the individual relationship between investment results and solvency was not consistently significant. The finding suggests that investment returns contribute to RBC through asset growth and liquidity, while profitability reflects the combined outcome of underwriting, investment, and operational activities and

therefore does not necessarily alter this relationship.

The Moderating Effect of Profitability on the Relationship Between Claim Expenses and Risk-Based Capital

The interaction between claim expenses and profitability has a negative coefficient of -6.207 and a significance value of 0.093. Since the significance value exceeds 0.05, H7 is not supported. Profitability does not significantly weaken the negative effect of claim expenses on RBC. Although profitable companies theoretically possess a larger earnings buffer to absorb claim payments, the results suggest that profitability is not the primary mechanism used to manage claim-related pressures. Insurance companies generally fulfil claims through premium funds, technical reserves, liquid assets, and reinsurance recoveries rather than through current-period profits alone.

From a theoretical perspective, profitability should reduce the adverse effect of claims because retained earnings provide additional financial capacity. However, the absence of a moderating effect indicates that claim management is more closely related to reserve adequacy, liquidity, reinsurance, and underwriting quality. This result is consistent with Handriani and Arif (2022), who explained that profitability does not always strengthen the effects of other financial variables on insurance company performance. It also supports Nasution and Nanda (2020), who emphasised the importance of underwriting and financial management factors in determining insurers' financial conditions. In signalling terms, strong profitability may provide a positive signal, but it cannot fully offset the negative information associated with increasing claims when risk exposure and capital requirements also increase.



The Moderating Effect of Profitability on the Relationship Between Underwriting Results and Risk-Based Capital

The interaction between underwriting results and profitability has a negative coefficient of -0.012 and a significance value of 0.653 . Therefore, H8 is not supported. Profitability does not strengthen the relationship between underwriting results and RBC. This finding indicates that an underwriting surplus, even when accompanied by high profitability, does not necessarily translate into stronger capital adequacy. Underwriting income may be offset by investment losses, operating costs, technical reserve requirements, business expansion, or increasing risk exposure. Consequently, overall profitability does not determine whether underwriting results will improve RBC.

Theoretically, profitability was expected to strengthen the effect of underwriting results because underwriting surpluses and overall earnings could jointly increase retained capital. However, the empirical result suggests that RBC is influenced by the allocation of profits and the level of risk borne rather than by the simultaneous presence of underwriting surplus and profitability. This result is consistent with Sinaga and Indrawati (2022), who indicated that underwriting and profitability do not always produce consistent effects on insurance companies' financial conditions. Handriani and Arif (2022) also noted that profitability reflects various financial activities and may not strengthen the contribution of a particular operating component. Thus, profitability does not function as a moderating variable in the relationship between underwriting results and RBC.

Conclusion

Based on the analysis of insurance companies listed on the Indonesia Stock Exchange for the 2020–2025 period, premium income did not significantly impact risk-based capital. Investment returns had a positive and significant effect, while claims expense had a negative but insignificant effect on risk-based capital. Meanwhile, underwriting results had a negative and significant effect on risk-based capital. These findings indicate that investment returns are a crucial factor in strengthening a company's solvency, while underwriting management requires attention because it can be associated with increased risks borne by the company.

Profitability was not shown to moderate the effect of premium income, investment returns, claims expense, or underwriting results on risk-based capital. Therefore, profitability levels were unable to strengthen or weaken the relationship between these operational factors and risk-based capital adequacy in insurance companies during the study period.

Insurance companies are advised to optimize the management of investments, premiums, claims, and underwriting while maintaining a balance between business growth and risk. Investors should consider the level of risk-based capital, investment returns, profitability, and the company's ability to maintain solvency before making investment decisions. Further research can add variables such as company size, liquidity, loss ratio, and retention ratio, as well as expand the period and number of samples to make the research results more comprehensive.

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