



Analysis of Early Warning System (EWS) and Risk-Based Capital (RBC) on the Financial Performance of Sharia Insurance Companies

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ABSTRACT

Maintaining financial performance and public trust is a difficulty for the Islamic insurance sector, especially in light of many company default situations. When evaluating how well Islamic insurance businesses manage tabarru' funds, underwriting surplus is a crucial metric. The purpose of this study is to examine the impact of Risk-Based Capital (RBC) and the Early Warning System (EWS), as represented by the claim expense, retention, and asset liquidity ratios, on the underwriting surplus of Islamic general insurance companies that are registered with the Indonesian Islamic Insurance Association (AASI) for the years 2022–2024. Quarterly data from six Islamic general insurance businesses, three full-fledged general insurance companies and three Islamic unit insurance companies. The study employs a quantitative methodology. The study's findings show that underwriting surplus is unaffected by the retention ratio or the claim expense ratio. On the other hand, underwriting excess is influenced by the asset liquidity ratio and Risk-Based Capital (RBC). All factors have a substantial impact on underwriting surplus at the same time.

ABSTRAK

Mempertahankan kinerja keuangan dan kepercayaan publik merupakan kesulitan bagi sektor asuransi syariah, terutama mengingat banyaknya situasi gagal bayar perusahaan. Dalam mengevaluasi seberapa baik bisnis asuransi syariah mengelola dana tabarru', surplus underwriting merupakan metrik yang krusial. Tujuan penelitian ini adalah untuk menguji dampak Modal Berbasis Risiko (RBC) dan Sistem Peringatan Dini (EWS), yang diwakili oleh rasio biaya klaim, retensi, dan likuiditas aset, terhadap surplus underwriting perusahaan asuransi umum syariah yang terdaftar di Asosiasi Asuransi Syariah Indonesia (AASI) untuk tahun 2022–2024. Dengan menggunakan analisis regresi data panel Model Efek Umum (CEM) dan data triwulanan dari enam bisnis asuransi umum syariah, tiga perusahaan asuransi umum penuh dan tiga perusahaan asuransi unit syariah. Penelitian ini menggunakan metodologi kuantitatif. Temuan penelitian menunjukkan bahwa surplus underwriting tidak dipengaruhi oleh rasio retensi atau rasio biaya klaim. Di sisi lain, surplus underwriting dipengaruhi oleh rasio likuiditas aset dan Modal Berbasis Risiko (RBC). Semua faktor tersebut memiliki dampak substansial terhadap surplus underwriting secara bersamaan.



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INTRODUCTION

Risk is an integral part of life, whether it is avoidable or not. Insurance serves as a protection mechanism to reduce the impact of undesirable events (Tri Azmi Ramadhani et al., 2023). The insurance industry in Indonesia has excellent growth opportunities, making the sustainability and reputation of companies crucial factors (Widyastuti & Sholihah, 2022). Therefore, insurance companies are required to maintain their credibility in the public eye by strengthening corporate governance, implementing more comprehensive risk management, and increasing regulators' oversight (Hartono & Hanggraeni, 2024). However, significant challenges remain, particularly regarding declining public trust stemming from non-payment cases at several insurance companies (Hasanah & Kamal, 2022). According to data published by CNBC Indonesia, the three companies with the most significant default values were Wanaartha Life, with total liabilities of approximately IDR 15 trillion; Jiwasraya, with liabilities of IDR 12.4 trillion; and Kresna Life, with a default value of IDR 11.6 trillion. The high amount of unfulfilled obligations not only reflects the significant financial burden borne by companies but also indicates weak supervision and the ineffectiveness of regulations in maintaining the health of the insurance industry (Vincent et al., 2023).

One indicator of an insurance company's financial performance is its underwriting level. One of the main differences between Sharia insurance and conventional insurance lies in the concept of underwriting surplus. "Underwriting surplus is the difference between total participant contributions (premiums) minus total compensation/claims payments, reinsurance contributions, and increases in technical reserves within a specific period" (Widyastuti & Sholihah, 2022). This difference is then distributed proportionally between the insurance company and the policyholders, unlike conventional insurance, which treats premiums and claims as entirely the company's property. Achieving an underwriting surplus in the Islamic insurance industry can be considered a form of success for the company in managing participant funds efficiently, thereby increasing public trust (Septiani, 2021). Conversely, if the company's performance in managing participant funds deteriorates and is considered a failure, the insurance company experiences an underwriting deficit. If the deficit persists, the company may eventually be closed and deemed unfit to continue operations (Nasution et al., n.d.).

Based on data from the Financial Services Authority (OJK) Islamic Insurance Statistics (2018-2022), three key stages can be observed in the growth of the underwriting surplus of Islamic general insurance during the 2018-2022 period, which shows a pattern of sharp fluctuations. In 2018, the underwriting surplus was recorded at IDR 11,493,031 million and increased significantly to IDR 17,509,187 million in 2019, reflecting relatively stable industry conditions before the pandemic with fairly optimal contribution growth and risk management. Entering the pandemic period in 2020-2021, the surplus declined consecutively to IDR 11,295,155 million and IDR 9,837,360 million, which was influenced by the economic slowdown, increased claim risks, and pressure on contributions and investment returns. However, in 2022, there was a fairly strong recovery, with a surplus of IDR 18,555,031 million, in line with improving economic activity and strengthened stability and risk management in the sharia general insurance industry (Perasuransian & Statistics, 2022). According to research, the underwriting surplus drastically decreased to IDR 946 billion when the Covid-19 pandemic era began in 2020 as a result of more claims and lower premium payments (Ikhwan & Rusydiana, 2022). This aligns with Research (Alifianingrum & Suprayogi, 2019), which confirms that the pandemic has led to a significant decline in the insurance industry's financial performance, mainly due to increased claims and reduced premium contributions. After the pandemic, conditions began to improve in 2021, with a surplus of IDR 1.02 trillion, an early sign of recovery (Yuliadi & Fitranita, 2024). Although in 2022 it corrected again to IDR 948.4 billion, financial performance remained relatively stable, in line with (Sugiharto, 2021) findings that the community's economic foundation began to improve. However, it had not yet fully recovered. A significant increase was observed only in 2023, with a surplus of Rp1.17 trillion, marking a phase of full recovery, supported by the normalization of economic activity and public confidence in the financial industry. These findings reinforce the argument (Fusen et al., 2020) that underwriting performance is not only influenced by external factors such as crises, but also by internal factors such as risk management, efficiency, and the application of risk-based capital.

The EWS is a monitoring mechanism that provides early signals of potential financial problems in insurance companies. Three primary ratios the asset liquidity ratio, the retention ratio, and the claim expense ratio reflect EWS, according to (Siregar et al., 2022). The relationship between EWS and underwriting surplus is reflected in

EWS's role in controlling the underwriting process (Khalimah, 2019). Controlled claim expense ratio, optimal retention, and adequate liquidity enable companies to generate high underwriting surpluses (Djaddang & Mulyadi, 2025). Conversely, if one of the EWS indicators deteriorates, for example, a sharp increase in the loss ratio, the underwriting surplus will be depressed and even potentially in deficit. Thus, EWS functions as an early detection mechanism that keeps underwriting results positive and sustainable (Pebruary & Fabiani Fanda, 2022). In line with this, Risk-Based Capital (RBC) is a key component in the company's financial health indicators. RBC serves as a capital buffer, strengthening the quality of the company's results. Companies with high RBC levels have greater capacity to bear claim risks, set optimal retention, and reduce reinsurance costs, resulting in a more stable underwriting surplus. Conversely, low RBC limits the company's room for maneuver in underwriting activities and reduces the opportunity to obtain a surplus (Ardi et al., 2022).

Claims experience is reflected in the incurred loss ratio. According to Ismiatun Khasanah et al. (2022), a high incurred loss ratio denotes subpar underwriting procedures and the acceptance of large risks, both of which are indicators of subpar financial performance. The company's income and financial health are better when the ratio is lower. According to research (Sumartono & Harianto, 2018) and research (Deni Atif Hidayat dan Meina Wulansari Yusniar, 2021), shows that claim expenses affect profitability. Therefore, the higher the claim expenses submitted by policyholders, the greater the negative impact on insurance companies' profitability, and conversely, the lower the claim expenses submitted, the greater the positive impact on insurance companies' profitability. Thus, the hypothesis proposed is:

H₁: The claim expense ratio affects financial performance.

The Retention Ratio measures an insurance company's ability to retain existing premiums. According to (Satria, 1994) in (Utami & Werastuti, 2020), a low indicates that the company is more likely to invest most of its net premium, suggesting that the risks faced by the company are increasingly high and thus poor company performance. Research by (Fadrul, 2020) and (Utami & Werastuti, 2020) supports this. Consequently, the theory put forth is:

H₂: The retention ratio affects financial performance.

According to (Awaliyah & Barnas, 2020), "the Asset Liquidity Ratio is closely related to the insurance industry's ability to meet immediate financial obligations". The faster insurance companies settle claims submitted by policyholders, the higher their liquidity. If the ratio of liabilities to assets is smaller, the company's financial health is better. A high liquidity ratio suggests that the business may be insolvent and is experiencing liquidity issues. Research by (Fadrul, 2020) provides evidence for this, while research by (Deni Atif Hidayat dan Meina Wulansari Yusniar, 2021) contradicts this. Thus, the hypothesis proposed is:

H₃: Asset liquidity ratio affects financial performance.

RBC is used to assess the health or financial stability of insurance firms. An insurance company's financial health is positively correlated with its RBC health ratio. RBC is the capital that insurance firms need to have in order to ensure that they have enough money to fulfill claims, particularly in the event that the company in question fails (Bogar, 2016). Research (Fadrul, 2020), (Utami & Werastuti, 2020), and (Sumartono & Harianto, 2018) all corroborate this, demonstrating that RBC improves insurance firms' financial success. Therefore, the following hypothesis is put forth:

H₄: Risk-based capital affects financial performance.

There is an inconsistency in previous empirical findings regarding the relationship between EWS and RBC with underwriting surplus. Similarly, more research is required on the link between EWS and RBC and the underwriting surplus of sharia general insurance businesses registered with the Indonesian Sharia Insurance Association in 2022–2024, considering the previous default situations of various insurance companies.

RESEARCH METHOD

Using secondary data from the performance summary reports (financial data and ratios) of insurance companies listed on the Indonesian AASI for the years 2022–2024, this study employs a quantitative approach using a panel data linear regression analysis method, which combines cross-sectional and time series data. Purposive sampling is the sample strategy employed in this investigation. Purposive sampling, according to Sugiyono (2012) in (Awaliyah & Barnas, 2020), is a method for choosing samples according to certain standards. Several considerations taken in sampling are as follows: (1) Listed as a general insurance company on the AASI 2022-2024, (2) The company published quarterly financial reports for a period of 3 years or during the 2022-2024 period consecutively, (3) General insurance quarterly financial reports have the data needed in the study, namely claim expense ratio data, own retention ratio, asset liquidity ratio, RBC, and underwriting surplus. The number of general insurance companies that meet the criteria is 6, of which 3 are full-fledged

insurance companies and the other 3 are sharia general insurance companies registered with the Indonesian Sharia Insurance Association in 2022-2024. The analysis tool used in this study was Eviews 13.

Data analysis in this study uses multiple linear regression based on panel data. It begins by estimating the model using three approaches: the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (REM) (Basuki, 2016). From these three approaches, the most appropriate model is then selected through several stages of testing.

1. Chow Test, which is used to determine the best model between CEM and FEM. If the cross-section chi-square probability value is > 0.05 , then the model selected is the Common Effect Model. Conversely, if the cross-section chi-square probability is < 0.05 , then the Fixed Effect Model is more appropriate to use.
2. Hausman Test, which aims to choose between FEM and REM. If the cross-section chi-square probability value is > 0.05 , then the Random Effect Model is chosen. However, if the probability is < 0.05 , then the Fixed Effect Model is more appropriate.
3. Lagrange Multiplier (LM) test, which is conducted to determine whether CEM or REM is better. If the cross-section chi-square probability value is > 0.05 , then the Random Effect Model is selected. Conversely, if the probability is < 0.05 , the Common Effect Model is more appropriate.

Based on the test results, the final model selected in this study is the Common Effect Model (CEM). The selection of CEM is based on the results of the Chow Test and the Lagrange Multiplier (LM) Test, which indicate that the probability value is greater than 0.05, indicating no significant differences in individual characteristics across cross-sections. This indicates that the CEM model can represent the data efficiently without the need for fixed or random effects

RESULT AND DISCUSSION

RESULT

Each variable's mean, median, maximum, minimum, and standard deviation offer a statistical description of the variables in this study.

Table 1. Descriptive Statistics

	SU	BK	RS	LA	RBC
Mean	110.2937	0.944167	0.688472	2.271806	35.04222
Median	36.71000	0.750000	0.640000	1.855000	22.44000
Maximum	683.8300	6.050000	1.990000	5.450000	132.0900
Minimum	0.730000	0.140000	0.800000	1.050000	2.010000
Std. Dev.	155.0247	0.933417	0.342084	1.185943	35.65519
Obs	72	72	72	72	72

Source: Data Processed by the Author (Eviews 13)

Table 1 shows that the underwriting surplus rate of six sharia general insurance companies in 2022-2024 has an average of 110,2937 and a median of 36,71000. The highest or maximum underwriting surplus of 683,8300 occurred at PT Asuransi Askrida Syariah in the second and third quarters of 2023, while the lowest or minimum of 0,730000 occurred at PT Asuransi Wahana Tata in 2024.

In addition, the average claim expense for the six insurance companies for the 2022-2024 period was 0,944167, with a median of 0,750000. The highest or maximum claim expense was 6,050000, which occurred at PT Sampo Insurance Indonesia in 2022, while the lowest or minimum value of 0,140000 occurred in most insurance companies, such as PT Asuransi Askrida Syariah in 2023-2024, PT Sampo Insurance Indonesia in 2024, PT Asuransi Wahana Tata in 2022-2023, and PT Asuransi Takaful Umum in 2022 & 2024.

Retention at six insurance companies for the 2022-2024 period had an average value of 0,688472 and a median of 0,640000. In addition, the highest retention of 1,990000 was recorded at PT Sampo Insurance Indonesia and PT Mega Insurance in 2023-2024. Meanwhile, the lowest, 0,080000, occurred at PT Asuransi Askrida Syariah in 2024, PT Asuransi Wahana Tata in 2022-2024, PT Sampo Insurance Indonesia in 2022, and PT Asuransi Takaful Umum in 2022-2023.

The asset liquidity of the six insurance companies for the 2022-2024 period had an average value of 2,271806 and a median of 1,855000. The highest liquidity level was 5,450000, recorded for PT Chubb Syariah Indonesia 2022-2024 and PT Asuransi Wahana Tata 2022-2024. Meanwhile, the lowest was 1,050000, occurring at PT Mega Insurance in 2022-2024 and PT Asuransi Takaful Umum from 2022 to the third quarter of 2024.

The RBC of 6 insurance companies in Indonesia for the 2022-2024 period has an average value of 35,04222 and a median of 22,44000. The highest or maximum RBC level is 132,0900, which occurred at PT Asuransi Wahana Tata in 2023-2024, PT Asuransi Askrida Syariah, and PT Chubb Syariah Indonesia. Meanwhile, the lowest or minimum level is 2,010000 at PT Mega Insurance and PT Asuransi Takaful Umum in 2022-2023.

Analysis of Panel Data Regression

The CEM is the optimal panel data regression model for this investigation, according to the Lagrange Multiplier test findings. The table below displays the panel data regression findings..

Table 2. Regression Result

Independent Variable	Coefficient	t-statistic	Prob.	Conclusion
C	3.774341	7.759393	0.0000	
BK	0.142893	0.491684	0.6246	<i>Not significant</i>
RS	0.070044	0.230962	0.8180	<i>Not significant</i>
LA	-1.932414	-4.696031	0.0000	<i>Significant</i>
RBC	0.443718	2.324440	0.0231	<i>Significant</i>

Source: Data Processed by the Author (Eviews 13)

Based on the results of panel data regression testing using the CEM model, the following panel data regression equation was found:

$$SU = 3.774341 + 0.142893 BK + 0.070044 RS - 1.932414 LA + 0.443718 RBC$$

The findings of the partial test show that the independent factors have a partial impact on the dependent variable. Thus, it may be said that:

1. With a coefficient of 0.142893 and a probability value of 0.6246 (>0.05), the Claim Burden (BK) variable does not significantly affect underwriting surplus.
2. Underwriting surplus is not significantly impacted by the Self-Retention (RS) variable, as indicated by its probability value of 0.8180 (>0.05) and coefficient of 0.070044.
3. The Asset Liquidity (AL) variable has a strong negative impact on underwriting surplus, with a probability value of 0.0000 (<0.05) and a coefficient of -1.932414
4. Underwriting surplus is significantly positively impacted by the RBC variable, which has a probability value of 0.0231 (<0.05) and a coefficient of 0.443718.

To ascertain if the independent factors would have an impact on the dependent variable, a simultaneous test was employed in this investigation, yielding the following findings.

Table 3. F Test Results

F-Statistic	5.574209
Prob (F-Statistic)	0.000619

Source: Data Processed by the Author (Eviews 13)

According to the preceding table, the significance value of 0.05 is greater than the Prob (F-statistic) value of 0.000619. We infer that underwriting surplus is simultaneously impacted by the claim burden ratio, self-retention ratio, asset liquidity ratio, and RBC factors. The correctness of the independent variables in this study is assessed using the coefficient of determination. The table below displays the study's coefficient of determination values.

Table 4. R Square Value

R-Squared	0.249693
Adjusted R-Squared	0.204899

Source: Data Processed by the Author (Eviews 13)

The claim burden ratio, self-retention ratio, asset liquidity ratio, and RBC account for 24.97% of the variation in underwriting surplus, according to the panel regression model's R-Square value of 0.249693. In the meanwhile, additional variables not covered in the research have an impact on the remaining 75.03%.

DISCUSSION

Table 5. Financial Performance Indicator Benchmark

Variable	Threshold	Regulation	Average	Category
Claims Ratio	≤ 60-80%	POJK No. 5 Tahun 2023	74.42%	Within a reasonable range
Retention Ratio	≥ 20%	POJK No. 39 Tahun 2020	6.59%	Low
Asset Liquidity Ratio	≥ 1.00	POJK No. 5 Tahun 2023	2.28	Very healthy
Risk-Based Capital (RBC)	≥ 120%	POJK No. 5 Tahun 2023	350%	Very healthy

Source: Data Processed by the Author

The Effect of Claim Ratio on Financial Performance.

Based on descriptive statistics, the average claim cost reached 74.42%, which is within the range commonly applied in insurance industry practice of 60–80%. The fact that the claim burden did not affect financial performance indicates that Islamic insurance companies have strong and measurable underwriting capabilities. Claims costs for the current year are carefully projected through the underwriting process, making claims realization relatively predictable.

In some cases, estimated claims costs are even higher than actual claims realization, so that fluctuations in claims costs do not significantly affect the company's financial performance during the study period. This condition is consistent with the Underwriting Cycle, which suggests that during a period of disciplined underwriting, companies apply stricter risk selection and conservative pricing strategies, thereby creating a financial cushion against claim variability. Thus, the hypothesis is rejected, indicating that financial performance is not greatly affected by the claim burden ratio. The results of this study are not in line with previous Research by (Fadrul, 2020), which shows that claim expenses reflect a company's ability to meet its claim obligations through premium income, which can ultimately put pressure on financial performance and reduce Profitability.

The Effect of Retention Ratio on Financial Performance.

The results show that the average retention rate is 6.59%, indicating a relatively low retention rate. This causes limited data variation, so that changes in the retention rate are not large enough to affect the underwriting surplus. The low retention rate indicates a tendency for companies to transfer most of the risk to reinsurance. These findings refute the theory that the retention ratio affects financial performance. Thus, the hypothesis is rejected and there is no effect. The results of this study are in line with (Deni Atif Hidayat dan Meina Wulansari Yusniar, 2021). However, these findings contradict and are not in line with (Fadrul, 2020) study, which found that retention has a significant impact on financial performance.

The insignificant impact of retention on financial performance can be explained by the Reinsurance and Retention Decision Theory, which states that companies determine the optimal retention level based on risk-bearing capacity, capital adequacy, and reinsurance costs. When the retention level is set optimally, companies can absorb losses within their financial tolerance limits without significantly affecting profitability. In this study, managed policies generally involve relatively small coverage values and low risk exposure, so retention adjustments have less impact on underwriting surplus. In Islamic insurance, retention is closely related to the principle of ta'awun (cooperation), where risks are shared collectively through tabarru' funds. Due to a well-diversified and relatively low-risk portfolio, these funds can absorb claims effectively, thereby minimizing financial pressure.

The Effect of Asset Liquidity Ratio on Financial Performance.

Asset liquidity has an average value of 2.28, exceeding the healthy threshold of ≥ 1.00 , indicating that companies generally maintain sufficient current assets to meet short-term obligations. High liquidity enhances operational efficiency by ensuring claims are settled promptly and business processes continue uninterrupted, positively affecting financial performance and supporting the hypothesis.

Liquidity influences financial performance through the liquidity–profitability trade-off: while excessive liquidity may reduce returns relative to long-term investments, adequate liquidity ensures solvency and operational continuity, enabling the maintenance of an underwriting surplus and responsiveness to unexpected claims. In Islamic financial institutions, the Liquidity Preference Theory holds that firms prefer liquidity to fulfill obligations in a Sharia-compliant manner, where risk-sharing principles and the prohibition on uncertainty (*gharar*) emphasize prudence. Sufficient liquid assets in the *tabarru'* fund and operational accounts allow sharia insurance companies to meet claims without disrupting cooperative risk-sharing arrangements, thereby enhancing financial stability and Profitability. This finding aligns with (Fadrul, 2020), who demonstrated that changes in liquidity levels directly affect a company's ability to sustain underwriting surplus, particularly through improved claim settlement capacity and financial stability.

The Effect of Risk-Based Capital on Financial Performance.

According to the study's findings, RBC has an average value of 350%, which is far above the OJK's minimum limit of 120%. These findings show that the Research sample's Sharia general insurance businesses have extremely high levels of financial sufficiency. This indicates that Risk-Based Capital (RBC) affects financial performance, thereby supporting the theory.

Higher Risk-Based Capital (RBC) influences underwriting surplus through several structural mechanisms. Adequacy RBC increases the company's risk-bearing capacity, allowing it to underwrite a greater volume of policies and generate higher contribution income, which directly forms underwriting surplus. Strong capital also supports prudent risk selection and portfolio diversification, reducing claim volatility and protecting surplus from significant fluctuations. In addition, sufficient RBC reduces reliance on costly reinsurance, thereby improving the net underwriting result. During adverse claim events, capital buffers enable companies to absorb losses without disrupting operations, ensuring surplus stability. Through enhanced underwriting capacity, controlled risk exposure, and reduced cost pressure, RBC directly and positively influences underwriting surplus. Research by (Deni Atif Hidayat dan Meina Wulansari Yusniar, 2021) and (Utami & Werastuti, 2020), which discovered that a high RBC indicates a company's capacity to absorb risk and sustain financial stability, supports these findings. This capital sufficiency gives businesses greater freedom to manage underwriting risk better, thereby enhancing underwriting surplus revenue.

CONCLUSION

This study provides a conceptual contribution by repositioning the role of Early Warning Systems (EWS) in Sharia general insurance. The findings show that the effectiveness of EWS is determined more by the strength of the financial structure, particularly liquidity and capital adequacy, than by operational risk indicators such as claims expenses or retention. This confirms that the stability of underwriting surplus depends on the availability of adequate financial buffers, not solely on short-term risk fluctuations. Therefore, EWS in the context of Sharia needs to be understood not only as a risk-detection tool but also as a capital and liquidity-based resilience framework aligned with the principles of prudence and risk-sharing mechanisms.

In practice, Islamic insurance companies need to monitor RBC quarterly using internal standards that exceed minimum regulatory requirements and conduct regular stress tests on claim-surge scenarios. Liquidity management must ensure the availability of minimum buffers and strict separation between *tabarru'* funds for claim reserves and short-term Islamic investments. In addition, key ratios such as RBC, liquidity, and claim expenses need to be integrated into the internal risk management dashboard. From a regulatory perspective, more specific early warning thresholds are needed for Islamic insurance, accompanied by targeted audits of *tabarru'* fund management and underwriting practices to strengthen the industry's sustainability.

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