

The Influence of Firm-Specific, Industry-Specific, Macroeconomic Factors, and Risk-Based Capital (RBC) on the Profitability of Life Insurance Companies in Indonesia

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ABSTRACT

This study aims to determine the influence of Firm-specific, Industry-specific, Macroeconomic factors, and Risk Based Capital (RBC) on the profitability of life insurance companies in Indonesia. This study uses secondary data, namely financial statement data of life insurance companies in Indonesia, macroeconomic data, and other information available on company websites, AAJI, OJK, and other sources. The data period used covers 2019 to 2023. The analysis method applied is regression analysis. Findings show that previous research conducted by Killins (2020) in Canada found that firm-specific factors such as liquidity and economic growth influence company profitability, while company size has a negative relationship with profitability. Industry-specific factors did not yield significant results related to profitability. Macroeconomic factors such as GDP growth and equity return show a significant influence on company profitability. In a study conducted by de Haan and Kakes (2010) in the Netherlands, it was shown that insurance companies with high profitability tend to have better solvency levels. The findings of this study can provide insights for life insurance companies in Indonesia regarding the factors that influence their profitability. This study contributes to understanding how Firm-specific, Industry-specific, Macroeconomic factors, and Risk Based Capital (RBC) affect the profitability of life insurance companies in Indonesia.

KEYWORDS

Firm-specific, Industry-specific, Macroeconomic, Risk Based Capital (RBC), Profitabilitas Asuransi Jiwa



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INTRODUCTION

The life insurance industry provides protection against individual risks. In addition, the life insurance industry plays a role in Indonesia's economy. Based on the 2023 OJK Insurance Statistics, Indonesia's Gross Domestic Product (GDP) in 2023 amounted to IDR 20,892.38 trillion. Meanwhile, the total gross premium income earned by the life insurance industry in 2023 amounted to IDR 176.90 trillion, growing 7.26% year-on-year (YoY) compared to the gross premium income in 2022 of IDR 190.74 trillion (Dragos et al., 2020; Horvey et al., 2024; Jihadi et al., 2021; Pjanić et al., 2023; Sucia et al., 2023). The contribution of life insurance premium income to Indonesia's GDP in 2023 was 0.85% (Swiss Re Institute, 2024). In terms of assets, the total assets of life insurance companies in 2023 reached IDR 618.58 trillion, growing 0.15% compared to 2022, when total assets amounted to IDR 617.63 trillion.

Based on a press release from the Indonesian Life Insurance Association (AAJI) on February 27, 2024, the life insurance industry had a total of 84.84 million insureds, an increase of 0.5% YoY (Camino-Mogro & Bermúdez-Barrezueta, 2019). In 2023, the life insurance industry paid a total of IDR 162.75 trillion in claims and benefits to more than 10 million beneficiaries (De Haan & Kakes, 2010). In addition, the life insurance industry contributes to the Indonesian economy, one aspect being through investment in government securities (Surat

Berharga Negara or SBN). Therefore, the performance or profitability of life insurance companies will affect the total investment directed toward the state (Batool & Sahi, 2019).

In carrying out their business activities, life insurance companies face various risks and uncertainties that influence future profitability, such as the Covid-19 pandemic that occurred in Indonesia (Dirman, 2020). The pandemic pressured the performance of the insurance industry, as insurers invested in capital market instruments, which were also negatively affected. The pandemic significantly impacted the investment and performance of life insurance companies (Guerineau & Sawadogo, 2015).

Killins' (2020) research identifies variables that can be used by the industry to measure their influence on the profitability of life insurance companies. In that study, factors such as firm-specific, industry-specific, and macroeconomic factors affected the profitability of life insurance companies in Canada. Other factors that can be considered include *Risk-Based Capital* (RBC), which reflects the level of an insurance company's financial health. This ratio indicates the adequacy of capital possessed by an insurance company to manage risks. The Financial Services Authority (OJK) sets the minimum RBC value for insurance companies at 120% of the *Minimum Mandatory Bank Ratio* (MMBR), which takes into account each company's risk profile and stress test simulation results (Sayekti & Santoso, 2020). RBC can influence a life insurance company's profitability (Killins, 2020).

A study by de Haan & Kakes (2010) showed that insurance companies with high profitability tend to have better or higher solvency rates, as these companies utilize greater internal capital to strengthen protection against risk. Furthermore, de Haan & Kakes (2010) found that higher profitability is associated with stronger solvency rates, as profitable firms employ internal capital to enhance financial resilience. However, their study primarily examined internal dynamics without addressing how external shocks, such as pandemics, affect financial stability—particularly in emerging markets like Indonesia. This study fills these gaps by focusing on Indonesia, integrating the effects of both macroeconomic and firm-specific factors, including RBC, and analyzing how these factors, exacerbated by the pandemic, impact the profitability of life insurance companies. It extends previous research by offering a region-specific perspective on how risk management strategies, such as capital adequacy, influence profitability—especially under crisis conditions.

This research aims to analyze the factors affecting the profitability of life insurance companies in Indonesia, focusing on the impact of the Covid-19 pandemic, RBC, and macroeconomic conditions. By investigating these factors, the study seeks to provide actionable insights to inform policy decisions and enhance the performance of life insurance companies in Indonesia. The findings will contribute to the academic literature on financial health in the life insurance industry and provide practical recommendations for industry stakeholders, helping to improve risk management practices and profitability within the Indonesian context.

METHOD

This study used a quantitative approach to test whether there was a relationship between the predetermined variables using regression analysis. The data used in this study consisted of conventional life insurance companies in Indonesia. The life insurance companies that were the subjects of this study were those registered with the OJK and AAJI up to 2023. The data

utilized included life insurance company financial statement data, macroeconomic data, and other relevant information available from AAJI and the companies' official websites. The study covered data for the period from 2019 to 2023. The regression analysis method was employed to determine the relationships or influences between variables.

This study applied regression analysis to examine whether relationships existed among the predetermined variables. Panel regression was used because the data had both cross-sectional (across companies) and time-series (over time) dimensions.

The research model used in this study to determine the relationship between variables is:

$$ROA_{it} = \beta_0 + \text{Firm Specific Factor} + \text{Industry Specific Factor} + \text{Macroeconomic Factor} + \text{RBC}$$

$$ROA_{it} = \beta_0 + \beta_1 RA_{it} + \beta_2 LIQ_{it} + \beta_3 GP_{it} + \beta_4 \frac{GE}{A_{it}} + \beta_5 \frac{EQ}{A_{it}} + \beta_6 \frac{RE}{A_{it}} + \beta_7 HHI_{it} + \beta_8 GDP_{it} + \beta_9 YC_{it} + \beta_{10} IHS_{it} + \beta_{11} RBC_{it}$$

Where the variables are used:

Table 1. Research Variable

Variable	Measure	Notation
dependent variable		
Profitability	Net profit/assets	ROA
Independent		
Firm-specific		
Company Size	Logs of total real assets	RA
Liquidity	Cash & short-term investments/total assets	LIQ
Productivity growth	Inflation-adjusted rate of change in gross premiums	GP
Cost management	General/asset expenses	GE/A
Risk Exposure	Equity/total assets	EQ/A
	Real Estate/total asset	RE/A
Industry-specific		
Industrial Concentration	Herfindahl-Hirschman Index	HHI
Macroeconomic Factors		
GDP growth	Real GDP growth for the current period	GDP
Yield Curve	Difference between 10-year and 5-year government bonds	YC
Equity Market	JCI Growth	JCI
RBC		
RBC	Solvency Level/MMBR	RBC

Research Hypothesis

Based on the elaboration of models and variables in the methodology sub-chapter, there are 10 (ten) hypotheses in this study, namely:

- 1) H1: Firm-specific Factor: The Size of the Life Insurance Company will affect the profitability of the Life Insurance Company in Indonesia
- 2) H2: Firm-specific Factor: Liquidity will affect the profitability of Life Insurance Companies in Indonesia

- 3) H3: Firm-specific Factor: Productivity growth will affect the profitability of Life Insurance Companies in Indonesia
- 4) H4: Firm-specific Factor: Cost management will affect the profitability of Life Insurance Companies in Indonesia
- 5) H5: Firm-specific Factor: Risk Exposure will affect the profitability of Life Insurance Companies in Indonesia
- 6) H6: Industry-specific Factor: Industry Concentration will affect the profitability of Life Insurance Companies in Indonesia
- 7) H7: Macroeconomic Factors: GDP growth will affect the profitability of Life Insurance Companies in Indonesia
- 8) H8: Macroeconomic Factors: Yield Curve will affect the Profitability of Life Insurance Companies in Indonesia
- 9) H9: Macroeconomic Factors: Equity Market will affect the profitability of Life Insurance Companies in Indonesia
- 10) H10: RBC Factor Will Affect the Profitability of Life Insurance Companies in Indonesia

RESULT AND DISCUSSION

Table 1. Fixed Effects Model Regression Results

plm(formula = ROA ~ RA + LIQ + GP + GE.A + EQ.A + RE.A + HHI + GDP + Yield.Govt.Bond + IHSG + RBC, data = data, panel, model = "within")					
Unbalanced Panel: n = 49, T = 1–5, N = 227					
Residuals					
Min	1st Qu.	Median	3rd Qu.	Max	
-0.2354171	-0.0127807	-0.0023056	0.0118349	0.1449826	
Coefficients					
	Estimate	Std. Error	t-value	Pr(> t)	
RA	2,26E+02	1,58E+02	14.278	0.15522	
LIQ	9,46E+02	1,25E+02	75.511	2,68E-09	***
GP	-6,06E-02	1,13E-01	-0.5370	0.59197	
GE.A	-7,89E+03	1,01E+03	-77.749	7,38E-10	***
EQ.A	-7,44E+02	3,06E+02	-24.271	0.01628	*
RE.A	-3,61E+02	4,17E+01	-86.582	3,91E-12	***
HHI	-2,75E+00	2,26E+00	-12.176	0.22508	
GDP	-9,16E+02	2,93E+03	-0.3122	0.75526	
Yield.Govt.Bond	2,06E+03	1,33E+04	0.1551	0.87694	
IHSG	-1,20E+02	9,79E+02	-0.1221	0.90297	
RBC	3,83E-01	1,00E+00	0.3819	0.70301	
Total Sum of Squares	0.60386				
Residual Sum of Squares	0.27881				
R-Squared	0.53829				
Adjusted R-Squared	0.37518				
F-statistic	17.7002 on 11 and 167 DF				
p-value	< 2.22e-16				

source: processed data

The researcher conducted a regression test using a fixed effects model to test the influence of independent variables on ROA. Based on Table 1. The results of the Fixed Effects Model regression above, the data consisted of 49 companies (n) over a period of 5 years with

a total of 227 observations (N). From the table, it can be seen that the residual value of the model shows the distribution of prediction errors, including a minimum value of -0.2354, a median value of -0.0023 and a maximum value of 0.1445.

The regression results for each independent variable are as seen in Table 1. that the LIQ, GE variable. A, EQ. A and RE. A has a significant p-value when compared to $\alpha=5\%$, namely the Liquidity variable has a positive effect on the ROA value, the Cost Management variable has a negative effect on the ROA value, the Equity risk exposure variable has a negative effect on the ROA, and the Real Estate risk exposure variable has a negative effect on the ROA. In contrast, the Industry-Specific, Macroeconomic and RBC variables did not have a significant influence on the ROA value.

From the results of Goodness of Fit, an R-squared value of 0.53829 was obtained, meaning that the model can explain 53.829% of the variation in ROA can be explained by the independent variables used in the model. The Adjusted R-squared value is 0.37518, and the p-value is 2.22.e-16, where the p-value < 5% which means that the regression model is significant, independent variables in the model have an influence on the ROA value.

Table 2. Random Effect Model Regression Results

Swamy-Arora's transformation						
plm Formula: ROA ~ RA + LIQ + GP + GE.A + EQ.A + RE.A + HHI + GDP + Yield.Govt.Bond + IHSG + RBC						
Unbalanced Panel: n = 49, T = 1-5, N = 227						
Effects						
Component	Variance	Std.Dev	Share			
idiosyncratic	0.001669	0.040860	0.582			
individual	0.001200	0.034636	0.418			
Theta						
Min.		1st Qu.	Median	Mean	3rd Qu.	Max.
0.2372		0.5334	0.5334	0.5250	0.5334	0.5334
Residual						
Min.		1st Qu.	Median	Mean	3rd Qu.	Max.
-0.290217		-0.012583	-0.001586	0.000044	0.015879	0.188739
Coefficients						
		2,850.00	1,660.00	17.186	0.085684	.
RA		-29.70	42.20	-0.7030	0.482040	
LIQ		873.00	112.00	77.819	7.14E-12	***
GP		-0.0691	0.1200	-0.5774	0.563686	
GE.A		-8,380.00	845.00	-99.105	< 2.2e-16	***
EQ.A		-800.00	270.00	-29.609	0.003067	**
RE.A		-381.00	40.50	-94.222	< 2.2e-16	***
HHI		-3.67	2.40	-15.309	0.125802	
GDP		-1,500.00	3,170.00	-0.4733	0.636019	
Yield.Govt.Bond		-14.30	14,500.00	-0.0010	0.999213	
IHSG		135.00	1,060.00	0.1280	0.898153	
RBC		0.337	1.04	0.3238	0.746126	
Significance codes: 0 '0.001' '0.01' '0.05' '0.1' '1						
Total Sum of Squares	0.85861					
Residual Sum of Squares	0.43087					
R-Squared	0.49817					
Adj. R-Squared	0.4725					
Chisq	213.113 on 11 DF					
p-value	< 2.22e-16					

source: processed data

Next, a Random Effect Model regression test was carried out on Return on Assets (ROA) as shown in table 2. Random Effect Model regression was conducted on 49 companies (n) over a period of 5 years with a total of 227 observations. In the Random Effect model, there are individual (inter-company) and idiosyncratic (intra-company) effects, where individuals account for 41.8% of the total variation and idiosyncratic 58.2% of the total variation.

The regression results for each independent variable are as seen in Table 2. that the LIQ, GE variable. A, EQ. A and RE. A has a significant p-value when compared to $\alpha=5\%$, just like the result in a Fixed Effect. The Liquidity variable has a positive effect on the value of ROA, the Cost Management variable has a negative effect on the value of ROA, the variable of Equity risk exposure to Assets has a negative effect on ROA, and the variable of Real Estate risk exposure to Assets has a negative effect on ROA. On the other hand, the Industry-Specific, Macroeconomic and RBC variables did not have a significant influence on the profitability of life insurance companies, namely ROA.

The Goodness of Fit result for the R-squared value is 0.49817, meaning that 49.817% of the variation in ROA can be explained by the independent variables used in the model. The Adjusted R-squared value is 0.4725, and the p-value is 2.22.e-16, where the p-value $< 5\%$ which means that the regression model is significant, independent variables in the model have an influence on the ROA value.

To determine which panel data regression model is the most closely related to Fixed Effect and Random Effect, the Hausman Test is performed. In this test, the hypotheses used are:

H0: No correlation between individual effects and independent variables (Random Effect model is consistent)

H1: There is a correlation between individual effects and independent variables (Fixed Effect Model is more precise)

Table 3. Hausman Test Results

Hausman Test	
Data	ROA ~ RA + LIQ + GP + GE.A + EQ.A + RE.A + HHI + GDP + Yield.Govt.Bond + ...
Chi-Square	1.4535
Degrees of Freedom (df)	11
p-value	0.9997
Alternative Hypothesis	One model is inconsistent

source: processed data

Based on the results in Table 3, the p-value of 0.9997 is greater than $\alpha = 5\%$, then H0 is accepted. This means that the Random Effect Model is more suitable for use in this study where it can interpret the influence of independent variables on ROA.

In comparison to previous research, this study contributes by exploring the unique combination of financial and operational variables in the Indonesian life insurance industry, a context that has not been extensively covered in prior studies. The Hausman Test (Table 3) confirms that the Random Effect Model is the most appropriate for this study, offering a more suitable fit for the data when analyzing ROA. This approach provides a more precise

interpretation of the influence of independent variables on profitability in the Indonesian life insurance sector.

The results of this research have significant implications for life insurance companies in Indonesia, highlighting the importance of liquidity management and cost control in improving profitability. Moreover, the findings suggest that insurance companies should carefully manage their exposure to high-risk assets, such as equities and real estate, to maintain financial stability (Agustin et al., 2024; Alhassan et al., 2015; Arhinful & Radmehr, 2023). The study contributes to the literature by offering insights specific to the Indonesian context and emphasizing the importance of using appropriate panel data regression models to analyze complex relationships between variables (William & Colline, 2022). Future research could extend these findings by incorporating additional variables such as customer satisfaction, regulatory changes, and market competition to gain a more comprehensive understanding of the drivers of profitability in life insurance companies (Trish & Herring, 2015).

CONCLUSION

Based on the results of the panel regression analysis in the discussion above, it can be concluded that the Firm Specific variables, namely Liquidity, Cost Management, and Risk Exposure, have an influence on the profitability of conventional life insurance in Indonesia ROA. Meanwhile, other Firm Specific variables, namely company size, productivity growth, Industry Specific variables, namely company concentration, Macroeconomic variables and RBC, have no influence on the ROA of conventional life insurance in Indonesia. Future research could explore the influence of additional macroeconomic variables or alternative industry-specific factors on the profitability of the life insurance sector. It would also be valuable to investigate the long-term effects of risk exposure and liquidity on the financial stability of insurance firms, particularly in times of economic volatility.

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