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Анґі РЕНАЛДО
Державний університет Джакарти, м. Джакарта, Індонезія

Унґул ПУРВОХЕДІ
Державний університет Джакарти, м. Джакарта, Індонезія

Ґатот Назір АХМАД
Державний університет Джакарти, м. Джакарта, Індонезія

Детермінанти капіталу на основі ризику в страхових компаніях Індонезії

Анотація. *Страхова галузь є однією з важливих складових світової фінансової системи, оскільки вона забезпечує економічний захист суспільства. Капітал на основі ризику – це певна сума капіталу, яку страхові компанії повинні мати під рукою, щоб захиститись від своїх ризиків. Цей капітал призначений для того, щоб компанія могла підтримувати платоспроможність та задовольняти всі свої фінансові операційні потреби. Мета цього дослідження – визначити фактори, що впливають на капітал на основі ризику, як показник що характеризує рівень платоспроможності страхових компаній. Ці фактори загалом поділяються на 2 групи: внутрішні фактори (характеристики компанії) та зовнішні фактори (макроекономічні чинники). Внутрішні фактори складаються з таких змінних, як премія та ліквідність. Зовнішні фактори складаються з таких змінних, як економічне зростання (ВВП) та процентні ставки національного банку. Вибірка цього дослідження представлена 12 страховими компаніями, що акції яких котуються на Індонезійській фондовій біржі. Дослідження охоплює період з 2014 по 2019 рік. Метод аналізу, використаний у цьому дослідженні, – це множинна регресія наряду з використанням моделі з фіксованими ефектами. Для обробки даних автори використали програмне забезпечення Eviews версії 9.0. Метод множинної регресії використано для аналізу впливу незалежних змінних на залежну змінну. Результати дослідження показали, що змінна ліквідності мала значний позитивний вплив на капітал на основі ризику. У той же час змінна відсоткової ставки має значний негативний вплив на капітал на основі ризику. Результати цього дослідження можуть бути використані для покращення управління платоспроможністю страхових компаній в Індонезії та в інших країнах.*

Ключові слова: *капітал на основі ризику, страхові компанії, ліквідність, процентна ставка, економічне зростання.*

Anggy RENALDO[1]
Jakarta State University, Jakarta, Indonesia

Unggul PURWOHEDI[2]
Jakarta State University, Jakarta, Indonesia

Gatot Nazir AHMAD[3]
Jakarta State University, Jakarta, Indonesia

Determinants of the Risk-Based Capital of Insurance Companies in Indonesia

Abstract. *The insurance industry is one of the important components of the world financial system because it provides economic protection for the society. Risk-based capital is a certain amount of capital that insurance companies must have on hand in order to hedge against their risks. This capital is there to make sure that the company can maintain solvency, and can fulfill all of its financial operating needs. This study aims to determine the factors that influence Risk-based capital (RBC) as the level of solvency of insurance companies in Indonesia. These factors are generally divided into 2 groups: internal factors (company characteristics) and external factors (macroeconomic factors). Internal factors consist of such variables as premium and liquidity. External factors consist of such variables as economic growth (GDP) and interest rates. The sample of this study is presented by 12 insurance companies that*

[1] **Anggy RENALDO**, Faculty of Economics, Jakarta State University (Jakarta, Indonesia).
ORCID 0000-0003-1545-5844

[2] **Unggul PURWOHEDI**, Faculty of Economics, Jakarta State University (Jakarta, Indonesia).
ORCID 0000-0002-0955-7871

[3] **Gatot Nazir AHMAD**, Faculty of Economics, Jakarta State University (Jakarta, Indonesia).
ORCID 0000-0002-2274-9499

listed on the Indonesia Stock Exchange (IDX). The study covers the period from 2014 until 2019. The analysis method used in this study is multiple regression with the Fixed Effect Model (FEM) approach using Eviews software version 9.0. This method is used to analyze the effect of independent variables towards the dependent variable. The research results showed that the liquidity variable had a significant positive effect on risk based capital. At the same time the interest rate variable has a significant negative effect on risk based capital.
Keywords: *risk-based capital, insurance companies, liquidity, interest rate, economic growth.*

1. Introduction

Insurance play a very important role in the economy allowing individuals and firms to transfer risk for a premium. The bankruptcy of insurance firms may reduce financial stability (Caporale, et al., 2017). Insurance companies protect individuals and companies from losses suffered, for example losses arising from natural disasters such as floods, etc.

Indonesian economy in 2019, as measured by Gross Domestic Product (GDP), increased 6.70% from Rp 14,837.4 trillion in 2018 to Rp 15,833.9 trillion in 2019. Within the same period, gross premium income of insurance industry increased by 11.0% from Rp433.4 trillion in 2018 to Rp481.1 trillion in 2019. Thus, in 2019 the ratio of gross premium to GDP increased from 2.92% to 3.04%. As of the end of December 2019, there were 380 companies operating business in Indonesia, consisted of 151 insurance and reinsurance companies, and 229 insurance intermediaries (exclude Actuarial Consultant and Insurance Agent).

Solvency can be defined as the insurance company's ability to pay its liabilities, whether it's short-term or long-term liabilities. The good condition of insurance company can be seen at company ability to pay and responsible for claims and have a high level of solvency.

According to National Association of Insurance Commissioners – USA (NAIC), Risk-Based Capital (RBC) is a method of measuring the minimum amount of capital appropriate for a reporting entity to support its overall business operations in consideration of its size and risk profile. RBC limits the amount of risk a company can take. It requires a company with a higher amount of risk to hold a higher amount of capital. RBC framework aims at setting a capital adequacy requirement that reflects the level of risk encountered by the insurers (Yakob, et al., 2012).

The government as regulator has the responsibility to monitor the financial solvency position of insurance companies. Indonesia uses the Risk Based Capital method to measure the solvency level of insurance companies. Based on "Peraturan Otoritas Jasa Keuangan nomor/POJK.05/2015" insurance companies are required to have a minimum 120% of solvency level.

2. Literature Review

Solvency determinant of insurance company is affected by both internal and external factors. Internal factors are company-specific (Majumder & Uddin, 2015). The macroeconomic factors are external determinant where the company does not have control over these factors. The growth of the insurance industry in the long term will depends on the national economy condition.

Premium is the amount of money that must be paid within a certain period of time by the insured as a form of compensation for the transfer of risk and losses. Lee (2018) define that the premium growth measures the rate of market penetration. Rauch & Wende (2015) define the premium growth is associated with an increase in the company's risk, as an aggressive growth strategy could increase the risk of insolvency. According to Caporale, et al (2017) the growth of gross premium written reflects how well an insurance firm is running its core business; a rapidly growing gross premium written may indicate potential huge losse (claims) in the future. In this study, researchers intended to confirm previous research because it has different results. Premiums are found to have a significant negative effect on solvency according to research by Caporale, et al (2017), Misas & Moreno (2017), Todevski & Fotov (2017) and Rauch & Wendeb (2015). Meanwhile, there are also studies found that premiums have no effect on Solvency by Lee (2018), Torno & Tiu (2014) and Kleffner & Lee (2009).

In general, insurance company condition is in good condition if it has high liquidity. There are several types of liquidity ratio, such as; current ratio, quick ratio, and cash ratio. According to Jawad & Ayyash (2019) liquidity reflect the Company's ability to meet its obligations when due. For insurance company, a high liquidity ratio indicates good claim-paying ability (Caporale, et al., 2017). Liquidity is the capability of an insurer to pay liabilities, which include operating expenses and payment for losses/benefits under insurance policies, when due (Joo, 2013). In this study, researchers intended to confirm previous research because it has different results. Liquidity according to the research conducted by Caporale, et al (2017) found that liquidity has a negative effect, while Majumder & Uddin (2015) get the opposite result. A unique thing was found in Abduh & Isma (2017) research which used two variables as the level of solvency, namely; EAR (Equity-to-asset Ratio) and ETR (Equity-to-technical reserve ratio). The results are contradictory, where liquidity has a significant positive effect on EAR and significantly negatively affects ETR. Meanwhile, liquidity was found to have no significant effect on solvency on research conducted by Jawad & Ayyash (2019), Utami & Khoiruddin (2016), Joo (2013), Yakob, et al. (2012) and Leadbetter & Stodolak (2008).

Economic growth measures the achievements of the country economy development. The progress measurement of an economy requires appropriate measuring tools, in the form of measuring tools for economic growth, which is Gross Domestic Product (GDP). According to Bogar (2016) the economic growth is the development of economy activities that increase the productivity of goods and services and the prosperity of the society increases. Economic conditions are also likely to affect insurer capitalization because raising capital may be easier in a relatively strong economy (Moreno, et al., 2018). In this study, researchers intended to confirm

previous research because it has different results. The macroeconomic factors of economic growth using the gross domestic product variable have also been carried out by previous research. Moreno, et al (2018) found that economic growth had a significant positive effect. Meanwhile, two other studies by Caporale, et al (2017) and Bogar (2016) found that economic growth is not one of the factors that affect solvency.

Negative economic growth and low interest rates indicate that these macroeconomic factors are the indicators of falling economic conditions and if it cannot be controlled, it will lead to potential monetary instability (Moreno et al., 2018). Interest rates can be proxied as investment income on insurance company profits (Cheng & Weiss, 2012). The Bank Indonesia Rate (BI Rate) is the prevailing interest rate in Indonesia set by Bank Indonesia as the Central Bank of the Republic of Indonesia. Kemu and ika (2016) stated that the Bank Indonesia Rate (BI Rate) is an interest rate control instrument used by Bank Indonesia to achieve monetary policy targets. In this study, researchers intended to confirm previous research because it has different results. Caporale, et al (2017) found that interest rates have a positive effect on solvency. Bogar (2016) found that interest rates are not a factor affecting solvency. Cheng & Weiss (2012) used two variables related to interest rates. Overall interest rates were found to have no effect, while changes in interest rates had a significant effect and had a positive relationship.

3. Research Methodology

The object of this research is the data of 12 insurance companies that are listed on the Indonesia Stock Exchange (IDX) from 2014 until 2019. The research method is quantitative research. By describing the effect of each independent variable on the dependent variable examined through the process of collecting, processing, and interpreting the data obtained using statistical analysis. The data analysis method is multiple regression of panel data using the fixed effect regression model with the help of Eviews software version 9.0. Several tests conducted to support the regression analysis, including chow test, hausman test, normality test, multicollinearity test, heterocedasticity test, autocorrelation test, and t test for regression results, multiple regression equations as follows:

$$Y = \alpha + \beta_1 PRM + \beta_2 LIQ + \beta_3 GDP + \beta_4 BIR + e$$

Based on the OJK regulation, insurance companies must meet a solvency level of at least 120% of the minimum Risk Based Capital. Risk Based Capital (RBC) can be calculated using the following formula:

$$RBC = \frac{\text{Solvency Margin}}{\text{Minimum RBC Requirement}}$$

Premium growth is stated as a percentage of the present premium growth compared to the previous year. Premium Growth Ratio can be calculated using the following formula:

$$PRM = \frac{\text{Premium year}_t - \text{Premium year}_{t-1}}{\text{Premium year}_{t-1}}$$

Liquidity will be proxied by the current ratio, current assets divided with current liabilities.

$$LIQ = \frac{\text{Current Asset}}{\text{Current Liabilities}}$$

Economic growth (GDP) is stated as a percentage of the present GDP compared to the previous year. GDP growth can be calculated using the following formula:

$$GDP = \frac{\text{GDP}_t - \text{GDP}_{t-1}}{\text{GDP}_{t-1}}$$

Interest rate will be proxied by The Bank Indonesia Rate (BIR) with average rate on 12 months (1 year) period.

Notes:
RBC = Risk Based Capital
PRM= Premium Growth Ratio
LIQ = Current Ratio
GDP = GDP Growth Ratio
BIR = Average Bank Indonesia Rate on 12 months (1 year) period.

4. Results and Discussion

4.1. Regression Model Approach Test

Table 1

Chow Test Result

Effects Test	Statistic	d.f.	Prob.
Cross-section F	12.02868	(11,56)	0.0000
Cross-section Chi-square	87.3192	11	0.0000

From the results, the probability value is 0.0000 or less than 0.05. These results indicate that other testing must be conducted with the Hausman test to determine the most suitable model, between fixed effects and random effects.

Table 2

Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.00000	4	1.00000

** Cross-section test variance is invalid. Hausman statistic set to zero.*

The results show that the Hausman test is invalid; it can be happened because one of the independent variables from the research data does not meet the requirements for a random effect model. Then the test process in the Eviews program will reject the Hausman test and it can be concluded that the most suitable model is the fixed effect.

4.2. Classical Assumption Test

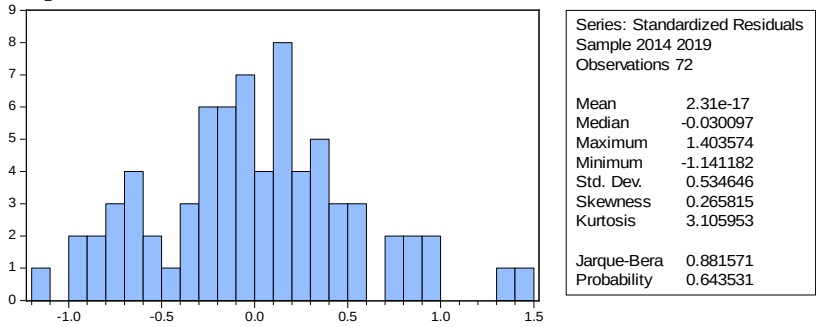

Figure 1. **Normality Test Result**

Based on the results of the normality test, the Jarque-Bera probability value using residual data is 0.643531, this value is greater than the specified test probability of 0.05. This shows that the residual data has been normally distributed or it can be concluded that the data does not have a normality problem.

Table 3

Multicollinearity Test Result

Variable	PRM	LIQ	GDP	BIR
PRM	1.000000	-0.061980	-0.093043	0.076952
LIQ	-0.061980	1.000000	-0.194880	0.317586
GDP	-0.093043	-0.194880	1.000000	-0.752865
BIR	0.076952	0.317586	-0.752865	1.000000

Based on the multicollinearity test, the correlation value between the independent variables used in this study was below 0.85. This shows that there is no multicollinearity problem in this study.

Table 4

Heterocedasticity Test Result

Dependent Variable: RESABS		
Variable	Coefficient	Prob.
PRM	-0.05569	0.12530
LIQ	0.21595	0.11200
PDB	-20.99650	0.14150
BIR	0.59778	0.79610

From the Glejser test results, it can be seen that the probability value of each coefficient of the independent variable, the results is not significant or > 5%. Hence it can be concluded that there is no heteroscedasticity problem in the data used in this study.

The results obtained from the autocorrelation test using the Durbin-Watson test showed that the DW value was 2.06195. While the value of dU = 1.7366 and value of 4-dU = 2.2634. It can be seen that the DW value is between dU to 4–dU (1.7366 < 2.06195 < 2.2634), it can be concluded that there is no autocorrelation problem in this study.

4.3. Regression Result

Based on panel data regression with the fixe effect model, a regression result is obtained that showed the effect of Premium, Liquidity, Economic Growth and Interest Rate to Risk Based Capital (RBC) as follow:

Table 5

Regression Result

Dependent Variable: RBC			
Independent Variable	Coefficient	Std. Error	Prob.
C	2.56253	6.78368	0.70700
PRM	-0.05188	0.14709	0.72560
LIQ	1.02537	0.21319	0.00001***
GDP	-7.20794	126.24640	0.95470
BIR	-20.07946	10.09475	0.0516**
R-squared: 0.757489			

Note:
** = significant level of 10%
*** = significant level of 5%

The results of the regression analysis show that the liquidity variable (current ratio) has a coefficient of 1.02537. The probability of this variable is significant at the 5% significance level. These results indicate that there is a positive effect of the liquidity on the RBC of insurance companies in Indonesia. This result confirms previous studies with the same results of Majumder & Uddin (2015) in Bangladesh and Abduh & Isma (2017) in Malaysia. It showed Insurance companies that have good capital adequacy tend to have a high level of liquidity, so the risk of insolvency is low.

The results showed that the Bank Indonesia Rate (BIR) had a coefficient of -20.07946. The probability is significant at the 10% significance level. The results can be concluded that there is a negative and significant effect of the interest rate on RBC. This result is slightly different from the previous studies by Caporale, et al (2017) and Cheng & Weiss (2012) which states that interest rates have a positive effect on RBC. In relation to the insurance industry, interest rates are one of the important macroeconomic factors and have an influence on the industry. Investors will use the interest rate as a standard reference in making comparisons between investment instruments to obtain optimal profits. This also has an impact on the level of Risk Based Capital of insurance companies.

The premium variable is not significant because the probability is greater than 5%. These results indicate that the premium has no significant effect on the RBC of insurance company in Indonesia. These results are similar with the study of Lee (2018), Torno & Tiu (2014) and Kleffner & Lee (2009). Several factors that can cause insignificant results from the analysis related to the influence of premium variables on RBC, one of which is the limited population of insurance companies in Indonesia that listed on the Indonesia Stock Exchange. Not more than 13 general insurance and reinsurance companies in Indonesia are listed on the Indonesia Stock Exchange.

The results show that GDP is not significant. These results indicate that there is no significant effect of the economic growth/GDP on the RBC of insurance companies in Indonesia. These results are similar with the study of Caporale, et al (2017) and Bogar (2016). The stability of economic growth / GDP in Indonesia during the period of the research could be a factor that caused insignificant effect, when the company only tends to maintain the level of capital adequacy and not increase capital significantly.

5. Conclusions

The results of analysis of the insurance companies that listed on Indonesia Stock Exchange showed that liquidity variable which proxied by current ratio, have a positive and significant effect on Risk Based Capital. Interest rates, proxied by the Bank Indonesia Rate, have a negative and significant effect on Risk Based Capital.

Further research can extend the longer period of research year and increase the number of sample companies and make comparisons with the same industry in other countries. Also, add other factors both internal and external that have the potential to influence Risk Based Capital in order to get better results.

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