Analyzing Banking Firms: Impacts of Credit, Currency Conversion Rates, Mortgage Rates on Equity Yields with Profit Margins

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Abstract: - Using profit margins as an intermediate variable, this research examines the effects of credit risk (X1), exchange rate risk (X2), and mortgage rates (X3) on equity yields in the context of banking businesses listed between 2020 and 2022 on the Bursa Efek Indonesia (BEI). A purposive sampling approach was used to determine the sample size, which was 43 firms. Path analysis and the Sobel Z test were applied to the data. The findings of the investigation may be summed up as follows: (1) The statistical significance of credit risk's impact on profit margins is shown by its p-value of 0.001, which is below the 0.05 cutoff. With a p-value more than 0.05, mortgage rates, however, do not show a statistically significant impact on profit margins. Moreover, a p-value greater than 0.05 indicates that profit margins do not substantially impact equity yields. (4) With a p-value >ccr0.05, credit risk has no discernible effect on equity yields. (5) In contrast, with a p-value smaller than 0.05, mortgage rates have a substantial impact on equity yields. (6) The Z-Sobel result drops below 1.96 at -0.87363822, indicating that credit risk does not directly influence equity yields via profit margins after doing an indirect impact analysis using Sobel's Z test route analysis. (7) In a similar vein, the Z-Sobel result of 0.35789034 stays below 1.96, indicating that mortgage rates do not directly affect equity yields via profit margins in the indirect impact study conducted using Sobel's Z-test route analysis.

Key-Words: - Rates of Interest, Profit margins, Risk of Credit, Returns on Stocks, Exchange Rate Risk, Banking Businesses, Path Analysis, Sobel Z Test.

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1 Introduction

There is now a strong demand from the public for investment activity. The Investment Coordinating Board (BKPM) notes a consistent and favorable trend in investment growth over the last four years. Investing involves allocating funds to one or more assets for a defined period, aiming to generate income or increase the original capital investment. The objective is to optimize the anticipated yield (return) while adhering to the risk tolerance level of each investor. The source used is, [1]. An investor's primary goal is to get a high return while minimizing risk. However, it is important to recognize that return and risk are inherently linked. According to the idea, as the rate of return increases, so does the degree of risk involved. The citation is from, [2].

Return refers to the measure of profit margins on an investment, [3]. Potential investors should assess the company's performance prior to making any investments. Stock return is the most effective metric for assessing the generation of value for shareholders' money, [4]. The return on investment typically consists of two components: dividends and

capital gains (or losses). The calculation of return in this research is based on capital gains (losses), namely the profits or losses derived from fluctuations in stock prices, [3].

[5], Profit margins refer to a business's capacity to generate a financial gain. Investors are likely to be attracted to firms that generate significant profits. The potential gain grows in proportion to the company's profit margin. Investors would undoubtedly allocate their funds to lucrative enterprises to get a return on their investment. Profit margins are a crucial metric for banks operating in the banking sector. The profit margins of a bank are crucial in safeguarding it against unexpected losses by strengthening its capital position and enhancing future profit margins via investments funded by retained profits. The bank's probability of survival is directly proportional to its degree of profit margins. Hence, banks must enhance their profit margins to excel. Banking profit margins are measured by the yield on assets (YOA). [6], supported, [7]. His study showed that YOA positively affected stock performance. However, [8], found that YOA did not affect returns.

The capital market returns on banking equities are impacted by several variables, including both internal and external elements inside the banking organization. Credit risk is an outcome of the bank's internal operations. The probability of a bank facing a financial crisis rises in proportion to the bank's level of exposure to credit risk. As loans generate interest that decreases bank income, credit risk plays a vital role in determining bank profit margins. Each loan granted by a bank incurs a payment deferment, resulting in a reduction of the bank's profit margins and equity. In the event that the bank is unable to fulfill its responsibilities, it might eventually lead to the collapse of the bank. Credit risk is assessed by using non-performing loans (NPL) as a proxy, which involves comparing the total amount of NPL to the whole credit extended by banks to debtors, [9].

The non-performing Loans (NPL) metric is used to assess the proficiency of bank management in handling NPLs issued by banks. A rising NPL ratio indicates a deteriorating quality of bank credit, leading to a rise in the number of NPLs and resulting in financial losses. In contrast, a decrease in NPL levels would increase the bank's profit or profit margins. [10], and, [11], argue that credit risk does not significantly harm equity yields, but it does have a significant adverse effect on profit margins. In contrast, [12], research suggests that non-performing loans (NPL) do not have a significant influence on stock gains.

The bank's performance is influenced by external factors such as the exchange rate of the rupiah and the KPR rates in Indonesia. According to, [13], the Rupiah conversion rate is the value of one currency compared to another currency, or the amount of one currency that may be traded for each unit of another currency. According to, [14], the exchange rate is the agreed-upon price level at which people from two different countries do business. The exchange rate is the ratio at which one country's currency may be exchanged for another country's currencies, as defined by, [15]. It is of paramount significance for capital market participants in Indonesia to ascertain the conversion rate of the rupiah relative to foreign currencies. The foreign exchange rate significantly impacts the costs and profits related to stock and securities transactions on the capital market exchange.

The volatility of currency rates will diminish international investors' trust in the Indonesian economy. This will negatively impact stock trading on the capital market, leading to a withdrawal of money by foreign investors. According to, [16], the establishment of Capital of Flow will lead to a reduction in stock prices. [4], [7], and, [17], discovered in their research that exchange rate risk had a notable and favorable impact on profit margins. Conversely, Recent research on the influence of Currency conversion rates and currency rate risk on financial variables has presented varying conclusions. [5], reported that Currency conversion rates do not have a significant detrimental effect on profit margins. In contrast, [18], study in 2021 suggested that currency rate risk has a notable adverse impact on equity yields. On the other hand, [11], research proposed that exchange rate risk could have a considerable beneficial influence on returns. These mixed findings highlight the complexity of understanding the relationship between Currency conversion rates, currency rate risk, and financial outcomes.

Most firms are now unable to repay their bank loans as a result of the depreciation of the Rupiah against the US currency. To mitigate currency rate volatility, the government has implemented a mechanism of raising mortgage rates via the Securities and Money Market (SBPU) and Bank Indonesia Certificates (SBI). Mortgage rates are the second factor that affects equity yields. Investors are motivated to invest in firms that align with their investing goals, and similarly, attractive deposit rates will encourage consumers to invest in financial institutions.

A substantially elevated interest rate can negatively impact the present value of a firm's cash flow, diminishing the appeal of investments and reducing investors' willingness to lend their funds. Higher mortgage rates result in increased capital expenses for the company, necessitating a higher return on investment expected by investors. As per findings by, [19], empirical research highlights that the influence of mortgage rates on equity yields yields mixed results. [20], research in 2018 reveals that mortgage rates do not exert a statistically significant influence on equity yields. Conversely, [1], study indicates a substantial impact of mortgage rates on equity yields. Furthermore, [21], investigation suggests that mortgage rates do not sway equity yields. These differing conclusions emphasize the intricate nature of the relationship between mortgage rates and stock market performance.

2 Literature Review

2.1 Effect of Credit Stress on Revenue

An excessively high-interest rate will have an impact on the company's cash flow's present value, which will make investments less appealing and cause investors' interest in lending their money to decline. Elevated mortgage rates will also result in higher capital costs for the business and a higher return on investment needed by investors. According to, [9], An excessively high interest rate will have an impact on the company's cash flow's present value, which will make investments less appealing and cause investors' interest in lending their money to decline. Elevated mortgage rates will also result in higher capital costs for the business and a higher return on investment needed by investors. [10], state that credit risk has a significant effect on profit margins, the resulting hypothesis is as follows:

H1: Credit risk has a significant effect on profit margins.

2.2 Effect of Currency Conversion Rates on Profit Margins

The exchange rate refers to the valuation of a certain currency in relation to the currency of another nation. The economy is impacted by currency conversion rates when there is a depreciation in the exchange rate. A depreciated exchange rate leads to an increase in the inflation rate, thereby resulting in a decline in profit margins. The influence of currency conversion rates on bank profit margins suggests that fluctuations in Currency conversion rates, whether appreciating or depreciating, will affect the bank's foreign currency commitments at maturity. [18], suggest that bank profit margins are influenced by fluctuations in currency value, namely appreciation and depreciation, and are further impacted by the absence of hedging strategies. In their study, [17], stated that the exchange rate has a considerable impact on profit margins. The resultant hypothesis is as follows:

H2: The exchange rate has a significant effect on profit margins.

2.3 The Effect of Mortgage Rates on Profit Margins

Before investing, investors need to be aware of how mortgage rates fluctuate. Because they will directly lower the company's earnings, high mortgage rates will make things more difficult for it. Overly high mortgage rates will have an impact on the cash flow of the business. Conversely, a drop in mortgage rates will result in an increase in loan credit, which will directly boost business earnings. Keynes's theory states that household income determines how much money households save, not the magnitude of the interest rate, which would ultimately affect the bank's profit margins. The household will save money in the bank, which will also be large if the income is substantial. [22], in their research, said that mortgage rates significantly affect profit margins. From the description, the results of the hypothesis are as follows:

H3: Mortgage rates have a significant effect on profit margins.

2.4 Effect of Profit margins on Return

Profit margins are the ability of the business to turn a profit. In the long run, this profit margin study will be crucial for investors. Investors will get gains, for instance, in the form of dividends. Returns on investment are another name for profits. A business's profit margins can be calculated by summing up the profits from its primary operations and the wealth or assets it has (operational assets) that are used to produce those profits. Investor returns increase in proportion to improved (higher) YOA (Edusaham.com). [23], in their research, said that profit margins have a significant effect on equity yields. From this description, the resulting hypothesis is as follows:

H4: Profit margins have a significant effect on returns.

2.5 Effect of Credit Risk on Return

Bad loans or NPLs can reduce banking revenues and profits, and bank performance will generate a negative response from investors. Banks must improve the management of credit risk or NPL not exceeding the provisions given by Bank Indonesia. If the bank's credit risk is high, investors are less interested in buying shares owned by the bank because it will hurt profit margins if the credit risk is high. This risk causes investors' hopes of getting a return on their investment to decrease to the point where it becomes a loss if the bank goes bankrupt if stock/bond prices fall. [11], in his research stated that credit risk has a significant positive effect on equity yields. From this description, the resulting hypothesis is as follows:

H5: Credit risk has a significant effect on equity yields.

2.6 Effect of Exchange Rate on Return

The depreciation of the rupiah will diminish public enthusiasm for investment due to its impact on investment yields. [24], state that the exchange rate is determined by the equilibrium between the supply and demand of local and foreign currency. The depreciation of the rupiah currency exemplifies a situation where the public's inclination to use it has diminished, and they choose to transact in foreign currency owing to the waning influence of the domestic market economy. Simultaneously, the government will establish a fixed exchange rate that will remain constant indefinitely. The exchange rate serves as a significant determinant that impacts the performance of both the stock market and the money market. This is due to the fact that investors prefer to exercise caution and prudence when making investment decisions. In their study, [10] found that exchange rate risk had a significant and favorable impact on equity yields. The theory that has been derived is as follows:

H6: The exchange rate has a significant effect on equity yields.

2.7 The Effect of Mortgage Rates on Return

Keynesian theory posits that fluctuations in mortgage rates may influence stock prices. Specifically, an increase in mortgage rates is associated with a decline in stock prices. In contrast, a decrease in mortgage rates will increase stock prices, leading to a subsequent rise in equity yields. The company's cash flows will be significantly impacted by the high mortgage rates, resulting in a decrease in the present value of the investment and making it less appealing. The lack of investor participation in investment operations due to their perceived unattractiveness would eventually impact equity yields. The decline in investor interest is the primary cause of this situation, leading to a subsequent decrease in equity yields as a result of elevated mortgage rates. According to, [8], mortgage rates have a major impact on equity yields. Therefore, whether mortgage rates are high or low, they will influence the produced equity yields. Based on the above description, the resultant hypothesis may be summarised as:

H7: Mortgage rates have a significant effect on equity yields.

2.8 The Effect of Profit Margins as an Intervening Variable between Credit Risk on Equity yields

Profit margins are a crucial metric in banking that investors prioritize when making investments since they reflect a company's capacity to generate returns for its owners. [25], argue that non-performing loans arise from irregular principal and interest payments, leading to a direct decline in bank performance and inefficiency. Credit risk has a direct effect on profit margins since it stems from the occurrence of NPL, which in turn may diminish the revenue generated from interest on bank credit. According to, [24], their study demonstrates that profit margins might act as a mediator between credit risk and equity yields. Based on the above description, the resultant hypothesis may be stated as:

H8: The relationship between credit risk and equity returns through profit margins.

2.9 The Effect of Profit Margins as an Intervening Variable of Currency Conversion Rates on Equity Yields

Currency conversion rates affect the economy if the exchange rate depreciates. A weak exchange rate causes the inflation rate to rise. This causes a decrease in profit margins. According to, [26], bank profit margins will change if the bank experiences appreciation and depreciation and does not carry out bank headings which will decrease. If profit margins decrease where the return earned by investors will decrease, this will cause investment interest to decrease. [27], in their research, said that profit margins could mediate Currency conversion rates on equity yields. From this description, the resulting hypothesis is as follows:

H9: The exchange rate affects equity yields through profit margins.

2.10 The Effect of Profit Margins as an Intervening Variable of Mortgage Rates on Equity yields

Share prices are inversely correlated with mortgage rates, meaning that when mortgage rates rise, share prices tend to fall. The probability of losing money then increases significantly. Excessive mortgage rates will also affect the company's cash flow. Elevated mortgage rates have a direct negative impact on credit quality and profit margins, which in turn have a negative impact on equity returns. According to Keynes' theory, the level of family savings is determined by household income rather than the level of interest rates. This could potentially affect banks' profit margins in the future, [24]. In their study, [28], found that mortgage interest rates have a significant impact on returns by influencing profit margins. Based on the results of this analysis, the resulting hypothesis could be stated as follows:

H10: Mortgage rates affect equity yields through profit margins.

The conceptual framework of this research is presented in Figure 1.

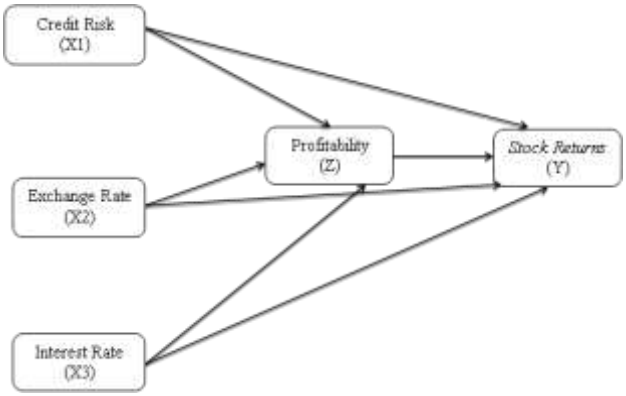

Fig. 1: Conceptual Framework

3 Method, Data and Analysis

This study was initiated to address current issues in the field by integrating theoretical reinforcement, resulting in the use of a quantitative research strategy. The research population consists of banks listed on the Bursa Efek Indonesia (BEI) from 2020 to 2022. When collecting research samples, it is important to examine many factors, especially Banking companies listed on the Bursa Efek Indonesia (BEI) publish financial statements for the years 2020 to 2022 and remain listed. To substantiate the research findings, data gathering was conducted through library research. This involved obtaining a theoretical perspective by reading and studying books relevant to the research problem, as well as collecting and analyzing relevant data about the company, particularly its financial reports. The methodology used is path analysis, facilitated by the use of AMOS 2018 software. The efficiency of mediating factors in this study was assessed using the Sobel Z test. [29].

4 Result and Discussion

4.1 Descriptive Statistical Analysis

A statistical analysis method called descriptive statistics gives a summary of the data and the correlation between the research variables. This study's intervening variable is profit margins, whereas the study's independent variables are mortgage rates, currency rates, and credit risk. On the other hand, equity yields serve as the study's dependent variable. The statistical data findings for all research variables from 2020 to 2022 display the values of the minimum, maximum, mean, and standard deviation.

Table 1. Descriptive Research Variables

Variable	Amount	smallest value	highest score	Mean	Standard Deviation
Credit risk	129	0,02	7,81	1,8933	1,46902
Exchange rate	129	13538,00	14482,00	13976,6667	386,23474
Interest rate	129	4,24	6,10	5,0833	0,7166
Profit margins	129	-9,24	9,10	0,7158	2,06363
Return Stock	129	-69,82	820,00	14,7879	84,57531

Source: Output SPSS, 2022

Based on Table 1 with a total of 129 data, the lowest value for the variable (X1), namely credit risk, is 0.02, the average value is 1.89, and the highest value is 7.89, with a standard deviation of 1.47. The currency risk variable (X2) has a stdr value. dev of 386.23 with an average of 13.98. The interest rate variable (X3) with the smallest value is 4.24 and the highest is 6.10, where the stdr value is the dev of 0.72. The profit margin variable (Z) has a range value of 0.89, namely from -9.24 to 9.10, while the standard error value is 2.06. The endogenous variable, namely stock returns (Y), has values ranging from -69.82 to 820 with a value range of 14.79 and a standard deviation value of 84.57.

4.2 Classical Assumption Test Results

4.2.1 Normality Test Result

The normal test is used to test for whether or not the dependence and independent variables are normally distributed, using the one-sample Monte Carlo test with the condition that if the significance value is above 5% or 0.05, then the data are normally distributed. Conversely, if the probability of significance is less than 5% or 0.05, the data is not normally distributed.

Table 2. Results of the Normality Test

Number of Data (N)	Significance Level (α)	Asymp. Sig, (2-tailed)
109	5% (0,05)	0,451

Source: Processed primary data, 2022

They conducted an outlier data analysis on the 129 data that were initially collected for the first test using SPSS. The findings showed that the data was not normally distributed or that the Kolmogorov-Smirnov test scores were less than 0.05. Table 2's 109 data points were used for the normality test using SPSS after outliers, and the findings indicate a significance value of 0.451 > 0.05. In summary, research data is often dispersed, or what is referred to as average assumed data.

4.2.2 Multi-Collinierity Test Result

The purpose of the multi-collinearity test is to evaluate a regression model to ascertain if multi-collinearity exists within the model or whether correlations exist across independent variables that shouldn't be inside the regression model. There are many strategies to get around the model's multi-collinearity: High correlation factors should be changed or eliminated, more observations should be made, or the data should be transformed into a different format.

Table 3. Results of the Multi-collinearity Test

Variable	VIF	Tolerance	Information
Credit Risk	1,273	0,785	There are no symptoms of multi-collinearity
Interest Rate	1,002	0,998	There are no symptoms of multi-collinearity
Profit margins	1,275	0,784	There are no symptoms of multi-collinearity

Source: Processed primary data, 2022.

The multi-collinearity of the regression model is shown by the results of the multi-collinearity test, which was carried out with 109 data points using SPSS. To avoid the occurrence of multi-collinearity in the regression model, I followed a number of specified steps. I was able to achieve this by eliminating factors that occur frequently or have strong relationships. The exchange rate risk variable (X2), which has the highest correlation with 109 data points as the independent variable in the regression model, is the one removed from this analysis to prevent multi-collinearity.

With 109 data points, the results of the multi-collinearity test indicate that there is no correlation between the variables or that there is no multi-collinearity because the value of profit margins is 1.275 < 10, the value of interest rate is 1.002 < 10 and the value of VIF credit risk is 1.273 < 10. Meanwhile, there is no multi-collinearity or correlation between the variables as indicated by the credit risk tolerance values of 0.785 > 0.10, 0.998 > 0.10, and the profit margins tolerance values of 0.784 > 0.10.

4.2.3 Heteroscedasticity Test Results

The non-squared test looks for an inequality of variance in the regression model using the residuals of a single observation. The regression model does not exhibit homogeneity if the significance value is greater than 0.05, and vice versa, according to the standards for decision testing. If the value of significance of the regression model is less than 0.05, heteroscedasticity is present.

Table 4. Result of the Heteroscedasticity Test

Variable	Sig.	Information
Credit Risk	0,703	There were no symptoms of heteroscedasticity
Interest Rate	0,061	There were no symptoms of heteroscedasticity
Profit margins	0,549	There were no symptoms of heteroscedasticity

Source: Processed primary data, 2022

The foreign exchange risk variable (X2), which has a high correlation in the multi-collinearity test, is included in the heteroscedasticity test if the results of the test, which includes a total of 109 data points, indicate that heteroscedasticity also occurs in the regression model. To avoid the model that causes heteroscedasticity in the multi-collinearity test, I continue to remove the exchange of the value risk variable (X2). The results of the heteroskedasticity test in Table 3 show that there is no heteroskedasticity in the exchange rate variable (X2). This is indicated by the fact that the profit margin variable has a significance value of 0.549 > 0.05, the interest rate variable has a significant value of 0.061 > 0.05, and the credit risk variable has a significant value of 0.703 > 0.05, all of which

indicate that the regression model is not heteroscedastic.

4.2.4 Coefficient of Determination (Goodness of Fit)

The capacity of the independent factor to explain the dependent variable is measured using the coefficient of determination (R^2). We need to examine the R Square value to ascertain the value of determination. The test results for the Coefficient of Determination (R Square) are presented in Table 5.

Table 5. Test Results for the Coefficient of Determination (R Square)

Model	R2 (R Square)
1 (Profitability)	0,251
2 (Stock Return)	0,254

Source: Processed primary data, 2022

Based on the results of the regression analysis with profit margins as the dependent variable with credit risk and mortgage rates as the independent predictors from Table 4, the adjusted R-squared value is 0.251 or 20.1%. This shows that the contribution of credit risk and mortgage rates to the explanation of profit margins is 25.1% and the remaining 79.9% is explained by other variables or variables not examined. At the same time, the value of the adjusted R-squared for credit risk and mortgage rates is the dependent variable, while the independent variable has a value of 0.254 or 25.4%. This shows that credit risk and mortgage rates can explain 25.4% of the return and the remaining 74.6% is explained by other or untested variables.

4.2.5 Path Analysis

[30], of North Carolina State University defines path analysis as an extension of the baseline regression model used to test the alignment of the correlation matrix with two or more models of causal relationships that researchers are comparing. The Diagram AMOS is presented in Figure 2.

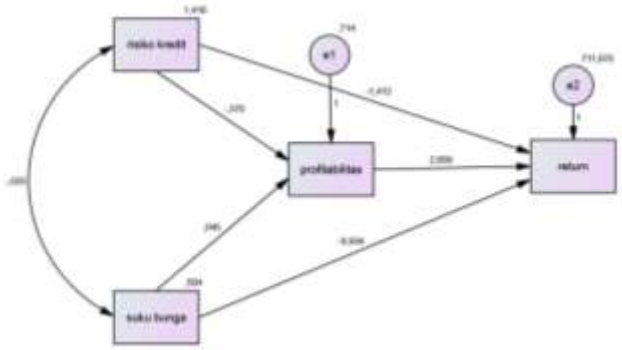

Fig. 2: Diagram AMOS

4.2.6 Hypothesis Testing

To determine the effect of the independent variable on the dependent variable, hypothesis testing was carried out by looking at the size of the significant value and the Z-Sobel test value. If the significance value is < 0.05 and the Z-Sobel value is > 1.96, then there is a directional effect, or it can be said that there is a significance between the dependent variable and the independent variable.

Table 6. Path Analysis Results Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
Z	<--	X1	-,370	,068	-5,420	***	Par-3
Z	<--	X3	,045	,115	,396	,692	Par-4
Y	<--	X1	-1,412	2,433	-,580	,562	Par-1
Y	<--	Z	2,689	3.038	0.885	,376	Par-2
Y	<--	X3	-9,939	3,621	-2.745	,006	Par-5

Source: Amos, 2022

Table 7. Z-Sobel Test Results

Indirect Effect		Z- Sobel	Information
$X1 \rightarrow Z \rightarrow Y$	-0,99493	-0.87363822	< 1,96
$X3 \rightarrow Z \rightarrow Y$	0,121005	0.35789034	< 1,96

Source: Uji Z-Sobel, 2021

Effect of Credit Risk (X1) on Profit margins (Z)

The impact of credit risk (X1) on profit margins (Z) has a probability value of 0.001 <0.05, according to the path estimation utilizing AMOS findings in Table 6. This indicates that the effect of credit stress on revenue is considered important since the value of the probability is less than 0.05. Profit margins are unaffected by the degree of credit risk when H1 is approved and H0 is denied. Because the probability value is smaller than 0.05, the route analysis testing findings using AMOS demonstrate that credit risk significantly affects profit margins. The first hypothesis, or H1, is accepted based on the study's findings. The study's findings show that banks' profit margins decrease when credit risk exposure increases. The findings of this research support the idea of, [27], which contends that because credit risk entails the possibility of losing all or part of interest or loans, it might have an adverse effect on bank profit margins.

According to data released by the Financial Services Authority (OJK), the percentage of non-performing loans (NPLs), or banking NPLs, rose to

3.1% in January 2020. Loan growth was seen in 2020, hitting 8.24%, and continued to expand to 8.5% through March 2018. During this time, declining commodity prices and a weakening of the currency rate presented banks with the challenge of growing non-performing loans (NPLs). Since the price of imported goods and raw materials may rise as a result of the rupiah's depreciation, producers will need to raise prices to maintain profits, which will lower consumer purchasing power and ultimately lower producer profits. Bank credit payments are hindered by the fall in producer earnings, which raises non-performing loans (NPLs) and affects bank credit quality and profit margins for banks.

Effect of Mortgage rates (X3) on Profit margins (Z)

Mortgage rates have no impact on profit margins or are not significant since the findings of path analysis or probability values are more significant than 0.05. This is shown by the effects of path analysis using AMOS in Table 6 on profit margins (X3) of 0.629 > 0.05. to state that H0 is accepted and H3 is denied. The AMOS analysis test findings demonstrate that profit margins are unaffected by mortgage rates. The third hypothesis (H3) in this investigation, which claimed that it had no significant impact since the probability value was higher than 0.05, was shown to be false. The study's findings support the idea put out by Keynes in, [31]. Keynes argues that the amount of consumer savings is dependent on household income rather than interest rate size, which will ultimately affect bank profit margins. The household will save money in the bank, which will also be large if the income is substantial. We might infer that just as a rise or fall in mortgage rates has no effect on other increases or decreases in mortgage rates, neither does it have an impact on investors who choose to invest in banks.

Effect of Profit margins (Z) on Stock Return (Y)

Mortgage rates have no impact on profit margins or are not significant since the findings of path analysis or likelihood values are greater significant than 0.05. This is shown by the effects of path analysis using AMOS in Table 6 on profit margins (X3) of 0.629 > 0.05. to state that H0 is accepted and H3 is denied. The AMOS analysis test findings demonstrate that profit margins are unaffected by mortgage rates. The third hypothesis (H3) in this investigation, which claimed that it had no significant impact since the probability value was higher than 0.05, was shown to be false. The study's findings support the idea put out by Keynes in, [31]. Keynes argues that the amount of consumer savings is dependent on household income rather than interest rate size, which will ultimately affect bank profit margins. The household will save money in the bank, which will also be large if the income is substantial. We might infer that just as a rise or fall in mortgage rates has no effect on other increases or decreases in mortgage rates, neither does it have an impact on investors who opt for investments in banks.

Effect of Credit Risk (X1) on Stock Return (Y)

Table 6 presents the path analysis findings using the AMOS analysis tool. The influence of credit risk on equity yields is shown with a probability value of 0.562 > 0.05, indicating that there is no meaningful relationship between credit risk and equity yields since the probability value is high or low. Credit has no bearing on the reward investors will get. It is possible to view this as rejecting H5 and accepting H0. Credit risk has little impact on stock returns, according to the route analysis findings performed using the AMOS analytic tool. Because the probability outcomes in this research are more than 0.05, it may be argued that the fifth hypothesis (H5) should be rejected or that it has no significant impact. One internal factor that affects bank performance is credit risk. The likelihood of a bank experiencing a financial crisis increases with the firm's exposure to credit risk. Banks are now very cautious when granting loans to potential borrowers due to Bank Indonesia's increasingly strict risk management standards. By lowering the number of non-performing loans (NPL) ratios at banks, Bank Indonesia hopes to maintain bank profit margins and send a good message to investors. Because of this, credit vulnerability does not affect equity yields.

The Effect of Mortgage rates (X3) on Equity yields (Y)

Table 6 presents the findings of a path analysis using the AMOS research tool. The influence of mortgage rates on equity yields is shown with a probability value of 0.006 <0.05, indicating a substantial effect of mortgage rates on equity yields due to the probability value being less than 0.05. After that, H0 is rejected and H7 is approved. The hypothesis derived from research on the impact of mortgage rates on equity yields is to accept the sixth hypothesis (H7) and reject H0 since the probability findings are less than 0.05. The regression analysis using AMOS demonstrates that mortgage rates affect equity yields. This research adheres to, [25], hypothesis. The variety of returns on investment may be impacted by changes in mortgage rates.

Stock prices will decrease if mortgage rates rise, and vice versa. The price of stocks will increase when mortgage rates decline. This is due to the fact that rising mortgage rates will also increase the return on investment linked to mortgage rates. The present value of the business's revenue will be impacted by high mortgage rates, making the investment less appealing. When investing activities are seen as unappealing, investors will choose not to participate in them, which will eventually lower equity returns. Therefore, equity yields will be impacted by both high and low mortgage rates.

Effect of Profit margins (Z) as Intervening Variable Between Credit Risk (X1) on Stock Return (Y)

Table 7 explains the results of data analysis using the Sobel test, which will explain the influence of exogenous variables (profit margin) on endogenous variables (credit risk) with the result of a z-Sobel value of -0.87363822 < 1.96, where the calculation process uses the following formula:

$$Z - Value = a^2\ b/\ SQRT(b^2\ x\ s_a^2\ +\ a^2\ x\ s_b^2)$$

It might be understood that credit risk does not have a direct influence on stock yields via profit margins, or it can alternatively be deemed route analysis not significant since the z-Sobel value is lower than 1.96. Therefore, we must exclude H8 and accept H0. Path analysis using the Sobel Test demonstrates that credit risk does not significantly impact equity yields via profit margins. Specifically, the z-Sobel value is less than 1.96, indicating that the relationship between the two variables is not statistically significant. This research suggests that the null hypothesis (H0) is the correct one.

The Effect of Profit margins (Z) as an Intervening Variable Between Mortgage rates (X3) on Equity yields (Y)

The results of the Sobel test to determine the z-Sobel value are 0.35789034 < 1.96, to explain the relationship between variables (mortgage interest rate --> profit margin --> return on equity) the calculation is carried out as follows:

$$Z - Value = a^2\ b/\ SQRT(b^2\ x\ s_a^2\ +\ a^2\ x\ s_b^2)$$

Equity yields are not directly related to mortgage rates because of how profit margins work. Since 1.96 is smaller than the z-Sobel value, we may conclude that H0 is correct and H10 is incorrect. The Sobel test's findings on the relationship between mortgage rates and equity yields via profit margins demonstrate that there is no meaningful relationship between the two variables. The hypothesis gained from this investigation is to reject the tenth hypothesis (H10).

4.2.7 Implications of Research Results

Credit risk has an essential effect on profit margins with a probability value of 0.001 0.05, as shown by the discussion and results of the research entitled Effects of credit risk, exchange rate risk, and interest rate risk on equity yields with profit margins as an intervening variable in banking companies listed on the IDX in 2020-2022, leading to acceptance of the first hypothesis (H1). [10], found that credit risk significantly reduces profit margins, and our findings are consistent with their findings.

Mortgage rates have no significant influence on profit margins since the probability value is bigger than 0.05, 0.692 > 0.05. The hypothesis gained is to reject the third hypothesis (H3). Contrast these findings with those of, [32], whose study "The Influence of Currency Conversion Rates and Mortgage Rates on Equity Yields with Profit Margin as an Intervening Variable in Manufacturing Companies Registered on the Indonesia Stock Exchange in 2015-2017" found that interest rates on mortgages have a "significant effect" on businesses' profit margins. [33], in a study titled "The Influence of Rupiah Currency Conversion Rates, Bank Indonesia Mortgage Rates, and Inflation on Equity Yields with Profit margins as Intervening Variables in Banking Companies on the Indonesia Stock Exchange (IDX) in 2012-2015," found that mortgage rates did not affect profit margins.

Since the probability value is more than 0.05 (0.562 > 0.05), the relationship between profit margins and equity yields is not statistically significant. This research suggests that the null hypothesis (H0) is the most likely explanation. Profit margins are shown to have a considerable impact on stock yields, contrary to the findings of a study by, [28] titled "The Effect of Currency Conversion Rates on Equity Yields with Profit Margin as an Intervening Variable" (2021). Profit margins were shown to have no impact on equity returns, contrary to claims made by, [26].

Since the probability value is more than 0.05 (0.376 > 0.05), credit risk has no appreciable impact on stock returns. As a result, the result of this investigation suggests that the fifth hypothesis (H5) is false. Other studies, such as "The Effects of Credit Risk and Exchange Rate Risk on Profit Margins and Return of Banking Stocks on the IDX"

by, [10], and, [11], find that credit risk has a significant positive effect on equity yields.

The results of this research provide support for the seventh hypothesis (H7), which states that mortgage rates have a considerable impact on equity returns (P=0.006 > 0.05). In line with the findings of this study, [33], whose study was titled "The Effect of Rupiah Currency Conversion Rates, Bank Indonesia Mortgage Rates, and Inflation on Equity Yields With Profit Margins as an Intervening Variable in Banking Companies on the Indonesia Stock Exchange (IDX) 2012-2015," found that mortgage rates have a substantial impact on equity yields.

Since profit margins are not a direct determinant of stock rates, the effect of credit risk on equity yields is not moderated by profit margins. This study's hypothesis is to reject the eighth hypothesis (H8), as shown by the study's Z-Sobel value of -0.87363822 1.96. [10], found that profit margins may moderate the effect of credit risk on stock returns, although these findings contradict their findings.

Since the relationship between mortgage rates and equity yields cannot be mediated by profit margins, the latter does not affect the former. This study's Z-Sobel score is 0.35789034 1.98, suggesting that the null hypothesis (H0) should be rejected. This study contradicts the findings of, [17], who argue that interest rates on mortgages have a substantial impact on returns via profit margins.

5 Conclusion

Researchers may infer that the magnitude of credit risk will affect the profit margins of banking businesses listed on the IDX in 2020-2022 based on the findings and discussion of the submitted study. Since there is a strong correlation between credit risk and exchange rate risk, researchers must eliminate the exchange rate variable to avoid further correlation before drawing any conclusions about the impact of exchange rate risk on profit margins (H1 or H2). Profit margins of banks included in the IDX in 2020–2022 are unaffected by mortgage rates, regardless of interest rate size. Equity returns investors get from banking businesses listed on the IDX in 2020-2022 are unaffected by profit margins since investors in these companies consider factors other than profit margins when making investment decisions.

For 2020–2022, the amount of credit risk has no effect on stock yields for banking businesses listed on the IDX. Since the credit risk variable is highly correlated with the exchange rate risk, we cannot draw any firm conclusions about the effect of exchange rate risk on stock returns. To avoid any potential link, the researcher drops the exchange rate variable. In 2020–2022, an increase in mortgage rates will have a considerable impact on the equity yields of IDX-listed financial institutions because of the correlation between mortgage rates and the returns on mortgage-related investments. In 2020-2022, the stock yields of banking businesses included in the IDX are unaffected by credit risk as measured by profit margins. Because of the strong relationship between credit risk and exchange rate risk, H9 cannot be chosen. To avoid any potential link, the researcher drops the exchange rate variable. In 2020-2022, the equity yields of banks included in the IDX are unaffected by the interest rate on mortgages via the banks' profit margins.

References:

[1] Hertina, D., & Saudi, M. H. M. (2019). Stock Return: Impact of Return on Assets, Return on Equity, Debt to Equity Ratio and Earning Per Share. *International Journal of Innovation*, vol.6(12).

[2] Matytsin, D. E. (2021). Internet Investing as a Remote Algorithm of the Retail Investment Financing. In: Popkova, E.G., Sergi, B.S. (eds) Modern Global Economic System: Evolutional Development vs. Revolutionary Leap. ISC 2019. *Lecture Notes in Networks and Systems*, vol 198. Springer, Cham. https://doi.org/10.1007/978-3-030-69415-9_204.

[3] Sausan, F. R., Korawijayanti, L., & Ciptaningtias, A. F. (2020). The effect of return on assets (YOA), debt to equity ratio (DER), earnings per share (EPS), total asset turnover (TATO) and exchange rate on stock return of property and real estate companies at Indonesia stock exchange period 2012-2017. *Ilomata International Journal of Tax and Accounting*, vol.1(2), pp.103–114.

[4] Amalya, N. T. (2018). "The influence of return on assets, return on equity, net profit margin and debt to equity ratio on stock prices". *SECURITIES Journal (Stocks, Economics, Finance and Investment)*, vol.1(3).

[5] Ardianto, D., & Rivandi, M. (2018). "The Influence of Enterprise Risk Management Disclosure, Intellectual Capital Disclosure and Management Structure on Company Value". Profita: Scientific Communication

and Taxation, vol.11(2), pp.284–305, https://doi.org/10.22441/profita.v11.02.009.

[6] Haryani, S., & Priantinah, D. (2018). The influence of inflation, Rupiah/US Dollar exchange rate, BI interest rates, DER, YOA, CR and NPM on stock returns. Nominal: A Barometer of Accounting and Management Research, vol.7(2), pp..106–124.

[7] Egam, G. E., Ilat, V., & Pangerapan, S. (2017). "The influence of Return on Assets (YOA), Return on Equity (ROE), Net Profit Margin (NPM), and Earning Per Share (EPS) on the share prices of companies included in the LQ45 Index on the Indonesian Stock Exchange for the 2013-2015 period". *EMBA Journal: Journal of Economic, Management, Business and Accounting Research*, vol.5(1).

[8] Supardi, H., Suratno, H. S. H., & Suyanto, S. (2018). The Effect of Current Ratio, Debt to Asset Ratio, Total Asset Turnover and Inflation on Return on Assets. *JIAFE (Scientific Journal of Accounting, Faculty of Economics)*, vol.2(2), pp.16–27.

[9] Yang, L. (2003). "The Asian financial crisis and non-performing loans: Evidence from commercial banks in Taiwan". *International Journal of Management*, vol.20(1), 69.

[10] Catherine, J. R., & Septiani, A. (2017). "The Influence of Family Control on Profitability and Company Value in the Consumer Goods Industry in Indonesia". *Diponegoro Journal of Accounting*, vol.6(3), pp.625-634.

[11] Ekinci, R., & Poyraz, G. (2019). "The effect of credit risk on financial performance of deposit banks in Turkey". *Procedia Computer Science*, vol.158, pp.979–987.

[12] Kustina, Ketut Tanti and Kustina, Ketut Tanti, MSMEs Credit Distribution and Non-Performing Loan towards Banking Companies Profit in Indonesia (2017). Kustina, K., Dewi, I., Prena, G., & Utari, I. (2018). MSMEs Credit Distribution and Non-Performing Loan towards Banking Companies Profit in Indonesia. International Journal Of Social Sciences And Humanities (IJSSH), 2(1), 10-23. doi:10.29332/ijssh.v2n1.72, [Online]. https://ssrn.com/abstract=3683450 (Accessed Date: December 1, 2023).

[13] Fabozzi, F. J., & Franco, A. (1997). Handbook of Emerging Fixed Income and Currency Markets (Vol. 31). *John Wiley & Sons*.

[14] Dupor, B. (2000). "Currency conversion rates and the fiscal theory of the price level". *Journal of Monetary Economics*, vol.45(3), pp.613–630.

[15] Cavallo, M., & Ghironi, F. (2002). "Net foreign assets and the exchange rate: Redux revived". *Journal of Monetary Economics*, vol.49(5), pp.1057–1097.

[16] Hasanov, F. J., Bayramli, N., & Al-Musehel, N. (2018). Bank-specific and macroeconomic determinants of bank profit margins: Evidence from an oil-dependent economy. *International Journal of Financial Studies*, vol.6(3), 78.

[17] Fajaria, A. Z., & Isnalita, N. (2018). The Effect of Profit Margins, Liquidity, Leverage and Firm Growth of Firm Value with its Dividend Policy as a Moderating Variable. *International Journal of Managerial Studies and Research (IJMSR)*, vol.6(10), pp.55–69.

[18] Alfiyati, Y., & Santoso, B. H. (2021). "The Influence of Liquidity, Solvency and Profitability on Share Prices in the Real Estate Property Sector". *Journal of Management Science and Research (JIRM)*, vol.10(3).

[19] Chenhall, R. H., Hall, M., & Smith, D. (2010). "Social capital and management control systems: A study of a non-government organization". *Accounting, Organizations and Society*, vol.35(8), pp.737–756.

[20] Vo, X. V., & Ellis, C. (2018). "International financial integration: Stock return linkages and volatility transmission between Vietnam and advanced countries". *Emerging Markets Review*, vol.36, pp.19–27.

[21] Kusumah, R. W. R., Ramdhani, C., & Aryanti, D. (2021). The Influence of Company Growth and Company Value on Equity Yields. *Psychology and Education*, vol.58, 6.

[22] Claessens, S., Coleman, N., & Donnelly, M. (2018). "Low-For-Long" mortgage rates and banks' interest margins and profit margins: Cross-country evidence". *Journal of Financial Intermediation*, vol.35, pp.1–16.

[23] Nguyen, T. N. L., & Nguyen, V. C. (2020). The determinants of profit margins in listed enterprises: A study from Vietnamese stock exchange. *The Journal of Asian Finance, Economics and Business*, vol.7(1), pp.47–58.

[24] Brastama, R. F., & Yadnya, I. P. (2020). "The effect of capital adequacy ratio and non-performing loan on banking stock prices with profit margins as intervening variable". *American Journal of Humanities and Social*

Sciences Research (AJHSSR), vol.4(12), pp.43-49.

[25] Nur, E. Y., & Emanuel, K. (2018). The effect of credit risk on bank profit margins with efficiency as the intervening variable. Russian *Journal of Agricultural and Socio-Economic Sciences*, vol.74(2), pp.179-186.

[26] Sucipto, A., & Chasanah, N. (2019). Effect Of Liquidity Ratio, Profit Margins, And Solvency On Equity Yields With Capital Structure As An Intervening Variable (Study On Food And Beverage Sub Sector Listed In Indonesia Stock Exchange (Idx) Period 2013-2017). *Eksktra: Journal of Business and Management*, vol.3(1), pp.52-68.

[27] Sari, I. A. G. D. M., & Sedana, I. B. P. (2020). Profit margins and liquidity on firm value and capital structure as intervening variables. *International Research Journal of Management, IT and Social Sciences*, vol.7(1), pp.116–127.

[28] Kusumaningtyas, N., Widagdo, B., & Nurjannah, D. (2021). The Effect of Interest Rate, Inflation and Exchange Value on Equity Yields with Profit Margins as Intervening Variables. *Journal of Business Management and Entrepreneurship (JAMANIKA)*, vol.1(2), pp.97–108.

[29] Ubaidillah, F., Fernandes, A. A. R., Iriany, A., Wardhani, N. W. S., & Solimun, S. (2022). "Truncated Spline Path Analysis Modeling on in Company X with the Government's Role as a Mediation Variable".

[30] Garson, G. D. (2013). Path analysis. *Statistical Associates Publishing Asheboro, NC*.

[31] Appelt, K. (2016). "Keynes' Theory of the Interest Rate: A Critical Approach". *Theory, Methodology, Practice*, vol.12(01), pp.3–8.

[32] Ruan, Q., Bao, J., Zhang, M., & Fan, L. (2019). The effects of exchange rate regime reform on RMB markets: A new perspective based on MF-DCCA. *Physica A: Statistical Mechanics and Its Applications*, vol.522, pp.122–134.

[33] Suryani, E., & Mardiana, Y. (2022). The Role Of Profit Margins As An Intervening Variable On The Effect Of Inflation, Mortgage Rates, And Currency Conversion Rates On Equity Yields (Study On Consumer Goods Industry Sub-Sector Companies Listed On The Indonesia Stock Exchange For The 2017-2020 Period). *Management Science Research Journal*, vol.1(3), pp.126–138.

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- Fahrudin Zain Olilingo designed the research concept and model, and was responsible for the research carried out
- Rita Alfin carried out data analysis and is responsible for journal publication
- Listiyana wrote and designed the paper and was responsible for administration when the research was carried out.
- Sonny Leksono carried out data collection, data analysis and wrote the research results chapter.

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