

Global Banking Industry Financials : An Analysis of Derivative Usage on The Financial Performance of Major Banks

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Abstract

Hedging has become a vital strategy for the banking sector, given the complexity and volatility of today's global financial markets. Hedging is also used as one of the strategies to reduce risks associated with fluctuations in the value of assets and liabilities. In Indonesia, the Banking Sector faces challenges in managing risks associated with economic and financial variability. This study focuses on micro and macro factors that can influence hedging decisions in the banking sector. The micro factors considered in this study are liquidity and leverage. On the other hand, the macro factors considered in this study are interest rates and exchange rates. The sampling method used is nonprobability sampling, namely the purposive sampling method. The samples in this study were 15 banking sector companies listed on the IDX for the period 2020-2023. This study uses the help of Eviews 12 used to test the goodness of the model, and logistic regression and hypothesis relationships designed in this study. The findings in this study indicate that interest rates have a negative and significant impact on hedging decisions, and liquidity has no significant effect on hedging decisions. This can happen because market liquidity is stable and not volatile, while exchange rates and leverage positively and significantly affect hedging decisions.

Keywords : Hedging, Exchange Rate, Interest Rate, Leverage, Liquidity

JEL Codes: M10, M12, M30

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1. Introduction

The banking industry has a very important role in the economy of a country, including Indonesia. Banking is not only a place to store and borrow funds, but also involved in various financial activities, including risk management. Fluctuations in foreign exchange rates pose significant risks and impacts on international trade transactions. According to Repie & Sedana (2015) the value of one currency in relation to another currency is expressed as an exchange rate, or rate. International commercial activities carry high risks due to uncertainty, which is represented by high variations in exchange rate movements. (Sofia & Hedismarlina Yuneline, 2019).



Figure 1. Rupiah exchange rate against USD 2020-2023

Source : Bank Indonesia

In Figure 1. is a graph of the movement of the rupiah exchange rate against the US dollar for the period 2020-2023. The rupiah exchange rate is based on supply and demand. One of the pieces of information related to the rupiah against the US dollar is the Bank Indonesia transaction rate. This can be measured using the middle rate. Fluctuations in currency exchange rates can have a direct or indirect impact on the company. The exchange rate experienced increases and decreases between 2020 and 2023, and there is a greater possibility of a depression or devaluation of the rupiah against the US dollar. The risks associated with these currency exchange rate fluctuations can be reduced by planning risk management.

Risk management is one of the most important things that every business must have. The use of company rules and procedures to monitor, manage and control risk exposure is known as risk management. The goal of this risk management is to reduce or even completely eliminate trading risks. Exponents are one of the items that are susceptible to risk and will directly affect the performance of the organization when the expected risk occurs. The most common relationship between this exposure and finance

Hedging is one way for businesses to avoid the risk of exchange rate changes. According to (Belghitar., 2008) that business actors will be more interested in hedging if the rupiah falls. One way to do hedging is by using derivative instruments. Derivative instruments include options, futures, swaps, and various other structured products. The value of a derivative contract depends on the price or performance of another asset called the underlying *asset*.

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The principle of *Hedging* is to cover the losses of the initial asset position with the profits from the *Hedging instrument position*.

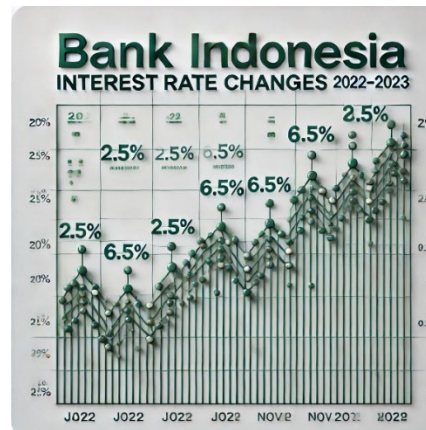


Figure 2. Development of Bank Indonesia Interest Rates

Source : Bank Indonesia

In Figure 2. can seen This is the first rate hike after the last rate was raised to 5.75 percent in early 2023 and maintained until September 2023. Deposit interest rates also rose to 5.25% and lending interest rates rose to 6.75% as a result of the decision. Bank Indonesia's decision to increase the benchmark interest rate is a form of strengthening the stability of the rupiah exchange rate in response to the impact of high global uncertainty and to mitigate the impact of imported inflation. This interest rate is always changing because Bank Indonesia's policy takes into account the economic conditions of Indonesia and the economy abroad such as Europe, America, and Asia. Therefore, the BI *rate* is used as a reference for assessing interest rates.

The sample of banking companies listed on the IDX is used in this study. Banking companies are always associated with finance, because the function of banks is mainly involved in the financial sector. Three things are involved in banking activities: receiving money, allocating money, and offering financial services. *Purposive sampling* , or sampling based on predetermined criteria, will be used in this study to select IDX banking sector companies. The existence of research gaps that occur in previous studies requires deeper research with different variables. This is the background for the author to conduct research entitled "Global Banking Industry Financials : An Analysis Of Derivative Usage On The Financial Performance Of Major Banks"

2. Literature Review

This literature review explores various dimensions of how derivatives usage impacts financial performance among major global banks. Theoretical frameworks, such as hedging theory, suggest that derivatives can stabilize cash flows by managing financial risks like interest rate, currency, and credit risk—thereby enhancing value (Froot, Scharfstein, & Stein, 1993). However, agency theory posits that while derivatives may align managerial and shareholder interests by reducing earnings volatility, excessive use can introduce speculative risks (Stulz, 2004). Empirical evidence indicates that banks using derivatives often report higher returns on assets (ROA) and equity (ROE) due to lowered risk exposure (Allayannis & Weston, 2001). However, results vary, as benefits depend on factors such as derivative type, regulatory environments, and managerial risk preferences (Batten, 2016). On the risk profile side,

derivative trading can increase banks' credit and market risks, particularly during market volatility, as seen in the 2008 crisis when derivatives contributed to financial instability (Acharya & Richardson, 2009; Brunnermeier et al., 2009). The regulatory landscape, including frameworks like Basel III and Dodd-Frank, influences derivative usage, imposing capital requirements and risk mitigation rules that affect profitability (Allen & Carletti, 2013; Hull, 2018). Regarding financial reporting and investor perceptions, derivatives can aid income smoothing, but excessive use may obscure actual risk levels, impacting stock performance and investor trust (Géczy, Minton, & Schrand, 2007; DeMarzo & Duffie, 1995). Collectively, these themes illustrate the complex relationship between derivatives, financial performance, and risk within the global banking sector, providing a nuanced understanding of both the advantages and potential risks of derivative usage.

The use of derivatives in the global banking industry has diverse impacts on financial performance, affecting profitability, risk, and market stability. Banks utilize derivatives such as forwards, swaps, options, and futures to manage risk and enhance returns. Their effects vary across different banking environments and economic conditions. The following section explores the impact of derivatives on bank performance, risk, and systemic stability. Derivatives can improve bank profitability by increasing return on equity and net interest margins. For example, in deposit banks, derivatives significantly influence net interest margins, while in participation banks, they affect return on equity (Tura & Kaya, 2022). In the European market, banks that use derivatives exhibit higher profitability and lower net interest margins, indicating efficient capital allocation and risk management (Chang et al., 2018). While derivatives provide risk hedging and liquidity, they also introduce systemic risk. The complexity and leverage associated with derivatives can exacerbate market volatility, particularly during financial crises (Wang & Ying, 2024). In developing countries and newly emerging economies, derivatives have been found to reduce bank performance, suggesting that the associated risks may outweigh the benefits in less mature markets (Keffala & Peretti, 2016). An effective regulatory framework is essential to mitigating the negative impact of derivatives on financial stability. Proper regulation can enhance market efficiency and prevent excessive risk-taking (Wang & Ying, 2024). The Romanian banking system, for instance, is exploring ways to improve the use of derivatives while managing systemic risk through regulatory measures (RĂDULESCU et al., 2024). While derivatives offer significant benefits in terms of profitability and risk management, they also pose challenges related to systemic risk and market stability. The impact of derivatives depends on the context, varying with financial market maturity and regulatory environments. Understanding these dynamics is crucial for banks and policymakers to harness the benefits of derivatives while maintaining financial stability.

3. Research Method

3.1. Types of research

This study uses a quantitative method based on the philosophy of positivism (an event that actually happened), using a specific sample population, and using the documentation method to collect data using secondary financial reports taken from the idx.com website. The company's financial report data that has been published on the Indonesia Stock Exchange is recorded and monitored through the documentation method. A set of items that work together to achieve a common goal (Sekaran & Bougie, 2017). The population of this study consists of banking businesses listed on the IDX between 2020 and 2023. According to the survey conducted, there are a total of 46. A specific sampling technique was used in this study, where

a predefined set of criteria was applied to select the sample.

3.2. Place Study

In compiling this scientific work, due to time constraints and circumstances that did not allow it, the author chose to take secondary company financial report data from trusted sources, namely Indonesia Stock Exchange website banking sector period , 2020-2023.

3.3. Framework Draft

The conceptual framework explains the theoretical relationship between the variables to be studied. Thus, a theoretical explanation of the relationship between the independent and restricted variables is needed. The idea behind this study is to examine how the independent factors X1, X2, X3, and X4 affect the dependent variable Y. where Y is the outcome of the hedging process as determined by the use of derivative instruments, and X1, X2, X3, X4 are the exchange rate, interest rate, liquidity, and leverage. Regarding the research design, it is as follows :

The data source referred to in this study is the object from which data can be obtained (Sugiyono, 2010). The required data source in this research is primary data. According to Sugiyono (2012), primary data is defined as a data source that directly provides data to the data collector, referred to as the primary source. Among the 46 banking companies that met the research criteria, 15 companies were selected as the research sample. Here is the list of banking :1. BBTN - Bank Tabungan Negara (Persero) Tbk, 2. BBKA - Bank Central Asia Tbk, 3. BNGA - Bank CIMB Niaga Tbk, 4. BDMN - Bank Danamon Indonesia Tbk, 5. BMRI - Bank Mandiri (Persero) Tbk, 6. BBNI - Bank Negara Indonesia Tbk, 7. NISP - Bank OCBC NISP Tbk, 8. BNLI - Bank Permata Tbk, 9. BBRI - Bank Rakyat Indonesia Tbk, 10. PNBNI - Bank Pan Indonesia Tbk, 11. MEGA - Bank Mega Tbk, 12. BBHI - Allo Bank Indonesia Tbk, 13. BNII - BK Maybank Indonesia Tbk, 14. BTPN - Bank BTPN Tbk, 15. BBYB - Bank Neo Commerce Tbk.

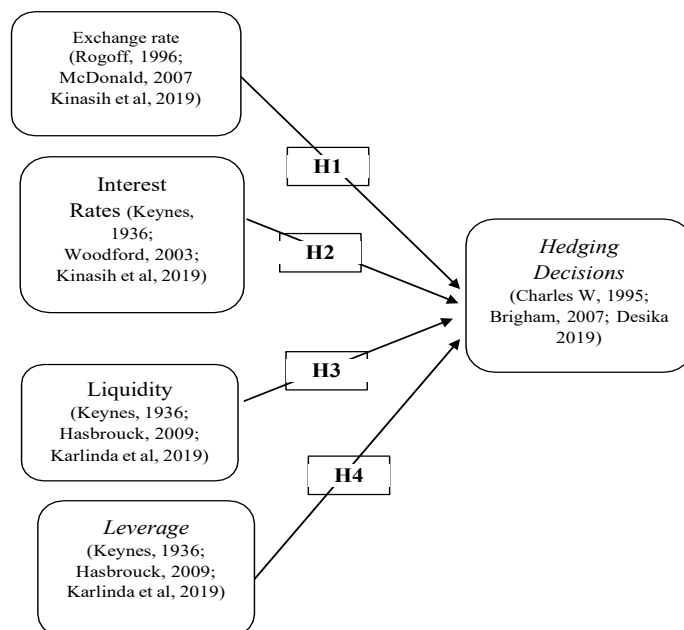


Figure 3. Research Design

Information :

H1 = X1 and Y exist connection

H2 = X2 and Y exist connection

H3 = X3 and Y exist connection

H4 = X4 and Y exist connection

4. Findings and Discussions

4.1. Statistical Analysis

To explain and provide an overall picture of all variables studied, this study uses descriptive statistical analysis, examining the mean, median, minimum, maximum, and standard deviation of each variable. Table 1. below displays the findings of the descriptive statistical tests conducted on 15 banks for the years 2020-2023.

Table 1. Descriptive Statistics of Research Data

	ETHNIC GROUP FLOWER	MARK SWAP	LIQUIDITY	LEVERAGE
Mean	0.050625	14880.25	0.611333	0.631333
Median	0.052500	14842.50	0.400000	0.540000
Maximum	0.060000	15731.00	4,870,000	2,500,000
Minimum	0.037500	14105.00	0.220000	0.010000
Std. Dev.	0.008432	7,104,742	0.709314	0.521957
Skewness	-0.578740	0.053770	4,599,692	1,676,544
Kurtosis	1,931,182	1,123,342	2,575,155	5,861,203
Jarque-Bera	6,205,333	8,833,522	1,505,654	4,857,422
Probability	0.044929	0.012073	0.000000	0.000000
Sum	3,037,500	892815.0	3,668,000	3,788,000
Sum Sq. Dev.	0.004195	29781641	2,968,449	1,607,389
Observations	60	60	60	60

a. Interest rate

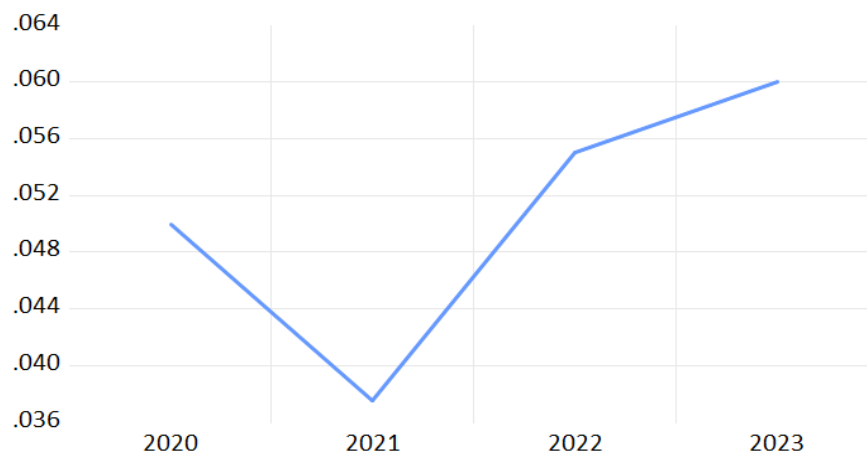


Figure 4. Interest Rates

Based on the results of statistical tests on Interest Rates conducted for the period 2020-2023, as seen in Table 1, it is known that the average value obtained is 0.050625 or, if expressed as a percentage, 5.06%, while the middle value is 0.052500 or, if expressed as a percentage, 5.25%. It can be seen from figure 1. it is known that the maximum value is in 2023, namely 0.060000 or if expressed as a percentage of 6.00% and the minimum values occur in 2021, namely 0.037500 or if expressed as a percentage of 3.75%. The standard deviation obtained is 0.008432.

b. Exchange rate

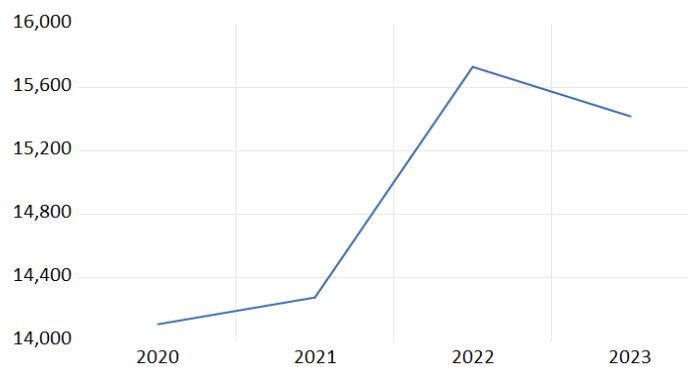
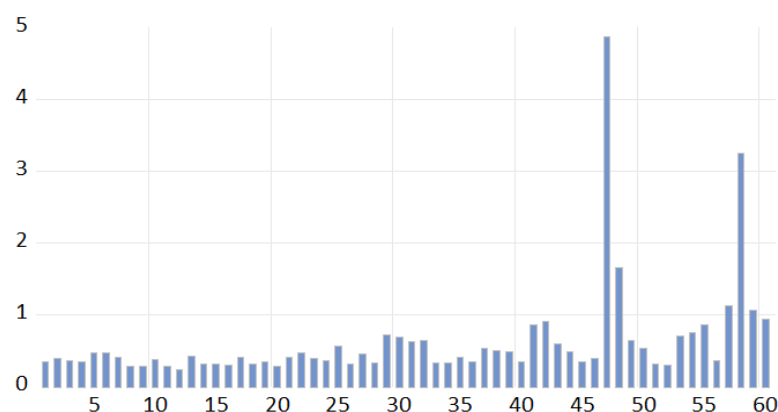


Figure 5. Exchange Rate

Based on the statistical results on the exchange rate for the period 2020-2023, as seen in Table 1, the average value obtained is worth 14880.25, while the middle value is worth 14842.50. Figure 4.2 shows that the maximum value occurs in 2022, which is 15731.00, and the minimum value occurs in 2020, which is 14105.00. The standard deviation obtained is 7,104,742.

c. Liquidity

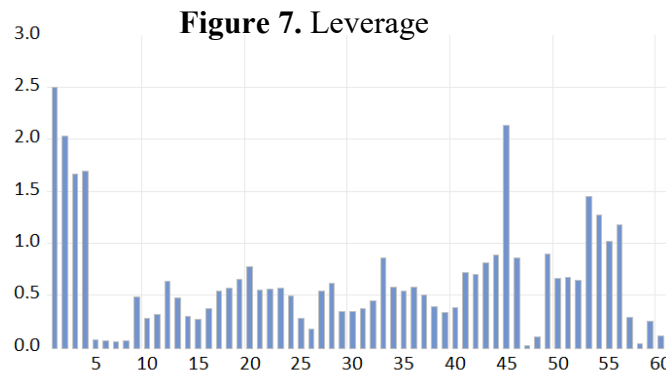
Figure 6. Liquidity



Based on the results of statistical tests on liquidity (*current ratio*) conducted on 15 banks for the 2020-2023 period, as seen in table 4.1, it is known that the average value which is generated is 0.611333, while the middle value is 0.400000. It can be seen from Figure 4.3 that the maximum value falls on the Allo Bank Indonesia Tbk company in 2022, which is 4,870,000, and the minimum value falls on the CIMB Niaga Tbk company in 2023, which is 0.220000. The standard deviation obtained is 0.709314.

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d. Leverage



Based on the results of statistical tests on *leverage* proxied by (*Debt to Equity Ratio*) in 15 banks for the period 2020-2023 as seen in table 1. it is known that the average value obtained is 0.631333, while the middle value is 0.540000. As seen in Figure 4.4, it is known that the maximum value falls on the Bank Tabungan Negara Tbk company in 2020, which is 2,500,000, and the minimum value falls on the Allo Bank Indonesia Tbk company in 2022, which is 0.010000. The standard deviation obtained is 0.521957.

4.2. Logistic Regression Analysis

Likelihood Ratio Test (LR Test)
Table 2. Likelihood Ratio (LR Test)

LR statistic	33.19053	Avg. log likelihood	-0.347744
Prob (LR statistic)	0.000001		

Likelihood Ratio test measures the simultaneous influence of independent variables on the dependent variable. Comparing the calculated *chi-square* with the *chi-square* table is used in the *Likelihood Ratio* test . Rejecting H_0 or independent variables can affect the dependent variable simultaneously is proven if the calculated *chi-square value* > *chi-square* table. Conversely, if the *chi-square value* < *chi-square* table, H_0 is accepted indicating that the independent variables do not affect the dependent variable simultaneously.

Based on the results of the LR test seen in table 2, the *LR-Statistic* or *chi-square* count value is 33.19053 and the *chi-square* table value with $\alpha = 0.05$ is 9.4873. *chi-square* count (33.19053) > *chi-square* table (9.4873), H_0 is rejected, meaning that simultaneously the independent variables have a significant effect on the dependent variable.

Z Statistic Test
Table 3. Z Statistic Test

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	35.39127	13.23522	2.674023	0.0075
Interest Rate	-43.58420	58.40612	-0.733665	0.4632
Exchange Rate	-0.0002409	0.000993	-2.426314	0.0153
Likuiditas	-1.552250	1.948423	-0.796670	0.4256
Leverage	3.141710	1.176341	2.670749	0.0076

To find out whether the independent variable affects the dependent variable, the Z test can be performed. In this study, Exchange Rate, Interest Rate, Liquidity and *Leverage* are

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independent variables. The Z test is to compare the probability value with α . If the probability $< \alpha$ means rejecting H_0 , so it can be concluded that the independent variable affects the dependent variable. Conversely, if the probability $> \alpha$ means H_0 is accepted, so it can be concluded that the independent variable does not affect the dependent variable. The following are the results of the Z test for each variable :

Interest Rate Variable

The probability value of the independent variable of the interest rate is 0.4632, in this case it is greater than α . In this study α is 0.05 or 5%. Thus it can be said that the interest rate does not affect the *hedging decision*.

Exchange Rate Variable

The probability value of the independent variable on the exchange rate is 0.0153 in this case less than α . In this study α is 0.05 or 5%. Thus it can be said that the exchange rate has an influence on *hedging decisions*.

Liquidity Variable

The probability value of the independent variable on liquidity is 0.4256 in this case is greater than α . In this study α is 0.05 or 5%. Thus it can be said that liquidity does not affect *hedging decisions*.

Leverage Variable

The probability value of the independent variable on *leverage* is 0.0076 in this case less than α . In this study α is 0.05 or 5%. Thus it can be said that *leverage* has an influence on *hedging decisions*.

Determination Coefficient Test (R^2 McFadden)

Table 4. Determination Coefficient Test (R^2 McFadden)

McFadden R-squared	0.443014	Mean dependent var	0.316667
S.D. dependent var	0.469102	S.E. of regression	0.342792
Akaike info criterion	0.862154	Sum squared resid	6.462846
Schwarz criterion	1.036683	Log likelihood	-20.86462
Hannan-Quinn criter.	0.930422	Deviance	41.72923
Restr. Deviance	74.91976	Restr. log likelihood	-37.45988
LR statistic	33.19053	Avg. log likelihood	-0.347744
Prob (LR statistic)	0.000001		

As stated in the previous chapter, the quality of the regression line in logistic regression cannot be determined using the conventional coefficient of determination R^2 value. Logistic regression analysis can use the McFadden coefficient or McFadden R-squared. It can be seen from table 4. shows that the independent variables in this model can explain the probability of *hedging decisions* of 44.30%, with other variables outside this model can explain 55.70% of the remaining.

Interpretation of Logistic Regression Equation

Table 5. Logit Model Estimation Results

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	35.39127	13.23522	2.674023	0.0075
Interest Rate	-43.58420	58.40612	-0.733665	0.4632
Exchange Rate	-0.0002409	0.000993	-2.426314	0.0153
Likuiditas	-1.552250	1.948423	-0.796670	0.4256
Leverage	3.141710	1.176341	2.670749	0.0076
McFadden R-squared	0.443014		Mean dependent var	0.316667
S.D. dependent var	0.469102		S.E. of regression	0.342792
Akaike info criterion	0.862154		Sum squared resid	6.462846
Schwarz criterion	1.036683		Log likelihood	-20.86462
Hannan-Quinn criter.	0.930422		Deviance	41.72923
Restr. Deviance	74.91976		Restr. log likelihood	-37.45988
LR statistic	33.19053		Avg. log likelihood	-0.347744
Prob (LR statistic)	0.000001			
Obs with Dep=0	41		Total obs	60
Obs with Dep=1	19			

Based on the results of the tests that have been carried out, the following logit equation results were obtained:

$$\ln \frac{p}{1-p} = 35.39127 - 43.58420 \text{ Interest rate} - 0.002409 \text{ Exchange rate} - 1.552250 \text{ CR} + 3.141710 \text{ DER}$$

Assuming that the other independent variables are constant, each partial coefficient in the above equation calculates the change in the estimated logit value in response to a change in the variable's value. This is explained as follows:

1. Interest Rate Variable

The Z test conducted shows that the independent variable of interest rates does not significantly affect hedging decisions. This is proven by a probability value of 0.4632 with α a 0.05. This shows that the hypothesis of interest rates having a significant effect on hedging decisions is not proven. The interest rate coefficient, with -43.58420, indicates a negative direction.

The results of this test are similar to a study conducted by (Firmansyah, 2016) Which found that interest rates did not affect *hedging decisions*.

2. Exchange Rate Variable

The Z test conducted shows that the independent variable exchange rate has a negative and significant influence on *hedging decisions*. Proven by a probability value of 0.0153 with α is 0.05. This shows that the hypothesis of exchange rate has a significant influence on *hedging decisions* has been proven. The exchange rate coefficient with -0.002409 indicates a negative direction .

The results of this test are similar to a study conducted by (Ayuningtyas et al., 2019) which found that exchange rates have a negative effect on *hedging decisions*.

3. Liquidity Variable

The Z test conducted shows that the independent variable liquidity does not have a significant effect on *hedging decisions*. Proven by a probability value of 0.4256 with α is 0.05. This shows that the hypothesis of liquidity having a significant effect on *hedging decisions* is not proven. The liquidity coefficient with -1.552250 indicates a negative direction.

The results of this test are similar to studies conducted by (Syaputry et al., n.d.) and (Verawaty et al., 2019) which found that liquidity has no effect on *hedging decisions*.

4. Leverage Variable

The Z test conducted shows that the independent variable *leverage* has a positive and significant influence on hedging decisions. Proven by a probability value of 0.0076 with α is 0.05. This shows that the hypothesis of *leverage having a significant influence on hedging decisions has been proven*. The leverage coefficient with 3.141710 shows a positive direction.

The results of this test are similar to the study conducted by (Saraswati & Suryantini, 2019) and (Karlinda & Manunggal, 2023) which showed that leverage has an effect on hedging decisions.

5. Conclusion

The conclusions drawn from the research findings conducted in the previous chapter, which examined the variables influencing the decisions of Indonesian banks, are explained as follows:

1. According to the logistic regression test results, exchange rates, interest rates, liquidity, and leverage influence hedging decisions simultaneously.
2. The partial test results can be seen as follows:
 - a. Interest rates are known to have a negative and insignificant effect on hedging decisions.
 - b. Exchange rates are known to have a negative and significant effect on hedging decisions.
 - c. Liquidity is known to have a negative and insignificant effect on hedging decisions.
 - d. Leverage is known to have a significant negative effect on hedging decisions.

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