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THE EFFECT OF INTEREST RATES, EXCHANGE RATES, AND FOREIGN DIRECT INVESTMENT ON FINANCIAL STABILITY IN INDONESIA

Abstract

Objective: The purpose of this study is to analyse the effect of interest rates, exchange rates, and foreign direct investment on the financial stability of banks in Indonesia.
Research Design & Methods: This study uses secondary data in the form of time series data from 2007 to 2021. Data sources come from publications and dynamic statistics of the World Bank and International Monetary Fund (IMF). The analysis technique used is multiple linear regression analysis with the Ordinary Least Squares (OLS) method.
Findings: The findings show that interest rates have a significant negative correlation with banking stability, while exchange rates and foreign direct investment have a significant positive correlation. Rising interest rates can reduce demand for credit and economic activity, while exchange rate depreciation can help improve financial stability by improving competitiveness of exports. Foreign direct investment also plays an important role in providing banks with stable long-term capital flows, helping to overcome liquidity challenges, and increasing the diversity of bank income. Policy responses to foreign direct investment during the global crisis and the COVID-19 pandemic showed significant differences, with an emphasis on incentives and stimuli to support post-pandemic economic recovery.

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Implications/*Recommendations*: Monetary and banking authorities need to work together to closely monitor and manage interest rate policy, thus maintaining a balance between supporting economic growth and the stability of the banking. Indonesian banks need to improve their foreign exchange risk management. Policies should support sound foreign investment while addressing potential risks.

Contribution: This study makes an important contribution to understanding the complexity of the interaction between interest rates, exchange rates, and foreign direct investment, and their effects on the financial stability of banks in Indonesia. The findings of this study provide valuable insights for policymakers, monetary authorities, and banking industry players in designing effective economic policies and maintaining the stability of the financial sector. In addition, this research can also provide a foundation for further research in this field, which can further contribute to the development of theory and practice related to financial stability in developing countries.

Keywords: interest rate, exchange rate, foreign direct investment, financial stability.
JEL Classification: E42, E43, G21.

1. Introduction

Globalisation and technological advances have had a significant impact on the financial industry, leading to a more integrated financial system as well as diversification of financial products with higher stability (Jaumotte, Lall & Papageorgiou, 2013). However, these changes can also lead to instability in the financial system (Laeven, Levine & Michalopoulos, 2015). Analysis of the causes of financial system instability is essential to predict potential hazards and anticipate their impact on the economy. Instability in the financial system can hinder the process of effective allocation of funds, affect monetary policy, disrupt the intermediation function, and cause public distrust (Pistor, 2013). Therefore, efforts to avoid or reduce the risk of financial system instability are essential to maintaining economic growth.

In the financial world, maintaining the stability of the financial system is a top priority for all countries (Platonova *et al*., 2018). Financial stability has recently become a concern for central banks and governments in an effort to prevent a crisis in the financial sector. In general, the financial system can be said to be stable if it can maintain real sector and financial system activities through allocation of sources of funds and good absorption of economic shocks, and can support economic growth and economic mechanisms in pricing (Beck, Degryse & Kneer, 2014). Past financial crises, such as the global financial crisis of 2008, have revealed how important it is to pay

attention to the stability of the financial system as a precaution against widespread and prolonged economic decline (Bordo & Meissner, 2016).

The global financial crisis led to a worldwide reduction in confidence in the market. The global crisis of 2008 was felt not only in the United States but also in all countries in the global market. They were forced to sell their assets on financial markets due to the withdrawal of foreign investors' funds and declining confidence. These shocks in financial markets can disrupt financial stability (Creel, Hubert & Labondance, 2015). Therefore, the management and maintenance of stability in the financial system has become a major focus of economic policy and financial regulation. Babar *et al*. (2019) support the idea that financial stability can be achieved through operational efficiency of the financial system, control of financial risks, and efforts to minimise the impact of systemic crises.
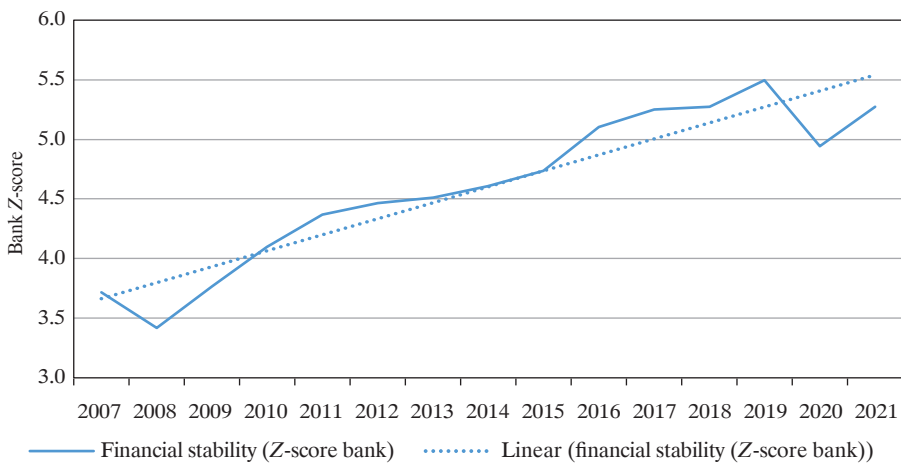

Fig. 1. Movements in Financial Stability in Indonesia

Source: World Bank (2007–2021).

In addition to the global financial crisis of 2008, the most recent global crises namely the COVID-19 pandemic and the war in Ukraine demand serious attention from countries around the world to prevent a continuing crisis (Allam, Bibri & Sharpe, 2022). Financial institutions, including banking institutions, must have strong resilience to shocks caused by the COVID-19 pandemic, and must also be prepared for upcoming challenges (Ghosh & Saima, 2021). Previous crises have significantly affected financial

mobility in many countries, with depositors more likely to be anticipatory and withdraw funds, and financial intermediary partners reducing the amount of funds disbursed (Elnahass, Trinh & Li, 2021).

Indonesia is one of the countries that is highly dependent on commodity exports, such as crude oil, natural gas, and coal. This dependence on commodity exports makes the Indonesian economy vulnerable to fluctuations in world commodity prices that can affect the stability of the financial market (Hidayat *et al*., 2023). Financial stability in Indonesian banks experienced an upward trend during the 2007–2021 period, as shown in Figure 1. This indicates an improvement in financial stability, despite the impact of the global financial crisis of 2008 and the COVID-19 pandemic in 2020. The COVID-19 pandemic has affected the economy as a whole, including declining business performance, declining revenues, and increased credit risk and economic uncertainty (Flögel & Gärtner, 2020). The decline in bank Z-scores reflects significant pressure on the banking sector and indicates potential systemic risks that could disrupt financial stability (Klomp, 2014). However, towards 2021, there were signs of recovery and improvements in banking stability over time. This can be explained by the policies taken by financial and monetary institutions to overcome the negative impact of the pandemic (Elnahass, Trinh & Li, 2021). Despite signs of recovery, it points to a more significant improvement in banking stability, Thus, careful monitoring of banking stability and an in-depth assessment of the vulnerability of the banking sector in the midst of the COVID-19 pandemic remain important priorities (Siregar, Gunawan & Saputro, 2021).

By investigating the complex interactions between interest rates, exchange rates, and foreign direct investment, and their effect on Indonesia's financial stability, this study is expected to contribute significantly to the economic literature. This research allows decision-makers to better understand how fluctuations in interest rates and exchange rates, as well as the magnitude of foreign direct investment, can shape the framework that affects a country's financial stability. In contributing to economic literature in Indonesia, this research fills knowledge gaps that have not been previously explored by in-depth analysis by looking at the movement of variables. In addition, the study has the potential to provide a more holistic view of ways of managing and maintaining financial stability in complex situations, and the interdependence between those variables.

2. Literature Review

Monetary policy is expected to play a more active role in maintaining Indonesia's financial stability. Stabilisation can be achieved by controlling the money supply, interest rates, and exchange rates. Explanation of financial stability issues is only undertaken by monetary authorities when they affect the outlook for price stability and economic activity (Vredin, 2015). According to Fahr *et al*. (2013), both standard and non-standard monetary policies initially maintain stability in the financial system, overcoming dysfunctional financial markets, as well as opening up blocked monetary transmission processes.

Financial stability is important because instability brings various adverse impacts such as inefficient allocation of funds, which occurs as a result of ineffective intermediation, and which can disrupt economic growth (Phelan, 2016). A low level of public confidence in the financial system can make investors withdraw their funds, thereby increasing liquidity risks (Abdel Megeid, 2017). The cost of economic recovery due to a crisis is higher if it is a crisis that has a systemic impact and the recovery is prolonged.

After the financial crisis financial stability became one of the important issues for economists and policymakers because of its far-reaching socioeconomic impact (Saha & Dutta, 2021). Although financial stability is very important, there is no unanimously agreed definition of the term. However, Phan *et al*. (2021) citing financial stability as an attribute of the financial system that addresses financial imbalances resulting from the system or from adverse and unanticipated external events. A stable financial system is able to absorb internal and external shocks (economic and non-economic) through built-in automatic stabilisers, thus protecting the economy and other financial systems from disruption.

When measuring financial stability, this study uses bank *Z*-scores as a proxy for these variables. This is because the data is complete, available, and easily obtained (Ahamed & Mallick, 2019). The bank *Z*-score is also widely used as a measure of financial stability (Vo, Nguyen & Van, 2021). According to Mare, Moreira and Rossi (2017), bank *Z*-score is a comprehensive measure based on accounting information that combines indicators of solvency, profitability, and variability of revenue. This combination of information aims to provide a fairer estimate of vulnerabilities in the banking sector. A high bank *Z*-score indicates a lower risk of bankruptcy and higher financial stability. Anarfo, Abor and Osei (2020) state

that the bank *Z*-score is able to illustrate the profitability of the default banking system in a country.

As yet, there is no accurate and definitive definition of financial stability. First, where the causes are interconnected, the bankruptcy of an institution can lead to the failure of the banking system in general (systemic crisis) (Battiston *et al*., 2016). Secondly, it occurs when shocks affect many actors and cause simultaneous failures that destabilise the entire economy (Oatley *et al*., 2013). According to the Financial Services Authority (Otoritas Jasa Keuangan, 2023), financial system stability refers to conditions in which the financial system is stable, is able to allocate funds effectively, and can absorb and handle shocks to keep the real sector and the financial system running well.

According to Morozova and Sahabutdinova (2013), stability in the financial system refers to the ability of the financial system to withstand shocks and reduce barriers in the financial intermediation process. Whereas, according to Warjiyo and Juhro (2020), financial system stability can affect or be affected by monetary policy through several factors, such as interest rates, exchange rates, liquidity, bank credit, and corporate decisions. According to Fink *et al*. (2016), bank *Z*-scores calculate the probability of default for a bank or banking system, and are used by certain authors to describe financial stability in the banking industry.

3. Research Methods

The data used in this study is quantitative data in the form of a time series collected by taking secondary data, namely data in the form of publications from one institution relevant to this study. The source of data in this study comes from publications and dynamic statistics of the World Bank and the International Monetary Fund (IMF) (see Table 1). The data period used annual data from 2007 to 2021.

This study used quantitative analysis techniques using calculation methods with multiple linear regression estimation techniques Ordinary Least Squares (OLS). Monetary variables are used as independent variables, and financial stability as a dependent variable, so the functions of this study are formed as follows:

$$BZS = f\,(SB, NT, FDI). \tag{1}$$

From the above function, a regression equation can be formed for this research model, which is as follows:

$$BZS = \alpha + \beta_1 SB_t + \beta_2 NT_t + \beta_3 FDI_t + \varepsilon. \qquad (2)$$

BZS is financial stability, β_1, β_2, β_3 are the coefficients of the independent variable, SB as the interest rate variable, NT as the exchange rate variable, and FDI as the foreign direct investment variable, α as the constant, and ε is the standard error.

Table 1. Variable and Data Source Description

Variable	Notation	Measurement Variable	Formula	Data Sources
Bank Z-score	BZS	Z-score bank data	$Z = \dfrac{ROA + \left(\frac{Equity}{Total\ assets}\right)}{ROA}$	World Bank
Interest	SB	annual interest rate	$EAR = \left(1 + \left(\frac{Interest\ rate}{n}\right)\right)^n - 1$	IMF
Exchange rate	NT	nominal exchange rate	$\dfrac{LCU}{US\$}$	World Bank
Foreign direct investment	FDI	net FDI	*FDI Capital inflow – FDI Capital outflow*	World Bank

Source: World Bank and IMF (2023).

4. Results and Discussion

4.1. Interest Rate Movements in Indonesia

Interest rate movements in Indonesia experienced a downward trend, however, on the other hand, the variable of bank stability showed an upward trend. This indicates that there is a negative correlation between the two variables (Fig. 2). A very significant reduction in interest rates occurred in 2009, the global financial crisis that occurred in 2008 was caused by the subprime mortgage crisis in the United States (Simorangkir & Adamanti, 2010). This crisis then spread throughout the world and affected many countries, including Indonesia. As a result, interest rates fell and Indonesia's economic growth, which in 2008 was 6.01%, fell to 4.63% in 2009 with downside risks especially if the global economic downturn was greater than expected. During the global crisis, Indonesia's benchmark interest rate was lowered significantly in response to deteriorating economic conditions (Taylor, 2011). Measures were taken to stimulate economic activity, minimise the risk of investment decline, and facilitate access to credit (Di Maggio *et al*., 2017).
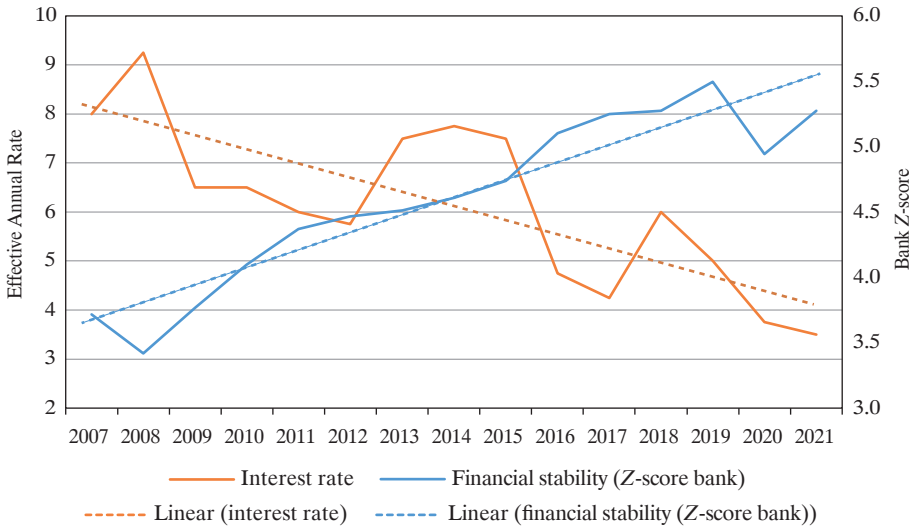
Fig. 2. Interest Rate Movements in Indonesia

Source: World Bank and IMF (2007–2021).

In 2018, Bank Indonesia raised its benchmark interest rate six times from 4.50% to 6.00%. This was done to maintain rupiah stability against higher American interest rates. The weakening rupiah exchange rate against the dollar to reach Rp 14,000 in 2018 was one of the reasons for Bank Indonesia to raise interest rates. Since 2018, the benchmark interest rate in Indonesia has always shown a decline. Inflation that remains under control and within the target range set by Bank Indonesia provides room for the central bank to adjust interest rates (Juhro, 2022). The interest rate cut after the COVID-19 pandemic was also an effort to ameliorate financial risks arising from global uncertainty (Song & Zhou, 2020). Low interest rates can reduce potential interest expenses for companies and households, thereby minimising the risk of default or bad loans that can disrupt the stability of the financial system.

4.2. Exchange Rate Movements in Indonesia

Indonesia currently uses a free-floating system. This means that the position of the exchange rate against foreign currencies (in particular the USD) is determined by market mechanisms and forces. In a free-floating system, the laws of supply and demand will apply (Liu, 1990). Exchange rate fluctuations will depend on the conditions of demand and supply of the national currency in the foreign exchange market. When inflation occurs,

the local currency has low purchasing power against foreign currencies, so imported goods will be more expensive.

Figure 3 shows fluctuations in the exchange rate with an upward trend, with the highest increase in 2020. The main causes of depreciating exchange rates were, disruptions to the global economy caused by the COVID-19 pandemic which caused foreign capital withdrawals from emerging markets including Indonesia, falling world oil prices that harmed the Indonesian economy as an oil producer, and trade balance deficits and government policy responses that affected investor perceptions (Aloui, 2021). When compared to the variable movement of banking stability, there is a trend in line with the exchange rate, which shows a positive trend.
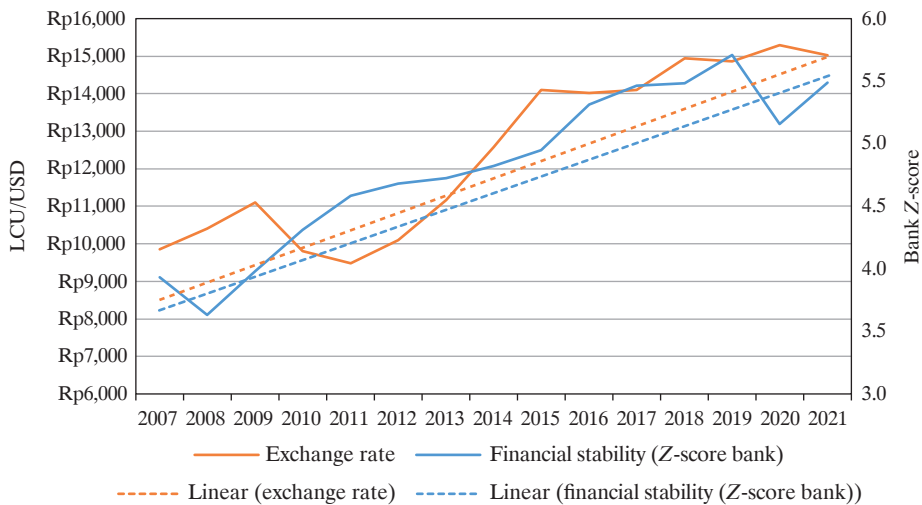

Fig. 3. Exchange Rate Movements in Indonesia

Source: World Bank (2007–2021).

The rupiah depreciated significantly in 2015 due to the decline in world oil prices (Husaini & Lean, 2021). The decline in world oil prices caused Indonesia's trade balance deficit to decrease and tight monetary policy from Bank Indonesia made investors more interested in investing in Indonesia (Purba, 2020). In 2020, the rupiah also depreciated, as a result of COVID-19 (Pontoh, Zahroh & Sunengsih, 2021). The spread of COVID-19 caused great volatility in global financial markets (Li, 2021). Investors tend to look for assets that are considered safer, such as the USD, causing pressure on emerging market currencies including the rupiah (Hasan *et al.*, 2021).

The decline in economic activity as well as uncertainty about the economic recovery resulted in capital outflows from Indonesia's financial markets.

4.3. Movement of Foreign Direct Investment in Indonesia

Foreign direct investment in Indonesia shows a positive upward trend, in line with the trend of banking stability. As shown in Figure 4, the decline in foreign direct investment occurred in 2016. Indonesia is a country that depends on commodity exports such as oil, gas, coal, and palm oil (Chandrarin *et al*., 2022). In 2016, there was a significant decline in global commodity prices, reducing Indonesia's export earnings and making investment in the sector less attractive to foreign investors (Christensen, 2016). However, FDI in Indonesia in 2017 reached USD 32.24 billion, up 13.2% compared to the previous year. FDI in Indonesia is concentrated in three main sectors, namely the processing, mining and quarrying industries as well as electricity, gas and clean water (Gopalan, Hattari & Rajan, 2016). In the manufacturing industry sector, the largest FDI comes from Singapore and Japan. While in the mining and quarrying sector, the largest FDI comes from Australia and the UK.
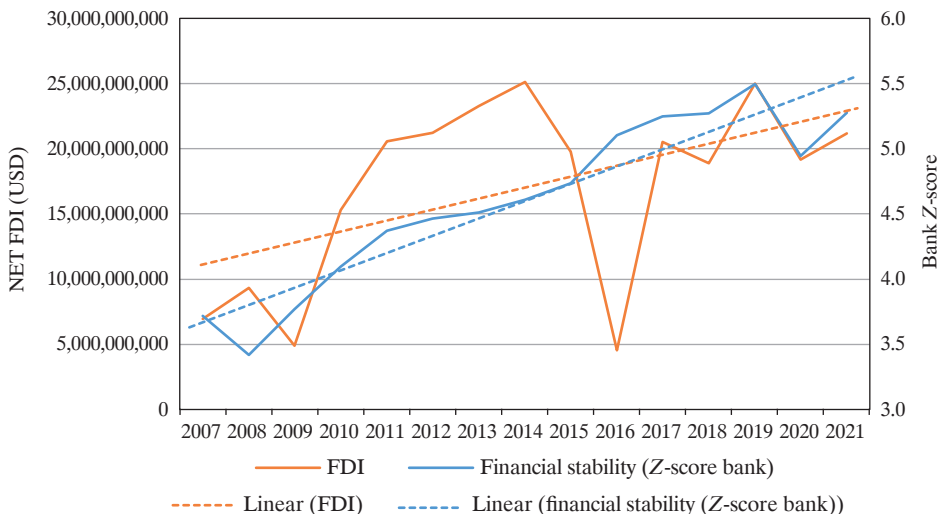

Fig. 4. Foreign Direct Investment Movements in Indonesia

Source: World Bank (2007–2021).

The COVID-19 pandemic has also had an impact on FDI in Indonesia. The long-term and uncertain impact of the COVID-19 pandemic on economic growth and investment prospects creates higher risks for investors. Uncertainty about when and how economic recovery will occur may hinder long-term investment decisions. The decline in global demand due to the impact of the pandemic on consumption and investment has had a negative impact on sectors that previously attracted foreign investment (Castañeda--Navarrete, Hauge & López-Gómez, 2021). In addition, disruptions in global supply chains due to factory closures, restrictions on the movement of goods, and logistical difficulties can affect foreign investment decisions (Liu, Lee & Lee, 2020).

4.4. Descriptive Statistics

Statistical descriptions for each variable used in this study are displayed in Table 2. The variables studied include bank Z-scores influenced by interest rates, exchange rates and foreign direct investment for 15 years from 2007 to 2021. The table shows the mean, median, maximum and minimum values, standard deviation, skewness, and kurtosis. The total number of observations is 15.

Table 2. Descriptive Statistics

Specification	SB	NT	FDI	BZS
Mean	1.776460	9.353589	23.43072	4.602078
Median	1.791759	9.381366	23.70789	4.607392
Maximum	2.224624	9.587557	23.94696	5.495973
Minimum	1.252763	9.079141	22.23657	3.418616
Standard deviation	0.288405	0.194892	0.589140	0.639159
Skewness	−0.375645	−0.131627	−1.133701	−0.373201
Kurtosis	2.141767	1.325869	2.710422	2.028808
Jarque-Bera	0.813124	1.795011	3.265604	0.937707
Probability	0.665936	0.407585	0.195381	0.625719
Sum	26.64691	140.3038	351.4608	69.03117
Sum Sq. Dev.	1.164487	0.531761	4.859197	5.719335
Observations	15	15	15	15

Source: Output EViews 9 (2007–2021).

Financial stability in the banking sector can be reflected by the bank Z-score variable, which shows the level of bank solvency in the face of crisis. The average bank Z-score for 15 years in Indonesia was 4.60% and the highest bank Z-score occurred in 2019 at 5.49%. However, the lowest bank Z-score occurred in 2008 with a value of 3.41%. From Table 2, it can be seen that the variable interest rate has a mean value of 1.77% with a highest value of 2.22%, and a lowest value of 1.25%. Next is the exchange rate variable which has an average value of 9.35% with a highest value of 9.58% and a minimum value of 9.07%. Then there is foreign direct investment which has an average value of 23.43% with a maximum value of 23.94%, and a minimum of 22.23%. Data variations in the variables in this study are quite diverse, as shown by different standard deviations. This indicates significant departures from the average value. Data distribution on interest rates, exchange rates, and banking financial stability has a negative tail, while FDI variables have a longer negative tail. These results indicate that there is a potential for low values or outliers on the negative side of these variables. In terms of distribution form, FDI stands out with the highest kurtosis. This reflects that the distribution of foreign direct investment data tends to be blunter than normal distribution and has a long tail.

4.5. Model Estimation Results

The results of the estimated model test using Ordinary Least Squares (OLS) are as follows:

$$\widehat{BZS} = -18.79606 - 0.715081(SB) + 1.845650(NT) + 0.316038(FDI). \qquad (3)$$

Based on Table 3, it is known that the variables in the study have satisfied the classical assumptions. In addition, it is known, with a probability of less than $\alpha = 5\%$, that the variable interest rate has a negative direction, meaning that it has a negative and significant effect on banking stability, the exchange rate variable has a negative and significant effect on $\alpha = 1\%$, the variable of positive and significant foreign direct investment at $\alpha = 5\%$. From the probability F-statistic below $\alpha = 1\%$ shows that the three independent variables together affect financial stability.

Table 3. Regression Estimation

Variable	Coefficient	*t*-statistic	Probability
C	–18.79606	–3.395796	0.0060
BZS	–0.715081	–2.144548	0.0552*
NT	1.845650	3.699020	0.0035***
FDI	0.316038	2.400123	0.0352**
R-squared		0.848016	
Prob. (*F*-statistic)		0.000083	
Normality		Histogram-Normality Test	
Jarque-Fallow		0.319257	
Probability		0.852460	
Autocorrelation		Breusch-Godfrey	
F-statistic		0.303166	
Obs*R*-squared		0.946768	
Prob. *F*(2,9)		0.7457	
Prob. Chi-Square(2)		0.6229	
Heteroskedasticity		Breusch-Pagan-Godfrey	
F-statistic		2.125452	
Obs*R*-squared		5.504339	
Scaled explained SS		2.568008	
Prob. *F*(3,11)		0.1550	
Prob. Chi-Square(3)		0.1384	
Prob. Chi-Square(3)		0.4631	
Multicollinearity		Variance Inflation Factors	
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	30.63730	5,815.549	–
SB	0.111183	68.24095	1.638412
NT	0.248958	4,136.168	1.675292
FDI	0.017339	1,807.920	1.066167
F table		2.769	
t-table		2.003241	

Notes: *, **, and *** indicate significance levels at levels of 10%, 5% and 1%.
Source: Output EViews 9 (2007–2021).

4.6. The Relationship between Interest Rates and Banking Financial Stability

Interest rates have a significant influence on banking stability, these two variables are negatively correlated. Interest rates are a major factor influencing performance and risk in the banking sector (Baselga-Pascual, Trujillo-Ponce & Cardone-Riportella, 2015). Rising interest rates can increase borrowing costs for consumers and companies, further reducing demand for loans and economic activity (Peltoniemi & Vieru, 2013). A decline in demand for credit has the effect of reducing the income from interest received by banks, disrupting their profit potential (Were & Wambua, 2014). At the same time, higher interest rates lead to increased credit risk for banks (Chaibi & Ftiti, 2015). Rising interest rates also cause interest payments on consumer and corporate debt to increase, making it difficult for them to meet financial obligations. This has the potential to lead to an increase in default risk and poorer asset quality in the bank's loan portfolio (Campbell & Cocco, 2015). In this situation, banks need to allocate more resources to allay higher credit risk. In addition, the negative correlation between interest rates and banking stability also has an impact on asset values. Rising interest rates tend to cause a decrease in the market value of fixed-interest assets such as bonds (Domanski, Shin & Sushko, 2017). If banks have significant bond portfolios, a drop in the value of these assets can reduce the total value of their assets as well as affect the health of capital. These results are in line with research by Köhler (2015), Fu, Lin and Molyneux (2014), and Smets (2014).

The BI7DRR (7-day reverse repo rate reference interest) policy implemented in Indonesia has had a significant impact on bank stability. The benchmark interest rate set by Bank Indonesia affects various operational and financial aspects of banks in Indonesia (Raharjo *et al.*, 2014). The BI7DRR policy may also affect liquidity conditions in financial markets (Tanjung *et al.*, 2022). Higher interest rates tend to attract funds from the real sector to the financial sector, thus affecting liquidity in the money market and capital market (Roberts, 2013). Banks need to monitor their liquidity carefully as well as taking appropriate measures to maintain their stability. Interest rate movements at home and abroad can affect BI7DRR policy. If other countries raise interest rates, or global conditions are unstable, Bank Indonesia needs to adjust interest rates to maintain domestic economic stability. During the COVID-19 pandemic, Bank Indonesia took a series of monetary policy measures to respond to significant economic impacts. One of the steps taken was the adjustment

of the benchmark interest rate, namely BI7DRR (Murdiana, Adrianto & Alfarisi, 2022). Bank Indonesia continued to monitor banking stability during the pandemic. The lower interest rate needs to be balanced with close monitoring of credit risk, liquidity, and the overall financial condition of the banking industry.

4.7. Exchange Rate Relationship to Banking Financial Stability

Based on the regression results, the exchange rate is positively correlated and significant in affecting banking stability in Indonesia. This result is in line with the rise in exchange rates shown in Figure 3, meaning that the Indonesian rupiah continued to depreciate against the US dollar. The depreciation or devaluation has had a positive effect on financial stability (Chuliá, Fernández & Uribe, 2018). In some cases, exchange rate depreciation can increase a country's export competitiveness, which can benefit the economy as a whole, including the banking sector (Zia & Mahmood, 2013). In addition, in some situations, controlled exchange rate depreciation can help improve overall economic stability by boosting export growth and reducing trade deficits (Sarno, Taylor & Frankel, 2003). However, on the other hand, exchange rate depreciation can be a problem if it is not well balanced with various other factors. Too large a depreciation can pose a risk to banks that have liabilities denominated in foreign currencies, as the value of their assets denominated in domestic currency may undergo a relative decline. This could affect the liquidity and solvency of banks (Bitar, 2021).

In a controlled floating exchange rate regime, monetary authorities attempt to keep the rupiah exchange rate within a certain range by targeted intervention in the foreign exchange market. Banks can manage their risks and business activities more effectively with a stable rupiah exchange rate (Warjiyo, 2013). In a controlled floating exchange rate regime, exchange rate stability maintained by the monetary authority is able to provide certainty to banks when planning operational policies and risk management (Bordo & Levin, 2017). Controlled exchange rate fluctuations can help banks anticipate the risk of exposure to foreign currency volatility and reduce uncertainty in international transactions. This has a positive impact on the stability of banking assets and liabilities related to foreign exchange transactions. In addition, exchange rate stability can also affect bank liquidity stability. In a controlled exchange rate regime, sudden changes in exchange rates can be better managed, and banks have a greater ability to anticipate liquidity needs (Diamond, Hu & Rajan, 2020). This helps reduce the risk of banks defaulting on their financial obligations. Banking

supervisory authorities have a clearer view of the risks associated with exchange rate fluctuations in a controlled regime. These results are in line with research by Ghosh (2015), Beck, Jakubik and Piloiu (2013), and Makri, Tsagkanos and Bellas (2014).

Based on movements in the Indonesian rupiah exchange rate during the 2008 global crisis and the COVID-19 pandemic, there were significant differences in policy decisions and responses. During the 2008 global crisis, the policy response focused on adjusting the benchmark interest rate as a means of controlling exchange rate movements. Such efforts are intended to maintain rupiah exchange rate stability against foreign currencies, especially the US dollar (Warjiyo, 2013). The main objective of the policy response during the global crisis period of 2008 was to prevent excessive depreciation of the rupiah exchange rate. Depreciation that is too rapid and sharp can encourage foreign capital outflows, which can, in turn, undermine economic and financial stability (Jongwanich & Kohpaiboon, 2013). In addition to adjusting the benchmark interest rate, the government and Bank Indonesia also took measures to control foreign capital outflows (Lindblad, 2015). This step was carried out as an effort to prevent further pressure on the rupiah exchange rate. On the other hand, during the COVID-19 pandemic, the policy response was more comprehensive and involved more policy instruments, not only the benchmark interest rate. The response included fiscal stimuli, liquidity policy, and real sector support. Bank Indonesia increased liquidity in financial markets through various mechanisms, such as adjusting liquidity regulations in the banking industry, purchasing government bonds and the like (Guofeng, 2021). This step helped to maintain liquidity and smooth transactions in financial markets. Despite the broader response, maintaining exchange rate stability remained one of the main objectives. Bank Indonesia took measures to maintain rupiah exchange rate movements in line with economic and foreign exchange market conditions.

4.8. The Relationship of Foreign Direct Investment to Banking Financial Stability

Foreign direct investment has a significant positive influence on the financial stability of banks. FDI is able to provide stable and sustainable long--term capital flows into the country, thus contributing to the strengthening of the economic and financial sectors (Bonatti & Fracasso, 2013). Foreign direct investment in Indonesia covers sectors such as manufacturing, energy, mining, technology, and infrastructure. FDI helps increase the country's foreign exchange reserves, which is one of the important indicators in

maintaining currency stability and international payments (Aizenman, Cheung & Ito, 2015). Foreign direct investment has played a crucial role in maintaining financial stability. FDI flows not only help increase investment in key sectors of the economy but also help reduce macroeconomic risks and financial instability (Mijiyawa, 2015). FDI brings in foreign capital that can be used by both companies and local financial institutions, including banks. With additional capital available, banks can overcome liquidity challenges and strengthen their capital positions. This helps banks deal with possible liquidity crises or capital shortages that could threaten financial stability. FDI is able to create relationships with foreign companies and institutional investors. Thus, allowing banks to diversify their sources of income. When banks have diverse incomes from different sectors and countries, the risk of dependence on one particular sector or market can be reduced, which ultimately increases their stability. Multinational companies are able to encourage more sophisticated risk management strategies and practices. It certainly affects risk management practices in local financial institutions, including banks. These results are in line with research by Fu, Lin and Molyneux (2014), Ozili (2018), and Dafermos, Nikolaidi and Galanis (2018).

Policy responses to foreign direct investment during the 2008 global crisis and the COVID-19 pandemic showed significant differences. In the 2008 global crisis, many countries focused on monitoring and incentives to attract FDI, especially in maintaining economic stability amid uncertain conditions. Measures such as more investor-friendly regulation and protection of intellectual property rights are used to strengthen the investment climate (Fernandez, Almaazmi & Joseph, 2020). However, the policy response during the COVID-19 pandemic has become more comprehensive and diverse. Deeper economic uncertainty can influence investment decisions, especially in affected sectors such as tourism and retail. Countries responded by providing support and flexibility to investors, by providing specific stimulus and incentives given to key sectors in need of economic recovery (Stern & Zenghelis, 2021; Rudenko *et al.*, 2022). The focus on digital technology, health, and infrastructure has become more important, as efforts to revive post-pandemic economic growth.

5. Conclusions and Recommendations

Based on the results of the study, it was found that interest rates, exchange rates, and foreign direct investment (FDI) have a very strong influence on financial stability in Indonesia. An increase in interest rates could destabilise

the banking industry and overall economic activity. A stable exchange rate plays an important role in maintaining asset stability, liquidity, and risk management in banking. With the adoption of a controlled floating exchange rate regime, the Indonesian monetary authorities seek to keep the rupiah exchange rate within a controlled range and minimise adverse fluctuations. On the other hand, FDI flows can strengthen economic stability through contributions to foreign exchange reserves, additional capital, and help mitigate macroeconomic risks, with cooperation in the investment sector encouraging more sophisticated risk management strategies and practices. In addition, there are differences in terms of monetary policy responses taken by the monetary authorities and the Indonesian government between the financial crisis of 2008 and the COVID-19 crisis of 2020.

Uncontrolled interest rate policy as well as significant fluctuations in interest rates can create major challenges to banking stability. Monetary and banking authorities need to work together to closely monitor and manage interest rate policy in order to maintain a balance between supporting economic growth and the stability of the banking sector. Indonesian banks need to encourage improved management of their foreign exchange risks. If the exchange rate has a significant influence on a bank Z-scores, fluctuations in the exchange rate can have an impact on the bank's financial stability and health. More effective foreign exchange risk management can help banks reduce their exposure to exchange rate risk. Sudden fluctuations in foreign capital flows are capable of causing turmoil in financial markets and exchange rates, which negatively affect macroeconomic stability. Therefore, it is necessary to maintain a balance between supporting sound foreign investment and maintaining the availability of policy instruments needed to overcome any potential risks that may arise.

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