

A Macroeconomic Correlation Analysis of Foreign Direct Investment in Indonesia

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Abstract

Indonesia has natural resources that can be utilized. Foreign direct investment (FDI) can be used to manage these natural resources to increase economic growth. However, Indonesia has a relatively low level of FDI as a developing country compared to the five major countries in ASEAN. This study was conducted to see if FDI, as the dependent variable, can be increased by taking into account the investment interest of foreign investors through macroeconomic factors such as inflation (INF), gross domestic product (GDP), interest rate (7th day, repo rate) (IR), and exchange rate (ER) as independent variables. The data for this study was obtained from governmental sources through the *Badan Pusat Statistik* (Statistics Indonesia), Bank of Indonesia, *Badan Koordinasi Penanaman Modal* (Investment Coordinating Board), and *Portal Statistik Perdagangan* (Trade Statistics Portal) from the second quarter of 2016 to the third quarter of 2021. This research used descriptive and explanatory methods based on a quantitative approach, with multiple linear regression analysis to test its hypotheses. The results showed that GDP and ER had no significant correlation with FDI in Indonesia; however, INF and IR were significantly correlated with FDI.

Keywords: *FDI, inflation, GDP, interest rate, exchange rate*

Introduction

The purpose of the Indonesian state as stated in the 1945 Constitution is to protect the entire nation of Indonesia and all Indonesians, as well as promote the general welfare (Sekretariat Jenderal DPR RI, 2016). Indicators of a country's prosperity can be seen from the community's welfare, which is influenced by various factors, one of which is economic development (Sulistiawati, 2012).

Indonesia has many natural resources that can be utilized to improve its economic development. The use of domestic funds alone is not enough to manage existing natural resources. Therefore, foreign funds are needed to finance the management of natural resources in Indonesia (Nurmasari & Arifin, 2018). Foreign financing can come from debt as well as foreign investment. However, if debt continues to grow, it could accumulate over a long period, which ultimately would become a burden to the national budget (Dewi & Cahyono, 2016).

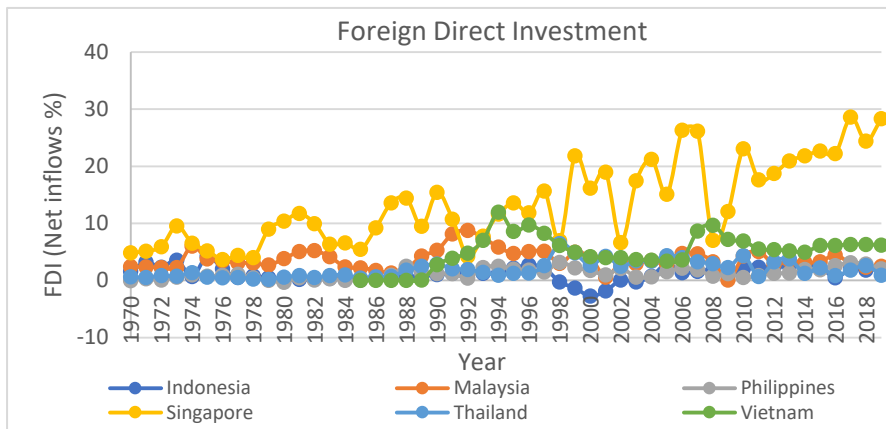
The endogenous theory says that domestic and foreign investments play a role in long-term economic development (Barro, 1990). Foreign investment may be divided into two categories, namely Foreign Direct Investment (FDI) and Foreign Indirect Investment. FDI is foreign investment in a nation's economic sectors. At the same time, Foreign Indirect Investment refers to investing financial assets in capital markets, such as purchasing stocks and bonds. FDI has more benefits compared to indirect investment. The influx of FDI into a country is usually followed by the inclusion of new technologies, engineering skills, experience in organizing, market information, advanced production techniques, product renewal, as well as training the local workforce in new skills (Permana & Rivani, 2013). Foreign investors who invest foreign direct capital by building companies or factories in Indonesia are expected to absorb local labor to the maximum to reduce unemployment (Nurmasari & Arifin, 2018).

As shown in Figure 1, FDI in Indonesia has fluctuated. In addition, Indonesia has lower average FDI, even negative for 1998 to 2001, compared to Singapore, Malaysia, the Philippines, Thailand, and

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Vietnam. FDI has many benefits that can support economic development, but a relatively low FDI value shows that Indonesia has not fully obtained these benefits.

Figure 1 Foreign Direct Investment in Six ASEAN Countries from 1970–2020



Source. World Bank (2021)

The world economy experienced a drastic decline caused by the Coronavirus (COVID-19), which caused FDI to decrease in Indonesia because business has become more complicated (BKPM, 2020). Thus, COVID-19 is an obstacle to foreign investment in Indonesia. In a recent press release (2020), Surianta said that this pandemic would strongly influence FDI and capital inflows into Indonesia.

The low value of FDI may be caused by reduced investment interest from foreign investors. Macroeconomics characterized by stability in terms of inflation rate, size of gross domestic product (GDP), determination of interest rates (7th day, repo rate), and the exchange rate are benchmarks that foreign investors use to make investment decisions in a country. High inflation will lead to rising prices of goods and services, thus lowering consumption and corporate income, along with foreign investors' interest to invest. High interest rates cause rising investment costs, resulting in a decrease in interest by foreign investors. Appreciated exchange rates could lead to increased labor costs that would impact a company's profit, which also lowers investment interest. High GDP values indicate high revenues and the production of many goods and services, which makes foreign investment attractive. This research is done to see what factors were correlated with and increased the growth rate of FDI in Indonesia. This study used research data from the 2nd quarter of 2016, the first publication of interest rates (7th day, repo rate), until the 3rd quarter of 2021; besides that, 2020 to 2021 were during the COVID-19 pandemic. Thus, the author conducted a study using inflation, GDP, interest rate (7th day, Repo Rate), and exchange rate as the macroeconomic independent variables.

Literature Review

Previous studies on macroeconomic influence on FDI in Indonesia have had contradictory results. Research conducted by Dewi and Cahyono (2016) found that GDP and inflation had no correlation with FDI in Indonesia, but interest rates were negatively correlated with it. On the other hand, Saepuloh et al. (2019) reported that GDP, inflation, and interest rates significantly affected FDI, while Nurmasari and Arifin (2018) also found that interest rates were correlated with FDI.

Signaling Theory

According to Spence (1973), two parties can overcome information asymmetry by sending a signal to reveal some relevant information to the other party. Internal parties such as management may provide information that is pertinent to external parties—in this case, the government. The company sends a signal by providing information to the government on its financial and corporate performance. This may sway decisions that affect macroeconomic variables such as inflation, GDP, interest rate, and exchange rate, which can influence the investment decisions of foreign investors.

Marginal Efficiency of Investment and Marginal Efficiency of Capital

According to Sasana (2008), the Marginal Efficiency of Capital (MEC) is the rate of return of new investments that are expected to be made. Investments tend to rise if interest rates decline or because MEC increases. According to Keynes (2018), the concept of MEC is the amount to be invested based on the expected profit from the investment, or so-called Marginal Efficiency of Investment (MEI), meaning that investments will be made if MEI is greater than the interest rate.

Foreign Direct Investment (FDI)

Foreign Direct Investment (FDI) means that investors or companies from a capital-supplying country supervise assets invested in a receiving country in a *de facto* or *de jure* manner (Permana & Rivani, 2013). FDI can be in the form of corporate acquisition, providing capital for new companies, or construction of factories. According to Dewi and Triaryati (2015), FDI in Indonesia can help economic development, create jobs, and enable the emergence of new resources that provide work.

The main reasons foreign investors choose Indonesia as a recipient of investment funds include the richness of natural resources, a good economic and investment climate, a stable political system, and an active role in building bilateral and international relations (BKPM, 2017). The motive for FDI is in line with a company's objectives, namely, to maximize the welfare of investors by maximizing the returns to the company. To maximize the company's return, the company must maximize the output that will be generated for the domestic market. When the domestic market cannot accommodate the output generated, the company will look for other areas as new target locations to start company operations. This is the basis of the emergence of FDI in a country.

Inflation

Inflation is an economic situation where prices of goods or services increase over a long period of time in a country. According to Atmadja (1999), quantity theory states that inflation can occur if there is increased circulation volume, fiat money, or commercial bank money. Inflation can also be caused by the amount of money in circulation or expectations from the public about future price increases. According to the Bank of Indonesia (2009), inflation also results from an increase in circulation or liquidity in a country's economy. In other words, an increasing amount of money in circulation or increased liquidity can cause increases in the prices of goods and services.

Gross Domestic Product (GDP)

Gross domestic product is the market value of the goods and services produced by a country during a certain period of time. Goods and services can be produced by domestic or foreign nationals working in the country (Dewi & Cahyono, 2016). Increasing the consumption of goods and services can improve a country's economy due to the consumptive nature of society (Nofiatin, 2013).

Interest Rate (7th day Repo Rate)

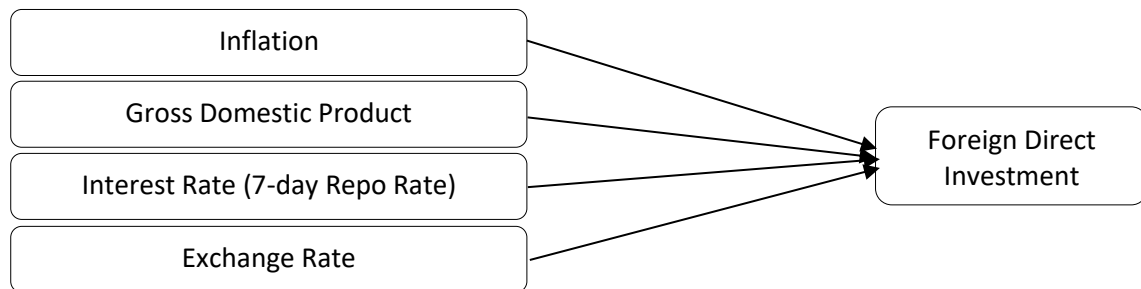
The interest rate (7th day, Repo Rate) or BI Rate is the price/profit calculated from the economic value of loan funds lent to a debtor that is received by a creditor. Rakhimsyah and Gunawan (2011) stated that interest rates are the prices used in investment markets. The difference between the use of interest rate policy (7th day, Repo Rate) and the BI Rate is in the savings period of the Bank of Indonesia. The 7th day reverse repo rate provides a time period of 7 days (14 days, 21 days, and so on), while the BI rate is 360 days and one month (Aminulloh & Prasetyo, 2019).

Exchange Rate

Mishkin (2016) stated that exchange rate is a currency's price expressed in another currency. The exchange rate is a comparison of foreign and domestic currency values. The exchange rate facilitates buying and selling goods and services internationally (Dinar & Hasan, 2018). The role of the exchange tool as an economic interaction between countries is crucial, so efforts are needed to maintain the position of the currency exchange rate in a relatively stable state, which depends on the exchange rate system used by a country (Ardiyanto & Ma'ruf, 2014). Exchange rates are used to compare values or prices between the currencies of countries (Syamsuyar & Ikhsan, 2017).

The conceptual framework (Figure 2) shows assumed relationships between the independent variables inflation, GDP, interest rate, and exchange rate on the dependent variable, FDI.

Figure 2 *Conceptual Framework*



Hypothesis Development

Correlation between Inflation and Foreign Direct Investment

One factor that causes inflation is an increase in imported goods. The value of money in circulation is higher than that of the goods, which makes the quantity demanded increase (Ridha & Yafiz, 2019). Consequently, those who produce goods will increase prices, which triggers inflation. Syaikh and Haryati (2017) also argued that inflation will reduce output if it is high enough. If inflation is high, then the prices of goods and services will rise, which reduces people's purchasing power, and results in a reduction in company income. This will in turn reduce investment interest.

Pratiwi et al. (2015) stated that inflation had a significant influence on FDI. The negative result of inflation is that when it rises, then foreign investment will decrease, and vice versa. In addition, research from Anggraeni and Sulasmiyati (2019) and that of Romadhona (2016) stated that inflation had no significant effect on FDI.

H_1 : Inflation is significantly correlated with Foreign Direct Investment.

Correlation between Gross Domestic Product and Foreign Direct Investment

According to Ramadhani et al. (2015), GDP can describe a country's income from the goods and services that are produced. In other words, GDP can be one of the country's references for its economic condition. With good GDP in a country, investors are drawn to invest in the country. According to Permana and Rivani (2013), an increase in GDP shows that a country's good economy can encourage investors to invest in the country. Thus, GDP can be an essential factor for foreign investors who are analyzing the country, especially Indonesia.

Fadilah (2017) and Sumantyo and Putra (2017) stated that GDP had a significant positive influence on FDI. This result means that if the value of GDP rises, then the value of FDI will also go up, and if the value of GDP falls, then the value of FDI will also decrease. On the other hand, Sari and Baskara (2018) stated that GDP had no significant effect on FDI.

H_2 : Gross Domestic Product is significantly correlated with Foreign Direct Investment.

Correlation between Interest Rate (7th day Repo Rate) and Foreign Direct Investment

Rising interest rates can cause investment costs to increase, so foreign investment will decrease. On the contrary, when interest rates fall, which causes investment costs to fall, investment will increase (Ernita et al., 2013). The rising cost of investment due to the increasing prices of goods and services is due to the high interest rate imposed on businesses or companies that buy bonds or loan money to the bank, thus leading foreign investors to invest less.

Sari and Baskara (2018) stated that interest rates have a significant negative influence on FDI, i.e. when interest rates fall, then FDI will also rise. On the contrary, if interest rates rise, then FDI will decrease. In addition, Letarisky et al. (2014) stated that interest rates significantly influence FDI but the relationship is positive, i.e. when interest rates go up, FDI will go up, and vice versa.

H_3 : Interest Rates (7th day, Repo Rate) are significantly correlated with Foreign Direct Investment.

Correlation between Foreign Exchange Rates and Foreign Direct Investment

According to Brigham and Houston (2019), a theory that explains the Exchange Rate is called Interest Rate Parity Theory. This theory reveals that investors will be able to obtain the same rate of return on investments in all countries after adjusting for the level of risk. Investors can also obtain a higher overall return on investment if a country's currency appreciates in comparison with the currency value of that investor's country. In other words, foreign investors will look for countries whose currency values have depreciated against the US Dollar. With such circumstances, production costs such as labor, rent and others will become cheaper, and investors will benefit.

Septifany et al. (2015) stated that the exchange rate has a significant negative effect on FDI. This negative result means that when the rupiah exchange rate falls, the value of an incoming foreign investment will increase. However, Pratiwi et al. (2015) stated that the exchange rate has no significant effect on FDI.

H_4 : Exchange Rates are significantly correlated with Foreign Direct Investment.

Research Method

The research design of this study used descriptive and explanatory methods based on a quantifiable approach. Quantitative research is interested in quantity, frequencies, or magnitude of a phenomenon. This research was dependent on the quality of the measurement instruments used for observation, surveys, and experimental tests (Schindler, 2019). The study also used trend analysis to predict the future by looking at how many fluctuations occurred over a set period, and multiple linear regression tests to test the influence of independent variables on dependent variables.

The regression used in this study was tested for feasibility using the classic assumption test. This research used a normality test with a significant value of 0.200. A heteroskedasticity test was conducted for each variable. The values for inflation, GDP, interest rate, and exchange rate were 0.030, 0.536, 0.001, and 0.089 respectively. A multicollinearity test was performed for each variable; the tolerance and VIF values for inflation, GDP, interest rates, and exchange rates were 0.873 and 1.145, 0.316 and 3.162, 0.828 and 1.208, 0.352 and 2.837 respectively. An autocorrelation test for significant values yielded a score of 0.827. Thus, it can be claimed that the regression used in this study was normally distributed and free from symptoms of heteroscedasticity, multicollinearity, and autocorrelation. The regression equations used were as follows:

$$FDI = \alpha + \beta_1 INF + \beta_2 GDP + \beta_3 IR + \beta_4 ER + e$$

Where:

FDI	= Foreign Direct Investment
α	= Regression Equation Constants
β	= Independent Variable Regression Coefficient
INF	= Inflation (Consumer Price Index)
GDP	= Gross Domestic Product (Production Approach)
IR	= Interest Rate (7 th day, Repo Rate)
ER	= Exchange Rate
e	= Error

The FDI, inflation, GDP, interest rate (7th day, Repo Rate), and exchange rate data for the country of Indonesia were collected from the 2nd quarter of 2016 until the 3rd quarter of 2021. This secondary data was collected from government websites as follows: FDI data obtained from Badan Koordinasi Penanaman Modal (BKPM); inflation data and interest rates (7th day, Repo Rate) from the Bank of Indonesia (BI); GDP data obtained from Badan Pusat Statistik (BPS); and exchange rate data from the *Portal Statistik Perdagangan* (Trade Statistics Portal). The sampling method used was purposive sampling; therefore, the criteria for this study are described in the following table.

Table 1 *Research Sampling*

No.	Sample Criteria	Sum
1	The number of years used is data for 2016–2021	4
	Research period[1 x (4 years x 4 quarters)] + [(1 x (2 years x 3 quarters))]	22
2	Research population from outside Indonesia	-
3	Research data are taken outside of government data	-
	Total Research Samples	22

Result and Analysis***Descriptive Statistical Test Results Analysis***

Descriptive statistical test results are shown below in Table 2. Table 2 shows the average, maximum, minimum, and standard deviation values of the five variables used. The standard deviation is used to see the distances between average and actual sample data figures. FDI as a dependent variable represents an average value of \$7,331.61 and a standard deviation of \$666.46, with a maximum value of \$8,355.1 in the fourth quarter of 2017, and a minimum value of 6,080.7 in the first quarter of 2019.

Table 2 *Descriptive Statistical Test Results*

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
FDI	22	7,367.045	590.1147	6,080.7	8,355.1
INF	22	2.357176	1.242292	0.03	4.29
GDP	22	3,712,054	344,086.7	3,087,000.00	4,325,400.00
IR	22	0.0472848	0.0078253	0.035	0.06
ER	22	14,027.70	551.3511	13,130.67	14,754.33

Note. FDI in US\$, INF in percentage (%), GDP in million Rupiahs (Rp.), IR as decimal number, ER in Rupiahs (Rp.)

INF produced an average value of 2.36%, a 1.24% standard deviation, and a maximum value of 4.29% in the second quarter of 2017. Further, it yielded a minimum value of 0.03% in the third quarter of 2016. GDP in the table produced an average value of Rp. 3,712,054 and standard deviation of Rp. 344,086.7, with a maximum GDP value of Rp. 4,325,400.00 in the third quarter of 2021 and a minimum value of Rp. 3,087,000.00 in the second quarter of 2016. The IR yielded an average value of 0.047 (4.7%) and a 0.00706 (0.007%) standard deviation, with a maximum value of 0.06 (6%) in the first and second quarters of 2019, and a minimum value of 0.035 (3.5%) in the second and third quarters of 2021. The ER in the table above returned an average value of Rp. 14,027.70 and a standard deviation of Rp. 551.35 with a maximum ER of Rp. 14,754.33 in the first quarter of 2020, and a minimum ER of Rp. 13,130.67 in the third quarter of 2016.

Hypothesis Test Results Analysis

As shown in Table 3, the result of the T-test can be calculated using the following formula:

$$FDI = 16960.77 + 173.36 (INF) + .0002776 (GDP) - 51053.03 (IR) - .4675057 (ER) + \varepsilon$$

Based on the constant intercept value of 16960.77, if all independent variables are 0, then the value of FDI will be 16960.77.

Effect of Inflation (INF) on Foreign Direct Investment

Table 3 shows a p-value result of 0.030, which is lower than the significance level of 0.05. Based on these results, H_1 which states that INF had a significant correlation with FDI is accepted, and H_0 is rejected. The results of several studies were in harmony with the results of the hypothesis test above. Research studies by Fadilah et al. (2017) and Permana and Rivani (2013) found that inflation has a significant correlation with FDI.

Table 3 T-Test (Partial)

Variable	Hypothesis	Expectation Sign	Coefficient	Sig.	Explanation
INF	H ₁	+	173.3625	0.030	Accepted
GDP	H ₂	+	-.0002776	0.536	Rejected
IR	H ₃	-	-51053.03	0.001	Accepted
ER	H ₄	-	-.4675057	0.090	Rejected
Constant			16960.77	0.000	
N			22		
F-stat/LR chi2			7.80		
Prob>F			0.0009		
Adj. R Square			0.5643		

The significant result of INF means that inflation in a country is positively correlated with investment yields. If inflation rates increase, the value of FDI will also increase; however, if inflation decreases, the value of FDI will also decrease. If inflation is high, the prices of goods and services will rise, thereby reducing purchasing power and resulting in lower corporate income than usual. This will reduce the level of interest that investors have in such destinations (Syaikhu & Haryati, 2017).

The findings from this research are contrary to those of Romadhona (2016), who concluded that inflation had no significant correlation on FDI. Investors can still benefit from rising and falling prices caused by INF if prices still do not exceed the production costs that are incurred (Anggraeni & Sulasmiyati, 2019).

Effect of Gross Domestic Product (GDP) on Foreign Direct Investment

Table 3 shows a p-value result of 0.536, which is higher than 0.05 or 5%. Based on the results obtained, H₂ which states that GDP has a significant correlation with FDI is rejected, and H₀, which states that GDP does not have a significant correlation with FDI, is accepted. This study agrees with Sari and Baskara (2018), who found that GDP had no significant correlation with FDI. Based on these results, it can also be said that the value of GDP does not influence investments made by foreign investors. These insignificant results may be due to a company providing financial performance information directly to external parties through their annual reports (Sari & Baskara, 2018).

This research is not in line with a study conducted by Fadilah (2017) or one by Sumantyo and Putra (2017), who concluded that GDP has a significant positive influence on FDI. The result means that changes in the value of GDP are not related to FDI.

Effect of Interest Rate (IR) (7th day Repo Rate) on Foreign Direct Investment

In Table 3, the p-value for Interest Rate was 0.001, which is < 0.05 or 5%, showing that IR is significantly correlated with FDI. Thus, H₃ is accepted and H₀ is rejected. This study had similar results with Sari and Baskara's (2018) research, which found that IR was significantly correlated with FDI.

This study found that IR had a negative and significant influence on FDI; these results were aligned with Marginal Efficiency of Capital (MEC) theory. Thus, investors see that higher Interest Rates will lower MEC values and reduce investments unless returns on capital remain higher than the IR charged (Anwar et al., 2016). In other words, rising IR will hinder investment growth, while falling IR drives increased investment.

This study's results differed from the research of Letarisky et al. (2014), who found that IR had a significant positive influence on FDI. This result means that IR and FDI have a direct relationship, where when IR rise, FDI will also go up, and vice versa.

Effect of Exchange Rate (ER) on Foreign Direct Investment

Table 3 shows that Exchange Rate had no significant influence on FDI with a p-value of 0.090, which exceeds the significance level of 0.05. Thus, H₄ is rejected, and H₀ is accepted. This research is in line with that of Pratiwi et al. (2015), who noted that ER was not significantly correlated with FDI.

Insignificant returns mean that the prevailing ER did not determine foreign investors' small investments. According to Tambunan et al. (2015), ER changes in the short term are not correlated with FDI, which tends to be influenced more by long-term trends.

The results of one study were contrary to those of this study. Septifany et al.'s (2015) research found that ER had a negative and significant influence on FDI. This negative result meant that when the rupiah ER falls, the value of incoming foreign investment will increase.

Conclusions

Based on these results, inflation was significantly correlated with FDI in Indonesia from 2016 to 2021. In other words, the rise and fall of the Indonesian inflation rate influenced the foreign investors' decisions about whether to invest in Indonesia. However, Gross Domestic Product did not significantly impact FDI in Indonesia from 2016–2021. This indicates that the value of GDP did not affect the decision of foreign investors to invest in Indonesia. Interest rates (7th-day repo rate) had a significant negative influence on FDI in Indonesia from 2016–2021. In this case, Indonesian interest rates affect foreign investors' investment decisions. When interest rates rise, then the attractiveness investing in Indonesia, along with total FDI, will decrease. On the contrary, if interest rates fall, then the interest of foreign investors along with the value of FDI in Indonesia will rise. The exchange rate had no significant effect on FDI in Indonesia from 2016–2021, so it can be concluded the Rupiah exchange rate did not affect the amount of new FDI in Indonesia.

The researchers can give the following advice to foreign investors who are deciding whether or not to invest in Indonesia. Since inflation and interest rates are significantly correlated with FDI in Indonesia, foreign investors can review information related to inflation and interest rates before deciding to invest in Indonesia. The government is also involved in investments decisions. The government can keep Indonesian inflation and interest rates in line with targets to provide a win-win solution to foreign investors and the people of Indonesia. Inflation must be kept at a stable rate, so that it does not cause an increase or decrease in buying and selling prices, which impact company income and investment decisions. Interest rates must also be maintained so that investment costs related to interest rates, such as bond and bank loans, do not increase. Furthermore, researchers can also use the results of this study as a reference point. Future studies of FDI in Indonesia may utilize a longer research time span than this study. Furthermore, researchers can also add research objects limited to Indonesia, such as countries in Asia, especially ASEAN. In addition, researchers can also add other variables that may be correlated with FDI in a country, such as wages, export values, infrastructure, human resources, poverty levels, etc.

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