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Foreign Direct Investment in Indonesia and Its Macroeconomic Dynamics

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Abstract

Purpose: This study investigates the effects of exchange rates, interest rates, human capital, and Gross Domestic Product (GDP) on Foreign Direct Investment (FDI) inflows in Indonesia in both the short and long run.

Research Methodology: This study employs secondary monthly time-series data from January 2014 to June 2024 and Applies the Autoregressive Distributed Lag (ARDL) approach to examine the dynamic relationships among variables. The analysis was conducted using EViews 12, supported by stability tests and multicollinearity diagnostics.

Results: The ARDL bounds test confirms the existence of a stable long-run cointegrating relationship among the variables. The estimation results show that GDP has a positive and statistically significant effect on FDI in both the short and long run. In contrast, the exchange rate, interest rate, and human capital do not exhibit statistically significant effects on FDI in either period. Model stability tests indicate that the ARDL specification is structurally stable, although a relatively high degree of multicollinearity is observed between human capital and GDP.

Conclusions: The findings indicate that Foreign Direct Investment (FDI) inflows in Indonesia are primarily driven by economic growth, as reflected by Gross Domestic Product (GDP), while other macroeconomic variables play a limited direct role.

Limitations: This study was limited by multicollinearity issues and the use of a relatively narrow set of macroeconomic variables.

Contributions: This study provides empirical evidence on the determinants of FDI in Indonesia using the ARDL framework and offers policy-relevant insights emphasizing growth-oriented investment strategies.

Keywords: *Exchange Rate, Foreign Direct Investment, Gross Domestic Product, Human Capital, Interest Rate*

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1. Introduction

Amid global economic uncertainty, Indonesia faces significant macroeconomic challenges, including persistently high interest rates over the past six consecutive months. Considering the dynamic interactions and potential long-run equilibrium among macroeconomic variables, this study Adopts the Autoregressive Distributed Lag (ARDL) model, which allows for the simultaneous analysis of short-run dynamics and long-run relationships affecting Foreign Direct Investment (FDI) in Indonesia. As found by Budiono and Purba (2023), variables such as electricity, water, the Human Development Index (HDI), and the COVID-19 pandemic significantly contribute to FDI, which may reflect the impact of monetary policy through economic stability.

According to Elia and Marselina (2023), in a less dynamic economy, where new jobs expected from foreign investments may emerge slowly, unemployment and labor quality become major concerns. High unemployment can affect productivity and create social challenges that the government must manage to maintain stability. In addition, Indonesia's trade balance deficit and dependence on imports of certain products remain key factors in attracting FDI, particularly in industrial sectors that rely on imported components. Prolonged deflation would further weaken Indonesia's export competitiveness and may reduce foreign investors' perceptions of the country's future business prospects.

Mendonça and Tiberto (2024) show that prudent monetary policies, including interest rate management, are crucial for attracting Foreign Direct Investment (FDI), although their focus is broader on developing countries, including Indonesia. In the case of high interest rates, the burden of external debt becomes a particular concern. When borrowing costs rise and economic growth moderates, servicing national debt becomes more challenging because of sluggish growth. Investors become wary, as this raises questions about the long-term sustainability of Indonesia's sovereign credit. Gross Domestic Product (GDP) has a significant positive impact on FDI, while the exchange rate has a negative impact on FDI, and the exchange rate has a positive but insignificant effect on FDI.

According to Budiono and Purba (2023), human capital has a significant positive impact on FDI. To address these issues, the government has introduced economic reforms aimed at creating a conducive environment for increasing FDI and establishing regulations that facilitate ease of doing business. However, under conditions of high interest rates, such policies must be continuously evaluated for their effectiveness in attracting foreign capital amid ongoing macroeconomic challenges. This study is grounded in a macroeconomic context and analyzes how the dynamics of macroeconomic factors influence FDI inflows into the country. Countries with credible monetary policy frameworks and manageable interest-rate environments tend to be more successful in attracting long-term investments.

2. Literature Review and Hypothesis Development

2.1. Literature Review

2.1.1. Exchange Rate

According to Jannat (2020), the exchange rate is the price of one currency in terms of another, reflecting the relative value between two currencies. Exchange rates may fluctuate owing to various economic, political, and market factors. Islam and Beloucif (2024) define the exchange rate as the value at which one currency can be exchanged for another. Firdos, Subhan, Mansuri, and Alharthi (2024) describe the exchange rate as the value of the domestic currency against the US dollar, measured as a period average. Meng et al. (2024) state that the exchange rate represents the value of a country's currency relative to other currencies.

According to Agustina, Barus, Firza, Halim, and Ginting (2024), the exchange rate is the relative price of one currency expressed in another currency (or a basket of currencies). Hesniati, Ogawa, Clarence, Topher, and Engelina (2022) state that the exchange rate represents the relative value of one currency against another, reflecting a country's currency position within the international trading system. The exchange rate refers to the price or value of one unit of a country's currency in terms of another country's currency.

Beyond its definitional role, the exchange rate is a key macroeconomic variable that influences cross-border investment decisions by affecting production costs, asset valuation, and profit repatriation for foreign investors. Exchange rate stability, which is often associated with low and stable inflation, is widely regarded as an indicator of macroeconomic stability and policy credibility. Chew (2024), using the Autoregressive Distributed Lag (ARDL) approach, finds that exchange rate stability measured through inflation has a positive and statistically significant long-run relationship with Foreign Direct Investment (FDI) inflows in Malaysia, indicating that a stable macroeconomic environment reduces uncertainty and enhances foreign investors' confidence.

2.1.2. Interest Rate

Islam and Beloucif (2024) argue that the interest rate is the cost of borrowing money, which is usually expressed as a percentage of the loan amount. Davtyan (2025) explains that, in the context of monetary policy, the interest rate is defined as the rate charged or paid on loans or investments, where short-term interest rates function as conventional monetary policy tools and long-term rates serve as unconventional instruments when short-term rates reach the zero lower bound. Karahan and Bayır (2022) define the interest rate as an important variable influencing investment decisions, in which high interest rates reduce the attractiveness of FDI by increasing borrowing costs and lowering potential investment returns. Interest rates also reflect a country's economic conditions and macroeconomic stability, which in turn affect foreign investors' confidence.

Ramadhani, Rahim, Astuty, Hastuti, and Irwandi (2025) explain that interest rates influence international capital flows and the attractiveness of foreign investments, which in turn affect the value of the currency relative to other currencies. Alafif (2023) explains that interest rates represent the cost of borrowing or the return on investment, determined by credit conditions, inflation expectations, and central bank policies. The interest rate refers to the level of interest applied in a country, measured based on regulations established by the central bank (Hesniati, Delfina, et al., 2023). Beyond their conventional monetary role, interest rates are also considered a key component of financial development, reflecting the depth and efficiency of a country's financial system. El Fakiri and Cherkaoui (2022), employing a panel ARDL model for MENA countries, find that interest rates exert a positive and statistically significant effect on Foreign Direct Investment (FDI) inflows in the long run, suggesting that well-functioning financial markets and stable interest rate structures enhance foreign investors' access to finance and investment attractiveness.

2.1.3. Human Capital

According to Islam and Beloucif (2024), human capital refers to the skills, knowledge, and experience possessed by individuals that enhance productivity and efficiency in an economy. The World Bank Report in 2021, states that investments in human capital through quality education and continuous training are key factors in addressing global labor market transformation. Meressa (2022) argues that human capital is a determinant of productivity, as higher education levels across the workforce increase productivity and facilitate adaptation to technological innovation. Hesniati, Jeslin, and Candy (2023) define human capital as the total knowledge, skills, and competencies acquired through education, work experience, and training. Cuandra and Candy (2024) define human capital as the collection of knowledge, skills, and competencies possessed by employees within an organization that enhances the firm's value and productivity.

The development of human capital is crucial for improving competitiveness and sustaining organizational performance, particularly in the context of digital transformation and business innovation. Febiola, Mon, and Setyawan (2024) state that human capital is a concept that describes the value and potential possessed by employees, which can be enhanced through education, training, and work experience. In an organizational context, human capital plays a crucial role in determining performance and success, as the quality of human resources becomes a key factor in achieving organizational goals. Empirically, Epor, Yua, and Iorember (2024) define human capital as an index encompassing education and skill levels and demonstrate that it positively contributes to both Foreign Direct Investment (FDI) inflows and economic growth in emerging markets. Using an ARDL approach, their study finds a positive and statistically significant long-run relationship between human capital and FDI in Brazil and Vietnam, highlighting the role of workforce quality in attracting foreign investments in developing economies.

2.1.4. Gross Domestic Product

GDP is not merely a measure of economic growth but also reflects complex socioeconomic dynamics, including welfare and sustainability. IMF (2025) highlights the importance of total GDP as an indicator of post-pandemic economic recovery and sustainable growth. Manihuruk, Sitohang, and Sari (2024) define GDP as the total monetary value of all final goods and services produced within a country over a specific period. Liu et al. (2024) describe GDP as a traditional indicator of economic growth, although it does not fully capture social welfare and environmental sustainability, leading to the need for alternative indicators. According to Bryniuk (2023), Gross Domestic Product (GDP) is the most commonly used indicator to measure economic growth and is calculated by summing expenditures from production, consumption, and government spending within an economy. Shafrullah et al. (2024) define Gross Domestic Product (GDP) as a measure of the total value of goods and services produced within a country over a specific period, which is used to assess national economic growth.

Beyond its conceptual role, recent empirical studies employing the ARDL framework provide strong evidence of the relevance of GDP for foreign investment. Using a panel ARDL approach, Wehncke, Marozva, and Makoni (2023) confirm a positive long-run cointegrating relationship between GDP growth and FDI in emerging markets, indicating that higher economic growth significantly increases FDI inflows. GDP is positioned as a key long-run determinant of FDI in developing economies.

2.2. Hypothesis Development

2.2.1. Exchange Rate on Foreign Direct Investment

Miranda-Agrippino and Rey (2022) note that exchange rates exhibit complex dynamics in influencing capital flows and international trade, especially in the era of digital globalization. Firdos et al. (2024) find that exchange rate volatility adversely affects FDI inflows by reducing investor confidence. Mehta, Gupta, and Maitra (2024) report that exchange rates are not a significant factor in explaining changes in FDI. However, some studies suggest that exchange rate appreciation may attract FDI by increasing the value of foreign investments.

> H_{1a}: Exchange rate has a negative effect on Foreign Direct Investment (FDI) inflows in the short run.
>
> H_{1b}: Exchange rate has a negative effect on Foreign Direct Investment (FDI) inflows in the long run.

2.2.2. Interest Rate on Foreign Direct Investment

S&PGlobal (2024) reports that interest rate cuts by the US central bank may increase capital flows to emerging markets with strong fundamentals, such as those in Southeast Asia. Firdos et al. (2024) find that lower interest rates encourage FDI by creating more favorable investment conditions. Mehta et al. (2024) also identify interest rates as a key determinant, as foreign investment is often debt-financed. Bernanke and Blanchard (2025) argue that a tight monetary policy, including interest rate adjustments, may be necessary to achieve price stability.

> H_{2a}: Interest rate has a significant negative effect on Foreign Direct Investment (FDI) inflows in the short run.
>
> H_{2b}: Interest rate has a significant negative effect on Foreign Direct Investment (FDI) inflows in the long run.

2.2.3. Human Capital on Foreign Direct Investment

Islam and Beloucif (2024) state that high-quality human capital attracts foreign investors who require skilled labor. Meressa (2022) argues that countries with higher workforce quality tend to receive greater FDI inflows. Triatmanto, Bawono, and Wahyuni (2023) find that human capital plays a central role in economic development and provides cumulative long-term effects.

> H_{3a}: Human capital quality has a weak and insignificant effect on Foreign Direct Investment (FDI) inflows in the short run.
>
> H_{3b}: Human capital quality has a positive effect on Foreign Direct Investment (FDI) inflows in the long run.

2.2.4. Total GDP on Foreign Direct Investment

Upadhyaya and Barreto de Góes (2024) highlight the crucial role of GDP in attracting FDI. Mehta et al. (2024) find that GDP significantly attracts FDI due to large market size and high demand. Saleem et al. (2021) demonstrate a positive and significant bidirectional relationship between GDP and FDI.

> H_{4a}: Increased DP growth positively affects Foreign Direct Investment (FDI) inflows.
>
> H_{4b}: Positive effect of GDP growth on Foreign Direct Investment (FDI) inflows.

2.3. Research Model

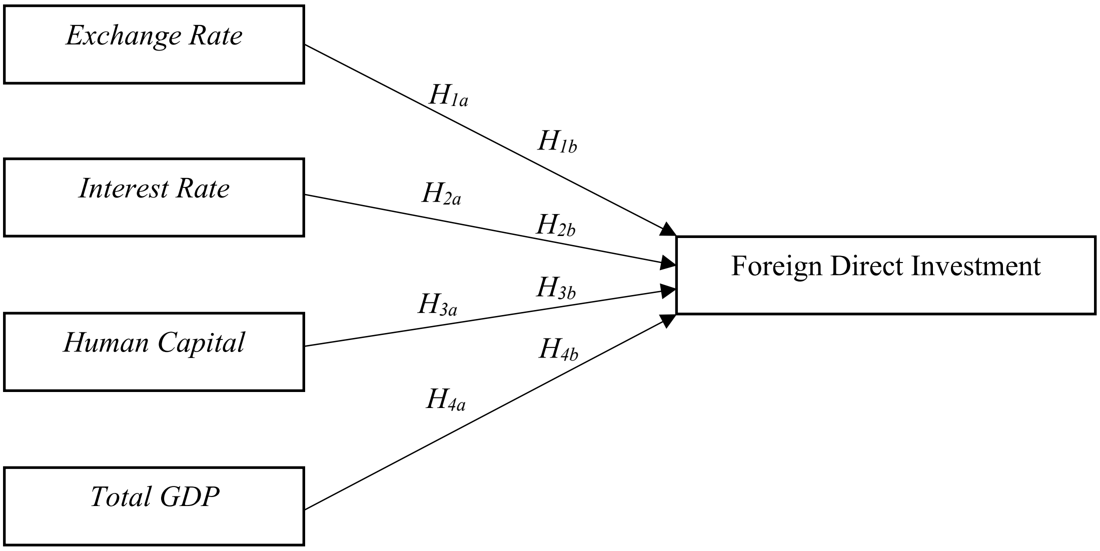

Figure 1. Research model

3. Methodology

3.1. Type of Research

This study employs secondary data obtained from annual reports of government institutions, official national statistical publications, trade databases, and online economic portals. The data cover the period from January 2014 to June 2024 in Indonesia, allowing the analysis to capture the dynamics of changes in the variables over the past decade. Some variables are originally reported on a quarterly basis and were converted into monthly series to ensure consistency across all variables. The transformation was conducted using a linear interpolation method, whereby quarterly observations were distributed evenly across the corresponding three months, assuming smooth intra-quarter movements. This method is widely applied in macroeconomic time-series studies when higher-frequency data are unavailable and helps preserve the underlying trend of the original series without introducing excessive volatility.

Interpolated monthly data were subsequently used in the empirical analysis. Data estimation was conducted using the Autoregressive Distributed Lag (ARDL) approach, which allows for the simultaneous examination of short-run dynamics and long-run relationships among variables with mixed orders of integration, provided that none of the series is integrated of order two. The ARDL framework is particularly suitable for this study, given the relatively limited sample size and the mixed frequency nature of the original data.

Table 1. Definition and operationalization

Variables	Indicators	Sources
FDI	Foreign Direct Investment flows	(SatuData, 2025)
Exchange Rate	USD exchange rate against the rupiah	(BI, 2025b)
Interest Rate	BI-Rate	(BI, 2025a)
Human Capital	Indonesian Labor Force	(BPS, 2025)
Total GDP	Indonesian GDP	(SatuData, 2025)

The dependent variable in this study is the amount of foreign investment allocated to Indonesia, namely Foreign Direct Investment (FDI), while the independent variables are the exchange rate, interest rate, human capital, and total GDP. The collected data were processed and analyzed using EViews software, version 12.

4. Results and Discussions

4.1. Results

Table 2 presents the descriptive statistics for all research variables.

Table 2. Descriptive statistics

Variables	Minimum	Maximum	Mean	Std. Dev.
FDI (million)	72,000,000	217,300,000	105,000,000	0.124249
Exchange Rate	11,404	16,421	14,135	5.71E-05
Human Capital	31,042,997	50,135,194	41,338,774	4937549
Interest Rate	0.035	0.0775	0.0525	0.013618
GDP (million)	2,506,300,200	5,536,495,200	3,799,213,500	0.096799

In terms of data dispersion, as reflected by the standard deviation, the LTRGDP and LFDI exhibited the lowest and most stable variations relative to their mean values, with standard deviations of 0.096799 and 0.124249, respectively. The EXCR variable also showed a relatively stable pattern, although it operated on a very small numerical scale. In contrast, HUMC displayed a much larger dispersion (4,937,549), which was proportional to its high value scale, whereas INT exhibited considerable variability relative to its central tendency. Overall, the data distribution can be considered well controlled, with most variables approximating a normal distribution, except for EXCR, which appeared more peaked (leptokurtic) and may contain extreme values.

This section presents the results of the data processing and analysis conducted using the Autoregressive Distributed Lag (ARDL) model. The analysis aims to evaluate the long-run and short-run relationships among the variables under study. The results are presented in tables and figures, including the long-run bounds test, stability test, and ARDL model estimation. This section presents the results of the data processing and analysis conducted using the Autoregressive Distributed Lag (ARDL) model. The tests aim to evaluate the long-run and short-run relationships among the examined variables. The findings are presented in tables and figures, including the long-run bounds test, model stability tests, and ARDL model estimations.

Table 3. Conditional error correction regression

Variables	Coefficient	Std. Error	Prob.	Result
Constant	0.002530	0.001804	0.1634	Not Significant
FDI	-1.024474	0.089307	0.0000	Significant
Exchange Rate	-2.47E-06	4.58E-06	0.5514	Not Significant
Human Capital	-9.09E-10	2.74E-09	0.7372	Not Significant
Interest Rate	-0.423625	0.871593	0.6287	Not Significant
Total GDP	0.585613	0.203926	0.0048	Significant

The short-run estimation results presented in Table 3 indicate that total GDP has a positive and statistically significant effect on FDI, whereas other variables, such as human capital, interest rates, and exchange rates, do not exhibit significant effects. This implies that, in the short term, an increase in GDP plays an important role in encouraging the inflow of foreign direct investment, whereas exchange rate fluctuations, changes in human capital, and movements in interest rates have not yet become dominant factors influencing FDI flows during the observed period.

The lack of statistical significance of the exchange rate, interest rate, and human capital variables in the short-run estimation indicates that, within the observed period, variations in these variables do not exert an immediate measurable impact on FDI inflows. This suggests that short-term fluctuations in macroeconomic conditions and human capital indicators are not sufficiently strong to influence foreign investors' decisions contemporaneously. Such results may reflect adjustment lags, information delays, or the possibility that these variables affect FDI indirectly through other macroeconomic channels captured by GDP.

The ECT was negative and statistically significant (−1.024474), confirming the existence of a valid long-run equilibrium relationship among the variables. The magnitude of the coefficient indicates a rapid adjustment process, implying that deviations from long-run equilibrium are corrected within one period. The absolute value of the coefficient exceeding unity suggests the presence of short-run overshooting before the system converges back to its long-run equilibrium path.

Table 4. Level equation

Variables	Coefficient	Standard Error	Prob.	Result
Constant	0.002469	0.001732	0.1567	
Exchange Rate	-2.67E-06	4.47E-06	0.5512	Not Significant
Human Capital	-8.87E-10	2.65E-09	0.7381	Not Significant
Interest Rate	-0.413504	0.852123	0.6284	Not Significant
Total GDP	0.571623	0.207989	0.0069	Significant

In the long-run estimation presented in the level equation in Table 4, the analysis reveals that only total GDP has a positive and statistically significant effect on FDI, with a coefficient of 0.571623 ($p < 0.01$). This indicates that, in the long run, an increase in GDP contributes to higher inflows of Foreign Direct Investment into Indonesia. This finding is consistent with the short-run estimation results, which also identify GDP as the main factor driving FDI.

By contrast, the exchange rate, human capital, and interest rate variables do not show statistical significance in the long run, as their probability values exceed 0.05. Therefore, there is insufficient empirical evidence to conclude that these three variables influence FDI in the long term. This lack of long-run significance suggests that persistent changes in macro-financial conditions and human capital indicators are not strong enough to directly determine FDI inflows or that their effects may operate indirectly through overall economic growth rather than through independent channels. Nevertheless, the signs of the coefficients can be considered to understand the direction of their relationships. The coefficients of exchange rate and human capital are negative, indicating that increases in these variables tend to be associated with a decline in FDI, although the relationships are not statistically significant. Similarly, the interest rate shows a negative and insignificant relationship with FDI.

Moreover, the constant term in the model was also statistically insignificant, implying that fixed factors or other components not included in the model do not exert a meaningful influence on FDI in the long run. Overall, these findings emphasize the importance of economic growth as the primary determinant of FDI, whereas other factors, such as exchange rates, human capital, and interest rates, have not been proven to have a significant effect on Foreign Direct Investment inflows into Indonesia in the long term.

Table 5. F-Bounds test

Test Statistic	Value	Significance Level	I	I (1)
F-statistic	24.72747	10%	2.20	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
Actual Sample Size	124	Finite Sample (n=80)		
		10%	2.303	3.22
		5%	2.688	3.698
		1%	3.602	4.787

The F-statistic value of 24.72747 far exceeds the upper bound critical value at the 1% significance level, clearly indicating the existence of a long-run relationship among the variables examined: FDI, exchange rate, human capital, interest rate, and GDP. Accordingly, the ARDL model employed can capture cointegration among these variables, allowing for long-run analysis. This finding implies that although several explanatory variables may appear insignificant in the short run, their joint movements are tied to a stable long-run equilibrium relationship with FDI.

The existence of this long-run relationship is further reinforced by the estimation of the error correction term, which yields a negative coefficient of −1.02 and is statistically significant at the 1% level. This coefficient indicates that any deviation from the long-run equilibrium will be corrected in the subsequent period at an adjustment speed of approximately 102% per period. This implies that the adjustment process occurs very rapidly, suggesting that the model is stable in describing the long-run dynamics among the variables. The confirmation of cointegration further supports the appropriateness of the ARDL framework in capturing the long-run equilibrium relationship among macroeconomic variables.

Figure 2. Stability test

The model stability test was conducted to ensure that the parameters in the ARDL model remained stable throughout the observation period. Figure 2 presents the results of the stability test using a Cumulative Sum (CUSUM) graph, with the 5% significance boundaries indicated by dashed lines. As shown in the graph, the CUSUM line lies entirely within the significance bounds over the period from January 2014 to June 2024. This indicates that the model parameters do not exhibit instability or significant structural changes, suggesting that the ARDL model is stable and suitable for analyzing both short-run and long-run relationships. The stability of the model parameters strengthens the reliability of the estimated short-run and long-run coefficients over the observation period. The stability of the model parameters implies that the insignificance of certain explanatory variables reflects their limited empirical influence rather than being driven by structural breaks or parameter instability over the sample period.

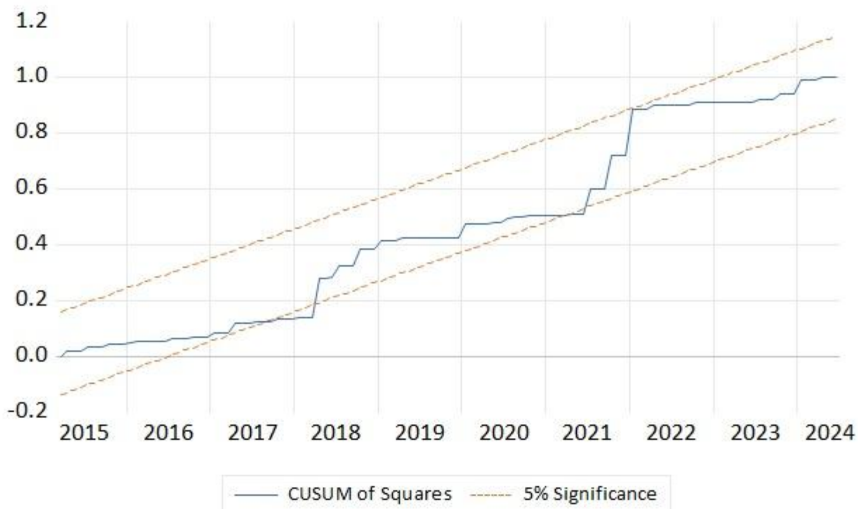

Figure 3. Stability square test

Furthermore, Figure 3 presents the results of the parameter stability test using the CUSUM of Squares method. As shown in the graph, the test line lies entirely within the 5% significance boundaries throughout the observation period. This indicates that the variance of the model parameters did not experience instability or significant structural changes. Therefore, the ARDL model employed is considered structurally stable and satisfies the assumption of parameter stability, allowing the estimation results and the interpretation of relationships among variables, both in the short run and the long run, to be regarded as valid.

This finding further confirms that the statistically insignificant coefficients observed for several explanatory variables are not driven by parameter variance instability but rather reflect their limited explanatory power within the model during the study period. Before interpreting the results of the ARDL model estimation, it is necessary to test the classical assumptions to ensure that the model meets sound econometric criteria. One important test is the multicollinearity test, which aims to determine whether there is a high linear relationship among the independent variables in the model. The results of the variance inflation factor test are presented in Table VI.

Table 6. Variance inflation factor test

Variables	Coefficient Variance	Uncentered VIF	Centered VIF
C	7.51239	420104.4	NA
EXCR	7.16E-11	795.8302	4.648807
HUMC	1.28E-17	1175.254	17.32667
INT	0.142417	24.61031	1.465230
LTGDP	0.034646	470122.9	18.01016

The results of the Variance Inflation Factor (VIF) test in the table above indicate the presence of multicollinearity among the independent variables in the regression model. Based on the centered VIF values, the HUMC and LTGDP variables record values of 17.33 and 18.01, respectively, both of which exceed the commonly accepted threshold of 10. This indicates a high degree of multicollinearity, suggesting a strong linear relationship between these variables and other explanatory variables in the model. Such conditions may lead to inflated standard errors, potentially rendering coefficient estimates less precise and weakening statistical inference.

Meanwhile, the EXCR variable, with a centered root-mean-square-error-of-prediction (VIF) value of 4.65, and the INT variable, with a value of 1.47, remained within acceptable limits, indicating no serious multicollinearity concerns. Overall, the regression model exhibits multicollinearity issues that warrant attention, particularly for the HUMC and LTGDP variables. The high multicollinearity between human capital and GDP reflects their structural linkage in a growing economy, where improvements in workforce quality tend to move in tandem with economic expansion. Although this condition does not bias ARDL estimations, it may inflate standard errors and reduce the statistical significance of individual coefficients, thereby partially explaining the insignificant effect of human capital observed in both the short-run and long-run estimations.

Nevertheless, given that the primary objective of this study was to analyze short-run and long-run relationships using the ARDL framework, the presence of multicollinearity can be tolerated as long as it does not alter the consistency of the estimated coefficients' signs and the overall stability of the model. After ensuring the multicollinearity condition among the variables, the next step was to estimate the ARDL model to analyze the short-run and long-run relationships among the research variables. The results of the ARDL model estimation, along with the R-squared values and the model's statistical tests, are presented in Tables 7 and 8.

Table 7. ARDL Test

Variables	Coefficient	Standard Error	Prob.	Result
Constant	0.002524	0.001804	0.1643	Not Significant
FDI	-0.02012	0.089300	0.8144	Not Significant

Exchange Rate	580.5709	1,013.346	0.5678	Not Significant
Interest Rate	-0.418231	0.872602	0.6326	Not Significant
Human Capital	-8.49E-10	2.71E-09	0.7544	Not Significant
Total GDP	0.584056	0.203759	0.0049	Significant

Based on the estimation results, only the total GDP variable has a significant positive effect on FDI, with a p-value of 0.0049 ($p < 0.01$). This indicates that an increase in GDP significantly encourages FDI inflows in the short run. The other variables–the exchange rate, interest rate, and human capital–are not statistically significant, although their coefficients are negative. This suggests that short-run fluctuations in these variables have not yet produced a measurable impact on FDI inflows, possibly because of adjustment lags, indirect transmission through economic growth, or the presence of multicollinearity, particularly between human capital and GDP, which may inflate standard errors and weaken short-run statistical significance.

Table 8. R-Squared and statistic test Model ARDL

Statistic	Value
R-squared	0.074283
Adjusted R-squared	0.035508
F-statistic	1.893759
Significance F	0.100511

From the perspective of model adequacy, the R-squared value of 0.074283 and the adjusted R-squared of 0.035058 indicate that the model explains approximately 7% of the variation in FDI changes. Although this explanatory power appears low, such values are common in macroeconomic time-series models of FDI, where investment decisions are influenced by numerous unobserved institutional, political, and structural factors beyond standard macroeconomic indicators. Nevertheless, the Prob(F-statistic) value of 0.100511, which is close to the 10% significance threshold, suggests that the model remains sufficiently viable for further analysis.

In addition, the Durbin–Watson statistic of 1.987962 indicates the absence of serious autocorrelation problems, implying that the estimation results are reasonably reliable. Thus, although most variables are not statistically significant in the short run, the model provides a valid empirical foundation for analyzing long-run relationships. Despite the limited explanatory power of the model, the consistency of the GDP coefficient across different specifications reinforces its role as the most robust determinant of FDI in this study. Moreover, the consistency and significance of the GDP coefficient across different model specifications reinforce its role as the most robust and stable determinant of FDI in this study.

4.2. Discussion

These findings indicate that economic growth, as measured by GDP, is the most consistent and significant factor in driving FDI inflows, both in the short run and the long run. This result is consistent with the studies of Mehta et al. (2024), Saleem et al. (2021), Upadhyaya and Barreto de Góes (2024), which emphasize the importance of maintaining macroeconomic stability and creating a conducive business climate as strategies to attract foreign investors. The policy implications of these results are aligned with Firdos et al. (2024), namely, the importance of maintaining interest rates at competitive yet stable levels in the long run.

Other fundamental aspects, such as infrastructure and the quality of human capital, are also crucial, as shown by (Islam & Beloucif, 2024; Meressa, 2022; Triatmanto et al., 2023). Indeed, human capital may exert a greater impact in the long run than is reflected in the short-run model. Meanwhile, the exchange rate is not proven to significantly affect FDI in Indonesia throughout the January 2014 – June 2024 period. Although the direction of the relationship is consistently negative, this finding is in line with Mehta et al. (2024) indicating that the exchange rate is not a primary determinant of FDI in Indonesia.

5. Conclusions

5.1. Conclusion

This study examines the effects of key macroeconomic variables namely, the exchange rate, interest rate, human capital, and Gross Domestic Product (GDP) on Foreign Direct Investment (FDI) inflows in Indonesia using the Autoregressive Distributed Lag (ARDL) approach over the period from January 2014 to June 2024. The ARDL bounds testing procedure confirms the existence of a stable long-run cointegrating relationship among the variables, allowing for the analysis of both short-run and long-run dynamics.

The empirical results indicate that, in the short run, GDP is the only variable that has a positive and statistically significant effect on FDI inflows. This finding suggests that periods of stronger economic activity and market expansion play crucial roles in encouraging foreign investors to allocate capital to Indonesia. In contrast, the exchange rate, interest rate, and human capital variables do not exhibit statistically significant effects on FDI in the short run, indicating that their influence may be indirect or mediated through broader economic conditions.

In the long run, GDP remains the sole variable with a positive and statistically significant impact on FDI, underscoring the importance of sustained economic growth as the primary driver of foreign investment inflows into Indonesia. Although the exchange rate, interest rate, and human capital variables display negative coefficient signs in the long-run estimation, these relationships are not statistically significant. Therefore, the empirical evidence does not support the conclusion that these variables independently determine FDI inflows during the study period. The insignificance of human capital may be partly attributed to its high degree of multicollinearity with GDP, reflecting its structural linkage in a growing economy.

Overall, the findings emphasize that Foreign Direct Investment in Indonesia is predominantly growth-driven. From a policy perspective, this implies that strategies aimed at accelerating and sustaining GDP growth are likely to be more effective in attracting FDI than narrowly focused monetary or labor market interventions. Policymakers should therefore prioritize growth-enhancing measures, such as infrastructure development, industrial upgrading, and the expansion of productive sectors that increase market size and domestic demand. In addition, maintaining regulatory certainty and policy consistency during periods of economic expansion can help ensure that GDP growth is effectively translated into increased foreign investment inflows. While exchange rate stability, interest rate management, and human capital development remain important from a broader macroeconomic perspective, their direct role in attracting FDI appears to operate mainly through their contribution to sustained economic growth rather than as independent policy instruments.

5.2. Research Limitations

This study has several limitations that should be acknowledged when interpreting the results. First, the analysis relies on a limited set of macroeconomic variables the exchange rate, interest rate, human capital, and GDP, which, although widely used in the FDI literature, may not fully capture the complexity of the factors influencing foreign investment decisions. FDI inflows are also shaped by institutional, political, and structural conditions, such as regulatory quality, political stability, and trade openness, which are not explicitly included in the model.

Second, although the ARDL approach is well suited for analyzing both short- and long-run relationships with variables of mixed integration orders, the model's explanatory power remains relatively low. This finding suggests that a substantial proportion of the variation in FDI inflows may be driven by unobserved factors or external shocks, including global financial conditions and geopolitical developments, which are beyond the scope of the current framework.

Third, the study employs interpolated monthly data for variables originally reported at lower frequencies. Although interpolation is commonly used in time-series macroeconomic studies and allows for higher-frequency analysis, it may introduce measurement error and smooth short-term fluctuations, potentially affecting the estimated coefficients and their statistical significance.

Finally, the presence of multicollinearity, particularly between human capital and GDP, may inflate standard errors and weaken the statistical inference for individual coefficients. Although this issue does not bias the ARDL estimates or compromise model stability, it may partially explain the lack of statistical significance of certain variables, especially human capital. Therefore, the results should be interpreted with caution, and the findings should be viewed as indicative rather than exhaustive explanations of FDI dynamics in Indonesia.

5.3. Suggestions and Directions for Future Research

Based on these findings, policymakers should prioritize strategies that support sustained and inclusive economic growth, as GDP is consistently shown to be the most significant determinant of FDI inflows in Indonesia. Efforts to improve infrastructure, enhance regulatory efficiency, and strengthen key productive sectors can help maintain an investment-friendly environment and reinforce Indonesia's market attractiveness to foreign investors. Although interest rates and exchange rates were not found to be statistically significant determinants of FDI in this study, maintaining overall macroeconomic stability remains essential for reducing uncertainty and preserving investor confidence, particularly during periods of global economic volatility.

Furthermore, continued investment in human capital development through education, vocational training, and skill enhancement should be pursued to support long-term economic competitiveness and improve the quality, rather than merely the quantity, of foreign direct investment. Although human capital does not exhibit a direct statistically significant effect on FDI within the current empirical framework, its strong linkage with economic growth suggests that its role may be indirect and materialize over a longer horizon.

Several extensions are recommended for future research. First, comparative studies across other emerging markets in Southeast Asia and broader developing economies can be conducted using the ARDL framework to assess whether the dominance of GDP as the main determinant of FDI is country-specific or reflects a more general pattern among emerging economies. Such cross-country comparisons would allow for a deeper understanding of the structural differences in FDI determinants.

Second, future studies are encouraged to incorporate additional macroeconomic and institutional variables that may better capture investment-related risks and uncertainties, such as inflation, political stability, regulatory quality, trade openness, and financial market development. Including these variables may improve the explanatory power of the model and provide a more comprehensive assessment of the factors influencing FDI inflows. Finally, extending the sample period or employing alternative econometric approaches, such as panel ARDL or nonlinear ARDL models, may offer further insights into the potential asymmetric or regime-dependent effects of macroeconomic variables on FDI.

Author Contributions

CC Conceptualization, study design, data collection, manuscript drafting, and revision. CN Data analysis, interpretation of results, manuscript revision, and final approval. INA Literature review, methodology development, and manuscript editing.

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