Research Article

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Analysis of Factors Affecting Foreign Direct Investment (FDI) in Indonesia

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Abstract: *This study aims to analyze the factors affecting foreign direct investment in Indonesia. The data used is dynamic panel data for the period 2010 to 2022, the dependent variable used is foreign direct investment in Indonesia, and the independent variables used are infrastructure reflected by the total length of provincial roads, macroeconomic stability reflected by the consumer price index, and market size reflected by gross regional domestic product per capita. The analytical tool used is multiple linear regression with the generalized method of moment (GMM) analysis method. The results showed that infrastructure, macroeconomic stability, market size, and FDI in the previous year had a significant effect on FDI in Indonesia.*

Keywords: *FDI, Infrastructure, Macroeconomic Stability, Market Size.*

Introduction

Indonesia is a developing country with great economic potential that can attract foreign investors to participate in its economic development. With highly varied natural resources, a potential market with a large population, fairly competitive labor costs, and a higher level of openness has increased the attractiveness of foreign investment in Indonesia (Tambunan 2011). Foreign direct investment (FDI) is defined by law as investment made by foreign investors to manage and control business activities in Indonesian territory, in accordance with the provisions set out in the Investment Law No. 25 of 2007. FDI is an investment that is made in the long term and is insensitive to economic turmoil, which is what makes FDI an indispensable source of funding to develop a country's economy (Ramadhan and Sitorus 2023). FDI is usually done by establishing a company, cooperating, or acquiring a company in the destination country. FDI has a positive impact on the host country's economy through increased national income, employment, and foreign exchange reserves (Imam Awaluddin, et al. 2023). FDI can also provide opportunities for recipient countries to become part of regional chains and increase exports (Giap, Gopalan, and Luthra 2020).

The United Nations Conference on Trade and Development (UNCTAD) has repeatedly emphasized the importance of foreign direct investment into developing countries, because developing countries need large investments to advance their economies (Andrian and Suprihatin 2024). Investment makes a major contribution to a country's economy because the overall development of economic activity is driven by investment (Nairobi and Afif 2020). This notion is also supported by the potential of FDI on long-term sustainable economic growth (Paton 2018). FDI is considered very important, both for the home country and for the host country because FDI inflows provide an opportunity for companies to reduce domestic production costs and seek new markets abroad. Investment acts as one of the capital resources that can create growth in production as well as future income (Aida et al. 2021). Moreover, FDI also does not incur debt and is preferred to cover external current account deficits especially in developing countries (Demekas and Horváth n.d.).

In the publication of the Investment Coordinating Board's Strategic Plan for 2020-2024, it is stated that the higher growth of foreign investment and domestic investment shows that their role in investment and economic growth is very important (BKPM Republik Indonesia 2022). The determinants of FDI inflows are of particular concern to policymakers in capital-deficient countries. Many countries have policies that aim to create incentives that are stronger and capable of attracting more FDI, the provision of incentives and the adoption of policies that stimulate FDI are motivated by the fact that FDI is a more reliable source of capital than investment portfolio. Marselina (2022) argues that Foreign Direct Investment (FDI) as one of the main sources of long-term economic financing of the economy is the main financing option that can be used by many developing countries in the face of an integrated global economy, as FDI is able to provide more stable growth than other forms of capital flows (Marselina and Prasetyo 2023).

Based on the Entry Mode Theory, which is the development of the eclectic theory states that there are three motivations that encourage foreign companies to invest in other countries, namely resource seeking, efficiency seeking, and market seeking. Resource seeking is the reason to obtain quality and cheap natural resources, labor, or capital in the destination country. Efficiency seeking is the reason for improving production efficiency by taking advantage of differences in costs, taxes, regulations, or economies of scale in the destination country. Market seeking is the reason for to expand the market or reduce trade barriers by bringing production closer to consumers in the destination country (Lesmana and Soetjipto 2022).

Infrastructure is one of the factors that reflect the superiority of resources owned by a region, with adequate infrastructure, companies can reduce logistics costs, improve operational efficiency, and expand the reach of existing markets. Quality infrastructure can facilitate connectivity between regions and can facilitate the management of supply chains and product distribution. Macroeconomic stability is one of the factors that investors also consider. Macroeconomic stability refers to a state where the country does not experience large variations in key macroeconomic indicators, such as inflation, economic growth, and exchange rates. Such stability is important as it creates a conducive environment for investment, foreign investors will seek investment locations that not only offer low operating costs but also a stable and predictable business environment. Through macroeconomic stability, companies can plan and operate their investments more efficiently, reducing the risks associated with economic volatility. One of the objectives of FDI is to find markets usually related to market size, per capita income, market growth, access to regional and global markets, consumer preferences and domestic market structure (Wadhwa and Reddy S 2011). Per capita income is often used as an indicator that reflects the size of a region's market, a region with a high per capita income indicates greater income per individual, which can attract foreign investors as strong purchasing power indicates greater consumer potential.

In an effort to understand the factors that influence FDI in Indonesia, this study takes a dynamic panel analysis approach that considers the previous year's FDI as a determinant of current FDI. The previous year's FDI variable reflects the continuity and momentum of investment, which is often overlooked in previous studies. Past investment experience plays a significant role in shaping investors' future expectations and decisions. FDI that occurs in the previous year can create a carryover effect, where the success of the initial investment will attract more subsequent investments, both from the same company and from new investors. Therefore, the previous year's FDI variable is an important component in this research model to capture the long-run effect and ensure that investment dynamics are accurately represented. On the other hand, the challenge posed by using the lag of the dependent variable as an independent variable is the potential endogeneity that can affect the estimation and cause bias in the model. To overcome this, this study uses the Generalized Method of Moment (GMM) method which allows the use of instrument variables to correct for endogeneity issues. GMM is expected to be an appropriate method

due to its ability to provide consistent estimates in situations where the independent variable may be correlated with the error-term. Based on the background explained earlier, the factors that influence FDI in each province in Indonesia have a crucial role in directing investment flows. Researching the factors that influence FDI in Indonesia is important because FDI has a significant impact on the Indonesian economy. By understanding the characteristics and economic dynamics of each region, it is expected that policies can be designed that support the growth of FDI in a sustainable manner.

Method

This research is a type of quantitative research, with the dependent variable being foreign direct investment and the independent variables including provincial minimum wage, road length, human development index, inflation, and gross regional domestic product per capita. The data used is on 33 provinces in Indonesia for the period 2010 to 2022, with a note in which the North Kalimantan Province which was a division of East Kalimantan Province in 2013 was merged with its parent, namely East Kalimantan Province, therefore in this study only 33 provinces in Indonesia were used. The type of data used in this study is secondary data in the form of panel data sourced from the central statistics agency (BPS) and the investment coordinating agency (BKPM).

In this research, the analysis method is used First Difference - Generalized Method of Moment (FD-GMM) is an approach used in the estimation of dynamic panel data models where the dependent variable has a lag as one of the independent variables. This approach overcomes the endogeneity problem by taking the first difference of the variables in the model. The analytical tool used is Eviews 10 with the following regression model:

$$\ln FDI_{it} = \beta_0 + \beta_1 \ln IFR_{it} + \beta_2 \ln SM_{it} + \beta_3 UP_{it} + \beta_4 \ln FDI_{it-1} + \varepsilon_{it}$$

Description:

FDI	: Foreign Direct Investment
β_0	: Constant
$\beta_1, \beta_2, \beta_3, \beta_4$	: Regression coefficient
IFR	: Infrastructure
SM	: Macroeconomics Stability
UP	: Market Size
FDI_{t-1}	: FDI one year earlier
ε	: Error Term

Results and Discussion

This study has endogeneity problems arising from the use of lags of the dependent variable as an independent variable and the alleged reverse causality between market size reflected by gross regional domestic product per capita and FDI. To overcome the endogeneity problem, instrument variables are used, namely variables that do not have a direct influence on the dependent variable. The instrument variable chosen in this study is the average years of schooling of the population 15 years and over because Average years of schooling as a measure of education has a strong relationship with GRDP per capita. Better education tends to increase individual productivity and income, which in turn will increase GRDP per capita, as supported by the results of research conducted by Sitorus (2024) which shows that average years of schooling has a significant and directly proportional effect on GRDP per capita (Sitorus, Muchtar, and Sihombing 2024). The average years of schooling is also considered a good instrument because it does not

directly affect FDI, i.e. the average years of schooling is more correlated with the quality of human resources and the level of education in a region.

Table 1. Regression Result Generalized Method of Moment

Variable	Coefficient	t-Statistik	Prob.#
ln_IFR	0.0045	2.1874	0.0294**
ln_SM	-0.0076	-1.9615	0.0506*
ln_UP	2.1173	4.7379	0.0000***
ln_FDI$_{t-1}$	0.3342	39.8961	0.0000***
J-statistic		32.2695	
Prob(J-statistic)		0.35509	

#probability values have used one-way according to the hypothesis

* significant at α = 0.10

** significant at α = 0.05

*** significant at α = 0.01

In the table above shows the results of the t-test with the GMM model show that several variables are significant, including the infrastructure variable (lnIFR) with an absolute value of t-count (2.1874) > absolute value of t-table (1.6491), so that H_0 is rejected and shows that infrastructure has a positive and significant effect on foreign direct investment (lnFDI). Macroeconomic stability variable (SM) shows the absolute value of t-count (1.9615) > absolute value of t-table (1.6941), so H_0 is rejected and indicates that macroeconomic stability has a negative and significant effect on foreign direct investment (lnFDI). The market size variable (lnUP) shows the absolute value of t-count (4.7379) and > the absolute value of t-table (1.6941), so H_0 is rejected and shows that market size statistically has a positive and significant effect on foreign direct investment (lnFDI). The lag variable of foreign direct investment (lnFDIt-1) with an absolute value of t-count (39.8961) > absolute value of t table (1.6491). This shows that H_0 is rejected, which means that the lag variable of FDI (lnFDIt-1) has a positive and significant effect on foreign direct investment in the current year (lnFDI).

Dynamic Panel Data Model Evaluation

1. Sargan Test

   The sargan test is conducted to test the validity of the instruments used in the model estimation, this test checks whether the instruments used in the GMM model are exogenous, that is, they are not correlated with the error term. The sargan test can be done by looking at the probability of the J-statistic, with the following hypothesis:

   H_0 : The instrument used in GMM estimation is valid (uncorrelated with error).

   H_a : The instrument used in GMM estimation is invalid (correlated with error).

Table 2. Sargan Test

J-statistic	Prob(J-statistic)	Conclusion
32.2695	0.35509	Receive H_0

Based on the results displayed in the table above, the J-statistic probability > α = 0.05, so H_0 is accepted, which means that the instrument used is valid.

2. Arellano Bond Test

This test is conducted to check whether there is serial correlation in the error term after the model is transformed into first-differences. The hypotheses in the Arellano bond test are as follows:

H_0 : There is no autocorrelation in the error-term

H_a: There is autocorrelation in the error-term

If the probability in the first test order AR(1) < α = 0.05 and the second test order AR(2) > α = 0.05, then H0 is accepted which means there is no autocorrelation in the error term.

Table 3. Arellano Bond Test

Test order	Probability	Conclusion
AR(1)	0.0010	
AR(2)	0.3413	Receive H_0

Based on the results displayed in the table above, shows the probability value of AR(1) < α = 0.05 and the probability of AR(2) > from α = 0.05, so H_0 is accepted which means there is no autocorrelation in the error term.

3. Unbiased Evaluation

The evaluation of unbiasedness is done by comparing the regression coefficients of the dependent variable in lag form (FDIt-1) from the FEM, GMM, and PLS methods, this is done because GMM is designed to provide consistent estimators in the presence of endogeneity and autocorrelation in panel data. The regression coefficient of the FDIt-1 variable is expected to be between FEM and PLS.

Table 4. Unbiased Evaluation

Variable	Coefficient		
	FEM	**GMM**	**PLS**
lnFDI$_{t-1}$	0.3112	0.3342	0.8105

Based on the results displayed in the table above, shows that the magnitude of the regression coefficient of the FDIt-1 variable has met the requirement of unbiasedness, which is between FEM and PLS. This proves that the GMM model provides a consistent estimator and successfully overcomes the endogeneity problem.

Effect of Infrastructure on Foreign Direct Investment

Based on the estimation results with the GMM model, it shows that the infrastructure variable reflected by the total length of provincial roads has a positive and statistically significant effect on FDI in Indonesia. With a regression coefficient value of 0.91, it shows that any increase in infrastructure change by one percent will increase the change in FDI by 0.91 percent. This finding is in accordance with the hypothesis formulated earlier and in line with the results of research conducted by Gonzalo and Xavier (2024) who stated through their research that infrastructure has a positive and significant effect on foreign direct investment. Infrastructure is a determining factor for foreign investment, whether in the field of road transportation or the availability of better communication, because it facilitates the commercial performance of foreign-owned production, which contributes to higher returns (Halaszovich and Kinra 2020).

This finding supports Dunning's theory of resource seeking, which states that multinational firms undertake foreign direct investment (FDI) to obtain resources that are not available or cheaper in their home countries. According to Dunning, one of the main motivations for firms to undertake FDI is to access resources that can improve their operational efficiency and competitiveness. Good infrastructure is one of the important resources sought by multinational companies because adequate infrastructure will improve accessibility and connectivity between regions which will facilitate the movement of goods and services. This can reduce logistics costs and delivery times, which is crucial for companies looking to optimize their supply chains.

Effect of Macroeconomic Stability on Foreign Direct Investment

Based on the estimation results with the GMM model, it shows that the macroeconomic stability variable reflected through inflation as measured by the consumer price index (CPI) has a negative and statistically significant effect on FDI in Indonesia. With a regression coefficient of -0.0076, it shows that any increase in the change in the consumer price index by one will reduce the change in FDI by 0.76 percent. This result is in accordance with the previously formulated hypothesis, namely that it is suspected that the macroeconomic stability of a region has a negative effect on FDI. Supported by the results of research conducted by Luthra (2020) which found the same results, namely macroeconomic stability has a significant negative effect on FDI. Macroeconomic stability is very important for foreign investors because it provides certainty and reduces investment risk.

This finding supports Dunning's theory of efficiency seeking which states that a company invests in a country to benefit from lower costs, better production processes, and other factors that help it compete internationally. One of the main indicators of macroeconomic stability is the CPI which is used to measure the inflation rate, a stable CPI reflects controlled inflation. Low and stable inflation provides assurance to foreign investors that production and operational costs will not experience significant fluctuations. This is important because high inflation reflects unpredictability and can erode the value of investments and profits earned. Good macroeconomic stability can enable companies to make more accurate cost and revenue projections, which are important for long-term investment decision-making.

Macroeconomic instability reflected by high inflation rates will lead to an increase in the cost of raw materials, labor, and other operations, which will reduce the company's operations and competitiveness. Such instability will also have an impact on the uncertainty of raw material and final product prices which will make business planning difficult. A higher inflation rate in a region can reduce consumer purchasing power resulting in decreased demand and making the local market less attractive to multinational companies seeking a strong and stable market.

Effect of Market Size on Foreign Direct Investment

Based on the estimation results with the GMM model, it shows that both in the short term and in the long term, the market size variable reflected by gross regional domestic product (GRDP) per capita has a positive and significant effect on FDI in Indonesia. With a regression coefficient of 2.11, it shows that any increase in the change in GRDP per capita by one percent will increase the change in FDI by 2.11 percent. This result is in accordance with the previously formulated hypothesis, namely that it is suspected that market size has a positive effect on FDI in Indonesia. These results are supported by the results of research conducted by Soetjipto (2022) which states that gross domestic product per capita effectively increases FDI, and Yu Fu et al (2018) which states through the results of his research that gross regional domestic

product per capita has a positive effect on FDI, gross domestic product per capita reflects market size and regional economic strength. The larger the market size in a region will attract more FDI to the region.

One of the main motivations in the entry mode theory coined by Dunning, namely market seeking, states that companies conduct FDI to access new markets and increase their sales. GRDP per capita reflects the level of income and purchasing power in a region, a high GRDP per capita indicates a large and potential market, which is attractive to foreign investors. The higher GRDP per capita indicates the strong purchasing power of the consumers concerned and allows companies to target premium market segments for those willing to pay more for high-quality products. A large market allows a company to achieve economies of scale, where the production cost per unit decreases as the production volume increases, which in turn increases the efficiency and profitability of the company. Large markets also allow companies to offer a wide range of products and services, and offer long-term growth prospects that are attractive to foreign investors. Multinational companies look for locations that can provide sustainable profits in the long run.

The Effect of Previous Period Foreign Direct Investment on Foreign Direct Investment

Based on the estimation results with the GMM model, it shows that the previous period FDI variable has a significant positive effect on current period FDI. With a regression coefficient value of 0.33, it shows that any increase in the change in FDI one year earlier by one percent will increase the change in FDI in the current period by 0.33 percent.

This result is in accordance with the previously formulated hypothesis in which it is suspected that FDI in the previous period has a positive effect on FDI in the current period. The results of this study are in line with research conducted by Sato (2012) which found that FDI in the previous year had a positive and significant effect on FDI in the current year (Sato 2012). When multinational companies see that previous investments were successful and profitable, it will increase their confidence for further investment. The success of previous investments serves as evidence that investment in the region is conducive.

Conclusion

Based on the results of regression analysis, the following conclusions are obtained: a. Infrastructure which is reflected in the total length of roads has a significant positive effect on foreign direct investment (FDI) in 33 provinces in Indonesia for the period 2010-2022. Macroeconomic stability reflected by the consumer price index (CPI) has a significant negative effect on foreign direct investment (FDI) in 33 provinces in Indonesia for the period 2010-2022. Market size reflected by gross regional domestic product (GRDP) per capita has a significant positive effect on foreign direct investment (FDI) in 33 provinces in Indonesia for the period 2010-2022.

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