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Factors Determining Foreign Direct Investment In DKI Jakarta Indonesia

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ABSTRACT

This study aims to analyze the factors that influence foreign investment in DKI Jakarta, Indonesia. In this study using the Vector Error Correction Model approach. The data used in this research is time series data for the period 1980-2021 originating from the Indonesian Central Bureau of Statistics, the Investment Coordinating Board, and the World Development Indicators (WDI). The estimation results show that in the short term the GRDP and inflation variables have a positive and significant effect on foreign investment, while the exchange rate and labor variables have no effect on foreign investment. In the long run the GRDP variables and inflation variables have a positive and significant effect on foreign investment, the exchange rate variable has a negative and significant effect on foreign investment, and the number of workers has no effect on foreign investment. The regional government together with the Indonesian central bank are expected to be able to maintain economic stability through inflation targets and a conducive exchange rate of the rupiah against foreign currencies, so as to encourage FDI that is pro-employment.

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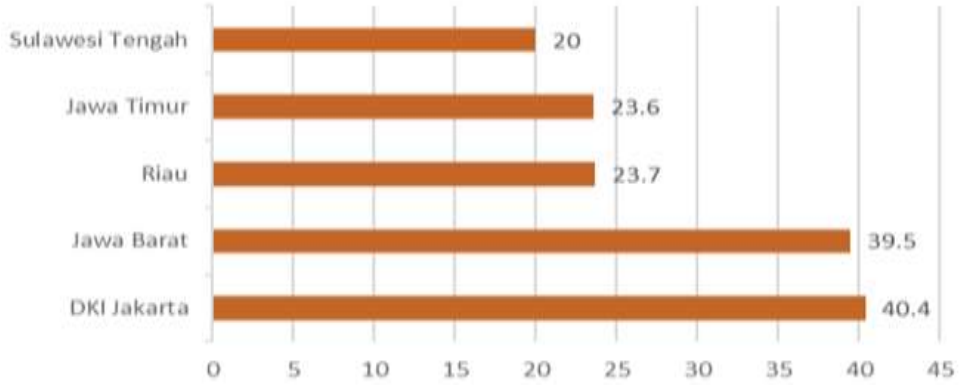
1. INTRODUCTION

Islam teaches its people to try to get a better life in this world and in the hereafter, so that physical and spiritual well-being can be achieved. Welfare in the economic field is indicated by an increase in economic growth (Todaro & Amith, 2009). Indicators of economic well-being, one of which is shown by an increase in investment. Islam provides limitations regarding investments that are permitted and prohibited to be carried out by businesspeople. A good investment that is made is a form of worship, obtaining inner satisfaction and blessings in this world and in the hereafter. The verse related to investing is the Qur'an Surah Al-Hasr: 18. This verse contains moral advice to invest as a provision for life in this world and in the hereafter because in Islam all types of activities if intended as worship will have the value of the hereafter.

Development and economic growth in a country can be increased by increasing the amount of investment. An increase in investment generally influences increasing state output, whereas a decrease in investment will result in low economic growth. The government is trying intensively to attract investors to invest their capital. According to Harod-Domar's growth theory (1946), investment has two effects, namely increasing demand and increasing production capacity. If production capacity increases, more demand is needed so that production does not decrease. If there is an

increase in production capacity but not matched by an increase in demand, it will result in a surplus of goods which will ultimately reduce production.



Source: BPS Indonesia 2022

Figure 1, Realization of the largest FDI in the first quarter of 2022

Figure 1 shows that the total realized investment in Indonesia is IDR 282.4 trillion in the first quarter of 2022 (BPS, 2022). The largest investment realization was achieved by DKI Jakarta province amounting to IDR 40.4 trillion, equivalent to 14.3% of the total investment realization in Indonesia. Followed by West Java Province, which amounted to IDR 39.5 trillion. Riau is in third place with an investment realization of IDR 23.7 trillion, and the fourth position is East Java with an investment realization of IDR 23.6 trillion. South Sulawesi is in the last position with a total investment realization of IDR 20 trillion.

2. RESEARCH METHODS

The VECM ((Vector Error Correction Model) method has an assumption that must be fulfilled, namely that all variables must be stationary at the same degree. Time series data is used in the VAR/VECM method because time series data describes economic fluctuations because of the impact of taking an economic policy. For example, Monetary policy on economic development in the real sector through mechanisms usually does not have an immediate impact but usually takes a certain period (Gujarati, 2022; Basuki & Prawoto, 2017).

The VECM model estimation is a test used to see if there is a relationship between past variables and the current dependent variable. Common models of VECM are as follows:

$$\Delta Y_t = b_{10} + b_{11}\Delta Y_{t-1} + b_{12}\Delta Y_{t-1} - \lambda(y_{t-1} - \alpha_{10} - \alpha_{11}y_{t-2} - \alpha_{12}z_{t-1} + \varepsilon y_t \quad \ldots\ldots\ldots\ldots 1$$

$$\Delta Z_t = b_{20} + b_{21}\Delta Y_{t-1} + b_{22}\Delta Y_{t-1} - \lambda(y_{t-1} - \alpha_{20} - \alpha_{21}y_{t-2} - \alpha_{22}z_{t-1} + \varepsilon z_t \quad \ldots\ldots\ldots\ldots 2$$

Where α is the long-term coefficient, and b is the short-term coefficient, λ is the error correction parameter, and the variables y and z must show cointegration.

Short term relationship:

$$\Delta(DFDI)t = \alpha_0+\lambda ec_{t-1}+\sum_{f-1}^{k}\alpha_1\Delta(GDRP)_{t-f}+\sum_{f-1}^{k}\alpha_2\Delta(LABOR)_{t-f}+ \sum_{f-1}^{k}\alpha_3\,\Delta(INF)_{t-f} + \sum_{f-1}^{k}\alpha_4\Delta(ER)_{t-f} + U_t \quad \ldots\ldots\ldots\ldots 3$$

Long term relationship:

$$\Delta(FDI)t = \alpha_0+\alpha_1\Delta(GDRP)_t+\alpha_2\Delta(LABOR)_t+\alpha_3\Delta(INF)_t+\alpha_4\Delta(ER)_t+U_t \quad \ldots\ldots\ldots\ldots 4$$

Where:
DGDRP : GDRP Difference
DINF : Inflation Differential
DLabor : Labor Differentiation
DER : Exchange Rate Difference
t : t-th period
$\alpha_1, \alpha_2, \alpha_3, \alpha_4$: Variable Coefficient
α_0 : Constant
U_t : Error variable
λ : Adjustment Speed Coefficient
f : Lag length in the model
ect_{t-1} : Error correction Term

Furthermore, after all the variables fulfill the stationary requirements at the same degree, then proceed with the lag length test, stability test, cointegration test, Granger causality test and Decomposition Variant analysis.

3. RESULTS AND DISCUSSIONS

The initial step that must be carried out in the VECM model regression is to test the stationarity of the data on all the variables used in the study. The regression equation with non-stationary variables will produce something called spurious regression, in this study to detect whether each variable is stationary or not, the ADF (Augmented Dickey Fuller) test will be carried out using the intercept. The following ADF stationary test on each variable is shown in Table 1 as follows:

Table 1. ADF Test Results Using Intercept on the first different

Variable	ADF t-Statistic	Mc KINNON Critical Value 5%	Information
FDI	-12.361779	-2.943427	Stasioner
Inflation	-7.914218	-2.938987	Stasioner
Exchange Rate	-7.591391	-2.936942	Stasioner
GDRP	-6.172809	-2.936942	Stasioner
Labir	-7.132041	-2.936942	Stasioner

Source: Processed data (2022)

Stationary test results Table 1 show that all variables are stationary at the first different level. This can be seen in each of the results of the first different stationarity test where the probability value of the ADF t-statistic for each variable is smaller than the Mc Kinnon Critical Value value of 5 percent. Then the lag length test was carried out. VECM estimation itself is very sensitive to the lag length of the data used. In this study the determination of the lag length was carried out by looking at the highest value of the quantitatively modified LR test statistic, with the included lag lengths ranging from 0 to lag 3. The optimal lag length is 2 in this study which can be shown in Table 2 as follows:

Table 2. Testing the Lag Length Using the LR Value

Length of Lag	Squential Modified LR Test Statistics Value
0	0
1	25.64644
2	50.30792

Source: Processed data (2022)

The third testing stage in VECM estimation is cointegration testing. The cointegration test itself aims to determine the long-term relationship of each variable. The requirement in VECM estimation is to have a cointegration relationship in it. If there is no cointegration relationship, then the VECM estimation is canceled, and the analysis tool uses VAR (Vector Autoregression). Cointegration test results are presented in Table 3 as follows:

Table 3. Johansen's Cointegration Test

Hypothesized	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.6575	105.2656	69.8189	0.0000
At most 1*	0.5244	69.9084	47.8561	0.0001
At most 2*	0.4817	45.3845	29.7971	0.0004
At most 3*	0.3407	23.6975	15.4947	0.0023
At most 4 *	0.2603	9.9483	3.8415	0.0016

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Based on Table 3 above, it can be explained that there are five variable ranks based on cointegration in the 5 percent test level (0.05). This is evidenced by the trace statistical values of 105,2656, 69.90843, 45.38453, 23,69752, 9.948349 where the value is greater than the critical value 0.05 which Then the Max-Eigen statistical values are 35.35722, 21.68701, 9.948349 where these values are greater than the critical value of 0.05, namely 33.87685, 21.13162, 3.841466. Based on this, it can be interpreted that the variables used have a long-term relationship (cointegration) with one another. Therefore, the VECM estimation in this study can be used in the next stage of the VECM stability test.

Testing the stability of the VECM model is the next step that must be carried out before estimating the VECM. Model stability testing is used to test the validity of IRF and VDC. Testing the stability of the VECM estimation can be shown in Table 4. Based on Table 4 it can be seen that the modulus value has an average value of less than one. Seeing this, the results of IRF (Impulse Response Function) and VDC (Variance Decomposition) analysis are valid. Therefore, further tests can be carried out, namely the Granger causality test.

Table 4. VECM Estimation Stability Test Results

Root	Modulus
-0.346463 - 0.695128i	0.776685
-0.346463 + 0.695128i	0.776685
-0.526688 - 0.295281i	0.603814
-0.526688 + 0.295281i	0.603814
0.127481 - 0.551279i	0.565826
0.127481 + 0.551279i	0.565826
0.531328	0.531328
-0.507134	0.507134
0.045030 - 0.432202i	0.434542
0.045030 + 0.432202i	0.434542

Source: Processed data (2022)

Next, the Granger Causality Test was carried out. This test is used to determine the causal relationship of each independent variable to the dependent variable. In this study, the causality test is more directed to factors that influence foreign investment, inflation, exchange rates, GRDP, and labor. The results of the Granger Causality test in Table 5 are as follows:

Table 5. Granger Causality Test

Null Hypothesis	Lag 2	
	F-Statistic	Prob
INF does not Granger Cause FDI	0.2628	0.7705
FDI does not Granger Cause INF	1.1033	0.3441
ER does not Granger Cause FDI	3.1247	**0.0576**
FDI does not Granger Cause ER	0.1208	0.8866
GDRP does not Granger Cause FDI	33.5306	**0.0000**
FDI does not Granger Cause GDRP	4.0927	**0.0261**
LABOR does not Granger Cause FDI	2.5153	**0.0967**
FDI does not Granger Cause LABOR	0.5438	0.5858

Source: Processed data

The inflation variable does not significantly influence PMA (Foreign Investment) with a probability of 0.7705 > 0.05, so that H0 is accepted and H1 is rejected or in other words there is no causal relationship between inflation and Foreign Investment. Vice versa, the Foreign Investment variable does not significantly affect inflation with a probability of 0.344 > 0.05, so that H0 is accepted

and H1 is rejected or in other words there is no causal relationship between the FDI (Foreign Investment) variable and inflation.

The exchange rate variable does not significantly influence PMA (Foreign Investment) with a probability of 0.3441 > 0.05, so that H0 is accepted and H1 is rejected or in other words there is no causal relationship between the exchange rate and PMA (Foreign Investment). Vice versa, the PMA (Foreign Investment) variable does not significantly affect the exchange rate with a probability of 0.0576 > 0.05, so that H0 is accepted and H1 is rejected or in other words there is no causal relationship between the PMA (Foreign Investment) variable and the exchange rate.

The Gross Regional Domestic Product variable does not significantly affect Foreign Investment with a probability of 1.E-08 > 0.05, so that H0 is accepted and H1 is rejected or in other words there is no causal relationship between FDI and FDI. However, the FDI variable significantly affects the GDRP variable with a probability of 0.0261 <0.05, so that H0 is rejected and H1 is accepted or in other words there is a causal relationship between FDI and GRDP variables.

The labor variable does not significantly influence FDI with a probability of 0.0967 > 0.05, so that H0 is accepted and H1 is rejected or in other words there is no causal relationship between labor and FDI. Likewise, the FDI variable does not significantly affect the workforce with a probability of 0.5858 > 0.05, so that H0 is accepted and H1 is rejected or in other words there is no causal relationship between the labor variable and FDI. The short-term VECM estimation results are presented in Table 6 as follows:

Table 6. Short Term VECM Estimation Results

Variable	Coefficien	t-statistic
CointEq1	-0.279051	[-2.24279]**
D(LOG(FDI(-1)))	-0.433261	[-2.26150]**
D(LOG(FDI(-2)))	-0.111917	[-0.67570]
D((INFL(-1)))	0.169568	[3.22941]***
D((INFL(-2)))	0.711543	[2.31464]**
D(LOG(ER(-1)))	-0.125242	[-1.53785]
D(LOG(ER(-2)))	0.134019	[0.15256]
D(LOG(GDRP(-1)))	0.046145	[0.11132]
D(LOG(GDRP(-2)))	0.988440	[2.27874]**
D(LOG(LABOR(-1)))	0.694825	[0.87119]
D(LOG(LABOR(-2)))	1.020054	[1.39724]
C	0.094948	[0.38804]

Source: Processed data (2022)

Table 6 shows that in the short term (one year, according to the type of data that has been used, namely annual data from 1980 to 2021) FDI itself has a significant effect only on lag 1, then there are two independent variables on lag 1 to lag 2 which have a significant effect to FDI, namely the inflation variable at lag 1 and lag 2, the GRDP variable at lag 2. The difference is indicated by the exchange rate and labor variables which do not significantly affect FDI in the short term.

Then, in the long term (40 years according to the research period, namely 1980-2021) it is known that there are three variables, namely inflation, exchange rates and GRDP which have a significant effect on FDI, while the labor variable has no effect on FDI. The complete long-term VECM estimation results are shown in Table 7 as follows:

Table 7. Long Term VECM Estimation Results

Variable	Coeffiscen	t-statistic
INF(-1)	0.431653	[4.30770]***
LOG(ER(-1))	-2,415363	[-4.28087]***
LOG(GDRP(-1))	1.224880	[2.77102]***
LOG(LABOR(-1))	-1.431195	[-0.83680]

Source: Data processed 2022

The long-term VECM estimation results (Table 7) explain that the inflation variable at lag 1 has a positive and significant effect on the FDI variable, which is equal to 0.431653. That is, if there is an increase in inflation of 1.00 percent in the previous year, it will increase FDI in the current year by 0.43165 percent. The results of the analysis show that the partial t-statistic value of the inflation

variable is 4.30770 which is greater than the t-table, which means that H0 is rejected and H1 is accepted where in other words, the inflation variable has a significant effect on FDI in the long run.

The use of IRF analysis has the goal of understanding how long the dependent variable will react to changes in the independent variable and eventually return to the equilibrium point before the shock occurred. The response function to shocks is used to observe the dynamics of the response of each variable when a shock of one standard error occurs. This response will show the effect of the shock on the dependent variable on the independent variable. IRF analysis can also be used to predict several future horizons for long-term information. The annual period is displayed on the horizon axis, while the response value in % percentage is displayed on the vertical axis. This IRF analysis is used to show the response of inflation, exchange rates, GRDP, and labor to FDI (Foreign Investment) shocks.

Variance Decomposition Analysis serves to measure the magnitude of the composition or contribution of the independent variable to the dependent variable. VDC analysis focuses on seeing the effect of inflation, exchange rate, GRDP, and labor on the dependent variable, namely Foreign Investment. The data used in this study is annual data from 1980 to 2021. This period is sufficient to explain the contribution of inflation, exchange rate, GRDP, and labor variables. VDC analysis can be shown in Table 8.

Based on the VDC test, the initial period of foreign investment is influenced by the variable itself, which is 100 percent (Table 8). Meanwhile, in the first period, the variables of inflation, exchange rate, GRDP, and labor did not have any effect on foreign investment. In period two to period 10 the influence of foreign investment was 59 percent. Based on the table above it is also known that in the first period the foreign investment variable was affected by inflation of 0 percent. However, in the last period the inflation variable affected foreign investment by 14 percent. The exchange rate variable initially only had an effect of 1.5 percent and then increased to 5.03 percent at the end of the period. The GRDP variable at the beginning of the year only had an effect of 3.54 percent and then increased to 12 percent at the end of the year. The labor variable at the beginning of the year had an effect of 4.2 percent and then increased to 11 percent at the end of the year.

Table 8. Decomposition Variant Analysis Results

Periode	SE	L(FDI)	L(INF)	L(ER)	L(GDRP)	L(LABOR)
1	0.6947	100.0000	0.0000	0.0000	0.0000	0.0000
2	0.7760	89.1916	1.4766	1.4995	3.5433	4.2891
3	0.8498	80.6086	1.2386	1.2516	5.3910	11.5102
4	0.9973	66.9697	13.0183	1.2910	8.4986	10.2224
5	1.1218	63.8009	14.8397	1.0235	9.7034	10.5425
6	1.2333	61.6859	14.4175	2.6457	9.8190	11.4320
7	1.3289	58.9651	16.0574	2.8257	10.5363	11.6155
8	1.4328	58.7379	14.9540	3.7633	11.5391	11.0058
9	1.5223	58.5042	14.2912	4.5029	11.9089	10.7927
10	1.5963	58.7856	13.8087	5.0374	11.8647	10.5037

Source: Processed data (2022)

From the results of the analysis, it is shown that if there is an increase in inflation in DKI Jakarta by 1 percent, it will have an impact on increasing foreign investment by 0.43 percent in the long term. The results of this study are in accordance with research conducted by Kur & Ogbonna (2019) where there is a long-term positive relationship between inflation on economic growth and FDI. Inflation causes an increase in the price of goods and services, if inflation can be controlled in accordance with the inflation target, then it can encourage FDI according to research conducted by Vasileva (2018). Vasilera's research discusses credible monetary policies, such as inflation targeting (IT), which can encourage FDI flows in developing countries, due to the creation of a conducive macroeconomic environment.

Other results show that DKI Jakarta's GRDP has a positive relationship to FDI. The relationship between GRDP and FDI shows that an increase in DKI Jakarta's GRDP will result in an increase in people's purchasing power, and an increase in people's purchasing power encourages an increase in consumption of goods and services (PMA products). These results are consistent with research conducted by Alshamsi & Azam (2015) and Chien & Zhang (2012), GDP per capita has a significant positive effect on FDI inflows.

In the long run the dollar exchange rate against the rupiah has an influence on the entry of FDI in DKI Jakarta, and the effect is positive between the exchange rate and FDI. An increase in the dollar exchange rate against the rupiah indicates a weakening of the rupiah value, this causes the prices of goods in the country to increase, but for people who have dollar bills, their purchasing power increases. This is what drives FDI to DKI Jakarta with the record that the increase in the dollar exchange rate against the rupiah is still in normal condition. This study is in accordance with research conducted by Udomkerdmongkol et al., (2009). This study investigates the effect of the exchange rate on US foreign direct investment (FDI) flows to a sample of 16 developing market countries using annual panel data for the period 1990-2002. The results reveal a negative relationship between FDI and a more expensive local currency. A cheaper local currency rate can attract FDI. To encourage increased economic development coupled with the welfare of its people, the DKI Jakarta government together with the Indonesian central bank must maintain that the rupiah exchange rate is in a safe and controlled condition, to continue to encourage FDI to enter Indonesian territory.

4. CONCLUSION

In the short term, the GRDP and inflation variables have a positive and significant effect on foreign investment, while the exchange rate and labor variables have no effect on foreign investment. In the long term, the GRDP variable and inflation variable have a positive and significant effect on foreign investment, and the exchange rate variable has a negative and significant effect on foreign investment. While the number of workers has no influence on foreign investment.

To maintain macroeconomic stability, especially increasing foreign investment in DKI Jakarta, the regional government together with the Indonesian central bank are expected to maintain economic stability through inflation targets and a conducive exchange rate of the rupiah against foreign currencies, to encourage FDI that is pro-increasing. labor.

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