The Impact of FDI, GDP and Inflation on Exports in Foive ASEAN Countries

Fitriana Lestari[1], Firsty Ramadhona Amalia Lubis[2], Dwi Apriliana[3]

fitriana2000010011@webmail.uad.ac.id[1], firsty.ramadhona@ep.uad[2], dwi2100010030@webmail.uad.ac.id[3]

[1,2,3]Universitas Ahmad Dahlan, Special Region of Yogyakarta, Central Java, Indonesia

Corresponding Author: Dwi Apriliana

Abstract. ASEAN is a collection comprising Brunei Darussalam, Indonesia, Cambodia, Laos, Malaysia, Myanmar, Singapore, Philippines, Thailand, and Vietnam, among ten nations in Southeast Asia. SUR Panel Method combined time series and Cross Section from 2011-2021. The goal is to increase economic growth, advance culture, uphold stability, and provide peaceful solutions. Exports are important in the ASEAN economy, with foreign investment increasing the competitiveness of industries and businesses. FDI helps overcome economic crises and boost growth. However, ASEAN countries are still stuck in the "middle-income trap" due to high infrastructure and logistics costs. Reforms are needed to increase exports. The COVID-19 pandemic disrupted global supply chains and its impact on ASEAN exports. Connectivity and logistics efficiency need to be improved. Singapore has the highest exports in ASEAN, followed by Vietnam, Thailand, Malaysia and Indonesia. It is important for ASEAN to compete in the global market. Countries can also boost exports with regional cooperation and economic integration.

Keywords: Foreight Direct Investment, Gross Domestic Product, Inflation, Interest Rate, and Export.

1. Introduction

ASEAN is a group comprising Brunei Darussalam, Indonesia, Cambodia, Laos, Malaysia, Myanmar, Singapore, Philippines, Thailand, and Vietnam, among ten nations in Southeast Asia. ASEAN's goals are to promote economic growth, advance the cultures of its member states, uphold stability, and provide peaceful solutions to disputes. Exports are an important aspect of the economy, with foreign investment helping to increase the competitiveness of the country's industries and businesses. It is important for ASEAN countries to have low production costs, good infrastructure, and free trade policies to increase exports and economic growth.

FDI (Foreign Direct Investment) is an investment from a foreign entity into another country with the aim of building long-term interests. FDI can help overcome economic crises, improve

ICBEESS 2024, August 01, Gresik, Indonesia

DOI 10.4108/eai.1-8-2024.2355128

technology, productivity, and economic growth. However, ASEAN countries are still trapped in the "middle-income trap" due to inadequate infrastructure and high logistics costs. Regulatory and infrastructure reforms are needed to improve this situation.

The COVID-19 pandemic has caused disruptions in global supply chains, affecting ASEAN countries' exports. Regional connectivity and logistics efficiency need to be improved to overcome the impact of the pandemic. One key indicator of the degree to which economic growth has varied throughout time is the amount of exports [4]. Exports are an important source of income for developing countries like Indonesia and can drive sustainable development in ASEAN.

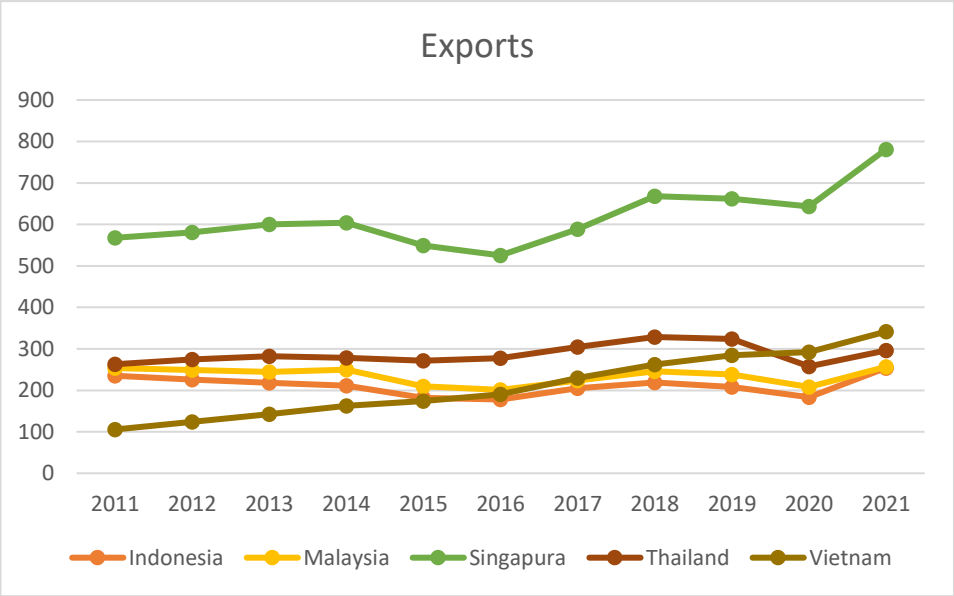

Figure 1. ASEAN-5 Export Chart 2011-2021

Source: World Bank Data processed

The export value of five ASEAN countries showed fluctuations during the period 2011 to 2021. Singapore has the highest export value followed by Vietnam, Thailand, Malaysia and Indonesia. The requirements to compete in the ASEAN Economic Community are low production costs, good infrastructure, and skilled labor. The export intensity of Indonesia, Malaysia, the Philippines, Thailand, Singapore and Vietnam declined only slightly in 2011-2012 due to the 2008 Global Financial Crisis. Cooperation with East Asian countries has increased ASEAN exports. Stating that the phase in 2008 coincided with the drop in prices; the global crisis' effects diminished people's purchasing power, which was shown in the sharply lower inflation rate from 2006 and 2008., [1]

ASEAN has a significant political impact on global trade. From January to August 2010, the value of ASEAN's exports exceeded that of the US, China, and the EU combined. AEC integration will increase attractiveness for foreign investors and minimize production costs. Foreign Direct Investment (FDI) can improve the competitiveness of ASEAN industries and businesses. ASEAN countries can intensify the real sector by processing raw materials into more valuable finished goods.

The value of exports is influenced by foreign demand. Demand for goods and services from other countries increases along with the growth in export value. During the observed period, Singapore had the highest export value, while Vietnam experienced the fastest growth. Indonesia, Malaysia and Thailand experienced fluctuations with mixed growth. Other factors that affect the value of exports are global economic conditions, trade policies, product competitiveness, and currency exchange rates.

2. Literature Review

Exports

Exports are when selling goods or services to another country with payment in foreign currency. Research shows that exports have a positive impact on foreign investment in the short term, but can be detrimental in the long term. The goal is to increase national income by increasing the amount of goods exported. The justification of foreign investment also supports this. Exports involve terms between sellers and buyers, such as payment systems, product quality and quantity. Factors that affect exports and imports include consumer preferences, product prices, currency exchange rates, consumer income, cross-border shipping costs, and government trade policies.

Foreight Direct Investment

Foreign Direct Investment (FDI) is defined by [6] as the flow of loans or acquisition of ownership of foreign businesses whose capital is predominantly owned by residents of the investing country. Krugman (2003:204) [7] explains that foreign direct investment (FDI) is the process by which businesses from one country create or expand their operations in another country. One of the main characteristics of foreign direct investment is that it involves the exercise of control and the transfer of resources, where the branch or subsidiary is a member of the same organizational structure as the parent company and also has financial obligations towards it. The differential rate of return hypothesis, The output and market size hypothesis and The currency areas hypothesis, Theory of FDI [8].

Inflation

High inflation does not provide a positive economic boost. Rising costs will lower productivity and create a greater risk of business failure. While inflation can increase production by increasing the price of goods before wage increases, hyperinflation can reduce output and weaken the value of the currency. A country's economy is affected by inflation of four types based on severity: mild, moderate, severe and hyperinflation. Inflation can be caused by demand-pull inflation and cost-push inflation, which occurs when spending is excessive due to rapid economic development and low unemployment. [24]

Gross Domestic Product

GDP is a method of measuring the national economic activity of a country. [13] GDP can also be explained as the total national income and total expenditure on the production of goods and services in a given period. There are two ways of looking at GDP, namely as the entire income of all people in the economy or as the total amount spent on goods and services generated in the economy There are two types of GDP, namely Nominal (based on market prices) and Real (based on constant prices). GDP can be calculated through three approaches: Production (adding up gross value added from all sectors of the economy), Income (adding up income from factors of production), and Expenditure (calculating public spending over a period of time). Scholars across many fields have directed their attention towards the role of innovation in enhancing the standard of living within the broader economy, with the aim of pinpointing the critical elements that impact innovation. Research by Raghupathi & Raghupathi indicates that nations with smaller GDPs rely more on foreign collaboration in innovation. [3], Researchers from diverse disciplines of study are focusing on the function of innovation as a critical factor in enhancing the quality of life in the economy as a whole in order to identify the primary factors that influence innovation. According to Raghupathi & Raghupathi's study, nations with lower GDPs are more reliant on international innovation cooperation. He is saying that more GDP leads to more rich, independent innovation. [2]

Interest Rate

The cost of borrowing is the definition of an interest rate that reflects the cost of resources that the debtor must pay to the creditor. Interest rates are the cost of using investment capital or borrowed funds. The indicator of one's savings or investment is the interest rate. The stability of the value of the rupiah is the goal of Bank Indonesia, which is determined based on the laws governing Bank Indonesia. The lending rate is the payment a customer receives for the use of his money. [18] A decrease in lending rates can encourage people to take out bank loans and increase investment, production, and exports. Real interest rates and nominal interest rates are two different categories of base interest rates, where real interest rates are obtained by subtracting the predicted inflation rate from nominal interest rates.

3. Research Methods

This research uses quantitative methodology. In research using statistical data analysis tools, namely Stata and Eviews. The data collection used is Panel data combined from Cross Section and Time series data and the objects used are 5 ASEAN countries in the period 2011-2021, the data used in the approach method is in the form of numerical or numbers obtained from the statistical analysis process and has an analytical purpose. According to [1] Data collection in this study comes from secondary data, namely from the official World Bank website. Quantitative data are those that have numbers in them that can yield more quantifiable information. Panel data regression is the analysis method that is applied. Panel data regression combines time series and cross-sectional data, which yields consistent cross-sections over several periods. Finding the relationship between one or more independent and dependent variables is the goal of the panel data regression analysis method [4]

1. Exports

Export variables are factors that affect or are affected by export activities. Analysis of export variables is divided into independent and dependent variables. This analysis is important for understanding international trade and formulating appropriate policies to increase a country's exports. Exports are also an important source of foreign exchange, which can increase the Rupiah exchange rate. Legitimate shipments of goods between countries are called exports, which are a major contributor to a country's balance of payments.

2. Foreign Direct Investment

Foreign Direct Investment is the investment of private individuals or governments from one country into another. FDI refers to international investment from companies of one country into another, either through capital investment or expansion of companies abroad. FDI is used as the independent variable in this research with data in million dollars from 2011 to 2021, obtained from the World Bank.

3. Inflation

Inflation is the continuous rise in the prices of goods and services in a country. According to [19], inflation is the process of rising prices in the economy. In this research, inflation is used as an independent variable (X2) with data in percentage form from the World Bank from 2011 to 2021. Inflation will increase if the cost of products and services in the country rises.

4. Gross Domestic Product

GDP measures the growth of production of goods and services in Indonesia from one period to the next. GDP growth relates to Indonesia's ability to produce goods and services for export and internal consumption. GDP is used as an independent variable in this study with data in million dollars from the World Bank for 2011-2021 [11].

5. Interest rate

Interest rate is the nominal percentage paid by the borrower to the lender or vice versa. Interest is compensation provided by banks to consumers based on standard operating procedures. Interest rates are used as an independent variable in this study, with units in percent. Interest rate data was obtained from the World Bank from 2011 to 2021.

Data Analysis Technique

The data analysis method in this study uses a quantitative approach and panel data with Stata/eviews software. A combination of cross section data and time series data is used. The panel data approach increases the amount of data, increases degrees of freedom, and overcomes problems with variables. The model in this study is used to identify the influence of macroeconomic variables. This method provides advantages in achieving accurate and informative results. The panel data model regression equation is:

$$YExports_{it} = \alpha + \beta 1FDI_{it} + \beta 2INF_{it} + \beta 4GDP_{it} + \beta 5SB_{it} + €_{it}\text{……..}$$

The SUR model will be built using the SUR approach, which was first introduced by [15]. The response variable in this model, which has not been studied in the statistical literature, can be explained by many possible sets of explanatory factors, and Zellner's statistical assumptions and testing methods differ from those used in ordinary regression models. The Seemingly Unrelated Regression (SUR) model displays errors in the structural equation when the errors are autocorrelated or correlated between one error and another error equation.

$$Y1t = \beta 0 + \beta 11X11,t + \ldots + \beta 1K1X1K1,t + Ɛ1t$$
$$Y2t = \beta 20 + \beta 21X11,t + \ldots + \beta 2K2X2K2,t + Ɛ1t$$
$$YGt = \beta G0 + \beta G1XG1,t + \ldots + \beta GKGXGKG,t + Ɛ1t$$

Description:
t= 1,2,3 …n.

4. Results and Discussion

Ordinary least squares panel is used in this study to analyze causation. We confidently choose the best model for model analysis prior to the analysis's setup. The Lagrangian multiplier test by Bruesch and Pagan and the Hausman test are used to determine if the model has fixed effects or random effects that better suit the data. We already discussed the requirements for selecting the optimal model in this section, [3]

Table 1. Stationary Test Results

LEVEL			
Variable	ADF	PP	LL
Export	6.23999 (0.7947)	33.7983 (0.0002)***	2.07073 (0.9808)
FDI	14.6495 (0.1454)	23.0595 (0.0105)***	-0.87689 (0.1903)
Inflation	12.5906 (0.2475)	31.9419 (0.0004)***	-1.03923 (0.1493)
GDP	7.41665 (0.6856)	18.5058 (0.0470)**	2.62547 (0.9957)
Interest Rate	24.5224 (1.0063)	53.1774 (0.0000)***	-0.92284 (0.1780)

Source: data processed, 2024

All probability levels of 0.050 correspond to the findings of the unit root test with levels using the Levin Lin Chu Test (LL) technique and the ADF method. The Philips Perron Technique (PP) results reveal stagnant results. Allowing the investigation to continue.

Table 2. Panel Data Regression Results

Variable	**CEM**	**FEM**	**REM**	**CEM**	**FEM**	**REM**
		Coefficient			**Probability**	
FDI	4.715714	1.970044	4.715714	0.000	0.000	0.000
Inflation	-10.17268	-7.575831	-10.17268	0.001	0.004	0.001
SB	-4.285248	0.927059	-4.285248	0.183	0.656	0.177
GDP	-6.113799	-3.438778	-6.113799	0.045	0.258	0.040

Source: data processed, 2024

The estimation results using three approaches show that there are different results between the three, because the probability value is above 0.05, the Common Effect Model which has a probability result above 0.05, namely the interest rate variable. Fixed Effect Model which has a probability value above 0.05, namely the interest rate and gross domestic product variables. Random Effect Model which has a probability value above 0.05, namely the interest rate variable.

Model Specification Results

Table 3. Chow Test

Test	Probability
Chibar2 (01)	0.00
Prob > chibar2	1.0000

Source: data processed, 2024

The probability value in the chow test is 1.0000> 0.05, so the hypothesis says H0 is rejected and the best model chosen is the Common Effect Model.

Table 4. Hausman Test

Test	Probability
Chi2 (4)	32.19
Prob > chi2	0.0000

Source: data processed, 2024

The probability value in the Hausman test is 0.0000> 0.05, so the H0 hypothesis is rejected and the best model chosen is the Fixed Effect Model.

Classical Assumption Results

Table 5. Normality Test

Variable	Observation	W	V	z	Prob > z
Export	55	0,91433	4.91433	3.150	0.00082

Source: data processed, 2024

The resulting probability value in the normality test is 0.00083 <0.05. So it can be concluded that the regression results are not normally distributed.

Table 6. Multicollinearity Test

Variable	Export	FDI	Inflation	GDP	SB
Export	1.0000				
FDI	0.9063	1.0000			
Inflation	-0.3689	-0.1941	1.0000		
GDP	-0.0559	0.0827	0.3777	1.0000	
SB	-0.1547	-0.1065	-0.1603	-0.1805	1.0000

The test results show that the coefficient value between variables is less than 0.90. Thus it can be said that there is no multicollinearity problem.

Table 7. Autocorrelation Test

F (1, 4)	**41.101**
Prob > F	0.0030

Source: data processed, 2024

The probability value of 0.0030 <0.05, this shows the results of the problem in the autocorrelation test.

Table 8. Heteroscedasticity Test

Chi2 (5)	**302.64**
Prob > chi2	0.0000

Source: data processed, 2024

The Chi Square probability value of 0.0000 <0.05, it can be concluded that these results indicate a problem in the heteroscedasticity test.

Simultaneous Test Results

Table 9. F Test

Variable	**Prob > Chi^2**	**Wald Chi^2 (4)**
FDI	0.000	146.32
Inflation		
SB		
GDP		

Source: data processed, 2024

The results of the F test calculation show that the calculated F value (146.32) is greater than the F table value (2.56). Furthermore, the probability value of 0.0000 is smaller than $\alpha = 5\%$, This suggests that the independent factors are significantly influencing the dependent variable at the same time.

Partial Significant Test Results

Table 10.T-test

Variable	**Z Count**	**Z table**	**P>|Z|**	**Remark**
FDI	11,34	1,67	0,000	Significant
Inflation	-4,57	1,67	0,000	Significant

Variable	Z Count	Z table	P>|Z|	Remark
Interest Rate	-2,16	1,67	0,031	Significant
GDP	-1,34	1,67	0,179	Not-Significant

Source: data processed, 2024

The results of the partial significance test (T test) above, it can be seen that the variables of FDI, Inflation, Interest Rates. It can be concluded that this variable has a significant effect on exports because the t value is greater than the t table value of 1.67. While the GDP variable has a t value smaller than the t table value of 1.67, so Gross Domestic Gross does not have a significant effect on Exports.

Interpretation and Discussion

Table 11. Seemingly Unrelated Regression Test

Variable	Coefficient	Std. Error	z	Prob.
FDI	4,715714	0,4156993	11,34	0,000
Inflation	-10,17268	2,223941	-4,57	0,000
SB	-6,113799	2,836717	-2,16	0,031
GDP	-4,285248	3,191084	-1,34	0,179

The relationship between the Foreight Direct Investment Variable and Exports has a probability value of 0.000 smaller than 0.05, it can be concluded that the FDI variable has a significant effect on the export variable. The FDI coefficient is 4.715714, which means that every 1% increase in FDI will increase exports by 4.715714%. FDI can also provide a country with the opportunity to increase the number of export markets it can access.

The relationship between inflation and exports has a probability value of 0.000 smaller than 0.05, it can be concluded that the inflation variable has a significant effect on the export variable. The coefficient of Inflation is -10.17268, which means that any increase in Inflation by 1% will increase exports by -10.17268%. This is in line with Ball's theory An increase in inflation can stimulate borrowing. Capital can be added to increase the production of goods and services after obtaining loans, resulting in an increase in exports. Producers or exporters will return the borrowed money, but at a lower value.

The relationship between interest rates and exports has a probability value of 0.031 less than 0.05. It can be concluded that the interest rate variable has a significant effect on the export variable. The interest rate coefficient is -6.113799, meaning that when the interest rate variable increases by 1%, the value of the export variable decreases by -6.113799%. According to In his book, Mankiw states that when lending rates fall, more people borrow money from banks and use it for investment,

The Gross Domestic Product to Export relationship has a probability value of 0.179 greater than 0.05. It can be concluded that GDP has no significant effect on the export variable. Because the occurrence of an economic recession causes a decrease in GDP generally triggered by an economic recession, which is characterized by a decrease in overall economic activity and this results in a decrease in domestic and global demand which in turn causes a decrease in exports, [14].

5. Conclusion

The following conclusions can be drawn from the results of data analysis and discussion in the previous chapter:

1. The magnitude of Exports is significantly and positively affected by variables related to Foreigh Direct Investment in all countries (Indonesia, Malaysia, Singapore, Thailand, Vietnam). So as the value of FDI increases, exports will increase.
2. The amount of Exports is significantly negatively affected by Inflation. As a result, as Inflation increases, exports will decrease.
3. The Gross Domestic Product indicator does not have a favorable impact that when a country's economy grows or drops to a minimum, Exports still have a high value.
4. Exports are negatively affected by the Interest Rate variable. Therefore as Interest Rates increase, exports will decrease.

References

[1] R. Khoirudin and M. L. A. Kurniawan, "A time-varying of property residential price in Indonesia: a VAR approach," *Jurnal Ekonomi & Studi Pembangunan*, vol. 24, no. 1, pp. 69–80, May 2023, doi: 10.18196/jesp.v24i1.17750.

[2] Fahriza, Y. N., Ramadhona, F., Lubis, A., Azizah, N., & Zakiyyah, A. (2022). *Analysis of factors affecting regional original revenue in Nusa Tenggara Timur (2015–2020)*. Eko-Regional: Jurnal Pembangunan Ekonomi Wilayah, 17(2), 108–118.

[3] M.N.Salim *et al.*, "Does information and communication technology improve labor productivity? Recent evidence from the Southeast Asian emerging economies," *Growth Change*, vol. 55, no. 1, Mar. 2024, doi: 10.1111/grow.12708.

[4] "Determinants of Poverty In Indonesia," *EKO-REGIONAL: Jurnal Pembangunan Ekonomi Wilayah*, Sep. 2023, doi: 10.32424/1.erjpe.2023.18.2.3182.

[5] Hussain, M., Firmansyah, R., Ramadhona, F., Lubis, A., & Basia, L. (2023). Analysis of Oil and Gas Exports Imports on the Indonesian Rupiah Exchange Rate in 1980-2020. *Journal of Asset Management and Public Economy (JAMPE)*, *2*(1), 17–27. http://journal2.uad.ac.id/index.php/jampe/index

[6] Ahmed, R. R., Ghauri, S. P., Vveinhardt, J., & Streimikiene, D. (2018). An empirical analysis of export, import, and inflation: A case of Pakistan. *Romanian Journal of Economic Forecasting*, *21*(3), 117–130.

[7] R. Krugman and M. Obstfeld, *International Economics: Theory and Policy*, 6th ed. Boston: Addison-Wesley, 2003,204.