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Original Article

The Influence of International Trade in the Automotive Sector on Indonesia's Gross Domestic Product

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Abstract: *The goal of this study is to determine how the exports and imports of the automotive sector affect Indonesia's gross domestic product. Techniques for quantitative research are used in this work. The multiple linear regression, coefficient of determination testing, F testing, and t testing used in this study's examination of time series data. According to the study's findings, Indonesia's gross domestic product is partially impacted favorably by exports in the car industry. The gross domestic product of Indonesia is, however, only somewhat negatively impacted by imports in the car industry. Together, exports and imports demonstrate a considerable impact on Indonesia's GDP.*

Keywords: *Automotive, Exports, Imports, Gross Domestic Product.*

I. INTRODUCTION

In 2022 Indonesia officially holds the Group of Twenty (G20) Presidency for a full year. The event, which will take place in Indonesia, will run from December 1, 2021, until the G20 Summit in November, 2022. According to the Gross Domestic Product (GDP), the Indonesian economy was worth IDR 4,513.0 trillion at current prices in the first quarter of 2022 and IDR 2,818.6 trillion at constant 2010 values. In the first quarter of 2022 compared to the corresponding time in 2021, Indonesia's GDP increased by 5.01 percent (y-on-y). The Transportation Business Sector and Warehousing saw the biggest rise of 15.79 percent in terms of production. To support integrated globalization, almost all countries in the world have entered into cooperation agreements not only in the economic and investment fields, but also in the fields of political security as well as social and culture.

Trade in products, trade in services, and investment are the three primary components of free trade agreements, or free trade agreements (FTAs). While FTAs work to retain market access and create favourable conditions for service providers to grow, trade in goods attempts to do away with tariffs and address non-tariff barriers. FTA aims to safeguard and promote investment in Indonesia in terms of investment. The ASEAN-China Free Trade Area (ACFTA) is an agreement between China and ASEAN member states to create a free trade area by removing or lowering tariff and non-tariff trade barriers, increasing access to market services, lowering barriers to foreign investment, and fostering economic cooperation to encourage trade between ACFTA parties.

The Indonesia-Korea Comprehensive Economic Partnership Agreement (IKCEPA) is an important and very beneficial agreement for both countries. IKCEPA is an expression of the leaders' commitment to reclassify their collaboration as a "special strategic partnership," which they decided to do. The Indonesian-Japanese Economic Partnership Agreement (IJEPA) is a contract establishing an economic alliance between Japan and Indonesia based on the EPA's principles (Economic Partnership Agreement). IJEPA's three main pillars are cooperation, facilitation of trade and investment, and liberalisation. The Indonesia-Australia Comprehensive Economic Partnership Agreement (IA-CEPA), a comprehensive economic partnership agreement between Indonesia and Australia, is built on a fair, mutually beneficial partnership. This collaboration will boost Australia and Indonesia's long-term economic connections.

Table 1 . Value of Exports, Imports , Trade Balance of the Automotive Sector, and Indonesia's GDP in 20 17 -20 21

Year	Export*	Import*	Balance of trade*	GDP*
2017	136,274,000	496,426,000	-360,152,000	1,015,618,742,565
2018	144,596,000	506,085,000	-361,489,000	1,042,271,531,011
2019	119,285,000	487,981,000	-368,696,000	1,119,099,868,265
2020	123,208,000	246,855,000	-123,647,000	1,058,688,935,454
2021	164,626,000	387,304,000	-222,678,000	1,186,092,991,320

**Value in US$, Source: World Bank, processed 2022*

Table 1 shows that Indonesia has suffered a deficit in its trade balance over the past 5 years. a situation where imports are more than exports in value. It can be concluded that Indonesia has a dependence on imports. The trade balance or *balance of trade* is the difference in value between all commodities and services exported and imported from a nation over a specific time period. This balance is the largest component in the balance of payments because it is an indicator to measure all international transactions. That is, if in one year the country exports more than it imports, the trade balance condition is a surplus. Conversely, if there are more imports than exports, the condition of the trade balance is a deficit.

II. RESEARCH METHODS

A. Data and Data Sources

A quantitative technique is used in this investigation. Sugiono (2016) claims that the quantitative approach is a scientific method that considers reality as something that can be categorised, physical, observable, and quantifiable, where the link between variables is causal in nature and the study data is presented as numbers. This study analyses time *series data* from 2002 to 2021 to explain the link between GDP, the dependent variable, and exports and imports, the independent variables, in Indonesia. Secondary data are the type of information used in this study. The World Bank and Intracen provided the information.

B. Variable Operational Definitions

The gross domestic product is the dependent variable, whereas the exports and imports used in this study are the independent variables. This study uses 3 (three) variables with operational variable definitions as follows: first, exports are obtained from calculating the FOB value of motor vehicle exports in US Dollars (USD$). Second, the imports in this study were obtained from calculating the CIF value of motorized vehicle imports in US Dollars (USD$). Third, the Gross Domestic Product (GDP) in this study is obtained from the calculation of the addition of the gross value of all population production plus product taxes minus subsidies which do not include the current year's product value with the previous year's. This calculation does not use asset depreciation or natural resource degradation. Gross Domestic Product Value is in US Dollars (USD$).

C. Analysis Tools

In this study, to answer the problem, the analysis used for this time series data is multiple regression analysis. The equation model of the analysis is as follows:

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + e$$

Information:

Y	: Value of economic growth
α	: Constant value
β1…β3	: Coefficient value of the independent variable
X1	: Export variable
X2	: Import variable

In this study, in analyzing data using IBM Statistics 25 software.

In this study, there were multiple stages to the data analysis process, starting with the traditional assumption test. In order to determine whether the regression model being used is the *Best Fit Model* or a Good Model, the traditional assumption test is performed. With the provisions of the normality test being carried out in this test, several tests were conducted to ensure that the model does not suffer from regression disease. These tests allowed us to assess whether the data from the dependent and independent variables, which were used to test the hypothesis, were regularly distributed or not. Heteroscedasticity testing is performed to determine whether or not the regression model has the same diversity of errors. Use a multicollinearity test to evaluate whether each independent variable is correlated or connected linearly. An autocorrelation test is used to examine whether the variables in the prediction model are associated with changes in time. To determine whether the given regression model is a good model and can be used as a research result, perform a linearity test.

To determine how the independent components impact the ISR level, hypothesis testing is the second stage. Employing the coefficient of determination test to assess the model's ability to account for the dependent variable's variation. To find out if the independent and dependent variables have an effect on the dependent variable simultaneously, apply the F test. The T test is employed to assess the validity of the assertion that there is no significant difference between two mean samples randomly selected from the same population (Sudjiono, 2010).

III. RESULTS AND DISCUSSION

A) Normality test

By using the Kolmogorov-Smirnov method to analyse significance, a normality test can be performed. The significance value must be higher than 0.05 for the normalcy test to be valid. It is obvious that the data in Table 2 are regularly distributed because the data have a significance value of 0.200.

Table 2. Normality Test

	Unstandardized Residuals
asymp. Sig. (2-tailed)	.200 [c,d]

Source: Secondary Data, processed in 2022

B) Heteroscedasticity Test

The Glejser test, which specifies that the significance value must be bigger than the alpha value of 0.05, can be used to determine heteroscedasticity. Each independent variable has a significance value in Table 3 that is more than alpha, specifically 0.482 for the Export variable and 0.971 for the Import variable. This indicates that there isn't any heteroscedasticity in this investigation.

Table 3. Heteroscedasticity Test

Model	Sig.
(Constant)	.191
Export	.482
Import	.971

Source: Secondary Data, processed in 2022

C) Autocorrelation Test

This study uses the Lagrange Multiplier test (LM-Test) to identify autocorrelation in the data with the following results:

Table 4. Autocorrelation Test

Model	R Square
1	.227

Source: Secondary Data, processed in 2022

The output data indicate that the R Square value is 0.227 based on Table 4. The estimated Chi Square value is (20 x 0.227 = 4.54) and the Chi Square table is 5.991 when this value is compared to the Chi Square table value with a df/v value of 2 (two) and a significance level of 0.05. The estimated Chi Square value < Chi Square table is 4.54 < 5.991, which suggests that there is no autocorrelation in this study according to this equation model.

D) Multicollinearity Test

A prerequisite of this test is that no signs of multicollinearity exist if the Variants Inflation Factors (VIF) value is less than 10 (VIF < 10). However, if *the Variants Inflation Factors* (VIF) value is more than 10 (VIF> 10) then multicollinearity occurs.

Table 5. Multicollinearity Test

Model	Collinearity Statistics	
	tolerance	VIF
(Constant)		
Export	.193	5.192
Import	.193	5.192

Source: Secondary Data, processed in 2022

As can be seen from the table above, there is no association between the independent variables because all of them have a VIF value of less than 10 (VIF < 10), or 1.337. It can be claimed that the regression model does not have multicollinearity and satisfies the requirements for being a good regression model because the independent variables in this study do not interact or have an influence over one another.

E) Linearity Test

A significant value at Departure from Linearity of more than 0.05 is required for data that does not exhibit linearity.

Table 6. Linearity Test X1

			Sig.
Y*X1	Between Groups	(Combined)	.175
		Linearity	039
		Deviation from Linearity	.337

Source: Secondary Data, processed in 2022

The value of the Deviation from Linearity is 0.337, which is larger than 0.05 (0.337 > 0.05), according to table 6. Then the relationship between the variables GDP (Y) and exports (X1) is linear.

Table 7. X2 Linearity Test

			Sig.
Y*X2	Between Groups	(Combined)	041
		Linearity	005
		Deviation from Linearity	082

Source: Secondary Data, processed in 2022

The value of the Deviation from Linearity is 0.082, which is larger than 0.05 (0.082 > 0.05), according to table 10. Then the relationship between GDP (Y) and Import (X2) variables is linear.

F) Regression Equation Model

Table 8. Multiple Linear Regression Analysis

Model	Unstandardized Coefficients	
	B	std. Error
(Constant)	359543280046.141	75794852752.531
Export	5283.133	1279583
Import	-385,548	403,202

Source: Secondary Data, processed in 2022

Based on SPSS 25 calculations, the multiple linear regression model in this study is:

$$Y = 359543280046.141 + 5283.133X1 – 385.548X2$$

The multiple linear regression equation can be understood as follows based on the model table:

a) A constant of 359543280046.141 is a constant number which means that if the independent variable (X) is constant or there is no change, it means that the Gross Domestic Product (Y) is worth 359543280046.141.
b) The coefficient value of the export variable (X1) is 5283,133 meaning that when there is an increase of 1 (one) unit, there will be an increase in Gross Domestic Product (Y) of 5283,133 units assuming the other independent variables remain constant (ceteris paribus).
c) The coefficient value of the import variable (X2) is 385,548 meaning that when there is an increase of 1 (one) unit, there will be an increase in Gross Domestic Product (Y) of 385,548 units assuming the other independent variables remain constant (ceteris paribus).

G) Determination Coefficient Test (R2)

Table 9. Determination Coefficient Test (R2)

Model	R	R Square	Adjusted R Square
1	.877 [a]	.768	.741

Source: Secondary Data, processed in 2022

According to Table 9, the Adjusted R square value is 0.741, meaning that exports (X1) and imports (X2), the independent variables, account for 74.1% of GDP (Y), the dependent variable, and that the remaining 25.9% is impacted by variables outside the scope of this study.

H) F test

By examining the significance value, it may be deduced that H0 is rejected and Ha is accepted if the significance value is less than 0.05 (Sig. 0.05). The conditions for this test are H0 being refused and Ha being approved if the F-count value exceeds the F-table (F-count > F-table), which may be determined by comparing the F-count value with the F-table.

Table 10. F test

Model		F	Sig.
1	Regression residual Total	28,209	.000 [b]

Source: Secondary Data, processed in 2022

A significance value of 0.000 is obtained from table 10 and is less than 0.05 (0.000 < 0.05). Conclusion: Ha3 is approved whereas H03 is disapproved. The F-count number is 28.209 more than the F-table value (2; nk = 20 - 2 = 18) of 3.555 (28.209 > 3.555), as can be seen by a comparison of the two values. So it can be concluded that the export and import variables simultaneously affect economic growth.

I) T Test

If the significance value is less than 0.05, H0 must be rejected and Ha must be accepted in order to pass the test. According to the test's rules, if the t-count value is greater than the t-table when compared to the t-table, H0 is rejected and Ha is accepted.

Table 11. T test

Model	t	Sig.
(Constant)	4,744	.000
Export	4,129	001
Import	-.956	.352

Source: Secondary Data, processed in 2022

a. Export to Gross Domestic Product

Table 11 demonstrates that H01 is rejected whereas Ha1 is accepted because the export significance value is 0.001, which is less than the alpha value utilised, 0.05 (0.001< 0.05). The t-count export value is 4.129 more than the t-table value with df 17 (df = n - k = 20 - 3), which is 4.129 (4.129 > 2.110), indicating that H01 is rejected and Ha1 is approved. This comparison using the t-table demonstrates this. So, it may be said that the export factor influences economic growth in part.

b. Import to Gross Domestic Product

From Table 10, it can be seen that H02 is accepted while Ha2 is rejected because the export significance value is 0.352, which is less than the alpha ( ) value used, which is 0.05 (0.352 > 0.05). T-table comparison reveals that H02 is accepted and Ha2 is rejected since the t-count export value is -0.956 higher than the t-table value with df 17 (df = n - k = 20 - 3), which is 2.110 (-0.956 < 2.110). Hence, it may be said that the import variable has a limited impact on economic growth.

J) Effect of Balance of Trade on Gross Domestic Product

Table 12. Effect of Balance of Trade

Model	Unstandardized Coefficients	
	B	std. Error
(Constant)	366435917748.023	119135908845.985
BOT	-1303,732	381,022

Source: Secondary Data, processed in 2022

Table 12 indicates that Indonesia's trade balance is in deficit or has a negative impact of -1303.03, as may be inferred. A deficit trade balance indicates that Indonesia's imports are worth more than its exports.

IV. CONCLUSIONS AND SUGGESTIONS

A) Conclusion

The exports and imports of the automotive sector, as determined by the coefficient of determination, account for 76.8% of the change in Indonesia's GDP between 2002 and 2021, with the remainder being explained by factors that were not taken into account in this study. The findings of the t-test revealed that the automotive sector's export variable had a significant positive impact on Indonesia's GDP, whilst the sector's import variable had a minor negative impact. The export and import factors in the automotive industry jointly impact Indonesia's Gross Domestic Product, according to the F test results.

B) Suggestion

The government can further develop the automotive industry and carry out wider international cooperation and direct the automotive industry to export in order to increase state revenue . Meanwhile in imports, the government can control import

activities in Indonesia, especially in the automotive sector and carry out international cooperation with other countries so that they do not have a dependence on imports again.

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