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The Influence of Defense Equipment Exports, Defense Equipment Imports, and the Defense Budget, on Economic Growth in Indonesia in 2017-2021

Yollanda Lakshinta Harningrum[1] Suwito [2] Edy Sulistyadi [3]
Defense Economics Study Program, Faculty of Defense Management, Universitas Pertahanan Republik Indonesia, Bogor Regency, West Java Province, Indonesia[1,2,3]
Email: yollandalakshinta@gmai.com[1] suwitoaau@gmail.com[2] edy_sulistyadi@hotmail.com[3]

Abstract
The development of the defense industry is influenced by several factors such as the defense budget and military technology related to the export of defense equipment and the import of defense equipment. This study aims to examine how the influence of the defense budget, export of defense equipment, and import of defense equipment on economic growth. This research uses quantitative methods. The data used is secondary data in the form of a time series (2017-2021) obtained from SIPRI and Global Fire Power. The data processing technique uses Eviews 12. The data analysis technique used in this study is the classical assumption test, multiple linear regression, partial significance test (t test), simultaneous significance test (F test), and the coefficient of determination (R2). The results of this study indicate that 1) Exports of defense equipment have no effect on economic growth with a probability of 0.1154. 2) Imports of defense equipment have no effect on economic growth with a probability of 0.3494. 3) The defense budget has no effect on economic growth with a probability of 0.1225. 4) The independent variables simultaneously have no influence on the dependent variable. The conclusion from this study is that defense equipment exports, imports, and the defense budget have no effect on economic growth either partially or simultaneously in the 2017-2021 period.
Keywords: Economy, Export, Import, Alutsista, Defense.

INTRODUCTION

Defense economics is like two sides of a coin that cannot be separated. That is, a strong defense requires a good economy. Then, even a good economy requires stability and security. So the two cannot be separated. There are two basic physical elements in building the nation's strength, namely economic and military factors (Liddle, 2006). In developing the defense industry, there are several factors that become obstacles such as for example the defense budget and the development of military technology. The development of military technology is related to the export and import of defense equipment.

This research examines the influence of the defense budget, defense equipment exports, and defense equipment imports on economic growth in Indonesia in 2017-2021, Ramadhana, Arga (2016). The defense budget is the amount of financial resources expended by a country to increase its armed forces. Then the export of defense equipment is the trade of defense equipment abroad, while the import of defense equipment is trading from outside to within the country, Afif (2020). The variables of defense budget, defense equipment exports, and defense equipment imports were examined for their relationship to economic growth. Economic growth is an increase in value and the amount of production of goods or services within a certain period of time, Shaid, Nur Jamal (2022).

Data regarding the defense budget in Indonesia continues to fluctuate every year. The ups and downs of the defense budget are adjusted to defense needs. Reporting from the ministry of

defense.co.id (2022), the need for the defense budget in 2023 for the Ministry of Defense and the TNI will be divided into several scopes including programs for implementing TNI tasks; soldier professionalism and welfare; defense policies and regulations; modernization of defense equipment, non defense equipment and infrastructure; development of defense resources; research, industry and defense higher education, to management support programs. The defense budget is needed to maintain and renew a country's war fleet or military defense equipment.

In practice, there is a research gap between the influence of the defense budget and economic growth. First, military spending has no significant relationship with economic growth. This is supported by the results of a previous study by Heo (2009) which examined the relationship between the military budget and economic growth. The defense budget variable is supported by Heo's theory (2009) which states that there is no statistically significant coefficient and correlation between defense budget and economic growth. On the other hand, there is research which states that there is a relationship between the defense budget and economic growth, which was revealed by Rahman and Siddiqul (2019). Apart from the defense budget, another challenge in the defense industry is the export of defense equipment and the import of defense equipment.

Export of defense equipment and import of defense equipment is a challenge for the defense industry. Data on defense equipment exports and imports of defense equipment in Indonesia continues to fluctuate every year. Indonesia has carried out export activities in several countries. These export activities can provide foreign exchange input for the country. In accordance with the Heckscher-Olin Theory (1979-1984), export activities are usually carried out by countries that have low costs in the production process, so that these countries can carry out their own production and sell it abroad to obtain foreign exchange. On the other hand, countries with production factors that are relatively scarce and expensive in production costs will import.

Based on research from Afif (2020), Exports of Defense Equipment do not have a significant effect on Economic Growth, while Imports of Defense Equipment have a significant effect on Economic Growth. Whereas in the research of Rahman and Siddiqul (2019), the export of defense equipment has a positive and significant effect on economic growth, while the import of defense equipment has a significant negative effect on economic growth. According to existing data, so far Indonesia has imported more defense equipment than exported defense equipment. Indonesia always imports defense equipment as an effort to support national defense. Based on an explanation of the existing phenomena, in this study researchers will examine the effect of defense equipment exports on Indonesia's economic growth, the effect of imports of defense equipment on Indonesia's economic growth, and the influence of the defense budget on Indonesia's economic growth, during the 2017-2021 period.

RESEARCH METHODS

The population in this study is the entire period of defense equipment exports, imports of weapons systems, defense budget and economic growth in Indonesia. The data used in measuring research variables is secondary data in the form of time series data obtained from SIPRI and Global Fire Power. The data processing technique uses Eviews 12. The data analysis technique adopted in this study is as follows:

1. Classical Assumption Test
2. Multiple Linear Regression
3. Partial Significance Test (t test)

4. Simultaneous Significance Test (F Test)
5. Coefficient of Determination (R2)

RESEARCH RESULTS AND DISCUSSION

Research Result

Based on the phenomena that have been described in the background, the researcher will examine how the influence of autsista exports, imports of autsista, the defense budget has on economic growth. The following is a tabulation of research data:

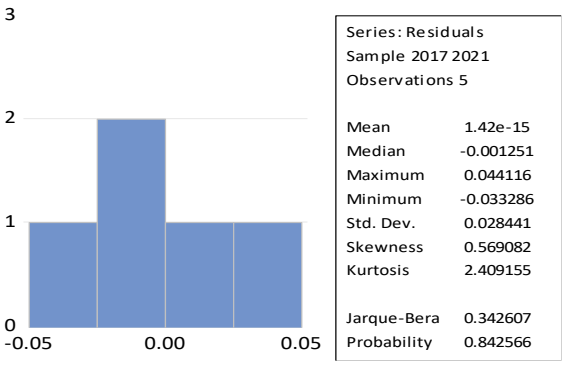
Table 1. Data Tabulation

Year	Economic Growth	Defense Equipment Export (US $)	Defense Equipment Import (US $)	Defense Budget (Billion US $)
	Y	X1	X2	X3
2017	5.07	95	1169	8.8
2018	5.17	15	339	7.56
2019	5.02	9	212	9
2020	-2.07	0	269	9.4
2021	3.69	17	328	9.2

1. Classical Assumption Test

The kasik assumption test consists of the Normality Test, Multicollinearity Test, Heteroscedasticity Test, and Autocorrelation Test which will be described as follows:

a. Normality Test



Data is said to be free from the normality test if the probability value is greater than 5% or 0.05. While the probability value of the research data is 0.8425, so 0.8425 > 0.05. It can be concluded that the data is free from normality.

b. Multicollinearity Test

Table 2. Multicollinearity Test

Variance Inflation Factors
Date: 12/01/22 Time: 22:20
Sample: 2017 2021
Included observations: 5

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	122.5638	189406.5	NA
X1	0.001373	355.5534	1.977909
X2	0.015152	5619.960	7.612058
X3	1.479625	242776.1	5.542643

Data can be said to be free of multicollinearity if the VIF value is < 10. As seen in the table, the VIF values of the three variables are < 10. So the data can be said to be free of multicollinearity.

c. Heteroscedasticity Test

Table 3. Heteroscedasticity Test

Heteroskedasticity Test: ARCH

F-statistic	8.57E-05	Prob. F(1,2)	0.9935
Obs*R-squared	0.000171	Prob. Chi-Square(1)	0.9896

It can be said to be free from heteroscedasticity if the Prob. Chi Square > 5% or 0.05. 0.986 > 0.05 so that the data is free from heteroscedasticity.

d. Autocorrelation Test

Table 4. Autocorrelation Test

R-squared	0.990225	Mean dependent var	1.658854
Adjusted R-squared	0.960898	S.D. dependent var	0.287655
S.E. of regression	0.056881	Akaike info criterion	-2.905142
Sum squared resid	0.003235	Schwarz criterion	-3.217592
Log likelihood	11.26285	Hannan-Quinn criter.	-3.743726
F-statistic	33.76592	Durbin-Watson stat	3.281296
Prob(F-statistic)	0.125680		

The DW value, which is 3.281, is at +-2, so it can be said to be free from autocorrelation.

2. Multiple Linear Regression

Based on the results of the classical assumption test, it is known that the research data is normally distributed, there is no multicollinearity and autocorrelation, and the residues are homogeneous or there is no heteroscedasticity in the research data. So that the research data can be continued to do multiple linear regression. The following are the results of research data that has been regressed using Eviews software version 12:

Table 5. Multiple Linear Regression Test

Dependent Variable: Y
Method: Least Squares
Date: 12/01/22 Time: 22:49
Sample: 2017 2021
Included observations: 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	60.25479	11.07085	5.442651	0.1157
X1	0.202152	0.037057	5.455223	0.1154
X2	0.201285	0.123092	1.635243	0.3494
X3	-6.242393	1.216398	-5.131865	0.1225

R-squared	0.990225	Mean dependent var	1.658854
Adjusted R-squared	0.960898	S.D. dependent var	0.287655
S.E. of regression	0.056881	Akaike info criterion	-2.905142
Sum squared resid	0.003235	Schwarz criterion	-3.217592
Log likelihood	11.26285	Hannan-Quinn criter.	-3.743726
F-statistic	33.76592	Durbin-Watson stat	3.281296
Prob(F-statistic)	0.125680		

In multiple linear regression using the Ordinary Least Square (OLS) model, the criteria for the best model are those with a prob value. <α=5%. The following will explain the Partial Significance Test (t test) and Simultaneous Significance Test (F Test).

3. Partial Significance Test (T Test)

Table 6. T Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	60.25479	11.07085	5.442651	0.1157
X1	0.202152	0.037057	5.455223	0.1154
X2	0.201285	0.123092	1.635243	0.3494
X3	-6.242393	1.216398	-5.131865	0.1225

The partial significance test is used to see the effect of the independent variable on the dependent variable partially. Partially independent variables are said to have a significant influence on the dependent variable if the p-value < α = 5%.
T test results (partial):
X1: 0.1154 > 0.05 (no effect)
X2: 0.3494 > 0.05 (no effect)
X3: 0.1225 > 0.05 (no effect)

4. Simultaneous Significance Test (F Test)

Table 7. F Test

R-squared	0.990225	Mean dependent var	1.658854
Adjusted R-squared	0.960898	S.D. dependent var	0.287655
S.E. of regression	0.056881	Akaike info criterion	-2.905142
Sum squared resid	0.003235	Schwarz criterion	-3.217592
Log likelihood	11.26285	Hannan-Quinn criter.	-3.743726
F-statistic	33.76592	Durbin-Watson stat	3.281296
Prob(F-statistic)	0.125680		

The F statistical test basically shows whether all the independent variables have a significant effect on the dependent variable simultaneously. The independent variable simultaneously is said to have a significant influence on the dependent variable if the p-value < α=5%. Based on research data that has been processed, the probability (F-statistic) obtained is 0.1256. 0.1256 > 0.05, so it can be concluded that the X variable together has no effect on the Y variable

5. Coefficient of Determination (R2)

Table 8. Determination Coefficient Test

Dependent Variable: Y
Method: Least Squares
Date: 12/01/22 Time: 22:54
Sample: 2017 2021
Included observations: 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	60.25479	11.07085	5.442651	0.1157
X1	0.202152	0.037057	5.455223	0.1154
X2	0.201285	0.123092	1.635243	0.3494
X3	-6.242393	1.216398	-5.131865	0.1225

R-squared	0.990225	Mean dependent var	1.658854
Adjusted R-squared	0.960898	S.D. dependent var	0.287655
S.E. of regression	0.056881	Akaike info criterion	-2.905142
Sum squared resid	0.003235	Schwarz criterion	-3.217592
Log likelihood	11.26285	Hannan-Quinn criter.	-3.743726
F-statistic	33.76592	Durbin-Watson stat	3.281296
Prob(F-statistic)	0.125680		

R Square Result: 0,9608

Based on the results of the regression shown, it shows that the value of R2 is 0.9608 which means that the variables of defense equipment exports (X1), imports of defense equipment (X2), and defense budget (X3), of 96.08% can explain the variance of economic growth.

Discussion

The Influence of Defense Equipment Exports on Economic Growth Partially

Based on the test results that have been obtained, it can be seen that the variables of defense equipment exports, defense equipment imports, and the defense budget have no influence on economic growth in the last 5 years. The lack of effect of each variable x on variable y is of course based on various things, such as the covid 19 pandemic that hit in 2020. This covid 19 pandemic has certainly created an economic imbalance. Apart from 2020, in 2014 and 2015, Indonesia did not carry out export activities at all. This is due to the decline in the National Economic Recovery Program. In accordance with the Heckscher-Olin Theory (1979-1984), countries with relatively high factors of production and low production costs will specialize in production to export. Indonesia still does not have these factors so that defense equipment export activities cannot be carried out optimally. Defense equipment export data has also fluctuated in the last decade. So that the export of defense equipment does not have a significant effect on economic growth.

The Effect of Imports of Defense Equipment on Economic Growth Partially

Based on the results of data testing, defense equipment imports fluctuate every year, and have no effect on economic growth. Based on the Heckscher-Olin Theory (1979-1984), countries with relatively scarce and expensive factors of production in production costs will import. Indonesia is one of the countries that imports far more defense equipment than it exports. The reduction in imports of defense equipment can be said to be an "achievement". This proves the government's commitment to trigger the growth of defense industry independence.

Based on the data, there has been a significant increase in imports of the main weapon system equipment in the 2017-2018 period, because Indonesia acquired 150 units of Leopard MBT battle tanks from Germany. Then in 2020 when the covid 19 pandemic occurred, Indonesia actually increased the production of imported defense equipment. An increase of US$ 57 compared to 2019. These phenomena are the background to the import of defense equipment which has not had a significant effect on economic growth in the last eight years.

Partial Effect of Defense Budget on Economic Growth

Based on the data that has been tested, the defense budget has had no effect on economic growth in the last eight years. In 2020 when economic growth declined due to the covid 19 pandemic, the defense budget actually increased by 4 US$ from 2019. Likewise, in 2016, when economic growth increased by 15%, the defense budget actually turned 2 US$.

In Indonesia, the fulfillment of military spending is limited by the existence of the Minimum Essentials Force policy which is a budget constraint in the procurement of defense equipment in Indonesia. Where the amount of the military expenditure budget is adjusted to the needs and planning of defense development. In this study, the defense budget has no effect on economic growth. This is supported by the results of empirical research using regression analysis (Heo, 2009) which states that there is no statistically significant coefficient and correlation between the defense budget and economic growth.

The Influence of Defense Equipment Exports, Defense Equipment Imports, and the Defense Budget on Simultaneous Economic Growth

Based on data processing tests and the phenomena that have been described, defense equipment exports, defense equipment imports, and the defense budget have no effect on economic growth simultaneously.

CONCLUSION

Based on the results of data analysis and discussion that has been described in previous chapters, with reference to the hypothesis, it can be concluded as follows: Defense Equipment Exports (X1) has no effect on Economic Growth (Y). In this case, Indonesia does not export defense equipment every year. So that the export of defense equipment does not have a significant effect on economic growth. Defense Equipment Imports (X2) have no effect on Economic Growth (Y). These results show that the import of defense equipment by Indonesia has not been able to support Indonesia's defense in the last eight years based on existing phenomena. The Defense Budget (X3) has no effect on Economic Growth (Y). This shows that the defense budget, the amount of the military expenditure budget is adjusted to the needs and planning of defense development. The independent variables simultaneously have no influence on the dependent variable.

BIBLIOGRAPHY

Heo, U. (2009). The Relationship Between Defense Spending and Economic Growth In The United States. Political Research Quarterly. Sage Journals.

Peraturan Menteri Pertahanan (Permenhan) Nomor 17 Tahun 2014.

Peraturan Pemerintah Nomor 10 tahun 2021

Rahman, T and Siddiqul. (2018). Arms Trade, Military Spending, Economic Growth.

Rahman, Taimur. (2019). The Effect of Military Spending on Economic Growth In the Presence of Arms Trade: A Global Analysis.

Ramadhana, Arga. (2016). Analisis Faktor-faktor yang Mempengaruhi Anggaran Pertahanan Republik Indonesia. Fakultas Ekonomi Yogyakarta. Universitas Islam Indonesia.

Rivai, Afif Maulana. (2020). Pengaruh Anggaran Pertahanan, Impor Alutsista, Ekspor Alutsista, dan Inflasi terhadap Pertumbuhan Ekonomi di Indonesia Tahun 1980-2019. Tesis Universitas Pertahanan Republik Indonesia.

Shaid, Nur Jamal. (2022). Apa Itu Ekspor: Pengertian, Jenis, Tujuan, dan Manfaatnya.

Shaid, Nur Jamal. (2022). Pertumbuhan Ekonomi: Pengertian, Ciri dan Faktor yang Mempengaruhinya.

Supandi. (2019). Ekonomi Pertahanan (Defense Economics): Panduan Studi Ilmu Pertahanan Edisi 1. Makmur Cahaya Ilmu. Jakarta.
Susilo, A. (2008). Buku Pintar Ekspor Impor. Trans Media Pustaka. Jakarta.