ECONOMIC GROWTH AND MILITARY EXPENDITURE IN DEVELOPING COUNTRIES DURING COVID-19 PANDEMIC

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Abstract: This study aims to provide an analysis of military expenditure, political stability, and the total of the workforce on economic growth through the GDP during the COVID-19 pandemic. Cross-section data for 40 countries with upper-to-middle income levels was used to analyze the evolution for the periods 2010-2019 and 2019-2020. For the period 2010-2019, there was a general decrease in the percentage of Gross Domestic Product devoted to Military Expenditure, but the real value per capita increased in many countries, due to the effect of the increase of real production per capita. In the year 2020 the Pandemic diminished the real value of Military Expenditure in a few countries.

Military expenditure, as well other components of Public Expenditure, and the total Labor Force/Workforces for 40 developing countries with upper-to-middle-income levels have shown a positive and significant impact on the value of GDP, which means that they encourage economic growth during the COVID-19 pandemic.

Keywords: Military Expenditure, Gross Domestic Product (GDP), the Total of Workforce, Ordinary Least Square (OLS).

JEL: O11, R11, P44.

1. Introduction.

This study consists of several parts. Section 2 describes the literature review in the study. It consists of military expenditure and economic growth, labor force/workforce and political stability. Section 3 present a summary of data related to Military Expenditure, Political Stability, and Development, of the 40 countries of this study and some comments on the consequences of the pandemic.

Section 4 describes the conceptual framework, the research approach, econometric process, regression analysis, hypothesis testing, and classical assumption test. Section 5 discusses the relationship between military expenditure and economic development with several previous research studies. Section 6 describes the conclusions in the study, limitations on the research, and suggestions for further research.

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2. Literature Review.

Military expenditure is often a crucial issue to defend a country from aggression and guarantee peace and development. This condition influences the resources it needs. However, any use of resources carries cost because it prevents funds and other resources from being used alternatively for purposes that might directly increase the pace of development (Dunne & Tian, 2013).

When governments do military expenditure, they provide income in the form of wages and cover other expenses for the armed forces and weapons procurement. In developing countries, it is very likely that weapons will be imported, especially advanced weapons systems, and will deplete valuable foreign exchange reserves. Military expenditure is an integral part of government spending, researchers around the world are interested in investigating the contribution of military expenditure to the economy.

From the early days to the present day, many researchers have conducted research and obtained some valuable findings that have ultimately enriched the field of defense economics (Raju & Ahmed, 2019).

In this study we analyze the following Hypotheses:

Hypotheses
H1*: The military expenditure (ME) affects economic growth through the value of Gross Domestic Product (GDP) positively.* *Comment: The degree of contribution will depend on the positive impact of ME to Political Stability and Development.*
H2*: The Gross Fixed Capital Formation (Capital) affects economic growth through the value of Gross Domestic Product (GDP) positively.* *Comment: Economic Growth, depends on several variables from the Demand and Supply sides, being GFCF an important variable from the supply side.*
H3: *The total workforce affects economic growth through the value of Gross Domestic Product (GDP) positively.* *Comment: The positive effect of the Workforce on economic growth and development, depends usually not only in the number of workers but on the level of education and training.*
H4: *The Political Stability affects economic growth through the value of Gross Domestic Product (GDP) positively.* *Comment: Political Stability usually may affect to economic development (GDP per capita) and sometimes also to total GDP.*

Human capital plays a crucial role in generating the country's economic growth, especially at the higher education level. Now, along with rapid technological advances and increasingly fierce competition, it has brought major changes in the labor market. This condition causes the demand for labor to increase. Today, the contemporary economy requires people with higher education to cater to a knowledgeable and skilled

workforce (Rambeli, et al., 2016). Many previous empirical studies have concentrated on the role of human capital investment and its relationship to production and economic growth. It is demonstrated by the long-term sustainable growth and development in various countries, as it is largely driven by the productivity of growth itself (Amir, et al., 2015).

Political stability is an assessment of political violence in the country and its actual or potential impact on the government (Bjorvatn & Farzanegan, 2015). Jadhav (2012) dan Kariuki (2015) have presented inconclusive findings on the impact of political stability on *Foreign direct investment (FDI)*, which has led to an investigation of political stability, to understand its impact on FDI inflows in the context of Asia Pacific countries. Politically motivated corruption significantly reduces FDI inflows in certain Asian countries (Rashid, et al., 2017). They need to know about the status of property rights, whether the state authorities are able and willing to guarantee fair competition in business activities and if the tax system is stable, meaning that it does not change frequently. It is crucial because when potential investors wish to undertake a prospective business plan, which includes investment costs, they must be able to make relative estimates in advance as far as expected revenues, costs, and profits are concerned. (Georgiou, et al., 2015).

3. The situation in year 2020 and consequences of the pandemic.

3.1. Military Expenditure, Political Stability, and Production in 2019-2020.

Table A1 in the Annex presents data of several variables of 40 upper-middle income countries regarding workforce, percentage of Gross Capital Formation, an indicator of Political Stability, Military Expenditure and Gross Domestic Product, that were used for the estimations in section 4.

Accordingly to the World Bank data, the World average of the percentage of Military Expenditure (ME) on Gross Domestic Product (GDP) amounted to 3.31% in year 1990, 2.19% in year 2019, and 2.36% in year 2020. In spite of the decrease of the percentage, Military Expenditure per inhabitant increased (in Dollars at international constant prices of year 2017) from 301 in 1990 to 382 Dollars in 2020. The Total Expenditure of the World also increased, from 1692 Bn (Billion=thousand million) in year 1990 to 2965 Bn in year 2020.

Around 70% of the 40 countries of this study have a percentage of Military Expenditure on GDP below World average (2.36%). Higher values correspond to special circumstances. The highest values correspond to Armenia, Azerbaijan, Jordan, Lebanon, and Russian Federation.

Asongu, et al. (2021) analyzed correlations between Military Expenditure (ME) and Political Stability (PS) in Africa, for the period 1996-2012, and they found a negative correlation of ME with PS, Domestic Terrorism, Transnational Terrorism, Unclear Terrorism, and Total Terrorism, and a positive correlation with variables related with economic development (Internet penetration, Human Development Index Adjusted by Inequality, and rate of growth of Gross Domestic Product).

Guisan (2022) considers that current value of PS is negatively related to Military Expenditure per inhabitant (MEH), but that the value of PS through time may be increased by the effect of MEH. With a sample of 164 countries, analyzes the impact of Production per head (PH) and Political Stability (PS) on Military Expenditure per head (MEH) in year 2019, with a positive estimation for the coefficient of PH and a negative value for the estimated coefficient of PS. Besides this author estimates an equation between PH in year 2019, its lagged value in year 2010, and the increase of Political Stability for the period 2010-2019, founding a positive impact of the increase of PS on PH. This means that a positive contribution of Military Expenditure to Political Stability has usually a positive impact on economic development.

3.2. Consequences of the pandemic

The International Monetary Fund (IMF) calls the economic crisis triggered by COVID-19 a Huge problem and projects that global growth in 2020 will fall to -3%, assuming that the pandemic and the necessary mitigations peak in the second quarter for most countries in the world and will recede in the second half. It is a 6.3 percentage point decline from January 2020, a major revision in a very short period. For the first time since the Great Depression, both developed and emerging market economies and emerging economies are in a recession.

This year, growth in developed countries is projected at -6.1%; Emerging markets with considerably normal growth rates above developed economies are also projected to have negative growth rates of -1% in 2020, and -2.2% if China is excluded.

Per capita income is projected to shrink for more than 170 countries (Song & Zhou, 2020). The economic effects of COVID-19 can be broadly categorized into supply and demand effects. Symmetrical effects of positive and negative components on financial development are found, while the influence of control variables such as exchange rates and trade openness is in line with general economic intuition (Kumar & Paramanik, 2020).

Maliszewska et al. (2020) claim that the pandemic is affecting the economy through the following channels:

(1) the direct impact of the reduction in employment;

(2) an increase in international transaction costs;

(3) a sharp decrease in travel, and;

(4) a decrease in the demand for services that require distance between personnel.

First, a decrease in employment leads to lower demand for capital, resulting in a loss of output. Second, rising costs of imports and exports of goods and services result in reduced trade and lost productivity. Third, the sharp decline in international tourism resulted in a decrease in revenue, thus leading to lost production (Padhan & Prabheesh, 2021). The marginal effect of FDI on growth is sensitive.

With regard to dynamic heterogeneity across sectors, estimates of the marginal effect of FDI for industrial growth, are consistently expected to occur in the long run (Edwards, et al., 2017)

The decline in the economy of several countries will also definitely create an impact on reducing employment. This condition affects political stability for developing

countries that have a copious workforce. Job creation has been one of the most obvious challenges, the varying performance of the economy over the last few years even in periods of high growth, has not been strong enough to create new jobs (Biltagy, 2019).

Based on these conditions, during the COVID-19 pandemic, it is necessary to analyze military expenditure on economic growth through political stability, and the size of the workforce. This study aims to provide an analysis of military expenditure, political stability, the total of the workforce on economic growth through the GDP during the COVID-19 pandemic. In this study, the researcher used cross-section data because the research observation took place during the peak of the COVID-19 outbreak in 2020. This study uses secondary data from developing countries in the world and is limited to several developing countries with upper-middle-income criteria. This study employs the quantitative method with OLS-based multiple linear regression.

This research used some previous studies as references, among others, "The effect of military spending on growth in a structured analytical framework using the share of military expenditure in GDP, military burden, as an independent variable" (Yesilyurt & Yesilyurt, 2019). Ali (2021) explained the relationship between military expenditure and economic growth in Egypt during 1980-2019. Su et al. (2020) investigated the dynamic relationship between defense spending and economic growth in China with causality tests. Solarin (2018) investigated the impact of globalization on military expenditure in 82 countries, using several series as control variables during 1989–2012. Le & Tran (2021) explain that in the short term, military spending, transportation, and communications are positively correlated with economic growth. Markowski et al. (2017) provided an analysis of the relationship between military expenditure and economic growth in countries in the Indo-Pacific Asia region. Saba & Ngepah (2019) investigated the relationship between military expenditure and economic growth of 35 African countries. Ajmair et al. (2018) investigated the relationship of military expenditure to economic growth in Pakistan. d'Agostino et al. (2019) explained the possible importance of endogeneity of 109 non-high-income countries regarding the mechanism of military expenditure on economic growth. Raju & Ahmed (2019) reviewed the impact of military expenditure on economic growth from India, Pakistan, and China. Dunne & Smith (2019) described the issues involved in estimating the effect of military expenditure on growth and the reasons for the lack of consensus in the literature.

Studies on cross-sections include cross-section as indicators of drug utilization and evaluation of antibiotics (Hu, et al., 2021). There was also a cross-section study as an analysis of unemployment factor data in Bogor (Sulistyowati, et al., 2020). Another cross-section study includes cash-based operating profitability analysis (a measure that excludes accruals) which outperforms a measure of profitability including accruals (Ball, et al., 2016). Another study identified corporate bond returns and found that downside risk is the strongest predictor of future bond returns (Bai, et al., 2019). Another cross-section study examined aggregate jump prices and volatility risk in a cross-section of stock returns (Cremers, et al., 2015). As a result, this research is projected to aid in the planning of military spending to promote political and economic stability in these countries. Second, this research is likely to offer a fresh perspective on defense economics with little precedent. Third, this study is intended to look into the function of

military budgets in developing nations as a further predictor during the COVID-19 outbreak.

4. Conceptual Framework, methodology and empirical results

4.1. Two frameworks for analyzing relationships between military expenditure, growth, and development

4.1.1. First framework: unilateral relationship with ME increasing GDP through an extended production function.

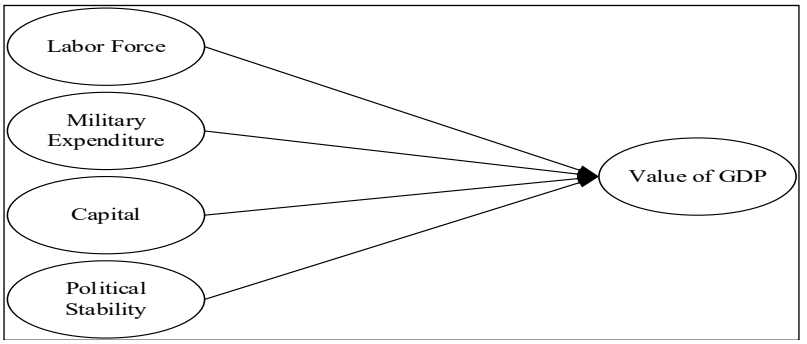

Figure 1: First Conceptual Framework of direct effects on GDP

4.1.2. Second framework: Following the approach by Guisan (2022) we consider a bilateral relationship between MEH=ME/Pop, and PH=GDP/Pop, where Pop is Population: 1) Usually there is a current relationship of MEH depending on PH (with positive coefficient) and PS (with negative coefficient), in year t. 2) Past values of MEH may have a positive effect on current values of PS, and PS usually has a positive effect on PH. In section 4.2.2 we estimate two equations: One that relates MEH with PH and PS (table 4) and a relationship that relates %ME with PS (table 5).

4.2. Methodology and results

4.2.1. Methodology and results of the first approach

The conceptual framework is used as a guide or description of the flow of thought in the focus of the research. In studying the effect of military expenditure on Gross Domestic Product (GDP) in 40 developing countries with upper-to-middle-income status, the topic should focus on macro variables. In general, military expenditure will have a negative/positive or insignificant impact on economic growth (Hou & Chen, 2013). Particular study characteristics emerged as significant determinants of the effect of military expenditure on growth, but there is not a simple pattern with significantly different characteristics (Yesilyurt & Yesilyurt, 2019). The fact that GDP growth leads to military expenditure rather than the other way around implies that defense decisions are not being made in a relatively growth-promoting manner (Saba & Ngepah, 2019). This study provides an analysis of the effect of military expenditure (ME) on economic growth through GDP growth in developing countries during the COVID-19 pandemic. This study uses four independent variables, namely Military Expenditure (ME), Number of Labor Force (Labor), Political Stability (PS), plus the variable Gross fixed capital formation (Capital).

Approach.

The approach used in this study was Quantitative. The quantitative approach describes data measurement and hypothesis testing. This approach is considered efficient in providing information, explaining an event more measurably, and leading to generalization results accompanied by appropriate evidence. The quantitative approach used was multiple linear regression with a cross-section model using E-Views 10 as a tool to analyze the data. The purpose of a cross-sectional study is to obtain reliable data with the possibility to produce strong conclusions and to create new investigatable hypotheses for future studies (Zangirolami-Raimundo, et al., 2018).

The data used in this study was secondary data taken from 40 developing countries with upper-to-middle-income levels in 2021 as determined by the World Economic Situation and Prospects 2021. GPD growth data, Labor Force, and Gross Fix Capital Formation (Capital) were taken from World Bank Data data in June 2020. Then Military Expenditure data was taken from the Stockholm International Peace Research Institute (SIPRI-2020). Political Stability (PS) data was taken from the Worldwide Government Indicators (WGI) for the 2020 period.

Table 1: Variable Description.

No.	Variable	Description	Source
1	GDPV	GDP Value	*World Bank Data 2020*
2	ME	Military Expenditure Budget	SIPRI-2020
3	Labor	Total of Workforce	*World Bank Data 2020*
4	PS	Country's Political Stability	WGI 2020
5	Capital	% Gross fixed capital formation	*World Bank Data 2020*

Econometric Process.

The study conducted an econometric analysis to determine the relationship between GDP growth and military expenditure for 40 developing countries with upper-to-middle-income levels. First, we tested the unit root of the variable using the OLS (Ordinary Least Square) test. Second, we investigated the long-term relationship between GDP growth and military spending. This study used statistical tests (t-test, F test, and normality test) and measured the accuracy of the R^2 regression model. Third, we justified the direction of causality using the classical assumption tests (multicollinearity, heteroscedasticity, or autocorrelation). Finally, some popular diagnostic tests have been performed to rationalize the findings.

Multiple Regression Analysis.

Multiple regression analysis is used, if the research intends to predict how the condition (increase and decrease) of the dependent variable (criteria), or if two or more independent variables as predictor factors are manipulated (increase in value). The analytical method used in this study is multiple regression which is used to examine the effect of the independent variables Military Expenditure (ME), Number of Labor Force (Labor), Political Stability (PS), Gross Fixed Capital Formation (Capital) on the dependent variable GDPV value, then Multiple regression analysis models that can be used are:

$$\boldsymbol{GDPV} = \propto + \boldsymbol{\beta_1}(\boldsymbol{ME}) + \boldsymbol{\beta_2}\,(\boldsymbol{Labor}) + \boldsymbol{\beta_3}\,(\boldsymbol{PS}) + \boldsymbol{\beta_4}\,(\boldsymbol{Capital}) \ldots\ldots\ldots\ldots \textit{(Eq. 1)}$$

In which:
GDPV = GDP Value
$\propto$ = Constant
(ME) = *Military Expenditure*
(Labor) = Workforce
(PS) = Political Stability
(Capital) = Two options: 1) % of Gross Fix Capital Formation (GFC) on GDP; 2)Value of GFCF. In Table 2 we have used the first option (Capital1) and in Table 3 the second one (Capital2).

Similar to Aizenman dan Glick's (2006), this study applies the term non-linear multiplication in the model. It is because military expenditure may not always be autonomous. Equation (2) is formulated as follows:

$$\boldsymbol{ln\,(GDPV) = \propto + \beta_1 ln(ME) + \beta_2 ln(Labor) + \beta_3 ln(PS) + \beta_4 ln(Capital)} \quad \textit{(Eq. 2)}$$

This equation is an extended production function with ln(ME) and ln(PS) representing effects of other variables, besides de primary inputs Capital and Labor. If the coefficients β_1 and β_3 are not null, it may be due, not only to the impact of these variables but also to the existence of a linear relationship between the variables ln(ME) and ln(PS) with other missing variables that also may have an impact on ln(GDP), as seen in the Annex of Guisan (2015) and other analysis on the effects of missing variables.

Hypotheses Testing

t-Test

The statistical t-test shows how far the impact of one explanatory or independent variable individually in explaining the variation of the dependent variable. The decision to accept or reject H0 is made based on the statistical test scores obtained from the existing data. In the significance test, a statistic is considered statistically significant if the value of the statistical test is in the reject area. On the other hand, a test is considered statistically insignificant if the value of the statistical test is in the acceptance region. Individual independent variables are considered to have a significant effect on the dependent variable with probability if the p-value (sig) is less than the level of significance (α) (Bai, et al., 2019).

The significant level applied in this study is α = 5%. It means that if the p-value (sig) is less than 5%, then the independent variables have a significant influence on the dependent variable individually. The Hypothesis used in this study were presented as follows (Ball, et al., 2016):

- H0: The independent variable has no significant effect on the dependent variable.
- H1: The independent variable has a significant effect on the dependent variable.

F Test

The F-test was conducted to determine whether the independent variables as a whole had a significant effect on the dependent variable. If the value of the F-count is greater than the value of the F-table, the independent variables as a whole affect the dependent variable (Zangirolami-Raimundo, et al., 2018). The independent variable as a whole is said to have a significant effect on the dependent variable if the p-value (sig.)

is less than the level of significance (α). The significant level applied in this study is α = 5%. This means that if the p-value (sig) is less than 5%, then the independent variable as a whole has a significant effect on the dependent variable. It means that if the p-value (sig) is less than 5%, then the independent variables have a significant influence on the dependent overall variable.

Normality Testing

The normality test aims to test whether, in the regression model, the confounding or residual variables have a normal distribution. If the data is normally distributed, then a parametric statistical test is used. Meanwhile, if the data is not normally distributed, non-parametric statistical tests are used. To test whether the data is normally distributed or not, the Jarque-Bera test (JB test) is performed. This test is to measure the difference between skewness and kurtosis of the data. If the significance value is greater than 0.05 (5%), then the data is normally distributed (Abdellatif, et al., 2018).

Classic Assumption Test

Multicollinearity Test: Multicollinearity test is used to determine whether the regression model detects a correlation between independent variables. A good regression model should not have a correlation between the independent variables. If there is multicollinearity in the model, the estimator is still the Best Linear Unbiased Estimator (BLUE). However, the estimator has an extensive variance and covariance, so it is difficult to get an accurate estimate (Salmerón, et al., 2018). The way to detect the presence of multicollinearity was done by detecting the high-pair-wise correlation ammon regressors through R2 which is high in the model. However, the t-statistical significance level is very small from the regression results and tends to be insignificant (Thompson, et al., 2017). Multicollinearity test is used to determine whether the regression model detects a correlation between independent variables. Multicollinearity can be seen from the value of tolerance and VIF (variance inflation factor). The criteria for making this test decision are: If the Tolerance value is **≤ 0,1** or equal to the **VIF value ≥ 10**, it indicates the presence of multicollinearity. On the other hand, if the Tolerance value is **≥ 0,1** or equal to the **VIF value ≤ 10**, it shows that there is no multicollinearity. (Lin, et al., 2017).

Heteroscedasticity Test: This classical assumption test aims to test whether in the regression model there is an inequality of variance from the residuals of one observation to another observation. Heteroscedasticity occurs when the disturbance variable does not have the same variance for all observations. Thanks to heteroscedasticity, the ordinary least squared (OLS) estimator is unbiased but inefficient (Salmerón, et al., 2018). A good regression model is a model in which heteroscedasticity does not occur. The heteroscedasticity test used in this study is the Harvey test which is available in the E-views 10 program. The guidelines that will be used in concluding are as follows (Sahabuddin & Hadianto, 2019):

- If ρ-value Obs*R-square < 0.05; then there is heteroscedasticity.
- If ρ-value Obs*R-square > 0.05; then there is no heteroscedasticity.

Regression Model.

The result of the regression analysis is presented in Table 2.

Table 2: Result of Multiple Linear Regression Score with Capital1=%GFCF

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.835526	0.895280	-4.284162	0.0001
LN_CAPITAL1	-0.003972	0.149587	-0.026556	0.9790
LN_LABOR	0.843297	0.087339	9.655475	0.0000
LN_ME	0.193774	0.084278	2.299230	0.0276
LN_PS	0.159264	0.127179	1.252281	0.2188

R-squared	0.966610	Mean dependent var	11.18699
Adjusted R-squared	0.962794	S.D. dependent var	1.936141
S.E. of regression	0.373462	Akaike info criterion	0.984465
Sum squared resid	4.881572	Schwarz criterion	1.195575
Log-likelihood	-14.68930	Hannan-Quinn criteria	1.060796
F-statistic	253.3018	Durbin-Watson stat	2.238600
Prob(F-statistic)	0.000000		

The regression was processed with E-Views 10. The significant level applied in this study is α = 5% (Bai et al., 2019; Ball et al., 2016). If the p-value (sig) is less than 5%, then the independent variables have a significant influence on the dependent variable

There is a problem with the negative coefficient of Capital1, which is due to the specific problems that often arise when mixing variables in levels with variables in percentages of GDP, as analyzed in Guisan (2015) and other studies. To overcome this problem, we estimate, Table 3 the model with Capital2, which is the value of Gross Fixed Capital Formation (GFCF) instead of the % of GFCF on GDP.

In Table 3. Gross Fixed Capital Formation (GFCF) is used as an indicator of Capital. It is usually a good indicator of the evolution of the Stock of Capital, although its value is much lower because it includes only the new investment of each year and not past investments, it is better than using the percentage of GFCF on GDP.

Table 3: Result of Multiple Linear Regression Score with Capital2=GFCF

Dependent Variable: LOG(GDPV). Least Squares. Sample 1-40				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-0.254855	0.960884	-0.265230	0.7924
LN(ME)	0.125202	0.064478	1.941775	0.0602
LN(LABOR)	0.432437	0.101978	4.240492	0.0002
LOG(PS)	-0.087963	0.096428	-0.912210	0.3679
LN(CAPITAL2)	0.438935	0.084263	5.209106	0.0000

R-squared	0.981191	Mean dependent var	11.18699
Adjusted R-squared	0.979042	S.D. dependent var	1.936141
S.E. of regression	0.280296	Akaike info criterion	0.410527
Sum squared resid	2.749804	Schwarz criterion	0.621637
Log-likelihood	-3.210545	Hannan-Quinn criteria	0.486858
F-statistic	456.4558	Durbin-Watson stat	2.329611
Prob(F-statistic)	0.000000		

The elasticities of Output on Labor and Capital are positive with an estimated value of around 0.43 for each primary input. The coefficient of ME seems to be positive and significant, likely due to the effects of other variables linearly related with ME. The coefficient of PS is not significant because this variable seems to affect more GDP per capita than the total value of GDP, as seen in Guisan (2022).

4.2.2. Methodology and results of the second approach

Table 4 relates MEH=ME/POP with PH=GDPV/POP and PS.

$$\boldsymbol{ME} = \propto + \boldsymbol{\beta_1}(\boldsymbol{PH}) + \boldsymbol{\beta_2}(\boldsymbol{PS}) + \boldsymbol{\beta_3}(\boldsymbol{PS}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textit{(Eq. 3)}$$

Table 4: Relationship between MEH, Production per capita (PH) and Political Stability

Dependent Variable: MEH. Method: Least Squares. Sample 1-40				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.178765	0.037975	4.707418	0.0000
PH	0.000637	0.004652	0.136917	0.8919
PS	-0.001357	0.000529	-2.568530	0.0146
D35	0.289970	0.065208	4.446823	0.0001
D8	0.180944	0.066804	2.708571	0.0104
R-squared	0.501295	Mean dependent var		0.127052
Adjusted R-squared	0.444301	S.D. dependent var		0.081863
S.E. of regression	0.061025	Akaike info criterion		-2.638598
Sum squared resid	0.130342	Schwarz criterion		-2.427488
Log-likelihood	57.77196	Hannan-Quinn criteria		-2.562267
F-statistic	8.795459	Durbin-Watson stat		1.999808
Prob(F-statistic)	0.000050			

Table 5 shows a negative relationship between %ME and Political Stability and includes two dummy variables.

$$\boldsymbol{ME} = \propto + \boldsymbol{\beta_1}(\boldsymbol{PS}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textit{(Eq. 4)}$$

Table 5: Regression of % Military Expenditure on GDP on Political Stability, in 2020.

Dependent Variable: ME%. Method Least Squares, Sample 1-40				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.902893	0.252238	7.544049	0.0000
PS20	-0.010295	0.004489	-2.293429	0.0278
DUM1	3.423355	0.271092	12.62803	0.0000
DUM2	2.326097	0.301893	7.705042	0.0000
R-squared	0.856236	Mean dependent var		2.050636
Adjusted R-squared	0.844256	S.D. dependent var		1.420631
S.E. of regression	0.560644	Akaike info criterion		1.775177
Sum squared resid	11.31557	Schwarz criterion		1.944065
Log-likelihood	-31.50354	Hannan-Quinn criteria		1.836242
F-statistic	71.47032	Durbin-Watson stat		2.079061
Prob(F-statistic)	0.000000			

The results of equation 3 (table 4) show a positive effect, although not significant, of GDP per capita on MEH, and a negative effect of PS. It includes two dummy variables for countries 35 (Russian Federation) and 8 (Botswana).

Regarding the possible positive impact of past values of MEH on current value of PH, when military policy is successful to increase PS, then usually there are positive effects on real PH and on other variables that imply improvements in economic development and quality of life.

In table 5, we include two dummy variables, which value is equal to unity in some special cases and 0 in the rest of countries of the sample:

DUM1=1 in countries: 3 Armenia, 4 Azerbaijan, 8 Botswana, 25 Jordan, 27 Lebanon

DUM2=1 in countries: 12 Colombia, 23 Iraq, 31 Namibia 35 Russian Fed.

We have used data from Table 6 in the Annex, but for the case of ME% of Iran, where we have substituted the percentage that results from table A1 by the percentage provided by the World Bank.

4.3. Discussion.

First approach. Based on the results of analysis and testing, military expenditure and the total Labor Forces of 40 developing countries with upper-to-middle-income levels have a positive and significant effect on the value of GDP. It means that they can encourage economic growth in these countries during the COVID-19. This condition explains that these developing countries use their military expenditure budgets in the context of preventing or controlling COVID-19 As Kollias & Paleologou explains (2019), public spending accounts for 13% of GDP growth for middle-income countries.

In a study by Hou dan Chen (2013) with 35 developing countries in 1975-2009 explains that military spending has a negative and significant impact on economic growth. Musayev (2015) explains that military expenditure in the presence of high internal threats boosts economic growth, while military expenditure driven by rent-seeking and corruption reduces growth. Furthermore, Ali (2021), who conducted a study in Egypt, explains that military expenditure does not affect GDP, but on the contrary, GDP affects military expenditure. Markowski et al. (2017) estimate military expenditure elasticity to GDP can be extended to an estimate of the elasticity of military expenditure for government revenues that have an impact on economic growth. Similarly, the share of military personnel in the workforce is a useful indicator of the labor intensity of the force structure.

Therefore, military expenditure on developing countries that face high internal threats can encourage or increase economic growth. In this study, 40 developing countries with upper-to-middle-income status during 2020 have faced the threat of the COVID-19 pandemic. These conditions encourage military expenditure to be used to deal with the threat of COVID-19, thus providing a positive and significant impact on GDP growth with other effects on economic growth.

Second approach. Empirical evidence shows that there are important relationships between Political Stability (PS) and the Percentage of Military Expenditure on GDP. When PS has a low value usually there are increases of % ME addressed to increase PS. When Military policies are successful there is appositive impact on PS and Political Stability usually shows a positive effect on economic development.

5. Conclusion.

During the COVID-19 pandemic, it is necessary to analyze military expenditure on economic growth and development through political stability, and the size of the workforce. This study aims to provide an analysis of military expenditure, political stability, the total of the workforce on economic growth through the GDP during the COVID-19 pandemic. Based on the results of the study, the estimated coefficient of Military Expenditure (ME) on GDP is 0.194. It means that if the value of Military Expenditure (ME) increases by one unit, the GDP will increase by 0.194 so that military spending (ME), and other missing variables related to ME, affects economic growth through the GDP positively (Hypothesis 1 is accepted).

The estimated coefficient of % of Gross Fixed Capital Formation (Capital1) to GDP is -0.004, due to the specification problem cited in section 4.2.1, and the coefficient of the value of the Gross Fixed Capital Formation (Capital2) is 0.43. Hypothesis 2 is accepted in the regression with Capital2.

The estimated coefficient of the Total Labor Force (Labor) on GDP is 0.843 in Table 2 and 0.43 in Table 3. It means that if the value of the Labor Force (Labor) increases by one unit, the GDP will increase by 0.843 so that the total labor force in a country affects economic growth through the GDP positively (Hypothesis 3 is accepted).

The estimated coefficient of Political Stability (PS) on GDP is 0.159 and not significant in Table 2 and negative and significant in Table 3. The empirical evidence seems to show that PS has a positive impact on GDP per capita while total GDP depends not only on GDP per capita but also on Population size.

Limitations and Suggestions. This study looks at cross-sectional data from the COVID-19 pandemic in 2020. Several other variables, such as government policy during a pandemic and the potential of internal and external wars, are still unaccounted for in this analysis. As a result, it needs to be further refined with a panel data technique and an additional period to determine the differences in the usage of the state budget and its impact on GDP growth before Covid-19, during Covid-19, and during the new normal.

References

Abdellatif, D., Moutaouakil, K. E., & Satori, K. (2018). Clustering and Jarque-Bera Normality Test to Face Recognition. *Procedia Computer Science, 127*, 246-255. doi:10.1016/j.procs.2018.01.120

Aizenman, J., & Glick, R. (2006). Military Expenditure, Threats, and Growth. *The Journal of International Trade & Economic Development, 15*(2), 129-155. doi:10.1080/09638190600689095

Ajmair, M., Hussain, K., Abbassi, F. A., & Gohar, M. (2018, March). The Impact of Military Expenditures on Economic Growth of Pakistan. *Applied Economics and Finance, 5*(2), 41-48,. Retrieved from https://ideas.repec.org/a/rfa/aefjnl/v5y2018i2p41-48.html

Ali, A. A. (2021). The Causal Relationship between Military Expenditure and Economic Growth in Egypt during the period from 1980 to 2019. *Scientific Journal for Economic& Commerce*, 701-734. doi:10.21608/JSEC.2021.165846

Amir, H., Khan, M., & Bilal, K. (2015). Impact of educated labor force on Economic growth of Pakistan: A human capital perspective. *European Online Journal of Natural and Social Sciences, 4*(4), 814-831.

Asongu, S. A., Roux, S. L., & Singh., P. (2021). Fighting terrorism in Africa: complementarity between inclusive development, military expenditure and political stability. *Journal of Policy Modeling, 43*(5), 897-922. doi:10.1016/j.jpolmod.2020.01.014

Bai, J., Bali, T. G., & Wen, Q. (2019). Common risk factors in the cross-section of corporate bond returns. *Journal of Financial Economics, 131*(3), 619-642. doi:10.1016/j.jfineco.2018.08.002

Ball, R., Gerakos, J., Linnainmaa, J. T., & Nikolaev, V. (2016). Accruals, cash flows, and operating profitability in the cross section of stock returns. *Journal of Financial Economics, 121*(1), 28-45. doi:10.1016/j.jfineco.2016.03.002

Biltagy, M. (2019). Human Capital, Labor Market Frictions And Migration In Egypt. *Applied Econometrics and International Development, 19*(2), 107-124.

Bjorvatn, K., & Farzanegan, M. R. (2015). Resource rents, balance of power, and political stability. *Journal of Peace Research, 52*(6), 1-16. doi:10.1177/0022343315593992

Briceño, H., & Perote, J. (2020). Determinants of the Public Debt in the Eurozone and Its Sustainability Amid the Covid-19 Pandemic. *Sustainability, 12*(16), 1-29. doi:10.3390/su12166456

Cremers, M., Halling, M., & Weinbaum, D. (2015). Aggregate Jump and Volatility Risk in the Cross-Section of Stock Returns. *Journal of Finance, LXX*(2), 577-614. doi:10.1111/jofi.12220

d'Agostino, G., Dunne, J. P., & Pieroni, L. (2019). Military Expenditure, Endogeneity and Economic. *Defence and Peace Economics, 30*(5), 509-524. doi:10.1080/10242694.2017.1422314

Dunne, J. P., & Smith, R. P. (2019). Military Expenditure, Investment and Growth. *Defence and Peace Economics, 31*(6), 601-614. doi:10.1080/10242694.2019.1636182

Dunne, J. P., & Tian, N. (2013). Military expenditure and economic growth: A survey. *The Economics of Peace and Security Journal, 8*(1), 5-11. doi:10.15355/epsj.8.1.5

Edwards, J. A., Naanwaab, C. B., & Romero, A. A. (2017). "Effect of FDI on real per capita GDP Growth: A Rolling Window Panel Analysis of 60 countries, 1982-2011. *Applied Econometrics and International Development, 17*(1), 19-36.

Georgiou, M. N., Kyriazis, N., & Economou, E. M. (2015). Democracy, Political Stability and Economic performance. A Panel Data Analysis. *Journal of Risk & Control, 2*(1), 1-18.

Guisan, M. C. (2015). Selected readings on econometrics methodology, 2001-2010: causality, measure of variables, dynamic models and economic approaches to growth and development. *Applied Econometrics and International Development, 15*(2), 213-220.

Guisan, M. C. (2022). Political Stability and Economic Development in 164 Countries, for 2010-2020. *Applied Econometrics and International Development, 22*(1).

Hou, N., & Chen, B. (2013). Military Expenditure and Economic Growth in Developing Countries: Evidence from System GMM Estimates. *Defence and Peace Economics, 24*(3), 183–193. doi:10242694.2012.710813

Hu, X., Zhang, X., Wang, Y., & Xie, X. (2021). Cross-sectional study on the drug utilization and evaluation indicator of antibiotics used in pediatric population. *BMC Health Serv Res, 21*(1091), 1-10. doi:10.1186/s12913-021-06727-3

Jadhav, P. (2012). Determinants of foreign direct investment in BRICS economies: Analysis of economic, institutional and political factor. *Social and Behavioral Sciences, 37*, 5-14. doi:10.1016/j.sbspro.2012.03.270

Kariuki, C. (2015). The Determinants of Foreign Direct Investment in the African Union. *Journal of Economics, Business and Management, 3*(3), 346-351. doi:10.7763/JOEBM.2015.V3.207

Kollias, C., & Paleologou, S.-M. (2019). Military spending, economic growth and investment: a disaggregated analysis by income group. *Empirical Economics, 56*, 935-958. doi:10.1007/s00181-017-1379-2

Kumar, K., & Paramanik, R. N. (2020). Nexus between Indian Economic Growth and Financial Development: A Non-Linear ARDL Approach. *Journal of Asian Finance, Economics and Business, 7*(6), 109 – 116. doi:10.13106/jafeb.2020.vol7.no6.109

Le, M. P., & Tran, T. M. (2021). Government Education Expenditure and Economic Growth Nexus: Empirical Evidence from Vietnam. *Journal of Asian Finance, Economics and Business, 8*(7), 0413–042. doi:10.13106/jafeb.2021.vol8.no7.0413

Lin, G.-F., Chang, M.-J., Huang, Y.-C., & Ho, J.-Y. (2017). Assessment of susceptibility to rainfall-induced landslides using improved self-organizing linear output map, support vector machine, and logistic regression. *Engineering Geology, 224*, 62-74. doi:10.1016/j.enggeo.2017.05.009

Maliszewska, M., Mattoo, A., & van der Mensbrugghe, D. (2020). The Potential Impact of COVID-19 on GDP and Trade : A Preliminary Assessment. *Policy Research Working Paper, no. 9211*.

Markowski, S., Chand, S., & Wylie, R. (2017). Economic Growth and Demand for Military Expenditure in the Indo-Pacific Asia Region. *Defence and Peace Economics, 28*, 473-490. doi:10.1080/10242694.2016.1274059

Musayev, V. (2015). Externalities in Military Spending and Growth: The Role of Natural Resources as a Channel through Conflict. *Defence and Peace Economics, 27*, 378-391. doi:10.1080/10242694.2014.994833

Nguyen, C. H., & Thi Truc Quynh Pham, T. H. (2021). The Relationship between Foreign Capital Inflows and Economic Growth: Empirical Evidence from Vietnam. *Journal of Asian Finance, Economics and Business, 8*(11), 0325–0332. doi:10.13106/jafeb.2021.vol8.no11.0325

Padhan, R., & Prabheesh, K. P. (2021). The economics of COVID-19 pandemic: A survey. *Economic Analysis and Policy, 70*, 220-237. doi:10.1016/j.eap.2021.02.012

Raju, M., & Ahmed, Z. (2019). ffect of military expenditure on economic growth: evidences from India Pakistan and China using cointegration and causality analysis. *Asian j. Ger. Eur. stud, 4*(3), 1-8. doi:10.1186/s40856-019-0040-6

Rambeli, N., Hashim, E., & Marikan, D. A. (2016). Relationship between Education Expenditure, Capital, Labor Force and Economic Growth in Malaysia. *International Journal of Academic Research in Business and Social Sciences, 6*(12), 459-468. doi:10.6007/IJARBSS/v6-i12/2510

Rashid, M., Looi, X. H., & Wong, S. J. (2017). Political stability and FDI in the most competitive Asia Pacific countries. *Journal of Financial Economic Policy, 9*(2), 140-155. doi:10.1108/JFEP-03-2016-0022

Saba, C. S., & Ngepah, N. (2019). Military expenditure and economic growth: evidence from a heterogeneous panel of African countries. *Economic Research-Ekonomska Istraživanja, 32*(1), 3586-3606. doi:10.1080/1331677X.2019.1674179

Sahabuddin, Z. A., & Hadianto, B. (2019). The effect of board governance and debt policy on value of non-financial firms. *Investment Management and Financial Innovations, 16*(2), 37-46. doi:10.21511/imfi.16(2).2019.04

Salmerón, R., García, C. B., & García, J. (2018). Variance Inflation Factor and Condition Number in multiple linear regression. *Journal of Statistical Computation and Simulation, 88*(12), 2365-2384. doi:10.1080/00949655.2018.1463376

Solarin, S. A. (2018). Determinants of military expenditure and the role of globalisation in a cross-country analysis. *Defence and Peace Economics, 29*, 853-870. doi:10.1080/10242694.2017.1309259

Song, L., & Zhou, Y. (2020). The COVID-19 Pandemic and Its Impact on the Global Economy: What Does It Take to Turn Crisis into Opportunity? *China & World Economy, 28*(4), 1-25. doi:10.1111/cwe.12349

Su, C., Xu, Y., Chang, H. L., Lobont, O.-R., & Liu, Z. (2020). Dynamic Causalities between Defense Expenditure and Economic Growth in China: Evidence from Rolling Granger Causality Test. *Defence and Peace Economics, 31*(5), 565-582. doi:10.1080/10242694.2018.1505583

Sulistyowati, U., Notodiputro, K. A., & Sumertajaya, I. M. (2020). A Repeat Cross-Section Model for Analyzing Unemployment Data in Bogor. *Indonesian Journal of Statistics and Its Applications*, 254-260. doi:10.29244/ijsa.v4i2.513

Thompson, C. G., Kim, R. S., Aloe, A. M., & Becker, B. J. (2017). Extracting the Variance Inflation Factor and Other Multicollinearity Diagnostics from Typical Regression Results. *Basic and Applied Social Psychology, 39*(2), 81-90. doi:10.1080/01973533.2016.1277529

Yesilyurt, F., & Yesilyurt, M. E. (2019). Meta-analysis, military expenditures and growth. *Journal of Peace Research, 56*(3), 352-363. doi:10.1177/0022343318808841

Zangirolami-Raimundo, J., Echeimberg, J. d., & Leone, C. (2018). Research methodology topics: Crosssectional sectional studies. *Journal of Human Growth and Development*, 356-360. doi:10.7322/jhgd.152198

Annex 1. Table 6.

Table 6: 40 Upper-middle-Income countries in year 2020

		units	(%)	(Million)	Upper %	Million
Nb	**Countries**	**Labor**	**Capital**	**ME**	**PS**	**Gdpv**
1	Albania	1402604	23.25	220.00	61.32	14799.62
2	Argentina	19191447	13.38	2907.19	58.96	383066.98
3	Armenia	1175542	16.57	633.96	41.98	12645.46
4	Azerbaijan	4881649	23.51	2237.76	35.38	42607.18
5	Belarusia	4909766	24.78	844.51	34.43	60258.24
6	Belize	172711	18.09	24.51	78.77	1763.70
7	Bosnia-Herzegovina	1297577	20.01	167.50	43.40	19788.42
8	Botswana	1086713	31.85	545.76	97.17	15781.73
9	Brazil	99843130	16.43	19736.35	44.81	1444733.26
10	Bulgaria	3238899	17.82	1247.23	74.53	69105.10
11	China	770950792	42.89	252304.22	49.53	14722730.70
12	Colombia	24802460	18.70	9216.42	36.79	271346.90
13	Dominican R	4858960	27.35	599.05	62.26	98808.01
14	Ecuador	8019239	23.53	2243.50	47.64	98808.01
15	Fiji	357260	15.86	73.51	92.45	4376.01
16	Gabon	726653	21.62	271.50	56.60	15593.18
17	Georgia	1892477	24.51	292.17	45.28	15891.69
18	Guatemala	6410911	13.51	342.77	45.28	77604.63
19	Guinea (Equatorial)	4456144	15.01	209.67	39.62	15681.05
20	Guyana	291832	31.73	66.02	54.72	5471.26
21	Indonesia	134616083	31.73	9395.53	42.92	1058423.84
22	Iran	26813322	22.72	15825.14	10.38	191718.27
23	Iraq	10356947	3.01	7015.56	3.77	167224.43
24	Jamaica	1457011	24.23	244.43	67.92	13812.42
25	Jordan	2595850	10.52	2077.04	47.64	43697.66
26	Kazakhstan	8778458	9.16	1732.92	50.00	169835.43
27	Lebanon	2317840	10.01	1921.39	10.85	33383.25
28	Malaysia	15904215	20.94	3807.71	61.32	336664.44
29	Mexico	53978977	18.79	6116.38	28.30	1076163.32
30	Montenegro	271834	27.61	102.09	58.49	4778.58
31	Namibia	942826	13.45	373.84	87.26	10699.93
32	North Macedonia	897070	20.59	157.98	61.79	12266.95
33	Paraguay	3562864	20.38	364.34	58.49	35304.24
34	Peru	16181966	19.69	2633.12	50.00	202014.36
35	Russian Fed.	71903592	21.76	61712.54	34.43	1483497.78
36	Serbia	3167119	21.49	1121.21	56.13	52960.13
37	South Africa	21742744	12.43	3150.83	51.89	301923.64
38	Thailand	38483357	23.06	7340.19	39.62	501794.96
39	Turkey	32317036	27.19	17724.63	18.40	720101.21
40	Turkmenistan	2360858	48.88	111.92	51.89	47350.00

Notes: (1) the number of workers, (2) is the % of Gross Fixed Capital Formation (GFCF on GDP), (3) ME is Military Expenditure of year 2020 in million Dollars (in (all the cases, but Iran, from ISPRI statistics, and from World Bank for Iran). Political Stability % of upper limit.

Annex 2. Analysis of the results of table 2.

Based on table 2, it can be concluded that: the value of R^2 is 0.966. It means that the variation of all independent variables (ME, LABOR, CAPITAL, PS) can affect the dependent variable (GDP) by 96.67% (0.966). This includes the effects not only of the included explanatory variables but also the effect of missing explanatory variables that have effect on GDP and linear correlation with the included explanatory variables, as seen in the Annex of Guisan (2015) on the effects of missing relevant variables. While the remaining 3.4% (0.034) is influenced by other variables outside the study, and not related linearly with the included explanatory variables. So that the regression equation can be arranged as follows:

$$\mathbf{ln}(\boldsymbol{GDPV}) = -\mathbf{3.835} + \mathbf{0.194ln}(\boldsymbol{ME}) + \mathbf{0.843ln}(\boldsymbol{Labor}) - \mathbf{0.004ln}(\boldsymbol{Capital}) + \mathbf{0.159ln}(\boldsymbol{PS})$$

Hypotheses Testing.
t-Test

Table 7: t-Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.835526	0.895280	-4.284162	0.0001
LN_CAPITAL	-0.003972	0.149587	-0.026556	0.9790
LN_LABOR	0.843297	0.087339	9.655475	0.0000
LN_ME	0.193774	0.084278	2.299230	0.0276
LN_PS	0.159264	0.127179	1.252281	0.2188

A partial t-test is indicated by the value of "*t-Statistics*". On Table 7 are:

- The partial t-test of military expenditure (ME) is positive at 2.299 with a probability value of 0.0276 (<0.05) so that H1 is accepted.
- Partial t of Total Labor Force (Labor) has a positive value of 9,655 with a probability value of 0.0000 (<0.05) so H1 is accepted.
- Partial t-test of Gross fixed capital formation (Capital) has a negative value of -0.026 with a probability value of 0.979 (>0.05) so that H0 is accepted.
- Partial t-test of Political Stability (PS)) has a positive value of 1.252 with a probability value of 0.218 (>0.05) so that H0 is accepted.

Based on the results of processed data, it is obtained that military expenditure (ME) and Total Labor Force (Labor) are smaller than the 5% significance level, and t statistics for military expenditure (ME) and Total Labor Force (Labor) are positive. This shows that military expenditure (ME) and Total Labor Force (Labor) have a positive and significant effect on GDP. Second, Gross Fixed Capital Formation (Capital) has a negative but not significant effect on GDP. Third, Political Stability (PS) has a positive but not significant effect on GDP.

F Test.

Table 8: F Test Results.

R-squared	0.966610	Mean dependent var	11.18699
Adjusted R-squared	0.962794	S.D. dependent var	1.936141
S.E. of regression	0.373462	Akaike info criterion	0.984465
Sum squared resid	4.881572	Schwarz criterion	1.195575
Log-likelihood	-14.68930	Hannan-Quinn criteria	1.060796
F-statistic	253.3018	Durbin-Watson stat	2.238600
Prob(F-statistic)	0.000000		

Simultaneous tests in e-views are shown in Table 8 with the results of the F test scores using the E-views 10 application. In E-Views it is labeled *F-statistics*. In this study, the F value is 253.301 with a p-value of 0.00000 which <0.05 or the critical limit of the study, so it can be concluded that you accept H1. Thus, H0 is rejected and H1 is accepted at the 95% confidence level, which identifies that military expenditure (ME), Total Labor Force (Labor), Gross Fixed Capital Formation (Capital), and Political Stability (PS) together affect GDP growth rate.

Normality Test.

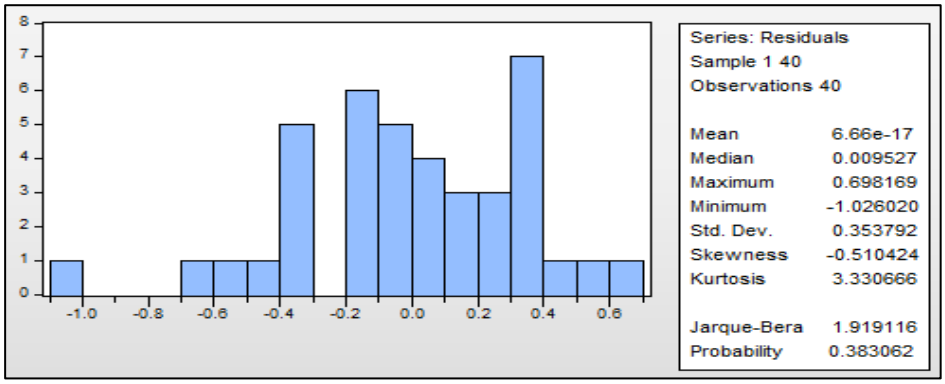

Figure 2: Normality Test Results.

Based on the results of the normality test, the **Jarque Bera** value obtained is 1.919 with a p-value of 0.383 where > 0.05 (5%), so the probability is greater than alpha 5% which means the residual is normally distributed. This means that the residuals are normally distributed so that the classical assumption of normality in the Ordinary Least Square-based multiple regression model has been fulfilled.

Classic Assumption Test
Multicollinearity Test

Table 9: Multicollinearity Test Results.

Variance Inflation Facors. Sample: 1-40 Included observations: 40			
Variable	**Coefficient Variance**	**Uncentered VIF**	**Centered VIF**
C	0.801527	229.8721	NA
LN_CAPITAL1	0.022376	57.75164	1.374278
LN_LABOR	0.007628	531.7290	7.406193
LN_ME	0.007103	110.9045	8.051044
LN_PS	0.016175	67.98362	1.705381

Based on the results of the VIF test, no VIF value is greater than 10. Where the VIF value for the military expenditure (ME) variable is 8051; Total Labor Force (Labor) Variable is 7,406; Gross fixed capital formation (Capital) Variables 1.374; and the Political Stability (PS) variable is 1.705. Thus, this regression model is proven to have no multicollinearity problem.

Heteroscedasticity Test.

Table 10: Heteroscedasticity Test Results.

Heteroskedasticity Test: Harvey			
F-statistic	1.255287	Prob. F(4,35)	0.3060
Obs*R-squared	5.018495	Prob. Chi-Square(4)	0.2854
Scaled explained SS	4.589867	Prob. Chi-Square(4)	0.3320

Heteroscedasticity occurs when the residual and predictive values have a relationship pattern. The pattern of this relationship is not only a linear but also different relationship. The heteroscedasticity symptom test method used is Harvey. If the value of Prob. F-count is greater than 0.05 then there is no indication of heteroscedasticity symptoms. Based on the results of the Harvey test, it can be seen that the calculated Prob F-count value is 0.306 > 0.05, so it can be concluded that there are no heteroscedasticity symptoms or this model is free from heteroscedasticity symptoms.