

Analyzing the Economic Effects of Military Expenditures in ASEAN Countries

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ABSTRACT

There have been numerous studies conducted towards explaining the relationship of military expenditure to economic growth, investment, and unemployment, but no conclusive verdict can be made due to varying outcomes. To contribute to this field of study, the researchers are using the OLS and Cochrane-Orcutt model to determine the linear effect of military expenditure on the dependent variables. The sample countries will be classified according to their level of military spending and income group to examine a possible existence of a trend. The regression results show that the classification of countries has no bearing with regards to the impact of military spending on economic growth, investment, and unemployment, rather, the impact is dependent on the specific situation of each country. Moreover, as past studies implied a transitive attribute towards the relationship of the variables, this study produces a modified assumption that if economic growth is negative, it does not mean that investment and employment will be negative for they may be insignificant, it means that if either or both of the variables are significant, they will follow the same relationship of military expenditure and economic growth.

Keywords: military expenditure, economic growth, investment, unemployment

1. Introduction

In the past decades, military expenditure has been one of the major concerns for both developing and developed countries in terms of economic growth because a lion's share of a country's budget is exhausted by the defense sector (Ali and Ather, 2015). There are studies that suggest that allocation of budget to military hardware lowers economic improvements because it crowds out investment to other productive sectors while others argue that in conflicting countries, it boosts business confidence which directly increases investments and economic growth (Asadullah and Aziz, 2017). For Pakistan, military expenditure is thought to be a major component of its total expenditure. Due to this, high spending on military forces reduces resources for other productive factors like education, policy implementations, development

projects, etc. hence, perceiving high military expenditure to having a low economic growth; however, the defense sector also has the potential to support economic development because it generates opportunities for employment (Ali and Ather, 2015).

Allocating the budget to defense expenditure consumes scarce resources of an economy. The opportunity cost of defense spending is the reduction to total output which is the cause of delay in economic growth resulting in a loss of potential growth (Ahad and Dar, 2017). Scarce resources are diverted from profitable areas in order to boost military development costs; specifically, for developing countries or places where militant conflicts are strong. This is likely to have a negative causal relationship between military expenditure and economic growth. In order to further support the spending on military development, scarce resources are lifted from productive sectors. This in return is expected to have a negative causal relationship between military expenditure and economic growth specifically for developing countries, or areas where militant conflicts are high (Chang et al, 2011). Aizenman and Glick (2016) stated that spending used in the defense sector can remove resources from productive sectors of the economy by crowding out consumption, investments, and labor. Similarly, Korkmaz (2015) mentioned that the allocation of budget for defense spending drives out resources for investments, which in turn slows down economic growth and limits employment in sectors not related to the defense sector. Based on the conclusions of these researchers, the impact of military spending presents an attribute of transitivity on economic growth, investment, and employment, wherein these variables can only have the same relationship with each other. Therefore, the objective of this study is to find out the validity of the previous statement, or if there can be instances where these variables will have opposing relationships with military expenditure on a per-country basis.

The researchers categorized the countries into groups based on their military spending levels to see if there was a significant difference in how the dependent variables were affected. Lastly, the researchers provided pertinent suits of policies that may effectively allocate military spending to influence favorable economic outcomes. In conducting this study, the researchers made use of data from ASEAN countries to identify the unidirectional influence of defense expenditure on economic growth, investment, and unemployment. Additionally, the relationship of the variables is only limited to a linear relationship, as no control variables were configured in the model.

2. Literature Review

2.1 Economic Growth

Researchers have conducted numerous studies in identifying the impact of military expenditure on the growth of the economy, but failed to reach a consensus, leading to varying results – positive, negative, and insignificant relationships. Yildirim et al. (2005) made use of the Feder model and classified countries based on their level of income, wherein the overall findings presented that economic growth is positively affected by military spending in Middle Eastern countries from 1989-1999. Araujo Jr et al. (2006) mentioned that the Solow and Barro Model, which are models of growth, are best used in conducting a study about defense expenditure growth topics. They were able to ascertain that countries with relatively progressive governments

and significant factors like external threats would make military defense expenditure increase economic growth. Arif et al. (2012) prepared mainly their article from the basis of different academic kinds of a literature survey to which suggested that there may be four possible causal ordering between economic growth: (1) bi-directional causality between military expenditure and economic growth, (2) unidirectional causality from growth to military expenditure or vice versa and the (3) absence of any causal relationship. It was found that if economic factors such as Gross Domestic Product/Gross National Income, Central Government Expenditure, and Foreign Exchange Availability of a country increase, the ability of that country to focus its resources on military purposes will be greater hence, it positively affects the growth of the economy. In comparison to the study of Kollias and Paleologou (2017) employing the panel vector autoregression (PVAR) model, they discovered that only high-income countries have a significant beneficial influence on GDP growth as a result of military spending. Moreover, Lin and Wang (2019) also utilized an advanced vector autoregression model (VAR), namely the mixed frequency VAR (MFVAR) model, demonstrating that there is a positive bidirectional relationship between economic growth and defense expenditure in Taiwan from 1975-2017. Ahmed and Raju (2019) conducted their study on India for the period of 1980-2017, and Pakistan and China from 1989-2017 with the goal of identifying the directional correlation of military spending and economic growth along with its impact in the short run and long run. Their study made use of the Engle-Granger cointegration test and Granger causality test which resulted in military expenditure having a significant positive impact on economic growth in the long run for India, Pakistan, and China, while no such evidence was witnessed in the short run.

Dunne and Vougas (1999) examined the impact of military defense spending and economic growth for the economies of South African countries with data covering the years 1964 – 1996 using granger causality techniques and vector autoregressive (VAR) methodology that uses cointegration. They were able to determine that military defense spending had a statistically significant detrimental influence on the economic growth of the developing countries observed. Galvin (2003) conducted his study using data from 64 developing countries by analyzing the impact of military expenditure on economic growth through the employment of a panel data analysis using the two-least squares and three-least squares method. The study showed that military defense expenditure is negatively correlated with both economic growth and savings-income ratio: it has a more detrimental impact in countries that are middle-income while low-income countries have a less adverse effect. Chang et al. (2011) employed a dynamic panel data (DPD) model with the application of Granger causality test in 90 countries from 1992-2006 and categorized them based on their level of income and geopolitical district. Findings suggest that in low-income countries, Middle East-South Asia, and European regions, military spending is inversely correlated with economic growth. Hou and Chen (2012) conducted a study on 35 developing countries from 1975-2009 by using the augmented Solow growth model with the application of system generalized method of moments (GMM) estimation, where they found military spending is negatively correlated with economic growth. Similarly, Dunne and Tian (2013) also implemented the augmented Solow growth model to 104 countries from 1988-2010 and categorized them into several sub-groups. The results showed that military spending significantly and negatively affects economic growth in developed and developing countries in the short run, but only remains significant and negative in developing countries in the long run, as it becomes insignificant in developed countries. Korkmaz (2015) utilized panel data for the study of 10 Mediterranean countries for the period of 2005-2012, resulting in military spendings having a significant negative correlation with economic growth. Those countries that are

surrounding the Mediterranean region are faced with security crises, which also heightens the need to strengthen the security of Mediterranean countries themselves. This forces the government to allot shares to military spending which will not be used for investments in education, health, and infrastructure fields, slowing down economic growth. Azam (2020) used a multivariate regression equation in conducting a study on 35 non-OECD countries from the period of 1988 – 2019, identifying that military expenditure and economic growth are negatively related. Furthermore, by using the Dumitrescu–Hurlin Granger causality test, it showed that the variables are linked in a bidirectional manner.

The previous studies stated above acquired a single relationship, positive and negative, respectively, between the variables, but there are also studies containing varying results, a mixture of positive, negative, and insignificant relationships, even with the use of a single method. Dakurah et al. (2001) used the granger causality method to check the link associated with military defense expenditure and economic growth in 62 developing countries to which they found that 23 countries showed a linear causality flowing from either defense spending to economic growth or vice versa; 7 countries showed a bi-directional causality; and that there was no causality in 32 countries whether be they are integrated in the same order or not. The results displayed that military defense spending through crowding out of investment affects economic growth negatively, but could positively affect it through increasing the aggregate demand. Aizenman and Glick (2006) modified the Barro-style growth model by taking into account external threats, corruption, and control variables, wherein they found that military spending stemmed from external threats results in a positive relationship with economic growth, while military spending stemmed from corruption results in a negative relationship in 90 countries. Hirnissa et al. (2009) applied an autoregressive distributed lag (ARDL) model to ASEAN-5 countries from 1965-2006 so they could investigate the causality between the variables. It was found that there is a bidirectional negative correlation between military spending and economic growth in Singapore, while Indonesia and Thailand have a unidirectional relationship flowing from economic growth to military expenditure, and Malaysia and the Philippines have insignificant relationships. A. Yang et al. (2011) managed a study on 92 countries from 1992-2003 by applying a threshold regression model with the addition of a threat variable and proxies. Findings suggest that military spending is negatively correlated with economic growth in 23 countries belonging to the threshold level of initial income, while the existence of external threats increases economic growth, and the rest of the countries presented an insignificant effect. Akhmat et al. (2014) examined 5 SAARC countries by gathering sample data from 1988 – 2008 by using Pedroni's test for panel cointegration framework and applying panel unit root. The results showed that external debt, economic growth, and military expenditure were cointegrated for the panel of five SAARC countries wherein in the long run, external debt is elastic with military expenditure while it is inelastic in the short run. This means that economic growth and military expenditures have a statistically significant negative and positive effect on the external debt of the five countries mentioned. Ali and Ather (2015) applied 2SLS to examine the influence of defense expenditures on the economic growth in Pakistan from 1980 to 2013 data and was able to reveal that these expenditures are both, directly and indirectly, related to the economic growth in Pakistan. The conventional panel data analysis model was used by Azam and Feng (2015) to investigate the influence of military spending on external debt to 10 Asian countries from the years 1990 up to 2011. Specifically, the models used were random-effects models and fixed-models which revealed that military expenditures affect external debt positively, while foreign exchange reserves and economic growth were found to have negative

effects on external debt. It was also mentioned that military spending induces adverse consequences to economic growth by giving rise to increasing external debt. Manamperi (2016) implemented a modified Barro-style growth model with the application of an ARDL model for investigation in the long-term relationship of military spending and economic growth, and a vector error correction model (VECM) for the short-term relationship. In the short and long term, the study showed that military spending has a negative link with economic growth in Turkey, whereas for Greece, it has a negligible influence in both the short and long run. Ahad and Dar (2017) conducted a similar study for different samples including USA, UK, and Russia for the period of 1992-2014 by using non-linear ARDL and Wald tests. Findings showed that military expenditure is negatively correlated with economic growth in the short-run and long-run in the USA and UK, while a positive relationship emerged in Russia in the short and long-run. Asadullah and Aziz (2017) gathered data for 70 low-income and middle-income developing countries from 1990-2013 and applied a method according to the Cobb-Douglas production function with an addition from political variables to include the role of the government and security variables to include the presence of threats.

They used a variety of estimating methods to determine the influence of military expenditure on growth which showed inconsistency in the results – system GMM, fixed effects and random effects model all presented a negative correlation; all regression models presented a positive relationship in the presence of internal conflict; cross-sectional OLS and low-income country fixed effects model presented an insignificant relationship. Ngepah and Saba (2019) applied the Fully Modified OLS and Dynamic OLS to investigate long-run elasticity, and GMM and System GMM estimation techniques to identify the unidirectional or bidirectional correlation between military spending and economic growth on a per-country basis. By taking into account the 35 African countries in the sample from 1990-2015, FMOLS and DOLS indicated that military spending has a long-term negative impact on economic growth while GMM and SGMM showed a bidirectional causality between the variables. On a per-country basis, military expenditure linearly affecting economic growth only existed in 2 countries, but a unidirectional causality from economic growth to military expenditure existed in 14 countries, and a bidirectional causality existed in 12 countries. The differences in the causal relationships in the samples may be due to the sample period, variation in the defense and growth policies, and type of government in each of the countries.

Yildirim et al. (2017) mentioned that the use of a Feder model will most likely lead to a positive or an insignificant relationship between economic growth and military spending. From Kollias and Paleologou (2017), and Lin and Wang (2019), the VAR model showed that military spending has a beneficial impact on economic growth in both cases, even with the application of different advanced VAR models. The implementation of a Solow-type growth model is most likely to exhibit that economic growth and military expenditure has a negative relationship (Dunne and Tian, 2013). Furthermore, ARDL, Barro model, and methods based on the Cobb-Douglas production function do not produce a distinct relationship between the variables (Aizenman and Glick, 2006; Hirnissa et al., 2009; A. Yang et al., 2011; Manamperi, 2016; Ahad and Dar, 2017; Asadullah and Aziz, 2017). Aziz and Asadullah (2017) stated that the use of different empirical models to estimate the relationship of the variables contributes to a bias regarding their effect. Generally, non-linear estimation techniques are the key to producing a positive relationship, alternative estimators for a negative relationship, and dynamic panel specification have inconsistent outcomes.

H1: Military expenditure is negatively related to economic growth.

2.2 Investment

As per the effects of investment on military expenditure, the researchers found various results of positive, negative, and insignificant relationships. Atesoglu, S. (2004) mentioned that there were researchers that expressed concerns regarding the rise of defense spending would reduce investment spending and thereby reduce capital accumulation and economic growth, there are economic techniques and annual data that support the view. By using the ordinary least squares (OLS) based cointegration technique to analyze the annual data, he stated that there is no long-term cointegration relationship on the two variables: defense spending and investment. The relation of the variables in the United States was examined by using post-World War II quarterly data and Johansen cointegration and error correction modeling techniques. The findings state that investment and defense spending have a positive connection and do not indicate a tradeoff between the variables and revealed that defense spending's and non-government spending's effects on investment depend on their magnitude. In comparison to the study of Malizard, J. (2014), from 1980 to 2010 He made use of the Keynesian model to explore the effects of military spending on investments in France. Because both parts share the same source of resources through the growing budget deficit and borrowing rates, defense spending drives out investment. Furthermore, because military equipment is manufactured by industries that are capital-driven goods, changes made in this sector have an elastic impact on private investments.

Smith (1980) used a regression model where data are treated as time series, cross-section, and pooled data. By using 14 large OECD countries through the years of 1954 and 1973 (postwar period), the hypothesis revealed that there was a huge opportunity cost of military expenditure by cutting down investment. This indicates that investment has a negative causal relationship with military spending. Meanwhile, Kollias (1995) utilized the error-correction approach in the country of Greece during the period of 1963 to 1990 and stated that defense expenditure can influence the economy through other economic aggregates with such effect - crowding out of an investment is one of the examples. In a pooled time-series cross-section sample of OECD nations from 1949 to 1971, Gold (1997) used a Single Equation model and cointegration techniques to find the likely short- and long-term tradeoff between investment and military expenditure. In certain developed countries including the US for example, a trade-off between military spending and investment was taken together and was identified and measured by the methods when it is analyzed separately. This in return was in a conflict of Boulding's (1973) and Edelstein's (1990) empirical research wherein they found insufficient proof of military spending-investment trade-off data which covers a lengthy time and they suggested that relatively low investment is not the only conceivable opportunity cost of military expenditure, but it has been that military expenditure and consumption is the primary trade-off. The measuring instrument for the military spending-investment trade-off has been decreased from a framework that incorporates both gross private and non-government investment, resulting in a negative relationship. Dunne et al. (2002), made use of dynamic panel data methods, the Feder-Ram model, and the Solow-Swan model, in 14 small-industrializing economies from 1960-1998. There is evidence that military expenditure can negatively affect investment, but no such proof exists for positive effects. In analyzing the 14 OECD countries from the time span of 1954-1973, Hou and Chen (2014) made use of an economic model called the "Smith demand-side model" and various evaluation methods which are time series, cross-section, and pooled data. During the

Post-Cold War period, they found out that the military expenditure drives out investment, and its effect was lessened. With the use of the demand-side model of Smith, they were able to measure the driving-out effect of military spending on investment. Thus, it illustrates that military expenditure has an opposing outcome on the investment.

Kollias and Paleologou (2010) utilized the data collated from the European Union-15 from 1961-2002. The researchers used three different models to assess the connection between defense expenditure, investment, and growth; these models are the trivariate VAR model, random coefficient model, and a fixed panel model. Thus, the outcome indicated a linear and positive relation of the subjects stated (military expenditure and investment). On the other hand, there is no signified quantitative relationship regarding defense expenditure, growth, or investment. Dunne and Smith (2019) used a two-way fixed effect VAR that contributed to analyzing military expenditure, growth, and investment from 46 countries from 1960 to 2014. By emphasizing the link between the military expenditure, the researchers focused on the direct effect on growth in capital stock determined by investment. Another model was utilized by Kollias and Paleologou (2017), known as the "panel vector autoregression (PVAR) model." along with SIPRI's new consistent time series dataset. From 1971 to 2014, the researchers used a balanced panel consisting of 65 nations. Overall, 2,730 observations were gathered, but there was no significant relationship concerning military expenditure and investment.

H2: Military expenditure is negatively related to investment.

2.3 Unemployment

Abell (1992) found out that the employment impact of defense spending on race and gender are not equally distributed across time by using VAR techniques to which the unemployment rate increases in relation to the race and sex of an individual as military expenditure increases. Khan et al. (2015) observed the effect of defense spending on unemployment from 1992 to 2013 on five Asian countries using a sundry of relevant tests prior to regression analysis. The empirical results display that lower defense spending reduces unemployment and by allocating more resources for other sectors, the economic and social welfare of the said countries would be more productive.

The Autoregressive Distributed Lag model was used by Qiong and Junhua (2015) utilizing data from 1991 to 2013 in China as a basis for estimation. The time-series properties of four variables (GDP, military expenditure, non-military expenditure, and rate of unemployment) were tested and revealed that military defense expenditure increases the unemployment rate. Meanwhile, its non-military counterpart decreases it. Chletsos and Roupakias (2017) applied the ARDL approach to cointegration for them to be able to identify the defense unemployment nexus in Portugal, Italy, Greece, and Spain during the period of 1960 to 2015. It was discovered that unemployment and defense spending have a stable long-run relationship to which the latter increases the rate of unemployment in Portugal, Greece, and Spain. For the empirical study, Selase (2019) used the Generalized Method of Moments (GMM) techniques with a sample size ranging from 2000 to 2017 on selected African nations sourced from the World Bank Indicator. It was mentioned that spending on infrastructure and education lowers the unemployment rate in the region, whereas spending on health care and defense raises it. The high prevalence of danger

and crimes in the region was discovered to be one of the reasons why there is a direct relationship between defense and unemployment.

Malizard (2014) used the Autoregressive Distributed Lag technique to cointegration to examine the impact of military spending on France's unemployment rate from 1975 to 2008. This revealed that both defense and non-defense expenditures have a negative effect on unemployment, but defense sector spending is more influential on the negative impact. From the period of 1960 – 2015 on Portugal, Italy, Greece, and Spain, Michael and Stelios (2017) applied the Autoregressive Distributed Lag (ARDL) to cointegration to be able to address the defense unemployment nexus. The results suggest that for the countries of Portugal, Greece, and Spain, a stable long-run link exists amidst the variables of military defense spending and unemployment, and as defense spending increases, unemployment decreases in the mentioned countries.

Huang and Kao (2005) adopted the annual data from 1966 to 2002 in Taiwan to determine the relationship between military defense expenditure, GDP, average monthly salary, and employment in the private sector. They concluded that defense spending positively influences long-term employment, but in the short run, it harms employment. Their method was Autoregressive Distributed Lag (ARDL) with the cointegration prospective by another economic literature. Dunne and Smith (2007) used a lengthy historical series of regressions for the United States, the United Kingdom, and pooled post-war data for 11 OECD nations to conclude that military defense spending has no major impact on unemployment rates. Tang et al. (2009) used the Granger causality test to examine the empirical relationship between military expenditure and unemployment rate using a collection of global set data from 46 nations. The findings suggest that there is minimal evidence of a direct relationship between unemployment and military spending, no matter the measurement of military spending is observed. According to Aydemir et al. (2016), military spending has both positive and negative effects on unemployment in several G20 states, depending on the situation of the country's economy. Furthermore, the positive effects are experienced over in relatively advanced economies, while the negative effects arise from relatively less developed economies. The countries which have neutral effects are those with abundant natural resources.

H3: Military expenditure is positively related to unemployment.

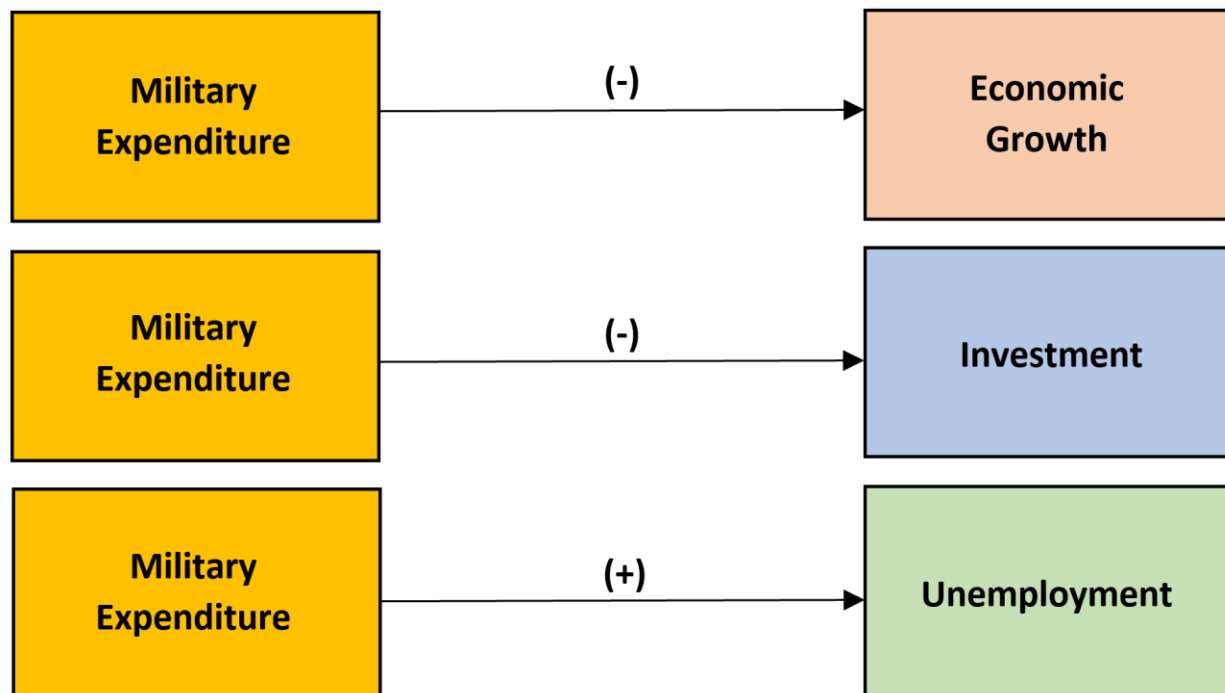
2.4 Synthesis

Military expenditure influences economic growth, investment and unemployment through the reallocation of resources and through spin-off effects. Expenditure in favor of the defense sector drives out resources to more productive sectors in the economy, which in turn reduces total output, leading to a decrease in growth. The reduction of resources to productive sectors will require less manpower for them to operate properly, thus increasing unemployment. In addition to this, increased military expenditure also has an opportunity cost of forgone investments, due to reduction of funds allotted for investments.

2.5 Theoretical Framework

Keynesian economics states that changes in output, employment, and inflation are heavily influenced by aggregate demand. In this light, expenditure that stimulates aggregate demand encourages growth through the addition of capital stocks. However, increased aggregate demand in the defense sector does not necessarily imply an improvement in the economy as a whole, due to the crowding-out of investment. Keynes also argued that unemployment is driven by insufficient aggregate expenditure, wherein full employment can only be obtained by having a sufficient amount of total spending.

2.6 Research Simulacrum



3. Research Method

To identify the individual linear effect of military expenditure on economic growth, investment, and unemployment, the researchers formulated the following simple regression models:

$$RGDP = \beta_0 + \beta_1 \text{MILEX} + \varepsilon$$

$$INV = \beta_0 + \beta_1 \text{MILEX} + \varepsilon$$

$$UE = \beta_0 + \beta_1 \text{MILEX} + \varepsilon$$

where

MILEX = military expenditure as percentage of GDP

RGDP = GDP (constant 2010 US\$)

INV = Gross fixed capital formation (% of GDP)

UE = Unemployment, total (% of total labor force) (modeled ILO estimate)

Annual time series data were collected for 7 ASEAN countries, namely Brunei, Cambodia, Indonesia, Malaysia, Philippines, Thailand, and Singapore from the period of 1993-2019. Military expenditure data were gathered from the SIPRI database, while data for economic growth, investment, and unemployment were gathered from the World Development Indicators (WDI) of the World Bank. Furthermore, samples were classified according to their levels of military spending, as recommended by Azam (2020), by computing the average military expenditure as a percentage of GDP of the samples, which amounts to 2.2%. This result leads to the categorization of countries where Cambodia (1.9%), Indonesia (0.9%), Malaysia (1.9%), Philippines (1.5%), and Thailand (1.6%) are grouped in countries with low levels of military spending by having average military spending below 2.2%, while Brunei (3.8%) and Singapore (3.9%) are considered to have high levels of military spending by exceeding the average of the samples. Additionally, the samples will also be classified according to their income group where Cambodia, Indonesia, Malaysia, Philippines, and Thailand are categorized as middle-income countries, while Brunei and Singapore are categorized as high-income countries.

4. Results

The objective of the study is to validate the general idea from previous findings that military spending has a transitive connection with growth in the economy, investment, and employment are true. The researchers will also look at the impact of military spending on economic growth, investment, and unemployment. Furthermore, it will be analyzed if there is a significant difference with the results if countries are classified according to their income groups and level of military expenditure. Simple regression models were utilized to determine the effect of military expenditure for each of the dependent variables. To do so, annual time series data for economic growth of Brunei, Cambodia, Indonesia, Malaysia, Philippines, Thailand, and Singapore were all gathered from the SIPRI database, and data for investment and unemployment were gathered from the World Development Indicators (WDI) of the World Bank from the time of 1993-2019. Average military expenditure amounting to 2.2% categorizes the country by grouping Cambodia, Indonesia, Malaysia, Philippines, and Thailand in the low military spending group, while Brunei and Singapore are placed in the high military spending group. Additionally, the samples will also be classified according to their income group where Cambodia, Indonesia, Malaysia, Philippines, and Thailand are categorized as middle-income countries, while Brunei and Singapore are categorized as high-income countries.

The data gathered were from the years 1993 to 2019 which shows the shifting values of military expenditure, GDP, investment, and unemployment of the countries Cambodia,

Indonesia, Malaysia, Philippines, Brunei, Thailand, and Singapore. Among the six countries mentioned, only Brunei has a significant event under Unemployment during the years of 2015 to 2019. From 2015 to 2017, the unemployment rate was at its peak; this is due to the oil price drop in February 2016 where it had a severe impact on the economy of Brunei combining with the fall of government revenue by 70% in 2014 and 2015. This led to a limited room for Brunei's government to create jobs. In 2018, the unemployment rate started to decline because of the establishment of an apprenticeship program called i-Ready which increased the employability of unemployed graduates that helps them be prepared for the industry. Another notable factor that made their unemployment decrease is the collaboration by the Ministry of Energy, Manpower and Industry (MEMI) to competent and relevant agencies that produce skilled workers and reskilling local job seekers according to the requirements of the industry (Musa and Idris, 2020). The other five countries' military expenditure, GDP, investment, and unemployment remain to fluctuate in a small-scale manner which indicates that there were no significant events that affected these variables from 1993 to 2019.

The researchers made use of the OLS model for the regression analysis along with transforming the dependent and independent variables. Moreover, they did not follow a uniform transformation of variables to acquire the best diagnostic results. The independent variable and dependent variables are either transformed into their first difference form or transformed into their logarithm form followed by a first difference transformation. However, some countries and their dependent variables exhibited a Durbin-Watson value that is outside the range of 1.50-2.50, indicating an autocorrelation error. Therefore, in these instances, the Cochrane-Orcutt model was also utilized to obtain an acceptable value of Durbin-Watson. It was found that the real GDP, investment, and unemployment of Brunei, Malaysia, Philippines, and Thailand had an insignificant relationship to military expenditure. Additionally, an acceptable Durbin-Watson for unemployment of Brunei could only be acquired by limiting the sample range to 1993-2014.

In Cambodia, the results showed that real GDP is a statistically significant variable to military expenditure at a 5% level of significance with a P-value of $8.12E-11$ at 1% alpha. The coefficient of real GDP represents a negative relationship between the variables, specifically, a single unit increase in military expenditure leads to a decrease of $-8.49602e+010$ in real GDP. The R-squared coming to a value of 0.791559 reveals that 79.16% of the changes in real GDP can be explained by the changes in military expenditure. On the other hand, gross fixed capital formation and unemployment proved to be insignificant variables to military spending.

In Indonesia, the outcome showed that real GDP is a statistically significant variable to military expenditure at a 5% level of significance with a P-value of 0.0116 at 5% alpha. The coefficient of real GDP represents a positive relationship between the variables, specifically, a single unit increase in military expenditure leads to a decrease of 0.117727 in real GDP. However, only 23.75% of the changes in real GDP can be explained by the changes in military expenditure, attributed to the value of R-squared being 0.237505. On the other hand, gross fixed capital formation and unemployment proved to be insignificant variables to military spending.

In Singapore, the outcome showed that real GDP is a statistically significant variable to military expenditure at a 5% level of significance with a P-value of 0.000018 at 1% alpha. The coefficient of real GDP represents a negative relationship between the variables, specifically, a single unit increase in military expenditure leads to a decrease of $-1.63980e+012$ in real GDP.

The R-squared coming to a value of 0.542186 reveals that 54.22% of the changes in real GDP can be explained by the changes in military expenditure. Unemployment also showed to be a statistically significant variable to military expenditure at a 5% level of significance with a P-value of 0.0076 at 1% alpha. The coefficient of unemployment represents a positive relationship between the variables, specifically, a single unit increase in military expenditure leads to an increase of 1.48609 in unemployment. However, only 26.11% of the changes in unemployment can be explained by the changes in military expenditure, attributed to the value of R-squared being 0.261094. On the other hand, gross fixed capital formation proved to be an insignificant variable to military spending.

These results urge the researchers to reject the null hypothesis for real GDP, investment, and unemployment for Brunei, Indonesia, Malaysia, Philippines, and Thailand. In addition to this, the null hypothesis for investment and unemployment of Cambodia, and Indonesia are also rejected, while only unemployment for Singapore is rejected. Conversely, the null hypotheses of the real GDP of Cambodia, and the real GDP and unemployment of Singapore are accepted.

5. Discussion

The finding that the economic growth of Indonesia is positively affected by military expenditure is supported by the studies of Yildirim et al. (2005), Araujo Jr et al. (2006), Arif et al. (2012), Lin and Wang (2019), and Ahmed and Raju (2019). In contrast to the study of Kollias and Paleologu (2017) where they found that a positive relationship is only present in high-income countries, the researchers discovered a middle-income country to have the same correlation. This relationship may exist because Indonesia has a voluntary military system, preventing the reduction in productivity in situations where skilled labor is forced to transfer into the military industry where they will be relatively inefficient. Instead, those who are willingly entering the military industry will contribute to economic growth. In spite of this, it is also possible that their military force increases their productivity through research and development that leads to technological advancements which trickle down to other industries, ultimately increasing productivity. Additionally, the military's use of advanced technologies may be a reason for a more productive defense sector compared to the civilian sector. Conversely, it was found that the economic growth of Cambodia and Singapore is negatively affected by military expenditure, supported by the studies of Dunne and Vougas (1999), Galvin (2003), Chang et al. (2011), Hou and Chen (2012), Dunne and Tian (2013), Korkmaz (2015), and Azam (2020). This may be due to the crowding-out effect of military expenditure that adversely affects civilian consumption by removing resources from more productive sectors which could have been used to develop education, health, and infrastructure. Additionally, Cambodia and Singapore are small countries which give them a disadvantage of possessing scarce resources, further aggravating impeding economic growth if resources are allocated in the defense sector. Moreover, Singapore also revealed a significant positive effect of military expenditure on unemployment supported by the studies of Khan et al. (2015), Qiong and Junhua (2015), Chletsos and Roupakias (2017), and Selase (2019). This shows that large capital inflow in the defense sector provides fewer job opportunities by negatively affecting the economy, supporting the negative relationship between military expenditure and the economic growth of Singapore.

In terms of classifying the nations according to levels of military spending and income groups, no compelling conclusion can be derived to generate a general idea regarding the influence of military spending on economic growth, investment, and unemployment. Most likely, the correlation of the independent variable to the dependent variables is determined by the specific situations of each country. Those countries with expendable resources or faced with external threats are likely to gain a beneficial impact with additional military expenditure, while those with insufficient resources will have detrimental effects by hindering growth in other productive sectors.

6. Conclusion and Policy Implications

This research seeks to investigate the general idea from previous findings that military spending has a transitive relationship with economic growth, investment, and employment and to determine the linear effect of military expenditure on the said variables. It will, later on, be analyzed if there is a trend with the results if countries are grouped by their income groups and level of military expenditure. For this to be done, simple regression models with the use of the OLS method will be employed by using annual time-series data gathered from the SIPRI database and the World Bank. Moreover, average military spending was computed for the samples in order to classify countries according to their level of military expenditure alongside a classification of income groups. In conducting the regression models, some of the Durbin-Watson values were outside an acceptable range, resulting in the application of the Cochrane-Orcutt model to treat the autocorrelation error. The results showed that military expenditure is significantly negatively related to the economic growth of Cambodia and Singapore, positively related to the economic growth of Indonesia, and positively related to the unemployment of Singapore, while the rest are insignificant. Since no trend was identified by classifying the countries into different groups, the researchers deduced that the impact of economic growth varies depending on the circumstances faced by each country.

The conventional belief that allocating budget to the defense sector removes scarce resources from productive sectors of the economy, crowding out consumption, investment, and labor leads to a plausible conclusion of a transitive attribute of the variables, such that if military expenditure negatively affects economic growth, investment and employment are also negatively affected. This study disproves this assumption as results often showed only a single dependent variable to be significantly related to military expenditure. However, based on the results of Singapore with a significant relationship for both economic growth and unemployment, it follows the transitive attribute where economic growth is negative with a consequent negative relationship for employment or a positive relationship for unemployment. From this, a better assumption would be that if economic growth is negative and if either or both investment and employment are significant variables, they are most likely to be negatively affected by military expenditure as well, vice versa. Furthermore, it was also seen that no consistent pattern regarding the relationship of the variables is present when classifying countries according to their income group and level of military expenditure. Overall, the regression result implies the null hypothesis to be accepted for the economic growth of Cambodia and Singapore and the unemployment of the latter. On the other hand, the null hypothesis is rejected for the economic growth, investment,

and unemployment for Brunei, Indonesia, Malaysia, Philippines, and Thailand, as well as the investment and unemployment of Cambodia, and investment of Singapore.

Since the researchers were able to find out that military expenditure, whether increasing or decreasing, is insignificantly related to the economic growth, investment, and unemployment of Brunei, Malaysia, Philippines, and Thailand, there is no possible socio-economic issue that can be addressed by this research on the mentioned countries. Same with the country of Cambodia wherein investment and unemployment are insignificantly related to the increase or decrease of military expenditure. However, both Cambodia and Singapore have negative economic growth in relation to their military expenditures. On the other hand, Singapore has a significant unemployment rate on military expenditures. Meanwhile, Indonesia's economic growth has a significant relationship with its military expenditures. Therefore, the researchers suggest allocating Singapore's expendable resources to focus on its economic growth and labor productivity since military expenditure has a negative effect on the prosperity of the productive sectors of this country; same with Cambodia's situation of economic growth; while Indonesia should continue to support their military spending to further prosper their economic value in the future.

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