Military Expenditure and Economic Growth in SAARC Countries: Pooled and Panel Data Analysis

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Abstract

The purpose of this study is to examine the relationship between military expenditure and economic growth of five SAARC countries by employing the data during the period of 2002 to 2014. Pooled and panel data analyses have been applied on the data. In addition, Pooled Ordinary Least Square Model is used to analyze the regression results. The empirical results show that there is significant and positive relationship between military expenditure and economic growth. This study contributes in the literature and the results of this study have implications for military and economic policymaking.

Keywords: Military Expenditure, Economic Growth, SAARC Countries

1. Introduction

Over the past several decades, the relation between economic growth and military expenditure has been the area of interest for research. Studies have been conducted in both developing as well as developed countries to empirically investigate the relation. Regardless of many researches on this relation, the topic is under the debate. The endogenous theories suggest that government expenditure has a long run effect on economic growth. Benoith’s (1973) pioneer study investigated this issue. It is also empirically evident by a latest study (Odhiambo, 2015), conducted in South Africa, which reveals that in a short-run economic growth and government expenditure are interrelated whereas in the long-run government expenditure is affected by economic growth of a country.

Different kinds of government expenditures have different effects on the growth of an economy. For example, the expenditure on health, education and public infrastructure are considered to be productive and has a positive effect on economic growth. While government expenditure on non-productive spending are subject to a reduction in income growth and hence a negative effect on economic growth. According to Shahbaz et al. (2013), military expenditure has negative impact over economic growth of a country while non-military spending have positive impacts. Although, these theories show the positive relationship of productive government expenditures with economic growth and negative relationship of non-productive spending on economic growth, empirical evidences do not always support it.

Military expenditure is considered to be non-productive government expenditure and hence it should have a negative impact on economic growth because it crowds out the investment from productive spending like health, education and infrastructure hence retarding the economic growth. Hou and Chen (2013) provide empirical evidence supporting this hypothesis for a number of different countries. They conducted study on 35 developing countries and they used the data over the period of 1975 to 2009. They concluded that military expenditures have negative and significant impacts on economic growth of a

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country. According to the latest study, which includes 106 countries and in which data used for analysis from 1988 to 2010, the results show the strong evidences supporting the negative relationship between the military expenditure and economic growth (Dunne and Tian, 2015). They also found that in some countries military spending has no any effect on economic growth.

While Keynesian type aggregate demand effects suggest that military expenditure may enhance economic growth. This theory suggests that any type of government expenditure has a positive effect on economic growth. Hassan et al. (2003) and Yildirim, et al, (2005) also support their hypothesis of positive relationship between military expenditure and economic growth. Hence, there are no clear cut conclusions that can define the effect of military expenditure on economic growth. A latest study by Pan et al. 2015 also concludes the inconsistency of results. The results of the study reveal that there are no such findings which can be generalized about the relation of military expenditure and economic growth. Deger (1986) argues that there are simultaneous changes and counter effects are present that makes the final causality quite difficult. Because of inconsistency in the results of studies on this topic, it is important to empirically investigate the relation between military expenditure and economic growth.

This paper aims to analyze the effects of military expenditures on economic growth of the SAARC countries during the period of 2002-2014 by using a panel data analysis. The purpose of this research is to examine the relationship between the military expenditure and economic growth of the five countries during the period of 2002-2014 by Applying ARDL approach. This study does not only contribute in the literature on military expenditure and economic growth in the context of a developing economy (i.e. Pakistan) but it has implications for military and economic policymaking.

2. Literature Review

Military expenditure and economic growth are debatable issues because military expenditure takes the great amount of budget as well as it is trades off between productive and nonproductive expenditures of a country. The study of issue was coined by Benoith (1973), he took 44 less developed countries (LDCs). This concluded the positive impact of military spending on economic growth. Since then many researchers have tried to explore this matter in different contexts with different methodological models.

According to Chude and Chude (2013), government expenditure and economic growth are related to each other. Benoit (1978) conducted study on military spending and economic growth in developing countries which found the positive relation between military spending and economic growth. He argued that economic growth can be increased by increasing aggregate demand through more spending on military, especially in developing countries because they have mostly underutilized resources which can be used to generate more jobs and in turn economic growth will increase.

According to Keynesian demand theory (1937), military expenditure increases the aggregate demand which in turn leads to economic growth. Hassan et al. (2003) examined the effect of military expenditure on economic growth of five out of seven SAARC countries by using panel data from the period of 1980 to 1999. They found positive correlation between the defense expenditure and economic growth in SAARC countries. It concluded that military expenditure can bring positive impact on economic growth. Dimitraki and Ali (2015) also found the similar results. In addition, study of Yeildirim et al. (2005) on Middle Eastern countries concluded the positive relation between military expenditure and economic growth.

Deger (1986) also argue that economic growth and military expenditures are related. It is considered that defense expenditures takes away the resources from the investment and fail to mobilize and create
additional investment therefore it is hurdle for economic growth (Deger, 1986). He also studied 44 less
developed countries same as Benoit (1978). Empirical analysis depicted negative relation between
military expenditure and economic growth. The results are in contrast with Benoit (1973, 1978) who
concluded the positive relation between military expenditure and economic growth. He further suggested
that military expenditure can boost up economic performance through investment on social and physical
infrastructure like roads and ports, and training and research, so the society will be benefited which will
lead to higher economic performance. Countries’ economic growth is negatively affected by military
spending because more funds utilized in military expenditures the less available for investment (Hou and
Chen, 2013). They empirically evident this phenomena, they examined military expenditures and
economic growth of 35 developing countries from 1965 to 2010. The results of their study show that there
is significant and negative impact of military spending on economic growth. Shahbaz et al. (2013) also
argue that military expenditure have negative impact on economic growth.

A recent study by Dunne and Tian (2015) shows that military expenditure and economic growth are
negatively related in both, long and short-run. In addition, Dunne and Tian (2015) concludes that some
types of countries have no significant relation between military spending and economic performance.
Furthermore, Faini et al. (1984) and Moon and Hyun (2002) also found negative impact of military
expenditure on economic growth. Chang et al. (2014) conducted study in China and G7 countries on relationship between military
expenditure and economic growth from 1988 to 2010. They found different results for countries and
concluded that this relation cannot be generalized over the other countries. While, Grobar and Porter
(1989) argue that there is no relation between military expenditure and economic growth.

Defense expenditure and economic growth has causality relation (Kolliaset al., 2004). They investigated
the 15 European Union countries and concluded the mixed result in term of causal direction. According to
Kolliaset al. (2004), majority of the countries showed unidirectional causality from the economic growth to
defense expenditures. While the results for five countries out of 15 showed no casualty between
variables. Yildrum and Ocal (2006) also support this view and the result suggested that military
expenditure is exogenous variable and it may affect economic activities of the countries. They concluded
that the relation between military expenditure and economic growth by analyzing the data of 10 Middle
East countries from 1988 to 2010. The results also reveal that there are inconsistency of results about the
relationship between military expenditure and economic growth.

It is evident from the past literature that there is inconsistency of the results in the findings. From the
historical point of view, military expenditure and economic growth are positively related. Some empirical
studies also support these findings while some studies show the negative impact of military expenditure
and economic development. Furthermore, some conclude the mix results whereas some argue that there
is no any relation. In addition, some argue that there is causal relation between these variables. This
study further extends the literature as past studies do not provide ample evidences about the impact of
military expenditure and economic growth of country.

3. Research Methodology

The data of military expenditure is taken from SIPRI yearbooks and the data for GDP is taken from
WORLD BANK DEVELOPMENT INDICATORS which was in constant US dollar. The study further
investigates the relationship by employing both the pooled and panel data estimations to validate the
results.
3.1 Pooled Ordinary Least Square (OLS) Analysis

According to Parys et al., (2011), pooled ordinary least square is accounted to estimate the regression models, because it assist to diminish the impact of error between the actual observed point and estimated points. By using OLS, individual and time effect is avoided mostly. For getting the relation between the military expenditure and economic growth of countries, following equation has been developed:

\[ GDP_{i,t} = \alpha + \beta_1 MIL_{i,t} + \varepsilon_i \]

Where GDP represents the economic growth of country \( i \) in year \( t \), and MIL stands for military expenditure of country. The error term is represented by \( \varepsilon_i \) and is considered to be serially unrelated to main zero.

3.2 Fixed Effects Analysis

On the premise of old demonstration, the relationship between gross domestic product and the military expenditures choices is liable to be indicated wrongly on account of the time-invariant segment's avoidance of obligation proportions that are liable to be connected with the variables on right-hand side (Lemmon et al., 2008).

Moreover, previous studies conclude that the model detail relies on the study's goals. There might be the odds of disappointment of the pooled OLS investigation to introduce the genuine relationship between illustrative variables and influence over the organizations as the models identified with central presumptions are not satisfied (Shah and Khan, 2007). As far as the broader examination, distinctive techniques can be used, whether it's arbitrary impact or settled impact.

As per Nickell (1981), fixed effects (FE) model yields a descending one-sided coefficient gauge for slacked subordinate variable. To create these appraisals, this study utilized STATA order "xtreg, fe". Model can be specified as:

\[ GDP_{i,t} = \alpha + \beta_1 MIL_{i,t} + \mu_i + \varepsilon_i \]

Where GDP\(_{i,t}\) represents the Gross Domestic Products for SAARC countries \( i \) in year \( t \), and the military expenditure are size (MIL), and \( \mu_i \) represents the firm fixed effects that control cross-sectional differences. The error term is represented by \( \varepsilon_i \) and is considered to be serially unrelated to main zero.

4. Estimation Results

Results of the study are shown below. Table 1 shows the descriptive statistics of data. The pooled and panel data estimation results are presented in Table 2. Trends in the data over the period of 2002 to 2014 are presented in Graph 1 and 2.
Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>GDP</th>
<th>MILEXP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>6.436174</td>
<td>7.468511</td>
</tr>
<tr>
<td>Median</td>
<td>6.469517</td>
<td>7.206980</td>
</tr>
<tr>
<td>Maximum</td>
<td>7.629951</td>
<td>10.81976</td>
</tr>
<tr>
<td>Minimum</td>
<td>5.479386</td>
<td>5.147720</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.565172</td>
<td>1.820474</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.198875</td>
<td>0.519984</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.182262</td>
<td>2.077849</td>
</tr>
</tbody>
</table>

Table 2: Pooled and Panel Data Estimation Results.

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variable</th>
<th>Pooled OLS</th>
<th>Fixed Effects</th>
<th>Random Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>MIL</td>
<td>0.0066*</td>
<td>0.0253**</td>
<td>0.0228**</td>
</tr>
<tr>
<td></td>
<td>Adj.R^2</td>
<td>0.0417</td>
<td>0.0447</td>
<td>0.0447</td>
</tr>
<tr>
<td></td>
<td>R^2</td>
<td>0.0541</td>
<td>0.0541</td>
<td>0.0541</td>
</tr>
<tr>
<td></td>
<td>F-Value</td>
<td>4.3500</td>
<td>24.860</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(Sig. F)</td>
<td>0.0404</td>
<td>0.0000</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Wald Test</td>
<td>-</td>
<td>-</td>
<td>22.87**</td>
</tr>
</tbody>
</table>

***, ** indicate significant levels at 1% and 5% respectively. Models are corrected for heteroscedasticity. However, random effects should be used because of the insignificance of Hausman Test, which shows the applicability of random effects over fixed effects.

GDP = Gross Domestic Production, MIL = Military Expenditure

Equation (1) and (2) are estimated using the pooled OLS technique and FEM (Fixed Effect Model).

Though the models are corrected for heteroscedasticity, the heteroscedasticity Hausman Test shows the existence of hetero in the data when fixed effects model is used. Due to the insignificance of Hausman Test random effects should be prioritize over fixed effects.

The independent variable MIL shows the significant results (0.0066) in Pooled OLS model at 5% while in random effect the results are significant up to 1% of significance level. Other measurements used to find the good fit of the model are also providing significant results. For example the adjusted R square which
is a statistical measure to show that by how much extend a variable included in a model is relevant. While R2 is also a statistical measure which shows by how much extend the data fitted the variance of the dependent variable. The F-Test defines the overall significance of the model and the Wald test defines the overall joint significance of the model. The F-test shows the significant results.

5. Conclusion

Over the past several decades, the issue of military expenditure and economic growth is the area of interest for research. Hence, the issue is under debate up-till now, because of inconsistency of results revealed from the empirical studies. Historically, it is viewed that economic growth and military expenditure are positively related (Benoith, 1973). Keynesian also supports this view while empirical evidences not support them much. Many studies show the negative relation between these variables whereas some reveals that there is no relation between them. In the literature of defense and economic growth, the issue of military expenditure and economic growth is much controversial and has been debated long. Due to inconsistency of results in the literature, the present study aims to empirically examine this relationship. The data of five out of seven SAARC countries from the period of 2002 to 2012 were used because of the unavailability of the remaining two countries.

The results of this study reveal that there is significant and positive relationship between military spending and economic growth of the five SAARC countries. These results suggest that higher the spending in military the higher economic growth and vice versa. The findings of this study are consistent with Keynesian view and Benoit (1973) who initially study this relation. The results are similar with Hassan et al. (2003), Dimitraki and Ali (2015), Yeildirim et al. (2005) and Zaman et al., (2013). However, the result of the present study are in contrast with Deger (1986), Moon and Hyun (2002), Hou and Chen (2013), Shahbaz et al. (2013), and Dunne and Tian (2015). These findings suggest that military spending boosts the economic growth of a country and military spending is also affected be economic performance of a country. This study contributes in the literature and the findings of present paper have implications for military and economic policy making.

References


