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THE IMPACT OF MILITARY EXPENDITURES ON THE ECONOMIC GROWTH OF THE SELECTED SAARC COUNTRIES

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ABSTRACT

In this study we investigate the impact of military expenditures on the GDP growth of selected SAARC countries (Afghanistan, Bangladesh, India, Nepal, Pakistan and Sri Lanka). For the mentioned aim we used the panel data for the period (2004-2017) and for the estimation we used the FMOLS and DOLS methods of cointegrating regressions. For the short run and long run causality we applied test vector error correction model and Wald test. The impact of military expenditures is positive but insignificant and the impact of alternative variable which is gross fixed capital formation is positive and significant which means using of resources in the military brings big opportunity cost with itself for the region.

Key words: Military expenditures, GDP, SAARC, GFCF.

1. INTRODUCTION

Related to government intervention in market, economists and policy makers face lots of theories. On the one hand mercantilists believed government should have an active role in market economy on the other hand Adam Smith and his classic thought of school are in the part of noninterference of government in market economy to prevent the deficiencies in the market. At the same time Keynesian school of thought believe that government should create demand, when in many cases market economy faces failure, and government needs to interfere in the market. One of those failures that market faces is providing the public goods which is the necessity of society and, at the same time, private sector cannot provide it to public due to features of these goods. which are their marginal cost for individual is nothing and the excludability of individuals from using of goods is impossible that's why government need to produce these goods (Stiglitz, 2000). One of the main government expenditures is the defense expenditure which can affect the economic growth through many channels. The net effect of many

military expenditure on the economic growth is still a controversial issue (Fatah and Sahiloglu, 2016). According to the endogenous growth theory government spending has different impact on the economy, the impact of military spending on economies depend on the size of government intervention and its component of spending. Spending in productive sector could have positive impact (Ram, 1986) as cited in (Pieroni, 2009) but according to Glomm and Ravikumar (1997) as cited in (Pieroni, 2009) increase in government spending in nonproductive sector could have negative impact on the economic growth. The arguments which support the positive correlation between military expenditures and economic growth are: first, research and development in the defense sector could have positive impact on civilian part of the economy, second, with military expenditure, security of the society become stable which encourage the society, third, military expenditures increase the aggregate demand which causes to increase the national output, fourth, such expenditures increase the quantity and quality of in the employment rate and fifth, with investment of military expenditures, private sector could benefits from infrastructures which are made for military Brasoveanu (2010). The arguments which are in the opposite of the above arguments are: first, military expenditures has crowding out impact on the private investment, second, in some cases the opportunity cost of ME could be higher, third, efficiency of resource allocation is less because these goods are not produced by the market economy (Brasoveanu, 2010). In this study relationship between military expenditure and economic growth of six SAARC countries which are Afghanistan, Bangladesh, India, Pakistan, Nepal and Sri Lanka are examined. In this region there is necessity for military due to many threats. Afghanistan is a country which has been in conflict for the decades so it needs to have strong security likewise there is threats for India and Pakistan from each other against and likewise Sri Lanka also faced unsecured from internal militants. Other reasons for the mentioned study are those we have used the data for period 2004-2017 which could be latest data for the mentioned study and we have seen since 2002 conflicts in this region specially in Afghanistan which has impact on the countries' economy and on their security. So, we can say in this period military expenditure could have impact on the economic growth. For the mentioned study data are used for the period of 2004-2017. GDP is the dependent variable and independent variables are military expenditure, investment. The objectives of the study are to answer the questions whether the military expenditure does have positive impact on economic growth? Whether the impact of nonmilitary expenditure is more than military expenditure? So in this study our hypothesis is as following:

H_0: Military expenditure does not have positive impact on the economic growth of six SAARC countries.

H_1: Military expenditure has positive impact on the economic growth of the selected SAARC countries.

For the analysis many tests are performed like ADF unite root test, Johansen co-integration test, short run and long run causality test and regressions with FOLS (fully modified ordinary least square) and DOLS (dynamic ordinary least square) methods will be applied. This study is divided into four sections which are consists of introduction, literature review, Data and methodology with remarks and conclusion respectively.

2. LITERATURE REVIEW

As we know, there are theories about the government intervention in the economies by the government. According to the classic economist, government should not intervene in the market economy, because it will cause to decrease the investment by private sector. Classics believe government expenditure will increase the interest rate and this increasing in rate of interest will lead to decrease (crowed out) in the private investment. The Keynesian school of thought studies the economics from demand side, they believe the government expenditures will increase the aggregate demand and this aggregate demand will increase purchasing power and national expenditures. Researchers studied the impact from either supply side or demand side.

There are lots of studies done regarding to military expenditures and economic growth. Some of the studies show the positive impact of military expenditures on the economic growth, as mentioned earlier some show negative and some show insignificant impacts.

A study done by Ageli and Zaidan (2013) using the unit root test in the form of Augmented Dickey - Fuller to show the stationarity and non-stationarity of data. The result shows the non-stationarity of all

variables. Finally, by using co-integration analysis and Granger Causality test and error correction model, it was proved that ME has been significant for the non-oil GNP of Saudi Arabia.

Another study in the case of Turkey done by the Gokmenoglu, Taspinar and Sadeghieh (2015), using the data for the period 1988-2013 shows the co-integration between variables in the long run and by using Granger Causality test it is found that there is uni-directional relationship running from economic growth to military to military expenditures, however evidence of causality from ME to GDP not found.

According to Apanisile (2014) military expenditure has negative impact on the out in the short run and positive in the long run but capital and labor have positive impact both in the long and short run in the case Nigeria. The study proposed the government to concentrate more on human capital than military expenditures.

In the case of Pakistan Hussain, Hussain and Erum (2015) examine the impact of defense expenditure on the poverty and it was found that defense expenditures have positive impact on the poverty. 1 percent increase in defense expenditures will increase poverty by 58 percent.

Korkmaz (2015) models the impact of military expenditures on the economic growth and unemployment rate of the Mediterranean countries. In this model data was used for the period 2005-2012 and panel data analysis was used as a method. The impact of military expenditures on the economic growth of Mediterranean countries found as negative and on the unemployment rate found as positive.

Khalid, Abdul and Mundahil (2015) using ARDL it was found that in the US economy government civilian expenditures affect the economy positively but military expenditures affect the economy of US negatively. This study uses the data for the period from 1970 to 2011.

Ajmair, Hussain, Abbasi and Gohar (2017) using the time series data for the period from 1990 to 2015, by using ARDL method it was found that military expenditure has negative impact on the economy of Pakistan in the long run but the number of person in the military positively related to the GDP of country.

Brasoveanu (2010) examined the relationship between military expenditure and economic growth in the case of Romania, by using the cluster analysis, quintile analysis; regression method and Granger Causality the result show the negative relationship between the variables.

Abell (1994) Examine the relationship between military expenditure and income inequality the result shows that increase in military expenditure cause to increase in income equality.

Tasiran, A. C. and Elveren (2017) examined the relationship between military expenditure, income inequality and profit for the 21 developing countries, the data was used for the period 1988-2008. The result shows that military expenditures have negative impact on the income inequality and income inequality has negative impact on the profit rate but military expenditure has relatively small positive impact on the profit rate.

Zaman, Shah, Khan and Ahmad (2013) studied the impact of ME and growth on external debts in the case of of SAARC countries. The result shows negative impact by the ME on the external debts and positive impact by the economic growth on the external debts. For the mentioned study the data was used for the period of (1988-2008).

Ismail (2017) models the relationship between ME and GDP in south Asian region. The result shows ME has neither effectiveness nor efficiency on the economic growth.

3. DATA AND METHODOLOGY

For the empirical analysis the current study has used the data for the six south Asian countries from 2004 to 2017. The dependent variable is GDP at current US dollars and the military expenditure and gross fixed capital formation were taken from the World Bank data site. The logarithmic form of the data was used to avoid econometric problem. The model in specific form is give as below.

$Log(Yit)=\alpha+\beta 1Log(Mit)+\beta jlog(Gitj)+\varepsilon it$ For i=1, 2,…, N; t=1, 2…,T and j=1,2,3

Where

α_o: constant of model

β_1= coefficient of independent variable

M= independent variable which stands for military expenditures of i_{th} country at the time T.

G= independent variable which stands for gross fixed capital formation.

Y= Dependent variable Gross Domestic Product of i^{th} country at the time T.

ε = error term.

Before testing the data for the estimation, we will calculate the individual descriptive statistics, than aggregate descriptive statistics, than we need to examine the stationarity of the data to be known its being stationary or non-stationary, after that if our variable became non stationary we apply the Johensen co-integration test under the null hypothesis (no co-integration exists amongst the variables) is applied. For the causality between variables the Granger causality test will be applied.

Table 1. Individual Descriptive Statistics

Mean	1.52E+10	1.77E+12	1.85E+11	1.24E+11	6.02E+10	1.65E+10
Median	1.59E+10	1.72E+12	1.80E+11	1.19E+11	5.91E+10	1.63E+10
Maximum	2.07E+10	2.66E+12	2.41E+11	1.80E+11	8.25E+10	2.15E+10
Minimum	8.24E+09	1.11E+12	1.39E+11	8.06E+10	3.92E+10	1.24E+10
Std. Dev.	4.54E+09	4.86E+11	2.95E+10	3.13E+10	1.46E+10	2.91E+09
Skewness	-0.246037	0.384502	0.352529	0.340538	0.087535	0.178731
Kurtosis	1.507019	2.025031	2.286248	1.968411	1.643616	1.80393
Jarque-Bera	1.441492	0.89946	0.587153	0.891356	1.091082	0.909044
Probability	0.486389	0.6378	0.745592	0.64039	0.579528	0.634751
Sum	2.12E+11	2.48E+13	2.60E+12	1.73E+12	8.43E+11	2.31E+11
Sum Sq. Dev.	2.68E+20	3.07E+24	1.13E+22	1.27E+22	2.78E+21	1.10E+20
Observations	14	14	14	14	14	14
Descriptive statistics						
Mean	2.05E+08	3.84E+10	6.86E+09	1.54E+09	1.40E+09	2.24E+08
Median	1.99E+08	3.72E+10	6.57E+09	1.58E+09	1.36E+09	2.26E+08
Maximum	2.98E+08	4.61E+10	8.32E+09	2.23E+09	1.66E+09	2.60E+08
Minimum	1.31E+08	3.20E+10	5.78E+09	1.12E+09	1.11E+09	1.94E+08
Std. Dev.	55488263	4.36E+09	9.76E+08	3.72E+08	1.85E+08	17890324
Skewness	0.375944	0.465753	0.647357	0.475069	0.038377	0.478251
Kurtosis	1.922288	2.12211	1.769548	2.074526	1.588143	2.948871
Jarque-Bera	1.007299	0.955731	1.861008	1.026238	1.166218	0.535215
Probability	0.604321	0.620106	0.394355	0.598626	0.55816	0.765208
Sum	2.87E+09	5.38E+11	9.60E+10	2.16E+10	1.96E+10	3.14E+09
Sum Sq. Dev.	4.00E+16	2.47E+20	1.24E+19	1.80E+18	4.46E+17	4.16E+15
Observations	14	14	14	14	14	14
Descriptive statistics	**AF_GFCG**	**IN_GFCF**	**PAK_GFCF**	**BAN_GFCF**	**SRI_GFCF**	**NE_GFCF**
Mean	2.45E+09	4.72E+11	2.96E+10	3.23E+10	1.37E+10	3.28E+09
Median	2.51E+09	4.60E+11	2.72E+10	3.10E+10	1.45E+10	3.33E+09
Maximum	2.91E+09	5.75E+11	4.08E+10	4.73E+10	1.77E+10	4.61E+09
Minimum	1.56E+09	3.44E+11	2.25E+10	2.52E+10	8.96E+09	2.31E+09
Std. Dev.	4.11E+08	7.03E+10	6.51E+09	6.91E+09	3.17E+09	6.28E+08
Skewness	-0.822067	-0.015162	0.750819	0.884332	-0.123398	0.218375
Kurtosis	2.664744	2.03449	2.081771	2.729624	1.392466	2.792982
Jarque-Bera	1.642416	0.544325	1.807201	1.86741	1.54296	0.136271
Probability	0.4399	0.76173	0.405108	0.393095	0.462328	0.934134
Sum	3.43E+10	6.61E+12	4.14E+11	4.52E+11	1.92E+11	4.59E+10
Sum Sq. Dev.	2.20E+18	6.42E+22	5.51E+20	6.20E+20	1.31E+20	5.12E+18
Observations	14	14	14	14	14	14

The descriptive statistics states inequalities amongst the countries, if we compare the Indian GDP with Nepal and Afghanistan, we can see the big difference. Likewise, big differences could be considered in the part of military expenditures amongst the countries. For instance, Indian military expenditure is 187 more than Afghanistan and Pakistan military expenditure between 2004 and 2017 averagely 33 times bigger than Afghanistan.

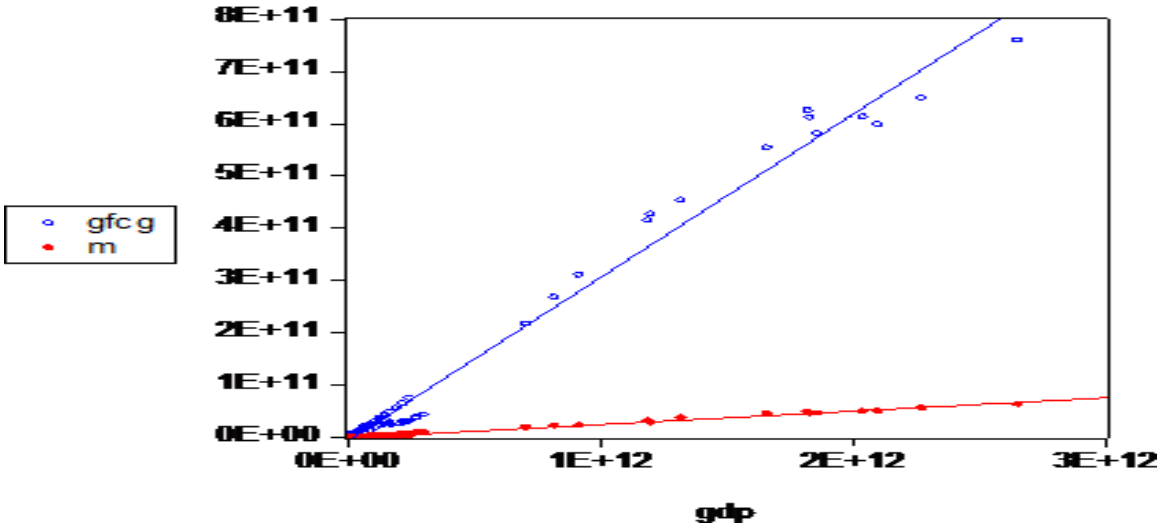
Table 2. Aggregate Descriptive Statistics

Statistics	GDP	Military expenditures	GFCF
Mean	3.48E+11	8.97E+09	1.03E+11
Median	8.01E+10	1.61E+09	2.18E+10
Maximum	2.27E+12	5.66E+10	6.49E+11
Minimum	6.97E+09	1.31E+08	1.84E+09
Std. Dev.	6.18E+11	1.61E+10	1.98E+11
Skewness	2.009011	1.928018	1.935249
Kurtosis	5.507009	5.13445	4.994794
Jarque-Bera	61.68139	53.41845	52.1399
Sum	2.29E+13	5.92E+11	6.82E+12
Sum Sq. Dev.	2.48E+25	1.68E+22	2.55E+24
Observations	66	66	66

Table 3. Covariance Analysis

Sample: 2004 2017			
Included observations: 84			
Correlation			
Probability	GDP	GFCG	M
GDP	1		
GFCG	0.993602	1	
	0	-----	
M	0.995555	0.990281	1
	0	0	-----

After descriptive analysis we perform the correlation analysis. From correlation analysis it clearly seems that variables have positive and strong correlations with each other as the P value is 0 and the coefficient value for all variables are more than 99 so we can say there is strong correlation amongst the variables.



Graph 1. Correlation Relationship with Regression Line

The Graph 1 also indicates correlation amongst the variables in which regressions line is upward for both variables gross fixed capital formation and military expenditures.
For the examining stationarity and non-stationarity of the data the unite root test are examined. Unite root test are applied by using the ADF-FC test and IPS test.

Table 4. Unite Root Test

METHOD	GDP		ME		GFCF	
	LEVEL	FD	LEVEL	FD	LEVEL	FD
ADF FC	4.32256 (0.9769)	24.9539 (0.0150)	14.7452 (0.2557)	28.4414 (0.0048)	11.1544 (0.5157)	22.8019 (0.0295)
IPS	3.27039 (0.9995)	-2.27387 (0.0115)	-0.64496 (0 0.2595)	-2.74719 0.0030	0.61795 (0.7317)	-2.0561 0.0199

In the Table 4 probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

In level the data is non-stationary but when we convert the data into the first difference our data become stationary and it means our variables are ready for Johansen Co-integration test.

Table 5. Co-integration Test

Series: LOGGDP LOGGFCG LOGM				
Null Hypothesis: No cointegrating				
Trend assumption: Deterministic intercept and trend				
			Weighted	
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	55.84345	0	83.12817	0
Panel rho-Statistic	1.708656	0.9562	1.412566	0.9211
Panel PP-Statistic	0.259027	0.6022	-1.032169	0.151
Panel ADF-Statistic	-2.198184	0.014	-2.355537	0.0092
Alternative hypothesis: individual AR coefs. (between-dimension)				
	Statistic	Prob.		
Group rho-Statistic	2.354946	0.9907		
Group PP-Statistic	-4.706135	0		
Group ADF-Statistic	-3.029714	0.0012		

Table 6. Pedroni Residual Cointegration Test

Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)				
Hypothesized	Fisher Stat.*		Fisher Stat.*	
No. of CE(s)	(from trace test)	Prob.	(from max-eigen test)	Prob.
None	99.34	0.0000	68.91	0.0000
At most 1	50.48	0.0000	34.43	0.0006
At most 2	37.18	0.0002	37.18	0.0002
* Probabilities are computed using asymptotic Chi-square distribution.				

For the examination the co-integration of variables we performed the Johansen fisher panel co-integration test and Pedroni residual co integration test, the results of our test rejects the null hypothesis clearly so we can say there is co-integration amongst the variables.

As we know variables are co-integrated so, now we can run FMOLS (fully modified ordinary leas square) test which is better to deal with serial correlation.

Table 8. FMOLS Estimation

Dependent Variable: LOGGDP				
Method: Panel Fully Modified Least Squares (FMOLS)				
Long-run covariance estimates (Bartlett kernel, Newey-West fixed bandwidth)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGGFCG	1.019555	0.104099	9.79408	0
LOGM	0.0519	0.11583	0.448076	0.6554
R-squared	0.950993	Mean dependent var		10.96517
Adjusted R-squared	0.950348	S.D. dependent var		0.71369
S.E. of regression	0.15903	Sum squared resid		1.92207
Long-run variance	0.06041			

According to the result of FMOLS the impact of gross fixed capital formation is positive and significant and the impact of military expenditures is positive but insignificant. In the results the impact of gross fixed capital formation is 1.019 at significant level and impact of military expenditures is 0.05. Furthermore, R-squared and adjusted R squared value is good in the our estimation.

Table 9. Method: Panel Dynamic Least Squares (DOLS)

Dependent Variable: LOGGDP				
Method: Panel Dynamic Least Squares (DOLS)				
Long-run variance (Bartlett kernel, Newey-West fixed bandwidth) used for coefficient covariances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGGFCG	0.933611	0.18403	5.073149	0
LOGM	0.146695	0.202835	0.723221	0.4755
R-squared	0.970362	Mean dependent var		10.96633
Adjusted R-squared	0.931198	S.D. dependent var		0.711108
S.E. of regression	0.186525	Sum squared resid		0.974166
Long-run variance	0.035398			

As FMOL is a non-parametric estimation and deals with correlation problems besides FMOLS we used another estimation which is called dynamic ordinary least square which deals with endogeneity of regressors. The results got from the DOLS approach, impact of GFCF is positive and significant but the impact of military expenditures is insignificat.

Table 10. Panel Causality Test

Dependent Variables	Panel Causality Test (independent variables) F- Statisitcs	Coeffecint		
	Short- run	Long -run		
	GDP	GFCF	Military EX	ECT
DGDP		10.85**	21.12***	0.003
DGFCF	1.14		14.07***	0.32**
DMilitary Ex	15.008***	5.86		0.22*

The last test we applied is panel causality test. According to the results of table10 there is long run causality from when we have GFCF and ME as dependent variables but the value is positive which should have been negative (less then minus 1 bigger then 0). In the short run there is causal relationship running from gross fixed capital formation and military expenditures to gross domestic product. Also there is causality running from ME to GFCF in the short run but no causality from GDP to GFCF. Furthermore, there is bidirectional causal relationship between ME and GDP at 1% significance level.

4. CONCLUSIONS

In this study, we wanted to investigate the impact of military expenditures on the economic growth of the selected SAARC countries by using panel data for the period of (2003-2017). The first thing that we found there was inequalities amongst countries. For our estimations we performed many tests. The first

applied test was unite root test to know the data's being stationarity and according to the result of unite root test our data was non stationary in the level and stationary in the first difference, then we applied the Johansen co-integration test and results showed that there was co-integrations amongst the variables. After the co-integration we applied the co-integrating regression by using FMOLS and DOLS methods. In both method methods FMOLS and DOLS the impact of military expenditures was positive but insignificant and the impact of alternative resource which is gross fixed capital formation was positive and significant. It means that the opportunity cost of military expenditures is higher. It will be better for this region to decrease the military expenditures and increase the investment expenditures which helps the economic growth.

REFERENCES

ABELL, J. D. (1994). Military Spending and Income Inequality. *Journal of Peace Research*, 31(1), 35-43

AGELI, M. M. and ZAIDAN, S. M. (2013). Consequential Effect of Defence Expendature on Economic Growth of Saudi Arabia:1970-2012. *International Journal of Economics and Finance*, *5*(2),155-163.

AJMAIR, M., HUSSAIN, K., ABBASI, F. A. and GOHAR, M. (2017). The Impact of Military Expenditure on the Economic Growth of Pakistan. *Applied Economics and Finance*, *5*(2),41-48.

APANISILE, O. T. (2014). Does Military Expenitures Influence Economic Growth in Nigeria during 1989 - 2013? A Bound Testing Approach. *Romanian Journal of Fiscal Policy*, *5*(2),56-71.

BRASOVEANU, L. O. (2010). The Impact of Defense Expenditure on Economic Growth. *Institute for Economic Forecasting*, (4),148-167.

FATAH, A. A. and SAHILOGLU, S. (2016). A comparative Study of the Impact of Defense Expendatures on Economic Growth in Indonsia and Turkey. *The Journal of Defense Sciences*, *15*(1),55-77.

GOKMENOGLU, K. K., TASPINAR, N. and SADEGHIEH, M. (2015). Military Expenditure and Economic Growth: The Case of Turkey. *Procedia Economics and Finance*, *25*(2015),455-462.

GLOMM, G. A. and RAVIKUMAR (1997). Productive Gorvernment Expenditures And Long Run Growth. *Journal Of Economic Dynamics And Control*, *21*(1), 184-204.

HUSSAIN, F., HUSSAIN, S. and ERUM, N. (2015). Is Defense Expenditure Pro Poor or Anti Poor in Pakistan? An Empirical Investigation. *Pakistan Development Review (PDR)*, 54(4),875-894.

ISMAIL, S. (2017). Military Expenditure and Economic Growth in South Asian Countries: Empirical Evidences. *International Journal of Economics and Financial Issues*, 7(3), 318-325.

KHALID, M. A., ABDUL, R. and MUNDAHIL A. J. (2015). The Impact of Military Spending on Economic Growth: Evidence from the US Economy. *Research Journal of Finance and Accounting*, 6(7),182-190.

KORKMAZ, S. (2015). The Effect of Military spending on Economic Growth and Unemployment in Mediterranean Countries. *International journal of Economics and financial Issues*, *5*(1), 273-280.

PIERONI, L. (2009). Military Expenditure And Economic Grwoth. *Defence and Peace Economics*, *20*(4), 327-339.

RAM, R. (1986). Government Size and Economic Growth: A New Framework and Some Evidence from Cross-Section and Time-Series Data. *American Economic Review*, *76*(1), 191-203.

STIGLITZ, J. (2000). *Economics of the Public Sectors*. New york: W.W Norton and company, I.

TASIRAN, A. C. and ELVEREN, A. C. (2017). Soft Modelling of Military Expenditures, Inequality and Profts [Mimeo]. https://www.aeaweb.org/conference/2017/preliminary/paper/DRSifQkh.

ZAMAN, K., SHAH, I. A., KHAN, M. M. and AHMAD, M. (2013). Impact of Military Expenditure and Economic Growth on External Debt: New Evedince from a Panel of SAARC Countries. *Journal of Economics and Social Science*, 3(2),131-146 .